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## **INTRODUCTION**

Journal of Accounting and Finance in Emerging Economies (ISSN: 2519-0318 & eISSN: 2518-8488) is a bi-annual open access research journal published by CSRC Publishing, Center for Sustainability Research and Consultancy Pakistan. The journal is independently managed by the advisory board and associate fellows of CSRC comprising of distinguished faculty at higher education institutions. The journal aims to cover topics and issues in various sub-areas of finance and accounting in context of emerging and developing economies. Purpose is to highlight the practical insights on the challenges faced by theorists and practitioners in these economies. The journal specially welcomes submissions which cover the topical areas related to sustainable accounting and financial policy.

## **SCOPE AND MISSION**

Finance and accounting are seen as basic mechanics for achieving markets efficiency and also considered as catalysts for design and successful implementation of market-based financial decision making related to economic policies in emerging and developing economies. With this background JAFEE aims to be a forum for discussion of high impact research in emerging economies covering general areas of accounting and finance. The journal is open to both academicians and practitioners in its subject areas.

The journal covers a wide range of areas in accounting and finance. It considers articles written in all areas of accounting in emerging economies including but not limited to accounting education, auditing, corporate social responsibility (including environmental accounting and disclosure) corporate governance, financial reporting, management accounting and performance measurement systems, not-for-profit organizations and public sector accounting, taxation, zakat and Islamic accounting. The journal also covers all areas of finance in emerging economies relating to banking, capital market, corporate finance, equity valuation and analysis, Islamic finance, microfinance, and venture capital.



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## Testing Market Efficiency, Predictability and Profitability at Pakistan Stock Exchange Using Firm-level Data

<sup>1</sup>Syed Arshad Ali Shah, <sup>2</sup>Naimat Ullah Khan, <sup>3</sup> Muhammad Daud Ali

<sup>1</sup> PhD Scholar at Institute of Management Studies, University of Peshawar Pakistan Email: arshad@bkuc.edu.pk

<sup>2</sup> Assistant Professor at Institute of Management Studies, University of Peshawar, Pakistan: Email: naimatims@yahoo.com

<sup>3</sup> Assistant Professor Department of Management Sciences, University of Haripur, Pakistan: Email: dr.daud@uoh.edu.pk

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p>This study examines market efficiency in the light of the simple moving average technical trading rules on daily closing share prices of 100 companies listed on Pakistan Stock Exchange over ten years from 2006 to 2015. The results show strong support for simple moving average rules having both predictability and profitability for PSX. It refers that the returns from these rules are not same as investors earn from a naïve buy and hold strategy. The uses of these simple moving average rules produce abnormal returns to investors and hence nullify the weak form of efficiency on PSX.</p>
<p><b>Keywords</b> Simple Moving Average Rules; Predictability; Naïve Buy and Hold Strategy; Pakistan Stock Exchange; Efficient Market Hypothesis</p>	

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Corresponding author's email address: arshad@bkuc.edu.pk

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### 1. Introduction

Market efficiency and technical trading rules (TTRs) are important for practitioners and researchers to judge the predictability and non-predictability of shares. Technical analysis is assumed to be one of the primary types of investment technique which traces back to the Dow theory, that was established by Charles Dow and further established by William Peter Hamilton in the 1800s. It states that security prices move in definite stages with foreseeable patterns. On the basis of this concept, the prices in moving trends are determined by the shifting behaviour of investors in the direction of a change of political,

monetary, psychological, and economic factors. Pring (2002) documented that “the skill of technical technique is to recognize trend deviations at a comparatively initial phase and to uphold an investment position up to the weight of signshows that the trend has overturned” (p. 3).

The beliefs of the technical analysis for making investment decisions are based on historical market data. Its purpose is to construct buying and selling rules that maximize the wealth of the stockholders and control the risk of loss. According to the EMH, market follows random walk and investors cannot predict future share returns based on the assumption of past data. Resultantly, the TTRs are futile as they can neither be applied in the predictability nor to earn abnormal profit. If shareholders can make abnormal profit by using these rules it shows that the market is inefficient (Tharavanij, Siraprasiri, & Rajchamaha, 2015).

In case of emerging<sup>1</sup> financial markets, the study conducted by Bessembinder and Chan (1995) suggested that SMA and TRB are quite useful to forecast profitability in the stock exchnages of Taiwan, Malaysia, and Thailand. The study conducted by Gunasekarage & Power (2001) in South Asian markets to find out the predictability of TTRs, and the results showed that rules had forecasting power in South Asian financial markets. The present study examines the weak form of market efficiency with the help of TTRs in the capital market of Pakistan. The current study is different from existing literature because it is among the first studies which uses technical trading rules to examine the EMH on the PSX. In addition, this study uses the firm share prices data instead of index data. Simple Moving Average (SMA) rules are applied for technical analysis of the market in this research article. One of the significant findings of this paper is to recommend to the policy makers that the financial market may be given more liberalization in order to reduce the overt reliance on loans. Moreover, the regulatory bodies should focus to enhance the level of access to information and transparency for listed firms on PSX, and also established a policy that educates all the market participants on investment decision making. In addition, this paper may also benefit decision makers who have participated in various aspects of capital market, especially, those studying the efficiency and profitability of SMA rules. Remaining of the paper is as follows: Section 2 is about Review of Literature followed by Section 3 on Methodology; Section 4 shows results and the last Section concludes the study.

## 2. Review of Literature

The financial market of a country plays a very essential part in developing the economic growth (Dsouza and Mallikarunappa, 2015). According to EMH, the stock prices fully reflected relevant information in the market and investors cannot earn abnormal profits on the basis of public or private information of the past (Fama, 1970). Fama (1970), categorized EMH into three forms, i.e., Strong form of efficiency, Semi-Strong form of efficiency and Weak-form of efficiency. The Weak form of EMH assumes the availability of the previous stock prices, whereas, Semi-strong form of EMH assumes the availability of public information and including past stock prices to all participants. The Strong form of EMH assumes the availability of public and private information to all investors with no information asymmetry (Fama, 1970). This study tests Weak form of EMH with the help of simple moving average rules. It assumes that investors cannot outperform the stock exchange based on past share prices.

However, a number of of the research works confirmed the usefulness of the TTRs in predictability. (Yu, Nartea, Gan, & Yao, 2013; Metghalchia, Marcucci, & Chang, 2012; Gunasekarage & Power (2001); Bessembinder & Chan, 1995; Brock, Lakonishok & LeBaron, 1992). Brock et al. (1992) tested TTRs, i.e., Simple Moving Average (SMA) and Trading Range Breakout (TRB) rules and suggested that these rules have the substantial forecasting power in DIJA index of the USA capital market. Another study conducted to investigate the forecasting power of the SMA and TRB rules and found that both the rules had

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<sup>1</sup>. This paper adopts the definition of emerging markets, which is used by IFC.

forecasted ability in the Taiwan, Malaysia, and Thailand equity markets, after considering the transaction costs. However, in the financial markets of the more established stock exchanges of Hong Kong and Japan had weak predicting ability (Bessembinder & Chan, 1995).

The study conducted by Gunasekarage and Power (2001) investigated the forecasting power of SMA rules in the four leading South Asian stock exchanges, i.e., Dhaka, Colombo, Bombay and Karachi Stock exchange, using daily index data. The results indicated that the four the markets had the predictable in stock prices. They observed that by using these trading rules the investors could earn excessive returns from the South Asian financial markets. Mitra (2011) studied the predictability and profitability of SMA rules and showed that SMA rules had predictability power the stock prices in the four Indian equity markets. In his study of the market he did not take the transaction cost into account. Finally, he documented that investors could earn excess returns from SMA. Yu, Nartea, Gan, and Yao (2013) took a sample of five leading Southeast Asian markets<sup>2</sup>, for the time period 1991 to 2008, with the help of SMA and TRB. . The findings suggested that the rules had stronger predicting ability in security price movement in the emerging markets except in the developed market of Singapore. They further suggested that after considering the transaction cost the rules were profitable to some extent in Thailand.

Tharavanij et al., (2015), tested technical trading strategies in five Southeast Asian financial market indices namely, JSX composite index, FTSE Bursa Malaysia KLC index, PSE composite index, FTSE straits time index and SET index, in Indonesia, Malaysia, Philippines, Singapore and Thailand respectively, from 2000 to 2013. They found the predictability of rules in the Thailand, but did not support the developed market of Singapore. These rules also generated abnormal returns in the three stock markets of Indonesian, Malaysian and Philippine. Though, after considering trading costs, maximum of the rules did not produce net returns. Study of Khan, Khan, Hussain, Shah, and Abbas (2017) observed that KSE-100 index is not a weak form efficient. They used data on KSE-100 index and employed various technical analyses such as an exponential and simple moving average rules with the generalized regression neural network. The research conducted by Khan, Aman, and Khan (2016) rejected the random walk hypothesis and claimed that investors can earn abnormal profits. The study of Almujaed, Fifield, and Power (2108) employed the technical trading rules for the forty two firms of Kuwait Stock Exchange and found that the filter rules had predictability power of stock prices in KSE.

The above literature has confirmed that the trading rules are efficient and have predictability in the case of emerging markets as well as developed markets. That implies the essence of the efficiency in these markets. In addition, the above studies use index data for analysis. The uniqueness of the study is the use of daily share prices of 100 firms listed on PSX over the period 2006 to 2015 using SMA rules.

### 3. Methodology

#### 3.1 Data

This study uses firm level daily closing share prices of 100 firms listed the PSX. These firms have been chosen on the basis of highest market capitalization since January 2, 2006. The time span covers a ten year from the January, 2006 to December, 2015. The returns for each company are computed as follows:

$$R_{it} = \text{Ln} [(I_{it} / I_{it-1})]$$

Where  $R_{it}$  is the return on a share  $i$  for the day  $t$ ,

$I_{it}$  is the stock price at time  $t$ ,

$I_{it-1}$  represents the stock price at time  $t-1$ ,

Ln denotes the natural logarithm.

---

<sup>2</sup>Thailand, Indonesia, Singapore, Philippines, and Malaysia

This paper opts technical trading rules of SMA, which according to Brock et al., (1992) are the simplest as well as most widely used in such analyses. These rules are used to gauge predictability and potential profitability. The SMA rules produced buy and sell signals on the basis of movement between short and long run period of share prices. The SMA rules involve buying (selling), when the short run period cross below (above) the long run period. The concept behind the application of the SMA rules is established on the assumption that time series data is unpredictable and may have movements in these series.

SMA rules are further divided in two categories; Variable Length Moving Average (VLMA) and Fixed Length Moving Average (FLMA) rules also known as Variable Moving Average, VMA and Fixed Moving Average, FMA rules. Brock et al., (1992) defined VLMA as, "A buy or sell signal initiates once the short run period cross above (below) the long run period by an amount higher than size of the bandwidth" (pp. 1735-1736). As per this rule, no signal is produced until the short run period is within the bandwidth. This rule suggests a policy where the investors take long position as the short run period moves above the long run period. Moreover, the investors should want in the market till the short run period moves below the long run period which signal for sale. If the band is 0%, this technique categorizes a full day into one or the other buys (sells).

The FLMA rule emphasizes on the crossover of the long run period by the short run period. Brock et al. (1992) define FLMA as "A buy (sell) signal is produced when short run period cross the long run period from above (below)" (p. 1736). The technician presume that returns must be changed for some days after signals are produced. Once a signal is initiated, the investors should stay in the same situation (buy/sell) for at least ten-day period (the study assume ten day study). (Brock et al. (1992). When the stipulated days are lapsed, the rule allows reacting to a new signal.

This study uses the same selection of lengths for short and long run period and the size of bandwidth which is used by Brock et al., (1992). For each VLMA and FLMA rules, the paper evaluates the 10 variation of the rules; (1,50,0); (1,150,.0); (5,150,0); (1,200,0); (2,200,0); (1,50,.01); (1,150,.01); (5,150,.01); (1,200,.01) and (2,200,.01). The rules vary from one another with regard to the length of the short run period and long run period and by the size of the bandwidth. In the parentheses, the left figure signifies the number of day's short run period' and the middle figure signifies the number of days in 'long run period' and the right side figure denotes the 'band size'. For example (1, 50, 0) 1 denotes short run period, 50 denotes the long run period and 0 represent the size of bandwidth in percentage.

The Buy and Sell signals are produced as follows:

$$\sum^S R_{i,t} / S > (1+ X) \sum^L R_{i,t-1} / L = \text{Buy} \quad (1)$$

$$\text{AND } \sum^S R_{i,t} / S < (1+ X) \sum^L R_{i,t-1} / L = \text{Sell} \quad (2)$$

$$R_{i,t} = (P_{i,t} - P_{i,t-1}) / P_{i,t-1}, \quad (\text{and } X=0\% \text{ and } 1\%)$$

Where  $R_{i,t}$  is the daily return of the PSX in the short run period S (1, 2 or 5 days);  
 $R_{i,t-1}$  is the daily return of the PSX in the long run period L (50,150 or 200 days);  
 $P_{i,t}$  is the daily closing prices PSX at time t And X is the percentage of band zero and one percent respectively.

This method is reiterated each trading day within order to take account of a constant shifting, moving average of the last N days. For VLMA rules, the buy position is held until the sell signal is initiated by the above equation 2:



### 3.2 Conditions for Predication for VLMA and FLMA Rules

According to Hudson et al. (1996), if a financial market follows the following conditions for VLMA and FLMA rules, then we are saying this particular financial market has the predictive ability.

1. If the number of signals for the buy is similar to the number of sell signals for both rules.
2. If the buy generate positive mean (return) and sell generate negative mean (return) for both rules.
3. If the buy and sell mean is considerably different from the unconditional mean of one day for VLMA and ten days for FLMA rules.
4. The profit can be earned from VLMA rules when the length of long period is increased similarly for FLMA.

### 4. Results and Discussions

Table 1 refers the summary statistics of the ten years for daily (Panel A) and ten days returns (Panel B). Panel A shows the results of one day return, which is used for comparison the result of VLMA method. One day mean return of 0.089 percent is reported by sample firms. The standard deviation of returns resulted to be 2.04 percent as per our analysis. The panel B reports 10-day returns, which is calculated for the purpose of comparing with the finding of FLMA.

**Table 1 panel A: Basic statistics of daily return of PSX.**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
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Panel A (Average Daily)		Panel B (Average 10 days)	
Mean	St.Dev	Mean	St.Dev
0.000890	0.020447	0.001801	0.019521

PERIOD	Rules	N.BUYS	N.SELLS	BUY Mean	SELL Mean	Buy > 0	Sell > 0	Buy -Sell
2006-2015	(1,50,0)	49294	49279	0.00718	-0.00719	0.022590	0.002563	<b>0.014370</b>
				(33.93259)	(-33.89455)			(52.296130)
2006-2015	(1,50,.01)	49276	49261	0.00718	-0.00718	0.022603	0.002572	<b>0.014360</b>
				(33.91998)	(-33.88195)			(52.275160)
2006-2015	(1,150,0)	49021	49012	0.00725	-0.00726	0.022353	0.001662	<b>0.014510</b>
				(34.18826)	(-34.14752)			(52.666900)
2006-2015	(1,150,.01)	49008	48999	0.00725	-0.00726	0.022364	0.001682	<b>0.014510</b>
				(34.17818)	(-34.13744)			(52.650323)
2006-2015	(5,150,0)	22299	22286	0.00377	-0.00378	0.024660	0.015246	<b>0.007550</b>
				(12.54751)	(-12.51718)			(18.465496)
2006-2015	(5,150,.01)	22303	22291	0.00376	-0.00377	0.024656	0.015261	<b>0.007530</b>
				(12.53942)	(-12.5095)			(18.454029)
2006-2015	(1,200,0)	48933	48923	0.00726	-0.00727	0.022285	0.001507	<b>0.014530</b>
				(34.19811)	(-34.15944)			(52.676990)
2006-2015	(1,200,.01)	48919	48909	0.00726	-0.00727	0.022294	0.001518	<b>0.014530</b>
				(34.18973)	(-34.15108)			(52.662905)
2006-2015	(2,200,0)	34695	34683	0.00558	-0.00558	0.024661	0.010909	<b>0.011160</b>
				(22.65661)	(-22.62236)			(34.080669)
2006-2015	(2,200,.01)	34677	34665	0.00557	-0.00558	0.024666	0.010909	<b>0.011150</b>
				(22.64373)	(-22.61237)			(34.062132)
<b>AVERAGE</b>				<b>0.006206</b>	<b>-0.006214</b>			<b>0.012420</b>

The table shows the descriptive statistics of the PSX over the period of 10 years (2006-2015). The mean presents the equally weighted average of the daily and ten days observations over the 10- years. Std.Dev, present the standard deviation of the daily and ten day returns. The number marked with \* is significant at 1% level

#### 4.1 Results of VLMA Rules

**Table 2:**

The Table 2 shows the results of 10 VLMA rules for the PSX, from 2006-2015, with zero and one percent band. Column 1 of the Table 2 refers the period, the column 2 shows the rules, whereas 3 and 4 columns shows the days of buy and sell signals for the various rules. Similarly, 5 and 6 columns shows the daily mean returns throughout buy and sell duration by corresponding *t*-statistics given in the same column in parentheses testing the quality of the corresponding returns with unconditional mean daily returns. The 7 shows a fraction of buys and 8 shows a fraction of sell signals. The averages across 10 rules are shown in the 9 column of the Table, where the Value of *t*-test is shown in parentheses and calculated with:  $\mu_p - \mu_t / (\sigma^2/M_p + \sigma^2/M_t)^{1/23}$ .

The Table 2 shows the numbers of sell signal is marginally lower than buy signal in all ten rules. The findings do not offer a strong support for the view that the PSX has been bullish trend over the period because the numbers of buy signal are slightly increase than sell signals (Table 2). The 5 and 6 columns show the mean of buy and sell returns. The buy mean returns are positive for all rules with an average 1-day mean return of 0.62 %, which is almost 16 %<sup>4</sup> at an annual return rate; the amount is close to the value reported by Hudson et al. (1996) and Brock et al. (1992). Using two tailed test at 1 % significance

<sup>3</sup> $\mu_p$  and  $M_p$  are the mean and number of buys signals and  $\mu_t$  and  $M_s$ , are the mean and number of sell signals for,  $\sigma^2$  is the estimated variance for the total sample.

<sup>4</sup> 260 days are taking for trading.

level, all the ten tests for both buy and sell, reject the null hypothesis as the return is equal to unconditional returns, 0.089% is the unconditional one-day return (reported Table 2). The rules (1, 200, 0) are the top performing rule with the maximum mean returns and t-values amongst all ten rules as per as the buying side is concerned. While all sell mean returns are negative for all rules with an average 1-day mean return of -0.62 %, which is almost -16%<sup>5</sup> at an annual return rate. The *t-test* is highly significant for all sell mean returns. Whereas, the sell side, again, the rules (1, 200, 0) are the top performing rule with the maximum mean returns and t-values amongst all described rules. It refers that investors can earn maximum return if it stays for one day in short run and 200 days in the long run with zero percent band. All the mean values of buy and sell are highly significant. In the above discussion, it is shown that PSX met the first three conditions of predictability and it also shows that a weak form of efficiency does not exit.

The value of the fraction of buys is larger than zero and the value of fraction of sells is higher than zero which is shown in columns 7 and 8 respectively. The range of the fraction for buys lies between 0.022 to 0.024 %, and it ranges between 0.010 to 0.015% for sells. The useful (abnormal returns) signals for the fraction is generated when the fraction of positive returns is equal for both. The findings show that both buys and sell signals are not equal which suggests that the rules do not produce useful signals.

This finding is same to Brock et al. (1992). The *t-test* is highly significant and rejects the null hypothesis of equality. The 9 column reports the differences between the mean daily buy returns and sell returns. The difference of buy mean returns and sell mean returns is positive and significant; we reject the null hypothesis of equality with zero. The overall findings are same to the results of Brock et al. (1992; Fifield; Power and Knipe, 2008; Yu et al., 2013). It has also been observed that in case of PSX, the introduction of 1 % band in every rule do not significantly enhance the spread between sell and buy returns. This result clearly rejects the null hypothesis that profits to be received from VLMA rules are same as those attained from 1 day unconditional return, therefore, offer degrees of forecasting ability in the Pakistan Stock Exchange Gunasekaraged and Power (2001).

A comparison of various results in the Table 2 shows that the profit earned from the VLMA rules slightly raises when the length of the long run period is increased. For instance, the long run period is calculated over a number of days varying from 50 to 200; the results of buy-sell profit increased from 0.014 to 0.015. Furthermore, in the case of the short run period the profit drops from the difference between buy and sell when the length of the short run enhances. For example, as the number of short -run days increased from (1, 200, 0) to (2, 200, 0) the profit drops from 0.014 to 0.011. Lastly, the highest profit is earned by the largest band of 1%, which generates a fewer number of signals. It's also confirmed that PSX has offered abnormal returns to investors because it meets the last condition.

The analysis of various trading strategies shows that increase in short and long period and bandwidth can lead to increase in profitability in comparison of the naïve buy and hold strategy.

## 4.2 Result of FLMA Rules

**Table 3:**

1	2	3	4	5	6	7	8	9
PERIOD	Rules	N.BUYS	N.SELLS	BUY Mean	SELL Mean	Buy > 0	Sell > 0	Buy -Sell
2006-2015	(1,50,0)	10494	10494	0.002173	-0.00208	0.021620	0.020440	<b>0.004253</b>
				(5.07724)	(-4.82581)			(7.141991)
2006-2015	(1,50,.01)	10491	10491	0.002174	-0.00207	0.021616	0.020453	<b>0.004244</b>

<sup>5</sup>The negative sign does not mean losses; instead it's only show downward trend, that why we calculated the return.

				(5.08026)	(-4.81340)			(7.135173)
2006-2015	(1,150,0)	10424	10425	0.002305	-0.00208	0.021586	0.020406	<b>0.004385</b>
				(5.36867)	(-4.81848)			(7.346002)
2006-2015	(1,150,.01)	10424	10425	0.002302	-0.00207	0.021584	0.020416	<b>0.004372</b>
				(5.36317)	(-4.79493)			(7.325053)
2006-2015	(5,150,0)	9297	9297	0.001565	-0.00157	0.022039	0.020433	<b>0.003135</b>
				(3.45557)	(-3.42959)			(4.954588)
2006-2015	(5,150,.01)	9295	9295	0.001571	-0.00155	0.022063	0.020430	<b>0.003121</b>
				(3.46809)	(-3.38611)			(4.932296)
2006-2015	(1,200,0)	10391	10391	0.002392	-0.00224	0.021480	0.020536	<b>0.004632</b>
				(5.56162)	(-5.17439)			(7.741326)
2006-2015	(1,200,.01)	10391	10391	0.002392	-0.00224	0.214740	0.020538	<b>0.004632</b>
				(5.56186)	(-5.16835)			(7.737146)
2006-2015	(2,200,0)	10109	10109	0.002035	-0.002	0.021999	0.020275	<b>0.004035</b>
				(4.67079)	(-4.55674)			(6.650155)
2006-2015	(2,200,.01)	10110	10110	0.002037	-0.002	0.022002	0.020283	<b>0.004037</b>
				(4.67738)	(-4.55427)			(6.653141)
<b>AVERAGE</b>				<b>0.0020946</b>	<b>-0.00199</b>			<b>0.004085</b>

The Table 3 shows the results of 10 FLMA rules for the PSX, over the period 2006-2015, with zero and one percent band. Column 1 of the Table 2 refers the period, the column 2 shows the rules, whereas 3 and 4 columns shows the days of buy and sell signals for the various rules. Similarly, 5 and 6 columns shows the daily mean returns throughout buy and sell duration by corresponding *t-statistics* given in the same column in parentheses testing the quality of the corresponding returns with unconditional mean daily returns. The 7 shows a fraction of buys and 8 shows a fraction of sell signals. The averages across 10 rules are shown in the 9 column of the Table, where the Value of t-test is shown in parentheses and calculated with  $(\mu_p - \mu_t) / (\sigma^2/M_p + \sigma^2/M_t)^{1/2}$ .

The Table 3 shows the number of buy signals is similar to the number of sell signals except the rules of (1,150,0) and (1,150,.01). The findings do not offer a strong support for the view that PSX has been a bearish trend over the period because the number of sell signals are slightly increased in buy signals.

The mean returns of buy and sell are described in 5 and 6 columns. The buy mean return of ten rules is positive. The average returns (i.e., 20%) are larger than the unconditional mean ten-day return (i.e., 18% as reported in panel B Table 1). It implies that the investor can predict the share prices and can earn abnormal returns; it's also referring that a weak form of efficiency does not exist. Similarly, the average of sell mean (i.e., -19%) lower than unconditional mean ten-day return (i.e., 18%). For all rules of both buy and sell, we reject the null hypothesis that returns are same to ten-day unconditional returns by using two tailed test at 1% significance level (Brock et al., 1992) and (Hudson et al., 1996). In addition, findings are highly statistically significant for all buy and sell mean to individual rules. The 7 and 8 columns represent buys and sells fraction which are larger than zero. The useful (abnormal returns) signal for the fraction is generated when the fraction of positive returns is equal for the sells and buys. The results show that both buys and sell signals are not equal which refers to the fact that trading rules do not generate useful signals (Brock et al. 1992).

The overall findings are same to the Hudson et al. (1996). The results show that guarantees the predictive ability in PSX. A general conclusion of FLMA rules which emerged from the result of this research, established that FLMA rules guarantees the predictive ability in Pakistan Stock Exchange. The buy and sell have similar number of signals. Buy signal produces (+ve) returns and sell signals produces (-ve)

returns. On average, this is considerably altered from the returns of ten days unconditional returns.

The column 9, delineates the differences between the mean daily buy returns and sell returns. The difference between buy mean returns and sell returns is positive and significant, which reject the null hypothesis of equality with zero. The overall findings are alike to the results of Brock et al. 1992; Fifield; Power and Knipe, 2008; Yu et al., 2013). It has also been observed that in case of PSX the introduction of 1 % band in every rule, do not significantly enhanced the spread between sell and buy returns. This result clearly rejects the null hypothesis that profits to be generated from FLMA rules are same as those attained from ten-day unconditional return, therefore, they offer degrees of forecasting ability in the Pakistan Stock Exchange Gunasekarage and Power (2001). A comparison of various results in the Table 3 shows that the profit earned from the FLMA rules raises slightly, when the length of the long run period is increased. For instance, the long run moving average is calculated over a number of days which differ from 50 to 200, the results of buy-sell profit increased from 0.0031 to 0.0046. Furthermore, in the case of the short run period; the return drops from buy-sell when the length of the short run enhances. For example, as the number of short -run days increased from (1, 200, 0) to (2, 200, 0) that profit drops from 0.0046 to 0.0041. Lastly, the highest profit is earned by the largest band of 1%, which generates a fewer number of signals. It's also confirmed that PSX has offered abnormal returns to investors because it meet the last condition.

## 5. Conclusion

This article investigates the predictability, profitability of the TTRs (applying the SMA rules) and its implication for testing weak form of efficiency on the PSX. The finding of the VLAM and FLMA rules show that stock returns in PSX are predictable because the days of buy signals are same to sell signals. The buy mean returns of ten rules are positive and the null hypothesis that the mean returns from buy is same to unconditional returns in both VLAM and FLAM is rejected; the same results are for sell mean returns. In addition, the findings of the study also confirm that the investors can earn abnormal profit from the VLAM and FLMA rules because the increased length of long run resulted an excess profit for both rules. The study also confirms that there is no trend (i.e., bullish/ bearish) in the PSX as both rules generate same signals to buy and sell. Moreover, VLMA and FLMA rules have beaten the buy and hold strategy in the PSX. The results also recommend that PSX is not a weak form of efficient. Finally, SMA rules prove that the traders can earn the excess profits on the PSX using technical trading rules.

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## Impact of International Trade and Trade Duties on Current Account Balance of the Balance of Payment: A study of N-11 Countries

<sup>1</sup> Imtiaz Arif, <sup>2</sup> Lubna Khan, <sup>3</sup> Fatima Farooq, <sup>4</sup> Tahir Suleman

<sup>1</sup> Professor, IQRA University, Karachi, Pakistan: arif.i@iuk.edu.pk

<sup>2</sup> Research Associate, IQRA University, Karachi, Pakistan: Lubna.khan@iqra.edu.pk

<sup>3</sup> Assistant Professor / School of Economics, Bahauddin Zakariya University, Multan, Pakistan

<sup>4</sup> Assistant Professor / Ph.D (Finance), University of Otago, New Zealand: tahir.suleman@otago.ac.nz

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p>This study is aimed to investigate the impact of international trade and trade duties upon the current account balance of the balance of payment of N-11 countries. Two constituents of each factor have been considered for the purpose of analysis. For International trade, import (IMPT) and export (EXPT) of goods and services have been considered whereas, for trade duties, taxes on international trade (TOIT) and customs and other import duties (CID) have been taken as the research variables whereas, current account balance (CAB) has been taken as the dependent variable. For the purpose of analysis panel data of N-11 countries for 27 years from 1990 to 2016 has been tested using different econometric technique such as Panel unit root test, Panel co-integration test, Hausman test, Panel regression analysis and Panel causality analysis. The results demonstrate that overall research variables are co-integrated and having long term relationship and affecting each other in the conventional manner. Notably, it is observed via results that in case of N-11 countries the CAB itself is the regulating factor and all other factors are adjusted according to the movement of CAB. The study provides recommendations for the rectification of current account deficit position and also provides scope for future research as well.</p>
<p><b>Keywords</b> Current Account Balance (CAB), International Trade, Trade Duties, Import (IMPT), Exports (EXPT), Taxes On International Trade (TOIT), Custom and Other Import Duties (CID.)</p>	
<p><b>JEL Classification:</b> F32, F39, P33, H25, H29</p>	



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Corresponding author's email address: arif.i@iuk.edu.pk

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### 1. Introduction

In the present time of globalization, liberalization of trade has been significant issue for governments and policy makers around the globe, particularly for developing countries. Trade liberalization tends to accelerate the growth and development of economy through advancement in technology and

specialization. It is largely believed that through international trade, countries specialize in goods and services by creating a competitive environment through promotion of new technologies help to create competitive and comparative advantage. Conclusively, human welfare would be increased as there would be a variety of products of low prices yet enhanced quality available for the consumers (Gupta & Choudhry, 1997)

Even though, liberalization of trade generally seems to be of great advantage for the growth of economy, its effect shows considerable variations on country to country basis and associated with various conditions pertaining to the structural and institutional framework of the economy (Chang, Katlani and Loayza, 2009).

Core value of trade openness is to uphold growth of economy by achieving static and dynamic benefits of trade through improved ways of resource allocation; increased competition; an inflow of knowledge and investment and a rapid pace of accumulation of capital and technological advancement. Trade barriers and anti-export biasness will hamper the growth of exports lower than the productive capacity. Barriers to import tend to decrease the efficiency, but on the other hand, they prevent the balance of payments from adverse impact. It is a general concept that liberalization of trade will increase the growth of exports along with imports but on the other hand having significant consequences on the balance of trade and the balance of payments keeping in view the prices of traded goods as another important factor to have effect on these two. Openness to trade may boost the growth of supply side as well but in case of worsening of balance of payments, growth would have unfavorably affected from the aspect of demand reason being that the deficits of payments generated from liberalization of trade are unstable and would be difficult to rectify through mere changes in relative prices or forex rates. (Khan and Zahler, 1985).

When the countries around the globe are having their respective domestic industries and domestic markets, in that case it is necessary to observe regulatory controls before they can interact with the highly competitive global market environment. Domestic industries and markets require protection and support in order to safeguard them from any strict competitive move such as dumping. Furthermore, countries are required to carefully monitor the issues such as depletion of their natural resources and pricing control etc. in connection with the international trade they undergo globally.

Nearly all countries, at least up to a certain extent, regulate their trade interactions with the international market by means of Trade Laws, Taxes and Tariffs which are referred to as Import and Export Duties. The aim is to bring into operation fair and safer trade practices which can also meet the ethical requirements as well. Tariffs get affected by economic, financial and political outlook of the Governments along with the mutual relationship between the trading countries.

Generally a specific percentage of the value of the commodity is set as the custom duty. The percentage based value of custom duty ensures that it gets adjusted automatically with the fluctuation of the international market prices. In addition to customs duty, additional/special duty are also applied such as certain fixed value per measuring unit of quantity of the commodity, with a view to regulate the export or import, or for the purpose of collection of revenue and several different circumstances related to international trade and relevant matters of the country.

These trade duties are aimed at generation of revenue, application of regulatory policies and protection of general outlook of the economy. They can be of retaliating nature on one hand or can be based on mutual trade agreement or understanding with trade partners on the other hand.

The current account balance has always been a vital subject of interest and attention for many researchers around the world as it is a direct indicator related to the trade activities carried on among different



countries internationally. Currently, there are several studies present related to this topic but according to my knowledge and observation majority of the studies are based on developed countries such as U.S, China, Japan and different American and European countries. For instance Chernyak, Khomiak and Chernyak (2013) investigated the balance of payment crisis in their research about Next-11 Eastern European countries, Weixian (1999) studied the dynamic relationship between China's trade balance and macroeconomic variables, Médici and Panigo (2015) investigated the existence of association in foreign asset formation (FAF) and terms of trade (TOT) with monthly data of Argentina, Pacheco-López (2005) studied the impact of liberalization of trade in the era of mid-1980s pertaining to the liberalization related to the North American Free Trade Agreement (NAFTA) on nonoil exports, imports, and the balance of trade in Mexico, Malhotra, Rus, Kassam (2008) analysed the effectiveness of antidumping (AD) duties pertaining to the agricultural sector of US for restricting trade with data related to U.S.

However, effect of international trade along with trade duties taken as the main determinants of current account balance, is still largely an unaddressed domain with a very few researches available where these determinants are considered for investigation. Moreover, the studies addressing this topic for N-11 countries are also very rare. As a group of N-11 countries which includes, Turkey, South Korea, Mexico, Iran and Pakistan, are considered as a rapidly developing economies and the extant of literature has not shown any evidence where an attempt to identify the impact of trade and trade duties on the current account balance of the balance of payment for N-11 countries is studied. Therefore, this research is an attempt to fill this gap.

This study is important in order to identify the nature and magnitude of impact each of the N-11 countries could have on their respective current account balance of the balance of payments due to implication of international trade and trade duties. Both these variables have vital role in the economy of any country. Insight knowledge of these variables may enable the country to adopt such measures in an attempt to improve the position of current account balance of the balance of payments of its economy. Therefore, results of this study could be vital enough to recognize the impact of international trade and trade duties upon the current account balance of the balance of payments of the N-11 countries collectively as a group.

### **Scope**

This study tends to investigate the impact of only 2 variables i.e. international trade and trade duties, both having two constituents, on the current account balance of the balance of payments of the N-11 countries keeping in view the limited data and time available for the purpose of research whereas in a totally dynamic economic environment there would be a number of other factors that could be affecting the current account balance of the balance of payments of the said countries. Therefore, the true impact of these variables, apart from other factors, on the current account balance of the balance of payments could only be observed in an isolated environment which seems quite impossible to manage.

Moreover, unbalanced panel data is available for trade duties for almost all countries except few and data for Nigeria is completely unavailable for trade duties. Conversely the data of imports, exports and current account balance is completely available for all countries. So the analysis through E-Views software has been performed considering missing values as zero. The software has automatically adjusted the observations accordingly, enabling the performance of econometric test in order to drive meaningful conclusions thereof.

### **2. Literature Review**

There are two most significant measures of the foreign trade of a country. One is current account balance and the other is net capital outflow. A current account balance is usually observed in two states i.e. a surplus or a deficit. Surplus of current account balance denotes the value of net foreign assets of a

country's (i.e. assets minus liabilities) in any particular period under consideration, conversely a current account deficit represents the opposite position of surplus where liabilities exceeds assets.

Payments, pertaining to both private and government sectors are accounted for the purpose of calculation. The reason why it is known as the current account is because consumption of goods and services generally pertains to the current period. In economics, current account balance of a country is one of the three components of its balance of payments, the other two are the financial account and the capital account. The current account comprises of the balance of trade, net primary or factor income (difference between foreign investments earnings less payments made to foreign investors) and net cash transfers taken place in a particular interval of time.

The current account balance can be defined in a precise manner as the difference between monetary value of the goods and services produced domestically and the aggregate demand of the goods and services (can also be called as absorption). The current account is said to be in surplus state when absorption is less than income and referred to be in a deficit position when the condition is such where absorption exceeds income. (Egwaikhide, 1997).

Besides current account balance, another related important concept which is also one of the most eminent components of the international trade is the trade barriers. Trade barriers are referred to as the restrictions, observed by regulatory authority or government of a country on foreign trade.

These barriers can be of several different forms including tariffs and non-tariff barriers to trade, subsidies, quotas, import and export licenses, devaluation of local currency, embargoes, voluntary restraints on exports and other sorts of trade restrictions. Yeh, 1999 suggested that a country should have an optimum level of tariff for the welfare of the state which is having an increasing growth rate.

### **3. Theoretical Background**

One of the most debatable topics among the researchers is that whether or not open economies excel swiftly as compare to the closed economies? A large number of empirical studies give positive response to this question in favor of open economies. The reason behind favoring the trade liberalization is fairly based on the results of these empirical studies, claiming that, consistently higher growth rates have been observed in the economically outward-oriented countries than the ones with inward-oriented economic setup (Yanikkaya, 2003).

Early studies demonstrate contradictory conclusions upon this matter. As far as export side is concerned, a number of studies expressed that countries having liberalized economic setup have improved their export performance (Ahmed, 2000, Bleaney, 1999, Joshi and Little, 1996, Helleiner, 1994, Weiss, 1992, Thomas et al., 1991). There are some other studies which provide evidence for the presence of some extent of association between growth of export and trade liberalization (Jenkins, 1996, Greenaway and Sapsford, 1994, Shafaedin, 1994, Clarke and Kirkpatrick, 1992, Agosin, 1991, UNCTAD, 1989).

For the import side, great number of researches concluded that a strong positive relationship is present between trade liberalization and growth of imports, keeping in view the impact of income and relative price changes upon imports (Mah, 1999, Bertola and Faini, 1991, Melo and Vogt, 1984). The lowering down of import barriers will demonstrate an effect of direct and continuing nature on growth of imports which will subsequently lead towards increase in domestic income in the future.

A small number of studies have been found which deal with the influence of trade liberalization on the balance of payments or the trade balance. Khan and Zahler, 1985 studied the impact of trade and financial liberalization on the South American economies of Argentina, Chile and Uruguay. It was found out that although there is increase in trade volume but serious unfavorable condition occurred for current account

of the balance of payments, and adjustment was required to finance the deficits because capital flows that were generated by differentials in interest rate, were insufficient to do so. The conclusion entails here in this case was that, without separating the impact of volume and price changes, in terms of value, imports excel swifter than the exports do.

Ostry and Rose, 1992 considered 5 different sorts of data sets without considering imports and exports or other aspects of liberalization separately and observed the presence of statistically insignificant association between changes in tariffs and the real trade balance. UNCTAD, 1999 has investigated the impact of liberalized trade on the trade balance for 16 countries for 26 year's period from 1970 to 1995 by using techniques for evaluation of panel data, and concluded to have significant negative association between trade balance and trade liberalization.

In studies related to liberalization of trade in developing countries, utmost consideration has been given in finding out its affect on economic growth performance of export, employment, inequality in wages and the distribution of income not much emphasis has been given to observe the impact of liberalized trade upon imports, the balance of trade and the current account of the balance of payments. These areas are of equal importance for inquiry purpose, because if the growth of imports increases more than exports due to liberalization of trade, this may result in growth constrains in countries, having below the growth productive potential, due to serious implications of balance of payments. It means that on one hand where in the liberalized trade, growth from the supply side is promoted by means of more efficient resources allocation, on the other hand increase in demand may stay constrained unless corrective measure were taken, such as depreciation of currency or deficits financing through sustainable capital inflow, in order to maintain a equilibrium between imports and exports.

#### **4. Empirical Studies**

Bown and Crowley (2007) investigated by means of empirical analysis that whether import-restricting trade policy implied by a country could possibly make distortions for the exports of a specific country to other countries. Data for this investigation was based on use of antidumping measures and trade safeguarding remedies by USA over the period of 10 years i.e. from 1992–2001 exercised over the exports of Japanese product to the third countries. A dataset was constructed for the exports of Japan for almost 4800 products to 37 countries for the period under consideration to assess the impact of import barriers by USA, in this way substantially exploited the variation in the products and time of exports of Japan to 3rd countries. The dependent variable taken was growth of other country's import from Japan where as explanatory variables includes change in, antidumping duties (AD) on Japan and on other countries, safeguarding policies, growth of Japanese and other countries GDP, growth of countries openness etc. Statistical techniques used for the purpose of analysis include GMM, fixed effect model and econometric model. Results and approach of this study are constrained by some limitations. The export responses of only a single US trading partner were assessed here. It would be notable to consider that whether US trade policy is having same implications in general on the other trading partners or the trade policy shows some variations on country to country basis.

Bussiere (2013), in this study, aimed to present, with the help of a set of dynamic discrete choice models, that in how much in advance the explanatory variable send signals before the actual anticipated happening of crisis situation. The article examined, using a conditional logit model, the role of country fixed effects in both cases i.e. with the dependence of state and in individual capacity. This study presented results from model having four specifications: static, dynamic, static with fixed effects and dynamic with fixed effects. The research considers monthly panel data from 1990 to 2001 of 27 countries, consisting of 8 Latin American, 9 Asian and 10 Eastern European countries. Crisis index was taken here as the dependent variable, whereas independent variables such as debt ratio, current account, Govt. budget balance, real exchange rate, lending boom measure, real growth rate and contagions across emerging markets are considered. Early indicators were supposed to detect crises in advance before time seemed to be

performing comparatively better if the objective is to forecast the crises in a specific time frame; however, it was difficult to predict the accurate starting date of the crisis. Collectively, the selected economic variables tend to forecast the crises included the growth rate of credit to the private sector ratio of short-term debt to international reserves, contagion from other countries, the over appreciation of the nominal effective exchange rate (with respect to trend).

Calderon, Chong, Loayza (2002) in their study used a wide range of stable macroeconomic data set pertaining to deficits of current account and other variables pertaining to national income, focused on developing economies. Annual panel data of 44 developing countries including, 21 Latin American & Caribbean countries, 5 East Asian and the Pacific, 4 from Middle East and North Africa, 3 South Asian, and 11 Sub-Saharan African was assessed for a period from 1966-94. Statistical techniques such as OLS regression analysis, trend analysis and correlation analysis were used for the purpose of evaluating the data to draw meaningful conclusions out of it. Deficit of current account as a % of gross national disposable income is taken as dependent variable where as independent variables included domestic output growth, public and private savings, real effective exchange rate, terms of trade, black market premium, balance of payment controls, OECD's output growth, and international real interest rate. The results showed that increase in domestic growth, appreciation in real exchange rate and deterioration of terms of trade caused the current account deficit to increase, whereas decrease in international real interest rate creates an increase in the current account deficit. Contrarily rise in the rate of growth of industrialized nations and public saving rates tend to reduce the deficit of the current account.

Chambers and Lopez (1993) compared the positive implications of ad valorem and fixed-price distortions for an open economic setup. The model presented here consists of a basic open economic setup with a single variable factor of production i.e. labour, and two products i.e. agricultural and non-agricultural goods. Production of agricultural commodity had been taken as the fixed factor. The analysis was performed by means of derivative model. This paper addressed significant contradictions between the beneficial impact of ad valorem interventions and fixed-price export protection interventions which the previous studies have ignored to do so. The results expressed that in the case of ad valorem tax, the fall in global price is not as eminent as with the distortion of fixed price due to reduction in the growth of domestic agricultural yield whereas domestic demand rise by more than in the case of fixed-price. This is because the domestic markets were insulated from world-price changes by the fixed-price regime, the elasticity of export supply just tends to determine whether immiserization occurs in case of ad valorem which is not observed in case of fixed-price.

Chernyak, Khomiak and Chernyak (2013) discussed the appearance and evolution of the balance of payments crisis in this paper. For the purpose of this research, data for next 11 Eastern European countries were considered for the period from 2000 to 2012. Exchange market pressure index has been taken as the independent variable where as indicators of the crisis included in the ratio with GDP such as reserves, current account, foreign direct investments, exports, imports, trade balance, monetary base. Econometric techniques such as probit, logit and OLS regression were applied. The result of analysis showed that variation in the share prices was significant for East European countries. It proves that ejection of foreign capital from markets of emerging countries could be a prominent initiator of the balance of payment crisis. The prime purpose in long-term period, is the diversification of the sources of capital's inflow and maintaining the direction of exports in such a way that will help in minimizing the impact of crisis in the position of balance of payment.

Christiansen, et al. (2009) empirically investigates the external balance of low income countries. For the purpose of analysis data of 134 countries was considered for a period from 1980–2006 for macroeconomic variables namely real exchange rates, current accounts, and net foreign assets. The data set included variety of indicators of these variables. The statistical techniques utilized for analysis of data

includes mainly empirical analysis along with OLS regression analysis and unit root test as well. The result of this study explained that, a favorable term of trade tends to rectify the position of current account and appreciate the real exchange rate, but the rise was mainly due to the variation in the price of exports. Some of the initial findings demonstrate that there is dependency of the effect of shocks in income on the current account may be due to the position of initial net foreign assets. Recommendations were given for further research depending on the availability of data of improved quality in order to have better understanding thereof.

Ianchovichina, E. (2004) investigated the duty drawbacks on imported intermediate inputs and investment goods utilized in exports production purpose. An empirical multi-region general equilibrium model was presented in which the implications of reforms in policy are differentiated based upon the orientation of trading firms. The model is useful for the analysis of liberalization of trade in the context of drawbacks of duties. The study undergoes through the investigation of China's WTO accession by employing Version 5 GTAP database (Dimaranan & McDougall, 2002), aggregated to 25 sectors and 20 regions starting from 1997 to post-accession tariffs. the results expressed that failure to account for exemptions of duty will suppose to overstate the rise in aggregate trade flows of China by 40% and welfare of China by 15%. This demonstrates that exemptions of duties in China have substantially reduced the border protection prior to the accession of WTO.

Jeon (2009) empirically investigated the authenticity of Thirlwall's Law both directly and indirectly in China during the period of reforms i.e. from 1979–2002. For the indirect test, firstly a demand function pertaining to aggregate import was estimated for income elasticity of import demand, afterwards, comparison was made between the actual rate of GDP growth with the predicted rate calculated by means of the estimated income elasticity of import demand. In the direct test, Thirlwall's Law was investigated by analyzing the existence of co-integration between rate of growth of GDP and of exports. Econometric techniques such as "bounds test approach" suggested by Pesaran et al. (2001) for co-integration analysis, OLS regression analysis, Analysis of variance (ANOVA) had been utilized for the purpose of analysis. Results of the study showed that in the context of an open economic setup, favorable position of balance of payments allows rapid growth of economy, which, according to Verdoorn's Law, leads towards faster growth in productivity. Moreover it also implied that the foreign demand of Chinese goods played a vital role in the growth of Chinese economy. Therefore a demand-side approach is the reason behind growth of Chinese economy because, the need for the factors of production pertaining to the supply-side such as the progress in technical abilities and growth of labor force are mainly due to the conditions in the demand-side driving the supply-side to meet the demand.

Lane and Perotti, (1998) studied the impact of movements in various constituents of fiscal policy in short-term period on the imports, exports and balance of trade, through a panel data set comprising of 17 OECD countries for a tenure from 1960 to 1995. The independent variables utilized in this study include variables pertaining to fiscal policy such as wage government consumption (CGW), nonwage government consumption (CGNW) and cyclically adjusted labor taxes (TAX). Whereas, ratio of trade balance to GDP is considered as the dependent variable. OLS regression and t-statistics were used as the statistical tools for the purpose of analysis. The results showed that the transformation in government's wage consumption having significant impact on the external account and the impact gets even stronger under flexible rates of exchange, which is aligned with the operativeness of a short-run transmission mechanism of fixed-price. The results also pointed out that, fiscal policy can play a vital part in the development of reforms designed for the betterment of external account.

Loria and Fujii (1997) in their article aimed to express that the external barriers to the economic growth of Mexico had notably been intensified due to the application of structural reforms for a period covering from 1950 to 1996. Calculation of the external barriers to growth was performed by means of Harrod

multiplier of foreign trade. The results showed that, the indicators of external factors hampering growth, particularly in manufacturing domain, had been dramatically intensified during the period considered in this study for the purpose of analysis. Moreover, external restrictions that caused the deindustrialization in the country consequently caused GDP and growth rates to drop, generating trade deficit. Increased level of trade deficit had been financed by means of inflow of short term capital at higher interest rates which was found to be not viable in the medium-term period. So, the sustainable revival of the Mexican economy not only required the expansion of exports, but also the avoidance of demand for imports in excess level.

Mah and Kim (2006) studied the association of macroeconomic variables with several empirical evidences of antidumping duties in Korea. Half yearly data of antidumping duties in Korea taken from the 1st six months of 1987 to the last six months of 2003 had been utilized. The statistical techniques that were used for the purpose of analysis included unit root test, Johansen's co-integration test, error correction model, Augmented Dickey Fuller test. The finding of this study showed that tools of protectionism such as antidumping duties caused the overall economic activities in Korea to slowdown. The implications of antidumping duties despite the level of development of economy in the current time may not be considered optimal for the global trading system. This study express that investigation of antidumping duties may lead towards the reduction of imposing country's national income, It implies that process of implementation of antidumping duties should be carried with cautions through investigation process by the countries planning to impose it.

Malhotra and Malhotra (2008) investigated that whether antidumping (AD) actions in the pharmaceutical industry of India have prevented trade transactions from countries whose name were there for the purpose of dumping. The data consist of all AD petitions initiated in the pharmaceutical industry during the tenure starting from 1992 to 2002 where value and quantity of imports was the dependent variable while trade restrictions (antidumping) and trade diversions were the independent variables. Ordinary Least Square OLS regression technique was used for the purposes of estimation and analysis. The results showed that anti dumping duties resulted in restriction of imports from countries that were having their names in the petition. It was implied that the foremost benefit of protectionist measure was obtained by the domestic producers rather than foreign producers. Furthermore significantly, the results also implied that, this could be a critical issue of concern for consumers, who would have to sustain the load of elevated prices as a consequence of protectionist measures on imports.

Malhotra, Rus, Kassam (2008) analysed the effectiveness of antidumping (AD) duties on the agricultural sector of US for countering trade. Data for investigations of antidumping of U.S., was considered for the tenure of 1990 to 2002. Ordinary least squares estimation, fixed effect and GMM model is used for the purpose of analysis. Results of the study confirmed the presence of vital association between antidumping duties and imports and effectiveness of antidumping duties in the protection of agricultural producers of the U.S. Analysis indicated that antidumping measures resulted in the expected manner by counteracting imports from countries having their names on the petition thus benefiting with deflecting a little trade to countries not having their names on the petition. The occurrence of this whole phenomenon was depended upon granting of petition and imposition of duties. It is debatable that whether trade remedy laws, specifically legislation pertaining to antidumping, came out to be effective in fulfilling this objective. The investigation in this article is an attempt to provide even more information upon this concern.

Médici and Panigo (2015) analyzed the association of foreign asset formation (FAF) with the terms of trade (TOT) in the nations characterized by unbalanced productive structures (UPS). For the purpose of research monthly data of Argentinean economy from January 2003 to October 2011 has been utilized. Statistical technique used in this research is called Global Search Regression (GSREG) which is a software stata code that allows selection of model automatically for time series, cross-section, and panel

data regressions. The results of the analysis showed that, improvements of TOT in UPS is not having any ambiguous impact on the BOP-constrained rate of GDP growth because effects of their favorable balance of trade had been relieved to an even overwhelming level by their adverse impact by means of the capital account. The results depicts a low near to nil effects of TOT on BOP constraints created by way of quasi-rent developed in the export sector of a UPS affirms the existence of a positively favorable relationship in TOT and FAF of emerging countries.

Nwani and Island (2006) investigated the long-run determinants of dynamics of the balance of payments of Nigerian economy for tenure from 1981 and 2002. Econometric techniques such as co-integration and mechanism of error correction were used for the purpose of analysis. The determinants of balance of payments taken in this research included exchange rate, inflation rate, balance of trade, trade openness, real GDP growth, external debt growth and terms of trade. It was derived that all the determinant variables except balance of payment itself, depicts non-stationarity. The results also indicated that balance of payment express co-integration with all the identified determinant variables, suggested that fluctuations in the position of balance of payment in Nigerian economy occurred due to the extent of openness to trade, burden of external debt, movement of exchange rate and domestic inflation. The results demonstrate that a decrease in fiscal deficits, increase in domestic production by means of private investment, inflation management and controlled capital market integration were the steps required to prevent the adverse swings in the position of balance of payment of Nigeria.

Pacheco-López (2005) studied the impact of liberalization of trade pertaining to the mid of 1980s from the liberalization alleged with the North American Free Trade Agreement (NAFTA) on nonoil exports, imports, and the balance of trade in Mexico for tenure from 1970 to 2000 estimated using an autoregressive distributed lag (ARDL) procedure to provide long-run estimates association in the independent and dependent variables. The results showed that trade liberalization in the mid -1980s had a favorable effect upon the performance of export and import growth with the same level, but response of imports came earlier than exports. On the other hand NAFTA showed significant impact on growth of import while having insignificant impact upon the exports due to the degree of the liberalization of trade which has taken place already. In spite the performance of Mexico being one of the leading exporters the considerable fact is the equilibrium between the levels of imports and exports and the level of current account balance of the balance of payments because this is something which have its impact on the creditworthiness of a country, sustainability of growth and the ability to borrow. Trade liberalization must be accompanied with governmental policies which are aimed to coordinate with the industrial and trade policy to achieve both internal and external equilibrium at the same time.

Paulino (2002) analyses the diminishing impact of tariff and non-tariff barriers on the dynamic panel data of 22 selected developing countries pertaining to imports for tenure from 1976–98. TSCS techniques have been used in the assessment of the impact of reforms pertaining to trade on the growth of import on average, and across regions. Primarily in this paper, it was examined as to what extent measures related to trade affect growth of import in developing countries. Import growth had been taken as the dependent variable where as independent variables include import tariff and trade liberalization. The conclusion provides empirical evidence suggesting that the removal of trade policy distortions significantly affect the growth of import in the positive manner. Consequently due to liberalization of trade, the excessive growth of import put serious stress on policy implications, particularly for the position of balance of payments and balance of trade, because in majority of the cases imports grow faster than exports, resulting in imbalances in trade. A great number of developing countries suffered from balance of payments crises had revealed the extent to which balance of payments positions inhibited growth rates. In most of the cases, trade policy reforms were lacking strategy to promote export. Liberalization should be handled in such a way that a sustainable balance of payments position could be maintained; otherwise it is easy that the benefits obtained by liberalization can be adjusted by losses of real generated resources, for the purpose of corrections in the position of balance of payments.

Paulino and Thirlwall (2004) investigated panel and times series/cross section data to analyze the impact of liberalization of trade on growth of export, import, the balance of trade and payments for a selected sample pertaining to 22 developing countries for a period covering from 1972 to 1997. The variables involved in the study included the rate of export duty ( $dx$ ) which is the ratio of revenue arising out of export duties to the value of exports and the rate of import duty (or implicit tariff,  $dm$ ) which is revenue arise from imports in the ratio with the value of import. This study involves statistical techniques such as Hausman test, heteroscedasticity test and correlation analysis. The outcomes of this study showed that liberalization of trade drive to a rapid growth of imports as compared to exports, this could be a critical issue with respect to the position balance of payments of countries that may restrict the growth below the potential of productivity. The liberalization showed positive effect on growth of imports whereas negative effect was observed on the trade balance and balance of payments. These effects are greater in the countries having more protection. Obtaining the correct balance between the growth of import and export in the process of trade liberalization can be as vital as achieving the right sequencing for it.

Samiei (1990) attempted to test for the importance of financial constraints in the determination of the oil-exporting countries' imports. Balance of payments constraint is an important determinant of the imports of a less developed country (LDC) therefore the analysis included less developed countries LDCs and OPEC countries for a sample size consisting of 29 years from 1956 to 1984. The econometric analysis is based on methods of estimating models of markets in disequilibrium. For this purpose discrete and smooth-switching models are estimated and compared. OLS regression had also been used as one of the statistical techniques for the purpose of analysis. The analysis was based on some simplifying assumptions including the complete exogeneity of the oil-exporters' terms of trade, the omission of exchange rates variations etc. The results support quite strongly the importance of financial constraints in determining trade. Although there are certain limitations and computational difficulties in the analysis process nevertheless the fact was strongly established that when the bloc is divided into high-absorbing and low-absorbing subgroups, the former is suggested to have faced financial constraints more often than the latter in the period under consideration.

Wang (2004) assessed the association of countervailing duties (CVD) import tariffs, foreign export subsidies and under imperfect competition. These protectionist measures were imposed with a view to counter the subsidization of foreign export, which hampers the competitiveness of domestic firms, whereas the import tariffs were implied in order to exercise protectionism or for the purpose of revenue generation. The said paper utilizes the quasi linear utility function for the purpose of analysis. The study considered the trade policy system in which import tariff were determined on priority basis as compared to the foreign export subsidies and the determination of CVD takes place subsequent to the subsidization of foreign export, resultantly CVD determination can be segregated from the import tariff. In the earlier studies the CVD was expressed as a constituent of the import tariff whereas, actually the CVD and the import tariff have their own different purposes. To separate determination of CVD from the import tariff and assess the function of CVDs in trade policies, This study expressed that the determination of import tariff takes place prior to the export subsidy, because the optimal level of CVD is dependent on the existing import tariff level; the position of an optimal CVD of more than 100% may occur if the current import tariff level has been forced to fall to a significantly low level, for instance as per the requirement of the GATT. Secondly, the optimal level of CVD can/ cannot determent the level of export subsidy as furnished by the foreign government when the current level of import tariff is significantly high/ low. Thirdly, the optimum level of import tariff is so outrageous that the optimum level of CVD becomes zero and thus driving the subsidization of foreign export to commence. Finally, upon examination of the impact of export policies implemented by the exporting countries for the purpose of determination of CVD, it turned out that a reduction in the level of subsidy of an exporting country confirm the chances of



imposition of a CVD upon the exporter residing in another country where no corresponding actions were taken by the government.

Weixian (1999) studied the dynamic nature of association found in balance of trade of China with its macroeconomic variables such as real exchange rate, domestic and foreign output, and domestic and foreign supply of money for the tenure from 1986 to 1996. The (ADF) unit root test and Granger Cointegration test were used for the purpose of estimation and analysis. The results of the tests and estimation confirmed the presence of J-curve in China. Devaluing the local currency pump up the import prices in comparison with the exports and so causing the improvements in the trade balance. There could be deterioration of the balance of trade at initial stage, but, gradually, increase in exports and imports elasticities elevates the expectations of improvement of balance of trade. Balance of trade of China does not show co-integration with a variety of variables which include the exchange rate. China began liberalization of its exchange rate in order to get in harmony with the international markets; exchange rate policy had been aimed to maintain the currency value. Thus, China needs to improve the quality of its export products along with reduction in its production costs and further strengthen its international trade strategy in order to have a balance in its foreign trade.

Yanikkaya (2003) studied the impact of growth of a large number of measures having on openness to trade. Panel data, for more than 100 developing and developed countries, was considered for application of cross-country regressions for tenure from 1970 to 1997. Trade openness was measured into two vast categories: one is trade volumes and other is trade restrictions. Measures of trade openness consist of variables such as U.S. trade openness, population densities and trade openness itself. Whereas, measures of trade restrictions include bilateral payments arrangements, total import and export duties, taxes on international trade and quantitative limitations on payments. Statistical outcomes for various measures for volumes of trade depict the presence of a significant favorable association between openness to trade and level of growth. Statistical outcomes for trade barriers showed contradiction with the conventional view of impact of escalation of restrictions to trade, which pointed out towards the existence of an unfavorable association between growth and barriers to trade. The said outcomes are fundamentally derived from developing countries so, they are in line with the predictions as mentioned in the empirical reviews pertaining to growth claiming that in some circumstances, trade restrictions may actually benefit the developing countries.

## 5. Data and Methodology

For analyzing the effect of international trade and trade duties on current account balance of the balance of payment of N-11 countries following estimation model was used.

$$CAB = \alpha + \beta_1 IMPT + \beta_2 EXPT + \beta_3 TOIT + \beta_4 CID$$

Where,

CAB = Current account balance of the balance of payment

IMPT = Import of goods and services

EXPT = Export of goods and services

TOIT = Taxes on international trade

CID = Custom and import duties

Data spanning over 27 years from 1990 till 2016 for next eleven (N-11) countries which includes Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, Turkey, South Korea and Vietnam was obtained from the World Bank. For cross section dependence CD-test was applied and CIPS second generation panel unit root test was used to check for the order of the series and later cointegration test was performed for testing of the long-run association between the studied variables.

Panel regression analysis has been performed by using fixed or random effect model which depends upon the outcomes of Hausman test. This test is used to examine the extent of connectivity between dependent and independent variables or how well the independent variables be able to explain the dependent variable.

### **5.1 Causality Analysis**

Causality analysis is used for assessing the relationship exists between dependent and independent research variables whether it is bi-directional or uni-directional.

**Ho:** Variable A does not granger cause on variable B.

**H1:** Variable A does granger cause on variable B.

Prob value of the results decides the acceptance or rejection of any of the given hypothesis. Value on or below 10% is considered significant and results in acceptance of alternate hypothesis HA and rejection of null hypothesis Ho. Opposite will be the case when the prob value turned out to be more than 10%.

### **5.2 Research Variables and their Operational Definition**

There are basically three research variables used in this study, one is international trade having two components namely import of goods and services and exports of goods and services (both taken as % of GDP), second is international trade duties having two components i.e. taxes on international trade (taken as % of revenue) and custom and other import duties (taken as % of tax revenue) and the last one is current account balance of the balance of payments (% of GDP). All these variables are defined as follows.

### **5.3 Current Account Balance**

The current account balance is one of the two constituents of the balance of payments of a country whereas the second component is the capital account thereof. It composes of the balance of trade (resultant net balance after subtraction of total value of imports from exports of goods and services), the net factor income (resultant net balance after subtraction of payments made to foreign investors for domestic investments from the return on investments generated abroad and obtain by local citizens) and net cash transfers, all these constituents are accounted in the local currency unit (LCU). Positive balance or surplus of current account depicts that the country becomes a net creditor for the rest of the world whereas opposite is the case with negative balance or deficit of current account. The ratio of the current account balance to the Gross Domestic Product (or % of GDP) serves as an important indicator of the extent competitiveness of the country on international level.

### **5.4 International Trade**

International trade represents the interchange of goods, services and capital across the international borders and territories. Any product been sold to the international market is referred to as export inversely any product that has been bought from the international market is referred to as an import. Imports and exports of goods and services of a country are the constituents of its current account of the balance of payments.

### **5.5 International Trade Duties**

International Trade duties are a form of tax collected on International trade i.e. imports and exports of certain goods, services or transactions by the government of a country generally through customs authorities. It is by and large calculated according to the value of the goods that are imported or exported. In line with the context, trade duty may also be observed as customs duty, tariffs and taxes on imports, export duties etc.

## 5.6 Descriptive Statistics

**Table 4.2**

	CAB	IMPT	EXPT	TOIT	CID
Mean	0.026	29.744	28.388	7.179	8.891
Median	-0.540	25.340	25.260	4.060	4.050
Maximum	32.540	91.060	93.620	32.560	43.240
Minimum	-16.550	0.000	0.000	0.000	0.000
St. Dev.	5.147	15.041	14.996	8.443	11.193
Observations	297	297	297	297	297

Source: Author's estimation

In the above table 4.2, the average of each variable is represented by its mean. In this study three variables namely current account balance (CAB), import (IMPT) and export (EXPT) of goods and services are expressed in terms of % of GDP whereas taxes on international trade (TOIT) is represented by % of revenue and custom and import duties (CID) is expressed in terms of % of tax revenue. The mean of CAB is 0.026 which denotes a surplus of 0.026% in the overall CAB of N-11 countries. Similarly, IMPT stands for 29.74% of GDP, EXPT at 28.388 % of GDP, TOIT at 7.179% of revenue and CID at 8.891 % of tax revenue.

## 5.7 Panel Unit Root Test

**Table 4.3** Summary of unit root tests

Method	I(0)		I(1)	
	C	C & T	C	C&T
<b>CAB</b>				
Levin, Lin & Chu t*	0.001	0.087	0.000	0.000
Im, Pesaran and Shin W-stat	0.000	0.005	0.000	0.000
ADF - Fisher Chi-square	0.003	0.017	0.000	0.000
PP - Fisher Chi-square	0.011	0.009	0.000	0.000
<b>IMPT</b>				
Levin, Lin & Chu t*	0.116	0.123	0.000	0.000
Im, Pesaran and Shin W-stat	0.199	0.046	0.000	0.000
ADF - Fisher Chi-square	0.145	0.053	0.000	0.000
PP - Fisher Chi-square	0.202	0.069	0.000	0.000
<b>EXPT</b>				
Levin, Lin & Chu t*	0.637	0.648	0.000	0.000
Im, Pesaran and Shin W-stat	0.817	0.349	0.000	0.000

ADF - Fisher Chi-square	0.681	0.376	0.000	0.000
PP - Fisher Chi-square	0.628	0.267	0.000	0.000
TOIT				
Levin, Lin & Chu t*	0.020	0.446	0.000	0.000
Im, Pesaran and Shin W-stat	0.044	0.296	0.000	0.000
ADF - Fisher Chi-square	0.141	0.147	0.000	0.000
PP - Fisher Chi-square	0.055	0.201	0.000	0.000
CID				
Levin, Lin & Chu t*	0.229	0.970	0.020	0.457
Im, Pesaran and Shin W-stat	0.240	0.816	0.000	0.000
ADF - Fisher Chi-square	0.462	0.879	0.000	0.000
PP - Fisher Chi-square	0.251	0.599	0.000	0.000

Source: Author's estimation

The results of above table 4.3 exhibit the summary of 4 methods of unit root test for both intercept and trend & intercept at level and first difference at lag 1. The results are based on the prob values of all 4 methods which should be less than the level of 10% in order to be considered as significant enough to reject the null hypothesis  $H_0$  which claims that data has a unit root problem i.e. having trends and is not stationary. Here the values show that out of all 5 series/ variables, only CAB has stationary results at level, both on intercept and trend & intercept, but as we moved towards 1st difference the remaining variables also show stationary results at trend and trend & intercept favoring the acceptance of alternative hypothesis that the data is stationary and now it has not contain any trends or unit root problem thus rejecting the null hypothesis. The results of unit root test give indication that the series of variables might exhibit a valid long term association and so in the next step co-integration between variables is tested.

## 5.8 Panel Co-integration Test

**Table 4.4** – Pedroni's co-integration test results

AR coefs	Individual intercept	Individual intercept & individual trend	No intercept or trend
Panel	Prob values		
v-Statistics	0.457	0.844	0.348
rho-Statistics	0.269	0.581	0.267
PP-Statistics	0.001	0.000	0.004
ADF-Statistics	0.002	0.000	0.008
Weighted Panel	Prob values		
v-Statistics	0.718	0.969	0.584
rho-Statistics	0.459	0.854	0.448
PP-Statistics	0.006	0.010	0.020

ADF-Statistics	0.008	0.000	0.021
Group	Prob values		
rho-Statistics	0.850	0.981	0.807
PP-Statistics	0.015	0.011	0.015
ADF-Statistics	0.019	0.000	0.018

Source: Author's estimation

In 1999 and 2004, Pedroni recommended the testing of both parametric and non-parametric long run variances pertaining to kernel estimation. The Pedroni's co-integration test has been implied because it allows all three specification i.e. No intercept or trend, individual intercept, individual intercept and individual trend whereas, Kao test allows individual intercept only. In the above table 4.4, null hypothesis (Ho) for all the eleven testing variants at 10% level of significance is that there is no long term co-integration present between research variables. Conversely, alternate hypothesis (HA) exhibits the presence of a long term relationship between the variables.

The above table 4.4 express that the prob value of majority of the above variants, at all three specifications, is less than the 10% level of significance which affirms the acceptance of alternative hypothesis that there is presence of long term association within the research variables and they are co-integrated with each other. With these results we can move towards further analysis.

## 5.9 Durban-Wu-Hausman test

**Table 4.5**

	Chi-Sq. Statistics	Chi-Sq. d.f.	Prob.
Cross section random	0.000	4	1.0000
Period random	0.000	4	1.0000

Source: Author's estimation

The above table shows that prob value of cross section random is above 10% level of significance therefore null hypothesis gets accepted here and alternative hypothesis gets rejected which represent that random effect model would be more suitable for the purpose of further analysis rather than fixed effect model.

## 5.10 Panel regression analysis

**Table 4.6**

Variable	Coefficient	t-Statistic	Prob.
IMPT	-0.663	-11.474	0.000
EXPT	0.693	13.270	0.000
TOIT	-0.008	-0.129	0.897
CID	0.021	0.480	0.631
C	-0.053	-0.058	0.953
R-square	0.619	Adjusted R-Square	0.559
F-Statistics	10.414	Prob (F-Statistics)	0.000

Source: Author's estimation

The above table 4.6 demonstrates that significance of each research variable by means of their respective prob values. The values are significant at 10% level of significance or below it. Here prob values of IMPT and EXPT represent to be significant which depicts material impact of these two variables upon current account balance. On the other hand prob values of TOIT and CID turned out to be greater than 10% level of significance which illustrate that they are not having considerable impact upon the CAD. The signs of coefficients show the nature of relationship between independent and dependent variables. In the above table IMPT and TOIT are expressing negative relationship with CAB whereas the other two variables i.e. EXPT and CID are showing positive association with CAB.

The value of R-square demonstrates the extent of movement caused in the value of dependent variable by the reason of independent variable. The value of R-square in the above table represent that 61.9 % of variation in the CAB is explained by the four independent variables. Further on, the value of adjusted R-square i.e. 55.9 % exhibits the same thing but it is adjusted for the number of variables and here it only slightly differs from the value of R-square because of less number of research variables used in this study. The value of prob (F-Statistics) depicts that in combination, all independent variables are having a significant impact on the dependent variable.

### 5.11 Panel causality analysis

**Table 4.7** Granger causality test results

Null Hypothesis:	F-Statistic	Prob.
IMPT does not Granger Cause CAB	0.844	0.359
CAB does not Granger Cause IMPT	3.245	0.072
EXPT does not Granger Cause CAB	1.416	0.234
CAB does not Granger Cause EXPT	6.151	0.013
TOIT does not Granger Cause CAB	0.036	0.848
CAB does not Granger Cause TOIT	0.212	0.645
CID does not Granger Cause CAB	0.614	0.433
CAB does not Granger Cause CID	0.504	0.478
EXPT does not Granger Cause IMPT	6.539	0.011
IMPT does not Granger Cause EXPT	15.254	0.000
TOIT does not Granger Cause IMPT	1.299	0.255
IMPT does not Granger Cause TOIT	0.002	0.959
CID does not Granger Cause IMPT	0.085	0.770
IMPT does not Granger Cause CID	0.289	0.591
TOIT does not Granger Cause EXPT	2.476	0.116
EXPT does not Granger Cause TOIT	0.095	0.757
CID does not Granger Cause EXPT	1.038	0.309
EXPT does not Granger Cause CID	1.049	0.306
CID does not Granger Cause TOIT	0.470	0.493
TOIT does not Granger Cause CID	0.025	0.874

Source: Author's estimation

The above table 4.8, pertaining to Granger causality analysis, tends to describe the existence of bi-directional causality between dependent and independent variables. The result demonstrates that at 10%

level of significance and lag 1, except CID and TOIT, CAB Granger cause remaining two research variables i.e. a uni-directional association exist between CAB & IMPT and CAB & EXPT, beside it, a bi-directional association exists between IMPT and EXPT.

## **6. Conclusion**

This study has been carried out with an intention to assess the impact of international trade and trade duties on current account balance of the balance of payment of N-11 countries. For the purpose of analysis, collection source of the data is the data bank of the World Bank from 1990 to 2016 for all N-11 countries. Findings from previous literature reviews implicate that current account balance is linked with several economic variables such as exchange rate, terms of trade, quantity and price of import & exports and trade duties. These variables are economic policy tools which take action to regulate the level of current account balance of an economy because current account balance holds great importance in identifying the economic health and general outlook of a country. Paulino and Thirlwall (2004) reported that liberalization of trade or leniency in trade formalities drive towards rapid growth of import and export both but import grows by more than the export which exhibit negative impact on the economy by impairing the positing of current account balance. Paulino (2002) also suggested that balance should be maintained in the import and export of an economy for the sustainability of the current account balance otherwise the benefit received from exports will be consumed in rectifying the adverse impact of imports on the current account balance. A number of studies concluded that trade restrictions are helpful in rectifying the adverse position of the current account balance but on the other hand hampering the growth of the country implying trade barriers. In the current study under consideration, several econometric techniques have been performed for the purpose of analysis and drawing out some meaningful conclusion thereof. Firstly, unit root test was performed to check the stationary characteristics of the data and it was obtained by the summary of all 4 methods namely, Levin, Lin & Chu t, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, PP - Fisher Chi-square, that the data is stationary and do not contain unit root problem at 1st difference. Afterwards, panel co-integration test was performed to evaluate the existence of long term association between the research variables and found out that variables are having long term relationship with each other. After that Hausman test was performed to find out whether fixed or random effect model would be suitable for further analysis and the results came out in the favour of random effect model which gives the signal to proceed with the panel regression analysis the result of which, confirmed the significance of IMPT and EXPT for effecting the CAB unlike TOIT and CID which found to be not having significant impact upon the CAB. Last but not the least panel causality analysis was performed via Granger causality analysis and obtained the results that except TOIT and CID, CAB is uni-directionally effecting the remaining two variables i.e. IMPT and EXPT, moreover a bi-directional relationship also found between IMPT and EXPT. The overall result of the analysis is sufficient to such extent enabling the establishment of a reasonable conclusion that there is association between CAB and the other research variables in some way or the other. But the important point to be noted here is that CAB turned out to be the ruling factor here and the other factors are adjusted according to the position and direction of the CAB which means that CAB itself is the prime indicating factor which is necessary to be considered before making any sort of changes in the regime of international trade of a country.

## **7. Recommendations**

The prime cause this paper is to identify the impact of international trade and trade duties on current account balance of N-11 countries. The group of N-11 countries included countries like South Korea, Mexico, Turkey, Iran and Pakistan, which are considered as rapidly developing economies having promising economic potential. Besides other internal and external factors, current account balance is one of the main indicators affecting the overall volume and quality of international trade of these countries. Adverse current account balance could be a critical problem for the economies of N-11 countries therefore following recommendations can be given for rectification of current account balance in order to smooth out the international trade process of these countries.

1. First and foremost recommendation is that there should be balance between imports and exports of these countries. Excess of any one of them could be hazardous for the economic health of the country (Paulino 2002). Too much import is harmful for domestic industries and will direct the local consumption towards imports. Too much export is also harmful for domestic consumers because it results in shortage of goods and services for local consumption causing domestic inflation.
2. Trade barriers are also an option for the rectification of current account deficit. Trade barriers include duties, taxes and quota etc, but caution should be applied before applying any sort of trade barrier because there are great chances that the implying country may have to face the retaliation in this regard and it may hamper the economic growth of the country (Mah and Kim, 2006).
3. Devaluation of local currency is the most common and comparatively easy to implement technique used by many economies around the world which help in recovering the adverse position of the current account balance. Devaluation of local currency causes exchange rate gap to increase with respect to other currencies which makes the export more profitable and imports more expensive and so directing the inward flow of foreign exchange which gradually improves the position of the current account balance (Weixian, 1999).
4. Price control can be considered as a significant policy tool for rectification of current account deficit because when domestic general price level decreases it will shift the local consumption from imported products towards domestic goods and services which on one hand relieves the pressure of imports and on the other hand provide the availability of low cost raw material for exports. Thus the increase in exports and decrease in imports will result in improvement in the position of current account balance.
5. It is highly recommended for the developing countries to conduct smart trade with the developed countries in such a way, to export those goods and services in whose generation they are comparatively competent, in exchange of latest technology and techniques which will not only improves their quality of exports but also enables them to provide better quality products domestically which gradually shifts consumer preferences towards local goods rather than imported goods.

## **8. Future Recommendations**

In this study, impact of trade and trade duties has been assessed over current account balance with the help of 4 constituents of these two prime variables, due to time and resource constraints. Practically there are lot more other variables, such as exchange rate, interest rate, price controls, terms of trade and other economic policy tools, which effect the current account balance in some way or the other so they also need to be accounted for on a extended scale in order to understand the true dynamics of the current account balance. Moreover, availability of complete and correct data is also a challenge for the purpose of achieving results which can be genuinely translated to reflect the true position of the current account balance. There are data constraints with respect to developing countries which restrict the research on many of their domains. If there is possibility for the availability of data from their local and internal sources it would be a major achievement in connection with the assessment of their socio economic problems and to drive remedies thereof because lots of researches are available in context with the developed countries where as developing countries lags behind in this aspect due to unavailability of adequate data.

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## A Tale of the Ticker; Stock Market Capacity Building Hegemony and Temporal Performance in the Emerging Economies

<sup>1</sup> Areeba Khan, <sup>2</sup> Imran Sharif Chudhary, <sup>3</sup> Sohail Saeed, <sup>4</sup> Muhammad Kamran Shahid

<sup>1</sup> Department of Management Sciences, The Islamia University of Bahawalpur, Pakistan

<sup>2</sup> Dean/Director, School of Economics, Bahauddin Zakariya University, Multan, Pakistan / Putra Business School, UPM, Malaysia

<sup>3</sup> Department of Commerce, The Islamia University of Bahawalpur, Pakistan

<sup>4</sup> Department of Management Sciences, The Islamia University of Bahawalpur, Pakistan

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p> <hr/> <p><b>Keywords</b> Capacity Building, Stock Market Capitalization, Economic Growth, Gross Domestic Product, Emerging Economies.</p> <hr/> <p><b>JEL Classification:</b> D24, D29, L11</p>	<p>This paper aims to examine stock market with a capacity building perspective for economic growth, focusing on the factors that enhance stock market capitalization in the long term. This study evaluates cross country series data of 26 emerging countries listed at MSCI index, through a period of 2006 to 2019. The data were collected through World Bank, Pakistan Stock Exchange and SECP database. Vector Error correction model and Multiple Regression analysis were applied on data to analyze the impact of assorted factors on stock market capitalization to GDP as a measure of long term capacity.</p> <p>The findings suggest that political stability and corporate tax rate are two important factors that may have significant impact on stock market capitalization to GDP. This research is different from all past researches with respect to methodological, aeon and acclimatization perspective. Capacity building is a relatively new phenomenon adopted from complex adaptive ecosystems and most studies in this area are of theoretical nature. Moreover, the fact that this research has considered not only the long term but also short-term market capitalization perspective, adds to its overall value and originality.</p>



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Corresponding author's email address: [imran@bzu.edu.pk](mailto:imran@bzu.edu.pk)

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### 1. Introduction

‘The market simply goes to prove that we still have loco weeds  
For the bull buys what he doesn't want, and the bear sells what he needs  
I bought an elevator stock, and thought that I'd done well  
Then the little bears all ran downstairs, and rang the basement bell’

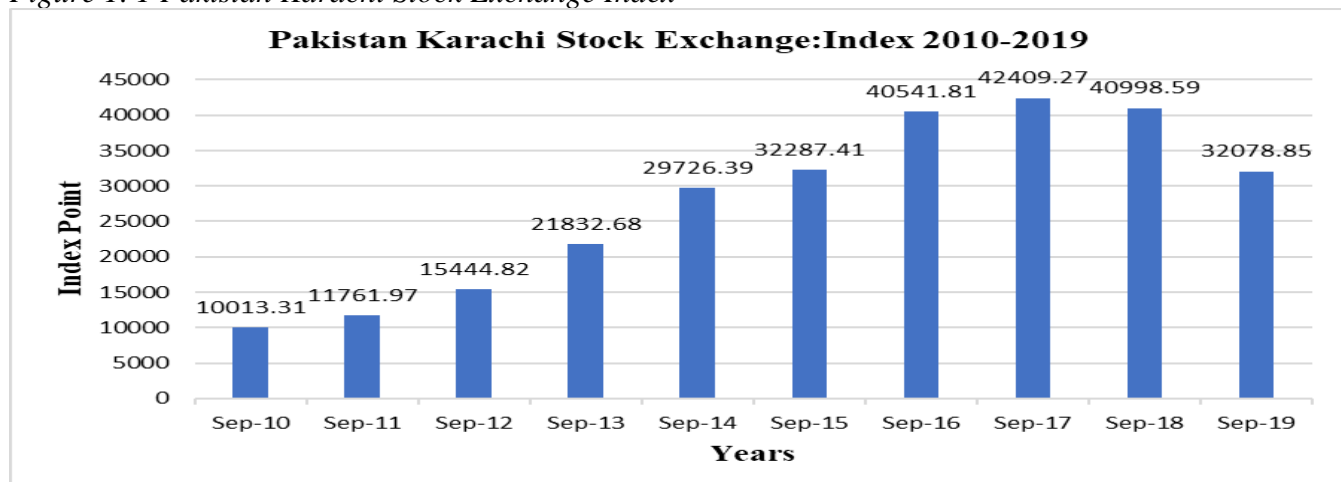
(Frank Crumit-A tale of the ticker)

Stock markets are epitome of volatility as they perform the function of channeling the flow of funds from savers to investors. Large investment projects are made possible through pooling of individual investments in a stock market. From a theoretical point of view, stock markets are postulated to promote long run economic growth through both consumption and investment channels (Iqbal, 2012). Life cycle/permanent income theory implies that higher asset prices increase individual's lifetime wealth resulting in higher consumption spending. This argument is valid if stock ownership by individuals is high. The Q-theory suggests a positive relation between investment and current and lagged stock prices. Thus, both the consumption- and investment-based theories imply that stock market has growth enhancing potential (Iqbal, 2012).

Othman Abbas (2016) assimilates that stock market liquidity and development of banking sector of a country provides the needed capital which assists in bringing investment within the market and improves the general condition of an economy. Financial market contributes tolerably in making this possible. This study tends to find out, whether stock exchanges of the countries affect the economic growth? Also, that, what are those critical variables of a stock market which contribute in enhancing the economic development of any country. Most of the studies of this field used a single stock market to concentrate and analyze the effects of stock market performance in the economy. Some of them also used aggregated stock markets of different countries and focus on other factors like size of the market and income level of the country. Many cross-country researches investigated the contribution of capital markets in building economy and agreed that well organized and effective financial investments are better tools to be used for economic development. Othman Abbas (2016) argued that with the rise within the popularity of worldwide stock markets, risk sharing is inspired by the market players which subsequently supports the resource allocation and improves economic growth.

Stock price index fell in 2008 due the recession in capital market of Pakistan. Stock market crashed in 2008 and stock price index reduced to 6000 points from 14000 points As past theories revealed the relationship between capital market and economy, therefore, by focusing on this field we would be able to diversify our risk and allocate our resources and investment efficiently.

Figure 1. 1 Pakistan Karachi Stock Exchange Index



(<https://www.ceicdata.com/en/pakistan/karachi-stock-exchange-index>)

As per the world bank data, in 2010 the capitalization as per the GDP is 21.42. Afterward the percentage shows some downturn that is 15.25 in 2011. After it shows some growth as per previous year that is 19.46 in 2012. In 2013, capitalization as per the GDP shows some up growth as compare to 2010 that is 24.79. Similarly, in 2014 Market capitalization as percentage of GDP shows more growth as compare to previous years that is 30.07. Again 2015 is shows down turn that is 24.42. But after all the capitalization as per the GDP have maximum flow of growth in 2016 with the rest of all previous years from 2010-2015 that is 32.97 as shown in the graph given below.

Figure 1. 2 Stock Market Capitalization as % of GDP



([https://www.theglobaleconomy.com/Pakistan/Stock\\_market\\_capitalization/](https://www.theglobaleconomy.com/Pakistan/Stock_market_capitalization/))

### Objectives of the Study

- To identify capacity building momentum of Pakistan through GDP to market capitalization ratio.
- To compare capacity building momentum of Pakistan with other economies of the same stature.
- To identify factors responsible for stock market capacity building in Pakistan.
- To ascertain the impact of stock market capacity building on economic development.

### Statement of the problem

Pakistan Stock Exchange (PSX) can increase in its market growth and investment portfolio, but as its registered points it decreases their points with the passage of time. PSX market growth and investment portfolio are not as per the emerging market. Their shown a decreasing trend in growth sectors. So, that all are not happen in PSX.

Extensive review of literature has identified about efficiently and a growth, but it will not discuss about capacity building with them. Without capacity building it can't explore such opportunity. As growth and efficiently concept is different, but before reach at that concept, it will need for capacity building to reach at that concept. Capacity building is a concept that mostly apply in ecology system but not in financial system. Financial system is also ecology system, because it all like units, hierarchy and move like that. One such theory adopted from ecology system it will increase in value. So, by using such measures it probably increases.

So, by using such capacity building concept we should need to explore all such opportunity of market growth and investment portfolio. Than can increase the growth of

PSX in emerging market.

## 2. Review of Literature

In this light stock markets influence growth through several channels: liquidity, risk diversifications, acquisition of information about firms, corporate governance and savings mobilization (Othman, 2016). Levine (1997) also shows that stock markets help protect investors against idiosyncratic risk by providing firms with the opportunity to hold a diversified portfolio. The diversification of risk also promotes investment in higher return projects and generates higher overall output growth (Nazir, Nawaz, & Gilani 2010). Again, due to the availability of portfolio diversification, firms can specialize in production activities thus increasing firm efficiency (Delali 2007).

The theoretical understanding of the stock market reactions to fiscal policies has been set out in a series of papers (Foresti & Napolitano 2017). In these studies, fiscal policy affects the stock market thanks to its effects on the level of economic activity. Therefore, according to economic theory, these effects can be positive, negative, or null depending on the assumption on the effects of fiscal policies on the level of economic activity.

(Perveen and Rahman 2018) explored impact of monetary and fiscal policies on Tehran stock market for period 2006-2012. The impact of money supply and exchange rate as monetary policy tools and government expenditures as fiscal policy tool on stock market was empirically analyzed. Analysis show that money supply negatively impacts stock market index. Further, govt. expenditures have significant influence on stock market index and exchange rate negatively impact stock market index. (Foresti and Napolitano 2017)

(Perveen & Rahman (2018) investigated the impact of monetary and fiscal policy on Iran's stock market. GDP, oil revenues, CPI, government expenditure, money supply, and stock exchange index have been used. Data was employed from 1991 to 2010 and Impulse response and variance decomposition model were employed for analysis. Results indicate that monetary and fiscal policies positively affect stock market directly or indirectly.

(Perveen and Rahman 2018) empirically explored the impact of fiscal and monetary policy on US equity revenues both in long run and short run for duration of 1960 to 2010. Researcher measured fiscal policy by federal budget deficit, monetary policy by federal rate and stock returns by S&P 500 index. Results of analysis confirms long run co-integration of equity prices with fiscal deficit, interest rate and industrial production. Monetary base and inflation show no effect on stock return in long run.

MAO and WU (2007) investigate impact of macroeconomic factors on stock returns of EU countries based on data from 2000 to 2012. The association was explored between equity returns and fiscal and macroeconomic variables like government debt, government expenditures, CPI, money supply, interest rate, foreign exchange reserve and foreign direct investments. Empirical analysis found correlation between CPI, interest rate and equity market return for developed EU stock market. While, emerging markets prove to be more vulnerable to fiscal developments.

Generally, interest rate was defined by MAO and WU (2007) as prices. Interest is a price that payable for the money that borrowed in a time period and stated in percentage from overall outstanding balance left where is changeable or fixed. In the context of



most common, interest is the amount of charge to the debtors within the time of using the credit provided (Hariz et al. 2017). Paramati and Nguyen (2019) define interest rate as a credit cost in economy and for more specific is a charge for price per year from the creditor to borrowers which is get a loan.

Hariz et al. (2017) considers that the relevant financial market will aggressively establish the nominal interest rate on deposits is positive in real terms (Clarke, 1982). The reason is that the depositor must incite to money held in connection with the assets and real assets grow at average rate of inflation (Hariz et al. 2017).

Number of theories has discussed the interest rates and its influence. Debt funds theory of interest rate has determinant views on the interest level in financial market as a result of factors that give the impact to the Debt funds supply and demand. This theory determined the interest rate is like determined the supply and demand of goods, Debt funds supply is increases as increases in interest, the all other factors is held constant (Hariz et al. 2017). According to Keynes (1965), he describes liquidity preference theory as the interest rate that mentions as money theory, employment theory or interest theory (Moyo and Le Roux 2018). According on Keynes (1965), money supply and demand had influenced the interest rate. Keynes mentions that through the effects on the scheduled investment spending that is the main way that will affect the rates of interest. (Shula, 2017)

Furthermore, Fisher (1930) states that the power of interest rate was influenced by the two factors such as source of savings were determined by the household or the source of investment demand and capital mostly from commercial industry. This theory deliberates the high interest rate will enhance the desirability to saving more rather than consumption expenditure that make it have the positive relationship among the interest rate and the size of savings.

Moreover, ample amount of studies has been conducted stating the significance of Interest rates. Some notable literatures amongst them are (Hariz et al. 2017) did a research on Financial Reforms, Interest Rate Behavior and Economic Growth in the financial sector of Nigeria. (Hariz et al. 2017) did a research on The Effect of Interest Rate Fluctuation on the Economic Growth of Nigeria using agricultural, manufacturing, financial, education and industrial sector. (Hariz et al. 2017) did a research on The Effect of Interest Rate on Economic Growth Rate. Daniel Musyoka Mutinda (2014) did a research on The Effect of Lending Interest Rate on Economic Growth of Kenya.

The result from (Hariz et al. 2017) concludes that interest rate had an insignificant effect on GDP and (Hariz et al. 2017) also has examined that there is significant negative correlation between interest rate and GDP.

**Following hypothesis could be inferred from the review of pertinent literature:**

**H1:** Inflation (consumer price index) have significant impact on the GDP to stock market capitalization.

**H2:** Political Stability have significant impact on the GDP to stock market capitalization.

**H3:** Interest Rate have significant impact on the GDP to stock market capitalization.

**H4:** Corporate Tax Rate have significant impact on the GDP to stock market capitalization.

**H5:** Indirect Tax Rate have significant impact on the GDP to stock market capitalization.

Table 2. 1 Table of Variable Description

Variables	Description	Measurement	Source
Inflation  (Shula 2017)	Inflation is a quantitative measure of the rate at which the average price level of a basket of selected goods and services in an economy increases over a period. It is the constant rise in the general level of prices where a unit of currency buys less than it did in prior periods. Often expressed as a percentage, inflation indicates a decrease in the purchasing power of a nation's currency.	Real Inflation, year to year, measure through consumer price index	World Bank Data base, Pakistan Stock Exchange SECP  The Global Economy
Political stability  (Perveen and Rahman 2018)	Political uncertainty (also called regime uncertainty) is a class of economic risk where the future path of government policy is uncertain, raising risk premia and leading businesses and individuals to delay spending and investment until this uncertainty has been resolved. Political uncertainty may refer to uncertainty about monetary or fiscal policy, the tax or regulatory regime, or uncertainty over electoral outcomes that will influence political leadership.	Political Stability Index  (-2.5 weak, 2.5 strong)	World Bank Data base, Pakistan Stock Exchange SECP  The Global Economy
Interest Rate/ Bond yield  (Shula 2017; Moyo and Le Roux 2018)	An interest rate is the percentage of principal charged by the lender for the use of its money. The principal is the amount of money lent. As a result, banks pay you an interest rate on deposits. They are borrowing that money from you.	Yearly Interest Rate	World Bank Data base. Pakistan Stock Exchange. SECP  The Global Economy
Fiscal Policy  (Foresti and Napolitano)	In economics and political science, fiscal policy is the use of government revenue collection (taxes or tax cuts) and Fiscal policy is based on the theories of the British economist John Maynard Keynes, whose Keynesian economics indicated that government changes in the levels of taxation and government spending influences aggregate demand and the level of	Dummy Variable  0 Loosening and 1 tightening.	World Bank Data base, Pakistan Stock Exchange SECP  The Global Economy

### 3. Conceptual Framework

Figure 2. 1 Framework



### 4. Method

The study sought to identify and describe the relationship between market capitalization and economic growth in Pakistan. The study primarily relied on secondary data on market capitalization and economic growth over the period 2009 to 2019 annually. In 2012 Dorko while undertaking a similar research study also used secondary Data. The data was sourced from World Bank data base, The Global Economy Security and Exchange Commission of Pakistan (SECP) and Pakistan Stock Exchange (PSX).

In this research Stock market capitalization to GDP (SMC) as a dependent variable and Political stability (PS), Real interest rate (RIR), Inflation consumer price index (CPI), Corporate tax rate (CTR) and Indirect tax rate (ITR) as an independent variable. Before implementing the model, all data are collected from World bank database, Pakistan Stock Exchange (PSE), Security and exchange commission of Pakistan and The Global Economy from 2009 to 2019 including twenty-six (26) emerging countries. The 26 emerging countries include Pakistan, China, India, Indonesia, Korea, Malaysia, Philippines, Taiwan, Thailand, Czech Republic, Egypt, Greece, Hungary, Poland, Qatar, Russia, Saudi Arabia, South Africa, Turkey, UAE, Argentina, Brazil, Chile, Colombia, Mexico, and Peru. For the results, the input of the data is used in three foam for analysis.

Firstly, all variables from 2009 to 2010 of all countries are used collectively to analysis the Vector Error Collection model (VECM), Secondly, for VECM there are three slab groups (0-40, 40-70, 70+), these groups are made by using the data of SMC from 2018 and 2019 of 26 emerging countries as a base for all other variables because it is our target variable. The 26 emerging countries include Pakistan, China, India, Indonesia, Korea, Malaysia, Philippines, Taiwan, Thailand, Czech Republic, Egypt, Greece, Hungary, Poland, Qatar, Russia, Saudi Arabia, South Africa, Turkey, UAE, Argentina, Brazil, Chile,

Colombia, Mexico, Peru. Now on the behalf of SMC as a base year the following slabs groups with countries are 0-40 group included Pakistan, Egypt, Greece, Hungary, Poland, Russia, Turkey, Argentina, Colombia and Mexico. 40-70 group included China, Indonesia, Saudi Arabia, UAE, Brazil and Peru. 70+ group included India, Korea, Malaysia, Philippines, Taiwan, Thailand, Qatar, South Africa and Chile, these all groups included data from 2009 to 2019 with variables SMC, PS, CPI, RIR, CTR and ITR.

Thirdly, for the Vector Autoregression model (VAR) and VECM groups are design as mentioned in the above paragraph. The change is taking complete values instead of averages. The excel sheet which is import in the EViews for analysis used as a group data and sheets not include the years and countries only values of variables are included. This analysis is run in three steps on the bases of group slabs (Soydemir 2000).

Vector autoregression (VAR) models introduced by the macro econometrician Christopher Sims (1980) to model the joint dynamics and causal relations among a gaggle of macroeconomic variables. VAR models are useful for forecasting. Consider a univariate autoregressive model— for instance, an AR (1)  $Y_t = \alpha + \beta Y_{t-1} + \epsilon_t$ —which describes the dynamics of only one variate  $Y_t$  (i.e., national income) as a linear process of its own past. (Soydemir 2000)

A vector error correction (VECM) model may be a restricted VAR designed to be used with nonstationary series that are known to be cointegrated. You may test for cointegration using an estimated VAR object, Equation object estimated using nonstationary regression methods, or employing a Group object. The VEC has cointegration relations constructed into the specification in order that it restricts the long-run behavior of the endogenous variables to converge to their cointegrating relationships while allowing short-run adjustment dynamics (Saeed 2017).

## 5. Results and discussion

This chapter also included the different techniques like Vector autoregression, Vector error correction model, and descriptive statistics for the analysis of our variable data. It includes the impact of Political stability, Inflation, Real interest rate, Corporate tax rate and Indirect tax rate on the Stock market capitalization to GDP during 2009-2019 of twenty-six emerging countries, and analysis of pakistan It also included the interpretation of the results of outputs.

The use of the stock market capitalization-to-GDP ratio increased in prominence after Warren Buffett once commented that it was "probably the best single measure of where valuations stand at any given moment." It is a measure of the total value of all publicly traded stocks in a market divided by that economy's gross domestic product (GDP). The ratio compares the value of all stocks at an aggregate level to the value of the country's total output. The result of this calculation is the percentage of GDP that represents stock market value.

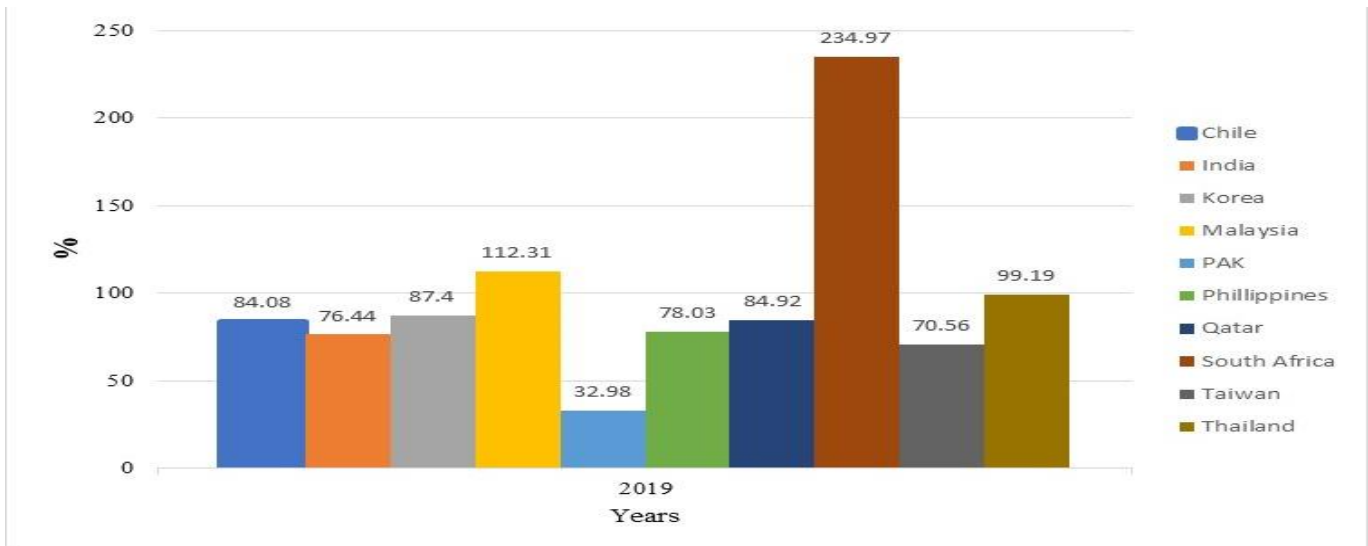
Typically, a result that is greater than 100% is said to show that the market is overvalued, while a value of around 50%, which is near the historical average for the U.S. market, is said to show undervaluation. If the valuation ratio falls between 50 and 75%, the market can be said to be modestly undervalued. Also, the market may be fair valued if the ratio falls between 75 and 90%.

Figure 4. 1 Stock Market Capitalization to GDP Pakistan



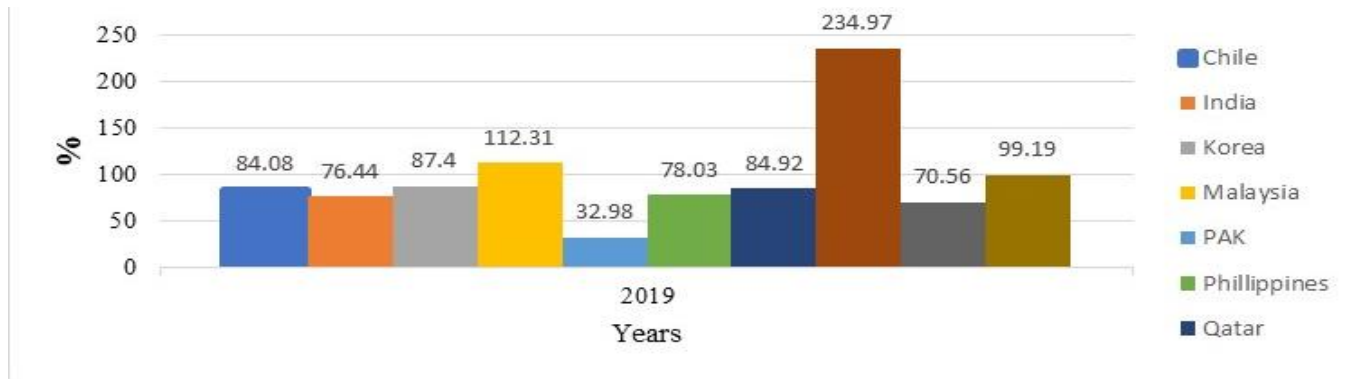
Typically, a result that is greater than 100% is said to show that the market is overvalued, while a value of around 50%, which is near the historical average for the U.S. market, is said to show undervaluation. If the valuation ratio falls between 50 and 75%, the market can be said to be modestly undervalued. Also, the market may be fair valued if the ratio falls between 75 and 90%.

Figure 4. 2 Stock Market Capitalization to GDP (0-40 Group)



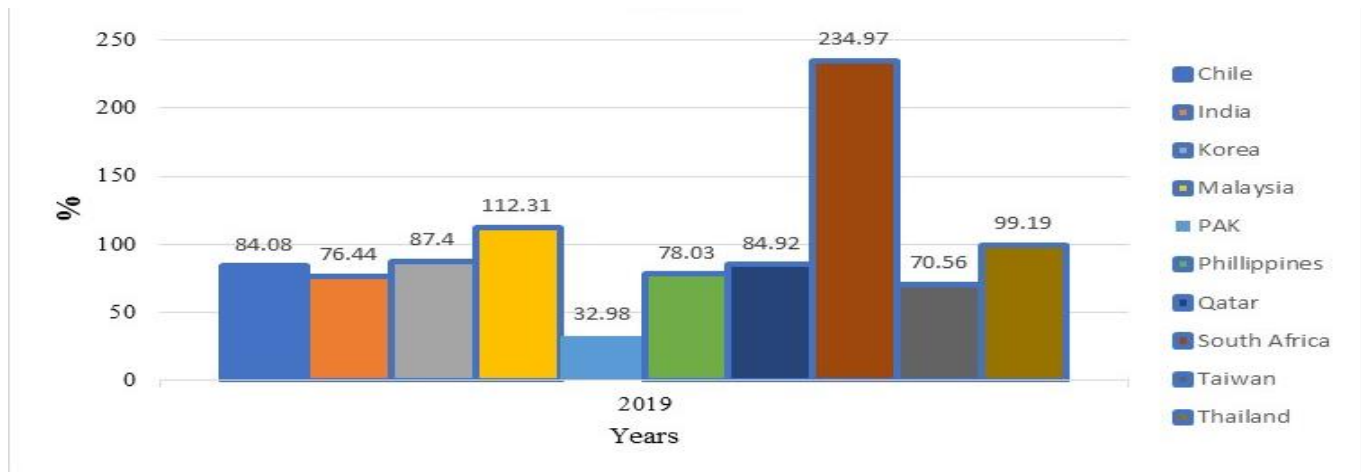
The average for 2019 of all 0-40 emerging countries group is 23.93 percent. The highest value is in Pakistan 32.98 percent and the lowest value is in Argentina 8.87 percent as shown in the above chart:2, of 0-40 emerging countries group. In the above chart 2, there are those countries whose SMC is below 40%, and all are undervalued countries. Typically, a result that is greater than 100% is said to show that the market is overvalued and is an indicator of well-developed stock market, while a value of around 50% and below is undervaluation and that indicate the underdeveloped of stock market, so for that all countries in the above chart 2 are underfeeding.

Figure 4. 3: Stock Market Capitalization to GDP 40-70 Group



The average for 2019 of all 40-70 emerging countries group is 48.22 percent. The highest value is in Saudi Arabia 63.44 percent and the lowest value is in Pakistan 32.98 percent as shown in the above chart of 40-70 emerging countries group. There are those countries whose SMC is above 40%, and all are undervalued countries as they all round about 50%. Typically, a result that is greater than 100% is said to show that the market is overvalued and is an indicator of well-developed stock market, while a value of around 50% and below is undervaluation and that indicate the underdeveloped of stock market. If the valuation ratio falls between 50 and 75%, the market can be said to be modestly undervalued, so for that all countries in the above chart 3 Saudi Arabia and UAE are modestly undervalued.

Figure 4. 4: Stock Market Capitalization to GDP 70+ Group



The average for 2019 of all 70+ emerging countries group is 96.09 percent. The highest value is in South Africa 234.97 percent and the lowest value is in Pakistan 32.98 percent as shown in the above chart of 70+ emerging countries group. There are those countries whose SMC is above 70%, and all are fair valued countries as they all round about 70%. Typically, a result that is greater than 100% is said to show that the market is overvalued and is an indicator of well-developed stock market like South Africa and Malaysia in above chart 4, while a value of around 50% and below is undervaluation and that indicate the underdeveloped of stock market. If the valuation ratio falls between 50 and 75%, the market can be said to be modestly undervalued, so for that all countries in the above chart 4 Taiwan is a modestly undervalued. Also, the

market may be fair valued if the ratio falls between 75 and 90% so, in the above chart 4, Chile, India, Korea, Philippines, Qatar and Thailand are fair valued countries.

Table 4. 1: Descriptive Statistic of Pak

<b>Descriptive Statistic</b>						
	<b>SMC_PAK</b>	<b>PS_PAK</b>	<b>CPI_PAK</b>	<b>RIR_PAK</b>	<b>CTR_PAK</b>	<b>ITR_PAK</b>
Mean	26.024	(2.546)	7.435	3.646	33.182	16.636
Median	24.790	(2.480)	7.200	4.693	34.000	17.000
Maximum	32.980	(2.400)	13.600	8.321	35.000	17.000
Minimum	15.250	(2.810)	2.500	(5.079)	30.000	16.000
Std. Dev.	6.662	0.142	3.917	4.420	2.089	0.505
Skewness	(0.206)	(0.484)	0.326	(1.196)	(0.528)	(0.567)
Kurtosis	1.556	1.923	1.636	3.076	1.645	1.321
Jarque-Bera	1.033	0.960	1.048	2.627	1.353	1.881
Probability	0.597	0.619	0.592	0.269	0.508	0.390

The mean or average value of the SMC (DV) of Pakistan is 26.024, and as per this description the value of SMC\_PAK lies between 15.250 to 32.980 as shown in the table 1. The average distance of SMC\_PAK between a single observation and the mean is 6.662 in emerging countries. Similarly, the description of other variables is shown in the table 1.

### 5.1 Vector Error Correction Estimates (PAK)

In Vector error correction model (VECM) analysis included Stock market capitalization to GDP (SMC\_PAK) as a dependent variable and Political stability (PS\_PAK), Real interest rate (RIR\_PAK), Inflation consumer price index (CPI\_PAK), Corporate tax rate (CTR\_PAK) and Indirect tax rate (ITR) as an independent variable.

Table 4. 2: Vector Error Correction Estimates Pak

<b>Vector Error Correction Estimates</b>			
<b>Cointegrating Eq:</b>	<b>CointEq1</b>		
SMC_PAK (-1)	1.000		
CTR_PAK (-1)	1.664 (0.030) [ 54.609]		
ITR_PAK (-1)	-3.455 (0.206) [-16.773]		
C	-23.736		
<b>Error Correction</b>	<b>D(SMC_PAK)</b>	<b>D(CTR_PAK)</b>	<b>D(ITR_PAK)</b>
CointEq1	-2.287 (0.407) [-5.625]	0.024 (0.070) [ 0.347]	0.012 (0.089) [ 0.138]
C	102.744 (26.603) [ 3.862]	-9.149 (4.586) [-1.99]	-2.049 (5.815) [-0.353]
PS_PAK	37.259 (9.724) [ 3.831]	-3.083 (1.676) [-1.839]	-0.776 (2.126) [-0.365]
CPI_PAK	-0.467 (0.219) [-2.133]	0.081 (0.038) [ 2.151]	0.009 (0.048) [ 0.179]
RIR_PAK	-0.804 (0.392) [-2.052]	0.061 (0.068) [ 0.901]	0.027025 (0.086) [ 0.316]
R-squared	0.912	0.787	0.050
Adj. R-squared	0.842	0.617	-0.709
F-statistic	12.969	4.628	0.066
Determinant resid covariance (dof adj.)		0.001	

The output obtained from the analysis is shown in above table 5. The vector error correction equation is as follows:

$$\text{VECM: } \Delta Y = \beta_0 + \sum_{i=1}^n \beta_i \Delta Y_{t-i} + \sum_{i=0}^n \delta_i \Delta X_{t-i} + \vartheta Z_{t-1} + \mu_i$$

.....(4.2)

From results the cointegrating equation coefficient is -2.287 for the error correction term lag zero period and coefficient values of x for this lag are PS\_PAK= 37.259, CPI\_PAK=-0.467, RIR\_PAK=-0.804 and the constant c is 102.744.



The cointegrating equation for the long run model is also shown as follows:

$$Z_{t-1} = ECT_{t-1} = Y_{t-1} - \beta_0 - \beta_1 X_{t-1} \dots\dots\dots (4.3)$$

In the results the value of SMC\_PAK (-1) =1.000, CTR\_PAK (-1) =1.664 and ITR\_PAK (-1) -3.454 for the lag period zero and constant ( $\beta_0$ ) for the cointegrating equation is -23.736.

The R-squared is 91% for this lag period and Adj. R-squared is 84% that predicted a good value, this variance is obtaining by testing different combination of endogenous and exogenous variables.

5.2 Unrestricted Vector Autoregression (VAR 10-40)

Table 4. 3: Unrestricted Vector Autoregression (0-40)

Unrestricted Vector Autoregression (VAR 0-40)						
	SMC	PS	CPI	RIR	CTR	ITR
SMC (-1)	0.513972 (0.17170) [2.99335]	0.006734 (0.00468) [ 1.44015]	-0.121278 (0.10640) [-1.13980]	-0.140213 (0.07433) [-1.88644]	-0.051478 (0.04469) [-1.15178]	0.005081 (0.02171) [ 0.23409]
SMC (-2)	0.158221 (0.17053) [0.92784]	-0.006030 (0.00464) [-1.29860]	0.141848 (0.10567) [ 1.34233]	0.161768 (0.07382) [ 2.19148]	-0.025252 (0.04439) [-0.56891]	-0.020156 (0.02156) [-0.93502]
PS (-1)	4.704016 (6.83003) [0.68873]	0.400689 (0.18599) [ 2.15441]	-10.43934 (4.23249) [-2.46647]	-3.207232 (2.95657) [-1.08478]	4.067862 (1.77785) [ 2.28808]	-0.188740 (0.86340) [-0.21860]
PS (-2)	-3.292768 (6.60077) [-0.49885]	0.539324 (0.17974) [ 3.00054]	9.255757 (4.09042) [ 2.26279]	2.466244 (2.85733) [ 0.86313]	-3.294821 (1.71817) [-1.91763]	0.125415 (0.83442) [ 0.15030]
CPI (-1)	0.197090 (0.25363) [ 0.77709]	-0.006130 (0.00691) [-0.88763]	0.855878 (0.15717) [ 5.44559]	0.120640 (0.10979) [ 1.09883]	-0.101871 (0.06602) [-1.54306]	-0.034067 (0.03206) [-1.06256]
CPI (-2)	0.357377 (0.27047) [ 1.32131]	-0.019758 (0.00737) [-2.68271]	-0.450990 (0.16761) [-2.69073]	-0.019032 (0.11708) [-0.16255]	0.189191 (0.07040) [ 2.68722]	-0.022792 (0.03419) [-0.66662]
RIR (-1)	0.314125 (0.35397) [0.88743]	0.000259 (0.00964) [ 0.02682]	0.207820 (0.21935) [ 0.94743]	0.782232 (0.15323) [ 5.10507]	-0.042330 (0.09214) [-0.45942]	-0.000815 (0.04475) [-0.01821]
RIR (-2)	-0.038973 (0.32337) [-0.12052]	0.001786 (0.00881) [ 0.20282]	-0.197049 (0.20039) [-0.98334]	-0.146482 (0.13998) [-1.04645]	0.132544 (0.08417) [ 1.57467]	0.017199 (0.04088) [ 0.42074]
CTR (-1)	1.079929 (0.63695) [ 1.69548]	-0.029265 (0.01734) [-1.68732]	-0.285412 (0.39471) [-0.72310]	0.190101 (0.27572) [ 0.68947]	0.834730 (0.16580) [ 5.03467]	-0.069454 (0.08052) [-0.86259]
CTR (-2)	-0.770229	0.018543	0.290969	-0.136833	0.063860	0.001284

From the above output table, the SMC strongly influences ascensive by the t-statistics of 2.99 for lag interval 1. but for the lag interval 2 SMC is not influences ascensive. The PS for the lag interval 1 and 2 is not predict or influence the SMC. CPI for the lag interval 1 not influence the SMC, but for the lag interval 2 influence the SMC with 1.321. RIR for the lag interval 1 and 2, is not influence the SMC. CTR for the lag interval 1 influence the SMC with 1.695, but no impact for the lag interval 2. ITR for the lag interval 2 influence the SMC with 1.495 and ITR for lag interval 2 have no impact. Similarly, the impact of SMC, PS, CPI, RIR, CTR and ITR impact for other equation is shown in the above output table. SMC have 51.40% and 15.82% increase in the SMC on average for the lag interval 1 and 2. CPI have 19.70% and 35.74% increase in the SMC on average for the lag interval 1 and 2. RIR have 31.41% increase in the SMC for the lag interval 1. PS and CTR have 470% and 107%

increase in the SMC for the lag interval 1. Similarly, for all other equation the impact of IVs is shown in the above output table.

### 5.3 VECM 1(0-40)

In this VECM analysis the results obtain from analysis are:

Table 4. 4: Vector Error Correction Estimates (0-40 Group)

<b>Vector Error Correction Estimates</b>						
<b>Cointegrating Eq:</b>	<b>CointEq1</b>					
SMC (-1)	1.000					
	8.594					
	(3.543)					
PS (-1)	[2.425]					
	7.651					
	(0.403)					
CPI (-1)	[19.00]					
	(1.259)					
	(0.617)					
RIR (-1)	[-2.042]					
	3.233					
	(0.516)					
CTR (-1)	[6.268]					
	6.239					
	(1.048)					
ITR (-1)	[5.952]					
C	(266.381)					
<b>Error Correction:</b>	<b>D(SMC)</b>	<b>D(PS)</b>	<b>D(CPI)</b>	<b>D(RIR)</b>	<b>D(CTR)</b>	<b>D(ITR)</b>
	0.105	(0.005)	(0.098)	0.039	0.000	(0.014)
	(0.027)	(0.000)	(0.008)	(0.011)	(0.009)	(0.004)
CointEq1	[3.912]	[-10.47]	[-12.23]	[3.560]	[0.038]	[-3.873]
	(0.160)	0.005	(0.088)	(0.201)	(0.049)	0.020
	(0.158)	(0.003)	(0.047)	(0.064)	(0.052)	(0.021)
D(SMC (-1))	[-1.011]	[1.862]	[-1.879]	[-3.144]	[-0.938]	[0.927]
	(0.037)	(0.003)	0.021	(0.105)	(0.094)	(0.007)
	(0.187)	(0.003)	(0.056)	(0.075)	(0.062)	(0.025)
D (SMC (-2))	[-0.199]	[-0.835]	[0.385]	[-1.385]	[-1.524]	[-0.266]
	(3.460)	(0.391)	(2.395)	(2.283)	4.752	0.544
D (PS (-1))	(7.157)	(0.128)	(2.131)	(2.895)	(2.369)	(0.958)

	(4.645)	(0.231)	4.266	0.322	(4.006)	(0.646)
	(6.976)	(0.125)	(2.077)	(2.822)	(2.309)	(0.934)
D (PS (-2))	[-0.666]	[-1.852]	[2.053]	[0.114]	[-1.734]	[-0.691]
	0.169	0.005	0.062	(0.083)	(0.246)	(0.007)
	(0.366)	(0.007)	(0.109)	(0.148)	(0.121)	(0.049)
D (CPI (-1))	[0.461]	[0.754]	[0.564]	[-0.560]	[-2.027]	[-0.152]
	0.440	(0.002)	(0.207)	(0.113)	0.184	0.031
	(0.284)	(0.005)	(0.085)	(0.115)	(0.094)	(0.038)
D (CPI (-2))	[1.549]	[-0.375]	[-2.447]	[-0.981]	[1.961]	[0.825]
	(0.156)	(0.006)	0.176	(0.200)	(0.182)	(0.040)
	(0.353)	(0.006)	(0.105)	(0.143)	(0.117)	(0.047)
D (RIR (-1))	[-0.441]	[-0.922]	[1.671]	[-1.404]	[-1.557]	[-0.849]
	(0.056)	(0.003)	0.021	(0.105)	0.075	(0.013)
	(0.269)	(0.005)	(0.080)	(0.109)	(0.089)	(0.036)
D (RIR (-2))	[-0.208]	[-0.685]	[0.265]	[-0.967]	[0.840]	[-0.350]
	0.647	(0.000)	0.057	(0.046)	0.139	0.064
	(0.595)	(0.011)	(0.177)	(0.241)	(0.197)	(0.080)
D (CTR (-1))	[1.088]	[-0.038]	[0.323]	[-0.190]	[0.707]	[0.804]
	0.241	0.011	(0.049)	0.167	0.086	0.064
	(0.537)	(0.010)	(0.160)	(0.217)	(0.178)	(0.072)
D (CTR (-2))	[0.449]	[1.115]	[-0.308]	[0.771]	[0.486]	[0.891]
	(2.363)	0.054	(0.656)	(0.032)	(0.428)	(0.087)
	(1.570)	(0.028)	(0.467)	(0.635)	(0.520)	(0.210)
D (ITR (-1))	[-1.505]	[1.905]	[-1.403]	[-0.050]	[-0.824]	[-0.412]
	0.699	(0.020)	(0.035)	(0.430)	(0.264)	0.058
	(1.274)	(0.023)	(0.379)	(0.515)	(0.422)	(0.170)
D (ITR (-2))	[0.549]	[-0.873]	[-0.092]	[-0.835]	[-0.625]	[0.340]
	1.596	0.007	(1.270)	0.310	(0.297)	0.054
	(1.241)	(0.022)	(0.369)	(0.502)	(0.411)	(0.166)
C	[1.287]	[0.323]	[-3.438]	[0.618]	[-0.722]	[0.327]
R-squared	0.660	0.881	0.929	0.562	0.323	0.476
Adj. R-squared	0.523	0.833	0.900	0.384	0.048	0.263
F-statistic	4.788	18.258	32.063	3.160	1.176	2.236
Determinant resid covariance (dof adj.)	129.292					
Determinant resid covariance	14.653					
Standard errors in ( ) & t-statistics in [ ], SMC, PS, CPI, CTR and ITR taken as an Endogenous variable and constant c as an Exogenous variable using Lag interval 1 and 2 for endogenous.						

#### 5.4 VECM 1(40-70)

The output obtain from vector error correction model are given below:

Table 4. 5: Vector Error Correction Estimates (40-70 Group)

Vector Error Correction Estimates						
Cointegrating Eq:	CointEq1					
SMC(-1)	1.000					
PS(-1)	16.354					
	(9.135)					
	[1.790]					
CPI(-1)	(4.777)					
	(1.697)					
	[-2.815]					
RIR(-1)	0.212					
	(0.471)					
	[0.449]					
CTR(-1)	2.082					
	(1.785)					
	[1.166]					
ITR(-1)	(2.340)					
	(0.705)					
	[-3.316]					
C	(45.935)					
Error Correction:	D(SMC)	D(PS)	D(CPI)	D(RIR)	D(CTR)	D(ITR)
CointEq1	(0.212)	(0.003)	0.023	(0.213)	(0.005)	0.050
	(0.168)	(0.003)	(0.040)	(0.119)	(0.035)	(0.047)
	[-1.259]	[-1.105]	[0.573]	[-1.796]	[-0.134]	[1.049]
D(SMC(-1))	(0.016)	(0.000)	(0.045)	0.083	(0.013)	(0.017)
	(0.207)	(0.004)	(0.049)	(0.145)	(0.042)	(0.058)
	[-0.078]	[-0.093]	[-0.903]	[0.568]	[-0.295]	[-0.299]
D(SMC(-2))	0.260	0.008	(0.050)	0.019	(0.033)	(0.019)
	(0.182)	(0.003)	(0.043)	(0.128)	(0.037)	(0.051)
	[1.426]	[2.436]	[-1.153]	[0.1479]	[-0.882]	[-0.380]
D(PS(-1))	(9.928)	(0.167)	0.295	3.189	(0.088)	0.600
	(9.902)	(0.184)	(2.360)	(6.969)	(2.032)	(2.777)
	[-1.002]	[-0.910]	[0.125]	[0.458]	[-0.043]	[0.216]
D(PS(-2))	11.234	(0.030)	(1.885)	(3.234)	(0.939)	1.766
	(9.716)	(0.180)	(2.315)	(6.838)	(1.994)	(2.724)
	[1.156]	[-0.166]	[-0.814]	[-0.473]	[-0.471]	[0.648]
D(CPI(-1))	(0.580)	(0.007)	(0.477)	(0.141)	(0.013)	0.019
	(1.070)	(0.020)	(0.255)	(0.753)	(0.220)	(0.300)
	[-0.542]	[-0.348]	[-1.872]	[-0.187]	[-0.058]	[0.064]
D(CPI(-2))	0.221	(0.001)	(0.417)	(0.257)	(0.047)	0.070
	(0.924)	(0.017)	(0.220)	(0.650)	(0.190)	(0.259)
	[0.239]	[-0.075]	[-1.895]	[-0.395]	[-0.250]	[0.271]

## 4.3.5 VECM 1(70+ 1Group)

Table 4. 6: Vector Error Correction Estimates (70+ Group)

Vector Error Correction Estimates						
Cointegrating Eq:	CointEq1					
SMC(-1)	1.000					
	(283.566)					
	(800.632)					
PS(-1)	[-0.354]					
	(1,079.089)					
	(297.243)					
CPI(-1)	[-3.630]					
	990.900					
	(325.963)					
RIR(-1)	[3.039]					
	386.807					
	(150.922)					
CTR(-1)	[2.564]					
	56.962					
	(127.214)					
ITR(-1)	[0.448]					
C	(11,069.8)					
Error Correction:	D(SMC)	D(PS)	D(CPI)	D(RIR)	D(CTR)	D(ITR)
CointEq1	0.001	7.87	0.000	(0.001)	(0.000)	-7.13
	(0.001)	(2.0)	(0.000)	(0.000)	(0.000)	(8.0)
	[0.519]	[0.387]	[2.489]	[-4.874]	[-1.812]	[-0.089]
D(SMC(-1))	(0.345)	0.000	(0.004)	(0.012)	(0.004)	0.002
	(0.121)	(0.002)	(0.011)	(0.010)	(0.010)	(0.007)
	[-2.859]	[0.217]	[-0.349]	[-1.228]	[-0.351]	[0.250]
D(SMC(-2))	(0.465)	0.002	(0.006)	(0.008)	(0.003)	0.006
	(0.141)	(0.002)	(0.013)	(0.012)	(0.012)	(0.009)
	[-3.291]	[1.048]	[-0.479]	[-0.655]	[-0.292]	[0.681]
D(PS(-1))	(7.276)	(0.238)	(1.379)	2.085	1.198	0.167
	(11.787)	(0.183)	(1.059)	(0.975)	(0.990)	(0.719)
	[-0.617]	[-1.302]	[-1.302]	[2.138]	[1.211]	[0.232]
D(PS(-2))	15.209	(0.135)	(1.116)	1.557	(0.055)	(0.525)
	(11.736)	(0.182)	(1.055)	(0.971)	(0.986)	(0.716)
	[1.296]	[-0.741]	[-1.058]	[1.603]	[-0.056]	[-0.733]
D(CPI(-1))	0.113	(0.006)	(0.357)	(0.417)	(0.058)	(0.132)
	(2.022)	(0.031)	(0.182)	(0.167)	(0.170)	(0.123)
	[0.056]	[-0.182]	[-1.965]	[-2.491]	[-0.338]	[-1.072]
D(CPI(-2))	1.059	(0.003)	(0.197)	(0.015)	(0.209)	(0.074)
	(1.750)	(0.027)	(0.157)	(0.145)	(0.147)	(0.107)
	[0.605]	[-0.102]	[-1.253]	[-0.104]	[-1.423]	[-0.693]

The empirical investigation of this study by VECM model and VAR shows that there is a significant relation between the stock market capitalization to GDP ratio and the political stability, inflation, real interest rate, corporate tax rate and indirect tax rate. This relation supported our literature. Now by this there is impact of DV on the stock market and economic growth. When there a significant between stock market capitalization to GDP and political stability there will be enhance of stable economic growth, when the stock market is stable from such impact than it will flourish the stock market capitalization by developing stable economy in such developing countries like Pakistan and the capacity for the stock should also enhance. Real interest rate also has a significant impact from investigation, so it also enhances the stock market capitalization,

there the overvaluation of the capital which enhance the economic growth of the emerging countries because that also allow the investors and householders towards investment and savings but for all that there should be capacity for such capitalization in the equity market.

## **6. Conclusion and Recommendations**

From this study we conclude that the impact of Inflation, corporate tax rate and indirect tax rate significantly enhances the market capitalization of stock market. Stable corporate tax rate helps the corporation to expansion and enhance their capital assets in a short run or long run. It also increases the market capitalization which ultimately enhances the economic growth and helps to boost up the capacity of the stock market.

This research is helpful for the firms and investors who are the part of this economy. This study also has implications for the policy makers and financial advisors, who are liable to make better and more efficient policies. The results of this study will be helpful for them to enhance the economic growth by investing in the stock market.

This region shall be considered as the key area of research in the coming future for the economists and researchers of financial development and economic growth. As far as the industry is concerned with the capitalization growth can be considered as the direct indicator of economic growth. This region is rich in resources, the only factor which is required is the stable environment for the investors and research and development. The government that can also play a vital role in increasing stock market capitalization by using different interventions like decreasing tax and interest rate.

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## Capital Structure Theories and Speed of Capital Adjustment towards Target Capital Structure along Life Cycle Stages of Asian Manufacturing Firms

<sup>1</sup> Muhammad Sajid Amin, <sup>2</sup> Hashim Khan, <sup>3</sup> Imran Abbas Jaddon, <sup>4</sup> Muhammad Tahir

<sup>1</sup> PhD Research Scholar, Faculty of Management Sciences, COMSATS University Islamabad, Pakistan: sajid.amin719@gmail.com

<sup>2</sup> Assistant Professor, Faculty of Management Sciences, COMSATS University Islamabad, Pakistan: hashim.khan@comsats.edu.pk

<sup>3</sup> Assistant Professor, Faculty of Management Sciences, COMSATS University Islamabad, Pakistan: imran.jadon@comsats.edu.pk

<sup>4</sup> Assistant Professor, Faculty of Management Sciences, COMSATS University Islamabad, Pakistan: m\_tahir@comsats.edu.pk

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p>Firms have different costs and benefits and asymmetric information across their life cycle stages and hence each stage has different financial pattern and speed of adjustment towards target capital. We use System GMM to test the hypotheses. We use market leverages proxies for the capital structure, life cycle proxies: introduction, growth, mature, shakeout and decline and the control determinants of capital structure such as profitability, tangibility, firm size and growth opportunities. We estimate the financial pattern and speed of adjustment along life cycle stages of manufacturing firms from eleven Asian economies over the period of 2010-2018. The results show that firms in earlier stages have more long term debt than mature stage. The speed of adjustment towards target capital structure is highest in mature stage than the other stages. The control determinants significantly affect market leverages. The findings suggest that management has to consider life cycle stages of their firms in order to adjust capital structure. Stockholders should consider stage of firm with relation to profitability and capital structure for long term prospects.</p>
<p><b>Keywords</b> Capital Structure Theories, Life Cycle Stages, Speed Of Adjustment, Market Leverages</p>	
<p><b>JEL Classification:</b> G32, G39, D91</p>	



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Corresponding author's email address: sajid.amin719@gmail.com

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### 1. Introduction

There are well documented studies that firms in different industry behave differently. Even, the firms from same industry have different financial constraints (Flannery and Hankins (2007) and Dickinson (2011)). These financial constraints may be the cause and effects of firm and country institutions. The

firms formulate financial policies particular for equity/debts or by combination of both within these constraints. Being an emerging concept in literature of capital structure, firm life cycle stages (LCS, hereafter LCS) has variant impacts on the speed of adjustment (SOA, hereafter SOA) towards target capital because firm's resources are quite different during its LCS. The literature provides very fewer evidences in this context like cost of equity variations along LCS (Hasan, Hossain, and Habib (2015), formulations of corporate policies with predefined pattern of life cycle (Faff, Kwok, Podolski, and Wong (2016)) and organizational capital along LCS by Hasan and Cheung (2018).

Life cycle has important role in determining firm's capital structure. Each stage of life cycle has different financial costs, benefits and asymmetric information, therefore, it is expected that stages have different SOA. Financial policies of Asian firms differ from western firms'. Firms from developing economies have more short term debts than long term debts as compared to advanced economies' (Booth et al. (2001)). Therefore, we use total market debt ratio in exploring financial pattern and SOA for Asian manufacturing firms along LCS.

As per our best knowledge, it is the first empirical study that captures the financial pattern and SOA along LCS. We have two major objectives in Asian setting: First, empirically investigate pattern of financial leverage along LCS. Second, empirically estimate and compare SOA towards target capital structure along LCS.

## **2. Literature Review and Hypotheses**

Static trade off theory (TOT, hereafter TOT) argues that firms adjust capital structure towards target in absence of costs. Pecking order theory (POT, hereafter POT) argues that firms have no specific target capital but firms track on predefined preferences of financing. The dynamic trade off model takes practical implications to adjust capital structure like adjustment costs. Modified POT supports soft target capital structure views and argues that firms adjust it by considering adjustment and disequilibrium costs.

Static TOT framework demands firms should seek tradeoff between debt tax shields against financial distress and bankruptcy costs. Modigliani and Miller are pioneers of this theory. They put two contradict views related to capital structure and firms' value. First, Modigliani and Miller (1958) argue that market worth of any firm is not related to its capital structure. Second, Modigliani and Miller (1963) theoretically argue that capital structure impacts the firms' value. Hirshleifer (1966) and Kraus and Litzenberger (1973) criticize Modigliani and Miller(1958, 1968) postulates on certain earnings' assumptions and argue that optimal financial structure seeks trade-off debt tax shields against bankruptcy costs. Therefore, the growing literature on dynamics of capital structure criticizes traditional capital structure models which do not give considerations to capital structure dynamics. The partial adjustment model is dynamic. Partial adjustment model implies that capital structure for each period is determined with comparison of observed capital structure to target one. Fischer, Heinkel, and Zechner (1989) find that transaction costs direct firms' financing policies regularly. Goldstein, Ju, and Leland 's (2001) study concludes retiring debt costs have a tendency for the firms to adjust leverage. Hennessy and Whitted's (2005) study of dynamic trade off model concludes that proportional floatation costs cause to increase equity issuance costs.

Myers (1984) criticizes Donaldson (1961) on the absence of target capital in his pecking order model. He proposes another version of POT by incorporating asymmetric information effects, floating costs and costs of financial distress. He identifies that asymmetric information produces different costs and firm may or may not issue new securities. He suggests that firm issues (purchases) new (outstanding) equities when its existing securities are overvalued (undervalued) and known as market timing theory. The investor perceives positive (negative) signal when firm launches new debt (stock). They perceive debt issuing firm has ability to repay its debt obligations in future and equity issuing firm going to catch opportunity of overvalued stock (known as signaling effect). Adverse selection depends on nature of

asymmetric information related to firm's value or related to firm's risks. Managers prefer retained earnings to avoid adverse selection related to firms' value and they prefer to issue equity in case of risks. Byoun (2008) observes adverse selection in his capital structure model.

Few empirics classify firms into categories like small and large, dividend paying and non paying Byoun (2008) and Faulkender et al. (2012)) and young and fast growing firms (Flannery and Rangan (2006)) to estimate and compare SOA. Kieschnick and Moussawi (2018) find that debt is inversely related with LCS. Berger and Udell's (1998) study growth of firms and identify the availability of financing and its costs depend on LCS. Dickinson (2011)<sup>6</sup> defines firm as a portfolio of multi-products in multi-industries. Each product has distinct stage of life cycle. Therefore, it is hard to capture LCS at firm level. She argues financing, investing and operating cash flow patterns associate with LCS as a non-sequential approach. She classifies firms' life cycle into introduction, growth, mature, shake out and decline stages.

Benefits and costs of debt vary along LCS and TOT addresses this nexus. Such as growing/mature firms have more profits, more tangible assets and larger diversified size to avoid financial and bankruptcy costs (Castro et al. (2016) and Fan et al. (2012)). The information asymmetric varies across LCS and POT discusses this nexus. It is higher at introduction and growth than maturity stage. Mostly, the firms opt for equity financing during introduction stage, growing and mature stages retain more earnings from profits to finance growth prospects. Firms use less debt with higher profits and larger size. Myers (1984) finds that adjustment costs create lags between target capital and actual debt ratio. Fischer et al. (1989) identify that fixed costs let firm to rebalance capital structure only when it deviates from a specified lower/upper limit. Shyam-Sunder and Myers (1999) find validation of POT in adjusting target capital. Byoun (2008) and Hovakimian and Li (2009) find that asymmetric adjustment costs relate to target capital structure.

By summing up the above discussion, TOT seeks balancing of benefits against costs of debt in adjusting capital structure. Therefore, benefits and costs of debt financing are likely change across life cycle and TOT addresses this nexus. POT argues that information asymmetric varies across firms and over time. We expect that asymmetric information is higher at introduction and growth stages than maturity stage.

Introduction stage has deficit knowledge of potential costs and revenues, investment in projects are high and need more debt to grow. Growth and maturity stages have less deficit knowledge of potential costs and revenues, potential increase in investment and efficiency, investment in projects are higher in both stages. Growth stage needs more funds to finance projects while mature stage engages in repay debts and/or repurchase equity. Decline stage is characterized with declining in prices and growth rates, liquidate assets to pay debt obligations and keeps focus on renegotiate debt. In order to shed light on financial leverage and its associated prospects, we investigate Asian firms' capital structure behavior across different LCS. We develop following hypothesis.

H1: Firms have comparatively higher debt ratio in earlier stages than maturity as they move from introduction to mature stage

Hovakimian et al. (2001) finds firms have different SOA from each other and over the period. Faulkender et al. (2012) identify firms adjust capital structure in two ways. First, when benefits are leftover costs and secondly when adjustment costs are relatively low. Small firms are exposed to problem of information asymmetry and have to bear higher cost of financing (debt or equity). Moreover, empirics highlight that firms with higher profitability, less financial leverage and mature in nature are likely to issue debt because they have more incentives in issuing debt (Huang and Ritter (2009)). Firms having growth prospects are always in need to finance their growth prospects; hence, they issue equity financing because it is less

<sup>6</sup> See for detail: Dickinson, V. (2011). Cash flow patterns as a proxy for firm life cycle. *The Accounting Review*, 86(6), 1969-1994

constraint. Moreover, TOT explains that high leveraged firms always prefer equity funding to avoid constraints of collateral attached to debts. Firms in mature stage have growth prospects and mostly have a significant portion of retained earnings. The growth prospects and based on the above views, we construct following hypothesis:

H2: The firms in mature stage have higher SOA than earlier stages introduction and growth and later stage decline.

We use determinants of capital structure like profitability, size, asset tangibility and growth prospects as control variables to justify POT and TOT. Firms are exposed with higher profitability are more likely to finance through retain earning and less reliance on debts. Firms with greater market capitalization enjoy easy access of equity financing. Tangibility floats good signal into market for issuing equities and ensures that firms' have enough collateral values. High market to book ratio is signal of superior performance of assets in place. Based on these views, we expect the negative relationship between financial leverage and firm's tangibility, profitability, size and positive relationship with growth opportunities under the POT. Dynamic TOT implies that more profitable firms have fewer probabilities of financial distress and bankruptcy. These are capable to serve the financial obligations. Firms with greater market capitalization enjoy easy access of debt finance because larger firms are stable and are less likely to be bankrupt. This theory deems that growth opportunities are intangible assets and have no collateral value. Firms with higher tangible fixed assets have more collateral value and simple approach to debt. Based on these views, we expect the negative relationship between financial leverage and growth opportunities and positive relationship with profitability, tangibility and size under the TOT.

### 3. Methodology

#### 3.1 Sample

We use firm specific data of eleven Asian countries obtained from OSIRIS over period of 2010-2018. We focus on manufacturing firms drawn from Japan, Pakistan, Sri Lanka, Indonesia, India, South Korea, Singapore, Malaysia, Turkey, Thai Land and Philippine. We follow Dickinson (2011) for data generating process.

#### 3.2 Variables Definition

The table 1 presents variables measurement. Market leverages reduce countries differences and manipulations (Booth et al. (2001)). Further Dickinson (2011) argues that her classification of life cycle proxies better explain the rates of return and stock returns. Therefore, this study prefers market leverage proxies.

#### 3.3 Model Specification

We have short panel data set. Therefore, we expect variations between groups dominates the variations within the groups. In addition to, we use lagged dependent variable as independent variable. Therefore, partial adjustment model is suitable. The model specification is as follow:

$$Mlev_{i,t} = (1 - \delta)Mlev_{i,t-1} + (\delta\alpha_i)Z_{i,t} + bi \sum_{k=1}^m LC_k + ci \sum_{k=1}^m LC_k * Mlev_{i,t-1} + \sum_{k=1}^m ID_k + \sum_{k=1}^m CD_k + \sum_{t=2011}^{2018} TM_t + \epsilon_{i,t} \quad \text{Equation I}$$

$Mlev_{i,t}$  represents market debt ratios in terms of long term debts and total debts.  $(1 - \delta)Mlev_{i,t-1}$  represents lagged value of market leverages and  $(\delta\alpha_i)Z_{i,t}$  is a vector of control determinants.  $\sum_{k=1}^m LC_k$ ,  $\sum_{k=1}^m ID_k$  and  $\sum_{t=2010}^{2018} TM_t$  are set of dummies for LCS, industries and years respectively.  $\sum_{k=1}^m LC_k * Mlev_{i,t-1}$  represents a vector of interaction terms between  $Mlev_{i,t-1}$  and the dummy of LCS. The coefficients of dummies  $bi$  capture the differences in means of LCS and  $1 - \delta - ci$  captures the SOA; where  $\delta$  is coefficient of  $Mlev_{i,t-1}$  and  $ci$  is the coefficient of interaction terms.

The sys-GMM performs better to estimate the equation I (Deesomsak et al. (2004) and Antoniou et al. (2008)). We apply pre-diagnostic tests such as Wooldridge, White /Koenker and Wu-Hausman to check autocorrelation, heteroskedasticity and endogeneity for suitability of GMM. We also apply post diagnostic tests such as AR(1) and AR(2) to check autocorrelation, Hanen's J-test to check instruments validity and Wald test to check the goodness of model.

**Table 1:** Capital Structure and its Determinants

Independent Variables	Proxy/ Measurement	Empirics
Total market leverage	Total book debt / (Total debt plus market value of equity (share price x number of outstanding shares))	Hovakimian et al. (2001), Antoniou et al. (2008), Byoun (2008), Huang and Ritter (2009), Fan et al. (2012) and Matemilola et al. (2018)
Long term market leverage	Long term book debt / (Long term book debt plus market value of equity (share price x number of outstanding shares))	Booth et al. (2001), Byoun (2008), Fan et al. (2012) and Matemilola et al. (2018)
Profitability	Earnings before interest and taxes (EBIT) / Total assets	Matemilola et al. (2018), Byoun (2008), Antoniou et al. (2008) and Flannery and Rangan (2006)
Growth opportunities	Market value of share / Book value of share (MB)	Matemilola et al. (2018), Huang and Ritter (2009), Flannery and Rangan (2006), Myers (1984) and Hasan and Cheung (2018)
Tangibility	Net property, plants and equipment (PPE) / Total assets	Matemilola et al. (2018), Fan et al. (2012), Byoun (2008) and Booth et al. (2001)
Size	Natural logarithm of market capitalization	Dickinson (2011) and Hasan and Cheung (2018)

Source: Author's Compilations

## 4. Results and Discussion

### 4.1 Descriptive Statistics

Firms in mature stage are stable and in decline stage are transitory (Dickinson (2011)). Therefore, we expect highest (lowest) rate of recurrence of observations in mature (decline) stage. Table 2 confirms this prediction and finds 58.04 (4.15) percent of firm-observations lie in mature (decline) stage. The mature firms have lower debt as compared to earlier stages.

**Table 2:** Life Cycle Stages Wise Data Distribution and Means of Debt Ratios

Sr. no	Stages	Number of observations	Percent (%)	Total market debt ratio (%)	Long term market debt ratio (%)
1	Introduction	1,876	7.34	45.28	23.67
2	Growth	4,886	19.12	38.40	23.71
3	Mature	14,831	58.04	26.05	14.68
4	Shake-out	2,897	11.34	26.08	13.42
5	Decline	1,061	4.15	32.80	15.99
Total/Pooled			100.00	30.11	16.98

## 4.2 Regression Results

The results of leverage pattern along LCS are presented in table 3 and SOA in table 4. The significance of Wooldridge test, White /Koenker test and Wu- Hausman test indicate that GMM estimator is suitable for the study.

As per findings of the study (refer to table 3), the findings are consistent with hypothesis 1 that predicts firms' financial leverage is on higher side in other stages when compare to maturity stage. The mature stage is positively associated with firm's leverage ( $\beta=0.0295$  and  $p<0.05$ ). The growth and introduction stages are positively associated with  $\beta=0.0476$  and  $\beta=0.047$  respectively at  $p<1\%$ , the shakeout stage is negatively associated ( $\beta=0.0065$  and  $p<1\%$ ) and decline stage is  $1.6 \times 10^{-5}$  and negatively insignificant. Mature firms repay debts and growing firms acquire more debt to finance their projects. This is consistent with hypothesis 1; firms are more leveraged as they move from introduction stage to mature stage and less leveraged in shakeout and decline stage. We do not find non monotonic association between LCS and total market leverage (refer to table 3).The findings are contradict with hypothesis 1 which predicts that firms in mature stage have lower financial leverage as compared to earlier stages. The reasons of the contradiction may be that firms in mature stage need more short term debt for working capital. Further, mature firms are more dividend paying and retain lower out of earnings than firms in other stages.

**Table 3:** Results of System GMM's: Pattern of Financial Leverage along LCS

	Long term market leverage		Total market leverage	
	Coefficients	z-statistics	Coefficients	z-statistics
Leverage(t-1)	.7775***	(14.80)	.8287***	(31.47)
Introduction	.047***	(12.83)	.0803***	(23.90)
Growth	.0476***	(23.50)	.0602***	(34.11)
shake out	-.0065***	(-2.92)	-.0106***	(-5.02)
Decline	-.000016	(-0.000)	.0022	(0.50)
Profitability	-.1945***	(-7.24)	-.2535***	(-10.86)
Size	.00021	(0.35)	-.003***	(-3.40)
Tangibility	.070***	(3.39)	.0415***	(3.91)
Growth opportunities	-.0036***	(-3.47)	-.0052***	(-6.45)
Constant	.0295**	(2.26)	.0974**	(5.38)
Year/industry/Country effects	Yes		Yes	
No. of groups	2835		2835	
No. of instruments	46		46	
AR(1) p value	0.00	(-12.44)	0.00	(-17.81)
AR(2) p value	0.502	(0.67)	0.172	(1.37)
Hansen test p value	0.439	(0.60)	0.933	(0.01)
Wald chi square	0.00	(17006.61)	0.00	(49322.70)
Wooldridge test P-value	0.00	(1013.47)	0.00	(1214.331)
Wu-Hausman test P-value	0.00	(26.4657)	0.00	(71.1933)
White/Koenker test P-value	0.00	(2020.430)	0.00	(1185.359)

Note: \*\*\*, \*\* and \* indicate coefficients are significant at 1, 5 and 10 percent levels, respectively.

The table 4 presents results of SOA along LCS. The coefficients of Leverage (t-1) and interaction variables explain the costs of adjustment towards target capital. Higher costs of adjustment slower down adjustment speed towards target capital. The reference category among LCS is mature stage. The incremental adjustment costs for introduction, growth and decline stages are 0.1462, 0.1538 and 0.128

respectively as compared with mature stage. The interaction variables are positively significant and reflect that these stages have lower adjustment towards target capital structure as compared to mature stage. The SOA of mature stage is 32.55% (1-0.6745) per year and for introduction, growth and decline stages are 17.93%, 17.17% and 19.75% per year respectively.

As concerned with total market leverage, the introduction, growth and decline stages have 0.0448, 0.0843 and 0.1238 higher adjustment costs respectively than mature stage and hence slower SOA towards target as compared to mature stage. The mature stage has SOA 25.13% (1-0.7487) that is greater than introduction 20.65%, growth 16.70% and decline 12.75% stages. Both results support the hypothesis 2 that firms in mature stage have higher SOA than other the stages of life cycle. The empirics on TOT and POT find that adjustment costs and asymmetric information do matter for the firms in determining how they quickly adjust their capital structure (Myers (1984), Hovakimian et al. (2001), Faulkender et al. (2012), Leary and Roberts (2005) and Flannery and Rangan (2006) support TOT hypothesis and Byoun (2008) and Huang and Ritter (2009) support Pecking order hypothesis).

The results show that growth opportunity and profitability have negative significant impacts on capital structure and are similar to the findings of Byoun (2008) and Flannery and Rangan (2006). Tangibility has positive significant impact and findings are in line with Matemilola et al. (2018), Byoun (2008) and Fan et al. (2012).

**Table 4:** Results of the System GMM's: SOA along the LCS

	Long term market leverage		Total market leverage	
	Coefficients	z- statistics	Coefficients	z- statistics
Leverage(t-1)	.6745***	(20.96)	.7487***	(35.42)
Introduction	.017 **	(2.51)	.0667***	(7.66)
Growth	.0163***	(2.84)	.0326***	(5.25)
Shakeout	-.0238 ***	(-4.74)	-.0398 ***	(-7.15)
Decline	-.0256 **	(-3.62 )	-.0416***	(-5.01)
Leverage(t-1)x (introduction)	.1462 **	(4.80)	.0448**	(2.10)
Leverage(t-1)x (growth)	.1538 ***	(5.47)	.0843***	(4.58)
Leverage(t-1) x (shake out)	.0961***	(3.24)	.0921***	(5.29)
Leverage(t-1) x (decline)	.128 **	(3.62)	.1238***	(5.47)
Profitability	-.2276***	(-11.41)	-.2934***	(-14.76)
Size	-.00036	(-0.62)	-.004***	(-6.13)
Tangibility	0886 ***	(8.64)	.0577***	(7.28 )
Growth opportunities	-.0041***	(-7.53)	-.006***	(-9.42)
Constant	.0533 ***	(4.76)	.1382***	(9.72)
Year/industry/Country effects	Yes		Yes	
No. of groups	2835		2835	
No. of instruments	51		51	
AR(1) p value	0.00	(-16.73)	0.00	(-20.61)
AR(2) p value	0.550	(0.60)	0.173	(1.36)
Hansen test p value (chi statistics)	0.735	(0.62)	0.545	(1.21)
Wald p value	0.00	(29641.74)	0.00	(81464.77)
Wooldridge t P-value	0.00	(862.689)	0.00	(1160.955)
Wu-Hausman P-value	0.00	(22.828)	0.00	(76.6671)
White/Koenker P-value	0.00	(1040.787)	0.00	(1251.963)

Notes: \*\*\*, \*\* and \* indicate coefficient are significant at 1, 5 and 10 percent levels, respectively.

## 5. Conclusion

Our findings show that firms in earlier stages of life cycle have comparatively more debt than the firms in mature stage. Moreover, the study also depicts that firm in the mature stage of their life cycle have fastest speed of adjustment followed by introduction and growth stages respectively. The results of total market leverage depict that firms in mature stage have comparatively more debt than other stage, implying that firms in emerging economies heavily rely on debt even in the mature stage which contradict the earlier finding based on long term market leverage. However, the findings in respect of SOA are quite similar as depicted in first proxy of the capital structure.

Our study adds knowledge in context of changing pattern of capital structure along LCS. Secondly, we fill research gap by determining SOA along LCS particularly in Asian context. The Asian manufacturing firms follow pecking order hypothesis that they mainly finance their projects from their profitability and trade off hypothesis for growth prospects, size and tangible assets.

The findings suggest that management has to consider LCS of their firms in order to adjust capital structure. The findings of current study may help stockholders to consider stage of firm with relation to profitability and capital structure for long term prospects. The policy maker may design policy rates that may be supportive for introduction and decline stages. Further, they should develop capital structure bench mark for adjusting capital structure along LCS.

The results of the study cannot be applicable to other industries like services. Future research may be conducted by using larger sample from other industries such as services and economies from regions other than Asia. Speed of adjustment may be estimated across life cycle by using the country specific macro and institutional determinants like GDP growth, interest rates, taxation and etc.

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## Corporate Governance and Return on Equity Evidence from Pakistan Stock Exchange

<sup>1</sup> Wahid Raza, <sup>2</sup> Kauser Hayat, <sup>3</sup> Naveed Farooq, <sup>4</sup> Hazrat Bilal

<sup>1</sup> PhD Scholar/ Assistant Professor, Department of Management Sciences Islamia College Peshawar and Government College of Management Sciences Wana South Waziristan, Tribal District, Pakistan: wrkhattak287@yahoo.com

<sup>2</sup> Assistant Professor, Shaheed Zulfiqar Ali Bhatto Institute of Science and Technology (SZABIST) Islamabad, Pakistan: dr.kauser@szabist-isb.edu.pk

<sup>3</sup> Assistant Professor, Institute of Business Studies and Leadership Abdul Wali Khan University, Mardan, Pakistan: Naveedfarooq151@gmail.com

<sup>4</sup> Assistant Professor, Center for Management and Commerce University of Swat, Pakistan: hbilal@uswat.edu.pk

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**ABSTRACT**

The main purpose of this paper is to study whether corporate governance aspects like board size, audit committee and board composition affect the return on equity (performance) of companies listed on Pakistan Stock Exchange. The data were gathered by purposive sampling techniques from the Balance Sheet Analysis report available on the State Bank of Pakistan website and relevant companies' websites. A regression model was incorporated to measure the available data for a sample of 50 firms, with a total of 150 years of observations for a period of 2013 -2015. The empirical results indicate that board size, audit committee and board composition are positively associated to return on equity. The result of this study suggests that each organization needs to develop good corporate practices to significantly improve the shareholder wealth in the form of return on equity. The selected sample is taken from non-financial firms with a small sample size, therefore, in future for more generalizability of the results a study may be undertaken to consider financial and non-financial firms with a large sample size.



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Corresponding author's email address: hbilal@uswat.edu.pk

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**1. Introduction**

Corporate governance is usually a structure through which firms are run and regulated (Ahmed Sheikh, Wang, & Khan, 2013; Ehikioya, 2009). The growth of corporate governance has been motivated by the need to gain both the stockholders and stakeholders confidence on capital markets and financial system. Efficient governance mechanisms can effectively extend companies' ability to make prompt business

decisions and improve business performance. Cadbury (1992) suggests that corporate governance is the performance of all activities and operations carried out within the organization to improve the financial position and the interests of shareholders. Similarly, the World Bank has elaborated corporate governance as rules and regulations, customs and policies that are prejudicial to and administered by companies. After the bankruptcy of two gigantic businesses Enron and WorldCom, the corporate governance scheme gained significance. Investors were discouraged from investing in any company, thereby restoring investor confidence and enhancing the corporate governance system and hence the Sarban Oxley Act (2000) was introduced.

Good corporate governance focuses on an openness, justice and accountability in the company management (Ehikioya, 2009). It protects the interests of shareholders and also helps to ensure the return of local and foreign investors. The Pakistan Security and Exchange Commission introduced the corporate governance code in early 2000, which was the first step towards its reforms. These codes include recommendations for improving businesses, such as boards of directors will be responsible to shareholders, the firm will be obliged to reveal real data to the general public, so all of these reforms will improve inner and external audit, board size and board composition. This aims to ensure the distinction of ownership and control, which often leads to principal-agent problems (Jensen & Meckling, 1976). Agency theory explains disagreements between owners and Board of Directors. The ownership and control among principal and agents has been one of the most contentious issues in financial literature (Ehikioya, 2009).

According to Ahmed Sheikh et al. (2013), analytical work into corporate governance and firm performance frameworks was largely grounded on data from advanced countries with many structural parallels. Empirical evidence does, though, show conflicting and contradictory findings. On the other side, little is documented empirically about firms with specific institutional structures in developing countries, Therefore, limited research on corporations in developing countries and equivocal findings are a number of reasons that more research need to be conducted on the connection of corporate governance and return on equity (Ahmed Sheikh et al., 2013). In Pakistan many studies are conducted on the said relationship in different organization with different parameters but In spite of attempts to establish new theoretical perspectives and to investigate behavioral variables in corporate governance, study is still required to explore such problems in various institutional environments (Westphal & Zajac, 2013).Therefore, this research is an effort to fill the gap by contributing to the literature through investigating empirically the association of corporate governance and return on equity ( firm's performance). This research will also provide a new evidence that how corporate governance influences return on equity, which will assist academics and corporate sector in decision making regarding corporate governances and performance.

## **2. Literature Review**

### **2.1 Corporate Governance**

From the point of view of agency theory , the goal of corporate governance is to ensure managers use techniques to optimize the worth of the organization and shareholders (Jensen & Meckling, 1976). Sheikh (2002) describes corporate governance as a structure whereby managers are empowered and responsible for managing their businesses. It is the way for corporate actions, agents and assets to achieve the corporate goal set by the shareholder of the corporation (Sternberg, 2004). In other words corporate governance is the system of legislation, regulations, forces controlling the company's activities and monitor organizational goals and results (Adams & Mehran, 2003; Gillan & Starks, 1998). In consequence, corporate governance distributes the rights and duties among different corporate members like board members, management, shareholders and other stakeholders, and it ensures that choices on corporate matters are clearly defined in laws and processes (Turlea, Mocanu, & Carmen, 2010).The practice of corporate governance is seen as an internal management monitoring mechanism. Good

governance is an effective instrument that helps a company to achieve better performance (Chen & Rezaee, 2012).

Corporate governance can be seen from the viewpoint of both the shareholders and the organization. From shareholders point of view corporate governance is usually related to maximizing shareholders wealth, while from organizational point of view, it is mostly concerned with monitoring and maintaining business operations mechanisms (Bruno & Claessens, 2007; Van den Berghe & Levrau, 2003; Zingales, 1997). In practical terms, corporate governance includes the corporation's responsibility to its shareholders and stakeholders. Corporate governance is a mechanism for framing and seeking to resolve the corporate stakeholders' agency problems, including shareholders and creditors (Abu-Tapanjeh, 2009; Hakim Sam, 2002). Even the aim of corporate governance is different from business to firm or country to country, but the main objective is to promote a good code of mechanisms to develop and regulate the organization (Abu-Tapanjeh, 2009). Hence, a good governance system helps to ensure that the management uses business resources properly for the best interests of the shareholders and reports reasonably the financial situation and performance of the business (Lin, Huang, & Chuang, 2018)

## **2.2 Corporate Governance and Firm Performance**

A good corporate governance system plays an essential role to increase firm performance, because it keeps close eye on every activity of managers, executives and administration which will reduce the fraudulent activities because of strong Audit Committee and will ultimately increase the firm performance (Bansal & Sharma, 2016; Rasheed & Nisar, 2018). In addition, it produces a transparent and accountable atmosphere in which all activities and people are accountable to their Manager (Wong, 2016). Thus, a good corporate governance scheme generates an atmosphere in which managers and executives do their work with complete efforts that are very useful to the businesses themselves and also boost investors' firm value and confidence (Carcello, Hermanson, & Ye, 2011; Narayanaswamy, Raghunandan, & Rama, 2012).

Dittmar, Mahrt-Smith, and Servaes (2003) investigate that firms with bad governance invest surplus money reserves in low-revenue investments and if the company is well governed, this adverse effect of surplus money expenditure on working results will be revoked. Further, their study results directly demonstrate how governance can increase corporate efficiency and understand the significance of governance in determining corporate policies. One of the most significant duties of directors is to supervise managers to guarantee that the interests of shareholders are protected. This connection is formalized between shareholders and their agents by Agency Theory (Jensen & Meckling, 1976). According to Agency Theory, Board of Directors work on behalf of owners of the organization, and take decision to increase their wealth. For improving the performance of a firm the organization must have proper board of directors with the required members and proper audit system to monitor agency function of an organization.

Adopting best corporate governance practices, like an improved audit committee, enhances management oversight and eliminates issues with information asymmetry (Aldamen, Duncan, Kelly, McNamara, & Nagel, 2012). High level of audit committees enhances the firm performance and is linked with improved monitoring of overall financial reporting process (Brennan & Kirwan, 2015; Klein, 2003). The convention on corporate governance adopted from advance market codes and guidelines to meet the Board's role requires the cooperation of both executive and non-executive directors (Rashid, De Zoysa, Lodh, & Rudkin, 2010). Boards lacking non-Executive Director were considered with a significant de jure power but little de facto power, controlled by the Chief Executive Officer and prone to desires clashes with principals (Weidenbaum, 1986).

Further, the association between corporate governance and performance has been examined in many studies in different countries with contradictory and inconsistency results (Arora & Sharma, 2016; Sanjai

Bhagat & Bolton, 2008, 2019; Brown & Caylor, 2004; Buallay, Hamdan, & Zureigat, 2017; Detthamrong, Chancharat, & Vithessonthi, 2017; Muhammad, Rehman, & Waqas, 2016). Similarly, Guest (2009) found no proof that organizational features that decide the board size in the UK lead to a better results connection for the board size. The negative association was found between board size and firm performance (Arora & Sharma, 2016; Dwivedi & Jain, 2005; Mashayekhi & Bazaz, 2008) and contrary a positive association in board size and firm performance was determined (Jackling & Johl, 2009; Mak & Kusnadi, 2005), whereas, in Malaysian firms Anum Mohd Ghazali (2010) found no significant association between board size and performance.

### **2.3 Board Size**

Board size refers to numbers of directors employed in an organization for the well-being of shareholders. The Board of Directors shall function as possessor of the company which shall take action and take decisions concerning the best interests of the shareholders. Fama (1980) argued that directors split authorities and tasks between employee for the best curiosity of shareholders and company. The board therefore operates on behalf of the owners and therefore the board size plays a significant part in improving company efficiency.

### **2.4 Audit Committee**

The Sarban Oxley Act (2000), make it compulsory for all businesses to maintain one professional audit committee managers who have the financial, audit and management understanding and autonomy of all other employees. According to the report of the blue ribbon committee (1999) the Audit Committee shows an central role in monitoring all business transactions, the audit process, the utilization and use of funds, when and where and from where funds are obtained, All these actions will therefore bring transparency and prevent fraudulent practices that will eventually boost the return on equity.

### **2.5 Board Composition**

The Board Composition implies the proportion of executive and non-executive directors operating an organisation to shareholders ' best interests. Dare (1998) asserts that non-executive directors have an important role to play to resolve all issue and monitors all the strategy of the company which will result higher firm performance. Moreover they feel free to make judgment while dealing with executive directors regarding appointing and dismissal of executive directors. O'Sullivan and Wong (1999) says that non-executive directors decrease their effect if they worked in the same board for long time. Similarly, Klein (2003) affirms that there is an insignificant relationship between the proportion of external managers and firm performance, but Fosberg (1989) performed a survey and discovered no relationship in the percentage of external managers and company performance measures. The connection between company performance and the percentage of external managers has therefore blended outcomes. The relationship between external directors' proportion and firm performance is mixed (Yasser, Entebang, & Mansor, 2011). The organizational performance is insignificantly correlated to a higher proportion of outsiders on the executive board (Baysinger & Butler, 1985). While on the other hand S Bhagat and Black (2002) established no significant link between board composition and firm performance. In Pakistan, the Corporate Governance Code limited all registered companies that the fraction of executive directors should not surpass 75% of the complete size of the board, as well as encouraging and cheering the representation of minority shareholders and autonomous directors.

### **2.6 Hypothesis**

One of the most significant duties of directors is to supervise managers to guarantee that the interests of shareholders are protected. This connection is formalized between shareholders and their agents by Agency Theory (Jensen & Meckling, 1976).According to Agency Theory, Board of Directors work on behalf of owners of the organization, and take decision to increase their worth. For improving the performance of a firm the organization must have proper board composition with the required board size

and proper audit system to monitor agency function within organization. Therefore, on the basis of this we hypothesize that:

H1: “A significant association exists between corporate governor facets (Board Size, Audit Committee and Board Composition) and Return on Equity (Performance)

### 3. Research Methodology

The population of this research was the entire non-financial firms registered with PSX from 2013 to 2015. A purposive sampling technique was used and only 50 firms were randomly selected whose data were available to perform the statistical analysis. The data was congregated from Balance Sheet Analysis available at State Bank of Pakistan Website. The data was analysed by the following statistical model.

$$Y = \alpha + \beta F_{it} + \varepsilon_i \dots\dots\dots (1)$$

Where, Y= Independent Variable,  $\alpha$  = Constant,  $\beta$  = Coefficient of variable (Corporate Governance Facet i.e. Board Size, Audit Committee and Board Composition”),  $F_{it}$  = explanatory variable and  $\varepsilon_i$  = error term.

Return on Equity was used as a representative of Firm Performance for a time space of 2013 to 2015. More specifically, by adopting econometric model mentioned in equation (1), equation (2) evolve, which is as under

$$\text{Firm Performance} = \beta\alpha + \beta_1\text{BSIZ} + \beta_2\text{AUDCOM} + \beta_3\text{BCOMP} \dots\dots\dots (2)$$

#### 3.1 Measurement of Variables

##### 3.1.1 Dependent Variable

In the literature, there is no consensus on the measure that is the best financial performance predictor. However, each measure has its own strengths and weaknesses, so there is no metric to be the best representative for financial performance (Haniffa & Hudaib, 2006; Marashdeh, 2014). Many studies analyze the firm performance using a number of financial indicators such as Tobin’s Q (Kiel & Nicholson, 2003), Return on Assets (Rashid & Lodh, 2008) and Return on Equity (Adjaoud, Zeghal, & Andaleeb, 2007). In this research, the firm’s performance is measured through Return on Equity. According to Ping, Chang-qing, and Li (2011) Return on Equity measure is the best indicator of firm’s performance. It not only shows the profitability of equity capital and its accumulation as an significant economic indicator, but also captures the greatest attention of investors

$$ROE = \frac{\text{Net Income}}{\text{Shareholder's equity}}$$

##### 3.1.2 Independent Variable

The important determinants of CG are taken to measure the overall Corporate Governance. These are:

Board Size: BSIZ = Total number of Directors

Audit Committee Size: AUDCOM = Total number of directors in the audit committee

Board Composition: BCOMP = Proportion of managers and non-managers sitting on the board

#### 3.2 Analysis

##### 3.2.1 Descriptive Statistics

In the given Table 1 the normal board size of the firms is 9, and the percentage of external director (Board Composition) is about 7. Audit committee has the largest value (91) which means that 91% of the companies have audit committee members collected on non-executive directors. According to the code of corporate governance (2002) of Pakistan it’s mandatory for every firm to have at least 3 “audit

committee” members comprising of non-executive boards having knowledge of accounting and auditing discipline.

**Table 1:** Descriptive Analysis

	ROE	BSIZE	AUDCOM	BCOMP”
Mean	0.24	9.4	0.91	7.5
Median	0.2	9	1	7
Std.Dev	0.17	2.50	0.26	3.8
Minimum	-0.05	6	0	0.25
Maximum	67.5	15	1	15
N.Valid	150	150	150	150

### 3.2.2 Regression Analysis

The correlation between all of the study variables is shown in Table 2 below. The results of the Pearson Correlation assessment indicate that ROE correlates positively and significantly with the board size. Likewise, the audit committee and the members of the board also have the same results.

**Table 2:** Correlations

	ROE	BSIZE	AUDCOM	BCOMP
ROE	1			
BSIZE	0.23	1		
AUDCOM	0.16	0.29	1	
BCOMP	0.14	0.59	0.55	1
Sig	0.000	0.000	0.000	0.000
N	150	150	150	150

The result of ANOVA shown in Table 3 depicts that the F- values of ROE which is used as a proxy for performance measure is  $F= 0.941$  ( $p=0.000$ ), which shows that a robust relation exist between ROE and corporate governance (Three corporate governance facets i.e. Board Size, Audit Committee and Board Composition)

**Table 3:** ANOVA

Model	Sum of Square	Df	Mean Square	F	Sig
Between Group	0.12	4	0.029		
Within Group	1.68	55	0.04	0.941	0
Total	1.79	59			

The estimates of the coefficient are presented in Table 4. The board size ratio is 0.0219, indicating a favorable connection between board size and ROE, and the statistical significance level is 5% and 10%. As a consequence, the connection between the Audit Committee, the Board of Directors and the ROE is positive and substantial at a rate of 5%. Statistically, the average size of the board is about 9, which is very low in the context of Pakistan. This statistical outcome is therefore comparable to the outcomes of prior scientists (Sanda et al., 2005; Bokpin et al., 2006). There is also a beneficial and important connection between board structure and ROE. It means that firm financial performance and outside directors of the board have strong association with each other. The same result is also investigated by Bhagat and Black (2002) and Sanda et al. (2005)”. The outcome also demonstrates that there exist positive and significant relation between audit committee members and firm performance.



**Table 4:** Regression Analysis

Independent Variables	ROE
BSIZE	0.0219
BCOMP	0.0141
AUDCOM	0.0487
R2	0.6391
Adjusted R2	-0.0042
F Statistics	0.9384
Sig.	0.000
No of Observations	150

#### 4. Discussion and Findings

In this research study, researcher has used three “Corporate Governance Facets (Board Size, Audit Committee and Board Composition) as independent variables and ROE” as dependent construct used as proxy of financial performance measure. A sample size for this study is 50 firm enlisted in PSX for the time period of 2013 to 2015.

The findings of the study are as following

- ROE and Board size have significant positive association with each other”
- Positive and significant association was found between audit committee and ROE(Firm performance)”
- ROE and Board Composition are also positively and significantly interlinked to one another”.
- Based on these statistical results and findings we accepted the assumption "Corporate Governance Facet (Board Size, Audit Committee and Board Composition) and Firm Performance (ROE) have an important connection.

#### 5. Recommendations and Limitations

For future research, it is recommended that researchers should increase numbers of firms, time period and also include maximum variables of corporate Governance facets for robustness of result. This research has certain constraints. The first limitation is selection of small sample size. The second limitation is short span of time. Third limitation is consideration of very few facets of corporate governance facets. The fourth and final limitation is that the selected companies are taken from non-financial sectors which are enlisted in Pakistan Stock Exchange. The area for additional and future researchers is in-depth examination of all financial and non-financial sectors of Pakistan which are enlisted in Pakistan Stock Exchange (PSX) and inclusion of some moderating and mediating variables.

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## The Curve of Cross Border Cartel Enforcement (Challenges and Remedies in Global Business Environment)

<sup>1</sup>Shahzada Aamir Mushtaq, <sup>2</sup>Fraz Ashraf Khan

<sup>1</sup> Ph.D Scholar at School of Law and Economics, Zhengzhou University, Henan, Mainland China:

aamir.adv@gs.zzu.edu.cn

<sup>2</sup> Assistant Professor, University of the Punjab, Jhelum Campus, Pakistan: frazashraf@pujc.edu.pk

ARTICLE DETAILS	ABSTRACT
<p><b>History</b>  Revised format: February 2020  Available Online: March 2020</p> <hr/> <p><b>Keywords</b>  <i>Cartels, Economic Effects, Extraterritorial Jurisdiction, Evidence Gathering, Relevant Market</i></p> <hr/> <p><b>JEL Classification:</b>  D49, H23, L11</p>	<p>The purpose of this article stated that the global economic arena has taken new insights across the shore of nations. THE new economic challenges are waiting for the anti-trust enforcers to make sure strict compliance with the antitrust laws and in addition this dissertational work highlights the incipient violations across the borders and suggests its possible legal outcomes in the near future in order to make the economic market a level playing field for any business entrants. It particularly shed light on the cross border cartels and their effects on the relevant market, additionally we have taken the global view of the legislative aspects along with their de jure appliances and improvements for the proper economic growth under the auspices of legal framework. The ramification of cross border cartel enforcement has surfaced astoundingly between 1998 to 2015, underlining the earnest and prompt action to strengthen and revisit the competition law enforcement tools and proficiency. The technological advancements and liberalization of trade has risen significant challenges which includes the enforcement of cross border cartels and mergers. The globalization of corporate activities and deregulation of business markets and numerous industrial sectors has endangered the theoretical foundation of domestic and international competition enforcement regime. The transnational anticompetitive practices like monopolization of markets, collusive price fixing, vertical restraints of trade and international cartels currently challenged the jurisdiction and policies of OECD, WTO, UNCTAD, and ICN. This frightening situation necessarily be regularized by establishing worldwide competition policy and globally admirable enforcement standard. The weaknesses of unilateral, bilateral, and multilateral compacts be re-examined in order to cope with the cross-border competition challenges efficaciously. The extraterritorial, jurisdictional, and investigative mechanisms could be enclosed with binding nature of legal structures to deter cross border antitrust violations for smooth economic growth. The EU and US actively pursuing to establish the unanimous international antitrust regime instead of discrepancies to integrate WTO and ICN being multilateral cooperation forum. Currently, US, CANADA, EU, JAPAN and CHINA across the globe become more engaged in international cartels evidence gathering and investigations. The developments in information sharing, private enforcement, follow on civil litigation, dawn raids, extraterritorial reach of enforcement watchdog is yet to be established.</p>



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Corresponding author's email address: aamir.adv@gs.zzu.edu.cn

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## 1. Introduction

A few decades ago the antitrust matters were the subject of National or Regional boundaries relying on the doctrines that the law stops at a Nation's shore, but with the passage of time the revolutions taken place in the world economies along with that the antitrust concerns have become surprisingly international. The Nations face an augmentative vista that their economies would be harmed by anti-competitive behavior that have taken place solely or in part in other jurisdictions. It is an axiomatic fact that the world has realized the pivotal role of competition law enforcement as a necessary tool to protect the welfare of consumers and maintain the integrity of free market from anti-competitive behavior of multinational enterprises. It has also been established that competition policies have not only strengthened the growth of economies but also developed this approach that a competitive economy can best be achieved by maintaining and protecting free-market. The globalized economies have transnational effects and competition law aims to regulate their business conduct by providing the level playing field to every competitor, ensure the protection of consumer rights and restrict the concentration of economic power of corporate enterprises. The need for coordination also arises from the fact that sanctions against international cartels are not synchronized. This fact reduces the incentives of cartelists to report their cartels through leniency programs, since once the cartel is discovered the party that reported the cartel might still be subject to sanctions in other jurisdictions in which it does not enjoy leniency. In fact, this situation strengthens international cartels relative to domestic ones, as cheating on them by way of reporting produces lower rewards. It is thus important to devise ways to solve these incentive problems. The current international antitrust system is largely based on unilateral enforcement whereby each jurisdiction deals, on its own, with antitrust issues surfacing at its borders. The unilateral enforcement regime is also the main source of the enforcement problems of small and of developing jurisdictions.

In 1990 only 25 jurisdictions had a competition law and 16 had antitrust enforcement agencies. The world witnessed a growth of more than 200% in the number of competition agencies between 1990 and 2013. In the year 2013, 127 jurisdictions had a competition law body 115 of which are functioning competition enforcement authority (organization for economic co-operation and development OECD report 2014," challenges of international co-operation in competition law enforcement.")

Today approximately more the 130 countries are observing antitrust laws including the newly emerged agencies and the agencies of the under developed economies, not all the countries seem active in enforcing their competition laws especially in cases where enterprises with anti- competitive misconduct is located outside of their borders. The growing economies are becoming more interdependent and multinational enterprises and economic entities developing the tendency to mutually operate across the borders in order to accelerate the economic efficacy. The proliferation growth of antitrust agencies, competition laws across the globe and the boost of technological trade and international industrial trade which gives birth of increasingly cross border transactions raises many new challenges to the enforcement of antitrust and competition laws. The globalized era has paved the path to economic markets for anti-competitive conduct of foreign corporate sector who have brought these practices to the other regions of

the world. The concept of internationalization of cross border antitrust enforcement is a reaction to this worldwide scale of anticompetitive behavior (Clarke J and Evenett SJ, 2002).

Since 2000 to 2016, 75 new big cartels reported each year around the globe and in spite of these astounding figures it is still believed that a various number of cross border cartels remain undetected. Those enterprises who possess exclusive market control and involved in cross border cartels for the sake of capturing new markets and maximizing profits are resultantly causing unbearable damages to the emerging and developing economies. The astonishing effect of cross border cartels is that it directly exploiting the gross domestic product (GDP) in poorest economies and regional or national antitrust tools seems incapable to detect and penalize them due to inefficient and stagnant competition mechanisms. Furthermore, this practice in fact limiting the international trade benefits for under developed economies ensured by the various international organizations and conventions. Global cartels are now earning undue profits from worldwide commercial markets and even if they are punished in line with the internationally established codes with heavier fines would be scrimpy. Therefore, the key international organizations such as organization for economic co-operation and development (OECD), world trade organization (WTO), international competition commission (ICN), and united nations conference on trade and development (UNCTAD), are trying to encounter this common exigency arises as a result of cross border or global cartels.

The first portentous multilateral attempt was made in July 1944, at the Bretton woods conference with the ambition to take away international anti-competitive enforcement hurdles. During the postwar period the Americans department of justice took aggressive prosecution measures against international cartels but the efforts was useless due to the ineffectiveness of world efforts the United States then took unilateral measures to deter cross border cartels by the implication of its own antitrust laws extraterritorially. The leading case on the extraterritorial application of national anti-trust laws was the United States vs Aluminum Company of America.<sup>12</sup> 148 F.2D 416(2D CIR.1945). Gradually with the passage of time the (OECD) has presented numerous nonbinding proposals to strengthen the antitrust enforcement assistance and promote harmonization respectively in 1967, 73, 79, 86, 95, 98, 2005, and 2014. It is also pertinent from the pages of history that the loss caused to developing economies by the cross-border cartels estimated was \$ 51.1 billion in 1997 irrespective of the undetected cartel damage and further affected the imports of under developed countries up to the extent of 4.7 percent and 0.9 percent GDP. The developed economies had also troubled and cross border hard core cartels causes' \$140.8 consumer welfare loss to established economies. Although, enthusiastic efforts have been launched by all the concerned cross-national organizations but many deficiencies still remain unsolved and fully operational mechanism required in order to deter the cross-border menace. One sound and central working body is mandatory instead of the creation of many local, regional, or international joint working committees, platforms, and mechanisms to put this challenge down and institutional reforms might be revisited to strictly address the core issues and the spirit of free competitive market and open market access will be the theme of this article.

In the year 2016, the report was prepared by the Global competition review which witnessed macrocosm of almost 200 antitrust enforcement bureau's and this is due to the accretionary anti-competitive lead dominating and harming the global economic, in the shape of mergers, price fixing and hard-core cross border cartels. Investigation and compliance of competition rule are still byzantine due to the impediment of numerous challenges. However, iron like efforts are still required to properly address these incipient challenges as a result of technological furtherance and opening up of new common markets (Daabah MM. 2010).

## **2. Methodology**

The data for this research has been taken from the various websites like international competition network, OECD, UNCTAD, WTO, US department of justice, European Union, African Union, and the reports which had been published by numerous anti-trust enforcement authorities about the augmentative trend of the cross border cartel violations and the data has also been taken from the judicial judgments of the American and Japanese Supreme court's who ruled out new principles for the extra-territorial application of the anti-trust laws across the borders. After careful perusal of this data various results have been drawn below to analyze and unfold the legal obstacles and make economic efficiency more progressive and rapid. we have taken results from region to region and focuses mainly on the legal restraints which exists commonly at all the regions. The online journals study has also paved the way to draw some practical hypothesis.

### **3.1 Cross Border Co-Operation Among Regulators**

The EU and US primarily enlightened the beaucoup bilateral agreements with Canada and Japan in order to develop the potential association between agencies in the year of 1990, simultaneously, the EU also assists other countries in dealing the matters of competition concerns through free trade covenants and economic agreements. On the other hand, the US such as Israel, Brazil, Canada, Japan and Australia. The canonic objective of these agreements was to determine the path of co-operation among regulatory authorities with palatial results. These bilateral concordats gradually become the effective tools for co-operation and provides guiding principles on competition policy matters. However, these co-operative compacts results in a hodgepodge of principles and therefore produce ambiguities and anomalousness for the antitrust watchdogs and corporate executives. Another obstacle for the developing economies was the problem to adopt which enforcement modal for the efficacious economic growth and controlling mechanism for their enforcement authorities (Lake, D. A. 2010). The outcomes of the bilateral, regional, and national compacts seeks the necessity of multilateral harmonization of co-operation on hard core cartels.

After the EU and US the other major move commence by the OECD in the form of recommendations on competition plan observance since the 1960s. Legion committees within the framework of the organization have bring forth a volume of findings and recommendations on multiple aspects of enforcement plans over the decades such as systematic cooperation among its members, the sharing of information involved in hard core cross border cartels and uniformity of procedures etc. all the four reports of the OECD respectively 1995, 1998, 2005, and 2014, chiefly focuses on the issues of anti-cartel actions with the enhancement of corporate fines, public awareness programs about cross border menace, trenchant sanctions against cartel demeanor, and multinational cooperation in investigation.

Another platform which bring forth the proposals for the efficacious implication of antitrust enforcement round the globe is UNCTAD. This was the attempt to fill the vacuum left by the predecessor organization. It was the transition periods in the world economy and the tendency was shifted from developed to developing economy. In order to deter anti-cartel conduct more effectively worldwide (Sokol, D. D. 2007). In the 1980, the UNCTAD embrace the statute on restrictive business practices which includes best practices guidelines for multinational enterprises taking on board the markets of under developed countries. After these developments which has not completely taken place yet the scholars move forward to establish other organs in the form of GATT/WTO.

Furthermore, a new statute was namely the Draft international Anti-Trust Code (DIAC) bring in by the joint working group comprised of the European, Japanese, and German scholars with the intention to merge some competition touchstone to the GATT and then to be implemented at the national levels for hawling progress, but it was vehemently opposed by US scholars and anti-trust policy makers (Hartzenberg T, 2016).



The speedy and inevitable ontogeny of hard core cross border cartels lead the US to follow up on other ways of co-operation and transnational enforcement resultantly international competition policy advisory committee was formed in 1997, to revisit the anti-trust and enforcement challenges which in its report charge the WTO to be a malapropos and advise the origination of “ Global competition initiative” which in 2001 paved the way for the instauration of international competition network( ICN).

In spite of all these thought-provoking developments the challenge to deter the cross-border cartels has not been cemented yet, but the approaches keep changing now recently in 2018 the Singapore’s antitrust authority has found five Japanese and local enterprises guilty in fixing the prices and other transnational cartel engagements and proceed to fine four companies out of five with a total cost 19.5 million Singapore dollars which amounts to \$14.8 million. It is also noted that like investigations are afoot in South Korea and China, and concluded that the authority is working in line with similitude of EU, US and Japan. This case was presumed to be the high profile and exemplary for the enforcement agencies currently working on across border cartels.

### **3.2 Information Exchange Phenomena**

The enlargement of the network industry, service sector, the incipient growth of the technology and maturation of the digital economy has a sarcastic impact on conventional industry, exacting the involvement of expeditious exchange of information among the operative enforcement institutions. The huge impediment in the way to dissuade cross border cartels is the deficiency to exchange the relevant information among global antitrust watchdogs, although attempts has been made to enlarge the co-operation and information of the transnational violations but the barriers has not been removed. The different nature of the domestic and international codes further aggravated the situation because lack of trust exists between developed and newly surfaced enforcement agencies (Burney, A., Abbas, Z., Mahmood, N., & Arifeen, Q. U. 2013). There is no binding statutes globally in respect of the information sharing mechanism. The UNCTAD defines some pattern of information co-operation taking into account the principles of mutual trust, good will, and a thirst to work jointly (Byrne, A., & Fitzpatrick, Ú. 2009). The concept of exchange of information and sweetening the co-operation between members has always remain key agenda and central point of discussion but how this challenge could be tackled has not been addressed with contemplative thought.

The uniformity and unanimous consensus to share the information involving cross border violations is severely lacked at transnational and regional level because of jurisdictional discrepancies. It is considered to be the chief component which lacks consentaneous approach. The enforcement agencies of UK, Canada, US, China and Australia majorly concentrating on the new investigative tools and established mechanism for exchange of information including the confidential information in order to aggressively deter the cross-border cartels and to lessen their concentration of economic power by the use of unlawful means (Singh, V. K. 2017). Now it is the time that OECD, WTO, ICN, and UNCTAD to make some binding regulations for the member states and for regional enforcement authorities to address the cross-border issues that surpass beyond their jurisdictions. The latest development which has taken place in Japan is exemplum for the rest of the global enforcement agencies regarding the sharing of information and booming the co-operation with other antitrust regulators of the world.

The Japan modal categorized the transnational antitrust co-operation compacts into two parts for impelling cooperation across the globe. The first part includes the agreements between states for exchanging the published information and the second part deals with the covenants of sharing confidential information. Japan’s most antitrust agreements about mutual cooperation with the mature enforcement agencies like Australia, Canada falls within the domain of the first category. The step was initiated by Japan in 2015, and upgraded in 2017 respectively because of changing economic trends. The WTO and ICN could adopt this kind of model for effective mutual cooperation and quicken the ability of under

developed economies to respond the wrongdoings done by the corporate executives. The second proposed part (which includes the sharing of confidential information) has pivotal importance and needs the equal confidence and trust level between all competition agencies developed and developing. This part is sensitive in nature because mature agencies perceived the performance of newly surfaced competition authorities to be the house of cards (Hartzenberg T, et. el.)

If Japan succeeds in signing the treaties with the European and Asian countries regarding the exchange of confidential information what would be its effects on the developing economies and this question will remain the matter of grave concern for the globally functioning antitrust enforcement watchdogs. Japan had also entered into an agreement with the US in 2010 after amending its antitrust law and augmented the provision of information gateway in order to enabling the new competition enforcers to take the advantage and increased cross border performance. Therefore, the business and legal fraternity has also raised its reservations against the sharing of confidential information and the legal practitioners demanded the legislation to protect the communication between the attorney and client which is their legal right recognized by the legal world.

### **3.3 Increment of Cross Border Cartel Violations**

The staggering increment in technological and industrial advancements, rapid growth of trade liberalization and opening up of new economic horizons the apprehension of mal-business practices prevails which causes economic crunch and need to be dealt with strict regulations and the wave of competition and antitrust codes aims to serve this purpose. The birth of domestic, regional, and international enforcement watchdogs is an attempt to protect the economic market and make it better and more spellbinding for all the business competitors in the relevant market. The catching of cartels and anti-competitive practice is a core challenge tackling by competition bureau's around the world. Various cross border cartel detection inquiries are in the pipelines in Europe, Australia, US, Japan, China and South Korea.

The important instrument which is using by almost all the enforcement authorities is the doctrine of leniency which is very recently launched by the mature and newly developed competition regimes. Leniency is proving influential in catching the both domestic and cross border hard core cartels but its nature and application varies from jurisdiction to jurisdiction and region to region which is another challenge for the champions of antitrust law makers. International organizations and regional competition enforcers technically assisting the domestic competition watchdogs in several jurisdictions. To detect the cross border cartels only leniency instrument seems to be inadequate. The stupefying fact is that in whole Africa there is no suffice leniency plans due to the lack of proper reward schemes to the informants which again evidenced the complexity of the application of leniency doctrine.

It seems to be the greater challenge for the competition watchdogs to establish unanimous universal instrument to deter cross border cartels. However, this problem up to some extent but not completely be monitored and controlled by making the regional enforcement agencies full operational aiding with some binding set of laws for the member states. This exercise will upgrade the potential and capability of the regional institutions (Republic of Arg. v. Weltover, Inc.1992). In 2018 a big cross border cartel case has been caught by the Singapore's antitrust watchdog in which five electronic parts maker companies of Japan in collaboration with local businessman founds guilty to be involved in price fixing and mal-business practices.

### **3.4 Dynamic Nature Of Antitrust Enforcement And Modern Challenges**

To address the nascent challenges and enforcement of antitrust laws across the nation is still a complex phenomenon, the US and EU antitrust theories not have the same traits in numerous ways. They have diametric institutional and procedural fabrics. The aftershocks of Brexit jeopardize the instance of EU that

have favored competitive market and trade liberalization. We can analyze the different nature of antitrust enforcement procedures adopted by the EU and US recently in the high-profile cases against Google, Microsoft, Amazon, Facebook, and Apple apps. The FTC stopped its investigation against Google but EU has fined the Google with the penalty of \$1.49 billion for misusing its dominant position in the market, and that is not for the first time that Google has been fined it is approximately more than six (6) times up till now and unpredictable about the future. The act of Google was found harmful for online business and advertisements by excluding the other competitors from the market such as Microsoft and Yahoo (Dann, G. E., & Haddow, N. 2008).

The German Federal Cartel Office ban the use of data gathered by the Facebook without the express consent of the consumers and that is extra-ordinary development against technology tycoons. The ongoing debate on this recent development taken by the German FCO within other mature enforcement agencies is very thought provoking, whether it will have extraterritorial effects in the long run or not? (Sokol, D. D., & Comerford, R. 2015). Since the last 125 years, the United States uninterruptedly observing the three-fold enforcement procedures in order to scrap anti- competitive practices under the domain of federal, state level, and private enforcement. The US has a long history of antitrust law (THE SHARMAN ACT, 1890) than any other country on the map and has also relying on the above stated three modes of enforcement. The common law approach was followed by the US Congress at the time of framing antitrust laws in order to discourage the socially undesirable business conduct. The history of antitrust legislation renders the primary description of the destination which US Congress assayed to advance, competition and free market, and left the room empty for further development through the judicial interpretation. The reason was that in middle ages the most common law was originated through judicial precedents so same was the case with the development of the antitrust law (Gutiérrez, G., & Philippon, T. 2018).

In the US different measures were adopted through different institutions to enforce the antitrust laws. The FTC and US Department of justice are liable to guarantee the compliance of antitrust laws and to protect the market and consumers from any highhandedness of the corporate executives. The private enforcement is rapidly increased in recent years in which the individuals can seek damages from the wrongdoers for antitrust harms with the assistance of attorneys. The public and private enforcement of antitrust statutes has become core issue now, some jurisdictions are following both approaches for antitrust enforcement like US while some other are relying on private enforcement procedure like Europe. The myth of EU and US antitrust laws has been same but nature of enforcement varies which further aggravated the situation and puts the developing economies on the horns of dilemma.

The US justice department has been empowered to enforce the Sharman Act, 1890 both civilly and criminally, the justice department has the coercive investigative instruments which the private enforcement sector lacks in its body and can only file civil suits for damages to recover the loss suffered by them due to the harmful business conduct. This strength of the US justice department enables him to unveil and prosecute the cartels at the national level. Moreover, the federal competition law is applicable to local cartels only when the harmful conduct has a strong nexus to interstate trade. The investigation of the local cartels is beyond the jurisdiction of the justice department and only concerned states have been authorized to initiate civil suits for losses instead of criminal prosecution.

The three cartel enforcement procedures followed by the US at the federal level (under the authority of justice department and FTC) at state level through private enforcement (civil suits) symbolizes the decentralization of enforcement measures. In Europe the competition enforcement regulation 2003 revised in 2006 also depicts the same formula for cartels enforcement. Under the European competition enforcement mechanism, the power has been delegated to 26-member states to investigate the cartels at national level following the guidelines contained by the Europe's competition regulation 2006. In the US

the federal trade commission (FTC) has also been delegated the powers under section 5 of the federal trade commission act to investigate and prosecute the cartels civilly (Motorola Mobility LLC v AU Optronics Corp).

The parallel jurisdiction of two departments invites complex procedural issues but in Europe institutional conflict of procedural enforcement between member states and commission is very limited but not exclusively absent. It is noteworthy that article 3 of the European Regulation 2003 empowers national competition authorities and including their courts to apply articles 81, and 82 to those compacts, judgments, or conduct that poignant trade among member states. In the present circumstances several are worried that the process of decentralization for cartel enforcement in both EC and US will establish the renationalization of competition regime and again global dream will remain in darkness. No doubt that presently the increasing growth of private enforcement has attractive potential which lessens the governmental labor in deterring the cartels and collecting the evidences but all aspects of private enforcement is not encourage able due to the poorly designed scheme.

The OECD since the last two decades actively playing its leading role in providing the guidelines and recommendations across the nations to meet the challenges. In 1995, the OECD recognizes that the competition authorities can enjoy only limited powers in respect of cooperation and this practice still prevails globally. The hard-core cartels were first defined by OECD in the recommendations of 1998, and condemned it. It was also outlined that member countries ensure the effective enforcement of competition laws in detecting the hard-core cartels and sets forth the principles to protect common interest and cooperation in precluding hard core cartels. The further development was made by the OECD in 2005, stresses the establishment of globally recognized principles of best business practices. The recommendations also specifically deal the cooperation with respect to cross border cartel and merger cases and reduced inconsistencies. Again in 2013 the OECD and ICN (international competition network) had issued a report which witnessed that cooperation level between different jurisdictions was very vulnerable due to some domestic or regional legal constraints. In 2014, the OECD proposed revised recommendations which contains two important developments namely the adoption of the provisions at domestic level to exchange confidential information without the consent of the informant and heighten the cooperation with respect of investigation assistance. Finally, in 2017 at Paris the OECD roundtable debate was held to counter the challenges surfaced because of interdependence of market economies. The latest challenge was how to redress the domestic competition harm occurred in other jurisdictions and the infliction of transnational remedies, and to draw the line of action that how enforcement agencies deal the cross-border cartels (US Department of Justice, 2000).

**Table.1:** Comparative view of antitrust provisions

USA	China	Europe
The Sherman Act 1890 Section 1 prohibits contracts, combinations, and conspiracies that unreasonably restrain trade. " It is now understood that firms are in violation of Section 1 when there is an agreement among competitors to limit competition. "Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce	Anti-unfair competition law 1993 revised in 2018 Price law of 1998 Bidding law 2000 Anti-Monopoly law 2008 (AML) articles Chapter 2, monopoly agreements Chapter 3, abuse of dominant market position	The Treaty of Rome 1957 Establishment of European Economic Community (EEC) Creation of European commission (EC) 1992 Articles of the treaty Harmonious development of economic activities Competition in common market not distorted 82, 82. Rules dealing with

<p>among the several States, or with foreign nations, is declared to be illegal.”                  Section,2 Monopolizing trade a felony;                  Section,3 Every contract, combination in form of trust or otherwise, or conspiracy,                  The Clayton Act 1914                  Additional prohibited conducts                  Price discrimination                  Exclusive dealing agreements                  Tying agreements                  Intends to strengthen the antitrust enforcement                  Can imposed civil penalties only                  Enforced by antitrust division and FTC                  Federal Trade Commission Act</p>	<p>Chapter 4, concentration of undertakings                  Chapter 6, investigation of the suspected monopoly conducts                  Chapter 7, article 46 deals with the enforcement powers of the antitrust authority.</p>	<p>anticompetitive agreement 83,89, 85. Deals with enforcement                  , Article 101 (1) of the TFEU (1999) states: “The following shall be prohibited: all agreements between undertakings, decisions by associations of undertakings and concerted practices which... have as their object or effect the prevention, restriction or distortion of competition.”                  102. Prohibits the abuse of dominant market position</p>
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**3.5 The Curve Of Coordinated Efforts for Akin Investigation Process.**

The OECD is addressing the enhancement of cooperation and mechanism for sharing of information and joint investigation agendas since the last three decades. The decentralization of enforcement measures in Europe and other regions across the nation has an enthusiastic effort to determine coordinated investigation process at regional levels. The maturation trends of regional trade agreements (RTAs) between less developed and developed economies is now travelling speedily.

The UNCTAD has already submitted a report and emphasis the inclusion of the competition related provisions in the regional trade agreements and the findings proposed by the UNCTAD were discussed at various regional level seminars. The concrete objective of these findings is to improve the competition law enforcement strategies. The report also contain the key issues and highlights the effects of the inclusion of competition related provisions (CRPs) in regional trade agreements (RTAs) (US Department of Justice).

Following are some possible potential benefits of the inclusion of CRPs in RTAs.

1. It will strengthen the discouragement up shot of the national law.
2. Promote international cooperation as was suggested by WTO,ICN, etc
3. Brings potential changes in the nature, performance and status of domestic enforcement bodies.
4. To reduce the apprehension of weak competition culture.
5. Discourage the incompatible environment or practices in small markets.
6. Competition may become a concrete factor in poverty assuagement.

In the recent past, the Singapore case (in which national antitrust agency catch a foreign cartel involving local market as a result of joint investigation by Singapore and Japan) epitomize the concept of harmonious investigation started in one country lead to alike investigation in other country. This idealization of harmonious investigation at level between nations may become a powerful instrument for

detering the cross-border cartels. The potential of similar investigation process at regional level will also make the corporate sector liable to render serious cooperation with the investigative authorities. When the Singapore antitrust authority commence the investigations against the cross-border cartels that investigation was linked with the Japan's Fair-Trade Commission (JFTC). They mutually share the confidential information and also collected evidence then the electronic parts supplier companies Nichicon, Nippon, Ruby- con, and Chemi- con were not only punished by the competition commission of Singapore but were also fined by the FTC of Japan with the cost of 6.6 billion yen (\$62 million) on all the five companies for violating the domestic antitrust law through fixing the price. This doctrine sets the principle for other leading enforcement authorities to follow it in their circumstances (United States Department of Justice 1996).

### **3.6 The Scope of Extra-Territorial Jurisdiction of National Agency and Application of Leniency Program.**

In the last quarter of 2017 the noteworthy verdict was made by the Supreme Court of Japan giving mandatory jurisdiction to the Japan's domestic antitrust authority to go after the cross-border cartels causing harm to local market. The Supreme Court allowed the antitrust watchdog to punish the cross-border cartels if their conduct has been proved violated and affecting free and fair competition in domestic market (Campbell, A. N. 2017).

In 2010, a complaint was made to the FTC of Japan against a Malaysian unit of electronic maker (Samsung SDI) that the unit had conspired in fixing the price with other competitor's on picture tubes contrary to the anti- monopoly law of the land. The commission inflicted a fine on Samsung SDI with the liability of 1.37 billion yen (\$ 14.8 million). The company challenged the fine along with the jurisdiction of the Japan's FTC. The High Court upheld the fine and again it was appealed to the Supreme court of Japan. The top court passed the palatial judgment not only upheld the fine but expressly announced it that the Fair Trade Commission (FTC) has the extraterritorial jurisdiction to deter, investigate and punish the cross-border cartels if that cartels effecting the market of Japan and violates the provisions of the competition law. The judgment further said that the cartel was hitting the Japanese economic order and in that circumstances the jurisdiction of the domestic antitrust authority extends to catch it and punish it (Nam, S. S. 2018).

This principle is now following in the Europe and other regions of the world in order to obtain desired results against the complex phenomena of cross border cartels. It is also worth mentioning to elaborate here the applicability of the leniency principle which is very closely linked with all of this investigative process. If a cartel has been detected and the company subsequently applied for the leniency and fully cooperated with the investigative forces and endured not to repeat that practice should be privileged. For example, the Panasonic (an electronic devices maker company) was investigated by the Japan's FTC in 2014, and due to the company's cooperation was exempted from the fine. Again, the Panasonic recently has become the subject of investigation in Singapore and render full cooperation resultantly received full immunity from the financial sanctions.

### **3.7 New Areas of Enforcement**

The economic and trade progression ingrained new areas of competition enforcement affecting cross border economies. The fifth generation is the era of technologies rivalry. The red-hot competition enforcement orbit is, online advertisements, collision in the use of algorithms, online deceptive marketing practices. The monopoly of institutional investor in purchasing shares from open market, dominance over technology, excluding competition on social networks control and usage of big data private judicial proceeding etc. The pinching fact is that most of under developed economies have not focused yet on these areas of competition enforcement and no suffice legislation has enacted yet to counter these challenges. This new gainsay bringing into existence a gap in cross border enforcement of competition

laws. Regional competition platforms may render assistance and mechanism to deter these new developments in line with the competition enforcement policies (Urbanova, M. 2018).

### **3.8 Confronting Challenges In Cross Border Enforcement**

In the present arena, the biggest challenges for antitrust enforcement are to deter the cross-border cartel and merger control. In EC, US and Japan positive developments are under process but in Asian and African countries the successful dealing is lacking. The US and Japan recently adopted the extraterritorial approach for the enforcement of anticompetitive behaviors with same limitations while Europe is also taking same measures for aggressive enforcement. The Kenyan competition act also empowers its enforcement authorities to catch cross border cartels under section 6 of the act and provides foundation in adopting the extraterritorial approach. A few new challenges has been outlined below which needs the attention of authorities for improvement.

1. Constraints in cross border evidence gathering
2. Lack of binding nature of regulations across the globe
3. Lengthy and complex procedure of investigations
4. Ramification of more than one cartel enforcement global intuitions
5. The need of efficient mechanism for information sharing
6. Conflicting jurisdiction legislations
7. Deficiency in the application of Leniency program universally
8. Inconsistency between the principles of WTO, UNCTAD and ICN
9. Clash of economic interests among nations
10. Non-imposition of criminal liability
11. Different nature of administrative and civil law procedures
12. Uncertainty of enforcement rewards scheme

### **Proposals**

1. Adoption of unanimous Leniency programs
2. Need of evidence sharing agreements at regional or domestic level
3. Worldwide homogeneous investigative process
4. Application of binding recommendations for Member States
5. Congruent Merger Approval stipulations

### **3.9 Recent Cartel Cases**

Until recently, the immense cross border cartel violations have been uncovered through investigation which includes the freight forwarding air cargo, foreign exchange rates (Forex) auto parts, Samsung SOI tire maker companies, thin film transistor liquids crystal display (TFTLCD) online wall poster scandal of Amazon, oil company petrobras, London interbank offered rates (LIBOR).

Some countries around the world such as Argentina, Singapore, Japan, Brazil and Canada have inducted cross border cartel investigations with extraterritorial implication. Most recently Mexico has also flexing its cartel enforcement brawniness because its enforcement agency has fined five transnational shippers for being involved in a cross-border price fixing scheme related to vehicle carrier services.

Jurisdictional engagement at regional or domestic level is a care challenge that which law could be applied for the enforcement of transnational cross border cartels in the presence of transnational cross of various global institutions. The US opposed the inclusion of cross border enforcement provision in the constitution of world trade order and had relied on the non-binding stator rules which would be persuasive in nature strictly, while the EU proposed the internationalized competition arena. This unprecedented nature of jurisdictional battle is main restraint toward the achievement of global goals. Although after the decentralization the enforcement concern shifted from international to regional or national level the core

jurisdictional challenge has not been addressed yet for cross border enforcement, the newly surfaced challenges like data monopoly, vertical restraints exclusive mobiles app controlling power network social platforms creates new problems for the regional or national antitrust agencies and jurisdictional discrepancy has become more critical even a herculean task.

#### 4. Conclusion

Global competition regime is still developing. The establishment of regional competition Organizations is a broad step in enforcing cross-border competition challenges as it offers a number of opportunities such as enhanced cooperation and harmonization of laws. However, it still faces a myriad of challenges such as jurisdictional conflict, lack of harmonized legislations, and nature of voluntary cooperation amongst others. Taking into account that international anti-competitive conduct due to globalization, trade liberalization and technological advancement lead to transactions national or regional borders, the need to review transnational competition policy in cross border enforcement is vital. Developing countries should strengthen its national and regional regimes. Lastly, they must enhance mutual cooperation at national, regional and international level in order to aggressively deal new challenges. The United States' cooperation with antitrust enforcement authorities elsewhere in the Americas, however, is more limited. Other than Canada, the United States has executed bilateral antitrust cooperation agreements with only four American countries: Brazil, Chile, Colombia and Mexico. Only Brazil has a track record as an active cartel enforcer, and Colombia has only recently strengthened its cartel enforcement regulations and begun imposing fines of significance in cartel cases. Furthermore, these four bilateral cooperation agreements are largely toothless, mandating very little in the way of actual cooperation.

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## Expounding Dynamics of Tacit Knowledge Critical to Credit Decision Making: Juxtaposed Findings of GRA and RIDIT

<sup>1</sup> Abdul Basit, <sup>2</sup> Tehmina Fiaz Qazi, <sup>3</sup> Abdul Aziz Khan Niazi

<sup>1</sup> Academics Head, Lahore Institute of Science & Technology, Lahore, Pakistan: abasit\_shahbaz@yahoo.com

<sup>2</sup> Assistant Professor, IB&M, University of Engineering and Technology, Lahore, Pakistan:  
tehmينا.qazi@gmail.com

<sup>3</sup> Assistant Professor, IB&M, University of Engineering & Technology, Lahore, Pakistan: azizniazi@uet.edu.pk

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p>This study explores importance of Tacit Knowledge (TK) sharing for formal loan makers in Pakistan. Main objective of the study is to expound, conceptualize and hierarchicalize the factors of TK critical to credit decision making. The study follows positivist approach and overall research design consists of literature review, field survey and data analyses. Data was collected from credit officers of Pakistani banks. Following the triangulation approach for confirmation and comparison of results, multiple techniques viz EFA, GRA and RIDIT were employed. Results of EFA showed that there are eight major dynamics of TK. Findings of GRA revealed that TK about recovery of loans is the most important factor hence occupies the highest GRA rank, whereas, the TK about resources of borrowers occupies the lowest rank. RIDIT analysis showed that TK about multitude of business sectors is the most important factor hence occupies the highest RIDIT rank, whereas, TK about capacity to repay the loans occupies the lowest rank. Juxtaposition of results of GRA and RIDIT revealed that TK gained during recovery of loans is one of the most important factors. It is a seminal study in the area of knowledge management particularly in context of Pakistani banks based on original data collected in field setting. The study gives insight of critical factors of TK, which has high value for credit personnel in banks. The results are useful for decision makers in banks, academicians and researchers.</p>
<p><b>Keywords</b> Knowledge Management, Banks, GRA, RIDIT, Pakistan</p>	
<p><b>JEL Classification:</b> D80, E58, E59</p>	



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Corresponding author's email address: azizniazi@uet.edu.pk

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### 1. Introduction

There is no standardized way to run businesses be them that of even of same type. In ancient times, materials, assets and labor have been key factors for creating competitive advantage but in modern era of

technology leveraging knowledge is key to success (Koskinen & Vanharanta, 2002). Knowledge is now an important tool for decision-making and it is a differentiator for competitive advantage (Fan & Ku, 2010; Johannessen, Olaisen, & Olsen, 2003; McIver & Lepisto, 2017). How you convert your experience into strategic action plans is considered as a critical factor for sustaining competitive position. Knowledge Management (KM) has emerged as a domain of study. It is not restricted to human resource and information technology but linked with strategic decision-making and policy development of organization. It helps organization to tailor critical resources according to business requirements (Wyatt, 2001). Knowledge is created through interaction of employees while working in organizations (Malik & Garg, 2017; Zhang, Long, Wang, & Tang, 2015). When groups of people share their experiential knowledge on a specific issue, the knowledge is created that eventually helps an organization to learn and enhance its capabilities. Communities of practice are common source of capturing and sharing knowledge. Where there is culture of knowledge sharing organizations thrive but where individuals are not willing to share knowledge success of organization is jeopardized (Gubbins et al., 2012; Jordão & Novas, 2017).

In this era of mass production, business firms often borrow money from banks. Banks being formal money lenders strive to verify information about borrowers. They consider effective screening and monitoring of borrower vital for granting loans. Banks try to gain maximum knowledge about borrowers' behaviors to reduce credit risk. Comprehensive and standard set of documents is used to get information about borrowers for reducing uncertainty of loan repayments. Nevertheless, challenges remain particularly when borrower is a small business unit or a new startup and explicit information is insufficient. Such borrowers normally do not have longer credit history. Lack of documented knowledge about these customers makes it difficult for lenders to assess cases of such loans. Since credit decisions are subject to information provided by borrowers which varies from case to case, therefore, role of loan makers' experiential knowledge become critical. Lenders assess cases of loans in light of their experience and make analysis on the basis of questions they ask from borrowers about their intentions to use loan. It is possible now to convert some of one's tacit into explicit knowledge with help of available techniques of knowledge explication.

Banks encourage employees to collect information about borrowers and use different tactics for inducing them to share their experiential knowledge. They encourage to develop cross-functional teams for dissemination of TK (Basit, Tahir, Khan, & Latif, 2017). TK is now a very critical and conclusive for formal lenders (Arnal & Burwood, 2003). It plays a decisive role implicitly, however, sharing and use of TK is not easy, there are multiple barriers for TK sharing. These factors include lack of trust, communication and competition culture etc. (Cumberland & Githens, 2012; Le & Lei, 2017; Saini, Arif, & Kulonda, 2018). For intra bank and borrower-lender TK sharing, it is very important to have an effect-based trust, which will help bank managers to use TK in decision-making (Becerra, Lunnan, & Huemer, 2008; Rahman, Mannan, Hossain, Zaman, & Hassan, 2018). Furthermore, hierarchy of an organization directly influences the sharing of TK i.e. how much experience one (information provider) have (Joia & Lemos, 2010).

TK is not very difficult to ascertain and utilize since it is comprised of attitudes and experiences one may have faced. It is, however, not difficult to relate one's experience to a situation one is facing. Almost two third of total TK is received/collected from face to face communication, stories and knowledge incubation (Bretschneider & Zogaj, 2016). Information technology has warranted to effectively utilize knowledge, particularly, TK in decision-making (Martinez-Conesa, Soto-Acosta, & Carayannis, 2017). TK can be explicated through observations and implementing verbal protocols (Holford, 2018). It can be shared through face-to-face conversations, modern communication soft/hardware like worldwide webs, phones, mobiles and other social media (Ryan & O'Connor, 2013). In contrast, documented knowledge is very easy to use but this depends on organizational culture, people's cooperation and their mutual trust (Holste

& Fields, 2010; Sasaki, 2017). Appropriate utilization of knowledge helps organizations to heal their network by breaking down silo walls and it helps to solve problems proactively. In past, companies did not have to struggle hard, because, people seldom leave the company and knowledge used to remain with the company, which eventually used to transfer to new employees. But now, when people are frequently switching jobs, it has become inevitable for a company to save its TK (the valuable asset). Importance of TK is increasing day by day and loan makers come up with their own set of questions to get out as much details as possible. TK automatically reduces the overall credit risks, as bankers know more about direction and status of borrowers. In our research, we have focused the importance of TK over the documented knowledge (i.e. explicit knowledge). It reviews the renewed importance of TK sharing and it can be used implicitly to make wiser decision in sanctioning of loans. TK sets up the direction of a company, which eventually helps a lender to analyze the ground situation of the organization (Jasimuddin, Klein, & Connell, 2005). Evaluation of TK is becoming important, where innovations are taking place. The explicit method is only supporting the pre-defined things in the industry, which are not considered to be updated according to modern requirements. The intention of this paper is to appraise the importance of TK and its intra bank sharing. This study will help loan makers to analyze the risk levels and intentions of the borrower to use this loan, wherein the decision is subject to provided information that varies from case to case. The research paper has expounded the dimensions of TK, conceptualized and hierarchicalized various factors that loan makers take into account in making decision to sanction loan. It creates link between TK sharing and lenders' decision-making practices since TK plays critical role to assessing the borrowers' loan applications. Remaining part of the study consists of literature review, methodology, analysis and interpretation, discussion and conclusion.

## 2. Literature Review

KM is a complex term, many definitions of KM have been developed and published but there is no consensus upon its exact definition (Firestone, 2008). However, importance of KM is beyond any doubt, as it has emerged as a distinct multi-discipline scientific field (Qiu & Lv, 2014). Therefore, KM programs cannot be confined to a particular department, organization, or area of study. It has become essentially important to manage/share it and must be included in the organization's strategic management for adding value (Chuang, Jackson, & Jiang, 2016; Scarso & Bolisani, 2010; Shujahat et al., 2017). Living in knowledge-based global economy, knowledge is constantly growing and competitiveness of an organization is inherently linked to keep pace with growing knowledge and accelerate the knowledge transfer (Farooq, 2018). There are two dimensions of knowledge one is termed as documented (i.e. explicit) and other as undocumented knowledge (i.e. tacit). There is a wide spread agreement on the definition of Explicit Knowledge (EK) and is well documented in literature but upon TK definition, there is a disagreement (McAdam, Mason, & McCrory, 2007). It is pertinent to mention here the brief of EK and TK while keep in mind the scope of study. EK is known, structured information, resides in documents, policies, processes, repositories and databases (Alavi & Leidner, 2001; Lawson & Lorenzi, 1999; Minna & Aino, 2005; Mohamed, Stankosky, & Murrey, 2006; Nonaka & Takeuchi, 1995). EK can be transferred through many different ways including physical as well as electronic transfer. TK is an intangible resource, embedded in mind, hard to articulate, recognize and capture (Ambrosini & Bowman, 2001; Foss, Schum, & Rothenberg, 2006; Garrick & Chan, 2017; Klein, 2008; Nonaka & Takeuchi, 1995; Polanyi, 1966). TK is embedded in a social relation and normally transferred through meetings, observations and direct contact. As TK is embedded in the mind and it is unwritten, hidden and unspoken, so it is obtained through interaction of individuals in the organization (Mohajan, 2016).

Nonaka and Takeuchi (1995) further categorize TK in i) cognitive dimensions i.e. human mental models including ideas, values, beliefs and perceptions and ii) technical dimensions i.e. know-how which deal with human skills and expertise but workers do not want to articulate. That is why; the central theme in the field of KM is problem of capturing of TK. Intention to share the TK depends on many factors. A successful TK transfer largely depends upon the organizational structure, employees' intention to share

TK and the KM strategy adopted by the organization (Han, 2018; Joia & Lemos, 2010). One of the most important factors is prevailing the culture of knowledge sharing (Cumberland & Githens, 2012; Wahda, 2017). The results indicate that trust among employees is prerequisite for sharing of knowledge (Brooke, MohdRasdi, & Abu Samah, 2017; Park & Lee, 2014). According to Zhang et al. (2015) good relationship among employees play a pivotal role in sharing of TK. It provides support for the direct relation of motivation and intentions of employees in sharing of EK and TK (Chen, Nunes, Ragsdell, & An, 2018; Hau, Kim, Lee, & Kim, 2013). TK is more plausible and nowadays become essential for a loan maker to assess a borrower application. Scientists have revealed that 90% of the total TK is present in the mind of the employees (Wah, 1996b). It is therefore vital to manage this knowledge. For this purpose, a proposed set of questions can be shared with employees and then compile (Venkitachalam & Busch, 2012). In connection to this, forms are designed for collecting the documented knowledge from the borrower (Hau et al., 2013). Bank provides training to the loan makers to check and analyze all the documentation. Loan decisions are traditionally based on the industry established principles. However, there is a need to establish a standard procedure where a weigh must be given to the level of TK shared. It is observed that despite the process and standard procedure followed by the lender, the decision taken by loan maker varies according to the experience and nature of the loan maker (Kumar & Chakrabarti, 2012). Literature review revealed many aspects of knowledge, KM, EK and particularly TK sharing. It includes the behavior or attitude while sharing the knowledge and the extent up to which an individual want to share knowledge. As highlighted, loan makers who are able to leverage the TK are likely to make wise decisions in lending of loans. The review supports the notion that TK sharing practices improve the decision regarding loan making. However, merely sharing of TK is not enough but also its utilization. In changing competitive environment, the ability to recognize, acquire, sharing and utilizing TK is important for effective credit decision-making (Mueller, 2015).

### **3. Methodology**

In order to measure the importance of TK sharing, positivist approach has been followed as a philosophy and triangulation as a methodology in analyses. For a scientific research, it is necessary to use well-validated and reliable measures. Although many measures have already been developed for important organizational concepts and their psychometric properties have been established by developers but we could not find measures suitable for the study. This study has imposed ranking on the factors of TK important for decision making for giving loans. This, being a unique study of developing a model based on TK sharing in banks, no existing instrument measuring the constructs under study, was found. Therefore, a new suitable instrument was developed i.e. a seven-point Likert type scale “1” indicating the least favorable degree of agreement and “7” the most favorable degree of agreement. The scale in exact was: 1=very strongly disagree, 2=strongly disagree, 3=disagree, 4=neutral, 5=agree, 6=strongly agree, 7=very strongly agree. The questionnaire was developed with the help of literature review, field surveys, and consultation with academicians and bankers. In order to test the instrument, a pilot study was conducted in Lahore. The responses of thirty bankers from different banks in Lahore were obtained. Descriptive statistics was also generated on SPSS. As the standard deviation of population was not previously known, the standard deviation of pilot study has been used for calculation of sample size. The value of Cronbach’s Alpha reliability coefficient for all constructs was checked and found to be above 0.85 in all cases. The questions were reviewed on the bases of pilot study and after the necessary corrections based on feedback of pilot study; the instrument of measurement was finalized and launched for collecting the data. Principle component analysis was employed for extracting factors and orthogonal rotation with varimax was applied. As latent root criterion was used for extraction of factors, only the factors having latent roots or eigen values greater than one were considered significant; all other factors with latent roots less than one were considered insignificant and disregarded in further analyses. The official language and/or medium of instructions in banks is English and bank officers are mostly graduates or post graduates, therefore, medium of communication is English. The instrument was designed for securing responses through direct undisguised questioning. The constructs measured could

only be measured through self-reports (Renzi, 2008) hence the instrument is a self-reporting instrument. Results of any research can only be correct when measures that actually tap the concepts in theoretical framework are accurate. In order to be reasonably sure that the instrument we used in the research does indeed measure the variables that are supposed to, the goodness of measure was tested. In this connection, questionnaire was evaluated by seven experienced bankers and researchers from view point of relevancy, adequacy, simplicity and clarity. How well the results obtained from the use of the measure fit the theories around which the test is designed can be seen from the results of the study.

The research is based on population of more than forty commercial banks scheduled with the central bank of Islamic Republic of Pakistan. Statistical data of the population has been collected from secondary sources. Forty banks operating in Pakistan have above 10,000 branches all over the country. There are almost 2,500 branches of banks operating in four provincial capital cities. Total persons employed in credit and monitoring departments are around 20,000. In order to maintain uniformity of the data some adjustments have been made keeping in view the objective of the study. Due to centralization in decision making for loans at headquarters of the banks (Huang, Sheng, & Li, 2010; Yeung, 2009) it was considered appropriate to conduct the survey in four provincial capital cities (Lahore, Karachi, Peshawar & Queta). Non-bank financial institutions and micro finance banks are out of scope of the study.

An exploratory factor analysis was carried out to determine the various factors. We have calculated number of sample branches for sample number of persons in the proportion of total branches to total number of persons employed by using the unitary concept of mathematics. Based on standard deviation of pilot study, sample size of 314 persons was calculated (Malhotra & Dash, 2010). Following the suggested sample size, 314 questionnaires were floated out of which 293 responses are used for the analysis after data filtrations. We have made assumptions while collection of these responses, which include the certain experience level of respondent, only one response was recorded against every question. Each question has to be properly answered and nothing should be left blank. Where these policies were not followed, we have filtered out that response. In order to ensure the representation of all the forty banks the resultant fractions in cases of ten banks have been treated as one (i.e. at least one branch of each bank selected in sample). The size of sample was adjusted as 133 branches. Keeping in view the response rate, the sample size was increased to 195 branches. A stratified simple random sample has been drawn separately from all strata through a computerized random number generator. We obtained total 195 random numbers of branches with additional number of 62 branches only as against the sample of 133 branches. Reasons being:

To conduct large survey in the banking sector is considered a difficult job. The banks have scattered branch networks and specialized type of public dealing. They follow special code of conduct which is focused towards security and secrecy and access to the core departments like credit, recovery, foreign exchange, etc. of banks is difficult but despite of all that the response rate was quite satisfactory i.e. 93.31%. In order to record the perceptions of loan makers, we have dispatched the instruments to each sample branch by mail. Pakistan Post Office, Urgent Mail Service (UMS) i.e. the state owned postal service was considered appropriate because it is economical, track-able, reliable and speedy medium of communication. Two to three questionnaires were dispatched to each branch through UMS followed by telephone calls. The questionnaires were sent under a covering letter with self-addressed envelope. Subsequently, most of the sample branches were approached in person either by researchers or by the well-informed representatives of the researchers. Few of the branches reported as noncredit branches or the branches having credit functions based at specialized offices. Non-credit branches were replaced (as we have sample with replacement). The branches having credit function in specialized offices other than branch were asked to refer the questionnaires to relevant offices and officers dealing credit of that particular branch in order to get true representative response. Some questionnaires were returned duly completed by post, some were followed over the telephone and were collected with little bit effort, yet

some others were got completed after encompassing a lot of efforts. In order to investigate the phenomenon; Exploratory Factor Analysis (EFA), Grey Relational Analysis (GRA) and Relative to an Identified Distribution Integral Transformation (RIDIT) have been employed.

#### 4. Analysis and Interpretation

##### 4.1 Exploratory Factor Analysis (EFA)

Firstly, exploratory factor analysis was employed in SPSS to find out the factors important in credit decision making. As value of KMO (0.83) is showing significant sampling adequacy so it was proceeded further. Based upon loadings of items eight factors were extracted with twenty-six items out of forty-one items (Annexure I) and each factor was assigned a name as represented by the items being loaded, none of the factor showed low factor loading  $<.40$  as shown in Table 1. Factors having eigen values greater than one were retained and each factor explained pretty good variation. First factor accounted for 21.966 % of variation and other seven extracted factors accounted for 8.366, 5.697, 5.529, 4.381, 4.132, 3.671, 3.397 of variation respectively making it 57.138% altogether.

**Table 1:** Exploratory Factor Analysis

Statements		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Communalities	Reliability
KCR -1	$x_1$	.841								.774	.756
KCR -2	$x_2$	.686								.646	
KCR -3	$x_3$	.595								.601	
KCR -4	$x_4$	.586								.642	
KAUL-1	$x_5$	.570								.457	
VK-1	$x_6$		.704							.573	.701
VK-2	$x_7$		.684							.566	
VK-3	$x_8$		.671							.572	
VK-4	$x_9$		.656							.543	
KCD-1	$x_{10}$			.565						.542	.723
KCD-2	$x_{11}$			.631						.488	
KCD-3	$x_{12}$			.501						.483	
KCD-4	$x_{13}$			.758						.642	
KCD-5	$x_{14}$			.637						.409	



UKD-1	$x_{15}$				.709					.686	.713
UKD-2	$x_{16}$				.777					.678	
UKD-3	$x_{17}$				.545					.469	
UKD-4	$x_{18}$				.636					.641	
KR-1	$x_{19}$					.657				.515	.650
KR-2	$x_{20}$					.762				.660	
KR-3	$x_{21}$					.685				.618	
KO-1	$x_{22}$						.699			.602	.645
KO-2	$x_{23}$						.696			.577	
KAUL-2	$x_{24}$							.619		.536	
CK-1	$x_{25}$								.520	.529	.282
CK-2	$x_{126}$								.639	.569	
Eigen Values		6.590	2.510	1.709	1.659	1.314	1.239	1.101	1.019		
% of Variation		21.966	8.366	5.697	5.529	4.381	4.132	3.671	3.397		
Cumulative % of variation		21.966	30.332	36.028	41.557	45.937	50.069	53.740	57.138		

- Extraction Method-Principal Component Analysis, Rotation Method-Varimax with Kaiser Normalization KMO= 0.83, Bartlett's Test of Sphericity:  $p=0.000$  ( $x^2=2412.26$ , d.f= 435)
- Abbreviations: KCP=Knowledge of Capacity to Repay, VK=Value of Knowledge, KCD=Knowledge of Customer Dealing, UKD=Use of Knowledge in Decisions, KR=Knowledge of Reputation, KO=Knowledge of Ownership, KAUL=Knowledge of Actual Use of Loans and CK=Contextual Knowledge

### 4.2 Grey Relational Analysis (GRA)

GRA has been performed as follows:

Generated reference data series by using formula  $x_0=(d_{01} \quad [d]_{(02)} \quad [d]_{(03)}, \dots, d_{0m})$

Generated comparison data series by using formula  $x_i=(d_{i1} \quad [d]_{(i2)} \quad [d]_{(i3)}, \dots, d_{im})$

Computed the difference data series by using formula  $\Delta_i=(|(d_{01}-d_{(i1)})|, |[d]_{(02)}-d_{(i2)}|, |[d]_{(03)}-d_{(i3)}|, \dots, |d_{0m}-d_{(im)}|)$

Found global maximum value and minimum value in the difference data series by using formula  $\Delta_{max}=\nabla^{max}(\max \Delta_i)$  for maximum and  $\Delta_{min}=\nabla^{min}(\min \Delta_i)$  for minimum

Transformed each data point in each data series to grey relational coefficient by using formula  $\gamma_i(j)=(\Delta_{min}+\zeta \Delta_{max})/(\Delta_i(j)+\zeta \Delta_{max})$

Where:

$\gamma_i(j)$  = grey relational coefficient

$\Delta_{min}$  = minimum data point available in difference data series

$\Delta_{max}$  = maximum data point available in difference data series.

$\nabla=0.5$  which compensate the effect of  $\Delta_{max}$  in data set and its value can be taken between 0 and 1 but generally it is 0.5.

$\Delta_i(j)$  = j<sup>th</sup> value in difference data set.

Computed grey relational grade for each difference data series by using formula  $\Gamma_i = 1/m \sum_{n=1}^m \gamma_i(n)$

Sorted grey relational grade values in ascending order

Generated reference data series from the responses collected by way of field survey as a first step Table 2

**Table 2: Data Series**

Cases	$x_1$	$x_2$	$x_3$	-	-	$x_{21}$	$x_{22}$	$x_{23}$	$x_{24}$	$x_{25}$	$x_{26}$
$d_1$	7	7	6	-	-	6	6	6	7	6	6
$d_2$	2	3	6	-	-	1	7	4	3	2	7
$d_3$	3	6	6	-	-	3	2	6	7	5	3
$d_4$	2	2	4	-	-	1	1	6	7	2	2
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
$d_{287}$	5	6	6	-	-	5	6	6	7	6	5
$d_{288}$	6	6	6	-	-	6	5	7	5	6	6
$d_{289}$	4	5	6	-	-	7	7	7	6	7	5
$d_{290}$	4	6	7	-	-	6	6	5	6	6	7
$d_{291}$	3	4	5	-	-	4	6	6	5	6	2

Generated comparison data series by way of setting very strongly agree (i.e. 7 larger the acceptable) being reference series as second step and prepared Table 3

**Table 3: Comparison Data Series**

Cases	$x_0$	$x_1$	$x_2$	$x_3$	-	-	$x_{21}$	$x_{22}$	$x_{23}$	$x_{24}$	$x_{25}$	$x_{26}$
$d_1$	7	7	7	6	-	-	6	6	6	7	6	6
$d_2$	7	2	3	6	-	-	1	7	4	3	2	7
$d_3$	7	3	6	6	-	-	3	2	6	7	5	3
$d_4$	7	2	2	4	-	-	1	1	6	7	2	2
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
$d_{287}$	7	5	6	6	-	-	5	6	6	7	6	5
$d_{288}$	7	6	6	6	-	-	6	5	7	5	6	6
$d_{289}$	7	4	5	6	-	-	7	7	7	6	7	5
$d_{290}$	7	4	6	7	-	-	6	6	5	6	6	7
$d_{291}$	7	3	4	5	-	-	4	6	6	5	6	2

Computed the difference data series by taking the absolute difference of each data point with reference as a step three and prepared Table 4

**Table 4:** Difference Data Series

$\Delta_1$	$\Delta_2$	$\Delta_3$	-	-	$\Delta_{21}$	$\Delta_{22}$	$\Delta_{23}$	$\Delta_{24}$	$\Delta_{25}$	$\Delta_{26}$
0	0	1	-	-	1	1	1	0	1	1
5	4	1	-	-	6	0	3	4	5	0
4	1	1	-	-	4	5	1	0	2	4
5	5	3	-	-	6	6	1	0	5	5
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2	1	1	-	-	2	1	1	0	1	2
1	1	1	-	-	1	2	0	2	1	1
3	2	1	-	-	0	0	0	1	0	2
3	1	0	-	-	1	1	2	1	1	0
4	3	2	-	-	3	1	1	2	1	5

Calculated global maximum and global minimum as a fourth step in the difference data series i.e.  $\Delta_{max} = \forall^{max}(\max\Delta_i) = 6$  for maximum and  $\Delta_{min} = \forall^{min}(\min\Delta_i) = 0$  for minimum.

Transformed each data point in each data series to grey relational coefficient as a fifth step Table 5

**Table 5:** Grey Relational Coefficient

$\gamma_1$	$\gamma_2$	$\gamma_3$	-	-	$\gamma_{21}$	$\gamma_{22}$	$\gamma_{23}$	$\gamma_{24}$	$\gamma_{25}$	$\gamma_{26}$
1	1	0.75	-	-	0.75	0.75	0.75	1	0.75	0.75
0.38	0.43	0.75	-	-	0.33	1	0.5	0.43	0.38	1
0.43	0.75	0.75	-	-	0.43	0.38	0.75	1	0.6	0.43
0.38	0.38	0.5	-	-	0.33	0.33	0.75	1	0.38	0.38
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
0.6	0.75	0.75	-	-	0.6	0.75	0.75	1	0.75	0.6
0.75	0.75	0.75	-	-	0.75	0.6	1	0.6	0.75	0.75
0.5	0.6	0.75	-	-	1	1	1	0.75	1	0.6
0.5	0.75	1	-	-	0.75	0.75	0.6	0.75	0.75	1
0.43	0.5	0.6	-	-	0.5	0.75	0.75	0.6	0.75	0.38

Computed grey relational grade for each difference data series as a sixth step (Table 6).

Table 6: Grey Relational Grade

Statements	$x_1$	$x_2$	$x_3$	$x_4$	-	-	$x_{21}$	$x_{22}$	$x_{23}$	$x_{24}$	$x_{25}$	$x_{26}$
GRA Grade	0.614	0.634	0.717	0.494	-	-	0.648	0.631	0.634	0.664	0.661	0.648

Sorted grey relational grades in ascending order as a seventh step (Table 7).

**Table 7:** Grey Relational Grades and Ranks

Statements	GRA Grade	GRA Rank
KCD-5	0.789	1
VK-4	0.747	2
KCR -3	0.717	3
KAUL-1	0.700	4
UKD-1	0.699	5
KCD-2	0.698	6
KCD-3	0.698	7
KCD-4	0.695	8
UKD-2	0.685	9
UKD-4	0.684	10
KR-2	0.675	11
KCD-1	0.672	12
UKD-3	0.669	13
KAUL-2	0.664	14
CK-1	0.661	15
KR-1	0.658	16
KR-3	0.649	17
CK-2	0.648	18
VK-1	0.638	19
KO-2	0.634	20
KCR -2	0.633	21
KO-1	0.631	22
VK-2	0.622	23
KCR -1	0.614	24
VK-3	0.518	25
KCR -4	0.494	26

### 4.3 Relative to an Identified Distribution Integral Transformation (RIDIT)

RIDIT is applied as follows:

#### 4.3.1 Computed RIDIT for the reference data set:

- a. Selected a population (i.e. total responses of survey taken on seven point scale) to serve as a reference data set

- b. Calculated frequency for every category of response i.e.  $f_j$  where  $j= 1,2,3,\dots,n$ .
- c. Computed mid-point of frequencies by using formula  $F_1 = \frac{1}{2}f_1$
- d. Computed accumulated frequency for each category of responses by using formula  $F_j = \frac{1}{2}f_j + \sum_{k=1}^{j-1} f_k$
- e. Computed RIDIT value for each category of responses in the reference data set by using formula  $R_j = \frac{F_j}{N}$

**Table 8:** RIDITS for the Reference Data Set

Statements (x)	Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree	$\pi_i$
$x_1$	7	30	38	46	76	55	39	291
$x_2$	2	9	27	53	100	71	29	291
$x_3$	3	9	9	24	78	106	62	291
$x_4$	4	1	9	31	57	113	76	291
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
$x_{22}$	6	8	22	55	86	76	38	291
$x_{23}$	7	10	45	39	85	65	40	291
$x_{24}$	7	13	26	40	78	76	51	291
$x_{25}$	6	12	40	42	86	71	34	291
$x_{26}$	4	8	15	31	111	90	32	291
$f_j$	108	233	482	1023	2320	2065	1335	7566
$F_1$	54	116.5	241	511.5	1160	1032.5	667.5	
$F_j$	54	224.5	582	1334.5	3006	5198.5	6898.5	
$R_j$	0.01	0.03	0.08	0.18	0.40	0.69	0.91	

#### 4.3.2 Computed RIDIT and mean RIDIT for comparison data sets:

- a. Computed RIDIT value for each category of scale items by using formula  $r_{ij} = \frac{R_j \pi_{ij}}{\pi_i}$  where  $\pi_i = \sum_{k=1}^n \pi_{ik}$
- b. Computed mean RIDIT for each scale item by using formula  $\rho_i = \sum_{k=1}^n r_{ik}$
- c. Computed confidence interval by using formula  $\rho_i \pm \frac{1}{\sqrt{3\pi_i}}$
- d. Tested the hypothesis  $\begin{cases} H_0: \forall i, \rho_i = 0.5 \\ H_a: \exists i, \rho_i \neq 0.5 \end{cases}$  using Kruskal-Wallis statistics by using formula  $W = 12 \sum_{i=1}^m \pi_i (\rho_i - 0.5)^2$

**Table 9:** RIDITs for Comparison Data Set

Statements (x)	V.S.D	S.D	D	N	A	S.A	V.S.A	$\rho_i$	L.B	U.B
$x_1$	0.0002	0.0031	0.0104	0.0285	0.1045	0.1304	0.1220	0.3991	0.3651	0.4331
$x_2$	0.0001	0.0009	0.0074	0.0328	0.1375	0.1684	0.0907	0.4377	0.4037	0.4717
$x_3$	0.0001	0.0009	0.0025	0.0148	0.1072	0.2513	0.1939	0.5708	0.5368	0.6048
$x_4$	0.0001	0.0001	0.0025	0.0192	0.0784	0.2679	0.2377	0.6058	0.5718	0.6398
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
$x_{23}$	0.0002	0.0010	0.0124	0.0241	0.1168	0.1541	0.1251	0.4338	0.3998	0.4678
$x_{24}$	0.0002	0.0013	0.0071	0.0247	0.1072	0.1802	0.1595	0.4804	0.4464	0.5144
$x_{25}$	0.0002	0.0012	0.0110	0.0260	0.1182	0.1684	0.1063	0.4313	0.3973	0.4653
$x_{26}$	0.0001	0.0008	0.0041	0.0192	0.1526	0.2134	0.1001	0.4903	0.4563	0.5243
Kruskal-Wallis (W) =371.28										

Sorted RIDIT values into ascending order Table 10.

**Table 10:** RIDIT Valued and Ranks

Items	RIDIT Values	Ridit Rank
UKD-1	0.659	1
KCR -4	0.606	2
KCD-1	0.595	3
KCR -3	0.571	4
UKD-2	0.544	5
KCD-3	0.538	6
KAUL-1	0.535	7
KCD-4	0.532	8
KCD-5	0.532	9
UKD-3	0.52	10
KR-1	0.518	11
KR-3	0.505	12
VK-4	0.497	13
KCD-2	0.494	14
UKD-4	0.491	15
CK-2	0.490	16
KR-2	0.480	17
KAUL-2	0.480	18
KO-1	0.458	19
VK-3	0.448	20
VK-1	0.439	21
KCR -2	0.438	22
KO-2	0.434	23
CK-1	0.431	24
VK-2	0.418	25

KCR -1	0.399	26
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Findings of the GRA (i.e. grey relational grade and grey relational rank) and RIDIT (i.e. RIDIT value and RIDIT ranks) are juxtaposed for comparison Table 11

**Table 11:** Juxtaposition of Findings of GRA and RIDIT

Items	GRA Grade	GRA Rank	RIDIT Value	RIDIT Rank
KCR -1	0.614	24	0.399	26
KCR -2	0.633	21	0.438	22
KCR -3	0.717	3	0.571	4
KCR -4	0.494	26	0.606	2
KAUL-1	0.7	4	0.535	7
VK-1	0.638	19	0.439	21
VK-2	0.622	23	0.418	25
VK-3	0.518	25	0.448	20
VK-4	0.747	2	0.497	13
KCD-1	0.672	12	0.595	3
KCD-2	0.698	6	0.494	14
KCD-3	0.698	7	0.538	6
KCD-4	0.695	8	0.532	8
KCD-5	0.789	1	0.532	9
UKD-1	0.699	5	0.659	1
UKD-2	0.685	9	0.544	5
UKD-3	0.669	13	0.52	10
UKD-4	0.684	10	0.491	15
KR-1	0.658	16	0.518	11
KR-2	0.675	11	0.48	17
KR-3	0.649	17	0.505	12
KO-1	0.631	22	0.458	19
KO-2	0.634	20	0.434	23
KAUL-2	0.664	14	0.48	18
CK-1	0.661	15	0.431	24
CK-2	0.648	18	0.49	16

The juxtaposition revealed that there is significant difference between rankings of most of the dimensions while some dimensions are quite close in ranking. Only one dimension is found to be on the same rank assigned by two different techniques that is KCD-4 (i.e. I deal with different internal and external communities during recovery process) which is ranked eighth as a result of both techniques as highlighted

#### 4.3.3 Discussion

The study attempted to explore the relation of TK sharing and its influence on the loan maker's decision. While going through the formal procedure and depending upon the analysis of borrower data, Loan officer's TK is a key part of loan decision. But the studies on explication, sharing and dynamics of the TK are relatively very few that provides justification of current study. The results of the study indicate that TK is possessed and used in decision making in banks. Evaluation of the measurements used to elicit the data about utilization of TK revealed that TK has multitude of dimensions out of which eight have been extracted through principle component analysis. Although principle component analysis preliminary

depict reasonable results but still one of the measures KAUL-1 is statistically loaded on factor namely “Knowledge of Capacity to Repay” which is theoretically relevant to “Knowledge of Actual Use of Loans”. Reason may be that the language of this statement probably could not be clearly understood by the respondents. Therefore, before using this scale for future research this statement should be improved. Similarly, internal consistency of Contextual Knowledge is statistically does not meet the standard despite of its theoretical validity. Results of the study can be taken as preliminary evidence that in a context without sophisticated credit scoring systems or documentation about the loan applicant, loan officer’s personal knowledge about their clients may be invaluable in screening of the borrowers. The strength and importance of TK reflects in facing difficulty for competitors to imitate (Foss et al., 2006). When an organization realizes the strength of its employee’s wealth of TK and able to manage it, gets the ultimate progress (Mezghani, Exposito, & Drira, 2016). Therefore, this paper has focused on the importance of TK sharing that got same rank from both techniques of analysis. Moreover, reward policies are being devised to engage them to stay and motivate to articulate their embedded knowledge. These initiatives will surely beget the culture of sharing of tacit knowledge, resultantly avoiding failures, delays and mistakes and at the end to reap good returns (Arnett & Wittmann, 2014).

## 5. Conclusion

Millions of dollars have been invested on employees as organizations know they can only grow if their employees have a good exposure and better learning curve. Training of loan officers is much needed for understanding the behavior of the borrowers while sanctioning of the loans, as it must not only be on the basis of documentation but also on the intentions of the borrowers. Therefore, main objective of the study was to expound, conceptualize and hierarchicalize the dynamics of TK critical to credit decision making. EFA, GRA and RIDIT have been employed as techniques of investigation. Results of EFA showed that there are eight major dynamics of TK namely knowledge of capacity to repay, value of knowledge, knowledge of customer dealing, use of knowledge in decisions, knowledge of reputation, knowledge of ownership, knowledge of actual use of loans and contextual knowledge. Findings of GRA revealed that TK about recovery of loans is the most important factor hence occupies the highest GRA rank, whereas, the TK about resources of borrowers occupies the lowest rank. RIDIT analysis showed that TK about multitude of business sectors is the most important factor hence occupies the highest RIDIT rank, whereas, TK about capacity to repay the loans occupies the lowest rank. Juxtaposition of results of GRA and RIDIT revealed that TK gained through dealing with different internal and external communities during recovery of loans is one of the most important factors since it occupies the same rank according to both techniques. The study gives insight of critical factors of TK, which has high value for credit personnel in banks. The results are useful for decision makers in banks, academicians and researchers. This study has contributed towards literature by way of developing scale, extraction of different factors of TK, ranking of measures, identification and confirmation of the most important factors for TK critical. Future research may be conducted in different contexts and with larger samples to enhance the frontiers of contribution of the study.

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**Annexure I: Questionnaire**

1	KCR-1	I use my professional knowledge to assess financial capacity of borrowers.
2	KCR-2	I use my professional knowledge to assess managerial capacity of borrowers.
3	KCR-3	I want to know more about loan repayment capacity of borrowers.
4	KR-1	As I deal borrowers for longer period of time, therefore, financial position of borrowers is known to me.
5	KCR-4	During the process of credit appraisal, I want to know resources of borrowers to pay back loan.
6		I come to know background of borrowers when I interact for recovery.
7		I come to know repayment behavior of borrowers during recovery process.
8	KR-2	I am aware of market reputation of borrowers.
9	KR-3	I am sometimes aware of repayment behavior of borrowers with other financial institutions.
10	KAUL-1	I want to judge purpose of loan.
11	KAUL-2	I come to know, how borrowers actually use loan amounts.
12		I come to know, how borrowers misuse loan amounts.
13	KO-1	I come to know, about actual title of assets financed when I enforce recovery measures.
14	KO-2	I come to know, about actual title of assets taken as collateral when I enforce recovery measures.
15		I have an idea of price of assets subject to finance.
16		I have an idea of Forced Sale Value (FSV) of assets.
17	KCD-1	It is necessary for me to establish identity of a borrower before sanction of loan.
18		I provide important information to management regarding identification of borrowers before sanction of loan.
19	CK-1	I know context of loans.
20	UKD-1	I use my knowledge about different business sectors for credit decision making.
21	UKD-2	I consider the characteristics of different geographical areas for credit decision making.
22	UKD-3	I consider family background of borrowers for credit decision making.
23	UKD-4	I use my knowledge of assets to be financed during credit decisions.
24		I consider nature of collateral securities during credit decision making.
25		I have short time to give important credit decisions.
26		Loans are recovered over the period of time allowed as per sanction.
27		During the credit process, there are many occasions when I

		learns maximum about borrowers.
28		My knowledge about context of cases of loans is useful for recovery.
29	KCD-2	There are many occasions to learn during process of recovery of loans.
30	KCD-3	Knowledge gained through learning in processes of recovery is useful for credit decision making in future.
31	KCD-4	I deal with different internal and external communities during recovery process.
32		The enforceability of documents at law is actually tested during recovery process.
33	CK-2	I have undocumented knowledge about insurance matters.
34		I have useful knowledge about litigation processes.
35	VK-1	My knowledge about litigation processes is not documented.
36		I have a lot of knowledge about post litigation processes.
37	VK-2	Knowledge of my lawyers about post litigation processes is not documented.
38	VK-3	I have different types of knowledge about the borrower that is not documented.
39	VK-4	Undocumented knowledge possessed by credit and recovery personnel is valuable asset for a bank.
40	KCD-5	Recovery of loans is very important for a bank.
41		Survival of bank is based on recovery of loans.





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## Does Borrower's Personality Affects The Repayment of The Loan? A Study of Banking Sector of Pakistan

<sup>1</sup>Shahzadah Fahed Qureshi, <sup>2</sup>Rashid Ahmad, <sup>3</sup>Muhammad Saim Hashmi

<sup>1</sup>Institute Of Social Sciences, Bahauddin Zakariya Univeristy, Multan, Pakistan: Fahadqureshi@Bzu.Edu.Pk

<sup>2</sup>M.Phil Scholar (Public Administration), Bahauddin Zakariya Univeristy, Multan, Pakistan.

<sup>3</sup>Mirpur University Of Science And Technology (MUST), Azad Jammu And Kashmir, Pakistan: Msaimhashmi@Gmail.Com

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p>The Continuing Global Increase In Economic Activities Is Increasing The Importance Of The Banking Sector As The Hub Of Such Activities. The Banking Sector Issue Loans To Individuals, Firms, And Government. Various Factors Influence The Repayment Of These Loans. In This Study, We Argue That The Personality Of The Borrower Affects The Repayment Of The Loan. We Have Selected A Sample Of 500 Borrowers Of Five Major Banks In Pakistan By Using A Cluster Sampling Technique. We Selected 250 (50%) Regular Borrower And 250 (50%) Defaulters. We Measured Borrower Personality Through A 44-Items Big Five Inventory (BFI) Questionnaire Similar To John &amp; Srivastava (1999). We Analyzed Data Using One-Way ANOVA And Regression. The Results Show Considerable Significant Differences Between The Personality Of Regular Borrowers And Defaulters On All Five Traits Of Personality, Which Reveals That The Borrower's Personality Affects The Repayment Of The Loan. The Defaulters Were High On Extroversion And Neuroticism Dimensions, While Regular Borrowers Were High On Agreeableness, Conscientiousness, And Openness To Experience. The Results Also Depict The Strong Effect Of Demographic Characteristics Such As Income, Education, And Family Size On Loan Repayment. The Study Suggests Banks Consider The Personality Traits Of The Borrower At The Time Of Issuing Of Loan.</p>
<p><b>Keywords</b> Loan Repayment, Personality Traits, Regular Borrower, Defaulter</p>	
<p><b>JEL Classification:</b> H81, H89</p>	



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Corresponding author's email address: fahadqureshi@bzu.edu.pk

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### 1. Introduction

Although Pakistan Is Considered As An Agricultural Country, However, More Than 50% Of Its Income Is Generated From Service Sector. Banking Is A Sub-Sector Of The Service Sector And Regarded As A Vital Part Of All Sectors Of The Economy As It Offers Loans Which Are Crucial For The Functioning Of

Agriculture As Well As Industrial Sectors. Banks Are The Pioneer Sector In Adopting Modern Technology In The Country. Till 2011, Near About 5200 Atms Were Working In Pakistan (PAF Air War College Karachi, 2011). Banking In Pakistan Is Generally Referred To As Commercial Banking As It Belongs The Most Substantial Part Of It. A Commercial Bank Is One Whose Primary Function Is To Generate Income By Accepting Deposits From The Public At A Low Rate Of Interest And Providing The Loan To The Persons And Organization In Need At A Relatively High Rate Of Interest. The Credit Or Loaning Is The Most Essential Function Of Commercial Banks. Credit Is A Crucial Factor In The Development Of The Country. It Provides Investment Opportunities And Decreases Poverty Level. It Is A Key Factor To Adopt Latest Technologies (Khandker & Faruqee, 2003). Pakistan Belongs To Those Countries Where Rate Of Interest On Loans Is Very High And Hence The Default Rate Also. Decreasing The Default Rate Is The Main Issue Of Banking Sector All Over The World Especially In Pakistan. According To Hussain Et Al. (2014), Credit Risk Is Faced By About 82.2% Banks Of Pakistani Southern Punjab Due To Farmer's Default.

Loan Repayment Refers To The Payment Of Loan And Its Interest On Time Without Any Delay. The Lender Should Not Provide Credit To Those People Who Do Not Repay The Loan On Time (Ha Q Et Al., 2009). The Lending Relationship Established Between Lender And Borrower After Issuing Of Credit. Strength And Weakness Of This Lending Relationship Is Dependent On The Competition Of The Financial Market. Increased Competition In The Financial Market Decrease The Probability To Meet Reward, And Resultantly This Increased Competition Leads To The Weak Level Of The Lending Relationship Among Lender And Borrower (Petersen, 1999). Increased Repayment Period Leads To More Risk Of Credit. Hence, The Repayment Period Is The Primary Determinant Of Loan Repayment Of The Borrower In Small-Scale Enterprises (Abraham, 2002). The Loan Amount Can Affect The Repayment Of Loan On Time. Determinants Of Loan Repayment At Borrower End Include Educational Level, Other Sources Of Income, And Repayment Period Etc. (Kibrom, 2010). Profitability, Interest Rate, Moral Hazards, And Economic Stability Are The Key Factors Which Are Influencing The Loan Repayment (Makorere, 2014).

Personality Can Be Differentiated And Described On The Base Of Possession Of Traits By A Person (Hollingworth, 1938). Features Of A Personality Describe The Behavior Of A Person. Behavior Of Man May Vary According To The Traits Kept By Him (Murray, 1938). Neuroticism Decreases Risk-Taking Behavior. (Rustichini Et Al., 2012). Psychological Interpretation Is One Of The Best Ways To Understand And Describe Personality (Hollingworth, 1938). The Brain Has Influence On The Thinking, Feeling And Behavioral Process Of A Person (Murray, 1938). Personality Factors Which Can Identify Saving And Borrowing Behavior Of A Person Are Emotional Stability, Autonomy, And Extroversion. Nyhus & Webley (2001) Recognized That Personality Factors Which Are Essential For The Measurement Of A Particular Type Of Saving Behavior Are Agreeableness, Inflexibility, And Tough-Mindedness (Nyhus & Webley, 2001). Neuroticism Decreases Risk-Taking Behavior (Rustichini Et Al., 2012).

In This Study, We Investigated The Relationship Between Borrower Personality And Loan Repayment In Pakistan, I.E., Which Type Of Borrower's Personality Leads To A Regular Compensation Of The Loan And Which One Leads To The Default Of The Loan. Financial Institutions Know The Relationship Between Borrower Personality And Loan Repayment Likely Yields Better. The Banks May Fill A Simple Questionnaire (Or Conduct A Short Interview) Before The Loan Issuing And May Have The Idea About The Possible Repayment (Or Default) Of The Loan In Advance. The Importance Of Low Default Rate Increased In The Increased Islamization Of The Banking Sector In Pakistan Where Banks Will Not In A Position To Merely Enhance Their Interest Rates With The Increase In Default Rate. Rauf & Mahmood (2009) Insisted That Growth & Financial Performance Of Microfinance Institutions Is Feeble In Pakistan And Continually Decreasing More And More Rather Than Investing More. According To Them, It Is Because Most Of The Borrowers Cause Bad Debts And Show Default Behavior At The Time Of



Repayment And Profit Rate Of Such Institutions Is Very Low. Hence, The Study In The Direction To Reduce Default Rate Of Loans In Pakistan Is Vital.

## **2. Literature Review**

Keeping In View The Importance Of The Credit Risk For A Financial Institution, The Plenty Of Research Work Is Available Related To Credit Especially Focusing On The Determinants Of Credit. The Early Research Work In This Direction Was Started In The First Half Of The Nineteenth Century. Chapman (1940) Identified That Fundamental Factors Which Can Affect Credit Risk Include Age Sex, Marital Status, Number Of Dependents, Ability Of The Borrower To Repay The Loan, Willingness To Repay The Loan, Moral Level, Financial And Professional Condition. Abreham (2002) Elaborated The Importance Of Repayment Period. According To Him, Credit Risk Increased With An Increase In The Period Of Repayment. He Concluded Repayment Period Is The Primary Determinant Of Loan Repayment Behavior Of Borrower In Small-Scale Enterprises. Feschijan (2008) Identified Accounting Information As Crucial Factor To Determine The Creditworthiness Of Loan Applicants. Kibrom (2010) Identified The Importance Of Educational Qualification, Other Sources Of Income, Purpose Of The Loan, And Repayment Period Of The Loan Etc For The Repayment Of Loan. Makorere (2014) Identified Profitability, Interest Rate, Economic Stability, And Moral Hazards As The Key Factors Which Are Influencing The Loan Repayment Behavior In Tanzania. Kim & Devaney (2001) Identified Number Of Credit Cards, Interest Rate On Credit Card Loan, Credit Limit, Educational Level, Income Level, Assets Position, Positive Behavior Towards Credit, And Behind Schedule Payments As Positively Related To The Outstanding Credit Card Balance. Haile (2015) Identified That Income Level, Family Size, Attitude Towards Saving, Training Provided To The Customers And Experience Of The Customer Are Central Determinants Of Loan Repayment Performance; And Concluded That Default Behavior Of Customer Depends Upon These Elements Of Loan Repayment Performance.

However, The Studies Related To The Impact Of Personality On Loan Repayment Are Very Few And Conducted In Recent Times. Nyhus & Webley (2001) Identified Personality Factors Identifying Saving And Borrowing Behavior Of A Person Are Autonomy, Emotional Stability And Extroversion Trait. Bertrand & Morse (2011) Studied The Reasons For Cognitive Biases And Their Ability To Cause Financial Loss. On The Bases Of Correlation Analysis, They Suggested That Information From The Customer Related To Cognitive Biases Must Be Taken In Order To Regulate Borrowing And Hence To Avoid Financial Loss Ultimately. According To Cobb-Clark & Schurer (2012), The Individuals Having More Moral Costa And Less Naïve Showed A Low Level Of Default Behavior. By Analyzing Data Collected From 105 Bank Borrowers, Ogeisia Et Al., (2014) Concluded That There Is A Positive Relationship Between The Character Of Customer And Repayment Of The Loan. The Character Of The Customer Is The Main Factor In Finding Loan Repayment Attitude. Their Study Suggests That The Lender Should Check The Character Of The Borrower, In Order To Ensure Repayment Of The Loan. Hunt & Wilson (2016) Explored The Possible Impact Of Personality Characteristics Of Small Loans Borrowers On The Effectiveness Of Australian Loan Regulations. They Identified Three Personality Traits Likely To Be Most Relevant To Borrower Behavior, I.E., Risk Tolerance, Optimism, And Self-Control. Other Characteristics Which Can Impact On Debt Behavior Are Financial Literacy And Irrational Behavior.

The Personality Is One Of The Most Critical Determinants Of Loan Repayment. However, The Studies Related To The Impact Of Personality On Loan Repayment Are Very Few, Especially In The Pakistani And South Asian Environment, Having The Different Culture From The Other Parts Of The World. The Present Study Is Aiming To Fill This Gap.

### **3. Research Methodology**

The Population Of The Study Was The Borrowers Of The Banking Sector Of Pakistan. We Used Cluster Sampling Technique Following Nguta & Guyo (2013). We Divided Borrowers Into Two Groups (I.E., Good Borrowers, And Bad Borrowers Or Defaulters) Similar To Haile (2015) Who Selected 120 Household Borrowers To Find Determinants Of Loan Repayment Performance Of Microfinance Institutions Including 50% Defaulters And 50% Non-Defaulters. We Requested Five Major Banks (I.E., NBP, UBL, ZTBL, Meezan Bank Ltd, And HBL) Of The Country To Provide The List Of 250 Good Borrowers And 250 Defaulters. Following Kibrom (2010) To Select Borrowers From One Specific Region (I.E., North Region) Of Ethiopia To Find The Determinants Of The Successful Loan Repayment, We Selected Borrowers From One Specific Region Of Pakistan (I.E., Southern Punjab).

We Conducted A Face-To-Face Structured Interview With The Respondents. We Grouped Interview Questions Into Three Sections. The First Section Is Related To Demographic Information. This Section Includes The Ability Of The Borrower To Repay The Loan, Age, Sex, Marital Status, And The Number Of Persons Depending On The Borrower As These Are The Are Basic Factors Which Can Affect Credit Risk (Chapman, 1940). The Second Section Is Related To Personality, And The Third Section Is Related To Loan Repayment. We Used 44 Items Big Five Inventory (BFI) Questionnaire To Measure Personality Similar To John & Srivastava (1999) And Adopted The Loan Repayment Behavior Section From Kibrom (2010). We Modified Interview Questions And Made Few Additions (And Deletions) To Make The Tool Suitable For Collection Of Data From The Pakistani Borrowers.

To Exclude Bias, Interviewers Contacted All Borrowers In Face-To-Face Meetings. Interviewers Established A Good Report At The Start Of The Interview, In Which, The Borrower Was Convinced That The Information Is Only For The Study-Related Purpose And His Name And Other Information Will Be Kept Strictly Confidential.

We Used Cronbach Alpha Technique To Ensure The Validity And Reliability Of 44 Items Big Five Inventory (BFI) Questionnaire Scale. We Performed A Descriptive Analysis Of The Demographic Characteristics Of The Borrowers. We Used Correlation Analysis Following Bertrand & Morse (2011) To Check The Association Between Repayment And Personality Traits. To Know The Mean Differences Of Regular Borrowers And Defaulters On Personality Traits, We Compared Means Of Borrowers' Personality And Their Loan Repayment Following Cole Et Al., (2015). We Used One Way ANOVA To Check The Difference Between Two Groups Of Borrowers, I.E., Regular Borrowers And Defaulters On All Personality Traits. In The End, To Check The Direction And Intensity Of The Impact, We Used Regression Analysis.

### **4. Results and Discussion**

The Results Of The Demographic Profile Are Given In Table No. 1. The Results Show That People Having Young Age Are Mostly Defaulters While People Having Relatively Elder Ages Are Regular Borrowers. 194 (77.6%) Defaulters Have Age Less Than 35 Compared To Only 12 (4.8%) Regular Borrowers Of The Same Age Group. The Gender And Marital Status Have No Significant Effect On Repayment Behavior. Education Level Has A Significant Relationship With The Repayment Behavior Of Loan. Regular Borrowers Are Well-Educated People While Defaulters Are Mostly Less Educated Or Illiterate People. 224 (89.6%) Defaulters Are Either Illiterate Or Having The Primary Education While 234 (93.6%) Regular Borrowers Were Having The Secondary And Tertiary Education. Family Size Is One Other Vital Factor In The Loan Repayment. People Having Large Family Size Are Mostly Defaulters While People With Small Family Size Are Regular Borrowers. 209 (83.6%) Regular Borrowers Have A Family Size Of 2-5 While 235 (94%) Defaulters Have A Family Size Of 6-15.

**Table No. 1:** Demographic Profile Of The Borrowers

		Regular Borrower		Defaulter		Overall	
		Frequency	%Age	Frequency	%Age	Frequency	%Age
Age							
	25 And Below	1	0.4	0	0	1	0.2
	26-30	5	2	86	34.4	91	18.2
	31-35	6	2.4	108	43.2	114	22.8
	36-40	42	16.8	37	14.8	79	15.8
	41-45	87	34.8	6	2.4	93	18.6
	46-50	64	25.6	8	3.2	72	14.4
	51 And Above	45	18	5	2	50	10
	Total	250	100	250	100	500	100
Gender							
	Male	250	100	250	100	500	100
	Total	250	100	250	100	500	100
Marital Status							
	Single	3	1.2	0	0	3	0.6
	Married	232	92.8	229	91.6	461	92.2
	Divorced	6	2.4	8	3.2	14	2.8
	Wife Died	9	3.6	13	5.2	22	4.4
	Total	250	100	250	100	500	100
Education Level							
	Illiterate	2	0.8	117	46.8	119	23.8
	Primary Education	14	5.6	107	42.8	121	24.2
	Secondary Education	103	41.2	21	8.4	124	24.8
	Tertiary Education	131	52.4	5	2	136	27.2
	Total	250	100	250	100	500	100
Family Size							
	2-5	209	83.6	15	6	224	44.8
	6-10	41	16.4	165	66	206	41.2
	11-15	0	0	70	28	70	14
	Total	250	100	250	100	500	100

We Adopted The Questionnaire Used In Previous Studies, Did Necessary Modifications According To The Changes Of Situation And Environment, And Tested For Reliability. The Reliability Statistics Of Personality Traits Are Given In Table No. 2. The Value Of Chronbatch Alpha Is More Than 0.7 For Items Of Each Trait Which Shows That Our Scale To Measure These Traits Is Reliable.

**Table No. 2:** Reliability Statistics Of Personality Traits

Personality Trait	N Of Items	Cronbatch Alpha
Extroversion	5	0.828
Agreeableness	9	0.971
Conscientiousness	9	0.966
Neuroticism	8	0.7
Openness To Experience	9	0.765

According To Table No. 3, There Exists A Significantly Strong Correlation Among All Personality Traits And Loan Repayment. This Relationship Is Positive For The Association Of Loan Repayment With Three Personality Traits, I.E., Conscientiousness, Agreeableness, And Openness To Experience. It Shows That Loan Repayment Increases With The Increase In Conscientiousness, Agreeableness, And Openness To Experience (And Vice Versa). On The Contrary, There Exists A Negative Relationship For The Association Of Loan Repayment With Two Remaining Personality Traits, I.E., Extroversion And Neuroticism. It Shows That Loan Repayment Decreases And The Matter Go Towards Default Side With The Increase In Extroversion And Neuroticism (And Vice Versa).

**Table No. 3:** Correlation Among Personality Traits And Loan Repayment (N=500)

	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness To Experience	Repayment Behavior
Extroversion	1					
Agreeableness	.943**	1				
Conscientiousness	.945**	-.977**	1			
Neuroticism	-.927**	.949**	.951**	1		
Openness To Experience	.919**	-.952**	-.952**	.921**	1	
Repayment Behavior	-.926**	.956**	.961**	-.943**	.920**	1

\*\* . Correlation Is Significant At The 0.01 Level (2-Tailed).

Table No. 4 Shows The Comparison Of Mean And Standard Deviation For Both Regular Borrowers And Defaulters. The Findings Depict That There Exists A Considerable Difference Between Both Groups Of Borrowers. The Mean Of Regular Borrowers Is 2.7800 For Extroversion (4.09 For Defaulters), 4.1609 For Agreeableness (2.19 For Defaulters), 4.2071 For Conscientiousness (2.13 For Defaulters), 2.39 For Neuroticism (3.51 For Defaulters) And 3.62 For Openness To Experience (2.49 For Defaulters).

Findings Show That Borrowers Having Low Extroversion Means Are Mostly Regular While Respondents Who Have High Extroversion Mean Are Mostly Defaulters. The Borrowers Having High Agreeableness Are Mostly Regular While Who Have Low Agreeableness Are Mostly Defaulters. The Borrowers Having High Conscientiousness Are Mostly Regular And Borrowers Having Low Conscientiousness Are Mostly Defaulters. The Borrowers Having High Neuroticism Are Mostly Defaulters And The Borrowers Having Low Neuroticism Are Mostly Regular. The Borrowers Having A High Openness To Experience Are

Mostly Regular And Borrowers Having A Low Openness To Experience Trait Are Mostly Defaulters. So, In Short, It Has Resulted That The Borrowers Having Less Extroversion, High Conscientiousness, High Agreeableness, Low Neuroticism And High Openness To Experience Traits Are Mostly Regular And The Borrowers Having Extroversion, Low Conscientiousness, Low Agreeableness, High Neuroticism, And Low Openness To Experience Traits Are Mostly Defaulters.

All The Values Of ANOVA Are Highly Significant Which Proves That Both Groups Of Borrowers', I.E., Regular Borrowers And Defaulters Differ Significantly On All Personality Traits.

**Table No. 4:** Comparison Of Mean, Standard Deviation And One Way ANOVA

Personality Trait	Borrower Category	Mean Value	SD Value	Variance	Sum Of Squares	Df	Mean Square	F	Sig.
Extroversion	Regular Borrower	2.78	0.29	Between Groups	215.430	1	215.430	2991	0.000
	Defaulter	4.09	0.23	Within Groups	35.867	498	0.072		
	Overall	3.43	0.70	Total	251.298	499			
Agreeableness	Regular Borrower	4.16	0.35	Between Groups	485.222	1	485.222	5280	0.000
	Defaulter	2.19	0.24	Within Groups	45.761	498	0.092		
	Overall	3.17	1.03	Total	530.983	499			
Conscientiousness	Regular Borrower	4.2	0.32	Between Groups	535.498	1	535.498	6077	0.000
	Defaulter	2.13	0.26	Within Groups	43.882	498	0.088		
	Overall	3.17	1.07	Total	579.380	499			
Neuroticism	Regular Borrower	2.39	0.21	Between Groups	158.203	1	158.203	3993	0.000
	Defaulter	3.51	0.17	Within Groups	19.731	498	0.040		
	Overall	2.95	0.59	Total	177.934	499			
Openness To Experience	Regular Borrower	3.62	0.26	Between Groups	160.934	1	160.934	2734	0.000
	Defaulter	2.49	0.22	Within Groups	29.313	498	0.059		
	Overall	3.06	0.61	Total	190.246	499			

Mean Values: 1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, And 5 = Strongly Agree

Table No. 5 Shows The Regression Results Of The Model. We Took Loan Repayment As A Dependent Variable While Personality Traits As Independent Variables. The Value Of R Square Is 0.936 Which Shows That Independent Variables Explain 93.6% Variations In The Dependent Variable. The Beta Values Of Extroversion And Openness To Experience Are Not Significant While The Beta Values Of The Remaining Three Traits Are Highly Significant. The Beta Value Of Neuroticism Is Negative Which Depicts That Increase In Neuroticism Trait Decrease The Loan Repayment. On The Contrary, The Beta Values Of Conscientiousness And Agreeableness Are Positive. These Positive Values Describe That Increase In Conscientiousness And Agreeableness Increase The Loan Repayment.

**Table No. 5:** Regression Results (Dependent Variable = Loan Repayment)

Variables	B	Std. Error	Beta	T Value	P Value
(Constant)	1.714	0.199		8.626	0.000

Extroversion	-0.045	0.026	-0.064	1.716	0.087
Agreeableness	0.132	0.029	0.271	-4.565	0.000
Conscientiousness	0.221	0.028	0.477	-7.801	0.000
Neuroticism	-0.197	0.033	-0.235	5.963	0.000
Openness To Experience	-0.055	0.032	-0.068	1.714	0.087

R = 0.968, R Square = 0.936, F = 1.452

## 5. Conclusion

There Exists A Significant Relationship Between Borrowers Personality And Loan Repayment. Young Borrowers Are Mostly Defaulters While Elder Age Borrowers Are Usually Regular Borrowers. Less Educated Borrowers Are Usually Defaulters While Well-Educated Borrowers Are Usually Regular Borrowers. Borrowers Having Low Family Size Are Usually Regular Borrowers While Borrowers Having More Family Members Are Mostly Defaulters. There Is A Negative Relationship Between Extroversion Trait And Loan Repayment, Positive Relationship Between Agreeableness Trait And Loan Repayment, Positive Relationship Between Conscientiousness Trait And Loan Repayment, Negative Relationship Between Neuroticism Trait And Loan Repayment And Positive Relationship Between Openness To Experience Trait And Loan Repayment. The Borrowers Who Have Less Extroversion, High Conscientiousness, High Agreeableness, Low Neuroticism And High Openness To Experience Traits Are Mostly Regular While The Borrowers Having High Extroversion, Low Conscientiousness, Low Agreeableness, High Neuroticism, And Low Openness To Experience Traits Are Mostly Defaulters.

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## Knowledge Sharing Culture Influences on Organizational Commitment: The Mediating Role of Pay Satisfaction

<sup>1</sup>Naveed Farooq,<sup>2</sup> Kauser Hayat, <sup>3</sup>Hazrat Bilal, <sup>4</sup> Wahid Raza

<sup>1</sup>Assistant Professor, Institute of Business Studies and Leadership Abdul Wali Khan University, Mardan, Pakistan:

Naveedfarooq151@gmail.com

<sup>2</sup> Assistant Professor, Shaheed Zulfiqar Ali Bhatto Institute of Science and Technology (SZABIST) Islamabad, Pakistan: dr.kauser@szabist-isb.edu.pk

<sup>3</sup> Assistant Professor, Center for Management and Commerce University of Swat, Swat, Pakistan: hbilal@uswat.edu.pk

<sup>4</sup> Assistant Professor, Government College of Management Sciences Wana South Waziristan, Tribal District , Pakistan : wrkhattak287@yahoo.com

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Public sector universities are preliminary knowledge intensive and to stunt their information effective knowledge sharing among faculty is required. We focus on the faculty of public sector universities that share or limit knowledge sharing. Determining which factors promote, influence or impede sharing of knowledge in institutions constitute important avenues for exploration. This paper has focused on three such influences; “knowledge sharing” “organizational commitment” and “pay satisfaction”. In this regard, a conceptual model is developed in which pay satisfaction serves as mediator between knowledge sharing (KS) and organizational commitment (OC) among faculty members. Data determining the above mentioned variables is collected from 309 faculty members through standardized questionnaires. Data analysis reveals that KS has positive impact on OC and on Pay Satisfaction (PS). Furthermore, pay satisfaction mediates the relationship between KS and OC. This study recommends a KS culture and pay satisfaction of faculty to maintain and enhance level of commitment among faculty. As KS enable better and faster decision making, reduces the loss of know-how, enhances level of commitment and stimulate innovation and growth.

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Corresponding author’s email address: hbilal@uswat.edu.pk

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**1. Introduction**

In the knowledge base economy Knowledge Sharing (KS) is viewed critical for institutional effectiveness. It is argued that KS stimulates the performance of both public and private sector employees (Amayah,

2013). KS has gained importance in organizations (Fein and hesterly, 2007). Recently, in knowledge incentive economy an existing organization's knowledge is fetching important resources. Thus "resource base theory" considered knowledge as one of the most key strategic resource (Van Den Hooff & De Ridder, 2004). Hansen, Nohria, and Tierney (1999) earlier elaborate that the efficient utilization of this resource is a challenge for institutions. Osterloh and Frey (2000) posit that KS among employees and departments is a critical process.

Determining which factors are significant and assist to promote or hinder KS among university faculty constitute an important avenue for exploration. This study intends to explore two such effects Organizational Commitment (OC) and Pay Satisfactio (PS). OC denotes the loyalty of employees towards their organization (Farooq & Zia, 2013). Employees who remained in organization due to their emotional attachment show positive conduct, cooperation and sharing of knowledge among stakeholders (Pradhan & Pradhan, 2015). Dhar (2015) explains that OC contemplate the most imperative notion in the area of organizational behavior. Committed employees do not leave the institution and retaining of such knowledge work force by organization is because of affective commitment like employees voluntarily exchange and contribution towards the institution knowledge pool. Therefore, institutions relying on knowledge workers in businesses need to regulate and enhance the level of commitment through their valuable knowledge sharing (Jayasingam & Yong, 2013).

Farooq, Ullah, and Zia (2017) argue that pay is an economic value and a return of employees' efforts. Pay pleasure is incredible for motivation and for institutional commitment. Indirectly it helps to achieve organizational goals. Organizations have adopted diverse pay systems to motivate employees for knowledge sharing, improve performance and to get institutional goals. Ba, Stallaert, and Whinston (2001) elaborate that pay satisfaction is very important to facilitate knowledge sharing through formal pay system.

Therefore, this investigation aims to address the issue of KS with OC and to explore the mediating role of PS among the faculty of public sector universities. Jayasingam and Yong (2013) conjure that several studies have investigated diverse factors which influence the level of OC and specifically addresses different level of knowledge work at a micro level. The focus of this research is not only limited to knowledge sharing culture influence but intended to address the mediating position of PS between KS and OC.

## **2. Literature Review**

### **2.1 Knowledge Sharing Process**

Knowledge Sharing and transfer are synonymously use and consider to have overlapping content. KS refers to the exchange of knowledge amongst individuals, within and between groups, institutional units and organisations, may be oriented or fragmented, but it does not typically have an a priori clear objective. (Paulin, 2015). It is the dissemination and sharing of skills, thoughts, experiences and technology among each other in organization (Wang, Ahmed,& Rafiq, 2008). It is a procedure where employees jointly exchange their information and mutually generate novel knowledge. Such mutual exchange is critical in interpreting individual knowledge to institutional knowledge. This process involves both "donating", means bringing and "getting", refer to collecting knowledge. Donating knowledge transfers intellectual capital from one person to another, while collecting knowledge involves consulting peers to share knowledge with peers. Hence, both the courses are vigorous- either energetically shared to colleague what one discern or acquire what they discern (Van Den Hooff & De Ridder, 2004).

Previous studies regarding the influences of KS has recognized numbers of variables from "hard issue" for instance technologies and equipment (Hlupic, Pouloudi,& Rzevski, 2002) to "soft issue" for example

motivation (Kosonen, Gan, Vanhala, & Blomqvist, 2014), learning orientation (Matzler & Mueller, 2011), team innovativeness (Liu & Phillips, 2011), organizational culture (Lee, Shiue, & Chen, 2016), job satisfaction (Tong, Tak, & Wong, 2015), enterprise social network sites (Ellison, Gibbs, & Weber, 2015). In line with Hlupic et al. (2002) this paper plan to study the soft side of KS, related to both individual and organization.

## **2.2 Knowledge Sharing and Organizational Commitment**

Yalabik, Van Rossenberg, Kinnie, and Swart (2015) argue that commitment is a multi-facet perception. It is a force which binds employees for a specific action relevant to institutional goals. OC elaborate the relationship between individual and organization. Researchers has identified three types of commitment (Meyer and Allen 1997): affective commitment (emotional attachment); continuance commitment (switching cost from institution), and normative commitment (a feeling of obligation to serve with the organization). Employee remains committed to his/his supervisor, job, organization or peer. In general knowledge workers are considered more loyal to their profession and less committed to the organization (Jayasingam & Yong, 2013).

Organizations follow a number of strategies to encourage their workers to be more committed and loyal to their corporate objectives, thereby generating mutual benefits, increasing organizational performance through the knowledge sharing culture. (Han, Chiang, & Chang, 2010). Committed employees shares four organizational features such as sharing of information, knowledge, rewards and decision-making power and hence improve overall organizational performance (Bowen & Lawler III, 1992).

Prior investigations found that committed employees induce the essence of altruism (Podsakoff et al. 2000). According to Vandewalle, Van Dyne, and Kostova (1995), psychological ownership influence altruistic spirit over OC which encourages KS behavior. Hislop (2003) also documented that OC anticipate employee's knowledge sharing behavior. Jayasingam and Yong (2013) elaborated that it is important to keep knowledge workers committed and to ensure that institutions may not lose these workers.

Hall (2001) conjure that employees share their knowledge when they are appreciated and ensure that their knowledge is actually uses. Hinds and Pfeffer (2003) documented that various motivational aspects affects knowledge sharing included organizational individual behaviors. Committed workforce who trust on both management and on peers share their knowledge. Jarvenpaa and Staples (2001) stated that "Greater commitment may engender beliefs that the organizations has rights to the information and knowledge one has created or acquired". To conclude it is likely that knowledge giving and gathering has relation with OC.

Scholars have studied the connection between KS and OC (Hislop, 2002; Van Den Hooff & De Ridder, 2004; Jo & Joo, 2011; Casimir, Lee & Loon, 2012). In the same vein, Kelloway and Barling (2000) found that affective commitment influence organizational performance. Based on the reciprocal relation employees offer competencies to organization in exchange of pay. Smith and Mckeen (2002) also documented a positive relation between KS and OC. The above studies lead us that KS is important for OC, as OC effects both willingness to contribute and willingness to collect knowledge. Therefore, this paper aims to check the impact of KS on OC among the faculty members of public sector universities of KPK.

## **2.3 Pay Satisfaction and Knowledge Sharing**

Bartol and Srivastava (2002) posited that organizations use compensation to encourage employees for knowledge sharing. It ranges from monetary incentive for instance bonus to non-monetary reward like dinner or certificate. Literature revealed mix results of pay satisfaction with knowledge sharing. Carleton

(2011) found inverse relationship of pay satisfaction with knowledge sharing. The author argued that knowledge workers incline to personal growth rather than pay satisfaction. However, some studies found that a good pay structure stimulate knowledge sharing (Forstenlechner & Lettice, 2007). Horwitz, Heng, and Quazi (2003) documented that performance incentives, bonuses and attractive pay plan retained knowledge workforce. Knowledge workers quit organization due to poor pay and job dissatisfaction. Pay satisfaction is influential motivator (Walker & Yip, 2018), inducing knowledge workers' behavior (Lin and Tseng 2005; Forstenlechner and Lettice 2007). Keeping in view the above discussion the following hypotheses are developed.

**H1:** KS has significant impact on OC.

**H2:** KS has significant impact on pay satisfaction.

**H3:** Pay satisfaction meditates the relationship between KS and OC.

### 3. Methodology

The current study is survey based, cross sectional, correlational, regression, mediating and quantitative investigation of universities faculty.

#### 3.1 Sample and Data Collection

The population of this enquiry is the faculty members serving in public sector universities of Khyber Pakhtunkhwa. There are total 4039 faculty members (Hayat, Jan and Nadeem, 2017), all the faculty members represent the population.

We spread our survey questionnaires to 410 participants employed in Basic Pay Scale (BPS) and in Tenure Track System (TTS). BPS is a widely used pay scale by almost all public sector institutions which differentiate the level of pay (Pakistan-Hotline, 2012). TTS is alternative salary scheme initiated in 2002 for the faculty. The intention of this scheme is to enhance the performance of faculty (Khan & Jabeen, 2011). In response 309 useable questionnaires were returned, yielding a response rate of 75 percent. Average age of the respondents were 36 years (SD\_15.18), consisting 76% male and 24% female. Among the respondents 20% hold PhD degree, 75% faculty are having M.Phil. degree and only 5% are having Master degree. The mean tenure was 11.83 (SD\_10.13), years. When approaching our respondents, they were assure that the data will be used for the research purposes only and confidentiality will be emphasized. Simple random sampling technique was used to collect data regarding the knowledge sharing, pay satisfaction and organizational commitment among faculty.

#### 3.2 Measures

The research instruments for this study were structured questionnaires adopted from the literature, based on a Likert– Scale to measure KS, PS and OC. To measure knowledge sharing of employees a ten items scale was used. This scale measure knowledge donating and knowledge collecting and have used in different organizations (Van Den Hooff & De Ridder, 2004). The level of PS was assessed through Heneman III and Schwab (1985) pay satisfaction questionnaire (PSQ). This is a twenty items scale, universal instrument which measure various dimensions of PS (Heneman & Judge, 2000; Sturman & Short, 2000). A sample item is “Size of my current salary.” To measure the level of organizational commitment a twelve items scale of Meyer, Allen, and Smith (1993) was used.

#### 4. Data Analysis and Results

	Variables	M	SD	1	2	3
1	Knowledge sharing	4.81	0.76	(0.74)		
2	Organizational commitment	3.97	0.51	0.58**	(0.79)	
3	Pay satisfaction	4.53	0.63	0.57**	0.73**	(0.71)

N=309; Cronbach Alpha in parenthesis

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 1 above demonstrates the means, standard deviations, coefficient alphas and correlations between variables of the research. It explain that knowledge sharing is correlated with OC ( $r = 0.58$ ,  $p < 0.01$ ), with pay satisfaction ( $r = 0.57$ ,  $p < 0.01$ ) and the correlation between OC and pay satisfaction is ( $r = 0.73$ ,  $p < 0.01$ ). These values give preliminary support to the anticipated hypotheses.

The table also explains the reliability via Cronbach Alpha values of the variables of the study.

Cronbach Alpha values of KS, OC and PS is 0.74, 0.79, and 0.71 respectively. All these values are above 0.7 signifying that the data is consistent internally. Hair, Black, Babin, Anderson, & Tatham, (1998) also conjure the same interpretation. However, Flynn et al. (1990) recommend the value ranging from 0.895 to 0.946 is also acceptable. Hence, all sub-scales reveal well over the lowest adequate reliability level of 0.7.

#### 4.1 Regression and Mediation Analysis through Baron and Kenny (1986)

The mediation analysis of the knowledge sharing, OC and pay satisfaction is checked by regression analysis recommend by Baron and Kenny (1986). The results are shown in the Table 2 given below.

**Table 2.** Simple Regression Analysis

Predictor	$\beta$	R <sup>2</sup>	Adj R <sup>2</sup>	F	t	P
KS → OC	0.50	.254	.251	101.39	10.06	0.000
KS → PS PS → OC		.339		152.72	12.35	0.000

#### 4.2 KS (Knowledge sharing), OC (Organizational Commitment), PS (Pay Satisfaction)

Regression analysis elaborates the relationship of variables. The table explains that knowledge sharing has significant effect on OC. The t value is above 2 means that KS has found noteworthy influence on the OC. The  $\beta$  is 0.50 that explains that a one unit variation in KS carries about 0.50 unit changes in OC. Knowledge sharing has got significance effect on pay satisfaction. The value of t is 12.35 which is above 2, means that KS has influences on PS. The value of  $\beta$  is 0.58 that explains that a one unit change in KS

conveys about 0.58 unit changes in PS. Similarly, PS has strong impact on the level of OC. The value of t is above 26.32 and the value of beta is 0.83 signify that a 1 unit change in PS bring .83 unit change in the level of OC. All the values are in acceptable range of significance for conducting mediation analysis.

**Table 3** The impact of both KS and PS on OC.

		OC				
Predictor	$\beta$	R2	Adj R2	F	t	P
KS	0.026	0.504	0.254	101.39	.660	.510
PS	0.82	0.836	0.669	693.120	21.00	000

The results of table 3 demonstrates the last step of mediating effect of KS and PS with OC. The table shows and provide evidence the significant effects of KS and PS on OC. When both (KS & PS) were regress together the value of beta fall to 0.026 from 0.50 and the t value decreases from 10.06 to 0.66. Similarly, the value of PS fall to 0.82 from 0.83 and the t value decreases to 21.00 from 26.32. It explicate that pay satisfaction has observed knowledge sharing and has substantial impact on OC.

#### 4.3 Preacher and Hayes (2004) Bootstrapping Technique of Mediation

To give more robustness to this investigation Preacher and Hayes (2004) bootstrapping technique of mediation was also performed. As compare to Baron and Kenny (1986) this test is considered superior and Sobel test. According to (Preacher & Hayes, 2004), if zero is not included in the 95% CI for indirect effect, mediation is determined. Below in table 3 the mediation analysis results are presented.

**Table4. Mediating Regression Analysis through Preacher and Hayes Bootstrapping Technique**

Path	Total effect	Direct effect	Indirect effect	95% CI	
				Lower level	High level
KS → PS → OC	0.52	0.027	0.50	0.38	0.62

The above table explains that the direct effect of knowledge sharing on organizational commitment was (.027,  $p < .01$ ) and the indirect effect via pay satisfaction was significant (.50,  $p < .01$ , 95% CI=0.38, HI 0.62). The standardized total (direct and indirect) result of (KS) on (OC) was found 0.52, that is because both direct (unmediated) and indirect (mediated) effect of pay satisfaction on OC, when pay satisfaction increases by 1 standard deviation, OC increases by 0.52 standard deviations. The current result indicated that H3 of the research study was supported and confirmed that pay satisfaction mediates the relationship between knowledge sharing and OC.

## 5. Discussion

The main impetus of this enquiry was to verify the argument of growing realization that knowledge sharing within institutions is critical process, effecting diverse factors. The study found a positive connection of KS with OC. Roodbari, (2016) conjured the same positive association of KS with OC. Joo (2010) elaborated that highest level of OC is align with KS. Van Den Hooff and De Ridder (2004) found that knowledge sharing influence OC. Cabrera, Collins, and Salgado (2006) also argued that OC is related to KS. In the same vein, Joo (2010) found the same significance relationship of knowledge sharing with OC. The research investigated that knowledge sharing has positive relation with pay satisfaction. Jayasingam and Yong (2013) conjured the same positive linkages. Furthermore, the study found a

positive relation of pay satisfaction with OC. Nawab and Bhatti (2011) explored the same relationship among the educational institutes of Pakistan.

Lastly, the investigation confirm the mediating consequence of pay satisfaction between KS and OC and bridges the gap in literature of knowledge sharing, pay satisfaction and perceived organizational commitment in a single model.

## 6. Implications

Recently universities are operating in an increasing complex and in turbulent surrounding. To meet the challenges of the competitive academic environment flexibility, information sharing and openness are getting critically important for the survival of academia. Faculty is the most imperative resources, especially with universities in the hunt of a justifiable competitive advantage. This study suggest that universities should not be made a places of employment but seats of learning, research and repository of knowledge and innovation. The public sector higher education institutions are required to monitor its pay system, as pay satisfaction is significance in bridging KS with OC. The results of the current study suggest that pay satisfaction observed KS and have strong influence on the level of OC. Currently, HEC has demand 85 billion rupees whereas government has provided 68 billion rupees indicating that it is difficult for universities to enhance the level of commitment through pay satisfaction. Hence, supporting and knowledge sharing environment is the last resort to enhance the level of commitment and to retain expertise in universities. With respect to the hypothetical contribution, this exploration has linked organizational learning, public policy and organizational commitment research with each other's. Joo (2010) also argued that OC entails efforts on both the institutional (organizational learning culture) and group (employees) levels.

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## Testing the Validity of Purchasing Power Parity Theory and Dynamics of Exchange Rate Behavior (Pakistan, China, Iran and Turkey)

<sup>1</sup> Rana Shahid Imdad Akash, <sup>2</sup> Muhammad Mudasar Ghafoor, <sup>3</sup> Navid Ahmed

<sup>1</sup> Assistant Professor, School of Business Management, NFC-IEFR, Faisalabad, Pakistan:

shahid.imdad@yahoo.com

<sup>2</sup> Assistant Professor, University of the Punjab, Jhelum Campus, Jhelum. Pakistan: mudasar@pugc.edu.pk.com

<sup>3</sup> Lecturer IMS, University of Agriculture, Sub Campus Toba Tek Singh, Pakistan: navid\_\_mcom@yahoo.com

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p><b>Purpose:</b> This study is aimed at to observe the purchasing power parity (PPP) Theory. The purchasing power parity (PPP) is the most enduring debate of literature in international macroeconomics. It is most controversial due to various puzzles and tested with different econometric models for certain group of countries. Therefore, the PPP is valid assumption while international comparison due to use of common exchange rate and the prevalence of Law of One price.</p> <p><b>Design/Methodology/Approach:</b> The validity of PPP for relative countries (Pakistan, China, Iran and Turkey) was tested and analyzed for the sample period 2001 to 2018.</p> <p><b>Findings:</b> It is observed that exchange rates of Pakistan, China, Iran and Turkey are not consistent and constant. The deviations of PPP through structural changes identified and are not persistence over long period. Overall results reflected that there is an existence of long run equilibrium relation in between Pakistan and China as well as in between Iran and Turkey. The error correction model has confirmed the adjustment speed of short run disequilibrium to long term disequilibrium level.</p> <p><b>Implications/Originality/Value:</b> The expected differential level of inflation has significant positive impact to exchange rate shift to Pakistan and trading activity patterns. The changes in foreign exchange market and commodity market due to economic integration are important implications for economic globalization.</p>
<p><b>Keywords</b> Purchasing Power Parity, Law of One Price, Long Run, Short Run</p>	
<p><b>JEL Classification:</b> K12, K19, F20</p>	



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Corresponding author's email address: shahid.imdad@yahoo.com

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### 1. Introduction

The Law of one price indicates that the price of a commodity at domestic level should be the same at foreign level. However, the purchasing power parity theory is an economic theory which is based on underlying assumption of exchange rate and macro models in the open economy. It is a primary doctrine

in the literature of international finance. The purchasing power theory is a comparative compression of money at that level where one currency per value measured at equal base to another currency. The value of home currency must have the equal value to foreign currency. Froot and Rogoff (1995), Sarno and Taylor (2002) studied the PPP theory which is found mixed for its current floating exchange rate period because of overvalued or undervalued of a currency.

The fluctuations in the exchange rate implicate movements towards or away from long time equilibrium level. It is very crucial for policy perspective. In accordance, law of one price holds that at a same time a money value of identical products should be same while purchase and sale among two economies. The economies have high degrees of economic interdependence and fluctuation in exchange rate. On the other hand, demand of one product is fluctuated due to shift in inflation of one economy. The change in demand from home country to foreign country will be continued until the change in currency value of foreign country appreciated. The PPP can have implications to explain that the real exchange rates found non-stationary.

The non-stationary of real exchange rate is being held. The theory describes that traditional PPP is failing to hold due to non-stationarity in the fundamentals economic. The economic fundamentals are the basic premise of equilibrium and a long term equilibrium level implicates to hold of PPP. A non validity of PPP should also have better implications for a wide set of subsequent theories of international finance. So, PPP is proposed to be as a valid proposition for best flow with reference to economic fundamentals.

Most of the international economic fundamentals based on flow of exchange rate. Therefore exchange rate may goes under the name of risks due to volatility for the long run. The phenomena of long standing puzzle may arise. The currency prices not at fundamental values are basic premise and quick adjustment may validate at any instant the prices at their fundamental values and short run disequilibrium. The phenomena will have a long standing puzzle of exchange rate. The puzzle of exchange rate may create misallocation of scarce resources. PPP can minimize the misallocation of scarce resources and help to create global prosperity. The inefficiency of quick adjustment may create the mispricing to lead the puzzle. The disequilibrium cause price distortion leads eventually international welfare losses. Thus it should be needed considerable effort to locate the exchange rates correctly priced or not excessively price and parity conditions hold. An empirical analysis can be used to help for exploration of real exchange rates stationarity. The stationarity level supported to co – integration analysis. It can be helpful for a system comprising to a nominal level of exchange rate, its foreign prices and domestic prices.

The previous literature supported that a non-linear trends is a key assumption to explain the failure of the theory. Furthermore, it should also assist to determine PPP may have been found valid in Pakistan, China, Iran and Turkey.

## **2. Literature Review**

Khan and Qayyum (2007) identified the existence of PPP and validated a relationship of foreign exchange and integration of goods market. Chaung and Lai (1994) suggested supporting the assumption of purchasing power parity and indicating that two conditions are not consistent. Alba and Park (2005) showed that PPP holds under exchange rate to support for purchasing power parity theory. Bhatti (1996) examined that a nominal level of exchange rate is used to tend the domestic price ratio and foreign price that supports a real exchange rate behavior is also mean reversion. Taylor (2002) investigated the PPP and found a favorable with floating exchange rates also linked to deviations due to purchasing power parity. Taylor and Sarno (1998) explored that a real dollar exchange rate during post Bretton Wood system found evidence of mean reverting behavior of PPP. Sercu et.al (1995) observed the behavior of exchange rate and consider the inter dependence and non-traded goods of economy. Arize et.al (2004) suggested about the purchasing power parity assumptions holds with the conditions of equilibrium and

found PPP more stable in Asia as in African. Murray and Papell (2004) concluded that Taylor was very strong in study to perfume the unit root test of lags selection and rejected favor the assumption of PPP. Elsadig (2011) tested PPP of US dollar and Japanese Yen. A penal unit root and cointegration tests employed and mixed results found regarded to existence of PPP. Chortareas and Kapetanios (2013) studied the relationship in prices and exchange rates under purchasing power parity theory of MIST (Mexico, Indonesia, South Korea and Turkey) and BRICS (Brazil, Russian, Indian, China, and South African) countries. Glenville (2013) also explained about the exchange rate and price level integration of bivariate countries. The exchange rate stationarity proved and found a long term positive relation among price levels and exchange rates exist. Kamal (2014) explored an empirical study of real exchange rate of short run and long run relation to buying power. The unit root test does not support PPP due to non stationarity of exchange rate and no cointegration exists between price and exchange rate. Zyoud (2015) tested the PPP and found existence but weak level of PPP in short term due to slow movement as compared to change in value of currency. Bhatti (1996) and Shively (2001) supported a long term existence, relative price level move with the proportionate of nominal exchange rate risk and real exchange rate with its equilibrium level in long term. Shively (2001) found PPP have no impact on real exchange rate. However, PPP play a vital role to determine the nominal exchange rate. Kanyembo and Sheefeni (2013) indicated that the PPP holds and exist in the long run between South Africa and Zambia. He et al. (2015) suggested the globalization under the world economy. The China's foreign trade and its role with exchange rate and increase in inflation to its economy. Dixon et al. (2016) provided about the exchange rate reforms of specific regime announced by China to make flexible exchange rate economy. It also considers the monetary policy to develop industry and economy. Ma et al. (2017) argued the validity of PPP which have no strong base in China, Korea and Japan But also found that PPP holds and exist in China under the quantile approach specifically. The heterogeneity and non-stationarity found in disorder due to PPP deviated and found a long run rapid fluctuation in exchange rate. The long run parity related to Pakistan and India, PPP holds. The previous literature tested only existence of long term relationship but not short term relationship of PPP and exchange rate. This research hypothesis explored that whether the long term and short term relationship of PPP and dynamics of exchange rate exist or not.

### 3. Data and Methodology

#### 3.1 Data

The validity of PPP for Pakistan, China, Iran and Turkey is tested and analyzed for the sample period January 1, 2001 to December 31, 2018. PPP theory can be viewed under the strong foundation of law of one price. The difference in transaction cost such as transportation cost, tax and tariffs are the basic premise to violate the law of one price. Actually, the process of arbitrage will be used to ensure that same good traded in world market, would be sold at same price in every country. The prices should shows at similar price in a common currency.

The  $P_t$  and  $SP_t^*$  are the domestic and foreign prices of currency for goods or services. Thus, the law of one price in term of exchange rate prices:

$$P_t = e SP_t^* \quad (1)$$

To make a comparative relation to domestic and foreign currencies of countries should be as under:

$$P_t = eSP_t^* \quad (2)$$

$$E = P_t/SP_t^* \quad (3)$$

The theory of exchange rates, PPP equation (2) predicted the exchange rate to adjust at same level of price. The absolute PPP underlying assumption of real exchange rate and nominal exchange rate should also be adjusted as under:

$$\frac{eSpt^*}{Pt} = 1 \quad (4)$$

Where  $Qt$  is the real exchange rate can be as under:

$$Qt = \frac{eSpt^*}{Pt} = 1 \quad (5)$$

PPP theory is established by Cassel (1916) that a floating exchange rate and nominal exchange rate cannot be deviated from its PPP. There should not be any transaction cost such as trade restrictions and transportation cost. Assuming that there is the LOP hold as under

$$\sum_{j=1}^n W_j Pt_j = e S \sum_{j=1}^n W_j P_t^* \quad (6)$$

PPP theory tests are used to analyze the stationarity of exchange rate and price level series related to two countries. The unit root test applied.  $P_t$  as prices at domestic level and  $S P_t^*$  as prices at foreign level of other countries to compare with Pakistan. The real exchange rate in the logarithm formation and  $Qt$ , the real exchange rate should be calculated as:

$$\log(Qt) = \log(e) + \log(S P_t^*) - \log(Pt) \quad (7)$$

Augmented Dickey Fuller (ADF) (1979) unit root test for simple autoregressive model (AR) is as follows.

$$X_t = \Delta X_t - 1 + \mu_t \quad (8)$$

$X_t$  is a variable for the time  $t$ ,  $\Delta$  is a coefficient and  $\mu_t$  is an error term.  $\Delta X_t$  at 1st difference or second difference.

$$\Delta X_t = (\Delta - 1)X_t - 1 + \mu_t = \lambda X_t - 1 + \mu_t \quad (9)$$

The Phillip Perron (PP) (1988) test in autoregressive (AR) model for unit root test as under applied.

$$X_t = \lambda_0 + \lambda_1 X_t - 1 + \lambda_2 t \left[ t - \frac{T}{2} \right] + \mu_t \quad (10)$$

The Johansen (1988; 1991) and Johansen-Juselius (1990) test is a technique to identify cointegration.

$$\Delta X_t = \alpha + \sum_{t=1}^{n-1} \gamma_t \Delta X_t - 1 + \alpha t \Delta X_t - 1 + \mu_t \quad (11)$$

$\alpha$  in an equation of relationship is being a constant,  $X_t$  is a matrix of vectors,  $\gamma$  and  $\alpha$  are the parameters or coefficients.  $\Delta$  is taken as a operator of change for vectors in the matrix. Trace statistics equation is as under.

$$\hat{Y}_{trace} = -T \sum n \log(1 - \gamma Q) \quad (12)$$

The maximum Eigen value can have a prove of hypothesis of cointegration exist due to more than its critical value.

$$\hat{Y}_{Maximum} = -T n \log(1 - \lambda P + 1) \quad (13)$$

$\lambda P + 1, \dots, \lambda P = (N - P)$  is being used to its small square; where the  $T$  is taken a level of observations at its area specified. Bivariate co-integration analysis is used to observe a long term relationship among

two series. Bivariate autoregressive process among two different series identifying co-integration to show its effects in the long term.

$$X = \alpha_0 + \sum_{i=1}^n \lambda_i X_{t-1} + \sum_{i=1}^n \delta C_{t-1} + \mu_t \quad (14)$$

$$Y_t = \alpha_0 + \sum_{i=1}^n \lambda_i Y_{t-1} + \sum_{i=1}^n f_i \lambda_{t-1} + \mu_t \quad (15)$$

$X_t$  and  $Y_t$  are the series of stationarity,  $\alpha$  is a constant.

$$Y_t = \alpha_0 + \sum_{i=1}^n \lambda_i Y_{t-1} + \sum_{i=1}^n \Delta_i Y_{t-1} + \mu_t \quad (16)$$

The Eagle Granger causality analysis test is employed to identify the cause and effect whether one time series has lead and lag relationship to another. Therefore, a Granger cause is useful and assists to determine the factor of causality relation and lead lag values selection process.

$$\delta_{prob}(X_{t+n} | \mathcal{E}_t) = \delta_{prob}(X_{t+n} | \mu_t) \quad (17)$$

A conditional probability P probability set of information  $X_t$  at time  $t$  on  $X_{t+n}$  values at past and information set  $\mu_t$  values contained for both  $X_t$  and  $Y_t$  for the given period of time. Vector error model of correction is being used to identify misspecification to evaluate the relation at short term and adjustments at short term with reference to recent economic activity.

$$\Delta X_t = \lambda + \sum_{i=1}^n \lambda_i \Delta X_{t-i} + \sum_{i=1}^n \delta_i \Delta X_{t-1} + \gamma R_{i-1} + \mu_t \quad (18)$$

$$\Delta Y_t = \lambda + \sum_{i=1}^n \lambda_i Y_{t-i} + \sum_{i=1}^n \delta \Delta \lambda_{t-1} + \epsilon R_{i-1} + \mu_t \quad (19)$$

The stationary series are taken as  $X_t$  and  $Y_t$  in the given equations.  $\lambda$  is constants.  $\mu_t$  is an term of error and  $R_i$  is term of correction,  $A_i$  and  $B_i$ ,  $\delta$ ,  $f$ , are parameters or coefficients.  $\gamma$ ,  $\theta$  are parameters or coefficients of error, positive integer value  $n$  and number of values  $i$  is taken.

#### 4. Results and Discussion:

**Table - 1 ADF and PP Tests**

Variables	ADF Test at Level 5%	ADF Test at 1 <sup>st</sup> difference	PP Test at Level 5%	PP Test at 1 <sup>st</sup> difference
<b>Pakistan Vs. China Parameters</b>				
Cpi_Pk	-1.6464	-7.1817	6.2456	-8.6081
Cpi_China	-1.3456	3.2346	5.4078	-8.3424
S_Pk_China	1.2434	-8.5678	2.5679	-9.3657
Q_Pk_China	-2.4567	-10.4327	-4.8970	-17.5674
Rp_Pk_China	-3.4367	-11.0987	-7.7689	-23.8970
<b>Pakistan Vs. Iran Parameters</b>				
Cpi_Pk	-1.1235	-7.1289	5.5643	-6.6754
Cpi_Iran	2.4536	-3.6754	3.5609	-7.2360
S_Pk_Iran	-1.1137	-12.8970	-1.1872	-12.896
Q_Pk_Iran	-2.6754	-11.3450	-2.2345	-10.5490
Rp_Pk_Iran	-2.3809	-9.4980	-5.9087	-7.5789
<b>Pakistan Vs. Turkey</b>				

<b>Parameters</b>				
Cpi_Pk	-1.3478	-7.1618	5.9086	-8.6789
Cpi_Turkey	3.4678	-5.6790	3.7890	-9.1980
S_Pk_Turkey	-1.0345	-8.6790	-1.3478	-8.9807
Q_Pk_Turkey	1.6780	-7.5697	1.7098	-9.3467
Rp_Pk_Turkey	1.0987	-8.7698	1.8907	-9.7854

**Table 3.1: Critical Values:**

<b>Probabilities</b>	<b>1%</b>	<b>5%</b>	<b>10%</b>
<b>ADF at Level</b>	-3.43228	-2.86228	-2.56721
<b>ADF at 1<sup>st</sup> difference</b>	-3.46446	-2.87644	-2.57479
<b>PP at Level</b>	-3.43228	-2.86228	-2.56721
<b>PP at 1<sup>st</sup> difference</b>	-3.46446	-2.87644	-2.57479

Table 1 indicates that ADF and PP tests are applied to test the stationarity of data. The series is to be considered stationary when there exist no trend. The series of data tested at first order difference and second order difference when data is not stationary at level. The above results indicated that the series became stationary at 1<sup>st</sup> difference for Pakistan, China, Iran and Turkey. Co-integration tests are used in determining the long run relationship among the series. The ADF and PP tests indicate that the series of data become stationary at first order difference. The prove of data is stationary is a pre-requisite to apply Johansen and Juselius co-integration tests. The selection of series statistics at lag length is made according to SIC - Schwarz Information Criterion. The cointegration model is assumed constant and linear trend. Table 2 indicates that there exist long term relationships due to cointegration factors exist.

**Table 2: Johanson Multivariate Cointegration of Pakistan, China, Iran and Turkey (Trace Statistics)**

<b>Variables</b>	<b>Hypothesis No. of CE(s)</b>	<b>Eigen Value</b>	<b>Trace Statistic</b>	<b>At 5% Critical Value</b>	<b>Critical Remarks</b>
<b>Pakistan Vs. China Parameters</b>					In this there exist 5 Co-Integration Vector at Critical level of 5%.
Cpi_Pk	None *	185.51 4	69.818	0	
Cpi_China	At most 1 *	104.92 4	47.856	0	
S_Pk_China	At most 2 *	62.312	29.797	0	
Q_Pk_China	At most 3 *	35.156	15.494	0	
Rp_Pk_China	At most 4 *	10.256 8	3.8414	0	
<b>Pakistan Vs. Iran Parameters.</b>					In this there exist 4 Co-Integration Vector at Critical level of 5%.
Cpi_Pk	None *	185.03 6	69.818	0	
Cpi_Iran	At most 1 *	118.28 9	47.856	0	
S_Pk_Iran	At most 2 *	72.445 1	29.797	0	
Q_Pk_Iran	At most 3	34.982	15.494	0	



	*	9		
Rp_Pk_Iran	At most 4 *	0.050	3.8414	0.8229
<b>Pakistan Vs. Turkey Parameters</b>				
Cpi_Pk	None *	232.63 5	69.818	0
Cpi_Turkey	At most 1 *	160.36 5	47.8561	0
S_Pk_Turkey	At most 2 *	99.930	29.7970	0
Q_Pk_Turkey	At most 3 *	44.448	15.494	0
Rp_Pk_Turkey	At most 4 *	1.382	3.841	0.2396

In this there exist 4 Co-Integration Vector at Critical level of 5%.

There exist 5 Co-integrating vectors exist between Pakistan and China which indicates that long relationship exist between these two economies. However there exist 5 co-integrating vectors exist among Pakistan and china as well which also elaborate existence of long run relationships. Moreover there also exist 5 co-integrating vectors among Pakistan and Turkey as well. The trace statistics accepts  $H_0$  and rejects  $H_1$ . The Maximum Eigen Value tests also applied to confirm the presence of long run relationship. Table 3 indicates the results regarding Maximum Eigen Value.

**Table 3: Johanson Multivariate Cointegration of Pakistan, China, Iran and Turkey (Maximum Eigen Value)**

Equity Markets.	Hypothesis No. of CE(s)	Eigen Value	Max. Eigen Value Statistics.	5% Critical Value	Critical Remarks
<b>Pakistan Vs. China Parameters</b>					In this there exist 5 Co-Integration Vector at Critical level of 5%.
Cpi_Pk	None *	80.589	33.876	0	
Cpi_China	At most 1 *	42.612	27.584	0	
S_Pk_China	At most 2 *	27.155	21.131	0	
Q_Pk_China	At most 3 *	24.900	14.264	0	
Rp_Pk_China	At most 4 *	10.256	3.841	0	
<b>Pakistan Vs. Iran Parameters.</b>					In this there exist 4 Co-Integration Vector at Critical level of 5%.
Cpi_Pk	None *	66.746	33.876	0	
Cpi_Iran	At most 1 *	45.844	27.584	0	
S_Pk_Iran	At most 2 *	37.462	21.131	0	
Q_Pk_Iran	At most 3 *	34.932	14.264	0	
Rp_Pk_Iran	At most 4 *	0.0500	3.841	0.822	
<b>Pakistan Vs. Turkey Parameters</b>					In this there exist 4 Co-

Cpi_Pk	None *	72.270	33.876	0	Integration Vector at Critical level of 5%.
Cpi_Turkey	At most 1 *	60.434	27.584	0	
S_Pk_Turkey	At most 2 *	55.482	21.131	0	
Q_Pk_Turkey	At most 3 *	43.065	14.264	0	
Rp_Pk_Turkey	At most 4 *	1.382	3.841	0.2396	

According to Table 3 again there exist 5 Co-integrating vectors exist between Pakistan and China which indicates that long relationship exist between these two economies. However there exist 5 co-integrating vectors exist among Pakistan and china as well which also elaborate existence of long run relationships. Moreover there also exist 5 co-integrating vectors among Pakistan and Turkey as well. The Maximum Eigen value test also accepts  $H_0$  and rejects  $H_1$ . Table 4 a. describes bivariate co-integration to explore the long run relationship among the purchasing power parity variables of Pakistan and China.

**Table 4 a. Bivariate Cointegration for Pakistan Vs. China:**

Equity Markets.	Hypothesis	Eigen Value	Trace Statistics.	At 5% Critical Value	Critical Remarks.
<b>Pakistan Vs. China Parameters.</b>					
Cpi_China --- Cpi_Pk	None * At most 1 *	0.329	22.399	13.324	Co-integration Exist.
Cpi_China --- Q_Pk_China	None At most 1	0.065	0.709	4.598	Co-integration not Exist.
Cpi_China --- Rp_Pk_China	None * At most 1 *	0.098	14.678	12.654	Co-integration Exist.
Cpi_China --- S_Pk_China	None * At most 1 *	0.000	0.0760	4.325	Co-integration not Exist.
Cpi_Pk --- Q_Pk_China	None * At most 1 *	0.432	33.098	19.398	Co-integration Exist.
Cpi_Pk --- Rp_Pk_China	None * At most 1 *	0.546	0.598	2.629	Co-integration Exist.
Cpi_Pk --- S_Pk_China	None At most 1	0.982	6.294	13.271	Co-integration not Exist.
S_Pk_China --- Q_Pk_China	None At most 1	0.591	0.762	4.145	Co-integration not Exist.

The above results indicate that there exist long run relationship between CPI, Relative Price, Real and

Nominal exchange rates of Pakistan and China. Table 4 b. describes bivariate co-integration to explore the long run relationship among the purchasing power parity variables of Pakistan and Iran.

**Table 4 b. Bivariate Cointegration for Pakistan Vs. Iran:**

Equity Markets.	Hypothesis	Eigen Value	Trace Statistics.	At 5% Critical Value	Critical Remarks.
<b>Pakistan Vs. Iran Parameters.</b>					
Cpi_Iran --- Cpi_Pk	None At most 1	0.609	11.940	16.109	Co-integration not Exist.
Cpi_Iran --- Q_Pk_Iran	None At most 1	0.908	0.419	2.932	Co-integration not Exist.
Cpi_Iran --- Rp_Pk_Iran	None At most 1	0.185	9.281	14.286	Co-integration not Exist.
Cpi_Iran --- S_Pk_Iran	None At most 1	0.001	0.742	4.263	Co-integration not Exist.
Cpi_Pk --- Q_Pk_Iran	None At most 1	0.261	13.870	17.797	Co-integration not Exist.
Cpi_Pk --- Rp_Pk_Iran	None At most 1	0.006	0.967	3.761	Co-integration not Exist.
Cpi_Pk --- S_Pk_Iran	None * At most 1	0.098	6.173	18.4947	Co-integration one Exist.
S_Pk_Iran--- Q_Pk_Iran	None * At most 1	0.791	0.485	4.018	Co-integration one Exist.

The above results indicate that there exist no long run relationship between CPI, Relative Price, Real and Nominal exchange rates of Pakistan and Iran. Table 4 c describes a bivariate co-integration to explore the long run relationship between the purchasing power parity variables of Pakistan and Turkey.

**Table 4 c. Bivariate Cointegration for Pakistan Vs. Turkey:**

Equity Markets.	Hypothesis	Eigen Value	Trace Statistics	At 5% Critical Value	Critical Remarks.
<b>Pakistan Vs. Turkey Parameters.</b>					
Cpi_Turkey --- Cpi_Pk	None * At most 1	0.492	19.481	14.086	Co-integration one Exist.
Cpi_Turkey --- Q_Pk_Turkey	None * At most 1	0.830	0.963	4.198	Co-integration one Exist.

	1 *				
Cpi_Turkey --- Rp_Pk_Turkey	None * At most 1 *	0.05 6	16.904	13.648	Co-integration one Exist.
Cpi_Turkey --- S_Pk_Turkey	None At most 1	0.04 5	0.095	4.674	Co-integration not Exist.
Cpi_Pk --- Q_Pk_Turkey	None At most 1	0.00 9	13.969	18.739	Co-integration not Exist.
Cpi_Pk --- Rp_Pk_Turkey	None * At most 1	0.05 9	8.765	5.512	Co-integration one Exist.
Cpi_Pk --- S_Pk_Turkey	None * At most 1 *	0.85 4	12.281	9.837	Co-integration one Exist.
S_Pk_Turkey --- Q_Pk_Turkey	None * At most 1 *	0.93 8	2.164	1.419	Co-integration one Exist.

The above results indicate that there exist no long run relationship between CPI, Relative Price, Real and Nominal exchange rates of Pakistan and Turkey. There is no lead lag relationship in between the PPP variables of Pakistan and China. if  $H_0$  where  $p > 0.05$  then the null hypothesis accepted.  $H_0$  where  $p > 0.05$ . So, hypothesis accepted. Table 5 a. indicates that changes of Cpi of China lead lag and causes of Cpi of Pakistan, real exchange rate, nominal exchange rate and relative prices.

**Table 5 a.: Pair wise Pakistan versus China Causality Test:**

Null Hypothesis:	F-Statistic	Probability
CPI_CHI_RT → CPI_PK_RT	2.44384	0.0896***
CPI_PK_RT → CPI_CHI_RT	1.71505	0.1828
Q_RT → CPI_PK_RT	1.88586	0.1546
CPI_PK_RT → Q_RT	0.70432	0.4958
RP_RT → CPI_PK_RT	3.88032	0.0224**
CPI_PK_RT → RP_RT	0.52225	0.5941
S_RT → CPI_PK_RT	1.03235	0.3582
CPI_PK_RT → S_RT	0.61005	0.5444
Q_RT → CPI_CHI_RT	0.16002	0.8522
CPI_CHI_RT → Q_RT	1.05499	0.3503
RP_RT → CPI_CHI_RT	0.82217	0.4411
CPI_CHI_RT →	2.91958	0.0565***

RP_RT		
S_RT		
CPI_CHI_RT		0.08241
CPI_CHI_RT	S_RT	0.17878
RP_RT		
Q_RT		2.42344
Q_RT		
RP_RT		0.82487
S_RT		
Q_RT		1.66126
Q_RT		
S_RT		0.92821
S_RT		
RP_RT		0.48547
RP_RT		
S_RT		0.80266

0.0914\*\*\*

\*Significant

at level  $p < 0.01$ \*\*Significant at level  $p < 0.05$ \*\*\*Significant at level  $p < 0.10$ 

The Change in CPI of China leads to Change in CPI of Pakistan at  $p < 0.10$ . and change in relative price of Pakistan leads to Change in CPI of Pakistan. The change in relative price of China leads to Change in CPI of China. The change in relative price leads to Change in real exchange rate. There exist lead lag relationship in between the PPP variables of Pakistan and China. Table 5 b indicates that no lead lag and causes of Cpi of Pakistan, real exchange rate, nominal exchange rate and relative prices and Iran same variables of PPP.

Table 5 b. : Pair wise Pakistan versus Iran Causality Test:

Null Hypothesis:	F-Statistic	Probability
CPI_IRN_RT		
CPI_PK_RT	0.89667	0.4097
CPI_PK_RT		
CPI_IRN_RT	0.31859	0.7276
Q_RT		
CPI_PK_RT	0.03569	0.9649
CPI_PK_RT	Q_RT	1.00749
RP_RT		
CPI_PK_RT	0.00365	0.9964
CPI_PK_RT		
RP_RT	0.16381	0.849
S_RT		
CPI_PK_RT	0.03426	0.9663
CPI_PK_RT	S_RT	1.18379
Q_RT		
CPI_IRN_RT	0.00128	0.9987
CPI_IRN_RT	Q_RT	1.34512
RP_RT		
CPI_IRN_RT	0.00712	0.9929
CPI_IRN_RT		
	0.22084	0.8021

RP_RT				*Significant at level p< 0.01 **Significant at level	
S_RT	→				
CPI_IRN_RT		0.00212	0.9979		
CPI_IRN_RT	→	S_RT	1.4264		0.2428
RP_RT	→				
Q_RT		0.36398	0.6954		
Q_RT	→				
RP_RT		0.47624	0.6219		
S_RT	→				
Q_RT		0.60658	0.5463		
Q_RT	→				
S_RT		0.67498	0.5104		
S_RT	→				
RP_RT		0.44077	0.6442		
RP_RT	→				
S_RT		0.32104	0.7258		

p&lt; 0.05

\*\*\*Significant at level p&lt; 0.10

There is no lead lag relationship in between the PPP variables of Pakistan and Turkey. No bidirectional causality exist among the variables.

**Table 5 c.: Pair wise Pakistan versus Turkey Causality Test:**

Null Hypothesis:	F-Statistic	Probability
CPI_TUR_RT → CPI_PK_RT	8.97507	0.000000
CPI_PK_RT → CPI_TUR_RT	1.66356	0.145800
Q_RT → CPI_PK_RT	0.06786	0.996800
CPI_PK_RT → Q_RT	0.61903	0.685500
RP_RT → CPI_PK_RT	3.36619	0.006300*
CPI_PK_RT → RP_RT	3.40201	0.005900*
S_RT → CPI_PK_RT	0.09417	0.993000
CPI_PK_RT → S_RT	0.60366	0.697200
Q_RT → CPI_TUR_RT	0.08133	0.995100
CPI_TUR_RT → Q_RT	6.07228	0.000030*
RP_RT → CPI_TUR_RT	1.00314	0.417400
CPI_TUR_RT → RP_RT	7.80617	0.000001*
S_RT → CPI_TUR_RT	0.0772	0.995600

CPI_TUR_RT →	S_RT	5.82341	0.000050*
RP_RT →			
Q_RT		1.36261	0.2406
Q_RT →			
RP_RT		0.67971	0.6394
S_RT →			
Q_RT		4.72329	0.0004*
Q_RT →	S_RT	4.76353	0.0004*
S_RT →			
RP_RT		0.74234	0.5927
RP_RT →	S_RT	1.42578	0.2171

\*Significant

at level  $p < 0.01$ \*\*Significant at level  $p < 0.05$ \*\*\*Significant at level  $p < 0.10$ 

The Change in CPI of Turkey leads to Change in CPI of Pakistan at  $p < 0.10$ . and change in relative price of Pakistan leads to Change in CPI of Pakistan. The change in relative price of Turkey leads to Change in CPI of Turkey. The Change in real exchange rate and nominal exchange rate of Pakistan and Turkey. The study indicates that there is long run PPP exist in between Pakistan, China, Iran and Turkey. Table 6 a indicates the results of Vector Error Correction Model between Pakistan, China, Iran and Turkey.

**Table 6 a.: Vector Error Correction Model of Pakistan and China:**

	D(CPI_PK_RT)	D(CPI_CHI_RT)	D(Q_RT)	D(RP_RT)	D(S_RT)
CointEq1	-0.14567	-0.01859	0.353239	-110.78	0.256983
	-0.07162	-0.05926	-0.14083	-11.5087	-0.10421
	[-2.0340]	[-0.316]	[ 2.5083]	[-9.6257]	[ 2.4660]
D(CPI_PK_RT(-1))	-0.63913	0.061755	-0.23941	39.21027	-0.33201
	-0.30096	-0.24901	-0.5918	-48.3633	-0.43791
	<b>[-2.12365]</b>	[ 0.24800]	[-0.40454]	[ 0.81074]	[-0.7581]
D(CPI_PK_RT(-2))	-0.36332	-0.40269	0.698248	7.385058	0.963113
	-0.29969	-0.24796	-0.5893	-48.1587	-0.43606
	[-1.21234]	[-1.62402]	[ 1.18488]	[ 0.15335]	[ 2.2086]
D(CPI_CHI_RT(-1))	0.228753	-0.78202	-0.22069	17.92264	0.100893
	-0.28118	-0.23265	-0.55291	-45.1852	-0.40913
	[ 0.81354]	<b>[-3.36136]*</b>	[-0.39915]	[ 0.39665]	[ 0.2466]
D(CPI_CHI_RT(-2))	0.142148	-0.05415	-1.06489	0.821769	-1.17824
	-0.28533	-0.23608	-0.56107	-45.8523	-0.41517
	[ 0.49818]	[-0.22937]	[-1.89794]	[ 0.01792]	<b>[-2.8379]*</b>
D(Q_RT(-1))	-0.02117	0.074319	-0.90576	40.03413	-0.38826
	-0.36158	-0.29917	-0.71101	-58.105	-0.52612
	[-0.05855]	[ 0.24842]	[-1.27391]	[ 0.68900]	[-0.7379]

D(Q_RT(-2))	0.090395	-0.37574	0.664722	15.01808	1.35592
	-0.36349	-0.30076	-0.71477	-58.4127	-0.5289
	[ 0.24868]	[-1.24931]	[ 0.92998]	[ 0.25710]	[ <b>2.5636</b> ]*
D(RP_RT(-1))	0.000884	7.34E-05	-0.0027	0.288353	-0.00207
	-0.00074	-0.00062	-0.00146	-0.11961	-0.00108
	[ 1.18808]	[ 0.11923]	[- 1.84579]	[ <b>2.41075</b> ]*	[-1.9126]
D(RP_RT(-2))	0.000309	0.000357	-0.00058	0.106494	-0.00058
	-0.00048	-0.00039	-0.00094	-0.07658	-0.00069
	[ 0.64851]	[ 0.90615]	[- 0.61349]	[ 1.39058]	[-0.8392]
D(S_RT(-1))	-0.02409	-0.07953	0.335379	-49.9528	-0.21512
	-0.36316	-0.30048	-0.71411	-58.3585	-0.52841
	[-0.06633]	[-0.26468]	[ 0.46965]	[-0.85596]	[-0.4071]
D(S_RT(-2))	-0.0953	0.371511	-1.04935	-24.2704	-1.76323
	-0.36491	-0.30193	-0.71756	-58.6403	-0.53096
	[-0.26115]	[ 1.23047]	[- 1.46240]	[-0.41389]	[- <b>3.3208</b> ]*
C	8.54E-06	-7.80E-06	8.40E-05	0.001047	0.000104
	-0.00012	-0.0001	-0.00024	-0.01982	-0.00018
	[ 0.06927]	[-0.07646]	[ 0.34626]	[ 0.05284]	[ 0.5788]
R-Squared	0.400673	0.424226	0.397003	0.609087	0.421028
Adj. R-Squared	0.363216	0.38824	0.359315	0.584654	0.384843
F-Statistic	10.69663	11.78866	10.53412	24.92977	11.6352

\*significant at [t>1.96]

Vector error correction model is being used for evaluating the short term relationship among PPP variables. Whereas t-statistics at t>1.96 indicates the presence of short run relationship between the relevant variables and there held short run relationship within economies of Pakistan and China as Real exchange rate and CPI is indicating.

**Table 6 b.: Vector Error Correction Model of Pakistan and Iran:**

	D(CPI_PK_RT)	D(CPI_CHI_RT)	D(Q_RT)	D(RP_RT)	D(S_RT)
CoIntEq1	-0.59441	-0.68333	4.866503	3.20503	4.849232
	-1.59179	-1.59028	-1.90842	-7.03955	-1.95708
	[-0.37342]	[-0.42969]	[ 2.55002]	[ 0.45529]	[ 2.47779]
D(CPI_PK_RT(-1))	4.324628	5.043004	-2.13119	-3.08845	-2.40969
	-3.78799	-3.7844	-4.54147	-16.7521	-4.65727
	[ 1.14167]	[ 1.33258]	[- 0.46927]	[-0.18436]	[- 0.51740]
D(CPI_PK_RT(-2))	8.667555	9.298182	6.69429	13.38171	7.005369
	-3.62475	-3.62131	-4.34576	-16.0301	-4.45656
	[ <b>2.39122</b> ]*	[ <b>2.56763</b> ]*	[	[ 0.83478]	[



			1.54042]		1.57192]
D(CPI_IR_RT(-1))	2.590164	2.138267	7.783831	4.142884	7.991236
	-3.29298	-3.28986	-3.948	-14.5629	-4.04866
	[ 0.78657]	[ 0.64996]	[ 1.97159]	[ 0.28448]	[ <b>1.97380</b> ]*
D(CPI_IR_RT(-2))	-0.30568	-0.53739	3.38453	-10.6925	3.495645
	-3.13367	-3.1307	-3.757	-13.8584	-3.85279
	[-0.09755]	[-0.17165]	[ 0.90086]	[-0.77155]	[ 0.90730]
D(Q_RT(-1))	-1.71376	-1.73123	2.454117	3.714891	3.166173
	-2.28314	-2.28098	-2.73729	-10.097	-2.80708
	[-0.75062]	[-0.75899]	[ 0.89655]	[ 0.36792]	[ 1.12792]
D(Q_RT(-2))	-2.68308	-2.66033	-0.33065	-12.1111	0.085858
	-1.89767	-1.89587	-2.27515	-8.3923	-2.33316
	[-1.41388]	[-1.40322]	[- 0.14533]	[-1.44312]	[ 0.03680]
D(RP_RT(-1))	-0.00336	-0.00407	0.052164	-0.83523	0.05214
	-0.02214	-0.02212	-0.02655	-0.09793	-0.02723
	[-0.15189]	[-0.18398]	[ <b>1.96478</b> ]*	[- <b>8.52847</b> ]*	[ 1.91503]
D(RP_RT(-2))	-0.00622	-0.00649	0.025898	-0.29746	0.025812
	-0.01797	-0.01795	-0.02154	-0.07946	-0.02209
	[-0.34639]	[-0.36176]	[ 1.20220]	[- <b>3.74340</b> ]*	[ 1.16842]
D(S_RT(-1))	1.571973	1.581688	-2.72682	-3.22824	-3.44009
	-2.07951	-2.07754	-2.49316	-9.19647	-2.55673
	[ 0.75593]	[ 0.76133]	[- 1.09372]	[-0.35103]	[- 1.34551]
D(S_RT(-2))	2.435447	2.413763	0.010217	10.80529	-0.40426
	-1.75084	-1.74918	-2.09911	-7.74296	-2.15263
	[ 1.39101]	[ 1.37994]	[ 0.00487]	[ 1.39550]	[- 0.18780]
C	-0.00519	-0.00522	-0.0049	-0.00498	-0.00489
	-0.00534	-0.00533	-0.0064	-0.02361	-0.00656
	[-0.97112]	[-0.97907]	[- 0.76560]	[-0.21072]	[- 0.74472]
R-Squared	0.042558	0.044675	0.232318	0.515578	0.243448
Adj. R-Squared	-0.01694	-0.0147	0.184609	0.485472	0.19643
F-Statistic	0.715239	0.752477	4.869488	17.12578	5.177821

\*significant at [t>1.96]

Vector error correction model is being used for evaluating the short term relationship among PPP variables. Whereas t-statistics at t>1.96 indicates the presence of short run relationship between the relevant variables and there held short run relationship within economies of Pakistan and Iran.

**Table 6 c.: Vector Error Correction Model of Pakistan and Turkey:**

	D(CPI_PK_RT)	D(CPI_CHI_RT)	D(Q_RT)	D(RP_RT)	D(S_RT)
CointEq1	4.648885	4.920248	26.89385	8.617406	29.35863
	-7.77434	-7.77063	-10.2215	-8.92739	-10.565
	[ 0.59798]	[ 0.63319]	[ 2.63111]	[ 0.96528]	2.77886]
D(CPI_PK_RT(-1))	-0.558386	-0.15605	-22.08882	0.169659	-24.04587
	-8.67528	-8.67114	-11.406	-9.96195	-11.7893
	[-0.06437]	[-0.01800]	[-1.93659]	[ 0.01703]	<b>[-2.03963]*</b>
D(CPI_PK_RT(-2))	5.841176	5.998417	-5.243736	2.769047	-6.095168
	-7.57912	-7.5755	-9.96483	-8.70321	-10.2997
	[ 0.77069]	[ 0.79182]	[-0.52622]	[ 0.31816]	0.59178]
D(CPI_TUR_RT(-1))	-0.344596	-0.38139	20.26698	5.480655	21.60715
	-8.92122	-8.91695	-11.7294	-10.2444	-12.1236
	[-0.03863]	[-0.04277]	[ 1.72788]	[ 0.53499]	1.78224]
D(CPI_TUR_RT(-2))	5.536287	5.582842	16.22742	12.68664	16.73
	-7.74003	-7.73634	-10.1764	-8.88799	-10.5184
	[ 0.71528]	[ 0.72164]	[ 1.59461]	[ 1.42739]	1.59055]
D(Q_RT(-1))	-0.617438	-0.827274	-16.18042	-3.502068	-16.88502
	-5.00706	-5.00467	-6.58315	-5.74968	-6.80438
	[-0.12331]	[-0.16530]	<b>[-2.45785]*</b>	[-0.60909]	<b>[-2.48149]*</b>
D(Q_RT(-2))	9.498625	9.188814	1.037679	3.998714	1.075948
	-3.75554	-3.75375	-4.93769	-4.31254	-5.10362
	<b>[ 2.52923]*</b>	<b>[ 2.44790]*</b>	[ 0.21015]	[ 0.92723]	0.21082]
D(RP_RT(-1))	-0.036937	-0.032934	-0.146251	-0.395962	-0.157971
	-0.35812	-0.35795	-0.47084	-0.41123	-0.48667
	[-0.10314]	[-0.09201]	[-0.31062]	[-0.96287]	0.32460]
D(RP_RT(-2))	-0.583516	-0.574788	-0.544987	-0.778255	-0.557317
	-0.35175	-0.35158	-0.46247	-0.40392	-0.47801
	[-1.65890]	[-1.63486]	[-1.17842]	[-1.92676]	1.16591]
D(S_RT(-1))	0.611607	0.810506	14.34725	3.349279	14.94912
	-4.6716	-4.66937	-6.1421	-5.36447	-6.34851
	[ 0.13092]	[ 0.17358]	[ 2.33589]	[ 0.62434]	<b>2.35474]*</b>
D(S_RT(-2))	-8.77438	-8.489258	-1.345183	-3.743839	-1.404413
	-3.48754	-3.48588	-4.58533	-4.0048	-4.73943
	<b>[-2.51592]*</b>	<b>[-2.43533]*</b>	[-0.29337]	[-0.93484]	0.29633]
C	-0.004868	-0.004895	-0.005475	-0.005157	-0.005498
	-0.00505	-0.00505	-0.00664	-0.0058	-0.00686
	[-0.96377]	[-0.96940]	[-0.82431]	[-0.88896]	0.80092]

R-Squared	0.143617	0.14299	0.39745	0.182957	0.413257
Adj. R-Squared	0.090395	0.089729	0.360003	0.13218	0.376793
F-Statistic	2.69847	2.684725	10.61376	3.603172	11.33323

\*significant at [ $t > 1.96$ ]

Vector error correction model is being used for evaluating the short term relationship among PPP variables. Whereas t-statistics at  $t > 1.96$  indicates the presence of short run relationship between the relevant variables and there held short run relationship within economies of Pakistan and Turkey.

## 5. Conclusion

This study is aimed at to test the Validity of PPP theory and dynamics of exchange rate behavior between Pakistan and the economies of China, Iran and Turkey. The deviations from PPP are due to structural changes in real exchange rate. The PPP does not hold due to difference at transaction cost i.e. prices of goods, carrying cost, administration, custom taxes and tariffs. The difference at transaction cost level is being violated the parity conditions and law of one price does not hold under PPP. The transaction cost and law of one price is also being producer of growth and efficiency of the economy. The difference in growth and efficiency of countries Pakistan, China, Iran and Turkey is very important to consider and to develop policies accordingly. However results reveal that there exists long run relationship exists among the exchange rate dynamics of Pakistan with China, Iran and Turkey. Results are in alignment with the study of Froot and Rogoff (1995), Bhatti (1996) Arize et. al, (2004) but not in accordance with the study of Alba and Park (2005). However, there exist little evidences about short run relationship. The decisions of future can be made through the behaviour exchange rate. PPP is very helpful in an estimation of exchange rate behavior as identified by Li and Park (2017). The increase in inflation can cause to depreciate the home currency. The development of monetary policy can have implications to preserve the value of currency. The value of national currency and foreign trade strategies are actually based on PPP. The PPP must hold at long term due to tendency of currencies towards faire value sustained at long term. The faire value can be created through an arbitraging process “buying currency at low value and selling currency at high value. This under value and over value process must be profitable with better managing of exchange rate risk and ultimately settled at fair value. The optimization of currency level with reference to political and economic stability is also considerable factor for valid PPP in future.

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Journal homepage: [www.publishing.globalcsrc.org/jafee](http://www.publishing.globalcsrc.org/jafee)**The Flow - Performance Relationship: Evidence from Pakistani Mutual Funds**<sup>1</sup> Saleh Nawaz khan, <sup>2</sup> Amna Noor<sup>1</sup> Ph .D Candidate, Department Of management Sciences, The Islamia University of Bahawalpur.  
:sallehkhan@yahoo.com.<sup>2</sup> Assistant Professor, Department Of management Sciences, The Islamia University of Bahawalpur.  
:damnanoorch@gmail.com.

ARTICLE DETAILS	ABSTRACT
<b>History</b> Revised format: February 2020 Available Online: March 2020	The we use the novel sample of Pakistani mutual funds to examine the flow performance relationship. We apply linear regression model with fixed effect on unbalanced panel data for the period of 2012 to 2018. Consistence with the existence literature using sample of US and other developed countries ,we find positive flow- performance relationship , but the prior performance do not have larger impact on subsequent fund flows. Our results also exhibit that the shape of the relationship is not linear; it's convex like other developed countries. In other words, the past high performing funds attracts larger inflow in the next periods whereas the past low performing fund suffer from minimal out flow in the next period.
<b>Keywords</b> Flow-Performance Relationship, Convexity, Mutual Fund Flows	
<b>JEL Classification:</b> G19	



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Corresponding author's email address: [sallehkhan@yahoo.com](mailto:sallehkhan@yahoo.com)**Recommended citation:** Khan, S. N. & Noor, A., (2020). The Flow - Performance Relationship: Evidence from Pakistani Mutual Funds. *Journal of Accounting and Finance in Emerging Economies*, 6 (1), 145-154**DOI:** 10.26710/jafee.v6i1.1050**1. Introduction**

The flow performance relationship remains interest of the academic researchers all the time. The consensus is that the prior performance is an important determinant of mutual fund flows beside other fund characteristics (size, rating, cost, expense ratio). The notion is that the prior performance is the signal of the fund quality and rational investor will always invest in those funds that perform well in the past. Therefore it's expected that this flow-performance relationship should be positive.

The previous literature also document the positive flow-performance relationship but this relationship is not linear its convex (Ippolito, 1992; Chevalier and Elision, 1997; Sirri and Tufano,1998).This means that the past best performing fund attract larger inflow in next period; whereas past worst performing funds suffer from minimal out flow in the next period. Contrary, Jun et al. (2014) found linear relationship between “mutual fund flow and performance” in the Chinese mutual fund market. The “flow-performance relationship” has three main implications. First, the fund flows are directly associated with asset under management and fund manager fees are tie with amount of asset under management.

Finally, “the way flow responds to past performance also matter as it has implication for return persistence”.

Although the relationship between fund flow and its performance has attracted tremendous attention in the literature but most of the existing studies on this subject have been done in US and other developed countries but there is scarcity of literature on this subject in the developing countries. We cannot apply the findings of US and other developed countries to all over the world. The investor sophistication and literacy are different across world. Generally, in the developed countries investors are more financially literate and more sophisticated as compare to developing countries (Ferreira 2012). So this Paper fills one of the gaps in the flow performance studies by asking whether the findings in Developed market carry over to emerging market.

This paper contributes the literature in several ways, first unlike the previous researches which uses cardinal measures for return. We categorized raw return into rank on the basis of their performance in the prior years because the rank explains the flow performance relationship much better than using raw return directly. Another benefit of using rank instead of raw returns it decreases the intensity of outliers in the data set (Patel et al. 1991). Secondly, Samra et al, (2018) found a “positive relationship between fund flow and performance” in Pakistan but they did not concluded either the shape of the relationship is convex or linear. So this paper also fills this prevailing gap in the literature by investigating the shape of the relationship in Pakistani mutual fund market.

The remaining of the paper is organized as follows. Section 2: presents the literature pertaining to over study. Section 3: presents the data and methodology. Section 4: discusses result and Section 5: concludes.

### **Problem Statement**

Previous studies document that the “flow-performance relationship is convex”. The high performing funds attract larger inflow whereas the low performing fund suffers from minimal outflow. This situation gives over confidence to fund managers because then they will know that if they do not perform well investors will not leave their funds. This encourages manager’s risk taking behavior especially when they will not be performing well. Brown et al, (1996) first “pointed out” this behavior in mutual fund industry they found that the “mid-year loser” funds (funds that earn below the median) increase the level of risk relative to “mid-year winners”. This excessive risk taking behavior of mutual fund managers has much adverse implication. So it’s very crucial to understand whether this phenomena exist in Pakistani mutual fund market or not.

### **Objective**

Following are the objective of the study.

1. To examine the flow-performance relationship in Pakistani mutual fund market.
2. To investigate whether this relationship is convex or not in Pakistani funds market.

### **2. Literature Review**

In the field of mutual funds one important stand of research deals with fund flows and its relation with performance. Generally the literature on this subject is relatively very rich. A positive flow performance relation has been found in previous studies. The work of Ippolito (1992) gained too much popularity in the literature and considers the seminal paper in this field. In his work he measured investor’s reaction to recent fund performance. He studied the sample of 143 US mutual funds for the period of 1966 to 1985. These funds held approximately “80 percent” of the assets held by all mutual funds in US. Returns data were collected from Wiesenberger reports (returns include dividend plus capital gains minus expenses, and investment fees). In his model fund investor evaluate quality of fund from their recent performance. He made an assumption that all the earnings are reinvested in the fund and high quality funds are those

which have return more than index fund and low quality fund are those whose return are less than index fund. He also pointed out some flaws which he observed in previous studies. First the previous studies took sample for a short span that is one of the reasons that they found weak relationship between past performance and growth. Second, the models estimated in earlier studies could not take into account for serial correlation between performance residuals. So to overcome this problem he applied fixed effect model in his study. He found significant and strong relationship between past performance and fund growth. The relationship was positive but the interesting thing he pointed out is that the relationship is not linear. The best performing funds attract greater inflow in the next period whereas poor performing fund do not suffer from larger outflow.

Chevalier and Elision (1997) examined the relationship between fund performance and subsequent investment flow in order to determine whether the relationship generate incentives for alter the riskiness of their portfolio. They studied the sample of 449 US mutual funds for the period 1983 to 1993. The data was collected from Morningstar Inc. To avoid the problem of potential outliers they eliminated the funds that were facilitating the institutional investors, they also eliminated the funds which were high expense ratio and funds less than two years of age. They also found that investor do react strongly to historical return and over all the shape of the relationship is non-linear.

Sirri and Tufano (1998) study was one of the highly cited work in this field. In their paper they studied the household behavior of US equity mutual funds. They examine 690 US mutual funds over the period 1971 to 1990. They constructed quintile portfolio to examine the different relationship across different performance level. Cross-sectional time series regression was estimated. They found the asymmetric flow performance relationship and the slope of the relationship is higher in bottom performance quintile.

Del Guercio and Tkac (2002) compare the flow performance relationship between pension and mutual funds. They selected 562 Pension funds and 483 mutual funds for the period 1987 to 1974. In their study returns were measured in raw and risk adjusted form whereas flows were measures in term of dollars, percentage flows and change in numbers of clients. They applied pooled time series cross sectional regression. They pension fund flow are positive related to risk adjusted performance and negative related to tracking error whereas mutual fund flows are positive related to unadjusted risk performance. The most striking difference between two segments is the shape of the flow performance relationship. In pension fund the shape of the relationship was approximately linear but in mutual fund it was convex.

Mazur et al. (2017) examined the investment flow of Institutional investors and retail investors of United-state over the period of 1999 to 2012. They found that the convex relationship that was observed by the previous researchers characterized mostly in the upper region of the performance scale. However, in the lower region the shape of this relationship was concave. Beside this they observed that the shape of the relationship is convex in case of retail funds whereas it becomes concave in case of Institutional funds.

Ferreira et al. (2012) examined the flow performance relationship around the world. The intuition behind that the buying and selling behavior of US investors cannot apply to all over the world. They hypothesized that investor sophistication level would be different between developed and developing countries. They collected the data from Lipper hindsight database for the period 2001 to 2007. They selected 28 Countries in their sample but unfortunately Pakistan was not a part of the sample. They applied piecewise linear regression model and found a marked difference in flow performance relationship across countries suggesting the US finding concerning its shape cannot apply universally. In developed countries investor reacts to top performance more than the investors in underdeveloped countries. They also found that the convexity of the relationship is more pronounced in less developed countries.

In Pakistan only a single study had done in this stand of literature. Sumra et al. (2017) examined the funds flows and performance of Managed funds in Pakistan. Their sample comprised of all open and closed ended mutual funds operated in Pakistan over the period 2007 to 2013. They found positive flow-performance relationship in all categories except for balanced fund, index tracker fund and for Islamic equity fund. They indicated that the fund managers in Pakistan used past performance as a marketing tool to attract new investors. The main concern of their paper was asset allocation pattern that's why they did not discuss the shape of the relationship in their paper.

### 3. Methodology

#### 3.1 Data Description

Currently, there is no data base available in Pakistan from where we can collect the data of mutual funds. So the only way for obtaining the required data is the financial statements of the respective funds. Currently, there are 253 mutual funds operated in Pakistan. These funds are divided into nine broad categories namely; "Money market fund, Capital protected fund, Fund of Fund, Income funds, Balanced fund, Asset allocation fund, Index tracker fund, Equity fund and Shariah complaint funds". While investigating flow performance relationship previous studies had selected the actively managed equity funds. The rationale behind that the other categories of mutual funds give investor a guaranteed return, which are similar to deposit money in saving account of any bank that's why the true flow performance relationship cannot established in those categories. So following the previous researchers we also select the actively managed open ended equity funds in our sample. Currently, there are 21 open ended equity funds operated in Pakistan. To avoid biasness we included all 21 equity funds in our sample. The time period selected for the study is from June 2012 to July 2018 and it contains yearly observations. The data of market return was collected from 'Karachi stock' exchange website.

#### 3.2 Empirical Methodology

Following the previous studies we measure fund flow as percentage flow (Siri and Tufano, 1998; Del Gurecio and Tkac, 2002). The Raw flow is yearly net flow in and out of funds, which is defined as follows.

$$\text{Flow}_{i,t} = \text{TNA}_{i,t} - \text{TNA}_{i,t-1} \times (1 + R_{i,t}) \quad (1)$$

Where  $\text{Flow}_{i,t}$  is the net flow of fund  $i$  in year  $t$ .  $\text{TNA}_{i,t}$  is the total net assets of fund  $i$  in year  $t$ .  $\text{TNA}_{i,t-1}$  is the total net asset of fund  $i$  in previous year ( $t - 1$ ).  $R_{i,t}$  is the return of fund  $i$  in year  $t$ . To get percentage flow we divide the  $\text{Flow}_{i,t}$  by Total net assets of the year  $t - 1$ .

$$\text{Flow}_{i,t} \% = \text{Flow}_{i,t} / \text{TNA}_{i,t-1} \quad (2)$$

The percentage flow is the net of appreciation of asset growth rate. Raw return is readily available in fund manager report after adjustment of dividend distribution, so we obtain them directly from fund manager's reports. For examine the flow-performance relationship, we estimate the regression model with fix effect using unbalanced panel data like (Nanda et al. 2004). The regression is specified as follows

$$\text{Flow}_{i,t} \% = \alpha_i + \beta_1 (\text{Rank})_{i,t-1} + \beta_2 \text{LN}(\text{Size})_{i,t-1} + \beta_3 (\text{Load})_{i,t-1} + \beta_4 \text{LN}(\text{Rating})_{i,t-1} + \mu_{i,t} \quad (3)$$

Where the depended variable is the "net flow (percentage flow)" to the  $i$ th fund in year  $t$  and  $\text{Rank}_{i,t-1}$  is the independent variable which depend upon the fund performance in the previous year ( $t-1$ ). Where the control variables are explained as follows:



$\text{LN}(\text{Size})_{i,t-1}$  is the log transformation of the total net assets TNA of the  $i$ th fund at the end of year  $(t-1)$ .

$\text{Load}_{i,t-1}$ , is the front end fee ratio of the  $i$ th fund in the previous year  $(t-1)$ .

$\text{LN}(\text{Rating})_{i,t-1}$  is the log transformation of rating of the  $i$ th fund at the end of year  $(t-1)$ .

We categorized raw return into rank on the basis of their performance in the prior year because rank explains the flow-performance relationship much better than using raw return directly. Another benefit of using rank instead of raw returns directly is that it decreases the intensity of outliers in the data set (Patel et al 1991). We used lagged values in our regression because we hypothesized that the mutual fund investor make their investment decision on the base of historical data. Mutual fund size may potentially impact the fund flow, since larger fund are generally more difficult to grow (Chevalier and Elision, 1997) so we also include fund size as control variable in our study. We also include sales load as control variable because it can potentially affect fund flows (Spitz, 1970).

To examine the “convexity” in the flow-performance relationship we use the methodology as adopted by Jun et al. (2014) and divide the funds into two categories: High and Low on the basis of their performance. So two interacting dummy variables  $\text{High} * \text{Rank}$  and  $\text{Low} * \text{Rank}$  is included in the regression model with robust standard error.

$$\text{Flow}_{i,t} \% = \alpha_i + \alpha_1 \text{High}(-1) + \beta_1 \text{Rank}(i,t-1) * \text{High}(i,t-1) + \beta_2 \text{Rank}(i,t-1) * \text{Low}(i,t-1) + \beta_3 \text{LN}(\text{Size})(i,t-1) + \beta_4 \text{LN}(\text{Load})(i,t-1) + \beta_5 \text{LN}(\text{Rating})(i,t-1) + \beta_6 (\text{Risk})(i,t-1) + \mu_{i,t} \quad (4)$$

Where “High (low) takes the value 1 if the  $i$ th fund is ranked in the top 50 percent based on its performance in the past year  $(t-1)$  and 0 otherwise”. We do not include dummy variable “low” in our regression model to bypass the issue of multi co linearity. “Our main interest is in the difference between the coefficient of two interaction variables,  $\beta_1$  and  $\beta_2$ , which measure the flow sensitivity to past performance for high and low performing funds”. If the  $\beta_1 - \beta_2 = 0$ , it show that investor react to prior performance in linear manner for best and worst funds. But, if  $\beta_1 - \beta_2 > 0$ , then it show that investor reaction to prior performance is more in case of best performing funds whereas they respond less in case of worst performers. This situation makes the flow-performance relationship convex rather than linear. Fund size and front end load, Rating and Risk is included as control variable in the regression equation.

#### 4. Result and Discussion

**Table No. 1:** Descriptive Statistic

Stats	Return	Annualized Std. Dev.	TNA	Front-end load	Rating	Market Return
Mean	20.19	5.03	5424	2.37	7.45	17.53
Median	22.05	4.94	1161	2.50	7.50	16.01
Maximum	72.88	8.96	81793	5.00	10.0	54.41
Minimum	-23.35	2.22	101	0.00	4.50	-15.18
Std. Dev.	21.48	1.06	14328	1.04	1.14	19.29
High-Performing (Mean)	37.90	5.19	5355	2.58	7.46	31.48
Low-Performing (Mean)	2.95	4.86	5424	2.16	7.44	4.14

Note: Returns are measured in %, Total net assets (TNA) are in millions , Front end load are measured in %, Rating is measured on 10 point scale , where 0 shows very poor quality and 10 shows very high quality.

To get a general view about the Pakistani mutual fund market we perform the descriptive analysis in Table one. In overall sample period the mean fund return is 20.19 percent whereas the mean market return is 17.53 percent. This shows that on average Pakistani mutual fund market beats its benchmark over the sample period. The maximum fund return for the period is 72.88 percent which is approximately 19% more than market return. The minimum return for the period is -23.35 percent. This indicate that the mutual fund market in Pakistan is highly volatile like developed countries. The mean return for high performing group is 37.90 percent which is approximately 7 percent more than market return and 35 percent more than the mean return of low performing group. The average total net assets of all open ended equity funds is 5424 million during the sample period and is approximately same for high and low performing group which is quite interesting . The average fund rating is 7.45 which indicate high quality. Over all the market shows good stat and have potential to grow further.

#### 4.1. Flow performance relationship analysis

**Table No 2 :** Relationship between fund flow and performance

Independent Variable	Dependent Variable		Flow(%)	
	(1) Over all	(2) 2013-15	(3) 2016-18	
Rank $i,t-1$	0.16** (0.08)(1.96)	0.27** (0.11)(2.41)	-0.20*** (0.04)(-5.00)	
Control variables				
LN(TNA $i,t-1$ )	-2.43*** (0.34)(-7.03)	-4.40*** (0.54)(-8.09)	-3.94*** (0.28)(-13.97)	
Front-end load $i,t-1$	-25.46* (14.63)(-1.74)	-95.38*** (28.6)(-3.33)	-1.32 (9.18)(-0.14)	
LN (Rating $i,t-1$ )	4.63 (3.42)(1.35)	89.90*** (17.99)(4.99)	4.16 (2.61)(1.59)	
R-square	0.61	0.95	0.95	

Note: we apply the linear regression model with fix effect on unbalanced panel data . Flow percentage is the outcome variable and Rank  $i,t-1$  is our independent variable which based on the prior year fund performance( $t-1$ ). Control variables are defined as follows: LN(TNA  $i,t-1$ ) is the log transformation of the total net assets of the  $i$ th fund at the end of year ( $t-1$ ). Front end load  $i,t-1$  is the front end fee ratio of the  $i$ th fund in the previous year ( $t-1$ ). LN(Rating  $i,t-1$ ) is the log transformation of rating of the  $i$ th fund at the end of year ( $t-1$ ). The number reported in first parentheses is standard error and the number reported in second parentheses is T-statistics. R- square measures the fitness of model. \*\*\*, \*\*, \* indicate 1 . 5 and 10 percent significant level.

Here our primary interest is to examine the flow-performance relationship in Pakistani mutual fund market. To do so we run the regression equation 2. The Coefficient on Rank  $i,t-1$  is +ve which indicate that the relationship is positive which is significant at 5 percent level. Samra et al, 2017 also found the positive relationship between fund flow and performance in Pakistani mutual fund market. For robustness we split the sample into two halves: one from 2013 to 2015 and other from 2016 to 2018. In the first periods we find positive flow performance relationship and it is also significant at 5 percent level.

However in the second period we find the opposite relationship between flow and past performance. This is quite interesting and it violates the condition of rationality. This may be due to political instability that was prevalent during the period (Beaulieu et al, 2005). The Panama leaks in 2016, in which the name of the sitting prime minister was appeared created uncertainty in the capital market. Similarly, the Supreme Court decision on the disqualification of the prime minister was also created uncertainty in the capital market. After that election took place in 2018, it shows that so many political events took place in second half of data. That's why our finding in that period is not supporting the literature. But in overall sample we find the positive flow-performance relationship which is consistent with previous literature (Ippolito 1992, Jun et al, 2004). The R-square value in all three equations are pretty good which indicates that our models are quite well.

#### 4.2. Sensitivity of the Flow-performance relationship

Table No.3 The symmetric Flow performance relationship

Independent Variable	Dependent Variable	
	(1) Flow(%)	(2) Flow(Millions)
Rank( $i,t-1$ )* High( $i,t-1$ )	0.24*** (0.11)(2.22)	253 * (267)(0.94)
Rank( $i,t-1$ )* Low( $i,t-1$ )	0.08* (0.05)(1.62)	97.7 ** (48.14)(2.02)
$\beta_1 - \beta_2$ (Wald Test, p Value)	0.15 (0.10)(1.42)	155 (285)(0.54)
Control Variables		
LN(TNA $i,t-1$ )	-2.42 *** (0.76)(-3.19)	-18.32 ** (6.74)(-2.71)
Front-end load $i,t-1$	-28.37 ** (14.02)(-2.02)	-342*** (120)(-2.85)
LN(Rating $i,t-1$ )	4.29 (3.11)(1.38)	120 (99.8)(1.20)
(Risk $i,t-1$ )	-8.45 (9.81)(-0.86)	-57.31 (224)(0.25)
R square	0.62	0.60
Adj. R- square	0.49	0.46
F statistic	4.79***	4.27***

Note: we estimate the linear regression with fixed effect on unbalanced panel data where standard errors are clustered by fund. Flow % is the dependent variable and Rank  $i,t-1$  is our independent variable which is based on the prior year (t-1) fund performance. Dummy variable high(low) takes the value 1 if the fund is in top(bottom) fifty percent who have performed good (bad) in the prior year. Control variables are defined as follows: LN(TNA  $i,t-1$ ) is the log transformation of the total net assets of the  $i$ th fund at the end of year (t-1). Front end load  $i,t-1$  is the front end fee ratio of the  $i$ th fund in the previous year (t-1). LN(Rating $i,t-1$ ) is the log transformation of rating of the  $i$ th fund at the end of year (t-1). (Risk  $i,t-1$ ) is the annualized standard deviation of monthly returns. The number reported in first parentheses is standard error and in second parentheses is t statistic. R-square measures the fitness of model. \*\*\*, \*\*, \* indicate 1, 5 and 10 percent significant level.

In the above table we examine the sensitivity of the flow-performance relationship between high and low performing group. For brevity the coefficient of dummy variable low are not reported in the table. The Interacting variable Rank \* High measures the flow sensitivity to past performance for good performing funds whereas the interacting variable Rank\*low measures the flow sensitivity to past performance for bad performing funds. Here our interest is in the 'difference' between the coefficients ( $\beta_1 - \beta_2$ ) of our interacting variables. For this purpose we use Wald test and test the null hypothesis  $\beta_1 - \beta_2 = 0$ . The Wald test reject the null hypothesis  $\beta_1 - \beta_2 = 0$ . The Difference between  $\beta_1$  and  $\beta_2$  is positive which implies that  $\beta_1 - \beta_2 > 0$ . This suggests, in Pakistan Investors are more sensitive to prior year performance in good performing fund then the investors in the poor performing funds. It means the funds that progress well in the prior year get disproportionately larger cash inflows in the next period whereas the funds that do not progress well in the prior year experience a smaller cash out flows in the next period. This shows that the shape of the relationship is also convex in Pakistan as founded by previous researchers in developed world (Siri and Tufanao, 1998; Del Guercio and Tkac, 2002). For robustness we reexamine the equation 4 but at this time we take our dependent variable "flow" in millions instead of percentage change and find the same result. Our findings are not in favor of mutual fund investors. But unfortunately, it is in the favor of mutual fund managers especially for underperformers. Because this convex relationship allows them to take excessive risk, especially in the period of worst performance.

## 5. Conclusion

Most of the existing literature has examined the flow performance relationship in the developed countries, however very few studies have done in emerging countries. The investor sophistication levels are different among countries, so it is not logical to apply the findings of US to all over the world. So this study examine the flow performance relationship in Pakistani mutual fund market to very first time and fills this prevailing gap in literature. Unlike the previous researches we convert the raw returns into rank on the basis of prior performance. The main findings of our paper is summarized below:

First, on average Pakistani mutual fund market beats its benchmark over the sample period. The maximum fund return over the sample period is 72.88 percent which is approximately 19% more than market return. Second, we find positive flow performance relationship in Pakistani mutual fund market which is significant at 5 percent level. This means that the mutual fund investor chase past performance. Thirdly, the shape of the relationship is convex. It means the funds that progress well in the prior year get disproportionately larger cash inflows in the next period whereas the funds that do not progress well in the prior year suffer from smaller cash out flow in the next period

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## The Role of Rater Motivation and Training in Effective Performance Appraisal System in Public Sector Universities of Khyber Pakhtunkhwa, Pakistan

<sup>1</sup>Muhammad Asad khan, <sup>2</sup>Altaf Hussain, <sup>3</sup>Mohammad Hanif khan

<sup>1</sup> PhD Scholar, Universiti Tun Hussein Onn (UTHM) Malaysia: asadkhan818@yahoo.com

<sup>2</sup> Assistant Professor, Department of Commerce and Management Sciences, University of Malakand, Khyber Pakhtunkhwa, Pakistan: altafhussain@uom.edu.pk

<sup>3</sup> Lecturer, Department of Tourism and Hotel Management, University of Malakand, Khyber Pakhtunkhwa, Pakistan: hanifyousafzai@uom.edu.pk

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**ABSTRACT**

Performance appraisal is considered to be the most significant element of performance management but often the former involves controversial practices, among other variables influenced by accuracy and effectiveness. However, it is generally understood that performance appraisal system commonly result into positive organizational outcomes, yet the accuracy of the measuring tools is still an arguable issue with more criticisms. The ongoing matters are measured and tested as a case study approach by paying attention on higher education institutions. Since higher education is progressively playing a vital role in economic competitiveness of a country. Aiming to examine the effect of rater motivation and rater training on performance appraisal process in public sector universities of Khyber Pakhtunkhwa, Pakistan and recognized as a critical contribution to organizational and people's performance. Thus, this study finds the effects and consequences of rater motivation and rater training on performance appraisal system. This study is survey based, 300 questionnaires in total were distributed among the faculty of public sector universities of Khyber Pakhtunkhwa (KP), Pakistan. Out of which 160 were received back recording response rate of 53%. Findings of this study indicate that there was positive and significant relationship between rater motivation and performance appraisal and also between rater training and performance appraisal in public sector universities of Khyber Pakhtunkhwa, Pakistan. The current study offers researchers with the opportunity to search performance appraisal from a new perspective which has never been explored before in a developing country like Pakistan.

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Corresponding author's email address: asadkhan818@yahoo.com

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## **1. Introduction**

Universities as institutions can perform a prominent role in economic growth, social and human development of a country; many governments are inclined to expand the sectors capacity and quality for new frontiers (Saba & Nsubuga-Kyobe, 2014), thus high quality and quantity in the higher education sector cannot be accomplished without consistent evaluation and improvement of academic staff performance assessment (Linna et al., 2012). Universities as institutions are used so as to highlight the performance appraisal accuracy regarding rater motivation and training based on public sector universities from Pakistan (Saba & Nsubuga-Kyobe, 2014). The significance of performance appraisal for certain organizational activities like motivation, training, recruitment and selection, compensation has been widely discussed (Zhang, 2012). Accuracy in performance assessment has been a leading concern for the last 50 years (Lee, 1985). Efforts commonly have been carried out to rectify the rater errors, as these rating errors are mostly caused due to the lack of training and motivation of rater. Such training and motivation of rater enhance the rating accuracy in performance appraisal (Lee, 1985). Researchers and practitioners have made and implemented various changes to employees assessment criteria, rating instruments and techniques used for performance appraisal. All these changes were made in an effort to make the process fair and accurate (Kisang & Kirang, 2016). Though, some researchers have emphasized on the training of raters and rater motivation in instruments and methods of performance appraisal (Park, 2017). Managers/raters have a key impact on organizational outcomes and performance at all levels of an organization (Powell & Yalcin, 2010). Since managerial education regarding knowledge, skills and abilities is critical for today's success of organizations (Kutshera & Byrd, 2005), rater/managerial training and development has declared as a vital business issue for organizations. Powell & Yalcin, (2010) argued the vital role of training and proper motivation in the improvement and development of effective managers and raters in both public and private organizations. Performance appraisal can be viewed as a significant technique using supervisors to motivate raters, increase employee performance and distribute rewards among employees which affect both individual and organizational performance accordingly (Buller & McEvoy, 2012). As raters has a significant role in the process of performance appraisal, still stimulating accuracy in the raters of different organizations and institutions has been an important problem (Lahuis & Avis, 2007). Recent studies, have pointed towards the effects rater motivation has on the accuracy of performance appraisal (Wang et al., 2010). Nevertheless, due to supervisory nature of performance appraisals, work design aspects, that is, rater training and motivation has been less explored area in the literature (Wang et al., 2010). It is evident from research that organizational experience that effective performance appraisal system need two components in place i.e. developed rating methods and rater training (Kumar, 2005). According to Imtiaz Ahmad et al. (2013) untrained rater and less motivated rater are among the top hindering factors of effective performance systems in public sector universities of Pakistan which needs to be addressed.

## **2. Literature Review**

### **2.1 Performance Appraisal**

One of the important human resource function and practices is performance appraisal. If used efficiently, it attempts to develop competitiveness, innovation, employee improvement, productivity as well as motivation and performance enhancement (Murphy & Cleveland, 1995; Saba & Nsubuga-Kyobe, 2014). As the role of performance appraisal is crucial in the success of organization, effectiveness of performance appraisal system is indispensable in order to evaluate employee's performance fairly and accurately (Saba & Nsubuga-Kyobe, 2014). In the performance appraisal context, work performance is related with accuracy in performance appraisal. All the dimensions related to job has effect on rater motivation and accuracy of performance appraisals (Park, 2017). First, the appraisers need variety of skills and such skills not only make the job meaningful but also results in improved rating accuracy (Rosso, Dekas & Wrzesniewski, 2010). Second important thing in performance appraisal is the task identification by the rater which has an observable outcome in the performance rating (Rosso, Dekas & Wrzesniewski, 2010). Third is the task importance in performance appraisal which has a reflection in



performance ratings of employees and also affect the employee improvement and personnel decisions. Furthermore, the more autonomy and responsibility the rater feels in rating the employees' performance, the more efforts and energy rater put to make the appraisal system better (Rosso, Dekas & Wrzesniewski, 2010; Park, 2017). Lastly, getting feedback directly from their subordinates or employees, make the raters more knowledgeable about their tasks results which in turn enhance their accuracy by developing their work performance (Mero, Guidice & Brownlee, 2007), subject to the institutional settings or rating systems.

In the ongoing literature, the existing limitations of rater motivation and rater training in a relationship with performance appraisal are also highlighted to reach the actual obstacles that can harm performance appraisal system's effectiveness of public sector universities particularly in Pakistan. Performance appraisal system is criticized due to the biases which occur due to lack of knowledge, skills and abilities in raters (Bekele et al., 2014). For performance appraisal to be worthwhile, regardless of their particular purpose it should be accurate as possible regarding performance ratings. It has been noted that many problems of evaluation ratings are the outcomes of adaptive and goal driven behavior of rater and such problems in true evaluation do not occur due to the inability of raters (Tziner et al., 2005). These problems cannot be termed as rating errors and thereby cannot be solved by using different rating scales but only be rectified through rater motivation and rater training (Tziner, et al., 2005). Moreover, performance appraisal is contaminated with non-performance factors like impression management and rater motivation (Spence & Keeping, 2011; Nayyar & Raja, 2012). So far less empirical research has been carried out for examining the effects of rater's motivation on performance appraisal in context of higher education sector in Pakistan (Saba & Nsubuga-Kyobe, 2014). Due to inappropriate training of rater most of the performance appraisal systems subject to weakness (Bohlander et al., 2001). Because they lack precise standards of assessment for subordinates performance and also lack necessary observational and feedback skills. The main hindering factors for effective performance appraisal system in public sector universities of Pakistan are untrained rater and low level of rater motivation which needs to be addressed (Imtiaz Ahmad et al., 2013). In response of feedback, raters may sometimes distort ratings to justify their rating decisions.

The first gap about performance appraisal which is contaminated with non-performance factors like impression management and rater motivation (Spence & Keeping, 2011; Nayyar & Raja, 2012). So far very less empirical research has been conducted to examine the effects of rater's motivation on performance appraisal context in higher education sector of Pakistan (Saba & Nsubuga-Kyobe, 2014). So such gap present in the research is of crucial importance. A study reveals that few organizations carry out rigorous and skill based training of their raters (Grote, 1996). In public sector universities of Pakistan, very limited research has been carried out so far, on rater training to make performance appraisal able to be effective in terms of performance ratings and this gap needs to be addressed (Imtiaz Ahmad et al., 2013).

## **2.2 Rater Motivation**

The thrilling development of studying the concept of rater motivation provided further opportunity to search performance appraisal (Saba & Nsubuga-Kyobe, 2014), from a new dimension. The "concept of rating motivation" may be confusing as it illustrates instances in which raters perform around with i.e. expand, shrink or consolidate ratings (Tziner, Murphy & Cleveland, 2001). The other instances that come under the "concept of rating motivation" includes rater's lack of motivation for accurate rating (Bank & Murphy, 1985), rater's motivation to assign inaccurate rating (Cleveland & Murphy, 1992) and rater's having no interest at all in fair ratings (Harris, 1994).

## **2.3. Rater Motivation in Performance Appraisal Context in Pakistan**

Organizational effectiveness is dependent both on organizational as well as individual performance (Gong, Law, Chang, & Xin, 2009). Notwithstanding, majority public sector organizations in Pakistan

including universities are using performance appraisal system namely Annual Confidential Report (ACR) to evaluate employee's performance annually by his immediate supervisor (Rehman, 2012). Since its commencement, the system has been corrected many times to clarify some technical problems by higher education commission Pakistan (Rasheed et al., 2011), though some development has been done in last decade but the existing performance appraisal system is still far away from success in practical operation and world level standards. The shortcomings observed in such reports challenge both the success and fairness of the performance appraisal system by yielding subjective ratings of employee job performance (Saba & Nsubuga-Kyobe, 2014). As identified by Murphy, (2008) regardless its popularity and importance in various organizations, the link connecting actual performance with subjective ratings of job performance is not strong comparatively. Moreover, non-performance factors like impression management and rater motivation has also contaminated performance appraisal of employees (Spence & Keeping, 2011; Nayyar & Raja, 2012). Giles and Mossholder (1990) postulated that employees' satisfaction with performance appraisal session is ensured when feedback is more specific, timely and correct led by rater motivation. It is assumed, hence, that if rater motivation is higher, employee satisfaction with performance appraisal process will be higher and vice versa.

#### **2.4. Determinants of Rater Motivation**

Determinants of rater motivation i.e. perceived rewards, perceived negative consequences and impression management are important one among others determinants (Cleveland & Murphy, 1992). It is also supposed that both situational (accountability) and personal (mood) variables influence these determinants. According to Cleveland and Murphy (1992) extensive discussion has been made on these three determinants of rater motivation in context with performance appraisal. Another scholar also highlights these determinants as the predictor of performance ratings (Harris, 1994).

#### **2.5. Reward**

In performance appraisal, raters are subject to the possibility of getting rewards in the form of raises and promotions. Most of the public sector universities used performance appraisal for promotion purposes (Anjum, Yasmeen & Khan, 2011) and this is considered as one of the major issue. Fletcher, (2001) is of the view that organizations need to recognize and develop employee competence regarding their improvement in performance as well as to allocate rewards to them. According to Murphy & Cleveland (1991) in practice, extrinsic rewards has been used frequently in engaging performance appraisal activities, but it has worthwhile for making accurate ratings regarding rater motivation.

#### **2.6. Negative Consequences**

Negative consequences are termed as second determinant of rater motivation in the context of performance appraisal. Negative consequences related with performance appraisal system are many in numbers (Alonso & Lewis, 2001), but damage to subordinate supervisor relationship, lowering morale of employees, subordinate criticism on raters, supervisor criticism on raters and intervention with other tasks are worthy to mention (Murphy & Cleveland, 1991). Managers show uneasiness when accurate performance ratings are made or negative performance feedback results in damage of relationship with employees (Longenecker et al., 1987). Employees also raise voices concerns about censured employee ratings and feedback particularly if such feedback and ratings are not positive and beyond the employees' expectation (Murphy & Cleveland, 1991). Such problems related with performance appraisal prevails everywhere but it is considered an unexplored phenomenon engrained in performance appraisal system of public sector organizations of Pakistan (Khan, 2010).

Performance appraisal in public sector universities' is only used at low level for communication and having little feedback from rater's to subordinates and such relationship is very scarce in such a closed appraisal system (Khan, 2010). Findings of performance appraisal systems are kept secret from employees. The management shows unwillingness for communicating negative information so as to avoid

direct conflict with employees and a face saving is done as well (Khan, 2010). Such confidentiality of information from employees leads to mistrust and culture of secrecy and distances in the relationship of rater and subordinate.

### **2.7. Impression Management Concerns**

Villanova and Bernardin (1989, p.299) defined impression management as “any behaviour that alters or maintains a person’s image in the eyes of another and that has as its purpose the attainment of some valued goal”. Impression management activities are more in the workplace. According to Nayyar and Raja (2012), motives for both politics and impression management actions in organizational environment in higher educational sector in Pakistan may involve inflating employee’s ratings to avoid conflict with employees and to encourage anxious employees out of one’s department. Researchers have also identified that rater also involve in impression management activities (Villanova & Bernardin, 1989). While, Harris (1994) argued that accountability to employees would result to inflated ratings because of rater’s concerns that negative ratings will decrease employee’s motivation and hurt rater’s relationship with employees. Latest study has found that accountability may result into more fair and accurate ratings as long as rater’s or employee’s opinion is not known to the rater (Graham et al., 2012). According to Harris (1994), task outcome dependence should enhance rater motivation i.e. the greater the degree to which rater’s outcome is related to the employee’s work (task dependence), the more likely the rater will give fair ratings and accurate feedback.

### **2.8. Rater Training**

Performance appraisal needs a trained rater to accurately evaluate the performance of employees. While assigning ratings, rater must be reasonable, accurate and objective (Kumar, 2005). Due to inappropriate training of rater most of the performance appraisal systems subject to weakness (Bohlander et al., 2001). Because these raters lack precise standards for assessing performance of subordinates and also lack necessary observational and feedback skills. A study reveals that very less organization provide rigorous and skill based trainings to their raters (Grote, 1996). Previous literature shows that training of rater can decrease rater effects and rater errors (Kumar, 2005). According to Duncan (1983), rater training is of special importance because it helps them to understand and use performance appraisal system in such a way which highlight and enhance its positive aspects. Training makes the appraisers accurate and reliable raters and help decrease common errors like halo and leniency. Such errors can also be removed by attending workshops and training sessions where they practice rating behaviors (De Cenzo dan Robbins, 1996). Without training, raters may harm the overall effectiveness of performance appraisal (Armstrong, 1988). Performance appraisal system loses its efficacy and excellence if the raters or managers lack the knowledge of using it for positive effects.

Training can be used for many purposes such as setting objectives, maintaining and keeping accurate records and communicating all aspects of performance appraisal (Boice & Kleiner, 1997). The main hindering factors for effective performance appraisal system in public sector universities of Pakistan are untrained rater and low level of rater motivation which needs to be addressed (Ahmad et al., 2013).

### **2.9. Relationship of Rater Motivation with Performance Appraisal**

Performance appraisal system is used in almost every organization but common one is supervisory performance ratings (Murphy, 2008) for assessment of employee performance. It is a certain fact that performance appraisal has got its importance and popularity around the globe but actual performance is weakly related with subjective ratings of job performance (Murphy, 2008). Performance appraisal has been contaminated with non-performance factors such as impression management, negative consequences so the performance rating is affected badly (Djurdjevic, 2013). The lack of distinguished advancement in developing performance appraisal accuracy is largely due to the fact that raters are less keen or less motivated to provide correct performance ratings. Various researchers pointed out that attention may be

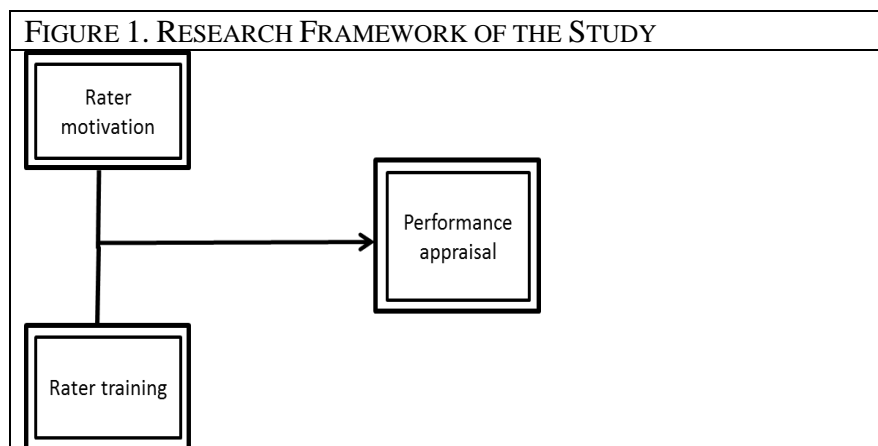
given to rater motivation in performance appraisal for the last three decades (Mohrman & Lawler, 1983). The focus has now been shifted to determine the impact of rater motivation on accuracy of performance appraisal. It is showed empirically by Wong and Kwong (2010) that raters have more interest in accomplishment of personal goals instead of provision of fair and accurate performance ratings. Various scholars have been argued that performance appraisal has got influence on rater goals and rating accuracy (Harris, 1994).

### 2.10. Relationship of Rater Training with Performance Appraisal System

Rater training is considered to be the most significant method that enables effective performance appraisal system (Anjum et al., 2011). The researcher further explains it, this is one of the critical issue related to the existing performance appraisal system. According to Kumar (2005) performance appraisal system has a relationship with rater training regarding performance ratings and rating accuracy. The basic need of performance appraisal is that rater should get objective results of employee job performance and applied that rating for the aim of improving performance (Kumar, 2005). Untrained raters create rating errors during measuring employee job performance and in turn which reduces the utility of performance appraisal system. A research done by Ahmad et al. (2013) and his results reveal that hindering factors of performance appraisal system in Pakistani universities are rater training and low level of rater motivation. From the studies of previous scholars (Longenecker, 1997; Kumar, 2005) it has been concluded that rater training is positively related with performance appraisal system.

### 3. Research Framework

The research framework for this study is based on the results of the previous studies which shows positive relationship for both rater motivation and rater training with performance appraisal (Decotiis & Petit, 1978; Longenecker, 1997; Kumar, 2005). In other words, if the rater is motivated and trained, the performance appraisal is assessed accurately and vice versa. The framework of this study is based on social exchange theory which elaborates that if the rater is motivated and has the required training for appraising the employees, performance appraisal is assessed accurately. Based on the findings of previous studies it is proposed that rater motivation and rater training is positively related with performance appraisal of employees in public sector universities of Pakistan. (Refer Fig.1)



### 4. Research Methodology

This study used survey based questionnaire to collect data from respondents. Simple random sampling (SRS) technique was utilized as sampling frame in the study. A total of 300 questionnaires were sent to the faculty members of six public sector universities of KP, Pakistan. Out of these 300, 160 filled questionnaires were received back recording a response rate of 53%.

#### 4.1 Measures

The constructs applied in this research were:

**Performance appraisal system scale:** the scale was used to measure performance appraisal. This scale was taken from Pearce and Porter (1986). It is a five-point likert scale ranging from “strongly agree” (5) to “strongly disagree” (1). The performance appraisal scale included of (5) items having alpha coefficient reliability of 0.93.

**Rater motivation:** the scale used to evaluate rater motivation was adopted and taken from the study of Park (2013). It is a five-point likert scale ranging from “strongly agree” (5) to “strongly disagree” (1). This scale has been tested earlier with alpha coefficient of 0.83.

**Rater training:** the scale used to assess rater training was adopted and adapted from the study of Elverfeldt (2005). It is a five-point likert scale ranging from “strongly agree” (5) to “strongly disagree” (1). This scale is found reliable with alpha coefficient of 0.73.

#### 4.2 Analysis of Data

Laatest version of SPSS was used to analyze the data of the study. Both correlation and regression anlaysis was carried out. The results have been elaborated with the help of tables. First performance appraisal is analyzed with the help of Pearson correlation with rater motivation and rater training. The coefficient of correlation among constructs is given in detail in the (Table 1).

Correlation analysis was carried out in connection to operationalize relationships among variables. The correlation coefficient between rater motivation and performance appraisal is 0.634, representing that both variables are strongly positivley correlated with each other

**Table 1:**

TABLE1: CORRELATIONS OF RATER MOTIVATION, RATER TRAINING AND PERFORMANCE APPRAISAL				
		Rater motivation	Rater training	Performance appraisal
Rater motivation	Pearson Correlation	1	.861**	.634**
	Sig. (2-tailed)		.000	.000
	N	306	306	306
Rater training	Pearson Correlation	.861**	1	.650**
	Sig. (2-tailed)	.000		.000
	N	306	306	306
Performance appraisal	Pearson Correlation	.634**	.650**	1
	Sig. (2-tailed)	.000	.000	
	N	306	306	306
** CORRELATION IS SIGNIFICANT AT THE 0.01 LEVEL (2-TAILED).				

While the correlation coefficient between rater training and rater motivation is 0.861 showing that both the variables are strongly postively correlated with each other. While the correlation coefficient between

rater training and performance appraisal is 0.65, also showing that both the variables are strongly positively correlated.

The value of coefficient determination (R<sup>2</sup>) is found as 0.443, which reveals that change of 44.3 % in the dependent variable i.e. performance appraisal is occurred due to the independent variables i.e. rater motivation and rater training. The change is not only caused by independent variables but some other factors also contribute in the improvement of performance appraisal. Overall the model of the study is significant (Refer Table 2).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.685a	.443	.492	.63428

The F statistic 116.645 indicates strong relationship between variables, through the significant level is at its optimum having value 0.000 (Refer Table 3), which leads to accept the hypotheses

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	92.208	2	45.604	116.645	.000b
Residual	121.107	304	.404		
Total	214.315	305			

a. Dependent Variable: performance appraisal.  
b. Predictors: (Constant), rater motivation, rater training.

The beta ( $\beta$ ) value = .459 for rater motivation which identified that one unit increase in independent variable (rater motivation) will increase the dependent variable (performance appraisal) up to 0.4 units as per table 4. While the beta ( $\beta$ ) value for other dependent variable (performance appraisal) is .283 which shows that one unit increase in rater motivation will enhance the dependent variable (performance appraisal) up to 0.2 units according to table 4.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.409	.283		2.061	.040
Rater motivation	.532	.087	.459	6.995	.000
Performance appraisal	.257	.086	.283	4.181	.002

The findings of this study reveal that if rater is highly motivated, trained and accurate in assigning performance ratings to their subordinates then employees will perceive performance appraisal is fair enough and subsequently will be motivated and satisfied and in turn will put more efforts to improve their

performance. So, such enhancement in employee performance will lead to organizational performance and better productivity.

To analyze the results of this study, these findings are in accordance with the earlier results of various researchers (Harris, 1994; Longenecker, 1997; Kumar, 2005; Decotiis & Petit, 1978) opined that rater motivation and rater training has a positive and significant relationship with performance appraisal. These results also confirmed that the findings of previous researchers (Kumar, 2005; Decotiis & Petit, 1978) that rater motivation and rater training has a positive and significant relationship with performance appraisal. The research on motivation theory further elaborates the limitations of cognitive process research which existed for over past twenty years (Roch et al., 2011). The critiques have highlighted the problems including rating inaccuracy which is an involuntary rating errors connected with cognitive limitations (Wang et al., 2010). It is further corroborated that raters need to be motivated and trained in order to conduct fair and accurate performance appraisal. Thus if the knowledge and skills of raters are developed for assessment of performance, such development of knowledge and skills of raters leads to enhanced rating accuracy of performance appraisal. Such trainings seek to improve performance appraisal accuracy by minimizing raters errors (Decotiis & Petit, 1978). The trainings of raters should be proper and accurate rating instruments further increase the capability of raters to be fairer while assigning performance ratings (Decotiis & Petit, 1978).

## 5. Conclusions and Recommendations

Various scholars have recently proposed that rater motivation and rater training are important factors in understanding performance appraisal problems. Higher education sector of Pakistan are faced with many challenges and problems, one serious problem is the lack of proper performance appraisal system. Government has struggled to bring improvement in the higher education sector but still these efforts towards improvement of performance appraisal system has not lead to the expected results. Research for last fifteen years (Ahmad, 2010; Andrabi, Das, & Khwaja, 2002) has documented that inspite that different innovations and sufficient financial aid by both foreign and local donors to the national education system has not added to the desired quality of higher education system of Pakistan particularly in universities (National Education Policy, 1998- 2010). It seems like higher education system of Pakistan is seriously dwindling and requires proper attention and transformation. Several factors contribute toward this decline of quality, one of which is lack of fair and transparent performance appraisal system in universities of Pakistan. Another factor could be the proper implementation of performance appraisal system, though steps have been taken toward improvement of its implementation in KP, public sector universities of Pakistan. Despite the steps taken for its improvement in the last decade, appraisal system still needs proper practical operation. In order to overcome such problems and issues, the performance appraisal system need to be aligned with the current practices and expertise of human resource. The connection of performance appraisal system with the social factors like rater motivation and rater training needs to be understood.

## 6. Limitations /Future Research

The limitations of this study was that it has been conducted only in one part of the Pakistan i.e. Khyber Pakhtunkhwa. The second limitation is confinement of this study to only public sector universities of Pakistan. The research design of this study is quantitative based and future study can include qualitative design using other variables i.e. feedback, employee participation and employee satisfaction. Future study can also include other regions of Pakistan for both public and private sector universities.

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## Analysis of Energy Crisis, Energy Security and Potential of Renewable Energy: Evidence from Pakistan

<sup>1</sup> Khalid Latif, <sup>2</sup> Muhammad Yousaf Raza, <sup>3</sup> Ghulam Mujtaba Chaudhary, <sup>4</sup> Adeel Arshad

<sup>1</sup> Assistant Professor, College of Commerce, Government College University Faisalabad, Faisalabad .Pakistan  
Khalidlatif@gcuf.edu.pk

<sup>2</sup> Department of Business Administration, Federal Urdu University of Arts Science and Technology Islamabad,  
Pakistan yousafrazat@gmail.com

<sup>3</sup> Assistant Professor, University of Kotli, Azad Jammu and Kashmir. ghulam.muftaba@uokajk.edu.pk

<sup>4</sup> Lecturer, Department of Business Administration, University of Kotli, Azad Jammu and Kashmir

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Over the last thirty years, Asian countries have become a chief player in the worldwide scene. Pakistan is facing an acute energy disaster since last decade that impacts on social and economic development. Sustainable energy supply is an essential feature for the economic growth of any society. From the last five years, Pakistan is facing a shortfall between 4,000-5,000 megawatt. This study inspects the association between energy security, energy crisis, energy demand, energy supply, and renewable potential in Pakistan. It also evaluates the final energy demand-supply gap, provincial renewable energy distribution, sectorial distribution, and policy recommendation for future energy. For this study, we applied renewable and non-renewable energy scenarios during 2014-2035 and Market-Allocation method to prove the energy situation in Pakistan. The outcomes show that renewable resources are the best option in reducing energy risk, import cost, and enhance environmental and economic sustainability. With the objectives of our key findings, targeted suggestions and policies are given.

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Corresponding author's email address: Khalidlatif@gcuf.edu.pk

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**1. Introduction**

The use of electricity is increasing continuously due to the growth of the global population and industrial development. In improving thermal efficiency and independence on external fossil fuel energy sources, solar energy, a clean energy source has provided great potential. This energy is used in environmental protection, CO<sub>2</sub> emissions reduction and in agriculture production. It is, therefore; due to increase in demand and consumption for energy identifies that it will create a key issue in the globe (Şen, 2004). To fulfill the requirement of vitality demand, clean power means are the best opportunities. Pakistan is facing acute energy crisis especially in the

northern, rural and off-grid areas (Raza et al., 2019). The energy management is still fighting to contract with the power disaster because the energy hindrance exceeds 2,888 megawatts in June 2017. But, in May 2018, the shortfall touched (6000-7000 MW), and load shedding has risen to five hours (Lin and Raza, 2019a). The rising demand of Pakistan's energy sector is met by petroleum products; electricity, LPG, and coal consumption (see Fig.1). Overall, the consumption of oil is increasing during the given period. Oil consumption increased by 107.6% while gas is the second consumption competitor which has increased by 98.02% during 2018. During 2017-2018, the energy consumption was reported as 55Mtoe which has increased by 9.7 per cent than the previous year 2016-2017 (HDIP, 2018). Final energy consumption during 2017-2018 with the share of different sectors i.e. industrial (37.5%), transport (33.9%), domestic (21.2%), commercial (3.6%), other Government (2.3%), and agriculture (1.5%) was calculated given in Fig.2, while Fig.3 illustrates that the primary energy supplies were shared by oil (31.2%), gas (34.6%), LNG import (8.7%), LPG (1.2%), coal (12.7%), and electricity by 11.6% (HDIP, 2018). This is because of the continuous increase in the consumption of transport and industrial sector of Pakistan (see Fig.2). The usual energy shortage started in the last decade due to economic competition (Shaikh et al., 2015). Due to much consumption and shortages, energy production sectors unsuccessful to generate the expected energy units. According to the Ministry of petroleum Pakistan, import bill of oil during the year 2017-2018 reached US\$12 billion which has become a huge burden on foreign reserves. For this, the government and petroleum ministry prepared a long-term plan with the help of public-private sector for the next twenty-five years. This plan will support in improving energy security in Pakistan. Overall, the total available energy in Pakistan in 2017-2018 was 88.25Mtoe while the domestic production was 46.725Mtoe and 41.525Mtoe (HDIP, 2018). This clarifies that Pakistan is much dependent on energy imports. Although, due to the high prices of petroleum products, Pakistan is unable to consistent its economy. According to (Khalil and Zaidi, 2014), the demand for electricity in Pakistan changes on a cyclical base and especially boosts in the summer season. So, the difference between supply and demand is encountered by blackouts and lack of energy has affected the industry of Pakistan to destroy (see Fig.3). This condition has forced agriculturalists and industrialists to choose for different sources of energy creation. Pakistan is situated in the most extreme sun-powered separation territory on the earth (Firoz and Intikhab, 2004). Consequently, in lessening energy crisis and shortfall in Pakistan it is essential to widen natural power sources such as solar, wind, hydropower, and wave. Recently, hydro-energy as a clean and renewable is ensuring much less environmental pollutions and could be applied at a macro level over the future. The major advantage is that the conversion of the dominant energy in hydrogen to electricity energy could be carried-out by growing hydrogen fuel cells as an economical and sustainable electric substance for hydrogen development reaction. According to (Shi et al., 2019), hydrogen is taken as an energy transporter not as a key fuel because the transportation of hydrogen energy has become a challenge in the world. Thus, many researchers, for example, (Askari et al., 2019); (Salarizadeh et al., 2019), and (Askari and Salarizadeh, 2019a) and (Askari and Salarizadeh, 2019b) considered hydrogen energy as energy carriers in the production, storage, transfer process. Although, there are some fundamental issues in Pakistan because of limited indigenous energy resources such as renewables, hydro, coal, gas, oil and renewable energy technologies (Raza and Shah, 2019). Without environmental concerns, the financial burden on national energy import is the major problem for the country's economy. Currently, Government of Pakistan (GOP) is pursuing policies to invite foreign investors in renewable energy production (i.e. hydro, coal, wind, solar, biomass, and geothermal) in the energy sector to substitute imported energy resources (HDIP, 2018). Additionally, the contribution of each energy supply during 2018 was 31.2%, 34.6%, 8.7%, 1.2%, 12.7%, 7.7%, 2.7%, 1.1%, and 0.1% of oil, gas, LNG, LPG, coal, hydro, nuclear, renewable, and imported electricity. In spite of huge electricity efficiency from hydro resources, the GOP should also discover alternative energy resources such as renewables. These will not only fulfill the needs of Pakistan but also reduce pollution, imported energy, and meet the future needs of the country.

The potential for clean vitality resources can be utilized to electrify the off-grid areas of Pakistan. According to (Farooq and Kumar, 2013), the solar energy can be used as water heaters and solar cookers. For the family unit necessity, Pakistan has utilized sun based vitality at the huge level because the normal sunshine hours in Pakistan are 3000h-3000h every year and the intensity of solar index for 6-7 h for each day is received (Sadiq, 2018)(Sadiq, 2018); (Raza et al., 2019). For this, Pakistan has contracted several clean energy plans with China i.e. Quaid-i-Azam solar power project of 300MW, Sachal wind power of 50 MW, 50 MW of Hydro-China Dawood, wind project of 99MW Jhimpir (Ministry of Finance, 2018). Overall, renewable primary energy balance was counted as 920,580Toe during 2017-2018 in Pakistan (HDIP, 2018). These renewable energy projects will help Pakistan in economic development, import/export, job creation and business activities (Table.2). For example, the government of Pakistan has also started work with a for-profit company providing supportable and ingenious solar products

such as fans, lights, mobile chargers, television, and bulbs to micro businesses in off-grid parts of Pakistan. As a result, these schemes have the extraordinary potential to create financial advantages, vitality security, and diminished contamination and reduce climate change (Masud, 2009). This condition inspires us to inspect the energy crisis and renewable energy potential from Pakistan's power sector. Additionally, this research discusses the energy crisis and encourages renewable energy technologies in Pakistan. Many researchers have proved in different countries i.e. (Khare et al., 2013) for India; (Ahmed et al., 2014) for Bangladesh; (Stritih et al., 2007) for Slovenia; (Gurung et al., 2013) for Nepal; (Aliyu et al., 2015) for Ghana; (Shaikh et al., 2015) for Pakistan and (Niu et al., 2019) for China have measured the output of clean electricity and found a consensus that clean energy is one of the best ways in sustainability, energy security, cope with energy crisis and ecological degradation. According to the (German Watch, 2017), Pakistan is at 7th in number among the most serious atmosphere influenced nations. For this Government of Pakistan established, Global Change Impact Studies Centre (GCISC act 2013) to cover this region in volume building, information distribution, support to policymakers and national planners related to numerous divisions such as food, water, agriculture, forestry, health, biodiversity, environment, food, livestock, and advanced technologies in Pakistan. These renewable projects will be helpful at the household level. So, to fill the gap and analyze the key reasons of the continuing energy disaster, we try to measure the current development of renewable energy resources including, solar, wind, biogas, micro Hydel, and bagasse.

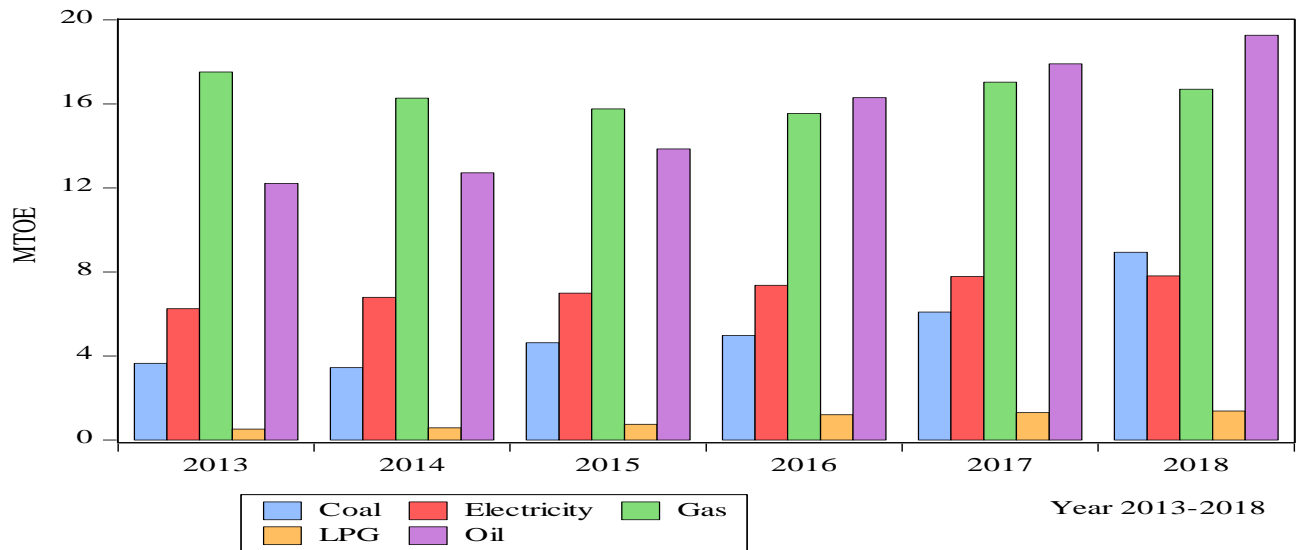
This research further analyzes policy issues linked to renewable energy technology resources and securities to resolve the current energy crisis in Pakistan. Among the rundown of a couple of countries; Pakistan is also vulnerable to the aftereffects of environmental change. For this, the ministry of climate change Pakistan focused on renewable energy sources and their policies are given as (see Table1).

The motivation and contribution of this study as follows: first, present study focuses on renewable energy, energy security, energy demand, energy supply, and energy import; second, we will estimate the sectorial energy consumption and situation of energy by source; third, study focuses on the solar energy and solar energy policies regarding Pakistan Energy Vision (2025) and Vision (2035). The analysis is based on two scenarios which enhance the renewable and non-renewable energy resources in Pakistan from 2014-2035. Finally, to analyze the energy security in Pakistan, we applied MARKAL (Market Allocation) method based on three scenarios i.e. base case and two reduction scenarios i.e. 5%, 10% during 2014-2035. For future energy security, the policy recommendations are provided based on outcomes because such measurements and policies do not exist. The present study like many other studies helps to improve our knowledge and understanding of energy security-related problems. Thus, according to the best of our knowledge, this study is the first of its nature related to analysis.

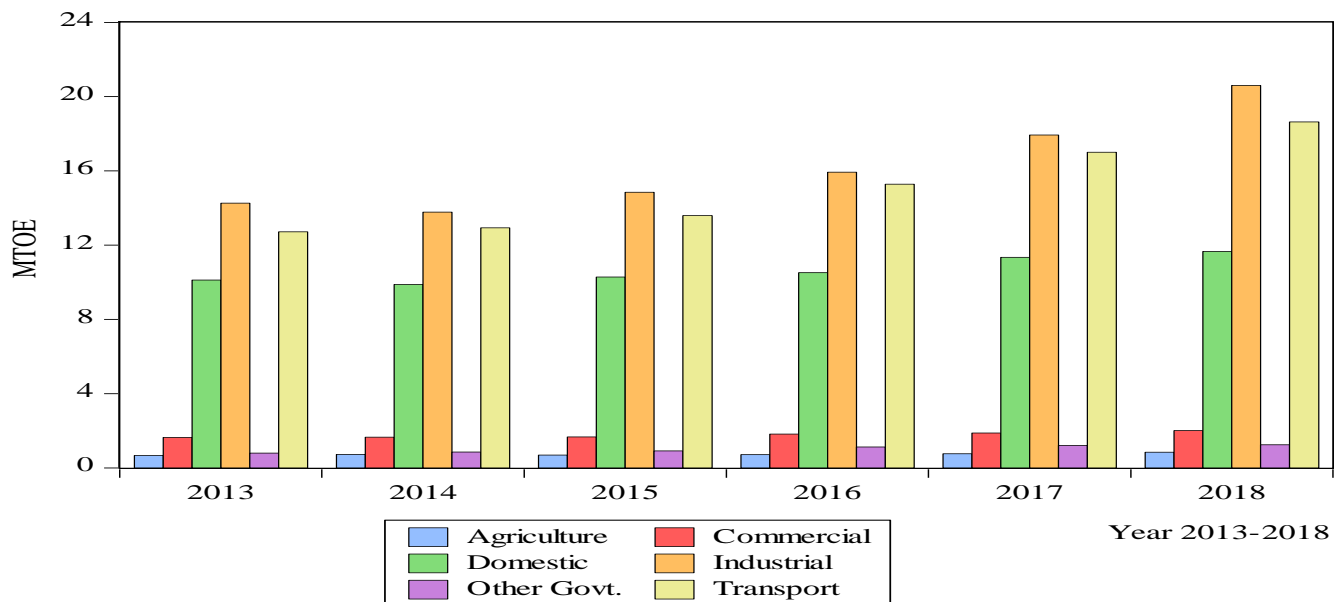
The research is organized as follows: Section 2 shows the literature review; section 3 identifies an overview of solar energy. Section 4 includes the energy security, section 5 provides policy recommendation and section 6 gives the conclusion.

**Table 1:** Climate change policies related to renewable energy Pakistan (NCCP, 2012).

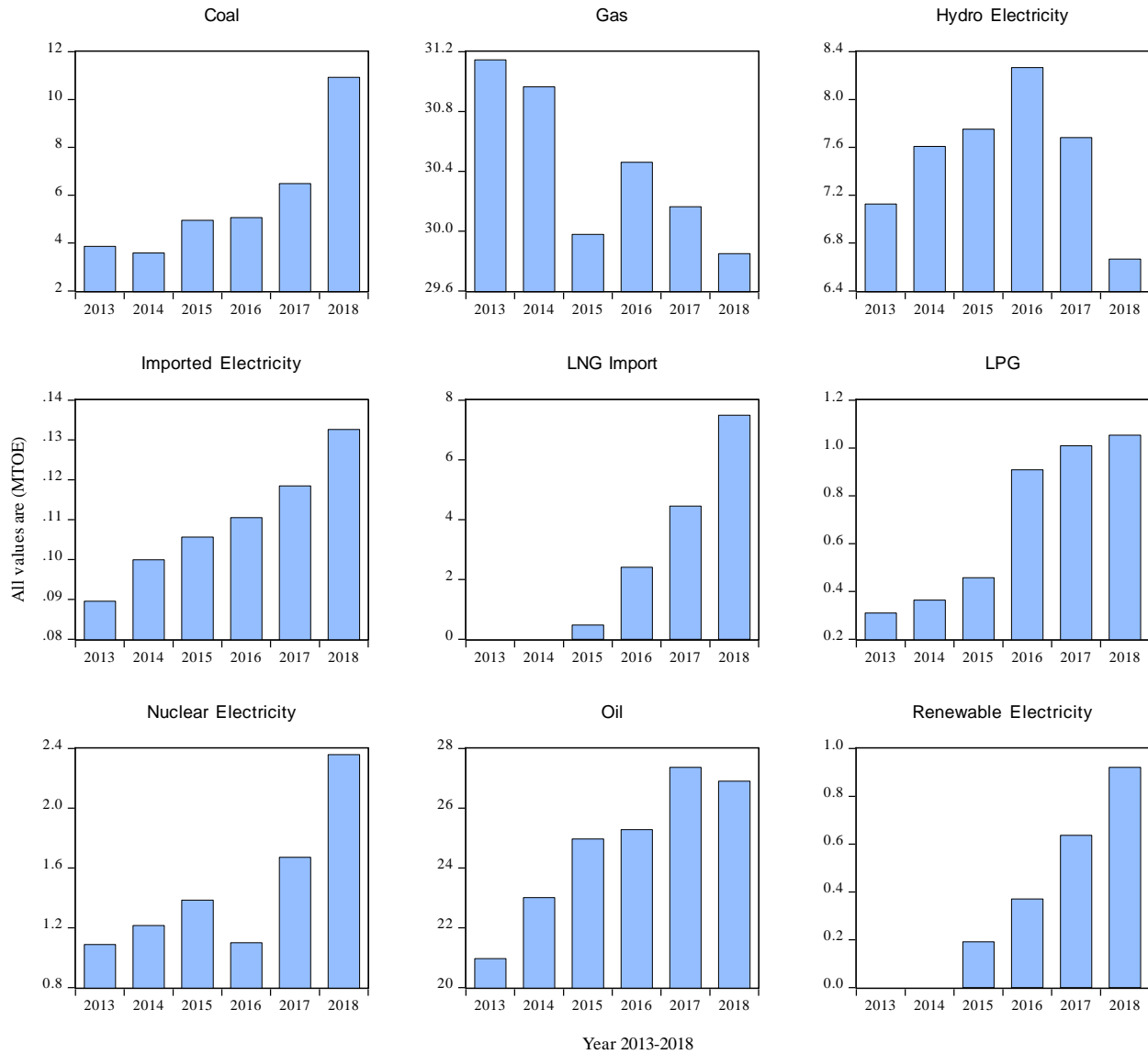
Serial no.	Threats
1	Focus on the growth and elevation of hydropower production.
2	Encourage the development of clean energy resources such as wind, solar, bio-energy, and geothermal energy.
3	The Government should take action in making innovative building designs with solar energy. Firstly starts from the public sector buildings.
4	Discover the opportunities of getting technical knowledge which will help in getting clean coal technologies for the huge coal reserves in the south of Pakistan. It should be applied for on i.e. Pressurized-Fluidized-Bed Combustion (PFBC) and Near-Zero Emission Technology (NZET) for these coal assets and their presence in future pulverized coal Integrated Gasification Combined Cycle (IGCC) systems.
5	Power should create by utilizing municipal waste.
6	For the distribution losses, decrease in transmissions; ensure best quality management of energy creation and energy supply.



**Fig.1.** Final energy consumption in Pakistan during 2013-2018.  
Source: (HDIP, 2018).



**Fig.2.** Final energy consumption by various sectors in Pakistan during 2013-2018.  
Source: (HDIP, 2018).



**Fig.3.** Primary energy supply by the source in Pakistan during 2013-2018. Source: (HDIP, 2018).

**2. Review of the Study**

Energy plays an important part in economic and social change (Raza et al., 2019). Pakistan has ample clean energy sources which are similar to Bangladesh, India, Iran, and many other countries in the region (Khare et al., 2013). Current situation of the country’s future supply, demand and sectorial consumption are given in (Fig. 1-3). A study of (Aslam et al., 2015) for Pakistan, generally the vitality utilization in Pakistan has expanded like creating nations and is required to pursue a similar pattern. It is due to the gap among supply and demand which has been stretched and shortfall touched at a higher level. The shortage of electricity has also caused industries, for this agriculturalists and industrialists need for energy substitutes (Shakeel et al., 2016). According to (Pasha et al., 2013), renewable energy production is two and half times more costly than other power generation. It needs maintenance and repair costs which are not accessible but useful for environment and energy demand. According to (Commission, 2015), the GOP is facing the following deficiencies of energy due to the following factors; inefficient energy mix, import of oil, unable to get coal and oil reserve due to modern technology, lowest share of coal than neighboring countries i.e. India and China, decreasing share of hydropower, less share of solar energies, problems with local related engineering industries, and tariff structure. For this, GOP made short, medium and long-run plans for the energy improvement for the social and economic development. The electricity generation plan is based on oil, coal, gas, hydro, nuclear and clean energy sources. According to (Lin and Raza, 2019a), Pakistan has signed coal power (capability of 7560MW) and clean energy (capability of 2790MW) with China Pakistan Economic Corridor (CPEC). Initially, China has invested \$6.4billion (b) for coal projects while \$8.8b for clean power production.

Peters et al., 2017; Peters et al., 2017; and de Leon Barido et al., 2018, have identified that in achieving the global goals energy efficiency play an essential role related to energy security; Bouton et al., 2010; Bouton et al., 2010; and Peters et al., 2017 for economic efficiency and IEA, 2017 for climate change and local pollution reduction. According to Demski et al., 2015, energy security in the form of a reliable, safe, and is affordable for the public. For example, Turkey energy security framework ensures the energy sources, production and providing the highest level of energy efficiency (Bulut and Muratoglu, 2018). To develop economy and energy security, many countries import fuel, for example, (Song et al., 2019) analyzed China's energy security and found that the national energy security indexed declined from 1990 to 2014, energy supply index decreased in 1990 and increased in 2010, environmental and economic-technical sub-index increased from 1990-2000 while increased during 2010-2014; (Ang et al., 2015) measured the energy security of Singapore and estimated that energy security remained stable during 1990-2010. They also analyzed that ecological-index improved due to declining of economic-sub-index and two growing sun-indexes such as economic and environment; (Yao and Chang, 2014) analyzed energy security for China and found best during 1981 to 1985 and then declined between 1995 and 2005. To improve energy security risk, the government should improve the domestic energy framework, productivity, and renewable resources (Lin and Raza, 2019b). This will mitigate CO<sub>2</sub> emissions, oil import, and imported cost of a country. Similarly, (Le and Nguyen, 2019) used a generalized least square model for 74 countries and estimated that energy security increases the economic growth of whole countries.

To avoid the risk, they developed a sustainable energy model with the help of the Government. More than 30 per cent population of Pakistan is living without electricity (Global Wind Energy Outlook, 2012). According to the (AEDB, 2014), currently, over 40,000 villages and 44 per cent of the rural households are away from the grid. For the betterment of these areas, renewable energy can be accessed. For this, (Chaudhry et al., 2009) identify that Baluchistan province of Pakistan has the best solar potential with the average sunlight of 8.5 h in a day and 20 MJ/m<sup>2</sup> of solar isolation. Additionally, Sindh and desert areas of Punjab provinces have high solar potential. Many researchers discussed the advantages of solar energy for example, (Jebli and Youssef, 2017) for Morocco's agriculture and social-economic development; (Asif, 2009)(Asif, 2009) for Pakistan's energy cost, security and sustainable energy; (Jianqi et al., 2014) measured for Iran's solar feasibility for rice irrigation; (Atam and Arteconi, 2017) for apricot orchards; (Ali, 2018) for solar water pumping in Sudan; (Kumar et al., 2015) for agriculture irrigation in India and (Xu et al., 2013) for China water irrigation.

The literature shows a secure, energy development and productive evidence from different countries. Currently, evidence from the South Asian countries, renewable energy technologies have become a tool for bounding GHG emanations and giving combined solutions in many countries (Geng et al., 2016)(Geng et al., 2016); (Morita and Matsumoto, 2018); (Quirapas et al., 2015); (Zhang et al., 2017)(Zhang et al., 2017). (Hu et al., 2017); (Kahouli, 2018); (Nasreen et al., 2017) identified that renewable energy is a friendly environment, affordable, and clean energy. It also effects on the economic development of a country. Pakistan is situated in South Asia and has many issues related to population, economy and energy security. For this, many researchers focused on it. For example, (Costanzo et al., 2018); (Jakica, 2018)(Jakica, 2018) found that population, economic growth, plentiful energy sources inspire in accepting renewable energy sources in South Asian countries. It is, therefore, many South Asian countries including Pakistan have started working in growing the share of clean electricity. The major objective is to decrease dependence on fossil fuels (Jakica, 2018)(Jakica, 2018). Moreover, the gap between possible supply and energy demand may effect on the social and economic growth (Lin and Raza, 2019a). According to (Ahmed et al., 2017)(Ahmed et al., 2017); (Lin and Raza, 2019a) identified that clean energy sources such as solar, wind, hydropower, biomass contains a lower carbon footprint. The continuous growth of clean energy technologies could lead urban areas away from the prime energy resources (Terziotti et al., 2012); (Wei et al., 2014); (IRENA, 2018); (Khuong et al., 2019)(Khuong et al., 2019). The literature says that some nations consider releasing indigenous policy for clean energy, but the Government involvement is still based on political blockage in the regions. For example, new clean energy policy in Malaysia was released in 2010 according to the governance rules which have created problems in 2017 due to approval and regulations of the energy sector (Yatim et al., 2016). Similarly, (Sustainable Development, 2017) identified a structure and process of sustainable governance growth in the review 2017 of the high-level political forum in the Philippines. The general governance policies were released in 2013 by Thailand. For this, the Alternative Energy Development Plan (AEDP) ensures that relevant agencies and public sectors undertake their responsibilities in a good manner but could not achieve all targets. According to (Tongsopit et al., 2015), the governance of Thailand is weak in the energy sector due to public involvement, independence, transparency, and accountability. For this, the Energy Regulatory Commission (ERC) of Thailand has been



assessed in the favor of autonomy and independence from the political meddling. The next section includes the energy situation in Pakistan.

### 3. Overview of Solar Energy in Pakistan

#### 3.1 Electrification from Renewable Energy Sources (RES)

The portion of RESs in the existing era is significant because of the acute crisis. Due to the shortage of indigenous hydrocarbon resources, excess use of fossil fuels, unstable prices of fuel, climate change leaves Pakistan with no other choice but to attend on the growth of existing and plentiful clean energy sources for the electricity production. According to (Shakeel et al., 2016) 'RES' is the emergent as one of the widest developing sources of energy production IN the globe. REN 21 clarifies that global capacity of clean electric energy from the various sources such as bio, geothermal, hydro, ocean, solar, and wind power was 2,017 gaga watts (REN21, 2017). Evidence from REN21 shows that Pakistan has reduced solar Feed-in-Tariff (FIT) was reduced by 36% for long-term contracts to solar products. 'RES' electrification is fasting momentum worldwide. The rising in political and investment support programs have allowed clean technologies to prosper and making accessible energy for the friendly environment, especially in the off-grid areas. As discussed in Fig.3, renewable energy is increasing each year which shows that Pakistan is the best in renewable energy generation. The demand for electricity is growing, while projections from the supply side are not positive. For this, Pakistan should take radical steps to safeguard the energy demand balances. In order to achieve energy demand goals, the country must focus on its rich and natural available renewable energy sources such as solar, wind, biogas etc. In this way, RES surely provides potential to supplement future requirements sustainably. This section briefly discusses the clean energy sources and their potential in Pakistan.

#### 3.2 Renewable Energy in Pakistan

Use of clean energy in Pakistan is inconsistent. Currently, Pakistan has 32 solar power stations in various places of Punjab, Sindh, and KPK provinces; 46 wind power station working in Punjab and Sindh provinces; 4 biomass stations working in Punjab, Sindh, and KPK provinces; 43 bagasse power stations are working in Punjab and Sindh provinces (SDPI, 2014). Renewable energy production detail is given in Table 2. The domestic use of clean energy is still at a low level as compared to other countries of the word. Table 2 provides total renewable energy capacity and generation from 2016-2018. Overall, solar and wind energy generation is higher than the biomass and bagasse and hydel power. This section measures the individual recent potential of clean power and needs policy recommendations. Pakistan has many strategies and national plans concerning the promotion and growth of clean energy inside the country. In table 1, climate change policies are provided. Various agencies in Pakistan for example, Intended Nationally Determined Contributions (INDCs); Pakistan energy vision-2035; National Climate Change Policy (NCCP); Vision 2025, and Climate Public Expenditure and Institutional Review (CPEIR) of Pakistan have made many endeavors to achieve maximum use of clean energy and energy output. The government of Pakistan has a history of development, research & development (R&D) when it comes to clean energy. Though, in spite of its development in the academic and private sectors, Pakistan has not attained its renewable energy targets. For example, according to (SDPI, 2014)(SDPI, 2014), the national solar energy target until 2020, 2025, 2030, and 2035 values are 30, 170, 800, and 900 MW. For this, Government has made budget scenarios for the future solar energy targets which are increasing 7684.79 million rupees for 2020, 204413.32 million rupees for 2025, 207051.23 million rupees, and 230244.95 million rupees for 2030. Similarly, other renewable sources have similar increasing power and budget for future energy targets. This will help in the energy crisis, energy potential and energy security. Such policies, future targets, and high-volume production of energy will decrease the cost of consumer bills and decrease the dependency on foreign energy suppliers. Moreover, renewable energy is fruitful for the clean climate because INDC found carbon emission roots within the Pakistan (Commission, 2015); (NCCP, 2012). For this Pakistan has already signed COP-21 in Paris for the betterment of climate change.

**Table 2:** Provincial electricity generation by renewable energy projects

Year	Technology	Province	Capacity	Generation
2016-2017	Solar Energy (Photovoltaic)	All over Pakistan	0.2MW	438MWh/Year
	Biomass (Biogas)	All over Pakistan	0.011MW	43.8MWh/Year (in terms of electricity generation)
	Micro Hydel	KPK & Gilgit /	9.7MW	42,486MWh/Year

		Baltistan		
	Wind Energy	Sindh, Baluchistan	150MW	540MWh/Year
2017-2018				
	Solar	All over Pakistan	430MW	768000MWh/Year
	Wind	Sindh, Baluchistan	1006MW	2101000MWh/Year
	Bagasse	Punjab, Sindh & KPK	201MW	988000MWh/Year

Source: Pakistan Energy Yearbook, 2017-2018

### 3.3 Solar Energy Cost Parity

Pakistan is blessed with huge potential of solar and wind resources that can be utilized for energy creation. GOP has decided to grow new renewable energy projects especially wind and solar based on budget availability. According to (SDPI, 2014), GOP has included various renewable and non-renewable energy projects in two scenarios (see Table 3, 4). Over the last five years, eighteen wind power projects of 1006MW accumulative capacity are supplying electricity to the national grid, while five solar energy projects of 430MW capacity have been made operational in 2018. Power generation from bagasse, approximate six sugar mills with a capacity of 201MW are working. The comparison of different renewable energy sources and non-renewable energy sources are given below Table 3, 4. According to the latest two scenarios provide heavy investment on solar, wind, and bagasse from 2014 to 2035. According to (IRENA, 2015), the average value of PV modules drops by nearly 80%. At the same time, the price of wind turbines also fell by 33%. This situation can make Pakistan most prosperous in energy growth. Technology is the main barrier in Pakistan because of the high cost in technology import. Additionally, Pakistan seems low-cost coal and gas energy for the future which is not supportive of climate and human life. For this, policymakers must take actions towards technologies making renewables more instantly cost-effective. Moreover, in Pakistan, most of the electric companies have a monopoly on electric distribution, and they should encourage cost-effectiveness and energy efficiency measures. For example, the World Bank's Regulatory Indicators for Sustainable Energy (RISE) advise a task force to screen and evaluate energy output in a country (World Bank, 2016)(World Bank, 2016). So far, the Government of Pakistan has approved the maximum budget for the renewables in promoting the energy efficiency of Pakistan.

**Table 3:** Investment scenarios of renewable energy and non-renewable projects from 2014-2035

	Non-renewable energy						
		Scenario A					
Year	Low Btu	Imported Coal	Local Coal	Waste Power	to Shale		
2014	49.2	68.33	74.3	0	0		
2015	19.51	0	0	0	0		
2016	29.2	186.2	195.8	0	0		
2020	13.94	198.1	365.44	36.83	0		
2025	0	12.1	12	39.8	0		
2030	9.95	20.1	20	76.7	0		
2035	9.95	10.6	10.5	39.8	0		
	Renewable energy	Scenario A					
	Geothermal	Bagasse	Wind	Biomass	Solar	Thermal	Hydro
2014	0	0	14.3	0	0	150.02	74.5
2015	0	23.9	1.82	0	0	171.01	223.2
2016	0	28.4	2.09	1.97	26.63	0	568.53
2020	7.43	17.42	2.62	1.97	7.68	0	1320.1
2025	7.43	47.3	5.2	11.9	204.4	0	2911.4
2030	59.42	47.3	7.6	39.42	207.1	0	1937.9
2035	62	10	5.04	24.81	230.3	0	2482.9

Values are given in Pakistan Billion rupees (Rs.)

Source: Pakistan Energy Yearbook, 2017-2018 (HDIP, 2018)

**Table 4:** Investment scenarios of renewable energy and non-renewable projects from 2014-2035

	Non-renewable energy						
		Scenario B					
Year	Low Btu	Imported Coal	Local Coal	Waste Power	to Shale		
2014	49.2	68.33	74.3	0	0		
2015	19.51	0	0	0	0		
2016	29.2	186.2	195.8	0	0		
2020	13.94	198.1	365.44	36.83	0		
2025	0	12.1	12	39.8	0		
2030	9.95	20.1	20	76.7	0		
2035	9.95	10.6	10.5	39.8	0		
	Renewable energy	Scenario B					
	Geothermal	Bagasse	Wind	Biomass	Solar	Thermal	Hydro
2014	0	0	14.32	0	0	150.02	74.5
2015	0	23.9	1.82	0	0	171.01	223.2
2016	0	28.4	208.64	1.97	53.2	0	568.53
2020	7.43	17.42	260.81	1.97	175.6	0	1320.1
2025	7.43	47.3	1542.3	11.89	363.73	0	2911.4
2030	59.42	47.3	996.63	39.42	1243.3	0	1937.9
2035	62	10	2036.7	24.81	373.3	0	2482.9

Values are given in Pakistan Billion rupees (Rs.)

Source: Pakistan Energy Yearbook, 2017-2018(HDIP, 2018)

### 3.4 Energy Security Indicators for Energy Demand, Energy Supply and Energy Import

As discussed in the literature, energy security plays a key role in the development of a country. For this, we have utilized the MARKAL (market-allocation) method which has been estimated by (Shakya and Shrestha, 2011); (Shrestha and Shakya, 2012); (Martchamadol and Kumar, 2012). For this, different indicators are used to measure energy security i.e. NEIR, VI, and NOID illustrated in Table 5. These outcomes are based on energy consumption data and measured in the form of reduction scenarios of the base case, 5%, and 10% during 2015-2035 (see Table 6). Thus, these variables will support policy makers to analyze the demand, supply and import related information. Table 6 shows estimations of NOID, VI, and NEIR. NOID shows maximum dependence on oil and found a decreasing trend in 2035 in the base case scenario. The main reason is the minimum use of oil in transport and agriculture sector of Pakistan (Ministry of Finance, 2018). This will decrease oil import, increase energy security and negatively impact on NEIR. NOID and VI are showing a decreasing trend which is evidence of increasing renewable energy resources. Furthermore, the reduction scenarios at 5% and 10% would be significant if the alternative energy resources should be applied and oil import is reduced.

**Table 5:** Details Of Energy Security Indicators

Net Energy Import Ratio (NEIR)	$NEIR = \frac{NEI}{DS + NEI}$	NEI is the net energy import (Mtoe). DS is the domestic sector supply (Mtoe).
Vulnerability Index (VI)	$VI = \frac{EEI}{GDP}$	EEI is the expenditure on energy import (Million US\$). GDP is the gross domestic product
Net Oil Import Dependency (NOID)	$NOID = \frac{NOI}{OPED}$	NOI is the net oil import (Mtoe). OPED is the oil primary energy demand (Mtoe).

**Table 6:** Energy security and import reduction targets based on 5%, 10% reduction scenarios.

Year	NEIR	VI	NOID
	Base case scenario		
2015-2020	37.97	0.016	0.725
2020-2025	56.66	0.0030	0.509
2025-2030	75.64	-0.0097	0.296
2030-2035	94.20	-0.0233	0.096
	5%		
2015-2020	36.07	0.015	0.689
2020-2025	53.82	0.003	0.84
2025-2030	71.85	-0.009	0.28
2030-2035	89.49	-0.022	0.092
	10%		
2015-2020	34.17	0.014	0.65
2020-2025	50.99	0.002	0.45
2025-2030	68.07	-0.008	0.266
2030-2035	84.78	-0.021	0.087

Source: Pakistan energy yearbook 2018. (HDIP, 2018)

### 3.5 Socio-Cultural and Infrastructure Dynamics

Socio-cultural dynamics play a vital role in the growth of clean energy and reducing carbon emissions. It is due to the actions of numerous social groups' i.e. native people, Government authorities, city authorities, media, suggested bodies, and political parties are directed by beliefs, taking interests, unbalanced resources, conflicting values, and complexity among the social relationships. Similarly, (Sovacool, 2017)(Sovacool, 2017); (Dahal et al., 2018) identified these ecological dynamics. (Dahal and Niemelä, 2016) showed that different departments, environmental establishments in that area, academic such as universities and research centers, energy companies, housing schemes and residents participate to the understanding carbon emissions and use of renewable energy resources. According to (Nawaz and Alvi, 2018) (Nawaz and Alvi, 2018)for Pakistan, energy safety is not only important for long-run benefits but also important for social-cultural, economic and environmental sustainability. Social awareness, renewable energy resilience, and political viability are critical for encouraging clean energy in Pakistan. For this, (Jung et al., 2016) identified that social awareness towards renewable energy can change city policies. For example, some residents are still not accepting the wind, biomass technologies. It is due to the high price which is not feasible to invest in clean sources and distribution of cities demographics. According to the (Ministry of Finance, 2018), 63.623% population of Pakistan is living in rural areas which are decreasing due to facilities in urban areas. Furthermore, the population situation from rural-urban areas can create pollution. It is, therefore, current clean energy policies should be adapted to address the population growth in Pakistan.

The physical infrastructure, such as power plant, storage of energy, grids, heating networks, and charging points are the basic services for the formation of clean energy technologies. In Pakistan, yet there is no electric vehicle system. So, renewable energy and bio-energy can be utilized in the heating systems at lower-level. Besides, huge coal reserves in Pakistan can be utilized in energy production by applying clean technologies. The research and development, and innovative electric policies can resolve the energy crisis and energy security in Pakistan. Additionally, due to the limited energy storage, the use of power storage batteries should be utilized at small and large-level because the renewable energy resources fluctuate in energy generation. In these cases, the financial encouragements are necessary for the early stage of development. For this, energy ministry and ministry of climate change of Pakistan should formulate effective policies for the growth of these infrastructures.

### 3.6 Economic Dynamics

Based on renewable energy technologies, the ministries should formulate strong policies and related business models. These business models with clean technologies i.e. solar, biomass, and wind should apply to the local energy markets. Currently, the prices are high at small-scale but the financial encouragement can raise the interest of consumers. Overall, the global investment in renewable energy in 2017 was \$333.5billion which has increased

by \$251.6 billion more than 10% of the last year (Bloomberg, 2017). In 2018, Pakistan has generated renewable energy from 2,668GWh to 3,857GWh with a growth of 44.6% than the previous year (HDIP, 2018). Table 3 and Table 4 measure the best scenarios and cost-effective for renewable energy sources.

### 3.7 Energy Security As The Policy Discussion

Different challenges related to clean energy technologies showed a comparison between fossil fuel energy and renewable technologies. The disparity in the energy supply mix and electricity production sources have created significant problems related to energy security and ecological sustainability (Lin and Ahmad, 2016). According to (Owusu and Asumadu-Sarkodie, 2016), renewable energy decreases energy imports, contribute to energy supply, cost, and provide opportunities to improve energy security. The natural resources are the most economical resources in the world. Thus, the existing research focuses on the relationship between energy crisis, and energy security coming from natural resources. According to a survey, the country's natural resources grow economic growth. Energy security provides confidence by using native resources, spreading the energy to the rural areas and caring for the atmosphere by decreasing CO<sub>2</sub> (carbon dioxide) emissions. According to the 2011 framework of Government's new policy, focused on the domestic resources and confirmed that at least 5% of energy supplies through renewable by 2025 (AEDB, 2011). Similarly, (IRENA, 2018) measured that clean energy not only provides benefit to weather change and pollution reduction but also boost employment, financial development, and energy security. In short, Government of Pakistan (GOP) should revisit the national and international energy security plan and should attention on local issues with domestic, alternative and clean resources to challenge the current energy crisis and to provide the upcoming power demand of Pakistan.

### 4. Policy Recommendation for Pakistan

Our findings propose experts should make projects for the generation of clean energy and energy security in Pakistan as follows:

First, there is easy access to solar, wind, biomass, and hydel energy sources in the provinces Punjab, Sindh and few areas of Khyber Pakhtunkhwa (KPK) are suitable for solar and wind energy while northern areas of Pakistan can produce clean energy by water which has been discussed in (SDPI, 2014)(SDPI, 2014); (Commission, 2015)(Commission, 2015). Second, tax policy should be revised to attract local and foreign investors to exploit the clean energy resources in the country. This will improve the energy security, human life, fresh climate, jobs, and economic growth of a country. Third, according to the (Ministry of Finance, 2018), 63.623% population of Pakistan is living in rural areas of five provinces Balochistan, Sindh, Punjab, Khyber-Pakhtunkhwa (KPK), and Gilgit Baltistan. The Maximum population of Pakistan is connected with agriculture, for this, it is suggested that the Government should help farmers to install small scale solar and industrial projects to increase the level of their income. Fourth, according to solar energy research center (SERC), 50, 000 villages are far away from the national grid, so providing each house a solar panel would be cost-efficient and would authorize people both socially and economically. In many villages, people are still using dung, deforestation, and wood fire for cooking. For this, the Government should give subsidy to villagers on the solar panel, biomass energy, and support private companies. Fifth, according to the (PPIB, 2002)(PPIB, 2002), it was not focused on clean energy and human resources but also focused on the target production of 1500MW of renewable energy by 2020. Sixth, for the betterment of energy security, energy import dependency should decrease based on energy substitution. This would increase friendly-environment and improve the living standard of people (Lin and Raza, 2019b). These policies will lessen the price of power production, raise income, agriculture production, trade openness, and clean climate. Climate change policies are mentioned in Table 1.

### 5. Barriers to Renewable Energy

Many barriers have banned the fast integration of clean energy in Pakistan during the last two decades (Farooqui, 2014)(Farooqui, 2014). These are regulatory barriers, policy barriers, economic, financial, fiscal barriers, institutional barriers, energy market barriers, information, social barriers, and technological barriers (Mirza et al., 2009). Alternative energy development board (AEDB) has also discussed some barriers during the last few years related to policy and regulatory authorities for wind, solar, and biomass. The current distribution of renewable energy is given in table 2. Additionally, the current circular debt of Pakistan is also a major problem for the power sector and has become an important barrier for energy growth in Pakistan. According to the power minister, the circular debt has boosted to 1.3 trillion rupees due to poor governance practices, power transmission, massive line

losses, and grid stations efficiency (Pakistan Today, 2018). Crucial improvements are needed to produce electric generation capacity, improve transformation system and distribution network.

## 6. Conclusion

This study analyzes Pakistan's energy crisis, energy security, energy demand, energy supply, and renewable energy. We focused on renewable (solar energy) and non-renewable energy for the understanding gap between demand and supply. The significance of energy supply and demand is not only for economic development but also for the present and upcoming generations. Overall, our study discusses that solar power is fruitful than wind energy. Most of the Pakistani belt is sunny which is more feasible and energy-efficient after fossil fuels, while wind turbines can only be adjusted in deserted or coastal areas of Pakistan. For this, we applied renewable and non-renewable energy scenarios and energy security scenarios by using the MARKAL approach from 2014-2035. Our analysis shows that total indigenous production of energy is 46.725Mtoe while renewable energy production is 3857GWh during 2017-2018. Solar energy production is 768GWh which is increasing every year which is sufficient to facilitate the domestic consumers. According to energy security reduction scenarios, Pakistan would improve renewable and energy security until 2035 with significant possibilities. In the end, the scenarios budget identifies that renewable energy sources are much imperative for the betterment of Pakistan's development. Renewable energy sources have provided environmental sustainability and economic growth of the off-grid areas of Pakistan.

## 7. Limitations

This study has also some limitation. The political situation puts robust stress on the influence of renewable energy sources to energy security through indigenous power generation i.e. CPEC, Vision-2025, and Pakistan Energy Vision-2035 are the best renewable energy policymakers. The policies should focus on collaboration between federal, provincial, and security agencies in the limitation framework. The project detail, capability and feasibility should be included. Current projects such as CPEC, Pakistan energy vision-2035, and current policies can improve the ability of Pakistan to reach its potential. Limitation of data is also a challenge because of improper websites. Another reason is that Pakistan has stepped down in clean energy only a few years ago. It is, therefore, technical staff related to these projects is limited which may reduce the energy potential. Furthermore, future researchers can conduct across various industries and housing societies in different cultures for making it successful.

Abbreviations			
CO <sub>2</sub>	Carbon dioxide	CPEC	China Pakistan Economic Corridor
MW	Megawatt	IEA	International Energy Agency
LPG	Liquefied Petroleum Gas	MJ/m <sup>2</sup>	Mega Joule Square meter
MTOE	Million Tons of Oil Equivalent	GHG	Greenhouse Gas
LNG	Liquefied Natural Gas	IRENA	International Renewable Energy Agency
GCISC	Global Change Impact Studies Centre	AEDP	Alternative Energy Development Plan
NCCP	National Climate Change Policy	ERC	Energy Regulatory Commission
PFBC	Pressurized-Fluidized-Bed Combustion		bi-directional causalities
NZET	Near-Zero Emission Technology	KPK	Khyber Pakhtunkhwa
IGCC	Integrated Gasification Combined Cycle	CPEIR	Climate Public Expenditure and Institutional Review
INDC	Intended Nationally Determined Contributions	COP	Conference of Parties
AEDB	Alternative Energy Development Board	RES	Renewable Energy Sources

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## Role of Banks in Money Laundering through Fake Bank Accounts and Writing off Loan in Pakistan: An Analytical Study

<sup>1</sup> Rao Imran Habib, <sup>2</sup> Attia Madni, <sup>3</sup> Naureen Akhtar

<sup>1</sup> Assistant Assistant Professor, Gillani Law College, Bahauddin Zakariya University Multan, Pakistan, raويمran@bzu.edu.pk

<sup>2</sup> Lecturer, Faculty of Law, International Islamic University Islamabad, Pakistan, atia.madni@iiu.edu.pk

<sup>3</sup> Assistant Professor, Gillani Law College, Bahauddin Zakariya University Multan, Pakistan, naureen.akhtar@bzu.edu.pk

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p> <p><b>Keywords</b> Banks, Money Laundering, Loan, Write off, Law</p> <p><b>JEL Classification:</b> G21, E59, H81, H89, N4</p>	<p>Recent media reports of money laundering through fake bank accounts implicate the involvement of banks in money laundering through "managed bank accounts". Further the waivers of loan of apparently sound institutions also give rise to specific questions and reservations on the role of banks. This paper attempts to explore the answer to those fundamental questions. The research follows qualitative content analysis methods to critically analyze the role of banks in money laundering and loan waiver policies. The research finds that despite of heavy banking regulations and laws the banking accounts are being used for money laundering. Further, the research concludes that the act of waiving off loans allegedly has provided a channel to misuse the public earned money, resulting in gross loss to the public exchequer. The research concludes that the role of bank in maintaining the fake/idle accounts and the loan waiver policy and its malafide usage in the banking sector resulted in financial frauds and money laundering in Pakistan.</p>



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Corresponding author's email address: raويمran@bzu.edu.pk

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### 1. Introduction

Banks act as an intermediary in financial transactions. They are licensed to accept money from the public and other financial institutions of the country. Banks provide financial services including safe deposits, currency exchange, premium bonds, credit accounts and mortgages on residential and commercial properties. The difference in the interest rate charged and paid is a profit of the Bank generated from different sources. Most of the countries in the world have institutionalized a system known as fractional reserve banking, which is crucial for the safety of general public money. Banks are the institutions which always deal with money. They generate money from money deposited by the public and charge money on

a few types of accounts to keep their money safe. Banks charge money in lieu of those services which they provide to maintain the statements of the account holders (service charges) and pay money to account holders for using their money (profit). Hence banks are the institutions to channelize the public money and to protect it. (Michael McLeay, 2014).

The Central Bank of the states controls the national commercial banks and all other financial institutions within a state. These IFIs are subject to substantial laws and regulation which, ideally, should not leave any room for activities like money laundering. Money laundering, however, still exists as one of the most organized financial crimes which also involve the banks, in most of the cases. (Rafał Dreżewskia, 2015). The activity of money laundering involves the placement, layering and integration of the illegal funds, the black money. In placement, the black money is introduced in any financial institution or entity for example any bank or business venture for the purpose of cleaning. In second phase, layering, funds are directed through the complex financial system and move to the integration. Through this cycle of the black money gets cleaned and are then transmitted into the economy in form of any investments. (Unger, 2007). For instance, a public servant, when obtains bribe, which if included directly to his income, will defiantly raise question mark because it is much higher than his confirmed income. He has to bring this amount into the financial system by its placement into any bank account. It may be in the form of any bank deposits, purchase of any prize bonds, currency exchanges, investment into any company, or purchase of any tangible or intangible assets, or smuggling. (J. C. Sharman, 2011).

Factors behind Money Laundering are Bribery, Tax Evasion, Weak Financial Regulations, Corruption and Failure of Banks in Detecting Laundered Money. (Nikolosk, 2012). Further absence of tracking system, which can automatically track the original Sources of Money and Lack of incentive, makes banks reluctant to work efficiently for the foolproof verification system. The Liberalization of Banking Sector without any check and balance is another main reason which paves the way for money launderers, Crime groups and drugs dealer to control the banking system. (Gilmour, 2016). The effects of these activities are far-reaching in an increasingly interconnected world. Money launderers and terrorist financiers take advantage of the complex international financial system, weak and ineffective legislation in different countries. This all helps those to get transfer the funds without being detected. (Hughes, 1991).

It sounds strange if one says that banks are channelizing and facilitating financial frauds and money laundering by opening and maintaining fake benami accounts but as a matter of facts the role of Bank, in this regard, cannot be negated. Currently, banks and other financial institutions, in Pakistan, are in the main firing line, by media, so far as money laundering is concerned. (Hannes Köster and Matthias Pelster, 2017). The current news regarding money laundering through the managed bank accounts and loan waiver by the banks to the companies, which are operating and solvent, also favours this hypothesis. Hence the research in hand focuses on exploring the role of banks in money laundering and other financial frauds, evaluate its impact upon public money and suggests numerous ways to overcome the issue of money laundering in Pakistan. (Sarigul, 2013).

## **2. Fake / Benami Accounts and the role of Bank**

Efficiency and low cost of the transactions in banks and other financial institutions make them a preferable mean of committing money laundering. Moreover the complexity and overlapping involved in the banking also facilitates the launderer. Given the advantages of convenience, accessibility and safety in banking transactions, money launderers prefer to use banks to enter in international payment system. Upon availing access to international market, they can transfer black money via contemporary electronic means instead using old customary methods.

Most of the countries of the world initiated legislative measures against money laundering in the 1980s (Cassella, 2003). Pakistan, being a member of Asia Pacific Group (APG) promulgated corresponding

national legislations on money laundering and terror financing. The State Bank of Pakistan (SBP) also issued regulation on Anti-Money Laundering and Combating the Financing of Terrorism (AML/CFT), in 2001. The State Bank of Pakistan also issued a circular on March 29, 2003. This circular amended the Prudential Regulation XI in apropos of Know Your Customer (KYC), Customer Due Diligence (CDD) policy. ( State Bank of Pakistan, 2003). These regulations provide the basic policies to minimize the activities of money laundering and terror financing in Pakistan. Among these regulations, Know Your Customer (KYC), Reporting of Transactions STRs/CTRs and Customer Due Diligence (CDD) are of utmost importance. Through these policies the central bank of Pakistan requires the Financial Institutions to be careful in their daily operation at banks. They are required to have complete knowledge of the customer's transactions and to report and take the proper action against fake and Benami account holders.

As legislative measures Anti-Money Laundering Ordinance, 2007 was promulgated to curb down the money laundering involving banks. The 2007 Ordinance focused mainly on the money laundering through banking transactions and made it mandatory for the banks to report the suspicious transactions. The 2007 Ordinance, however, had many flaws hence was amended several times finally it got replaced by Anti Money Laundering Act, 2010. (Azeem, 2012).Despite of these legislations Recent news about unearth money laundering through fake/ Benami bank accounts, in the names of 'Falooda' (a local sweet) vendors, factory worker and even dead man, by the investigating and regulatory authorities like FIA and FMU and issuance of notices to such persons by FBR and FIA has changed the perception of opening an account by oneself and making transactions from it. (Ahmad, 2017).

Notwithstanding the existence and importance of all these laws and banking regulation, there are certain factors that provide supportive environment for money laundering through banking medium. These factors include, but are not restricted to, the role played by financial institutions as advocate of the customer, the strange attitude of the banks towards account holder having strong balance sheet, the culture of secrecy adopted by every bank where they try to hide and protect every transaction of the customer, the secret reference, the lax and negligent controls and supervision and the rivalry with competing financial institutions. (Agarawal, 2005).Moreover the bank's customers may have different accounts in the same bank in which different transactions take place but banks ,in order to have more accounts and money ,ignore such activities. In fact, banks encourage customers to open multiple accounts without collecting the relevant information on these accounts. The supervision and control of these accounts is difficult and complex because of involvement of multiple sources, hence they prove to be perfect for the money laundering activities. Through such 'managed bank accounts' not only funds are routed to other accounts within the country or withdrawn without any ostensible trail available, but billions of rupees are transferred to numerous jurisdictions by skillfully structured methods. (Human Rights Case, 2018).

### **3. Writing -Off Loans and the Role of Bank**

The write-off is an accounting term which means declaring the book value of an asset to be Zero. A loan write-off occurs when the lender (a bank or other financial institution) decides that a loan is not collectable and removes it from its balance sheet. When the lender realizes that it will not be able to recover its dues through the collection for a variety of reasons such as the borrower might not have the capacity to repay, the borrower is absconding. The borrower is bankrupt. It introduces policies like a write-off. Purpose of write off is to support accounting accuracy objective on the one hand and to reduction of tax liability by showing more expenses and less income. While a loan is active, it is an asset to have on the lender's balance sheet as it indicates that the lender owed money. However, when there is a minimal possibility of recovery of loan, the Bank has to write it off to reflect the diminishing of the value of the asset. (Ishaq, 2012).

Before writing off the loan bank should discuss or offer IVA (individual voluntary arrangement) to the customer. It is a successful scheme/ arrangement working in United Kingdom and many other countries

in the world with different names. Usually, an insolvency practitioner deals with it and decide according to the client's circumstances whether the client meets the required criteria or not. Through this scheme, if a person is not able to return all or part of the money and financial institutions are not able to recover that loan, then he/she can enter into IVA. Financial experts help/guide/suggests the affordable monthly instalments for that person for a specific number of years (in the UK 5 years, 60 months). Through IVA, creditors always receive higher return than bankruptcy. (Angela Samantha Maitland Irwin, 2012).

The issue of written-off loans, in Pakistan, got highlighted recently when the Supreme Court of Pakistan (SC) issued notices to, appear before court, 222 individuals and companies who had got loan financing from different commercial banks from 1971 to 2009. Brief history of the matter is that a suo-moto action has been taken in the year 2008 by Supreme Court of Pakistan, after media reports broke the news that the State Bank of Pakistan (SBP) had allowed commercial banks to write off Non Performing Loan (NPLs). The loan waiver scheme was introduced by the former army chief and ex-president retired General Pervez Musharraf. In year 2011, a three-member commission headed by Mr. Justice Syed Jamshed Ali, a former judge of SC was constituted to investigate the legal standing of the loan waiver policy and the strategies of recovery of written-off loans from 1971 onward. The commission was directed to compile and submit a report. On completion of proceedings, the Commission submitted its final report before the three-member bench of SC headed by Chief Justice of Pakistan (CJP), Iftikhar Chaudhry, the Honorable SC then ordered that the report of the commission must be made public. (Iqbal, 2018). The report among all other points revealed that many of the beneficiaries of the loan waiver policy were solvent and the business entities were still operative.

In 2018, a two-member bench of SC headed by Chief Justice of Pakistan Mian Saqib Nisar again heard suo-moto case No. 26 Of 2007 with HR cases and Constitution Petition No .64 Of 2009 etc. (Constitution Petition, 2009). Through this press release issued by SC of Pakistan dated on 9 August 2018, the borrowers were directed to either deposit the 75% of the differential between amount recovered and amount sanctioned before the registrar SC or their cases were to be referred to Banking Courts to reconsider the entire case. Although the cases are yet to be investigated and loss to Government Exchequer is yet to be determined, but the Commission in its report held that bankers are responsible for all the loss yet to quantify. The commissions suggested in its report that banks grant loan facility to customer, either short-term or long-term, on the provision of inadequate securities. The report declares it to be the violation of banking policies and suggested that proper action should be taken against those employees. It further suggested that the banks have been issuing loans on unjustifiable concessions, whether against political considerations or any other, which resulted in massive NPLs ( Consumer Protection Department, 2003).

Non-Performing Loans (NPL) is an intrinsic part of Bank's lending business across the globe. In the business of banking, taking risks cannot be avoided; rather, the whole idea rests upon taking calculated risks and managing them efficiently. However, in order to minimize NPLs, banks need to ensure robust due diligence. Banker's first and utmost objective is to see that if the account getting weak due to certain valid business reasons and may warrant an overdue / NPL status than a primary task is always to nurse it through difficult times by restructuring to help complete revival. (Wang, 2010). However, in times of systematic crises where the economy at large or a particular sector gets affected badly, NPLs are bound to happen, for which an altogether different approach is adopted to arrest further deterioration of assets. (Hopton, 2006). Ishrat Hussain, the Ex. Governor of the SBP while Analyzing the Written Off Policy of banks in year 1999-2003 tried to explain the confusion and misunderstanding of the people towards the write off loans policy of the SBP and its impact on the economy of Pakistan. (Hussain, 2002). He explains that when a loan becomes overdue by 90 days, then the unrealized mark-up will continue to be added in the total of Non-Performing Loan (NPLs). As a corollary stock of existing NPLs always grow even if all

new loans are fully satisfied on due time Thus it should be noted that without any fault of the Bank, the aggregate value of NPLs escalates.

The depositors (common public) who invest their money in banks to take interest to provide investments and capital to banks, which provides a buffer to banks, if broken leads the banks to fail. It is a common perception that when banks write off its loans, it is the owners of the money who should bear the loss. In the banking system, the owners of the money are the people/shareholders who invest their money directly in order to take profits out of it. (Ali Arfan, 2014). As the majority of the banks are publicly traded which means common people used to be shareholders to the capital available with the banks and any loss to the capital available with the Bank would be an ultimate loss to the public/shareholders. (Mirza, 2013).

The Courts of the Country are fully convinced that without the involvement of banks opening of fake/benami accounts and money laundering through managed bank accounts was not possible. Judgments of numerous courts had depicted this view. In a Judgment in Muhammad Arif Teevno Vs. NAB through its Chairman, Division Bench of Sindh High Court has observed that as a bank manager, operation manager and compliance officer, petitioner has his specific roles and responsibilities to play and he intentionally failed to fulfil thus not entitled to claim relief of bail. Bail of the petitioner was rejected by the Honorable division bench of the Sindh High Court who was arrested on the allegations/grounds that being branch manager he was allegedly maintaining pension bank accounts through which pensions were paid to ghost pensioners against fake and fraudulent documents. (Muhammad Arif Teevno Vs. NAB, 2017). Similarly, in another case, Haq Nawaz Malik Vs. The State, Lahore, through the opening of fake bank accounts of widows huge amounts were misappropriated from the Benevolent Funds of Government, which showed involvement of the office of Benevolent Fund along with bank officials who helped to open a fake account of one Mst. Jannat Mai and its operation to withdraw amounts from the account of Government Exchequer allocated for pensioners. (Haq Nawaz Malik Vs. The State, 2002).

Banking Recoveries are made under Financial Institutions (Recovery of Finances) Ordinance 2001. Section 8 of the Ordinance, provide an ample regime for the recovery of written-off loans; however, the only impediment that may arise in future, after it is declared that a particular loan was written off based on considerations other than bona fide business considerations. The nexus that has been created with said provision with the Limitation Act, 1908 before initiating a proceeding under Section 9 of the Ordinance. The Limitation Act, 1908 provides three years time limitation for filing a suit for the recovery of written-off loans. (Consumer Protection Department, 2003). Given the limitation prescribed in Section 8 of the Ordinance, even if certain cases are declared to be written off on the consideration other than bona fide business consideration or for political reasons the recovery, suits for the recovery of such written-off loans could not be filed because of being time-barred in terms of the provision on Section 8 of Ordinance. It is however, suggested if this limitation for claiming the amount of written-off loans is removed from Section 8 of FIO and the said section is amended appropriately, the banks then would be in a position to initiate recovery proceeding vis-à-vis the written-off loans under Section 8 of FIO. (Azeem, 2012).

#### **4. Conclusion**

Banks in Pakistan prioritize and set a target for their branch manager to bring more money into their branch to get their bonuses and promotions. Instead of focusing on the prevention of money laundering, their training focuses on generating more and more funds into their branches. While developed countries in the world concentrate on different types of training which help them minimize fraudulent transactions. There should be a special focus and training on account opening processes, especially for accounts opened by intermediaries on behalf of third parties (trusts and nominee accounts). Institutions should obtain satisfactory evidence of their identity to avoid or minimize the risk of fake accounts. Positive or negative role of banks in writing off debt cannot be determined at this stage when the matters are still sub-judice before Competent Courts of law. However, it can be analyzed from the above discussion that whenever

there is a loss to public money or Government treasure, it is assumed that the policies were not made to favour the Government but individuals. As it is the institutions which are required to be strengthened, therefore, if any policy like write-off loans is introduced, loss to the institutions should be less than the benefit offered by such policy. However, it is recommended that in future institutions should be strengthened regarding their policy-making strategies.

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## The Importance of Organizational Justice, Appraisal Purposes and Employee Satisfaction in Performance Appraisal System in Academic Sector of Pakistan

<sup>1</sup> Muhammad Asad Khan, <sup>2</sup> Altaf Hussain, <sup>3</sup> Mohammad Hanif Khan

<sup>1</sup> PhD Scholar, Universiti Tun Hussein Onn (UTHM) Malaysia: asadkhanbte06@gmail.com

<sup>2</sup> Assistant Professor, Department of Commerce and Management Sciences, University of Malakand, Khyber Pakhtunkhwa, Pakistan: altafhussain@uom.edu.pk

<sup>3</sup> Lecturer, Department of Tourism and Hotel Management, University of Malakand, Khyber Pakhtunkhwa, Pakistan: hanifyousafzai@uom.edu.pk

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The purpose of this article is to find out the importance of organizational justice and its types along with employee satisfaction in the performance appraisal system. Data were collected from a sample of 180 respondents who replied their opinions regarding the variables included in the study. This study used SPSS to analyze collected data. The findings of study found a linkage of three kinds of organizational justice with performance appraisal. Also a strong association of employee satisfaction was found with components of organizational justice. The core restriction is that this study provides information limited to only one source, i.e. employees. This paper has practical effects on human resource development as it gives human resource practitioners and also to managers acting as rater of their employees with different ideas and recommendations. Such ideas and recommendations typify how to maximize the perceived justice of the performance appraisal system in higher education sector of Pakistan. This study will also add some extra knowledge to the stake holders in higher education sector to understand and pinpoint the role of performance appraisal in academic sector.

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Corresponding author's email address: altafhussain@uom.edu.pk

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### 1. Introduction

Performance appraisal is known as the main component of performance management systems (Gruman & Saks, 2011). Performance appraisal is a formal and systemic method used to identify measure and improve employee job performance (Prowse & Prowse, 2010). Shrivastava and Purang (2011) termed performance appraisal as a central technique for every organization. Armstrong and Taylor (2014) suggested the strategic role of performance appraisal and it is blended in the organizational policies and

actions of human resource. Dissatisfaction and perceptions of unfairness and inequity in appraisal evaluations result into failure of any performance appraisal system (Iqbal, Ahmad, & Haider, 2013). This research aims to explore facets of performance appraisal which are associated with organizational justice and its three kinds i.e. procedural justice, distributive justice and interactional justice. Especially, perceived purposes of performance appraisal are taken into consideration, method employed and employee satisfaction regarding performance appraisal. In public sector organizations performance appraisal is considered as a feature of “new managerialism”(Peters, 2013). Organizational justice is also one of the important points of concern about performance appraisal system (Thurston Jr & McNall, 2010). In management literature, studies have revealed that justice perceptions influenced employee’s behaviour in the organizations particularly in higher education sector (Elamin & Alomaim, 2011). Though, there is still disagreement on interactional justice should be perceived as a part of procedural justice or not in the whole organizational justice scenario of an organization (Jawahar, 2007). Employee satisfaction also plays a key role in the success of any performance appraisal system because its acceptance is related with employee level of satisfaction and depends on organizational justice (Jawahar, 2007).

### **Problem Statement**

Currently public sector universities in Pakistan are not performing well and its performance is alarming and not promising. Faculty members in these universities seems to be non-productive and rarely contribute towards the university performance (Khan, Shamsudin, & Syed Ismail, 2016; Shan, Ishaq, & Shaheen, 2015). It is noted with great concern that why the public sector universities are not making place in international ranking and performance. There are so many reasons behind this situation in which lack of organizational justice (Khan et al., 2016), employee satisfaction from appraisal and low job performance were find the most crucial ones and needs to be addressed. This study is conducted to ponder on essential queries regarding organizational justice in public sector universities of KP. It would benefit to inspect the usual influence of organizational justice aspects on employee satisfaction and performance appraisal system (Afridi, 2018). The organizational justice might be one of the leading problems that are not examined thoroughly in the public sector universities of Khyber Pakhtunkhwa to identify its impact on employee satisfaction and performance appraisal.

### **Research Questions**

- Is administrative purpose have any relationship with distributive and procedural justice
- What is the relationship between developmental purpose and interactional justice
- What is the relationship between employee satisfaction and procedural justice
- Is employee satisfaction have any relationship with interactional justice and organizational justice

## **2. Literature Review**

### **2.1 Organizational Justice**

Researchers have identified ideas of justice for the last 60 years that how and when organizational justice prevails in workplace (Rowland & Hall, 2012). Study of fairness at workplace is termed as organizational justice (Palaiologos, Papazekos, & Panayotopoulou, 2011). In organizational context, for the first time Greenberg (1986) apply organizational justice theory to performance appraisal. The author further elaborate that fairness is being subject to the organization. Three types of justice are of particular interest to human beings as per previous literature. Distributive justice deals with the fair distribution of the outcomes in organization (Al-Zu’bi, 2010). The author further stresses not only on the distribution but also on the perception of the fairness (Chernyak-Hai & Tziner, 2014). Another researcher like (Gupta & Kumar, 2012) maintained that employees match their efforts with the performance appraisal rating they obtain and the establishment of the fair ratings in performance appraisal. Some previous researchers identified that employees anticipate ratings leniently in comparison to others (Cardador, 2014). In continuation to the latter one, the procedural justice describes the fairness in procedures about outputs and

refers to establish fairness in issues regarding process, techniques and tools used to define those outcomes (Palaiologos et al., 2011). Procedural justice relates to the rules and procedures employed to accomplish ends. The last one is interactional justice, which obviously determines that employees perceived fairness in interpersonal dealing and communication that they observed (Fernandes & Awamleh, 2006). It is significant to highlight that interactional justice get attention on how the employees of the institutions are being treated by their immediate bosses using their authority in making decisions (Fernandes & Awamleh, 2006).

## **2.2 Purposes of Performance Appraisal**

Performance appraisal is used in organizations for carrying out different purposes likewise, to promote employee performance and productivity (Ikramullah, Shah, Khan, Hassan, & Zaman, 2012), improve employees to develop their abilities and also to improve those weak areas of employees that has negative scores (Katou & Budhwar, 2010). According to Boswell and Boudreau (2000) postulated that performance appraisal system is meant for administrative purposes i.e. salary, promotion, termination and layoff and also for developmental purposes i.e. training of employees, providing employee with continuous performance feedback and establishing employees strengths and weakness. Boswell and Boudreau (2000) suggested that supervisor or rater assign ratings leniently if it is used for developmental purpose and contrary to this, Cleveland and Murphy (1992) proposed that supervisor or rater assign high ratings for administrative purposes in terms of pay raises, promotion and give low ratings in terms of feedback and development. According to Palaiologos et al. (2011) found that employees believed rater/supervisor were the crucial to the performance appraisal success with focus on accurate ratings, purposes and feedback by supervisors. Wright (2004) opined that employees found performance appraisal to be more effective when they are specific and concentrated, intended and well managed, easy to comprehend and control the process. The success of performance appraisal system may be determined by employee's perception of fairness (Jawahar, 2007). If employee's perceived dissatisfaction, unfairness and inequity in performance assessment then any performance appraisal system will be considered failed (Palaiologos et al., 2011). While, Warokka, Gallato, Thamendren, and Moorthy (2012) argued that the performance appraisal method will cause dissatisfaction if employees perceived it biased, unfair and irrelevant. Shields et al. (2015) stated that performance appraisal is essential to established performance objectives, resolve performance issues and used incentive, selection and termination. Particularly, performance appraisal can also be applied for different purposes such as managing employee performance encompassing setting clear goals, career development compensation and identifying improvement prospects (Shields et al., 2015). According to Youngcourt, Leiva, and Jones (2007) there are two types of purposes namely administrative and developmental. In the administrative purpose supervisor assess the evaluation output and resolve problems such as salary increases and promotions. While on other hand, developmental purpose is meant for emphases both on employee development and competencies and their personal development (Werner & DeSimone, 2011).

Especially, the administrative purpose of performance appraisal established a linkage between performance appraisal and fairness. These relationship maximize the possibility that performance appraisal is supposed as more unbiased to both method and content. While, developmental purpose objects at individual development, looks more connected to interactional justice based on good interactive relations. Keeping in view previous literature following hypotheses is developed in present study.

H1. The administrative purpose of performance appraisal has a strong relationship with distributive and procedural justice.

H2. The developmental purpose of performance appraisal has a strong relationship with interactional justice.

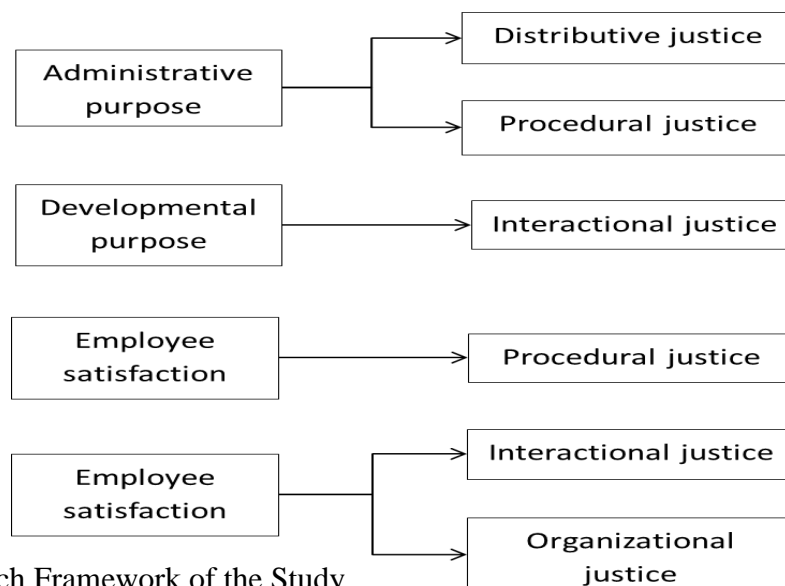
### 2.3 Employee Satisfaction

Kehoe and Wright (2013) have affirmed the prominent role of performance appraisal system in the development of employee attitudes and maximize motivation to improve job performance. Employee satisfaction has been considered as to motivate and improve employee job performance with performance appraisal system (Selvarajan & Cloninger, 2012). According to Gunlu, Aksarayli, and Şahin Perçin (2010) satisfaction is a significant goal for organization to achieve, factors which mostly contribute and relate to employee satisfaction are customer satisfaction, productivity and retention of employees. Those employees which are satisfied hence motivated to produce higher customer satisfaction and ultimately positively affect organizational performance (Bakotić, 2016). In addition, effectiveness of performance appraisal system is dependent on both its methodological aspects and overall administrative design and organizational design. Performance appraisal system is not only used as distributive activity but it also encompasses other organizational activities (Pooyan & Eberhardt, 1989). Employees' satisfaction has three major components associated with performance appraisal. First component of satisfaction relates with ratings, if they are highly rated in evaluation, it stimulates their positive reactions about performance evaluation (Kacmar, Wayne, & Wright, 1996). Performance ratings are also considered as an imperative facet of performance appraisal satisfaction according to Bernardin and Wiatrowski (2013), and act as base for several administrative decisions. Higher ratings has been taken by employees is a source of satisfaction in comparison with low ratings. The supervisor or rater has to play a key role to give assurance of positive outcome and provide some distinguished feedback to employees to improve their performance (Palaiologos et al., 2011). According to Kassing (2011) the most critical one is the ratee-rater relationship. Feedback is crucial because of its positive impact on employee's reaction to ratings (De Stobbeleir, Ashford, & Buyens, 2011). Hence, performance feedback and satisfaction performs a significant role in various administrative activities such training and development, career growth and motivation (Van Dijk & Kluger, 2011). Keeping in view the aforementioned findings, it is said that employee satisfaction with ratings is related with procedural element of performance appraisal which results into improved procedural justice. And employee satisfaction also exist a positive relationship with overall organizational justice.

H3. Employee satisfaction has a positive and significant relationship with procedural justice

H4. Employee satisfaction has a positive and significant relationship with overall organizational justice.

### 3. Research Framework



**Figure 1:** Research Framework of the Study

#### 4. Methodology

The data were collected by using questionnaires that were sending through an email. Respondents were faculty members of public sector universities of Pakistan. The criteria for involving a university or individual faculty member in our sample can be categorized as follows. First the organization or university has a performance appraisal system and prevailing for the last three years. Second the faculty members can answer the questionnaire only if they had been appraised at least one time in the service. The sample of this study comprises of 180 questionnaires, out of these 120 were obtained recording response rate of 66 %. Majority faculty members in this study sample are appraised annually and their head of the department/Dean being their supervisor in most of the cases. Our respondents were faculty members of different ranked such as Lecturers, Assistant professors, Associate professors and Professors.

##### 4.1 Measures

The questionnaire of this study was designed based on items taken from series of related studies, Jawahar (2007); Kuvaas (2007); Colquitt (2001) and (Youngcourt et al., 2007). The questionnaire contained total of 35 questions (variables of study), in which first part described the purposes of performance appraisal system and second part illustrated demographic information. All questions were measured using 5 points Likert scale. Its descriptive statistics can be seen in Table 1.

**Table1:** Statistics and Reliability of Variables

Dependent and independent variables	Normalized statistics (divided by no. of items)		Cronbach's alpha	Number of items
	Mean	SD		
Administrative purpose	3.31	0.745	0.769	3
Developmental purpose	2.26	0.878	0.748	3
Procedural justice	3.63	0.755	0.847	12
Distributive justice	2.92	0.723	0.972	5
Interactional justice	3.42	0.982	0.942	10
Employee satisfaction	3.75	0.805	0.912	2

#### 5. Results

The research paper is aimed to analyze the components performance appraisal which is associated with organizational justice. In a connection to test the model SPSS has been used to run correlation analysis is shown in Table 2.

**Table2:** Correlation between Variables

	1	2	3	4	5	6
Administrative purpose	1					
Developmental purpose	0.665	1				
Procedural justice	0.552	0.545	1			
Distributive justice	0.493	0.543	0.552	1		
Interactional justice	0.552	0.513	0.317	0.552	1	
Employee satisfaction	0.443	0.382	0.221	0.365	0.596	1

The three dimensions of organizational justice has taken as dependent variables and two types of purpose of performance appraisal as independent variable, and linked with employee satisfaction. Results of regression model have been shown in Table 3.

We examined a significant positive relationship ( $p < 0.01$ ) of administrative purpose with distributive and procedural justice. The regression coefficient for both the variables was 45.2 % and 19.4 % respectively. R2 was calculated as 77.3 percent. These findings confirmed H1. We also examined a positive significant relationship between the developmental purpose and interactional justice recording a regression coefficient of 32%. R2 was calculated as 34.7%. These findings confirmed H2. We also examined a significant relationship ( $p < 0.01$ ) between the employee satisfaction and procedural justice having regression coefficient of 24.9 %. R2 indicated 76.4 % variance in procedural justice. These findings confirmed H3. In the last, we examined the relationship between employee satisfaction and organizational justice. The regression coefficient was found significant having a value of 21.2 %. These findings confirmed H4.

## 6. Discussion

The aim of this study is to find out the purposes of performance appraisal that are associated with organizational justice. According to Jawahar, (2007) the performance appraisal system success depends on employee's perception of fairness and positive appraisal reaction including employee satisfaction. Conventionally, studies on performance appraisal stressed on the relationship between employee satisfaction and perceived purposes. There is a relationship between developmental purpose and satisfaction with rater (Klein et al., 1987). The results of this study supported (H1) reporting significant positive relationship between administrative purpose of performance appraisal and distributive and procedural justice. It looks credible that when organizations or universities make decisions about salary, fringe benefits, promotion of the employees it produces a positive impression regarding fairness in procedures and its outcomes. These results also supported (H2) that the developmental purpose of performance appraisal has positive and significant relationship with interactional justice.

According to Youngcourt et al. (2007) the administrative and developmental purposes are considered as individual focused. Based on their nature individual focused purposes have strong association with organizational justice. Issues related with employees like hiring, firing, salary are tangible in nature and subsequently influenced employees' daily routine as well as their general behavior in institutions. Therefore, there must be as sound and effective performance appraisal system which is based on justice and ultimately it leads to enhance employee's efficiency and performance. Such system of fairness reduces turnover and absenteeism rate and also creates loyalty and commitment within employees for organization.

**Table3:** Results of Regression Analysis for Organizational Justice and Employee Satisfaction

Dependent variables	Independent variables	Beta	R2	Adjusted R2	significance	F
Administrative purpose	Distributive justice	0.452	0.773	0.713	0.000	115.955
	Procedural justice	0.194				
Developmental purpose	Interactional justice	0.320	0.347	0.336	0.000	33.311
Employee	Procedural justice	0.249	0.764	0.734	0.000	245.440



satisfaction						
Employee satisfaction	Organizational justice	0.212				

Furthermore, these findings indicate that there is significant relationship exist between the two types of justice and the employee satisfaction. (H3) shows that employee satisfaction has positive and significant relationship with procedural justice. H3 is confirmed as it indicates a strong positive association between employee satisfaction and organizational justice i.e. distributive and procedural justice. These results also oppose previous research owing that employee satisfaction is only linked to distributive justice (Jawahar, 2007). It is because some part of the population of this sample thinks that if the technique used for performance appraisal is unbiased definitely it will enhance the fairness of performance appraisal in organizational purposes such as compensations and promotions.

The (H4) hypothesis is also supported by these results as a positive relationship is established between organizational justice and employee satisfaction. These results have already been confirmed by previous studies e.g.(Jawahar, 2007).

## 7. Conclusion

This study briefly labels the significance of the three components of organizational justice such as interactional, procedural and distributive along with employee satisfaction. Though, performance appraisal usually goes along with perception of fairness and satisfaction. Its execution is important for both managers and employees. The findings of this study lead to some recommendations and suggestions for researchers and scholars that can be illustrated as follows. It is recommended for the new employees i.e. faculty members to be aware of the performance appraisal procedures at the earlier start of their institutional or organizational life. The faculty members should know all about the performance appraisal during the orientation process. This will support them in their evaluation process and subsequent procedures prevail in the institutions. If performance appraisal ensures organizational justice regarding all the three elements of justice then in turn employees i.e. faculty members will be satisfied and will put more strength to advance organizational performance. Organizational justice as whole can also lead to enhance employee satisfaction and resultantly it affects productivity and performance positively. The significant relationship of organizational justice including interactional justice with satisfaction assists the significance of rater' role in employee satisfaction. The findings of this study also identified the importance of fairness and justice for every organization in general and especially for higher education sector i.e. universities in Pakistan. It is worth mentioning that if faculty member's perceived organizational justice in universities regarding performance appraisal definitely they will be satisfied and get motivated to perform better and efficiently. Satisfaction with ratings is also encouraging employees to participate actively and revise their performance according to the demand of the organization. This study shows a positive relationship of organizational justice with employee satisfaction and will assist policy makers to devise such a performance appraisal system for universities which propagate fairness and justice along with satisfaction for progressing towards high job performance of employees.

This study was limited only to public sector universities of Peshawar and its employees i.e. faculty members. Future research should be extended to other regions of the country including private universities and the data should be collected from both the faculty members and administrative staff in order to find out the gap in perceptions of them to analyze its possible effect on such variables. This study is also lacking discussion on informational justice.

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## SMEs Exports are Influenced by Different Risk Factors: Empirical Study of Emerging Economy

<sup>1</sup> Safia Nosheen, <sup>2</sup> Tahseen Mohsan Khan, <sup>3</sup> Fazal-Ur- Rehman

<sup>1</sup> University of Management and Technology, Lahore, Pakistan; safia.nosheen@umt.edu.pk

<sup>2</sup> Assistant Professor, Department of Finance, School of Business and Economics, University of Management and Technology, Lahore, Pakistan; tahseen.khan@umt.edu.pk

<sup>3</sup> MS scholar, University of Management and Technology, Lahore: 15002212004@umt.edu.pk

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p>The Study intent to identify the direct (indirect) risk factors that can influence the export of medical instruments from SMEs sector of Pakistan by using the time series monthly data sample for a period of fifteen years that is from FY 2003 to FY 2017. Empirically a strong long term relation between the export of medical instruments with operational risk, market risk, export refinance schemes and steel prices are proven by Johansen co-integration. Study also establishes a direct positive relation of operational risk and market risk with the export of medical instruments as a result of Vector Error Correction Model.</p>
<p><b>Keywords</b> Medical Instruments, Market Risk, Operational Risk, Export Refinance, SMEs</p>	
<p><b>JEL Classification:</b> G14, G19, L81, L89</p>	



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Corresponding author's email address: safia.nosheen@umt.edu.pk

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### 1. Introduction

Small and medium enterprises (SME) are considered as priority sector particularly for under developed and developing countries because of their contributory role in Gross Domestic Product, employment generation and poverty relief. SME also considered as the platform for creativity and innovation that stimulates national income by providing new business opportunities that leads to social stability. A study by International Finance Corporation (IFC) explains a positive correlation between the overall level of income of a country and the number of SMEs measured on a unit (per thousand) of population<sup>7</sup>.

The small and medium size enterprises are categorized on the basis of their number of employees and annual sales turnover. As explained by central bank of Pakistan in SME prudential regulation, a Small

<sup>7</sup> N Janadhan Rao in the article "SMEs in India" published in 'Global CEO' November 2007

Enterprise (SE) is a business entity which meets both number of employees up to 50 and annual sales turnover to PKR 150 million and Medium Enterprise (ME) is a business entity that meets both number of employees up to 51-250 for manufacturing and service concerns and 51-100 for trading concerns and annual sales turnover above PKR 150 million and up to 800 million (State Bank of Pakistan, 2016). The increase in the level of financing to a sector is considered to be one of the sign of growth. In Pakistan over the period of three years from 2013 to 2016 the financing to SME sector increased by 9 percent that is from 284 billion to 400 billion. Development of SME can be a milestone for the growth of any economy. Therefore the central bank of Pakistan is keen to enhance the SME's contributory role and direct to enhance SME's existing 8 percent share to private sector to 17 percent and to increase the number of borrowers from existing 174000 to 500000 by 2020 ('Policy for Promotion of SME Finance State Bank of Pakistan', 2017). Further, to bring more entrepreneurs within the network, the central bank also relaxed the existing upper limit from PKR 75 million to PKR 125 million for retail exposure. This relaxation by central bank encourage the SME sector by providing the incentive for risk weighted assets calculation under Basel framework by relaxing the eligibility criteria of retail portfolio that is increased in the existing upper limit for retail exposure from PKR 75 million to PKR 125 million ('Policy for Promotion of SME Finance State Bank of Pakistan', 2017). The SMEs having their contributory role both as a part of formal and informal sectors and are distributed in three categories that include manufacturing, services and trading.

Illiteracy is one of the basics issue in terms of basic education of the under-develop and developing countries and from time to time these countries used to address this issue. But in these countries so called illiterate people are observed to be more skilled than literate people and having major contributory roles in SME sector. The informal sector having major contributory role as compare to formal sector because this sector not only provide the opportunities but also develop and utilize the skills of illiterate people. Finding skilled people is one of the major global issue and most of the developed countries hire skilled people from under-develop and developing countries. Major industrial and other SMEs facing similar problems in term of finding skill labor a study by (Karadag, 2016) support this argument "SMEs are currently going through a tough test of survival capabilities, mainly due to tightening credit conditions, difficulties in finding new customers and shortage of skilled labor". Further, particularly in under-develop and developing countries child labor is one of the core issues. Where poor parents not even able to meet the food need of their children, no choice is left for them except to send their children for work. These children start their careers with SME sectors and grow themselves with this sector. Over the period these children not only start spending comfortable life but some of them also become national leading entrepreneur and hire number of high degree managers. Over last two or three decays the economic contributory role of women in society has achieved a new height. In developing countries number of women running their business as successful entrepreneur with creativity and innovation is increasing. SMEs are ranged as tier 1 among industries being supplier to large industry.

SMEs having its' global economic significance for all type of economics and play its' role for economic growth by providing decent jobs in mainstream economics, overcoming a large deficit between rich and poor revenue by providing opportunities for poorer survival in under-develop and developing economies. Social economy deals with the factors influenced by the behavior of people or in other words having awareness about the need of people. In present era the basic needs of humans are not limited to the extent of food, cloth and shelter but it also includes health, education and employment. The resources of under-develop and developing countries not having cushion even to meet the basic needs of their people. In such countries SMEs play vital contributory role not only by providing employment opportunities but also developing low cost products to meet their basic needs. SMEs solely cannot contribute to economy without state support and direction to the entrepreneurs. A study by (Taiwo, Ayodeji and Bako, 2012) states that "the most common constraints hindering small and medium scale business growth in Nigeria are lack of financial support, poor management, corruption, lack of training and experience, poor

infrastructure, insufficient profits, and low demand for product and services". SMEs as a part of private sector develop speedier and play a significance role as paramount way to coup poverty and inequality by integrating into global economy through economic liberalization, deregulation and democratization. In agriculture based economies, SMEs significantly play its' role by the transition of agriculture-led economies by involving processing activities. The processing activities convert agriculture-led into finish product through industrial ones that provide opportunities to generate more employment, additional resource of revenue and enhance the development process. The economic significance of SMEs is not only limited to under-develop and developing countries but this sector also have significant role for the main stream economy development.

Obstacles are considered to be a phenomenal part of every business and its growth. The key obstacles are observed in the growth of SMEs in under-develop and developing economies are energy crisis, taxation problems, labor issues, creativity, innovation, precise policy and regulatory reforms etc. Further, the SMEs that can play global role facing additional constrains in term of law and order situation images as key issue. A study by (Wang, 2016) as the results of the statistical analysis highlight, "the five most significant obstacles SMEs face are access to finance, tax rate, competition, electricity and political instability". There are countries having rich resources that provide opportunities to the entrepreneurs to start new business and globally introduce their products. Similar in under-develop and developing countries a number of entrepreneurs stop manufacturing their traditional handmade unique products. Because they have no access to product demand markets, financial constraints and have no support from State and/or financial institutions. A study by (Wang, 2016) highlights "Among the five obstacles, access to finance appears to be the biggest obstacle, followed by competition". SMEs sector even a part of formal sector being borrower face problem in exchange of information with lender and bear high cost because of small and medium size associated risk not only face in developing economies but also in main stream economies. A study also highlight asymmetric information as a factor by (Beck, 2007) conclude that "transaction costs and asymmetric information between borrower and lender are the driving factors explaining the limited access to external finance by many SMEs in developing as well as developed economies". Skill labor is one of the global problems, in case formal sector education became the hurdle for the illiterate skill person.

Pakistan is ranked 68th largest exporting country in the world<sup>8</sup> and the key exporting products from Pakistan includes Rice, Mangoes, Furniture, Leather, Sports, Cutlery and Surgical etc. Whereas the country consists of four provinces that include Punjab, Singh, Khyber Pakhtunkhwa and Baluchistan. Punjab is considered to be the largest province in terms of population or we can say in this province almost about 50% of country population is residing, the total population of Punjab equals to 110.01 million against the total population of country that is equal 207.77 million in 2017. As our study is focusing on the export of medical surgical instruments and we have chosen Punjab province as our study area because Punjab has major democratic medical surgical instruments export shares that is equal to about 90% of total country medical surgical instruments exports. Pakistan is facing high degree of trade deficit that is equal to \$26.57 billion during 2017, the country having export level equal to \$21.94 billion as compared to the import level equal to \$ 48.51 billion. The alarming sign is continuity of increasing trend in the level of trade deficit since last four years. Over four years the trade deficit increase by 32.97% from \$16.5 billion to \$21.94 billion. Medical instruments and metal allied products not having major share of country exports but the most significant role of this industry is their products are every global market demanding products and existing industry having export share equal to 80%-90% of their total production. Different initiatives are taken to enhance the export level by State and/or its' associate organizations also include surgical sector as promising one. In order to minimize the trade deficit, the country's' Central bank also initiate by introducing new refinance facilities at cheap rate for certain priority SME sectors that include IT, furniture, surgical goods, dates processing, gems & jewelry, leather

<sup>8</sup> [https://www.cia.gov/library/publications/the-world-factbook/rankorder/rawdata\\_2078.txt](https://www.cia.gov/library/publications/the-world-factbook/rankorder/rawdata_2078.txt)

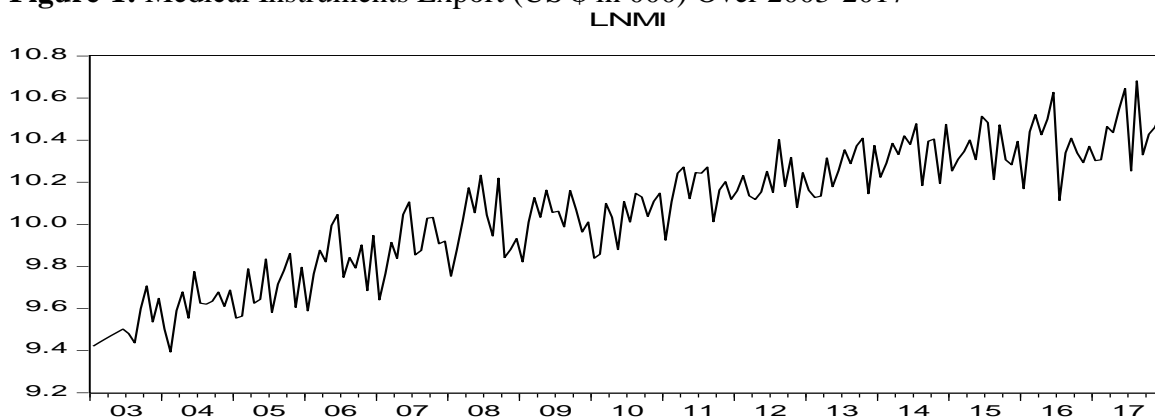
industry, fruits, vegetables & food processing and packaging, printing & packaging to encourage the exporters. Further, to overcome the deficit level the significance of SME sector is also more highlighted. “Pakistan Stock Exchange has proposed 20 percent corporate income tax rate for small and medium size listed companies to promote entrepreneurship”<sup>9</sup>. The significant role of SMEs are explained in SME Observe as “In Pakistan, around 99% of economic establishments are SMEs that collectively contribute an estimated 40% to GDP and over 40% to the exports”(SMEDA., 2017). Pakistan is considered to be an agriculture based country with agricultural base contributory industrial role as well; in terms of area the agricultural land is 35.2% of total land that is 770,875 sq km<sup>10</sup>. Pakistan is engaged in the export of different commodities that include food group, textile group, and petroleum group etc. The textile sector that is based on agriculture having leading exports from country role across all the groups as per the information provide by central bank of country<sup>11</sup>, the details can be evident from under mention table-1.

**Table-1:** Export of Commodity from Pakistan

COMMODITY	FY 2016 (Thousand US\$)	FY 2017 (Thousand US\$)
Food Group	3,722,489	3,611,952
Textile Group	12,756,277	12,453,506
Petroleum Group	450,201	410,718
Other Manufacture	3,804,506	3,654,627
<b>TOTAL EXPORTS</b>	<b>21,971,996</b>	<b>21,938,000</b>

The medical instruments value US\$ 400.85 million<sup>12</sup> export from Pakistan in 2015-2016 that include 89.31% export share from Punjab Province with the contributory role equal to US\$ 358 million as compared to \$ 339 million in 2014-2015<sup>13</sup>. The trend of medical instrument export over study interval can be viewed in figure-1.

**Figure-1:** Medical Instruments Export (US \$ in 000) Over 2003-2017



<sup>9</sup><http://www.pkrevenue.com/inland-revenue/budget-proposals-20172018-psx-recommends-20pc-corporate-rate-for-sme-listed-companies/>

<sup>10</sup> <https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html>

<sup>11</sup> <http://www.sbp.org.pk/stats/survey/index.asp>

<sup>12</sup> [http://www.sbp.org.pk/ecodata/Export\\_Receipts\\_by\\_Commodity.pdf](http://www.sbp.org.pk/ecodata/Export_Receipts_by_Commodity.pdf)

<sup>13</sup> Data collected from the sources of Surgical instrument Manufacturers Association of Pakistan (SIMAP)



The manufacturing of surgical instruments in fact in this region start at the shot of century when the demand of medical instruments generate by American Mission hospital of Sialkot and same successfully reproduce by local craft workers. In 1930 the medical instruments SME cluster start exporting their instruments to Egypt and Afghanistan. Further during Second World War they establish themselves as medical instruments manufacturing industry and play vital role to meet the demand of Indian and Allied forces. In 1941 the British Government takes the initiative to establish the Metal Industries Development Center to facilitate the local industry. Since that period to date Sialkot and its surrounding cities that include Gujarat, Gujranwala, Wazirabad etc. are engaged in the manufacturing of metal products include medical instruments, personal and saloon beauty care goods, hospital metal furniture, Hollowware etc.

SME sector businesses are engaged in three dimensions that include trading, services and manufacturing. We initiate to focus on the role of SME's medical instruments related manufacturing cluster and analyze the factors that have possible influence on the exports of medical instruments from the largest province of country that has major democratic export oriented manufacturing concerns. Sialkot is one of the famous city of the country and globally known for the world best quality sports goods and medical instruments. The world market size of surgical goods is estimated around US \$30 billion. In Pakistan there are about 3600 members firms register with Surgical Association.

Pakistan was established as an independent State on August 14, 1947 and inherited only 34 industries that include 17 surgical industries. Punjab being the largest province of country having major dependence on agrarian economy and require to develop more industries to boost economic growth. Industrial Planning Committee was setup in 1948. The committee efforts resultants to build 310 new industries in Punjab that include a major part of surgical sector. In 2004-2005 the survey of large, medium and small selected sectors covers the total number of units equal to 18006 and in 2010 small scale and cottage level industrial units report decrease by 1785714.

Common Facility Centre (CFC)<sup>15</sup> initiated by the State to facilitate the manufacturers by establishing cluster development program (CDP). CDP works as different business stakeholder network with the objective to boost economic activity by providing low cost manufacturing opportunity that also create employment opperunities. Futher, Small Medium Enterprise Development Authority(SMEDA)also initiate to promote SME sector by providing awareness about modern technology, global markets, human resource skill programs that include international certifications and global regulations etc. State from time to time also takes initiative to promote export and do address social issues. A study by Ghulam Mustafa (2011)<sup>16</sup>states "Federal Government is taking initiatives to boost surgical industry of Punjab and released Rs. 30 million issued out of export development program, these steps of federal government helped the surgical industry in innovation and growth of surgical export. Despite this effort, they also issue Rs. 28 million to make surgical industry free from child labor and Rs. 1.7 million for cluster development program in Punjab". Another state own entity Punjab Small Industrial Corporation (PSIC)<sup>17</sup> developed different projects that include Product Development Centre for sports goods, Cluster Development Centre for metallurgy, dies, casting and agriculture implements etc. Similar to this, Surgical Instrument Manufacturers Association of Pakistan (SIMAP) with the collaboration of Pakistan Council of Scientific and Industrial Research (PCSIR)<sup>18</sup>initiate common facility centers in Punjab. These associations and

<sup>14</sup><http://www.doi.punjab.gov.pk/history>

<sup>15</sup> It is one place shop for manufacturers or exporters in converting raw material to finished goods.

<sup>16</sup> Ex-Chairman of Surgical instrument manufacturing association of Pakistan

<sup>17</sup> It is an organization to develop with the aim to strong industrial estate in different regions of Punjab such as small industrial estate of Sialkot.

<sup>18</sup> It is an organization developed under societies act in 1953 with an aim to promote science and technology in industries of Punjab.

centers automatically help the industry by addressing the gaps in different sectors by introducing research, development and innovations.

## 2. Literature Review

The exports and imports play an important role to meet the shortfall of skills, services and goods across countries that help in their development and growth. The key challenge, which countries face, is to create the equilibrium between exports and imports. Countries having trade deficit more emphasize to increase their level of export and take different measures to encourage the export oriented sectors. The medical instruments manufacturing industry in Pakistan engage in the export of about 80%-90% of its production<sup>19</sup> and can play a vital role by increasing its production capacity. We are focusing on the different factors and initiate to analyze the impact of these factors on the export of the medical instruments from country. One of the factors is the way government provide support to different areas in the shape of different incentives schemes to the exporters.

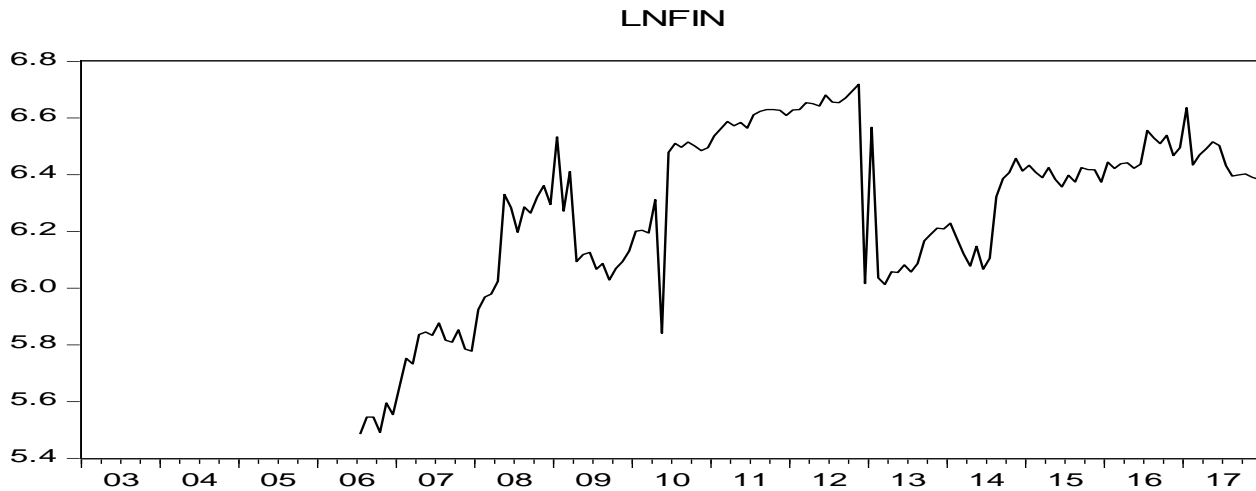
### 2.1 Export Refinance Scheme

The State plays an important role by providing different incentive schemes for exporters with the objective to generate foreign currency and to boost economic activities. The incentives to the exporters include cheap financing, reliefs, tax benefits etc. In Pakistan the Ministry of Commerce (MoC) has fix mark-up rate of 1.5% on Export Finance Scheme (EFS) on selected export sectors that include surgical sector, a source at MoC told *Customs Today*, adding that Ad-Hoc relief @ 3% of Free on Board to offset the impact of higher cost of utilities for Pakistani exporters in surgical sector along with others has been granted.<sup>20</sup> The State Bank of Pakistan (SBP) issue loans to exporters or manufacturer cum exporter to boost export and economic development. Further also ensures supply of sufficient financing to medical industry or any other value added industry at competitive rates and these policies are continuously reviewed to achieve optimal objectives. From time to time SBP uses to take steps to promote the export oriented industries by providing financing and/or refinancing schemes for continuity in growth and their smooth operations. Number of studies supports this argument i.e. (Wang et al., 2017) states that “export promotion program developed by government enhance the export performance of the country”. (Enad et al., 2017) indicate that “different countries establish various export promotion program in such way that it positively influence the export performance of economy which automatically strengthens the economy through bringing international currency in the country”. (Ali and Shamsuddoha, 2004) find that “export promotion program has impact on the firm performance of firm while it indirectly effects the determinant of firms such as firms’ export knowledge and manager behavior in dealing export and all these collectively influence the performance of the firm”. (Kim-Soon, Ahmad and Pei Shy, 2016) argues that “export promotion is given for the purpose of foreign trade delegation which enhance firms’ product quality and gaining reputation and in result export promotion increase the sale with profit”. (Haddoud, Jones and Newbery, 2017) argues that “all kinds of informational and experiential promotion programs improve all relationships of Small and Medium Enterprises while it is helpful to build strong relationship with foreign buyers”. (Ahmad, 2015) indicates “a direct relation between the levels of export is to incentives”. There are also numbers of studies that do not support arguments. (Geldres-Weiss and Carrasco-Roa, 2016) examine “the impact of export promotion program on sales performance of the Chile firms’ and analysis established on the user and non-user of export promotion program through longitudinal data but they did not find any significant difference in the performance of sales”. The detail of export refinance facility availed by medical industry over study interval can be viewed in figure-2.

**Figure-2:** Export Refinance Avail by Medical Instrument Industry in Punjab (US\$ 000)  
Over 2003-2017

<sup>19</sup><http://www.customstoday.com.pk/ministry-of-commerce-takes-measures-to-enhance-exports-of-surgical-instruments/>

<sup>20</sup><http://www.customstoday.com.pk/ministry-of-commerce-takes-measures-to-enhance-exports-of-surgical-instruments/export>



## 2.2 Operational Risk

Operational risk deals with the possible loss or failure due to breakdown of system, procedure, error or fraud etc. Pakistani industry facing big challenge in terms of electricity load shedding, there are alternative ways to meet this challenge but they are not cost effective. Secondly, it may not be possible for small industry to have backup solutions. We have also considered electricity as proxy for operational risk and as a factor that can influence the export of the medical instruments. To meet this requirement, we have only considered hydro production generation part because the electricity requirement of Punjab is captured by hydro.

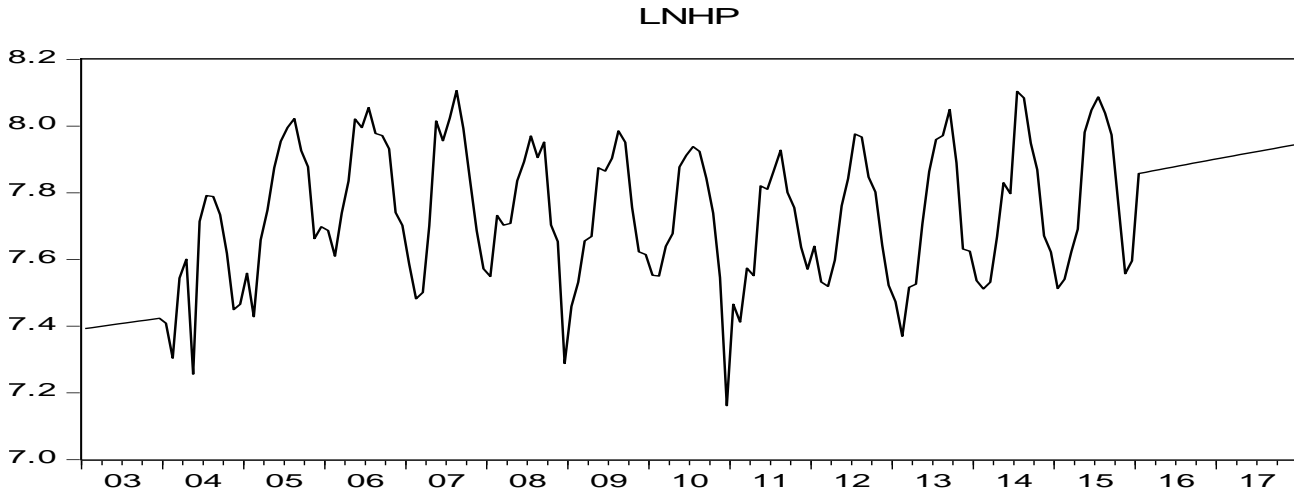
## 2.3 Electricity Production

The main sources of electricity generation in Pakistan are hydro and thermal powers, whereas other generation sources with a little role include solar, coal and wind. The electricity generation in country is consumed by industry, agriculture and residential areas and to make the electricity price cost effective, a proportion between the different sources is to be maintained. In fact it is not possible to solely rely on thermal power because of its very high cost, to make it cost effective by maintaining the proportion with cheap sources country have to face load shortage and load shedding directly affect the industrial production and agriculture. Further, the electricity break down causes an additional cost to the product due to material wastage, labor cost without work, delay in delivery etc. There are number of studies that support the argument in term of electricity generation and industrial production and/or exports. (Bashir, Nasim and Ismail, 2016) analyze that “electricity plays an important role in the growth of developing countries such as Pakistan because electricity production ensures optimum use of natural resources”. Energy generation is considered an important source to drive the economic vehicle. But Pakistan is still facing a gap between demand and supply of energy due to which the industrial front is badly affected. An article in daily Newspaper by (Khalida Parveen 2016)<sup>21</sup> highlight that “New units of production could not be opened, even that established units cannot run smoothly due to less supply of electricity”. Further, due to shortage of electricity and gas major export oriented industries like textile and knitwear facing decline in its production. (Acute et al., 2014) investigate “the relationship between energy consumption, trade and GDP and find out that in short run, relationship exist between energy consumption and export and energy consumption and export while in long run, relationship exist between energy and GDP but indirectly relationship exist between energy and export. (Javid et al., 2012) indicates a unidirectional causal relationship from electricity consumption to economic growth which implies that electricity is a limiting factor to economic growth and hence, shocks to electricity supply will have a negative impact on economic growth”. The detail of hydro production over study interval can be viewed in figure-3.

Figure-3

<sup>21</sup><http://nation.com.pk/business/18-May-2016/energy-crisis-hurting-economy>

## Hydro Electricity Production(Billion Kilowatt Hours) Over 2003-2017



### 2.4 Market Risk

Market risk deals with possible loss influence due to volatility in exchange rate and interest rate. We have also considered interest rate and exchange rate as proxy for market risk and as the factors that can influence the export of the medical instruments.

### 2.5 Interest Rates

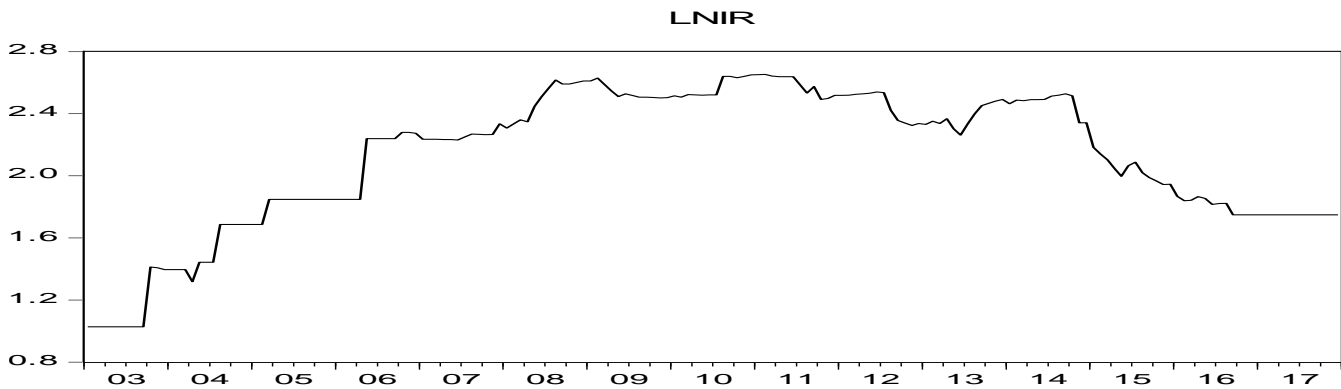
The interest rate is considered to be the price of credit availed through any source and any change in interest rate directly affect the cost of product. Interest rates have an impact on financing at any stage. The most popular Fed rates are driven as monetary policy decision by Fed managers considering to fostering maximum employment and price control. Interest rate is considered as the part of the loan that is paid to the financial institutions as charging amount for the use of money and also consider as a key factor to set the level of export in an economy. Higher interest rate lowers the net export because higher interest rates drive the exchange rate upward while investor wants to buy domestic currency and receive higher interest rate and thus lower down the export. In this context interest rate impacts on different variables, a number of studies are conducted, few of them are discussed here. A study findings by (Saraç and Karagöz, 2016) evident differently “no evidence that higher interest rates cause to a weakening of exchange rate”. Technically, if the interest rate is low than the export of country will automatically boost (Matthew John)<sup>22</sup>, it means interest rate has a direct impact on product cost that provide more negotiation cushion and business confidence. (Bikker and Vervliet, 2018) indicate that “a low interest rate environment indeed impairs bank performance and compresses net interest margins”. High interest rates normally discourage investor to take out high risky projects (Raah Financials)<sup>23</sup>. Interest rate has impact on both domestic and international level, when interest increases it means that exporters will get loan at higher rates which lead to higher production cost and thus lead to high sales price, in result export of country reduce (AnkitKakadiya)<sup>24</sup>. James Sackey (2015)<sup>25</sup> describes when US interest rates are higher than US dollar will be expensive means that value of US dollar appreciated as compared to the currency of other countries thus country will experience the growth in imports and decline in exports. To meet the study requirement we have chosen the return on Government of Pakistan Bond’s as proxy for interest rates and check its’ influence on the export of surgical instruments from Pakistan. The variation in the interest rates over study interval can be viewed from figure-4.

<sup>22</sup><https://www.quora.com/How-does-interest-rate-affect-net-exports>

<sup>23</sup><https://www.quora.com/Why-does-a-high-rate-of-interest-lower-net-exports-Please-answer-in-detail>

<sup>24</sup><https://www.quora.com/Why-does-a-high-rate-of-interest-lower-net-exports-Please-answer-in-detail>

<sup>25</sup><https://www.linkedin.com/pulse/how-interest-rates-affect-international-trade-james-sackey>

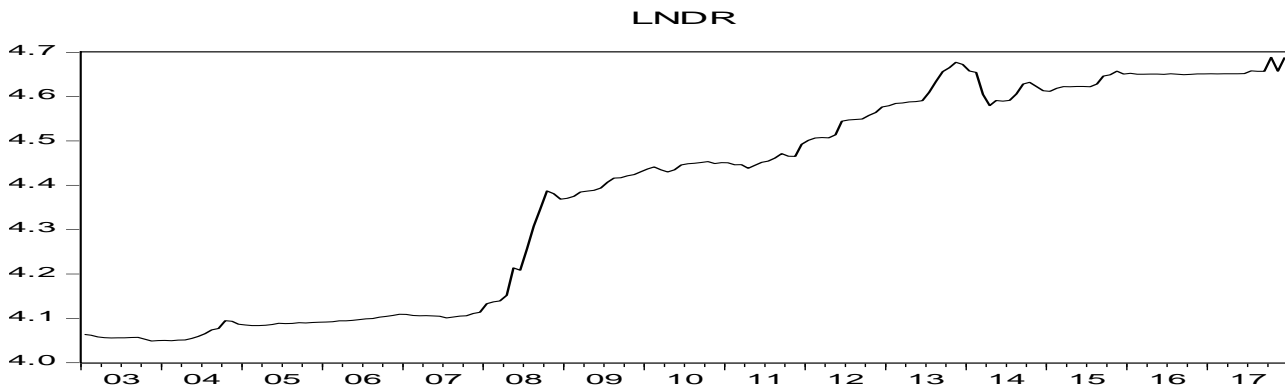
**Figure-4: Interest Rate Variation in Percentage Over 2003-2017**

## 2.6 Foreign Currency

The exports of medical instrument's major part is in US dollar and the dominance of US dollar for global trade is still having significant role. In this context of US\$ impacts on different variables, a number of studies are conducted and few of them are discussed here. A study by James Sackey (2015) <sup>26</sup> describes "a direct relation between US dollar exchange rate with imports and indirect relation with the exports". (Fang, WenShwo, Lai, YiHao and Miller, 2006) conduct a study on eight Asian countries investigate "depreciation encourages exports, as expected, for most countries, but its contribution to export growth is weak. Exchange rate risk contributes to export growth in Malaysia and the Philippines, leading to positive net effects. Exchange rate risk generates a negative effect for six of the countries, resulting in a negative net effect in Indonesia, Japan, Singapore, and Taiwan and a zero net effect in Korea and Thailand". Aqeel and Nishat (2006) investigate "the long run relationship between exchange rate volatility and export performance in Pakistan". (Haque and Kemal, 2006) evaluate impact of export financing and rebate/refund schemes on export performance and analysis shows that, "over the long run, the export financing scheme had a negative effect on exports while the rebate/refund scheme affected exports insignificantly". Other factor that can influence the exchange rates is the phenomena of demand and supply, although central banks of the countries keep their eyes on the movement and make necessary corrections when require in order to maintain the level of country foreign reserves. The countries who switched from fixed to flexible exchange rate system due to higher degree of variability associated with flexible exchange rate systems. The existing literature in the light of exchange rate volatility reflecting mix results that is it may have negative, positive and no impact on investments. Here, we can say its' not necessary that any change in exchange rate having direct effect on the price of product. Therefore, we have chosen US \$ as a factor and check its' influence on the export of medical instruments from Pakistan. The variation in US dollar over study interval can be viewed in figure-5.

**Figure-5: Dollar Exchange Rate Variation against PKR Over 2003-2017**

<sup>26</sup><https://www.linkedin.com/pulse/how-interest-rates-affect-international-trade-james-sackey>



## 2.7 Steel and Gold Price (Raw Materials for the surgical industry)

For the manufacturing of medical instruments the raw material is the key factor that influence the finish good in terms of quality and price etc. Raw material used in the manufacturing of medical instruments is imported and the price of raw material can be influenced due demand and supply, interest and exchange rates etc. The medical instruments are used for human welfare and it is the demand of modern era to have the surety to be up to health standards by applying sensitive checks. Steel is the key material used for the manufacturing of sensitive area instruments. The modernization play vital role by introducing wide range of steel with cost effectiveness. Manufacturing of metal medical instruments and allied is considered to be the most innovative area according to the need of mankind. Now the metal products are also going to be replaced by other materials like rubber, wood, ivory etc. But in accordance to the present era sensitive measures the iron, cobalt, chromium, titanium, and tantalum are proven to be most reliable and safe particularly for medical instruments and implant. As because of limited use of gold for plating of medical instruments gold is considered an optional part for manufacturing the medical instruments. .And for few special treatments like for Rheumatoid Arthritis gold make medical rings are used. Further, (Warren and Pearson, 2012) also evident that “a relationship exists between gold and prices of all commodities such as steel, iron etc. A study by (George Jackson 1938) establish a relation between gold and other commodities “the increase in the prices of Gold, it will automatically and immediately increase the prices of all other commodities”. Usually any additional cost to product either due price pressure or any other associate risk add to final product, but sometime due stiff competition such additional costs have to adjust against profit margin or to face loss. A survey of European chief executive officers and purchasing officers revealed that raw material cost hassignificant impact on the success of the European business performance. Factors that influence the raw material supply to business may include population growth, natural disasters, and political instability.

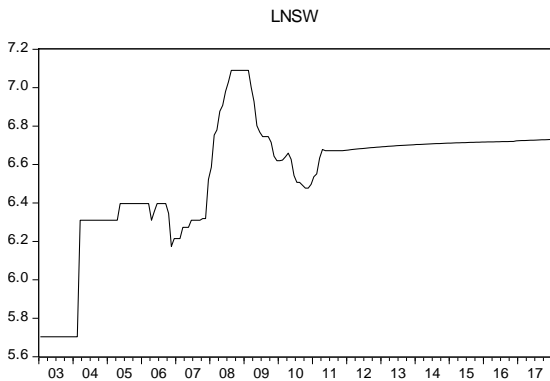
Therefore, we have also considered raw materials that include steel and gold as factors that can influence the export of the medical instruments. The variations in price of raw material is due to either material shortage, interest rate, exchange rate etc. influence adversely the operation and profit margins of the business concerns or add cost to the product. The price of products can also influence due to political instability, change in economic conditions, energy cost and/or load shedding, transportation cost or any other cost input. In short, we can say that an increase in cost of product has an adverse effect on the business concern. In order to mitigate such risks, the business concerns take different measures like hedging, by incorporating causes related to cost inputs as a part of agreements between buyers and sellers. “Companies must put in strong defenses against increases in raw material prices if they want to survive the global competition. It is also vital to take out risk by harmonizing purchase and sale prices, said Richard McIntosh, UK Managing Director of INVERTO27. “Companies are not using the full range of strategies available to them to defend against price increases and manage both costs and supply chain risk,” continued McIntosh.

<sup>27</sup><http://www.freshbusinessthinking.com/raw-material-price-rises-negatively-impacting-businesses/>

The variation in the prices of steel and gold over the study interval can be viewed in figure-6& 7.

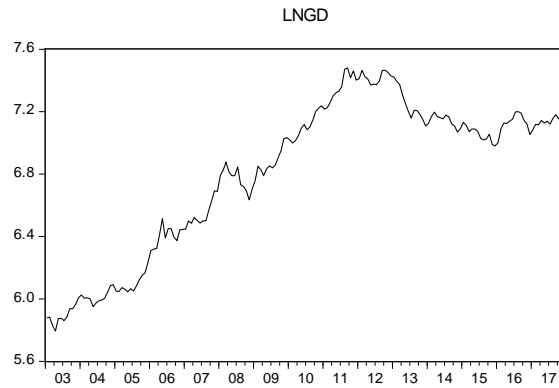
**Figure-6**

Steel Prices Variation (Metric per Ton)Over 2003-2017



**Figure-7**

Gold Prices Variation (Per Tora



The existing literature highlight country export levels significance in relation to enhancing the level of country foreign reserves, declining unemployment, industrial development, creativity, innovation, introduction to new technology and economic stability. Since almost two to three decades Pakistan due to its' strategic location and poor governance facing the multiple challenges particularly relate to law and order, energy crises, taxation problems, labor issues, precise policy and regulatory reforms. Pakistan being emerging economy facing instability due to cross boarder interference that distress internal law and order conditions, this instability stretch serious economic damage to country in term of shake in the confidence of foreign investors due to that country loss the opportunity of foreign investments and of foreign buyers as well. Further, country poor governance do not take serious measures to overcome country weaknesses like to generate cheap energy, taxation and regulatory reforms and control over fluctuation in interest and the exchange rates etc.

We find the influence of these factors as a gap to existing literature in term of the exports of the country. This study initiate to analyze the influence of multiple factors that include export refinance facilities, hydro electricity generation (use as proxy for operational risk), interest rate and dollar exchange rate (both use as proxy for market risk), steel wire prices and gold prices on the export of surgical instruments from Pakistan. The medical instruments industry is chosen being as a part of SMEs sector. Further, Punjab being biggest province of Pakistanis chosen as study sample because of its export contributory role that is equal to about 90% of total medical instruments exports from country.

This study initiates to provide the awareness among the surgical industry stakeholders to have understanding about the key factor that can have influence to the exports of medical instruments from Pakistan.

### 3. Theoretical Framework

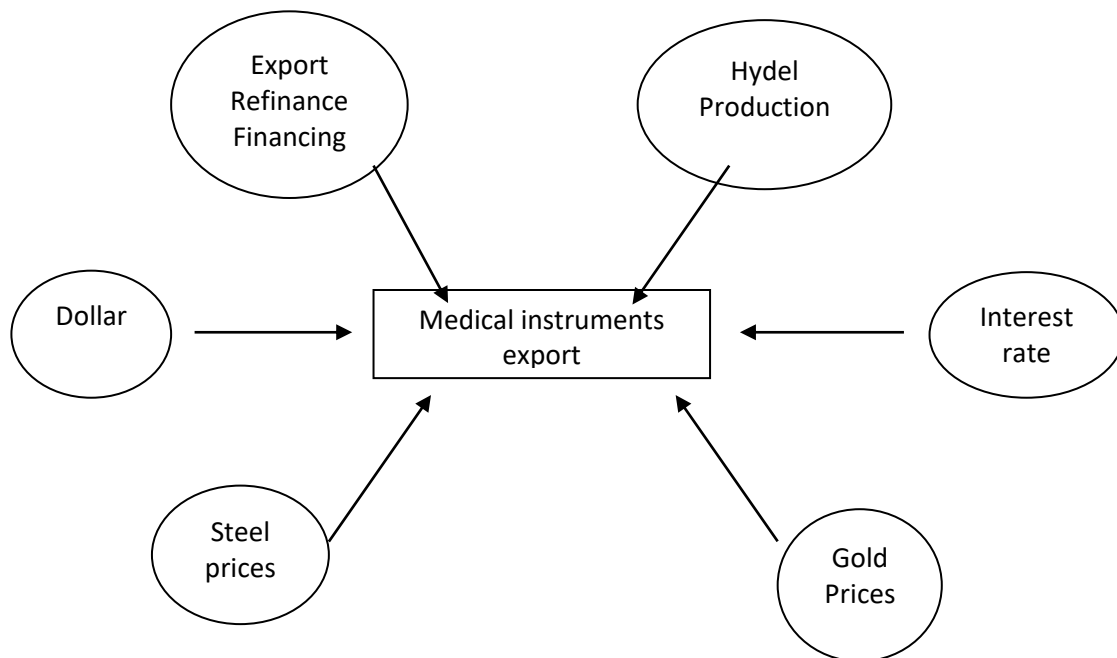
The products are exported from the country under assigned HS codes to make it transparent and for medical instruments export the assigned HS codes are 9018, 9019, 9020, 9021, 9022, 9025, and 1110. State Bank of Pakistan ensures supply of sufficient financing to the surgical industry at competitive rates and these policies are continuously reviewed to achieve optimization objectives and results having consistency with studies by Wang et al (2017), Enad et al (2017) and Geldres-Weiss (2016). The energy within country is generated by different ways that include solar energy generation, hydro power generation, thermal power generation and wind power generation etc. the current study focuses on electricity generation from Gujranwala Electricity Power Company (GEPCO) because it meets the energy

requirement of the area that cover the surgical instruments industry of Punjab. The interest rate within country has an influence on both domestic and international markets. Theoretically interest rate has an inverse relationship with country exports, whereas dollar has its significance as dominant currency in Pakistan. A study by Bashir et al (2016), Shahbaz (2015) support this argument “dollar is the main currency used in the export of Punjabi medical goods to the international market”. Steel is used as key raw material in the manufacturing process of medical instruments and its’ behavior is supported by disappointment theory. Gold creates attraction in the surgical instruments. The sensitive and/or specific surgical scissors rings are made of gold rings; however, it is optional in the manufacturing process.

#### 4. Conceptual Framework

The manufacturing process of medical surgical instruments that consist of different stages as highlighted above and the factors are consider to be analyzed in our study having great importance due to their influence. Export refinance is provided to facilitate exporters in pre and post manufacturing process under the export promotion program, possible breakdown of hydro electricity production do has direct influence on manufacturers. Cost of product base on imported raw materials requires to mitigate the financial risks that include interest and exchange rate variation risk.

**Figure 8:** Conceptual Framework



#### 5. Data and Methodology

##### 5.1 Data Description

The data is extracted from multiple sources that include State Bank of Pakistan (SBP), Ministry of Commerce, Islamabad, Pakistan (MOC), World Bank, Trading Economics, and Trade Statistics for International Business Development (Trade Map) and is classified as time series of required monthly frequency variables over the period of fifteen years that is from FY 2003 to FY 2017. Study is limited to analyze the influence of export refinance scheme, hydro electricity production, interest rate, dollar exchange rate, steel prices and gold prices on the export of medical surgical instruments from Punjab that is largest province of country with about 90% of medical instruments export share.



## 5.2 Research Objective and Hypothesis Construction

### 5.2.1 Research Objective

We intent our research with the objective to identify the analysis of the factors that can increase (decrease) the export of medical instruments. The analysis took into account how export refinance scheme, hydro electricity production, interest rate, dollar exchange rate, steel prices and gold prices influence with the export of medical instruments in Pakistan.

### 5.2.2 Hypotheses Construction

To assess the research objective we have constructed the following hypotheses:

H1: Export refinance scheme has relationship with export of medical instruments.

H2: Hydro electricity production has relationship with export of medical instruments.

H3: Interest rate has relationship with export of medical instruments.

H4: Dollar exchange rate has relationship with export of medical instruments.

H5: Steel wire prices have relationship with export of medical instruments.

H6: Gold prices have relationship with export of medical instruments.

## 5.3 Methodology

Study uses the time series monthly data for the sample period of fifteen years that is from FY 2003 to FY 2017. The study analysis applies the Johansen co-integration test for long run and applies the Vector Error Correction method for the short term relationship.

We emphasize on the significant relationship between operational/market risk and the exports of medical instruments by applying Johansen co-integration test and vector error model. The study analyze unit root presence by applying Augmented Dickey-Fuller test, optimal lags length by applying AIC support for five lags while SC and HQ support for one lag, Johansen co-integration test a strong long-run relationship between medical instruments export and independent variables and vector error correction model validity is also evident.

The following equations are representing the estimation model:

$$\Delta Y_t = \beta_0 + \sum_{i=1}^n \beta_i \Delta Y_{t-i} + \sum_{i=0}^n \delta_i \Delta X_{t-i} + \phi z_{t-1} + \mu_t$$

Z is the ECT and is the OLS residuals from the long run Co-integration regression:

$$Y_t = \beta_0 + \beta_1 X_t + \epsilon_t$$

and can be defined as

$$z_{t-1} = ECT_{t-1} = y_{t-1} - \beta_0 - \beta_1 X_{t-1}$$

## 5.4 Variables Explanation

There is one dependent variable and six independent variables:

Dependent Variable:

Export of medical instruments (LNMI) in US \$ in thousands

Independent Variables:

Government Refinance scheme (LNFIN) in US \$ in thousands

Hydro Power (LNHP) use as a proxy for operational risk and taken in billion Kilowatt Hours

Interest Rate (LNIR) return on government of Pakistan bonds in percentage use as proxy for market risk

Dollar Exchange Rate (LNDR) PKR VS Dollar use as a proxy for market risk

Steel wire prices (LNSW) US \$ per Metric ton

Gold prices (LNGD) US \$ per troy ounce

**Table-2: Variable Explanation**

	Variable	Definition	Nature	Unit of Measurement	Frequency
1	LNMI	Medical instruments export	Dependent	US thousand dollar	Monthly
2	LNFN	Export refinance scheme	Independent	US thousand dollar	Monthly
3	LNHP	Hydel power	Independent	Billion Kilowatt Hours	Monthly
4	LNIR	Interest rate	Independent	-	Monthly
5	LNDR	Dollar exchange rate	Independent	Rupees per Dollar	Monthly
6	LNSW	Steel wire price	Independent	Metric per ton	Monthly
7	LNGD	Gold price	Independent	Per troy ounce	Monthly

## 6. Results and Policy Inferences

We start looking into the relationship of different variables with the export of medical instruments, the investigative results of independent variables show increasing trends over the study interval that is evident from the above figures. To further strengthen our findings, we applied Johansen co-integration test and Vector Error Correction Model.

The results of Johansen co-integration confirm that there is one co-integration equation in the model. The results are mentioned in table-3.

**Table-3: Johansen Co-integration Test**

Unrestricted Co-integration Rank Test (Trace & Maximum Eigen Value)					
Hypothesized		Trace	Max-Eigen	Trace	Max-Eigen
No. of CE(s)	Eigenvalue	Statistic	Statistic	Prob.**	Prob.**
None*	0.378089	178.0341	64.59426	0.0000	0.0002
At most 1	0.310297	113.4399	50.52322	0.0018	0.0024
Trace test indicates 1 cointegrating eqn at the 0.05 level					
Max-Eigen value test indicates 1 cointegrating eqn at the 0.05 level					
* denotes rejection of the hypothesis at the 0.05 level					
**MacKinnon-Haug-Michelis (1999) p-values – Lag interval 1 to 1					

### 6.1 Vector Error Correction Model (VECM)

After confirming the co-integration among variables, Vector Error Correction Model is applied by using 1 lag over the time period 2003-2017. Table 4 exhibit result of Vector Error Correction Model, the results exhibit a direct positive relation of Hydro electricity generation and US\$ conversion in PKR with the export of medical instruments. The results are also supportive by earlier studies, a study (Bashir, Nasim and Ismail, 2016) argued that “electricity generation make sure proper running of factories and also support shut down units, however increment in production will lead to higher export of Pakistan”. The results also support the argument that “higher electricity generation reduces the operational risk because of less electricity load shading”. Further, the positive relation between US\$ conversion in PKR and export of medical instruments also theoretically support because this relation encourage exporter in order to have more local currency against the export. Whereas the value of error correction is negatively significant and indicate a long term relation between independent variables and the export of medical instruments with a

deviation of one unit having a recovery of 2 months and 9 days. The new challenge for Pakistan can be considered for future study that is to analyze the influence of recent devaluation of PKR that can have dual influence on import of raw material and the export of finish goods. The results can be depicted from under mention table-4 and support our hypotheses.

**Table-4: Vector Error Correction Model**

	Short-run outcomes	Long-run outcomes					
Error Correction	$\Delta$ LNMI	LNFIN	LNHP	LNIR	LNDR	LNSW	LNGD
CointEq1	-0.344030 [-3.28762]						
$\Delta$ LNFIN	-0.082043 [-0.98453]						
$\Delta$ LNHP	0.165021 [ 1.76597]	0.077511	0.660485	0.054583	0.802759	0.040723	-0.066511
$\Delta$ LNIR	-0.117422 [-0.38243]	[-0.99187]	[-8.49272]	[-0.91087]	[-5.18830]	[-0.42918]	[ 0.63712]
$\Delta$ LNDR	-1.199397 [-1.25860]						
$\Delta$ LNSW	0.218096 [ 0.68803]						
$\Delta$ LNGD	-0.178008 [-0.62554]						

T-Statistics in Brackets. Italic Coefficients are significant using lag order 1.

## 7. Conclusion

Study initiate to examine the impact of market risk that include interest and exchange rate variation, operational risk that include hydro electricity production, prices variation of steel and gold due to different factors and government incentive schemes on the export of medical instruments by small and medium sector in Pakistan. Country export having its significance in terms of employment generation and economy restructuring, particularly SME sector play its vital role at grass root level. Study use export of medical instruments as dependent variable and export refinance scheme, hydro electricity production, interest rate, dollar exchange rate, steel price and the gold price as independent variables. The study analysis use Time series approach on monthly frequency fifteen years data from 2003 to 2017.

It was hypothesized that short run and long run relationship exist between the selected proxies for operational risk (hydro electricity production, Steel prices, gold prices and government incentive schemes) and market risk (interest rate, exchange rate variation), and export of the medical instruments.

The Johansen co-integration and Vector error correction model are used for analysis. The Johansen co-integration confirms long-run relationship between the export of medical instruments and independent variables and VEC model results exhibit a direct positive relation of Hydro electricity generation and US\$ conversion in PKR with the export of medical instruments. Further, the positive relation between US dollar conversion in PKR and export of medical instruments is also theoretically supported because this relation encourage exporter in order to have more local currency against the export. Whereas the value of error correction is negatively significant and indicate a long term relation between independent variables and the export of medical instruments with a deviation of one unit having a recovery of 2 months and 9 days.

## 8. Limitations of the Study

As about 90% of medical instruments export is from Punjab territory, therefore we only focus on export from Punjab and in case energy we solely focus on hydroelectricity generated by GEPCO to meet research requirement. These limitations do not affect the validity of the results.

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## The Significance of Accreditation, Services Quality, Green Standards and Product Superiority on Customer Loyalty, With Mediating Role of Brand Image and Customer Trust; A Case of Healthcare Quality in Hospitals of Pakistan

<sup>1</sup>Manzar Abbas Hydari, <sup>2</sup>Muhammad Ali, <sup>3</sup>M Khyzer Bin Dost

<sup>1</sup> Superior University, Lahore, Pakistan

<sup>2</sup> Superior University, Lahore, Pakistan

<sup>3</sup> Superior University, Lahore, Pakistan

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p> <hr/> <p><b>Keywords</b> Accreditation, Brand Image, Customer Trust, Customer Loyalty, Green Hospital, Healthcare Industry, Services Quality</p> <hr/> <p><b>JEL Classification:</b> I11, O14,</p>	<p>The practices of Management Accounting have not been highly adopted in developing countries. But with increased importance of these practices, firms of developing countries are motivated to adopt MAPs. In this research, MAPs align with increased importance of SMEs have been studied and provide understanding to enhance adoption of MAPs in SMEs. This study outlines the usage of MAPs in Pakistani SMEs; identify the contextual factors that affect the adoption of MAPs by SMEs and lastly explore perceived benefits and problems in adoption of these practices. A mixed methodology was used to collect data. A questionnaire with five categories of MAPs was used to examine the extent of use of MAPs by 100 SMEs of Multan from textile sector. Eight interviews were conducted to identify the factors, benefits and problems. However, the results shows that majority of respondent firms adopt traditional MAPs and other medium sized firms do more focus on contemporary MAPs. The findings of current study can be helpful and informative for practitioners and policy makers in the development of contemporary MAPs as well as provide deep insight for SMEs to enhance their business by adopting these practices.</p>



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Corresponding author's email address: [khyzer\\_bin\\_dost@hotmail.com](mailto:khyzer_bin_dost@hotmail.com)

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### 1. Introduction

Standardized, secured and quality healthcare services delivery are key objectives of healthcare industry all around the world. But unfortunately health care institutions have been seen providing sub-standard and unacceptable services quality just like other industries and the service delivery of public hospitals adds insult to injury. Shabbir, Kaufmann, and Shehzad (2010) noticed that poor quality services in public hospitals motivate patients to visit private hospitals where hospital distance, treatment affordability,

therapy durations, medications, prompt service delivery by medical and paramedical staff are key factors of choosing private hospitals and these considerations are being constant due to delivery of improved health services. In Pakistan, mostly population tends to go to public or charity hospitals because treatment affordability is main concern for most of patients due to poor economic conditions.

Previous studies have acknowledged the fact that private sector provides outclass services to middle and upper-class of the country through excelling service quality and patient satisfaction and because of high trust levels as compared to public hospitals (Fatima, Malik, & Shabbir, 2018). Ujan, Bhutto, and Ismaili (2019) found that health industry in Pakistan is growing gradually from last couple of years as different institutions are paying attention on critical dimension of health (See Table 1). It is admissible fact that favorable brand image expands customer satisfaction that causes to enhance customer loyalty (Dennis, King, & Martenson, 2007).

Scholars discovered that customer trust is compelling agent between business operations and customer loyalty (Cheng, Chen, Yen, & Teng, 2017). This study aims to estimate and evaluate the claims that healthcare institutions get accreditation of different hospital standards and adopt green practices to provide quality health services and offer superior health products to its patients by establishing cooperative's brand image to get patient trust and loyalty. This study would also support in getting knowledge about patient's preferences and consequences on healthcare institutions.

**Table 1:** Health statistics of Pakistan

	2016-17	2017-18
Registered Doctors	195,896	208,007
Registered Nurses	99,228	103,777
Registered Dentists	18,333	20,463
Doctors per population	997	957
Dentists per population	10,658	9,730
Beds per population	1,592	1,580
*Source: Gallup Pakistan – Short Report on Health Statistics of Pakistan (2018)		

## Research Questions

Following questions are essential purpose of the investigation:

- What are the impacts of healthcare quality and environment standards, and could environment impact the trust, image branding and loyalty of patients?
- Whether quality services and product superiority affect in making brand image and building relationship of patient trust and patient loyalty?
- Does brand image of hospital and patient trust mediate the association between hospital standards, inner and outer environmental factors, product worthiness, healthcare service value and loyalty of patients?

## 2. Literature Review

### 2.1 Hospital Accreditation

Falstie-Jensen, Bogh, and Johnsen (2018) stated that hospital pursue accreditation as lifelong methodical structure for strengthening the track of throughputs that concentrate on governance and medical infrastructure including policies and procedures. The key objective is to be robust and give secure and quality care to patients. Anyways, aggregated testimonials of accreditation have endorsed fruitful implications while treating patients. Accredited medical institutes conduct on premise surveys after an interval of three-to-four years to guarantee consistent conformity of ongoing quality refinements. After



repeated accreditations, only somewhat evidences from literature are found that periodic accreditation cycles are effective. The studies demonstrated that hospitals devote ample finances on accreditation on first cycle and grab more advantages from consecutive three cycles, but this is not correlated to patient driven data. Investigations on patient-related outcomes are missing on effectiveness of periodically sequential accreditations (Falstie-Jensen et al., 2018).

## **2.2 Green Hospital**

Idea of green hospital is made by the U.S Green Building Council (USGCB). Green hospital is constructed with concept of reusing tangibles, decreasing waste, providing pure and hygienic material. The Joint Commission International (JCI) accreditation also focuses on the idea of green hospital to attain the objective of application of green business in health sector (Afifi & Amini, 2019). Karliner and Guenther (2011) elaborated that health industry is also participating in increasing ecological challenges although it endeavors to counter the consequences. Health industry is generating notable pollution involuntary and harming public health through resource consumption, wastes generation, construction and building operations.

Vittori (2002) described that building operations are one of main cause for generating of Carbon Dioxide from 35% to 45% in climate that is predecessor to global warming and wasting ozone layer. Karliner and Guenther (2011) stated that the Global Green and Healthy Hospitals Agenda (GGHHA) has taken first step to make attempts for more durable environmental wellness of worldwide health care industry. The GGHHA contains (1) Leadership (“Prioritize Environmental Health as a Strategic Imperative”), (2) Chemicals (“Substitute Harmful Chemicals with Safer Alternatives”), (3) Waste (“Reduce, Treat and Safely Dispose of Healthcare Waste”), (4) Energy (“Implement Energy Efficiency and Clean, Renewable Energy Generation”), (5) Water (“Reduce Hospital Water Consumption and Supply Potable Water”), (6) Transportation (“Improve Transportation Strategies for Patients and Staff”), (7) Food (“Purchase and Serve Sustainably Grown, Healthy Food”), (8) Pharmaceuticals (“Prescribe Appropriately, Safely Manage and Properly Dispose of Pharmaceuticals”), (9) Buildings (“Support Green and Healthy Hospital Design and Construction”), (10) Purchasing (“Buy Safer and More Sustainable Products and Materials”).

## **2.3 Product Superiority**

Consumer’s experience regarding product efficiency and linking it with expectations is known as product superiority. Consumers evaluate product superiority from the conclusions of how much happiness he or she has gotten from the product (Saleem, Ghafar, Ibrahim, Yousuf, & Ahmed, 2015). Fetter and Freeman (1986) expressed that hospitals and health givers offer health care products to individual patients in form of explicit series of goods and services, like other business corporations in the market. Specific treatment given to individual patients during proceedings of hospitalization depends on illness. This comprises of laboratory, radiology, ancillary and pharmaceutical services, prescribed by physicians, as part of treatment along with nursing care, operation theatre, surgical supplies, hotel and social services. Since hospital’s actual business is to treat patients, these are transitional acquisitions. Therefore, a set of these interim outputs given to individual patient is called a “product” of a hospital. Thus, hospital is a multi-product company having numerous goods and services. The product-line of the hospital is likely as comprehensive as it serves the patient volumes.

Hospitals have started struggling hard in focusing on superiority of healthcare products to incite patients in selecting best healthcare facility. Healthcare providers take service quality as critical component and sound benchmark as an edge to other healthcare facilities (Fatima et al., 2018).

## **2.4 Service Quality**

Kotler and Keller (2015) determined that “Quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs”. In context of healthcare, Wu

(2011) noticed that gap between patient's beliefs and impressions could be described as service quality. Beliefs are patient's expectations regarding medical offerings in hospital while impressions are patients' actual experience regarding specific medical service with reference to expectations. Practically, service quality in hospital deals with belief and impression of patient alignments. Hospital service excellence is the creditability divergence of services impression to patients and attendants and beliefs on services proposed by hospitals (Upadhyai, Jain, Roy, & Pant, 2019).

During presence of customers, services are performed and expended all together, and efficiency and quality of service can vary. Some disturbance may be occurred by undermining customer satisfaction due to prolonged waiting time. For endurance and progress of business, researchers have made association between service quality and customer satisfaction (Mbutia & Thaddaeus, 2015). Due to customer sophisticated expectations and desires, hospitals go with superior healthcare services to accomplish healthcare concerns (Fatima et al., 2018). Upadhyai et al. (2019) stated that unsatisfactory quality may cause assorted sensations in patients, attendants and families having fatigue and emotional tension, disappointments and desperations, being panic on additional expenditures, complicity in management of care, stress causing hindrance in health care pathways, disaffection from care arrangements.

## **2.5 Customer Trust**

Customer trust is beliefs of consumer on faith and loyalty of an entity while giving commitments (Afifi and Amini, 2019). Trust is the practicable speculation, associated convenience, and builds frequent correspondence that generates admirable affiliations (Lestariningsih et al., 2018). Customers become more loyal as company takes customer-friendly measures and therefore they intend to do more business with companies (Van Vuuren, Roberts-Lombard, & Van Tonder, 2012).

Medical researchers have established the fact that patient trust is extremely complicated. Nepotism in providing quality service would demolish customer trust. Some philosophers are convinced that patient trust is a firmed posture that physician would undertake treatment in a secured fashion (Shabbir et al., 2010). Leisen and Hyman (2001) noted that patients trust to physicians in curing diseases and expect proficiency and affirmative results along with goodwill. Patients expect that medications advised by physicians would cordially cure diseases and by this trust patients believe in treatments. In institutional terms, trust promotes products optimistically and elegant referrals that cause to improve the volume of business.

## **2.6 Brand Image**

Critical determining factor of decision making amongst the customers is recognized as Brand Image (Lock, 2016). Critical determining factor of decision making amongst the customers is recognized as Brand Image (Lock, 2016). Wu (2011) stated that in scenarios of healthcare, brand image of hospital is a set of faiths, understandings and reactions that a patient perceives from the hospital. . Patient builds brand image from the experience of clinical examinations and treatment encounters. In addition, hospitals use to build brand image through strategic marketing operations to improve competing postures. Therefore, sympathetic brand image of hospital inspires patient in selecting hospital.

Results of various studies have approved that brand image holds major impression on customer loyalty with slight disparities. A few research work has proved that brand image effects customer loyalty with other mediating elements whereas some researchers have demonstrated that brand image has no effect of customer loyalty (Yi Zhang, 2015).

## **2.7 Customer Loyalty**

Kotler and Keller (2015) defined loyalty as, "a deeply held commitment to rebuy or re-patronize a preferred product or service in the future despite situational influences and marketing efforts having the

potential to cause switching behavior". Sentimental affiliation is constructed between perpetual customers and company by building up loyalty redeems. Business share would rise as customer gives optimistic feedback and, loyal customers are easily attainable as compared to fresh ones (Mbuthia and Thaddaeus, 2015).

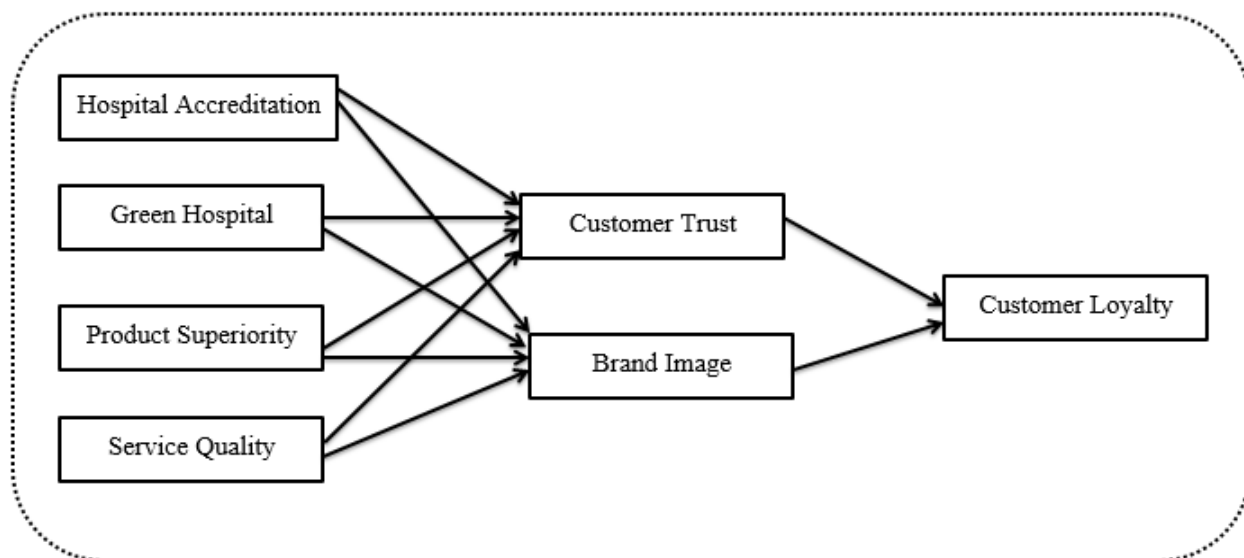
Anwar et al. (2011) found that health care service excellence influences patient faithfulness through patient peace of mind, and previous studies showed that satisfaction and trust plays a mediating role between quality service and loyalty (Ou, Shih, Chen, & Wang, 2011). Meesala and Paul (2018) noticed that satisfaction of women with service quality in hospitals effect loyalty to hospitals whereas this is not all with menfolk. (Patawayati et al., 2013) stated that trust impacts loyalty implicitly in a positive fashion as extensive trust would result in exceeding loyalty.

Sciulli and Missien (2015) affirmed that quality, service value and patient consummation in healthcare sector effect behavioral motives and, patient's re-considerations in getting hospital services for positive results that could be a pointer to loyalty in hospital marketing. Latif, Islam, Mohamad, Sikder, and Ahmed (2015) narrated that superior product offers distinct and exceptional supremacy from other products that do not present any distinctive feature and that specific product establishes compelling brand image. Lock (2016) found that product or service superiority determines the brand image that impacts trust on product.

### 3. Research Methodology

#### 3.1 Hypothetical Research Framework

This investigation applies the descriptive methodology to explain the hypotheses. The conceptual framework of research consists of independent, mediating and dependent variables.



**Figure 1:** Hypothetical Research Framework

The above **Error! Reference source not found.** shows that hospital accreditation, green hospital, product superiority and services quality are independent variables and customer loyalty is a dependent variable. Furthermore, customer trust and brand image are mediating variables.

#### 3.2 Hypotheses

H1: Patient trust mediates the positive association between hospital accreditation and patient loyalty.

H2: Patient trust mediates the positive association between green hospital and patient loyalty.

H3: Patient trust mediates the positive association between product superiority and patient loyalty.

- H4: Patient trust mediates the positive association between healthcare quality services and patient loyalty.
- H5: Brand image mediates the positive association between hospital accreditation and patient loyalty.
- H6: Brand image mediates the positive association between green hospital and patient loyalty.
- H7: Brand image mediates the positive association between product superiority and patient loyalty.
- H8: Brand image mediates the positive association between healthcare quality services and patient loyalty.

### **3.3 Research Approach**

This study used the quantitative research approach using a comprehensive questionnaire to measure responses. Bolarinwa (2015) defines the questionnaire as data collection tool that predefines a set of questions used to collect and record information about specific subject matter.

### **3.4 Population, Sample and Sampling Technique**

Population used for this research involves hospitals that provide healthcare facilities to patients. Privacy, security and confidentiality remained the key constraints for meeting and getting patient specific information that is why the researcher decided to use snowball sampling technique. The researcher selected seven hospitals as snowball sampling based on professional contacts from targeted population of health care institutions of Pakistan, considering them the influential persons in those hospitals.

A sample of 390 respondents was calculated by multiplying the total number of items with 10 as per Wolf, Harrington, Clark, and Miller (2013) rule. However a total of 580 questionnaires were distributed out of which 447 responses were obtained. The contacted persons were explained the objectives of survey and questions in questionnaire; and they were asked to fill the questionnaires independently being part of hospitals. They were asked further to attain the services of volunteer staff in their references and guide patients, patient families and visitors by elaborating the survey questionnaires to get their visit experience in the hospital.

### **3.5 Instrument**

A concise and close-ended survey questionnaire was designed to evaluate the latent variables to be participated in undergoing investigation. Items used for the constructs were chosen carefully from previous research studies to assure the content validity. Some questions were extracted from literature as self-extracted items. This survey form contained two parts, first section was comprised of 4 questions related to respondent's demographics; and the second part entailed questions discovering perception of respondents regarding hospital facilities, treatment quality, satisfaction levels, trust and loyalty towards health care providers.

By applying quantitative research method, survey questionnaire was designed as research instrument for this investigation report. All healthcare facilities were measured using five-point Likert scale representing: "Strongly disagree = 1", "Disagree = 2", "Not decided = 3", "Agree = 4", and "Strongly agree = 5". Items in Table 13 are used to measure constructs and adopted from prior research work.

### **3.6 Data Analysis Tool**

Data is examined in SPSS 20, which is a leading software suite to be used for interactive statistical analysis in social sciences by educational, medical, marketing, financial and other researchers, and SmartPLS (v. 3.2.8) which is one of the leading software tool with Graphical User Interface (GUI) for Variance-Based Structural Equation Modeling (VB-SEM) using the Partial Least Squares (PLS) path molding technique (Ringle et al., 2015). Sandoval and Ramos-Diaz (2018) encourages to use PLS-SEM approach (SmartPLS software) due to flexible software. Recording of coded outputs are made in MS Excel as CSV file to analyze in data analysis tools.

#### 4. Results and Analysis

The researcher distributed 580 questionnaires. After completing surveys, packed surveys in sealed envelopes were returned to researcher by hand or by courier services. Finally, out of 580 questionnaires, 447 valid responses with feedback of 77.07% were returned. During data collection process, survey was safeguarded by anonymity and voluntary contribution.

**Table 2:** Sample statistics

Sr. No	1	2	3	4	5	6	7	Total
Hospital	A	B	C	D	E	F	G	
Distributed	60	60	100	100	100	100	60	580
Received	54	29	79	84	96	69	37	447
Response Rate (%)	90.00	48.33	79.00	84.00	96.00	69.00	61.67	77.07

Note: Hospital names are kept secret because of anonymity

#### 4.1 Demographic statics

In Table 3, demographics (n = 447) illustrates that dominants respondents comprises of male gender of 60.6%, age 21–30 years of 37.8%, education graduation of 37.2% and visit purpose as family members of 27.3%.

**Table 3:** Demographic Analysis

Demographics		Frequency	Percent	Valid percent
<b>Gender</b>				
Valid	Male	271	60.6	60.8
	Female	155	39.1	39.2
	Total	446	99.8	100
Missing		1	0.2	
Total		447	100.0	
<b>Age</b>				
Valid	20 years or less	37	8.3	8.3
	21 – 30 years	168	37.6	37.8
	31 – 40 years	151	33.8	34.0
	41 – 50 years	63	14.1	14.2
	51 years or above	25	5.6	5.6
	Total	444	99.3	100.0
Missing		3	0.7	
Total		447	100.0	
<b>Education</b>				
Valid	Matriculation or less	44	9.8	10.0
	Intermediate	68	15.2	15.5
	Graduation	163	36.5	37.2
	Masters	141	31.5	32.2
	M. Phil or above	22	4.9	5.0
	Total	438	98.0	100.0
Missing		9	2.0	
Total		447	100.0	

Visit purpose				
Valid	A general visitor	46	10.3	10.6
	Visit to patient	72	16.1	16.5
	As patient family	119	26.6	27.3
	For medical tests	92	20.6	21.1
	For medical treatment	107	23.9	24.5
	Total	436	97.5	100.0
Missing		11	2.5	
Total		447	100.0	

### 4.2 Consistent PLS (PLSc)

The consistent PLS (PLSc) procedure makes improvement in interrelationships of reflective constructs to build reliable outcomes with a factor model (Dijkstra & Schermelleh-Engel, 2014) (Dijkstra & Henseler, 2015).

The consistent PLS Path modeling assessment is exhibited in Figure 1.

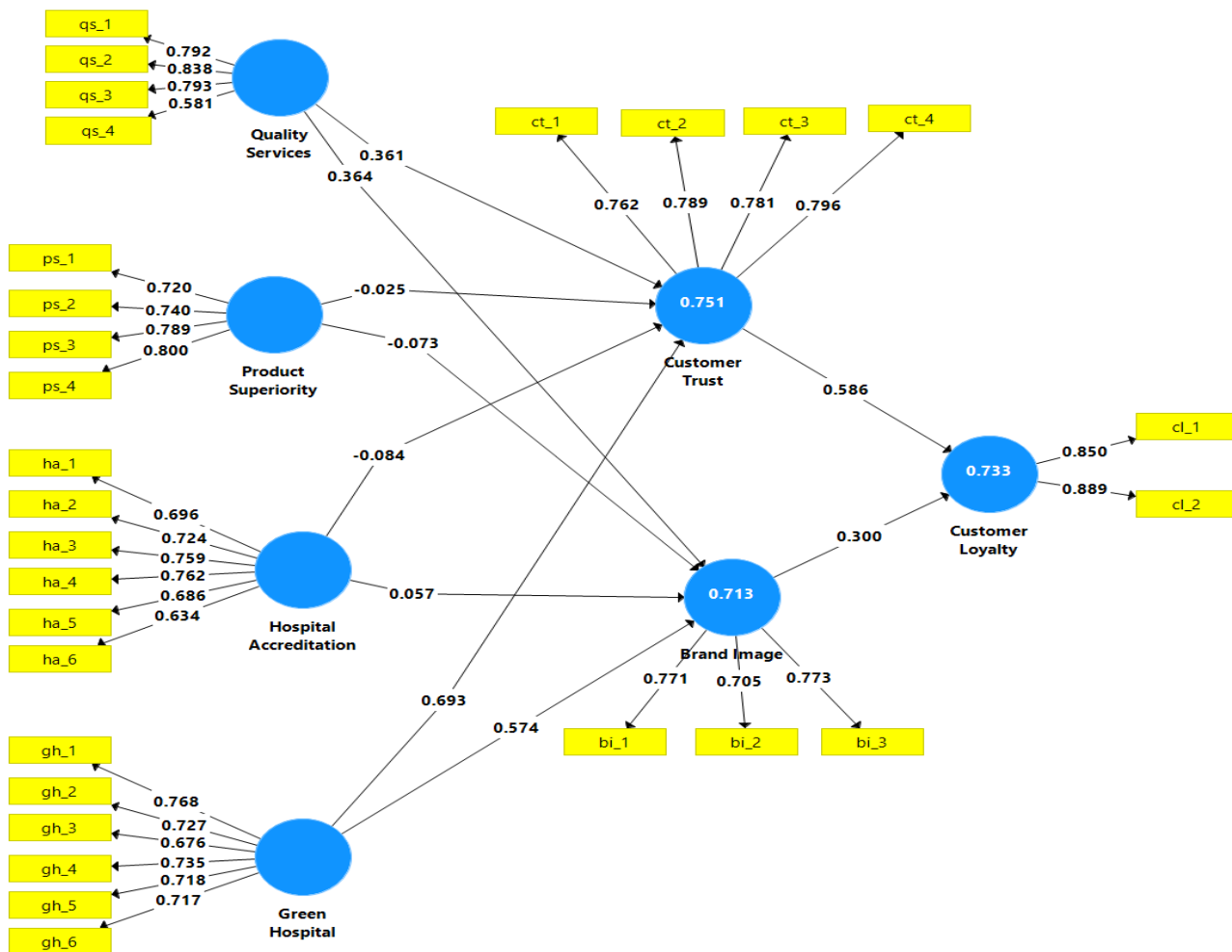


Figure 1: PLS Path model - Structural Equation Modeling (SEM) diagram

### 4.3 Measurement Model Analysis (Outer Model)

Evaluation of reflective external model includes consistency investigations of the specific items (indicator reliability), construct reliability, internal consistency (Cronbach Alpha and Composite Reliability), construct validity (loadings, and cross-loadings), convergent validity (Average Variance Extracted

(AVE)), and Discriminant Validity (Fornell-Larcker measure, Cross Loading, and HTMT condition) (Ab Hamid, Sami, & Sidek, 2017)

#### 4.4 Reliability

Reliability can be defined as firmness of measuring instrument i.e. questionnaire. If results of the measuring instrument are constant and less deviated, it means the higher reliability of instrument. Composite Reliability (CR) and Cronbach's Alpha are frequently in-use measures for Internal Consistency that measures the reliability depends on correlation of constructs. The reliability of data could be found by the coefficient of Cronbach's Alpha or Composite Reliability. Range of the coefficient is between 0.0 and 1.0; where higher value specifies higher reliability. In exploratory study, Cronbach's Alpha or Composite Reliability acceptable measures are between 6.0 and 7.0 whereas in more advanced levels the value of Cronbach's Alpha / Composite Reliability (CR) should be greater than 7.0. However, more than 9.0 value is not required and the value more than 9.5 is certainly not acceptable (Ab Hamid et al., 2017).

**Table 4:** Cronbach's Alpha and Compsite Reialbility

Latent variables	Cronbach's Alpha	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
Brand Image	0.795	0.796	0.794	0.563
Customer Loyalty	0.861	0.862	0.861	0.756
Customer Trust	0.863	0.863	0.863	0.611
Green Hospital	0.868	0.869	0.868	0.524
Hospital Accreditation	0.860	0.862	0.860	0.506
Product Superiority	0.848	0.849	0.848	0.582
Quality Services	0.855	0.856	0.855	0.663

In Table 4**Table**, values of latent variables for Cronbach's Alpha and Composite Reliability (CR) falls between 0.7 and 0.9 and these have good reliability.

#### 4.5 Validity

Construct Validity indicates an assessment intended to calculate a construct measuring that latent variable. Average Variance Extracted (AVE) should be 0.5 or higher (Bagozzi & Yi, 1988). AVE of each latent variable in Table 4**Table** is higher than 0.5 that is adequate for convergent validity. Discernment Validity or Divergent Validity establishes that indication that measure constructs must differ hypothetically from one another. The intensity of discriminant validity coefficients must prominently smaller than convergent validity coefficients (Hubley, 2014). Henseler, Ringle, and Sarstedt (2015) emphasized to employ the HTMT criterion for the evaluation of discernment validity in Variance-Based (VB) Structural Equation Modeling (SEM).

**Table 5:** Discriminant Validity (using HTMT)

Latent Variable	Brand Image	Customer Loyalty	Customer Trust	Green Hospital	Hospital Accreditation	Product Superiority	Quality Services
Brand Image							
Customer Loyalty	0.797						
Customer Trust	0.850	0.842					

Green Hospital	0.797	0.730	0.833				
Hospital Accreditation	0.771	0.691	0.763	0.820			
Product Superiority	0.653	0.659	0.680	0.709	0.748		
Quality Services	0.695	0.660	0.708	0.616	0.830	0.754	

Note: HTMT < 0.85 (Kline, 2015), HTMT < 0.90 (Gold, Malhotra, & Segars, 2001)

From the results in **Error! Reference source not found.**, study-wide HTMT for PLSc are within the threshold except 0.85 that is quite below from the strict threshold of (Kline, 2011). Therefore, discriminant validity of measurement is confirmed.

**Table 6:** Confidence Interval Biased Corrected

		Original Sample (O)	Sample Mean (M)	Bias	2.50 %	97.50 %
Customer Loyalty	Brand Image	0.797	0.797	0	0.722	0.867
Customer Trust	Brand Image	0.850	0.850	0	0.783	0.904
Customer Trust	Customer Loyalty	0.842	0.842	0	0.772	0.893
Green Hospital	Brand Image	0.797	0.796	-0.001	0.719	0.861
Green Hospital	Customer Loyalty	0.730	0.728	-0.001	0.649	0.803
Green Hospital	Customer Trust	0.833	0.833	-0.001	0.773	0.885
Hospital Accreditation	Brand Image	0.771	0.771	-0.001	0.695	0.836
Hospital Accreditation	Customer Loyalty	0.691	0.691	0	0.615	0.759
Hospital Accreditation	Customer Trust	0.763	0.764	0	0.692	0.826
Hospital Accreditation	Green Hospital	0.820	0.821	0	0.762	0.871
Product Superiority	Brand Image	0.653	0.654	0.001	0.557	0.732
Product Superiority	Customer Loyalty	0.659	0.659	0	0.571	0.737
Product Superiority	Customer Trust	0.680	0.681	0.002	0.588	0.764
Product Superiority	Green Hospital	0.709	0.709	0	0.635	0.775
Product Superiority	Hospital Accreditation	0.748	0.747	-0.001	0.660	0.819
Quality Services	Brand Image	0.695	0.694	0	0.610	0.771
Quality Services	Customer Loyalty	0.660	0.659	0	0.574	0.734
Quality Services	Customer Trust	0.708	0.708	0	0.629	0.778
Quality Services	Green	0.616	0.617	0.001	0.536	0.690



	Hospital					
Quality Services	Hospital Accreditation	0.830	0.830	0	0.761	0.888
Quality Services	Product Superiority	0.754	0.755	0.001	0.681	0.819

Bootstrapping procedure allows to determine whether HTMT considerably deviates from the value one (HTMTInference). There are two hypotheses in HTMT: H0 (HTMT  $\geq$  1) null hypothesis, a confidence interval of 1 indicates shortfall in discriminant validity; H1 (HTMT  $<$  1) an alternative hypothesis, if the value 1 falls out of boundaries of interval, the two variables are different empirically. In this study, Table 6 indicates that neither lower nor upper boundary confidence interval includes in the value of 1. Therefore, in conclusion discriminant validity has been established by running complete bootstrapping (5,000 samples) routine.

#### 4.6 Model Fit

After accessing the reliability and validity, the requirement is to access model fit. SRMR (Standardized Root Mean Square Residual) is the variance between data and model estimates is known as the residuals. Average of the residuals are measured, and its square root is processed. Hu & Bentler (1999) recommended that SRMR close to 0.8 or lesser corresponds to a sufficiently appropriate. A zero worth of SRMR specifies an absolute balance between model estimates and data. SRMR value in Table 7, model examined from the output of SmartPLS is 0.043. Therefore, it could be brought about good fitness of the model.

**Table 72:** Model Fit Summary

	Saturated Model	Estimated Model
SRMR	0.039	0.043
d_ ULS	0.631	0.737
d_ G	0.383	0.403
Chi-Square	881.568	921.526
NFI	0.89	0.885

NFI (Normed Fit Index) likewise recognized as the Bentler-Bonett Normed Fit Index points out that model being estimated has inconsistency between independence model and saturated model. The NFI differs between 0 and 1; where 1 is perfect. In Table 7, NFI is of 0.885, that specifies that model of interest has developed the fit by 88.5% comparative to void or imperative model.

#### 4.7 Structural Model Analysis (Inner Model)

After the confirmation that measurement model is reliable and valid, the subsequent phase is to measure and estimate the inner structural model. It contains extrapolative relevance of the model and relationships amongst the latent variables. Therefore, (1) coefficient of the determination (R-square), (2) Path coefficient (Beta value), (3) T-statistics value, (4) Effect size (f-square), (5) Predictive relevance of the model (Q-square), and (6) Goodness-of-Fit (GoF) index are the leading measures for the assessment of inside structure of the model.

#### 4.8 R-Square

The R2 assessment validates the variance percentage in exogenous construct that is described by endogenous constructs. According to J. F. Hair, Ringle, and Sarstedt (2011), the R-Square value above 0.75 is bigger, value 0.50 is medium and value 0.25 is smaller.

**Table 8:** R Square

Latent Variable	R Square	R Square Adjusted
Brand Image	0.713	0.710
Customer Loyalty	0.733	0.732
Customer Trust	0.751	0.748

In

Table 8, R-Square for latent variables Brand Image (0.713) and Customer Loyalty (0.733) are larger than 0.50. R<sup>2</sup> for Brand Image and Customer Loyalty is categorized as moderate. R-Square for the construct Customer Trust (0.751) is greater than 0.75 that can be categorized as substantial.

#### 4.9 F-Square

The effect size ( $f^2$ ) is a measure that is utilized to evaluate the respective effect of a forecaster construct on an independent construct (Pek & Flora, 2018). According to Lorah (2018),  $f^2$  value of 0.35 is considered as large, value of 0.15 is considered as medium, and value of 0.02 is considered as small effect sizes.

**Table 9:** Effect size (F-Square)

Construct	Brand Image	Customer Loyalty	Customer Trust
Brand Image		0.092	
Customer Loyalty			
Customer Trust		0.352	
Green Hospital	0.325		0.547
Hospital Accreditation	0.002		0.005
Product Superiority	0.006		0.001
Quality Services	0.117		0.113

In Table 9: Effect size (F-Square), the F-Square of variable Brand Image (0.092) is classified as low effect to Customer Loyalty variable. F-Square value of variable Customer Trust (0.352) is classified high effect to Customer Loyalty. The F-Square of variable Green Hospital (0.325) is classified as moderate effect to Brand Image; and variable Green Hospital (0.547) has high effect to Customer Trust. Hospital Accreditation has no influence on Brand Image (0.002) and Customer Trust (0.005) with values approximate to zero. Similarly, Product Superiority also has no impact on Brand Image and Customer Trust with values 0.006 and 0.001, respectively. Quality Services has low impact on Brand Image (0.117) and Customer Trust (0.113).

#### 4.10 Q-Square

Blindfolding is a method of sample recycling that calculate the Stone-Geisser's  $Q^2$  value which indicates valuation standard for cross-validated analytical significance of PLS path model. Q-Square test is used prediction relevance of model and  $Q^2$  values greater than zero that indicates that values are restructured thoroughly, and the model entertains predictive significance. Henseler, Ringle, and Sinkovics (2009) described that blindfolding measures are functional for only endogenous constructs in implementation of reflective measurement model.

Table 10 indicates that Brand Image ( $Q^2 = 0.346$ ), Customer Loyalty ( $Q^2 = 0.477$ ), and Customer Trust ( $Q^2 = 0.396$ ) are above zero that indicates that values soundly rebuilt the model, and model realizes the predictive significance.

**Table 10: Q-Square**

Construct	SSO	SSE	$Q^2 = (1 - SSE)/SSO$
Brand Image	1,341.00	877.13	0.346
Customer Loyalty	894.00	467.47	0.477
Customer Trust	1,788.00	1,079.56	0.396

#### 4.11 Goodness of Fit Index

As stated by Henseler and Sarstedt (2013), Goodness of Fit (GoF) index for PLS is estimated as the geometric mean of the average variance explained and the R-Square value.

$$GoF = \sqrt{\text{Average of AVE} \times \text{Average of } R^2} = 0.663$$

Aban, Perez, Ricarte, and Chiu (2019) depicts that GoF value of 0.1 should be considered as small, GoF value of 0.25 should be considered as medium, and GoF of value 0.36 or above should be considered as large. Henceforth, the GoF value of 0.633 is a large value that could be considered as a very good model fit.

#### 4.12 Collinearity statistics (VIF)

Multicollinearity is reciprocal of the tolerance value that takes place as two or more forecasters in the model are interrelated and deliver repetitious facts regarding the response. It evaluates to what degree the variance of a regression coefficient is exaggerated caused by multicollinearity in the model. Multicollinearity is calculated through Variance Inflation Factors (VIF) and tolerance. The rule of thumb for multicollinearity test is considering both result of tolerance and VIF where if the tolerance above 0.1 and VIF is below 10, it means that the variable is free of multicollinearity (Pangaribuan, Aggraeni, & Sitinjak, 2018).

**Table 11: Collinearity statistics (VIF)**

Latent Variable	Brand Image	Customer Loyalty	Customer Trust
Brand Image		1.990	
Customer Loyalty			
Customer Trust		1.990	
Green Hospital	2.198		2.198
Hospital Accreditation	2.906		2.906
Product Superiority	2.142		2.142
Quality Services	2.291		2.291

In Table 11, the VIF scores of the dependent variables for traditional PLS are below than threshold value of 3.3 (Diamantopoulos & Winklhofer, 2001), and thus inferring that there is no inner collinearity problem.

#### 4.12 Hypothesis Testing

Table 12 demonstrates the values of path coefficient ( $\beta$ ), t-statistics and p-value. The outcomes of hypotheses assessment could be estimated as follow:

**Table 12:** Hypothesis Testing

Hypothesis	Path	Path Coefficient ( $\beta$ )	T-Statistics t=1.96*	P Value	Status
H1	Hospital Accreditation to Customer Loyalty through Customer Trust	0.172	2.094	0.036	Supported
H2	Green Hospital to Customer Loyalty through Customer Trust	0.021	0.301	0.763	Not Supported
H3	Product Superiority to Customer Loyalty through Customer Trust	-0.012	0.343	0.732	Not Supported
H4	Quality Services to Customer Loyalty through Customer Trust	0.094	1.545	0.122	Not Supported
H5	Hospital Accreditation to Customer Loyalty through Brand Image	0.421	3.682	0	Supported
H6	Green Hospital to Customer Loyalty through Brand Image	-0.082	0.676	0.499	Not Supported
H7	Product Superiority to Customer Loyalty through Brand Image	-0.013	0.208	0.835	Not Supported
H8	Quality Services to Customer Loyalty through Brand Image	0.232	2.362	0.018	Supported

\*t-value= 1.96 at 5% two-tailed

H1: The mediating impact of Customer Trust between Hospital Accreditation and Customer Loyalty is gotten by the path coefficient which result 0.172; t-value 2.094 greater than 1.96; p-value 0.036 less than 0.05. So, there is adequate indication to accept the hypothesis (H1) which means that Hospital Accreditation is completely significant on Customer Loyalty mediating through Customer Trust.

H2: The mediating impact of Customer Trust between Green Hospital and Customer Loyalty is gotten by the path coefficient which result 0.021; t-value 0.301 less than 1.96; p-value 0.763 greater than 0.05. So, there is no adequate indication to accept the hypothesis (H2) which means that Green Hospital is not definitely significant on Customer Loyalty mediating through Customer Trust.

H3: The mediating impact of Customer Trust between Product Superiority and Customer Loyalty is obtained by the path coefficient which result -0.012; t-value 0.343 less than 1.96; p-value 0.732 greater than 0.05. So, there is no satisfactory indication to accept the hypothesis (H3) which means that Product Superiority is insignificant on Customer Loyalty mediating through Customer Trust.

H4: The mediating impact of Customer Trust between Quality Services and Customer Loyalty is gained by the path coefficient which result 0.094; t-value 1.545 less than 1.96; p-value 1.122 greater than 0.05. So, there is no acceptable indication to accept the hypothesis (H4) which means that Quality Services is positively insignificant on Customer Loyalty mediating through Customer Trust.

H5: The mediating impact of Brand Image between Hospital Accreditation and Customer Loyalty is attained by the path coefficient which result 0.421; t-value 3.682 greater than 1.96; p-value 0 less than

0.05. So, there is adequate indication to accept the hypothesis (H5) which means that Hospital Accreditation is positively significant on Customer Loyalty mediating through Brand Image.

H6: The mediating impact of Brand Image between Green Hospital and Customer Loyalty is gotten by the path coefficient which result  $-0.082$ ; t-value  $0.676$  less than  $1.96$ ; p-value  $0.763$  greater than  $0.05$ . So, there is no enough evidence to accept the hypothesis (H6) which means that Green Hospital is not unquestionably significant on Customer Loyalty mediating through Brand Image.

H7: The mediating impact of Brand Image between Product Superiority and Customer Loyalty is gained by the path coefficient which result  $-0.013$ ; t-value  $0.208$  less than  $1.96$ ; p-value  $0.499$  greater than  $0.05$ . So, there is no acceptable indication to accept the hypothesis (H7) which means that Product Superiority is positively insignificant on Customer Loyalty mediating through Brand Image.

H8: The mediating impact of Brand Image between Quality Services and Customer Loyalty is attained by the path coefficient which result  $0.232$ ; t-value  $2.362$  less than  $1.96$ ; p-value  $0.018$  greater than  $0.05$ . So, there is adequate indication to accept the hypothesis (H8) which means that Quality Services is certainly significant on Customer Loyalty mediating through Brand Image.

## 5. Discussion

The hypothesis (H1) describes that hospital accreditation impact positively to customer loyalty mediating through customer trust that means accreditation of standards supports in getting patient loyalty when patient trust is gotten. Consultations from hypotheses (H2) and (H3) describes that green hospital and product superiority both does not influence to customer loyalty through customer trust. The result of hypothesis (H4) describes that quality services do not influence to customer loyalty through customer loyalty that is not in agreement with that of (Lestariningsih et al., 2018).

Consequences from hypothesis (H5) depicts that customer loyalty is supported by hospital accreditation by mediating through brand image means that patients from Pakistan becomes loyal to hospitals if accreditation programs of hospital are successful in building brand image. Findings from both hypothesis (H6) and (H7) describes that customer loyalty can neither be supported from green hospital and nor from product superiority mediating through brand image. It seems that hospital efforts in delivering superior products and services and creating green environment in hospitals are not enough to build image of brands in minds of patients so that they could become loyal to hospitals. Outcomes of hypothesis (H8) confirm that quality services support customer loyalty positively through brand image; this means quality services in Pakistan provides support in making brand image of hospital in market that makes the customers to become loyal to hospital.

## 6. Conclusion

This study inspects the framework of services quality, product superiority, green hospital, and hospital accreditations on customer loyalty mediating through customer trust and brand image. The previous research studies focused on dimensions of healthcare services quality using different variables like patient satisfaction, customer trust, customer value, customer loyalty, green hospitals and hospital accreditations from different aspects.

This study explores the impact of healthcare quality services, quality improvement measures like attaining accreditation standards and implementation of green hospital concept, by adding two more variables of product superiority and brand image on patient loyalty. The findings of the investigations show that quality services and green hospital environment influences customer trust directly; and green hospital environment, product superiority and quality services impact brand image directly.

Customer trust and brand image also influence customer loyalty directly. Insofar as mediating effect, only hospital accreditation could support patient loyalty through customer trust and brand image; quality services construct could support customer loyalty through brand image construct. Whereas hospital accreditation and product superiority variables do not support customer trust and brand image directly; and green hospital, product superiority and quality services construct do not support to customer loyalty through customer trust; and green hospital and product superiority variables to customer loyalty through brand image of hospital.

Hospital management in Pakistan should dedicate efforts towards providing superior healthcare quality services are at the same height of customer satisfaction, trust and loyalty. Most of the customer are cautious not to discuss their feelings openly including complaints although hospital management encourage patients to log their complaints (Shabbir et al., 2010). Patients demand ever more quality in healthcare services. If they do not get as per expectations, they would switch to alternative hospital for better-quality facilities.

### 7. Limitations and Future Directions

The investigation outcomes are likely to build better considerations on accreditation, green environment of hospitals, and thereafter superiority and quality services by keeping in view trust and brand image while focusing on loyalty in healthcare industry of Pakistan. However, the mediating role of customer trust between green hospital, product superiority, quality services and customer loyalty is still open to discuss. Furthermore, data collected from seven hospitals cannot represent all hospitals of Pakistan. Therefore, results obtained from the study cannot not be generalized. Small sample size might not be able to generate significant outcomes. Researcher could get limited sample size (447 responses) that is also a limitation of this study since based on larger data sets researcher could have produced more precise results.

For future studies, integrated model can be replicated with a variety of hospital types or other settings to verify its applicability that might give distinctive or more supportive results. Further study could be planned to examine the attributes of hospital accreditations, services quality, brand image, customer trust, and customer loyalty in healthcare sector of other regions of the world using qualitative or mixed approaches. Current investigation has incorporated the mediating roles of brand image and customer trust while future studies might incorporate patient satisfaction. The study focused on patients, attendants, patient families and visitors while future researchers should incorporate input from medical and paramedical, other hospital staff and vendors to investigate variables brand image, trust and loyalty.

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## Hospital Service Quality and Patient Satisfaction: A Moderating Role of Trustworthiness

<sup>1</sup>Tariq Rafi, <sup>2</sup>Muhammad Khalique, <sup>3</sup>Sulaman Hafeez Siddiqui

<sup>1</sup>Jinnah Post Graduate Medical Centre, Pakistan; rafi57@hotmail.com

<sup>2</sup>Assistant Professor, MUST Business School (MBS) Mirpur University of Science and Technology (MUST), Mirpur Azad Jammu and Kashmir, Pakistan; drmkhalique@gmail.com

<sup>3</sup>Lecturer Department of Management Sciences, The Islamia University of Bahawalpur, Bahawalpur, 63100 Pakistan; sulman.siddiqui@iub.edu.pk

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The aim of the present study is to determine the effects of hospital service qualities on patient satisfaction in the healthcare sector of Pakistan. By using the non-probability sampling, 292 sample was gathered. Emotional exhaustion, organizational citizenship behavior, hospital and nurses facilities were used as predictors and trustworthiness was used as a moderator. The results from structural equation modeling revealed that hospital facilities quality and OCB have been found positively significant while nursing service quality and emotional exhaustion have been found insignificant in relation with patient satisfaction. Moreover, trustworthiness does not moderates any relationship in the structural model. The study concluded that the staff allocated is manifesting form of behavioral citizenship structured by cultural decorum and locally acceptable norms. Alongside citizenship, high quality miscellaneous supportive provisions comprising of sufficient backup equipment, medical apparatus and tools as well as the regular maintenance of utilities stand as considerable satisfaction determining aspects for patients. The cognitive dimensions in the form of trust structuring attributes don't really add much to the contributions of facilities and citizenship found in hospitals.



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Corresponding author's email address: rafi57@hotmail.com

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**1. Introduction**

Since few decades, the improvement in the process of nursing and hospital services have become major concern in Pakistan. Patient satisfaction with healthcare services is an important performance measure for healthcare providers. The preference for the healthcare organization is revealed from the patient centeredness that is implementing particular policies for achieving this objective (Silva, Ferreira, &

Daniel, 2018). A more effective and efficient use of resources as well as better performance of healthcare organizations is ensured as there are social stimulations in order to enhance the well-being and health of individuals and economic objectives behind these policies (Oppel, Winter, & Schreyögg, 2017; Tartaglione, Cavacece, Cassia, & Russo, 2018). Patients' satisfaction with quality of care has been revealed as an important component that explains a competitive position and survival of the hospital (Coutinho & da Costa Vieira, 2018).

It has been deemed that positive word of mouth is revealed from the satisfied patients that are usually returned due to their involvement in the hospitals. On the other hand, negative word-of-mouth, repeated investigations, and complaints, and second opinions are driven through the dissatisfaction. Thereby, a requirement for maintaining and expanding a patient base of hospital is due to high levels of patient satisfaction (Oppel et al., 2017).

Furthermore, past studies have shown that patient's satisfaction can be improved by nursing service quality (Coutinho & da Costa Vieira, 2018). In this context, Lukman, Tiara, and Mei (2017b) proclaimed that nursing service quality that ensure hospitality, good quality healthcare attention and courtesy. Henceforth, nursing service quality and patient satisfaction have significantly positive relationship that was also profoundly supported by (Aslan & Yildirim, 2017; Kaihatu & Djati, 2016; Ríos-Risquez & García-Izquierdo, 2016). In addition, nursing service quality was also considered an important factor, having positively significant impact, on patient satisfaction (Al-Hussami et al., 2017).

Moreover, numerous past researches have also shown that hospital facilities quality can help to improve patient satisfaction (Coutinho & da Costa Vieira, 2018). In this regards, there were ample literature that postulated positively significant relationship between hospital facilities quality and patient satisfaction (Halim & Sriwahyuni, 2017; Ziapour, Khatony, Jafari, & Kianipour, 2016). Another recent study claimed that patient satisfaction can be improved by adequate quality of hospital facilities (Sahu, Abdullah, & Masood, 2017). On the contrary, Patil and Shah (2018) found that quality of hospital facilities have none contribution to patient overall satisfaction with the hospital.

However, various studies in the past suggested that emotional exhaustion can decrease patient's satisfaction with the hospital and healthcare organizations (Ríos-Risquez & García-Izquierdo, 2016). There are extant studies of the recent times that recognized consequences of hospital staffs' emotional exhaustion (Boamah, Read, & Spence Laschinger, 2017; Boissy et al., 2016; Shanafelt et al., 2015). While some have identified that emotional exhaustion can leads to declining patient satisfaction (Dhaini et al., 2018; Edwards et al., 2018; B Hayes, Douglas, & Bonner, 2015; Nelson et al., 2014; Pinchbeck, Weygandt, Gisondi, & Lu, 2016).

While, it was also pronounced by the research that organizational citizenship behavior of the hospital staff and healthcare practitioners can considerably improve patient satisfaction (Oppel et al., 2017). Also, it has been manifested that organizational citizenship behavior helps to improve patient satisfaction (Kaihatu & Djati, 2016), whereas another study supported the similar argument and postulating positively significant relationship between organization citizenship behavior and patient satisfaction (Mahooti et al., 2018). In addition, Aslan and Yildirim (2017) have shared the viewpoint that private hospitals have patient-centeredness at their forefront; eventually, the organizational citizenship behavior of the nurses contributes to patient satisfaction.

Additionally, healthcare practitioners' trustworthiness can help to improve patient satisfaction in the presence of various other factors (Van Den Assem & Dulewicz, 2015), whereas Ferrand et al. (2016) attributed trustworthiness as an essential ingredient for patient satisfaction. Similarly, Van Den Assem and Dulewicz (2014) manifested that trustworthiness plays important role in improving patient

satisfaction and it does have significant moderating role between the factors affecting patient satisfaction. Henceforth, on the guidelines of Creswell (2009) for purpose statement and based on aforementioned scholarly discussions, the purpose of this survey study is to determine the impact of nursing service quality, hospital facilities quality, emotional exhaustion and organizational citizenship behavior on patient satisfaction moderated by trustworthiness in the hospitals of Karachi, Pakistan.

## **2. Literature Review**

### **2.1 Nursing Service Quality and Patient Satisfaction**

It has been exhibited that each individual possess different personality characteristics, values, and resilience that influence their satisfaction with the service provided by the hospital in order to make the notion highly complex even though patients categorize great significance of the opportunities of a regimen for the ailment that afflicts them, factors that provide them emotional and physical comfort, and reduction of their suffering (Al-Hussami et al., 2017; Ferrand et al., 2016) (De Man et al., 2002; Kaihatu & Djati, 2016). Moreover, Boamah et al. (2017) have revealed that assorted service quality determinants were significant for patient satisfaction, which include professional attitude of the physicians and nurses, attitude of respect, empathy and kindness, and technical competence of all the healthcare practitioners. In addition, Ríos-Risquez and García-Izquierdo (2016) have exhibited that the doctor's technical competence presumed by the patients by means of the minimization of their pain as well as to restore their health, which stresses upon significance for the service satisfaction Aljaberi et al. (2018) have further revealed that value of patients is explained by the doctor who provides regarding the treatment and the time spend in order to listen and to examine them. Hence, following hypothesis has been developed on the theoretical and empirical evidences.

H1: Nursing service quality has significant relationship with patient satisfaction.

### **2.2 Hospital Facilities Quality and Patient Satisfaction**

There is a tendency among loyal patients who are contended with the services provided by a hospital. This allows them to praise and suggest the hospital for its better service in spite of being important for service consumption (Al-Hussami et al., 2017). Patients have extensive complexity in order to evaluate it in terms to the technical service quality as they do not possess enough technical knowledge for conjecturing whether the medical evaluation is brief and if the surgical method or treatment used was appropriate and accomplished the effective consequences (Aljaberi et al., 2018; De Man et al., 2002; Lukman et al., 2017b). on the other hand, this irrelevancy of the patients is not revealed from the impairment of making a brief assessment of the technical quality of the service (Kaihatu & Djati, 2016; Nelson et al., 2014). In contrast, it is highly competent in order to reduce their recovery of better health and their suffering (Shah et al., 2018; Silva et al., 2018). Henceforth, the study has developed following hypothesis between hospital facilities quality and patient satisfaction.

H2: Hospital facilities quality has significant relationship with patient satisfaction.

### **2.3 Emotional Exhaustion And Patient Satisfaction**

Emotional exhaustion is defined as the degree to which employees feel emotionally drained and overwhelmed by their work. Employees face stress when they experience warnings that might come from actual resource loss, insufficient return of supplementary resources on investments of resources, and a risk of resource loss (Dhaini et al., 2018; Janssen et al., 2010). Feelings of emotional exhaustion are driven from the experienced stress when employees feel that their resources specifically might not be sufficient enough to acquire existing work demands after a great deal of resource investments in work (Bronwyn Hayes, Douglas, & Bonner, 2014; Pinchbeck et al., 2016). Employees become motivated for examining the cause of their worn-out state and to explore approaches in which they can replenish or protect their

depleting resources in terms of a current challenge (Janssen et al., 2010). Hence, the study has developed following hypothesis.

H3: Emotional exhaustion has significant relationship with patient satisfaction.

#### **2.4 Relationship Between Organizational Citizenship Behavior and Patient Satisfaction**

Better survival consequences are presented among patients who were more satisfied as compared to the patients who were less satisfied (Ahmadzadeh Mashinchi, 2011). They characterized this aspect to psychological aspects that improvise immunity and provide patients more encouragement in order to appropriately follow the nutritional and medical treatment instructions (Kaihatu & Djati, 2016). The integration of organizational citizenship behavior and consideration to the extent of satisfaction will be enabled for eradicating the impotent influence of this attribute to be substantial and is competent to expand the service quality performance presumed by the patient as a service organization that has an attribute in which the extent of quality service has not been enabled for developing patient's loyalty (Mahooti et al., 2018) (Ahmadzadeh Mashinchi, 2011; Kaihatu & Djati, 2016; Mahooti et al., 2018). Thus, the study has hypothesized following relationship between organizational citizenship behavior and patient satisfaction.

H4: Organizational citizenship behavior has significant relationship with patient satisfaction.

#### **2.5 Moderating Role of Trustworthiness**

In addition, high social relevance has been exhibited with patient's satisfaction that energize their immune system and expand their motivation and discipline for observing to the treatment regimen in order to promote their recovery as number of studies in the medical area have revealed that there is a positive psychological influence of patient's satisfaction (Li, Yu, Liu, & Huang, 2017) (Swain & Kar, 2017) (Van Den Assem & Dulewicz, 2015). In particular, one of the studies has examined the patient-doctor relationship from the perspective of a patient (Van Den Assem & Dulewicz, 2014). The study has reported an explicit comparison between low and high-patient satisfaction clusters as well as their presumptions of the trustworthiness, performance, implications for practice, and practice orientation of doctors (Van Den Assem & Dulewicz, 2014, 2015).

H5: Trustworthiness moderates the relationship between nursing service quality and patient satisfaction.

H5: Trustworthiness moderates the relationship between hospital facilities quality and patient satisfaction.

H5: Trustworthiness moderates the relationship between emotional exhaustion and patient satisfaction.

H5: Trustworthiness moderates the relationship between organizational citizenship behavior and patient satisfaction.

#### **2.6 Conceptual Framework**

Based on the above theoretical discussion, the following model is conceptualized.

### **3. Methodology**

Quantitative approach is used to study the relationship between hospital facilities, emotional exhaustion, OCB and patient satisfaction. In order to fulfill the objective, we targeted the patient of different hospitals. By using the Daniel Soper (2018) calculator, the sample was drawn. According to the calculation, 282 was the minimum sample requirement, therefore, we gathered 309 sample responses by using non-random convenience sampling.

#### **3.1 Measures**

The study has used five-point Likert scale questionnaire while the measures were adopted from various past published papers. In this regards, total three measures of nursing service quality and hospital facilities quality were adopted from Coutinho and da Costa Vieira (2018). In addition, nine measures of emotional

exhaustion were adopted from MASLACH BURNOUT INVENTORY (MBI) scale, four measures of patient satisfaction were adopted from Coutinho and da Costa Vieira (2018). Additionally, organizational citizenship behavior (OCB) has two reflective first-order constructs i.e. altruism and general compliance proposed by Smith, Organ, and Near (1983). In this regards, six measures of altruism were adopted from Smith et al. (1983). However, trustworthiness was reflective higher-order comprising competence/ability, benevolence, integrity and risk aversion as suggested by Van Den Assem and Dulewicz (2014). Therein, four measures of competence/ability, benevolence, integrity and risk aversion were adopted from Van Den Assem and Dulewicz (2014).

#### 4. Data Analysis

##### 4.1 Respondent's Profile

Table I presents the results of demographic profile. Out of 292 respondent's, 202 were female and 90 were male. Majority of the respondents (i.e. 160) were fall in the age bracket 26-35, 91 respondents were in between 18-25, 29 were in between 36-45, and rest of the respondents (19) were above 45 age. Most of the people participated in the study were graduates (176) and post graduates (104). In the sample, 245 respondents were from private sector hospitals and only 47 respondents were from public sector hospitals.

Demographic Profile (n = 292)			
Frequency		Percent	
Gender	Male	90	30.8
	Female	202	69.2
Age Group (in years)	18 – 25	91	31.2
	26 – 35	160	54.8
	36 – 45	29	9.9
	Above 45	12	4.1
Academic Qualification	Undergraduate	7	2.4
	Graduate	176	60.3
	Post-Graduate	104	35.6
	Others	5	1.7
Marital Status	Single	148	50.7
	Married	144	49.3
Preferred Hospital Category	Private Sector Hospital	245	83.9
	Public Sector Hospital	47	16.1

##### 4.2 Measurement Model

Before testing the hypothesis, inner and outer measurement model have been assessed. Table 2 shows the results of construct validity and reliability. It is found from the findings that both the validity and reliability of the constructs are established. The values of outer loadings and average variance extracted show the construct validity and reliability. According to Hair et al., (2014), factor loadings should be greater than 0.6 and composite reliability value should be greater than 0.7. In addition, Sarstedt, Ringle, and Hair (2014) recommended that the value of AVE should be equal or greater than 0.50. As per the suggested criteria, all the values fall within the threshold. Therefore, we conclude that the construct validity and reliability of each construct is established.

**Table 2:** Construct Validity & Reliability

Constructs	Loadings	CR	AVE
ALT1	0.641	0.876	0.589
ALT2		0.835	
ALT3		0.905	
ALT4		0.748	
ALT6		0.679	
Bene1	0.87	0.931	0.772
Bene2		0.859	
Bene3		0.852	
Bene4		0.932	
Comp1	0.92	0.943	0.807
Comp2		0.882	
Comp3		0.894	
Comp4		0.896	
EE1	0.798	0.894	0.586
EE2		0.733	
EE3		0.753	
EE7		0.757	
EE8		0.781	
EE9		0.767	
GC3	0.861	0.825	0.55
GC5		0.827	
GC6		0.732	
HFQ1	0.92	0.906	0.763
HFQ2		0.8	
HFQ3		0.897	

Discriminant validity has substantial importance in the structural equation modeling and therefore, we assessed discriminant validity prior testing hypothesis. Following tables provide relevant information about the discriminant validity of the latent constructs. In PLS-SEM, there are majorly three types of discriminant validity including Fornell and Larcker (1981) criterion, cross loadings and HTMT ratio. According to the first criteria of Fornell & Larcker (1981), the diagonal values which are the square root of AVE should be greater in their own construct. Table 3 reports the results of Fornell & Larcker (1981), conclude that discriminant validity has been established among each construct because all the diagonal values are greater in its own construct.

**Table 3: Fornell and Larcker (1981) Criterion**

	ALT	BENE	COMP	EE	GC	HFQ	INTE	NSQ	PS	RA
ALT	<b>0.768</b>									
BENE	0.001	<b>0.879</b>								
COMP	0.047	0.662	<b>0.898</b>							
EE	0.03	-0.005	-0.011	<b>0.765</b>						
GC	0.619	-0.049	-0.051	-0.08	<b>0.742</b>					
HFQ	0.003	0.217	0.197	0.074	-0.035	<b>0.874</b>				
INTE	-0.081	0.662	0.52	-0.043	-0.056	0.155	<b>0.84</b>			
NSQ	0.04	-0.066	-0.172	0.029	0.046	-0.489	-0.119	<b>0.769</b>		
PS	0.075	0.633	0.739	-0.058	0.032	0.243	0.638	-0.11	<b>0.93</b>	
RA	-0.021	0.487	0.542	-0.05	0.013	0.187	0.722	-0.105	0.702	<b>0.85</b>

Source: Author's estimation

The given table shows that all the HTMT ratio were found less than the recommended threshold of 0.85 (Henseler, Hubona, & Ray, 2016; Henseler, Ringle, & Sarstedt, 2015). Therefore, discriminant validity using HTMT ratio has been achieved.

**Table 4: Heterotrait-Monotrait (HTMT) Ratio**

	ALT	BENE	COMP	EE	GC	HFQ	INTE	NSQ	PS	RA
ALT										
BENE	0.103									
COMP	0.117	0.72								
EE	0.079	0.053	0.06							
GC	0.813	0.099	0.103	0.119						
HFQ	0.055	0.245	0.224	0.211	0.06					
INTE	0.131	0.751	0.562	0.134	0.103	0.173				
NSQ	0.112	0.105	0.265	0.213	0.127	0.508	0.171			
PS	0.107	0.679	0.784	0.063	0.056	0.262	0.705	0.119		
RA	0.074	0.538	0.596	0.071	0.088	0.217	0.843	0.142	0.768	

Source: Author's estimation

The following table 5 and table 6, reflective higher-order constructs of organizational citizenship behavior and trustworthiness. It is shown that reflective higher-order of organizational citizenship behavior has significantly reflected its first-order latent constructs of Altruism (0.929,  $p < 0.001$ ) and General Compliance (0.866,  $p < 0.001$ ).

**Table 5: Reflective construct of Organizational Citizenship Behavior**

	Estimates	T-Stats	Prob.
Altruism	0.929	134.176	0.000
General Compliance	0.866	49.552	0.000

*Source: Author's estimation*

Another table showed that reflective higher-order of trustworthiness has significantly reflected its first-order latent constructs of Benevolence (0.850,  $p < 0.001$ ), Competence/ability (0.839,  $p < 0.001$ ), Integrity (0.840,  $p < 0.001$ ) and Risk Aversion (0.811,  $p < 0.001$ ).

**Table 6: Reflective Construct of Trustworthiness**

	Estimates	T-Stats	Prob.
Benevolence	0.85	53.574	0.000
Competence/ability	0.839	53.937	0.000
Integrity	0.84	64.359	0.000
Risk Aversion	0.811	39.843	0.000

*Source: Author's estimation*

It has been manifested that path analysis is one of the sophisticated methods for hypothesis-testing (Nitzl & Chin, 2017; Sarstedt, Henseler, & Ringle, 2011) while path analysis has been substantially supported by Henseler and Fassott (2010) for moderating effect analysis. Therefore, following table 9 provides path analysis for hypothesis-testing using PLS bootstrapping technique executed at 5000 subsamples and 90 percent confidence interval.

**Table 7: Hypothesis-Testing using Path Analysis**

	Estimates	S.D.	T-Stats	Prob.
Emotional Exhaustion -> Patient Satisfaction	-0.038	0.055	0.694	0.487
Hospital Facilities Quality -> Patient Satisfaction	0.077	0.041	1.864	0.062
Nursing Service Quality -> Patient Satisfaction	0.046	0.054	0.866	0.387
OCB -> Patient Satisfaction	0.081	0.036	2.254	0.024
Trustworthiness -> Patient Satisfaction	0.803	0.029	27.922	0.000

Above table showed that emotional exhaustion (-0.038,  $p > 0.10$ ) has been found as statistically insignificant while negatively affect patient satisfaction postulating that emotional exhaustion of the hospital staff somehow decrease patients' satisfaction. Moreover, hospital facilities quality (0.077,  $p < 0.10$ ) and organizational citizenship behavior (OCB) of the hospital staff and employees (0.081,  $p < 0.05$ ) have positively significant impact on patient satisfaction postulating that these aspects of the hospital in Karachi, Pakistan support to improve patient satisfaction and therefore, hospital facilities quality and organizational citizenship behavior add values to the overall hospital quality and patients' interaction and engagement. However, nursing service quality (0.046,  $p > 0.10$ ) has been found positive but statistically insignificant positing that there is no effect of nursing service quality on patient satisfaction in Karachi,



Pakistan.

**Table 8: Moderation Analysis**

	Estimates	S.D.	T-Stats	Prob.
TRUST x EE -> Patient Satisfaction	0.033	0.039	0.858	0.391
TRUST x HFQ -> Patient Satisfaction	-0.050	0.034	1.464	0.143
TRUST x NSQ -> Patient Satisfaction	-0.032	0.035	0.926	0.354
TRUST x OCB -> Patient Satisfaction	-0.010	0.032	0.295	0.768

Trustworthiness (TRUST) does not moderates the relationship of emotional exhaustion (0.033,  $p > 0.10$ ), hospital facilities quality (-0.050,  $p > 0.10$ ), nursing service quality (-0.032,  $p > 0.10$ ) and organizational citizenship behavior (-0.010,  $p > 0.10$ ) with patient satisfaction. Following table 9 provides result of predictive relevance of the exogenous latent construct in the structural model including R-square, adjusted R-square and Q-square.

**Table 9: Predictive Relevance**

	R Square	R Square Adjusted	Q Square
Patient Satisfaction	0.683	0.673	0.549

It has been shown in the above table that 68.3 percent variability in patient satisfaction can be predicted by the combine effect of emotional exhaustion, hospital facilities quality, nursing service quality, organizational citizenship behavior and trustworthiness. However, Q-square was found as 54.9 percent that is higher than zero (Hair et al., 2011) and therein, predictive relevance using PLS-SEM has been achieved.

## 5. Conclusion and Recommendations:

The current paper revealed that emotional exhaustion of the hospital staff has a negative but statistically insignificant impact on patient satisfaction and it was found consistent with past studies (Dhaini et al., 2018; Pinchbeck et al., 2016). In this regards, Dhaini et al. (2018) stated that due to emotional exhaustion and burnout of the hospital employees, the consequences on patient will be adverse; but non-conforming behavior and job demand of the hospital staff, these consequences of emotional exhaustion and burnout may not cause any implications and imperatives on patient satisfaction (Bronwyn Hayes et al., 2014). Another study supported the similar argument positing that hospital staff are required to provide healthcare services (Pinchbeck et al., 2016); therefore, emotional exhaustion and other psychological deviance at the workplace may not act as barriers or hindering factors to their service provision The hypothesis of the study found consistent with past researches (Al-Hussami et al., 2017; Halim & Sriwahyuni, 2017; Silva et al., 2018). Thesis studies have supported the perspective that hospital facilities quality significantly contributes to patient satisfaction (Halim & Sriwahyuni, 2017; Santosh Kumar & Bano, 2017). In this regards, Al-Hussami et al. (2017) manifested that patients found to be more comfortable and satisfied with the healthcare service quality if facilities were found satisfactory. In addition, hospital facilities quality play important role in improving patient satisfaction (Silva et al., 2018) while it has been found statistically significant in numerous past studies (Swain & Kar, 2017; Ziapour et al., 2016).

Moreover, the results of the study have found that nursing service quality does not have any effect on patient satisfaction; however, these results were also found consistent with the previous researches (Al-Hussami et al., 2017; Aslan & Yildirim, 2017; Edwards et al., 2018; Lukman et al., 2017b; Ríos-Risquez

& García-Izquierdo, 2016). In this connection, recent study showed that patient satisfaction does not directly affected by nursing service quality due to secondary consideration to these aspects (Aslan & Yildirim, 2017). Furthermore, nurses are particularly involved and engaged for inpatient facilities (Lukman et al., 2017b), whereas outpatient facilities at healthcare organizations and hospitals were not prominent; therein, nursing service quality may not affect patient satisfaction (Ríos-Risquez & García-Izquierdo, 2016). However, another study presented the viewpoint that nursing service quality was found important for inpatient services in hospital postulating the perspective that nursing services were considered important for inpatients rather than outpatients prominently (Al-Hussami et al., 2017; Edwards et al., 2018).

In further, the study has found that organizational citizenship behavior has significantly positive impact on patient satisfaction and therein, numerous past researches have supported the similar viewpoint in recent times (Ahmadzadeh Mashinchi, 2011; Kaihatu & Djati, 2016; Mahooti et al., 2018)

The studies have shown that organizational citizenship behavior leads to higher propensity of providing services in out-of-the-way context and delivering services in the best of their practice (Ahmadzadeh Mashinchi, 2011). Some authors have suggested that OCB can be an initiating aspect of providing exclusive services in context to hospital due to high patient interaction and sympathetic aspects of the hospital and medical staff (Kaihatu & Djati, 2016). There were researches positing that work meaningfulness leads to higher tendency of vigor and ultimately providing their work-related services to the next level and contributes largely (Mahooti et al., 2018). In addition, organizational citizenship behavior have two major determinants i.e. work meaningfulness and positive well-being and therefore, these aspects contribute to their gratitude and kindness at the workplace with coworkers, partners and customers (Lu, Zhao, & While, 2019); hence, these studies also supported the results and findings of the current study.

Lastly, the results have found that trustworthiness does not moderate the relationship of emotional exhaustion, hospital facilities quality, nursing service quality and organizational citizenship behavior with patient satisfaction. However, these results have been supported by numerous past studies but the circumstances were obviously interesting (Connelly, 2016; Moolasarn, 2017; Swain & Kar, 2017). In an empirical study, it has been provided that due to lack of consistency in the healthcare service provision, trustworthiness may not constitute any importance (Moolasarn, 2017); whereby, Connelly (2016) manifested that trustworthiness may not accompanied in the healthcare industry due to its time-being need and perception (Swain & Kar, 2017). It has been exhibited that trustworthiness may have some imperatives for inpatient services but have lack of significance in outpatient service provision. These results have particularly supported the viewpoint that trustworthiness does not have any implications for outpatient hospital services and therein, consistent with the result and finding of the current study. The facilities designed at hospitals are more focused on reduction of patient retention time, which is the obvious requirement for the customer bases of hospitals. Issues may arise if the periodic patient observations are not followed as per schedule. Hospital management should be focused on developing and maintaining checks and balances for patient monitoring staff alongside their task associated equipment, disposable apparatus, medicine etc. for rejuvenation.

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## Activity Based Costing around the World: Adoption, Implementation, Outcomes and Criticism

<sup>1</sup>Maha Faisal Alsayegh

<sup>1</sup>Department of Accounting, Faculty of Economics and Administration, King Abdulaziz University, Jeddah 21589, Saudi Arabia. [mfalsayegh@kau.edu.sa](mailto:mfalsayegh@kau.edu.sa)

ARTICLE DETAILS	ABSTRACT
<p><b>History</b>  <i>Revised format: February 2020</i>  <i>Available Online: March 2020</i></p> <hr/> <p><b>Keywords</b>  <i>Activity Based Costing, Literature Review, ABC Adoption, ABC Implementation, ABC Outcomes, ABC Criticism</i></p> <hr/> <p><b>JEL Classification:</b>  <i>D61, Z11, Z19</i></p>	<p>The purpose of this article is to provide systematic and critical literature review of studies related to activity-based costing around the world. The literature review covers articles from developed and developing countries and is organized to provide insights on four major aspects of ABC adoption, implementation, outcomes and criticism. The adoption of ABC is generally greater in developed countries as compared to developing countries. Among the key benefits of using ABC include better product costing that ultimately increases the profitability and competitiveness of a company. Using ABC results in greater transparency of costs which have implications for planning, controlling and decision making. Successful implementation of ABC is to deal effectively with the specific behavioral, technical and organizational factors. Most of the problems found in the literature were related to the practical, technical and system difficulties of ABC. Due to cultural and organizational issues many companies fail as techniques need modification when used in different settings.</p>



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Corresponding author's email address: [mfalsayegh@kau.edu.sa](mailto:mfalsayegh@kau.edu.sa)

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### 1. Introduction

Activity-based costing (ABC) is one of the most innovative management accounting practices of 21st century. The concept was initially developed in late 1980s by Cooper and Kaplan in order to address the limitations of traditional costing method (Gosselin, 2006). It was observed that management accounting lost its relevance due to changes in the business environment of that time. One of the most feature of that change was increase in competition due to deregulation and privatization. In competitive business world, corporations needed to become more attentive to suitable costing procedures. Activity based costing by studying and analyzing the activities that drive costs can help the organizations in measuring the cost and verifying those activities that create value for firms by reducing those activities that has no value addition, this will help to increase the businesses profitability (Major & Hopper, 2005). Comparing with traditional costing method, ABC allocate overhead cost and multiple cost drivers to ultimate products and services

(Cooper and Kaplan, 2002). The practice of activity-based costing has proliferated in many parts of the world including USA (Kiani & Sangeladji, 2003), UK (Al-Omiri & Drury, 2007; Innes & Mitchell, 1995) France (Alcouffe, 2002; Rahmouni, 2008), Australia (Askarany, 2012; Byrne, Stower, & Torry, 2009; Zaman, 2009), Malaysia (Wahab, Mohamad, & Said, 2018), Turkey (Özcan, 2020), Srilanka (Gooneratne & Wijerathne, 2019) and Bangladesh (Babu & Masum, 2019)

Activity based costing has been suggested as a vital device for an organization for better costing that have implications for planning controlling and decision making (Özcan, 2020). The basic idea behind Activity based costing is to gain competitive advantage and made more accurate product costing (Hoa, 2010). Activity based costing results in better calculation of cost and through this organization can seek those activities that create value (Duh, Lin, Wang, & Huang, 2009). Recent research on Activity based costing demonstrated various adoption rates around the world. Likewise, various organizational, cultural, technological and technical factors explain the adoption and effective implementation of ABC around the world (Ahmadzadeh, Etemadi, & Pifeh, 2011; Alcouffe, 2002; Brierley, 2008; D. A. Brown, Booth, & Giacobbe, 2004; Malmi, 1997). This paper presents a critical review of existing research on ABC in developed and developing countries to determine four important issues related to the ABC adoption, implementation, outcomes and criticism. The rest of the paper is organised as follows. paper is divided into four sections. Second section discusses mechanics of ABC followed by third main section which provides the literature review. Section three is organised to provide insights related to four different aspects of ABC adoption, implementation, outcomes and criticism. Last section concludes the paper with summary of findings, research gaps and limitations.

## **2. Activity Based Costing Mechanics**

Activity based costing allocates overheads correctly and trace out indirect cost for individual customers, products and services (Atkinson, 2001). Allocating overheads in activity-based costing is a two-stage process. First stage involves assigning overheads to activity cost pools. Second stage involves assigning overhead costs from cost pools to cost objects based on the activity rates. Philosophically ABC believes that activities consumes costs which is against the traditional belief system that product consumes cost. ABC believes that product consumes activities and activities consumes costs so products should be charges costs based on activities they consume – hence activity-based costing. The two stages can be described in following steps that are required for successful implementation of Activity Based Costing (Krumwiede, 1998).

1. Identification of activities
2. Assigning cost to activities
3. Assigning cost driver to each activity
4. Calculate unit cost per cost driver for activities
5. Assign unit cost to each activity

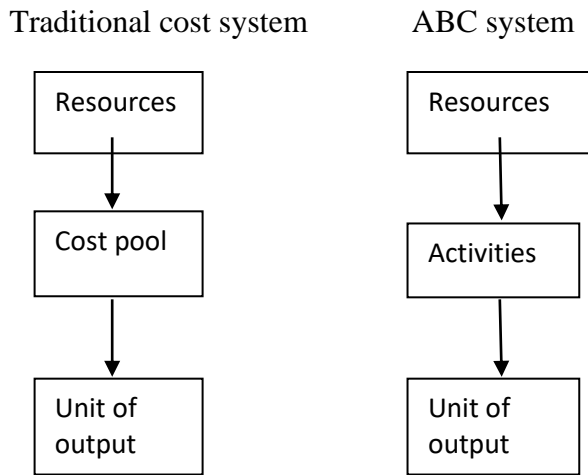
According to Compton (1996) the most important aspect in the implementation of ABC is the formation of ABC team. The team should be multidisciplinary and include three to five members that works on the design of ABC system in a way that should be a mirror image of the mechanism of a company. Before incorporating an Activity based costing system, some decisions must be made about existing system. Then training must be provided to all members, so that management has adequate information about successful application, execution and approval of an Activity based costing system. An essential element of the implementation of ABC is knowing about the information claim of their users (Duh, et al., 2009).

The ABC system includes activities, cost drivers, cost pools, activity rates, and cost objects. Flow chart is recommended as a tool that creates better understanding about difficulties of cost allocations. In this step computer technique is used exclusively. Like any other business techniques, Activity based costing should also practice a post implementation period. Through this post implementation evaluation, Activity based



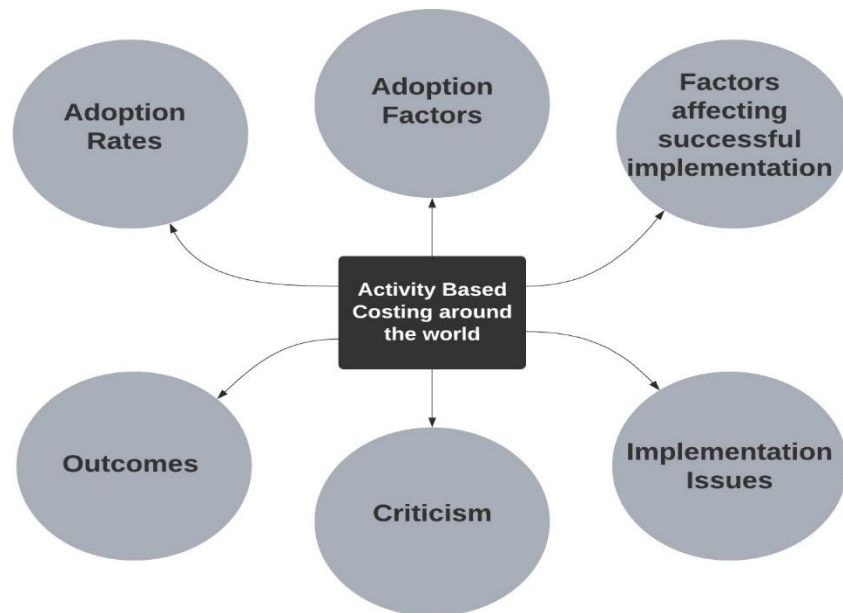
costing team members has a chance to determine the level of ABC project objective has been achieved or not, identify needed adjustments, assessing project implementation team performance, and made necessary suggestions about existing system advancement in the future (Gosselin, 2006).

Tradition method of absorbing overheads differ from activity-based costing in many ways. Traditional costing method utilized three common allocation bases, like direct labor hours, material dollars and machine hours, on the other hand Activity based costing employs several allocation bases, essentially number of times ordered, setup hours and overhead cost. Therefore, Activity based costing system is asserted to be better method that provides more accurate product costing than traditional costing (Innes, Mitchell, & Sinclair, 2000).



**3. Systematic Review of ABC Around the World**

This review of ABC studies is limited to four important issues related to the ABC adoption, implementation, outcomes and criticism. Diagrammatic Representation of these issues is presented in figure 1. In this section these issues are discussed in the light of existing empirical evidence.



**Figure1: Diagrammatic representation of topic covered in literature review**

#### **4. Adoption rates**

A fundamental theme behind adoption of ABC is that traditional cost systems are inefficient. Cooper argues that the companies adopt ABC will consequently show a higher rate of return and ABC will lead to better decision. Adopters of ABC had higher level of satisfaction and better financial results than the firms that are non-adopter. It is acknowledged that the adoption of ABC differs from country to country from industry to industry and does not look the same in every company. Below table 1 shows adoption rate for ABC in developed countries, table 2 shows adoption rate for Asian and Africans countries and table 3 shows factors affecting adoption of activity-based costing.

The emergence of ABC can be traced back to 1980s in the United states (Jones & Dugdale, 2002). Few of the earlier studies confirm the increasing trends of the adoption of ABC in the US. For example, Armitage & Nicholson (1993) conduct a study in U.S. by taking sample of some leading manufacturing firms. They reported that only 11% from the total respondents are ABC adopters. Another survey was conducted by Shim & Sudit (1995) among 1000 U.S companies, that reported the increase in the adoption rate to 25% which means that ABC was gaining popularity in these days. Another survey was conducted in 2003 by Kiani & Sangeladji (2003) among 500 U.S. leading companies. They confirmed further increasing trends in the adoption of ABC among US firms.

From U.S., activity-based costing rapidly spread to Europe and Canada, Australia and other developed countries. In a study conducted by Innes & Mitchell (1991) in United Kingdom only 6% respondent companies were using ABC while 33% of the companies anticipate using ABC in future. The adoption rate was increased to 13% in the study of Drury & Tayles (1994). Later on Innes & Mitchell (1995) conducted another study in 2000 and reported that adoption rates are 40.7% among financial firms, 14.3% among manufacturing firms and 12.1% among service firms. Recent study is conducted by Tayles and Drury (2002) found adoption rates are 23% in U.K.

In France, a survey study conducted by Bescos, Cauvin, Gosselin, & Yoshikawa (2001) examine the adoption of ABC. They found that the rate of adoption is 23% among sample companies. Although in other study conducted by Alcouffe (2002) reported that 15.9% among entire sample were currently using ABC system. (Cauvin & Neumann (2007) reported that firm's adoption rate of ABC is 23%. Moreover, in 2008 a study conducted by Rahmouni (2008) found that ABC adoption rate is increased up to 33%.

In Australia, a very little research has been done on the topic of ABC adoption. In 1997 a survey study conducted by Booth and Giacobbe covers the sample of some leading manufacturing firms, they reported that 12% implement ABC system out of total population. The findings of Clarke and Mia (1995) are consistent with Booth & Giacobbe (1997) they show that the adoption rates are 13% in leading manufacturing firms in Australia. A survey study carried out by Chenhall & Langfield-Smith (1998) aimed to examine the adoption rates and accounting practices like ABC in Australian leading manufacturing firms. They reveal that adoption rate of ABC is increased gradually, 56% out of total respondents were enjoying the benefits of ABC system.

A study conducted by CLlarke, Hill, & Stevens (1999) in Ireland aimed to examine the adoption rate in 1999, he found that adoption rates of ABC are 12% among manufacturing firms. Lately in 2004 a survey technique used by Brown & Pierce (2004) by investigating that overall rate of adoption of ABC was 27.9%. Additionally, they found that adoption rate increase from 12% to 34.9% in manufacturing firms and 17.8% to 28.6% in service sector respectively. Study conducted by Armitage & Nicholson, (1993) in Canada aimed to examine the trend in ABC system adoption among 740 leading companies. They showed results that from the total respondents 14% had implemented the ABC system, 15% will implement it in

future and 67% had consider that ABC is not suitable for their type of business. In 1997 a study carried out by Gosselin (1997) reported that majority of Canadian firms are in process for implementing ABC system and the adoption rates had increased to 30%.

Developing countries were lagging in the adoption of ABC. Also, adoption rates are generally lower as compared to developed countries. In 2010, Ngongang conducted a study in Cameroon and found that 9.3% corporations have adopted activity-based costing techniques and these firms have higher level of satisfaction with this costing system. In 2007, a study conducted by Moalla (2007) concluded that among the total respondents in Tunisia the adoption rate of ABC is 23.75%. A study conducted by Kamala, Sartorius, & Eitzen (2007) reported ABC adoption rates were 12% in South Africa.

Ruhanita and daing (2007) conduct a study covers population of Malaysian manufacturing firms, they found that 36% out of total respondents were utilizing activity-based costing system. In Thailand Chongruksut & Brooks (2005) conduct a survey study found that the adoption rates are 35%. A survey study conducted by Chen, Firth, & Park (2001) in Hongkong context the result of the study shows that among the total respondents 11% had implemented and 5% will implement it near future. Finally, the above studies concluded that the adoption rates of ABC are increasing generally among developed and developing countries.

### **5. Factors affecting adoption of activity-based costing**

Existing literature attributed various factors for the adoption of activity-based costing by many organisations around the world. Cooper & Kaplan (1991) explained that the main reason for using ABC system are product diversity and growing cost in current scenario. The result shows that variations in cost structure and massive industrialization are due to evolution of advanced manufacturing technologies. Van Nuyen and Brook (1997) used mail questionnaire survey by focusing on firm characteristics and environmental factors including firm's size, available resources, supportive management, diversity and difficulty in production and competitive environment faced by a firm. They suggested that firms that adopt ABC system are larger in size, involves in complex in production and exists in strong competitive environment.

A survey study conducted by Brown, et al., (2004) reported that technological factors namely cost structure and product quality are not associated with adoption of ABC. Additionally, they examine that environmental factors particularly competitors had insignificant impact on ABC adoption. Brierley (2008) conduct longitudinal approach examines that organizational factor has significant influence on adoption of ABC. A questionnaire survey conducted by Ahmadzadeh, et al., (2011) in Iranian context aimed to find out whether the adoption rates of ABC are motivated by organizational factors (Firm size, cost structure and product differentiation) or not. Analysis of the study shows that cost structure and product differentiation was positively associated with adoption of ABC. On the other hand, he found that organizational size and its type was negatively associated with adoption of ABC. Sartorius, Eitzen, & Kamala (2007) conduct a survey technique to analyze effect of technical and organizational factor on adoption of ABC. Study result found that organizational variables have stronger impact than technical variables on adoption of ABC.

Chongruksut & Brooks (2005) conduct a mail questionnaire survey in Thailand by analyzing organizational factor. The results of this study show that ABC users mostly indicated that increased competition and growing costs, high variation in product complexity, product costs and administrative costs. It was also observed that adoption of ABC was also results of the greater complexity in manufacturing operations and intensity of capital equipment. Bouwman, Brown and Baired (2007) conduct a survey using questionnaires in Moroccan firms by analyzing cultural and organizational factors and explained complexity of business operations as main organisational factor while outcome orientation,

innovation, team orientation and attention to detail as cultural factors.

## **6. Factors for Successful Implementation of ABC**

Shields & Young introduced a comprehensive model about implementation of Activity based costing system. They describe that outcomes of costing system depends that how well we match it with firm's goals, preferences, agendas, resources and skill of employees especially top management. Organizational, behavioral and technical factors playing a vital role in successful implementation of ABC. Beside the success, many current studies have started to address the issues encountered during implementation of Activity based costing system.

(Shields, 1995) examined the relationship of various technical, behavioral and organizational factors with the successful implementation of ABC. Shield (1995) found no significant relationship between ABC success and technical factors. In his research Anderson (1995) investigates the success factor of ABC implementation by using case study of General Motors (GM) period from 1986 to 1993. His findings reveal that on various stages ABC is significantly affected by organizational factors such as supportive top management, training conducted about uses of ABC system and compatibility of staff with existing costing system. By conducting a survey among leading firms in UK, Innes and Mitchell (1995, 2000) found that the success of ABC is influenced by some behavioral and organizational factors namely top management support has significant influence upon the success of ABC.

Gosselin (1997) conducted a survey-based study of 161 Canadian manufacturing firms to analyze the impact of organizational structure on implementation and adoption of activity-based costing system. McGowan and Klammer (1997) carried a survey by taking sample of 53 employees among four targeted sites in U.S.A aiming to analyze the employees' level of satisfaction is correlated with implementation of ABC or not. By using the factors concerned with employee's satisfaction such as supportive management, clearly stated and shared objectives, adequate resources and trainings, they determined that shared objectives and quality of information provided regarding implementation of ABC was positively associated with employee level of satisfaction. Brewer (1998) in his study find out the relationship between national culture and activity-based costing system. Moreover, Supitcha investigate by including aspect of national culture in a case study of Thailand owned enterprise. He found that due to difference in Thai culture, the implementation of ABC system requires continuous modification.

Krumwiede (1998) conducted a survey by taking sample of U.S.A manufacturing firms examines that how implementation process of ABC is affected by organizational factors (trainings and supportive top management) and contextual factors (firm size and cost information). He found that both organizational and contextual factors are significant impact on implementation of ABC. Moreover, a study conducted by Anderson & Young (1999) also examined the relationship among contextual and organizational variables such as firm structure, pricing strategy, management support, existence of information technology and its impact on successful ABC implementation. Sartorius, et al., (2007) conducted a mail survey to examine the impact of organizational factors upon the successful Implementation of ABC. They reported that adequate resources and supportive management are key elements for success of ABC.

In Saudi Arabia, Khalid (2005) carried out a questionnaire survey by taking a sample of 100 leading companies, he found that product diversity is positively associated with implementation of ABC. Ruhanita et al (2006) in his study examines the factors affecting ABC success by conducting a mail survey in Malaysia. His findings elaborate that supportive management, compensation and rewards, cost estimation and performance evaluation measures are significantly influence the success of ABC implementation. In China, Lana and Fei used case study of a well-known manufacturing firm aiming to investigate that how national culture and other organizational factors influence the implementation of

ABC. They determined that supportive management, loyal professionals and strong communication structure are key factors that significantly impact ABC success implementation. Colin et al (2008) surveyed UK service and manufacturing firms, they found that top management support, non-accounting ownership, adequate training provided to users of ABC determined the ABC success.

A questionnaire survey conducted by Baird, Harrison and Reeve aimed to examine the association between organizational culture, organizational factors and success of Activity based management system. By taking sample of randomly selected Australian business concerns, they found that organizational factors strongly associated with success of activity-based management system when compared it to organizational culture. In Malaysia, Majid & Sulaiman (2008) adopted case study method to evaluate ABC implementation process of a reputed manufacturing and service firm. On his study, he reported that two factors namely supportive management and use of suitable ABC software have positive impact on success of ABC. In addition, he found different barriers faced by management while using ABC system.

The results of previous research show that several studies about implementation of ABC has been done in developed countries but in developing countries particularly in Asian and African context very little research efforts has been done. Secondly, very little research has been done to examine the impact of corporate and national culture on success of ABC. A researcher Supitcha stated that due to difference in national culture, accounting practices used in one country should be revised in other country. Finally, the above debate shows that majority of research on implementation of ABC were conducted using quantitative method such as survey and questionnaire and very little research used qualitative method.

### **7. Implementation issues**

Implementation issues may also be classified as technical, behavioral and system-related which may arise while ABC practice in different settings. The failure of ABC may not be a failure that is a mirror image of limited understanding of uses and control of accounting system in practice. By conducting a survey of 187 British management accountants, Innes and Mitchell (1991) reported that many organizations rejected ABC by arguing that it was not suitable for their business. Several problems listed here concerned with technical, practical and system difficulties of ABC. Likewise, the results of several surveys (Pierce & Brown 2004; Sartorius et al. 2007; Cobb et al., 1992; Innes & Mitchell, 1992) found that due to difficulties in data collection process, some organizations believe implementation of ABC can create problems. Cohen et al. (2005) also conducted a survey by using questionnaire with the sample of 88 Greek companies in 2003. ABC adopters disclose that inadequacy of requested resources, difficulties in data collection for cost drivers, absence of top management support, lack of ABC software packages and personnel's resistance of ABC are main difficulties faced by users of ABC during implementation. In summary, the examination of firms that do no implement ABC system reveals that the cost of using ABC was too high, they have no appropriate knowledge and resources for implementation, their top management having no interest in ABC implementation because they have already satisfied with their present costing system.

### **8. Outcomes of ABC**

Most studies explain a positive association between ABC and firm performance. This means that organizations using ABC enjoys competitive advantages. Cagwin and Bouwman's (2000) reported in his study that if ABC implemented properly than it results higher return on investment and improved financial performance, Hoa (2010) also supported the above facts. Maiga & Jacobs (2005) in his study found by conducting a survey of 691 manufacturing firms that the use of ABC is significantly connected with cost improvement, quality improvement and cycle time improvement. Dooley (2007) found that cost is reduced 3 to 5% after implementing, and then examined that implementation of ABC method leads to better product management, pricing strategy and CRM. Shields (1995) and Foster & Swenson (1997) conduct empirical study and found that ABC Increase in financial performance of business. In his study Pizzini (2006) describes that implementation of ABC method normally results increase in shareholder

value, profitability and competitiveness. Banker, Bardhan, & Chen (2008) and Zaman (2009) also proved that ABC has positive impact on firm value. Recently, Jankla and Silvola (2012) examined that ABC is used by small businesses concerned with higher sales growth which is ultimately associated with higher return on equity. Kennedy & Affleck-Graves (2001) discuss the impact of ABC system on financial performance in his study. Current studies argue that ABC is used by 15-28% of companies (Al-Omiri & Drury, 2007). Finally, the above stated research shows that ABC has positive impact on firm's performance, but only in certain settings. Zheng & Abu (2019) in Malaysian context, reported that ABC system provides actual cost information and increase firm's profitability. Ittner, Lanen, & Larcker (2002) conducted an empirical study by approaching that improvement in quality and cycle time is directly related to ABC.

## **9. Criticism on ABC**

In 1980s when ABC introduced firstly, it enjoyed huge popularity. In academic journals ABC still presented in beneficial terms. Contrarily, based on some practical and theoretical grounds, ABC is criticized in 1990. According to Noreen (1991) ABC criticize on practical and theoretical grounds. According to Noreen (1991), surveys report indicate that ABC adopters are very few firms, and this shows level of dissatisfaction among users, and in theory ABC require absence of common costs. Current survey finds that many studies shown adoption rates were below 50% generally and in some cases these rates were decreasing (Innes, et al., 2000) although, the level of satisfaction achieved by the users of ABC are usually slightly positive and many consider it is not worth implementing (Krumwiede, 1998). Datar & Gupta (1994) determined that due to increasing number of cost pools the frequency of errors were increased in product cost measurement, so many users consider it is barrier of Activity based costing. Shields (1995) found through taking sample of 143 American firms by conducting survey method that 30% from his sample results low success of ABC and 25% of them reported that they had not been gained any financial benefits but these firms still implementing ABC method. Turner (2005) reported that ABC has lacked customer focus, did not enhance organizational learning, was not process oriented and was top down in approach. So, we can say that implementation of ABC only in specific settings delivered beneficial results. ABC due to some implementation problem might be unsuccessful or it may not be suitable for all level of firms.

## **10. Conclusions**

This study demonstrates the literature review of research on Activity based costing. It is clear from the above explanation of the literature available on, and research being conducted in, the various aspect of ABC. Majority of the firms have changed their traditional costing system to Activity based costing system to obtain attractive product costing and pricing. Generally, the firms with activity-based costing shows the sign of profitability and improved competitiveness. Activity based costing hypothetically is proposing to accomplish all the suggested objectives. Thus, this study shows that ABC implementation was a solution in the changed environment. In competitive environment, information provided by traditional costing system was not enough for management. This study is limited to four aspect related ABC Adoption, implementation, outcome and criticism. In western and Asian countries, the result of many previous studies focused on adoption of ABC. As compared to Asian countries, over the last decade many studies show that in Western countries the adoption rate of ABC generally increases. It is acknowledged that the adoption of ABC differs from country to country from industry to industry and does not look the same in every company. By gaining multiple benefits of ABC, many users of ABC had higher level of satisfaction particularly in terms of better performance measurement, more precise product costing, improvement in cost control, continuous business improvement and increase in profitability as well as increase in competitive ability. Effective behavioral, organizational and technical factors can be achieved by successful implementation of ABC. Many studies suggest the failure of ABC may not be a failure that is a mirror image of limited understanding of uses and control of accounting system in practice. A number of problems discussed in relevant studies are related to the technical, practical and system difficulties of

ABC. Due to cultural and organizational issues many companies fail as techniques need modification when used in different settings.

## 11. Limitations and Future Research

Limitation of the study include that several researches on Activity based costing was done in developed countries as compared to developing countries, especially in Asian context very little research has been done. Then there is a need to know that the way of doing business in Asian culture have different impact on adoption and implementation of Activity based costing. Secondly, very few researches had determined the impact of corporate culture on success of ABC. Hence, there is a need to identify the impact of corporate culture on success of ABC and how these factors much important than non-cultural factors. Thirdly, several studies organized in leading manufacturing companies of developed nations. So, there is need to conduct studies on SME's practices in developing nations, in spite the fact that culture of developing nations could leads to some challenge concerning implementation of ABC. Finally, the selected articles show that mostly studies on ABC has been done by using survey and questionnaire methods and very little research used qualitative approach. However, in future a study by using different methods to collect data by including sample of nonprofit and service sector shows different results on implementation of ABC.

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## Effect of Cash Conversion Cycle on Profitability of the firm: A Study of Oil & Gas and Engineering Sector of Pakistan

<sup>1</sup> Javed Iqbal, <sup>2</sup> Alia Manzoor, <sup>3</sup> Quratulain Akhtar, <sup>4</sup> Shaheera Amin

<sup>1</sup> Assistant Professor, Institute of Management Sciences, Bahauddin Zakariya University, Multan, Pakistan:

javediqbal@bzu.edu.pk

<sup>2</sup> PhD Scholar (University of Management and Technology, Lahore) Visiting Lecturer (University of Sahiwal, Sahiwal), Pakistan: [aliamanzoor@uosahiwal.edu.pk](mailto:aliamanzoor@uosahiwal.edu.pk)

<sup>3</sup> PhD Scholar (University of Management and Technology, Lahore) / Lecturer IB & M (UET) Pakistan: [q.akhtar96@yahoo.com](mailto:q.akhtar96@yahoo.com)

<sup>4</sup> Assistant Professor, Department of Business Administration, University of Sahiwal, Sahiwal, Pakistan: [shaheeraamin@bzu.edu.pk](mailto:shaheeraamin@bzu.edu.pk)

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The research is aiming at assessing the effect of cash conversion cycle on profitability of the firm. Three components are used to measure cash conversion cycle (CCC); average receivable period (ARP), average inventory period (AIP) and average payable period (APP). Henceforth, cash conversion cycle and its determinants are taken as Independent variables. The dependent variable is profitability being measured by return on asset (ROA). The data was collected with the help of pooled data containing a sample of 10 firms of two manufacturing sector such as Oil & Gas and Engineering, listed on PSX for the period 2010-2018. Regression and correlation techniques were used for analysis and come up with the outcomes that average receivable period and average inventory period have an adverse significant association with profitability of the firm except average payable period. In the end, there exists a highly negative significant association among CCC and firm's profitability as ROA. The results showed that lesser the no. of days of CCC, the firm has greater profitability. This paper contributes to the literature, which shows the association amongst CCC and ROA.



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Corresponding author's email address: [javediqbal@bzu.edu.pk](mailto:javediqbal@bzu.edu.pk)

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**1. Introduction**

In the global economic growth, Pakistan is the second largest country in the manufacturing sector after agriculture sector, and the current GDP is 21.3%. The manufacturing industry has grown rapidly since independence 1947 and the expansion has been well sustained over the past decade. Though there were many problems faced by the manufacturing sectors. Like as, supplies of raw material and capital

equipment has been so uncertain. The major problem of the manufacturing sector in Pakistan is the excess productive capacity in various industrial categories and it is due to the weak administration arrangements. In general, the problems like collection policies and payment policies are faced by the manufacturing firms. In financial management, cash management decisions are very important as it is considered to more common and treasured resource of any firm in the business world.

The decisions of companies regarding financial management are consisted on three major areas, which are as working capital for short term investment, capital structure for long term assets and capital budgeting for long term financing. According to these areas, the WCM has a greater importance in the company because it affects the company's overall profitability and liquidity (Appuhami, 2008).

According to Majeed, Makki and Saleem (2013), WCM is examined by two approaches: static and dynamic. The first method is grounded on the liquidity ratios. Generally used are current ratio and quick ratios built on balance sheet, which measures the liquidity position of the company. The later method is connected to the operations of the business. Cash conversion cycle (CCC) is an utmost dynamic dimension of the time among cash payment for raw constituents and then receiving it as accounts receivables. Rendering to liquidity management, CCC measures the liquidity encompasses both income statement and balance sheet data with measurement of time.

CCC is grounded on an analysis of three partial cycles. The first cycle is inventory and second is accounts receivables, which spot the span of a purported operational cycle. The third cycle is that of current liabilities, which is one artificial measurement of the aforesaid CCC (Bueniasz, 2011).

Numerous researchers such as Appuhami (2008), Bodie (2000) and Keown (2003) have instituted that CCC is the vital component of the WCM. CCC is well-thought-out to be all-inclusive measure of WCM for the reason that it efficiently reflects the time lag amongst the spending of raw materials founded on procurement and the assemblages from the borrowers on behalf of the sales of finished goods (Padachi, 2006). When the CCC has longer time span, the company make more investment in working capital. When CCC has shorter span, it would upsurge the profitability as it entails the increased sales (Attari, 2012). Though, when the investment rate has increased in working capital more than the profits connected with more inventories, it would decline CCC. Several researchers have claimed about the administration of short-term assets in an operative and efficient way and the liabilities such as short-term liabilities are certainly an imperative question in the administration of these assets and liabilities and investigated how much margin these things can do with the presence of firm.

The research emphases entirely on the CCC being the gadget of WCM of Oil & Gas and Engineering sector. In Pakistan, there are very few investigations that have been done concerning WCM and there is also a little-known research on CCC association with ROA. The scope of this research is restricted to the two substantial sectors are Oil & Gas, and Engineering. This paper evaluated the research problem of CCC with the emphasis of profitability of the firm: measured by ROA.

The current study is assessing the effect of CCC and the profitability in standings of ROA, of PSX listed companies and to detect substantial variables that are persuading CCC proficiency. Furthermore, the objective is also to evaluate the CCC as a measure of WCM for two sectors such as Oil & Gas and Engineering. The outcomes of the study will be supportive for academicians and industry authorities for policymaking and control tenacities.

The study aims are:

1. To scrutinize the current studies regarding WCM and CCC
2. To evaluate CCC, which shows as a measure of WCM

### 3. To analyzes CCC and degree of association with the company profitability as ROA

## 2. Literature Review

Conferring to Samiloglua and Akgunb (2016), the connection between WCM and performance of the firm, where performance given as profitability is measured by ARP, APP and CCC, was inspected. The linkage was researched on 120 manufacturing firms of Turkey, which were Istanbul Stock Exchange listed, as 2003-2012-time span. Multiple linear regression depicted the WCM connection with the firm's performance and found, from this paper, a negative substantial association of ARP with ROE, ROA, NPM and OPM. They expected that firms would lower the ARP, APP and CCC, then they can achieve value for their shareholders.

Wasiuzzaman (2015) examined that the imperative extent of finance is working capital, that has not been well examined. She subsidized her research to the literature and analyzed the profitability, calculated by ROE and ROA, together with working capital. She applied ordinary least square (OLS) on 160 manufacturing firms, as a sample size, to depict the relationship and the results showed that working capital & its elements have negative connection with firm's profitability, regardless of the payables, which showed a negative association with profitability. She made a comparison between this research to the additional studies, exposed that the connection amongst working capital & profitability is not momentous.

Trinh and Mai (2016) analyzed various factors such as the size of the firm, profitability, leverage, capital expenditure, cash flow, investment opportunities and profitability with CCC and level of cash holding. The results showed that level of cash holdings has affected the profitability and capital expenditure, which are considered as two important variables. As well as it has robust impact on the liquidity of the firm. In addition, they specified that WCM is affected by policies of cash holdings under financial conditions.

Hoang (2015) investigated the WCM association with the profitability of the firm. The researcher selected 98 manufacturing Ho Chi Minh City Stock Exchange listed companies for 6 years from 2009-2014. Results displayed that CCC, AIP, ACP, APP and net trade cycle have momentous as well as negative association with ROA. The researcher analyzed that firms can achieve the optimal level by lowering the CCC and its components, to progress the profitability.

Sharman and Kaur (2016) investigated the working capital and the sample was chosen as Bharti Airtel telecom company, for the period 2007-8 and 2014-15. This paper analyzed the ratio analysis, such as, current ratio, gross profit ratio, quick ratio, receivable turnover ratio, operating profit ratio and inventory turnover ratio, evaluated by statistical and econometrics techniques to know the association with performance. All the listed ratios showed satisfactory results with the performance, except current ratio. The researchers institute that there lies a noteworthy negative association among ratios and profitability.

Anser and Malik (2013) explored about CCC and firms' profitability. CCC is the foremost instrument, which is used to assess the risk-return association while managing liquidity. The researcher was anxious about appraising how CCC marks the manufacturing sector's profitability, which is listed at PSX of Pakistan, for five years. The research outcomes exhibited that manufacturing firms have lower ROA, on regular basis, and high ROE, on regular basis, with CCC. According to the regression results after adjusting for heteroskedasticity showed that CCC has inverse but noteworthy association with ROA.

Farooq et al., (2016) have done empirical investigation on CCC and its association with working capital, liquidity, and firm's performance. The investigators have verified the study by using descriptive analysis techniques, Pearson correlation and ANOVA. The outcomes suggested that CCC is statistically noteworthy connected with profitability of the company being measured by EBIT. This study explored

that the CCC period in days effects the firm size, profitability, so, it has negative association with the projected dependent variables as; ROA, ROE and sales revenue.

Leeper and Chambers (2013) argued that CCC is a suitable measure of firm's actual WCM and particularly the cash managing. This research was offered to inspect the stock of cash managing- a zone not being well-approached in the emerging nations similar to Pakistan.

Shah (2013) institute the association amongst CCC and ROA with a moderate part of the size of the firm. The researcher offered a painstaking analysis of cash managing, inventory managing, and trade credit managing techniques upshot the WCM in textile sector of Pakistan, with the influence of firm's profitability.

Singh (2013) investigated the managing of working capital transversely among various industries in India. The investigator had assumed financials from diverse companies fitting to seven Industries like; IT, automobile, steel, telecommunication, cement, chemicals, fertilizer and petrochemicals. The author had taken diverse parts of working capital like; return on capital employed, current ratio, working capital turnover ratio, inventory turnover, days inventory outstanding, days payable & days sales outstanding and CCC. This study used descriptive analysis and examined that working capital components vary across different industries

By reviewing literature, we come up with following hypothesis;

**H1:** ARP has a substantial association with ROA

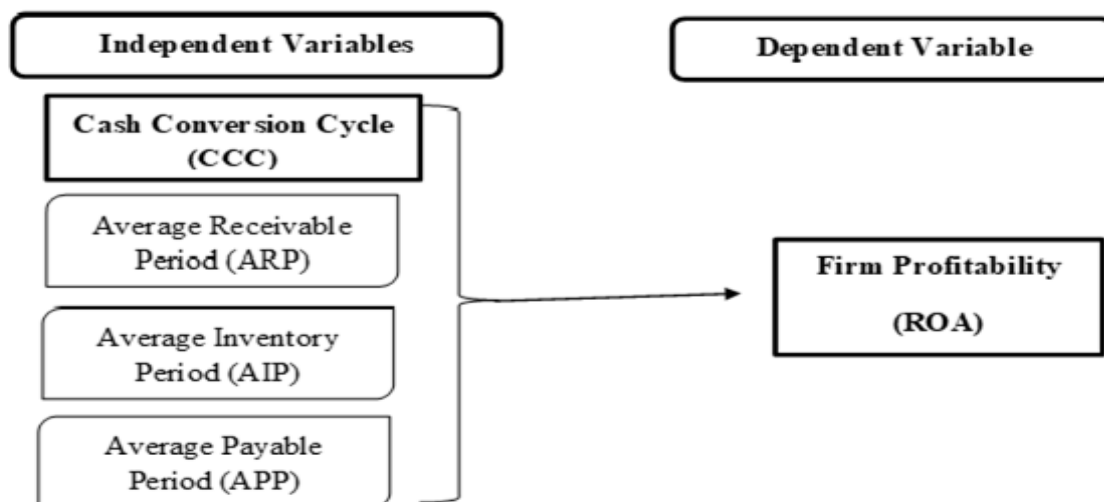
**H2:** AIP has a substantial association with ROA

**H3:** APP has a substantial association with ROA

**H4:** CCC has a substantial association with ROA.

## 2.1. Theoretical Framework

### Research Model:



## 3. Methodology

### 3.1 Research Design

This study is essentially directed to inspect the conjectured associations amid CCC and determinants of CCC with the firm's profitability concluded by correlation and regression analysis. The analysis of correlation is given the results to know the exact associations between the CCC length and its factors with

profitability. The regression analysis is used for analyzing the independent variables association with dependent variables.

### 3.2 Population

This study is conducted on Pakistan Stock Exchange (PSX) of Pakistan. In the process of research, there are 36 industries, included manufacturing and services, are listed on PSX website. The target population of this research study was two manufacturing sector such as Oil & Gas and Engineering sector, which are listed on PSX. Service companies are excluded from this current research, because of non-availability of inventory.

### 3.3 Sample Size

The sample comprises of PSX listed firms across the two industries (oil & gas, and engineering) of manufacturing sector. From each industry, there are five firms selected as a sample.

### 3.4 Sampling Technique

The companies are randomly taken from each industry, by using the Judgmental Sampling Technique. The data used for analysis is for the period 2010 to 2018.

### 3.5 Data Collection

Data of this study was collected from secondary sources, which contains the Oil & Gas and Engineering Industry data, for the years 2010 to 2018. The needed secondary data was collected from the financial statements available in the Annual Reports taken from the official website of the companies and the PSX Annual Reports, which covers the Nine Years at a glance period. We used the panel data, containing both time-series and cross-sectional.

## 4. Data Analysis

### 4.1 Regression Results

#### Hypothesis 1:

**H<sub>1</sub>:** Average receivable period has a substantial association with ROA

**Table # 1: Model Summary<sup>b</sup> ARP and ROA**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.705 <sup>a</sup>	.698	.680	0.59468

a. Predictors: (Constant), Average Receivable Period

b. Dependent Variable: Return on Asset.

As the value of R is 0.705, which shows strong degree of association between ROA and ARP. R square is 0.698, which is 69.8%. This R square value shows that 69.8% variation in ROA is due to average receivable period.

**Table # 2: Coefficients<sup>a</sup> ARP and ROA**

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta	T		Zero-order	Partial	Part	Tolerance	VIF
	1 (Constant)	-8.458	4.719			-5.530	.000			
ARP	-.557	.173	-.463	4.884	.000	-.779	-.643	-.559	.997	1.003

a. Dependent Variable: Return on Asset.

As the multiple regression line is:

$$\text{ROA} = \beta_1 + \beta_2 (\text{ARP})$$

$$= -8.458 + (-0.557)$$

The value of  $\beta_1$  is **-0.557** which shows that 1 day increase in ARP period will lead to decrease 0.557% ROA. As the value of  $p$  is 0.000 and the level of significance is 5%, which shows the  $\alpha$  value. The  $p$ -value is less than  $\alpha$  value and the value of  $t$  is 4.884, which is greater than  $t_{\alpha/2, (n-k)}$  (2.000), so we reject  $H_0$ . Thus, average receivable period has statistically significant association with ROA.

### Hypothesis 2:

$H_2$ : AIP has a substantial association with ROA

**Table # 3: Model Summary<sup>b</sup>**  
AIP and ROA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.809 <sup>a</sup>	.742	.701	0.06609

a. Predictors: (Constant), Average Inventory Period

b. Dependent Variable: Return on Asset.

As the value of R is 0.809, which shows that strong degree of association between ROA and AIP. R square is 0.742, which is 74.2%. This R square value shows that 74.2% variation in ROA is due to average inventory period.

**Table # 4: Coefficients<sup>a</sup>**  
Average Inventory Period and ROA

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta	T		Zero-order	Partial	Part	Tolerance	VIF
	1 (Constant)	-6.615	1.910			-3.205	.002			
AIP	-.781	.135	-.224	2.077	.042	-.796	-.765	-.624	.995	1.005

a. Dependent Variable: Return on Asset.



As the multiple regression line is:

$$\begin{aligned} \text{ROA} &= \beta_1 + \beta_2 (\text{AIP}) \\ &= -6.615 + (-0.781) \end{aligned}$$

The value of  $\beta_1$  is **-0.781** which shows that 1 day increase in AIP will lead to decrease 0.781% (ROA). As the value of  $p$  is 0.042 and the level of significance is 5%, which shows the  $\alpha$  value. The p-value is less than  $\alpha$  value and the value of  $t$  is 2.077, which is greater than  $t_{\alpha/2, (n-k)}$  (2.000), so we reject  $H_0$ . Thus, average inventory period has statistically significant association with ROA.

### Hypothesis 3:

$H_3$ : APP has a substantial association with ROA

**Table # 5: Model Summary<sup>b</sup>**  
**APP and ROA**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.679 <sup>a</sup>	.623	.594	0.27645

a. Predictors: (Constant), Average Payable Period

b. Dependent Variable: Return on Asset.

As the value of R is 0.679, which shows that strong degree of association between ROA and APP. R square is 0.623, which is 62.3%. This R square value shows that 62.3% variation in ROA is due to average payable period.

**Table # 6: Coefficients<sup>a</sup> (APP and ROA)**

Model		Unstandardized Coefficients		Standardized Coefficients		Correlations			Collinearity Statistics		
		B	Std. Error	Beta	T	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-7.829	1.642		-3.639	.001					
	APP	.289	.166	.197	1.743	.087	.526	.495	.456	.929	1.077

a. Dependent Variable: Return on Asset.

As the multiple regression line is:

$$\begin{aligned} \text{ROA} &= \beta_1 + \beta_2 (\text{APP}) \\ &= -7.829 + (-0.289) \end{aligned}$$

The value of  $\beta_1$  is **-0.289** which shows that 1 day increase in APP will lead to increase 0.289% ROA. As the value of  $p$  is 0.087 and the level of significance is 5%, which shows the  $\alpha$  value. The p-value is greater than  $\alpha$  value and the value of  $t$  is 1.743, which is less than  $t_{\alpha/2, (n-k)}$  (2.000), so we do not reject  $H_0$ . Thus, average payable period has no statistically significant association with ROA.

**Hypothesis 4:****H<sub>4</sub>:** CCC has a substantial association with ROA**Table # 7: Model Summary<sup>b</sup>****CCC and ROA**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.837 <sup>a</sup>	.788	.733	0.18358

a. Predictors: (Constant), Cash Conversion Cycle

b. Dependent Variable: Return on Asset.

As the value of R is 0.837, which shows that strong degree of association between ROA and CCC. R square is 0.788, which shows that 78.8% variation in ROA is due to CCC.

**Table # 8: Coefficients<sup>a</sup> (CCC and ROA)**

Model		Unstandardized		Standardize			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-6.300	3.335		-2.841	.006					
	CCC	-.648	.277	-.382	2.666	.014	-.767	-.715	-.582	.993	1.007

a. Dependent Variable: Return on Asset.

As the multiple regression line is:

$$\text{ROA} = \beta_1 + \beta_2 (\text{CCC})$$

$$= -6.300 + (-0.648)$$

The value of  $\beta_2$  is **-0.648** which shows that 1 day increase in CCC will lead to decrease 0.648% ROA. As the value of  $p$  is 0.014 and the level of significance is 5%, which shows the  $\alpha$  value. The p-value is less than  $\alpha$  value and the value of  $t$  is 2.666, which is greater than  $t_{\alpha/2, (n-k)}$  (2.000), so we reject  $H_0$ . Thus, CCC has statistically substantial association with ROA.

**4.2 Correlation Analysis**

The Table#9 shows that the correlation between ROA & ARP is -.350, which shows that longer the average receivable period tends to lower the firm's profitability and ARP is significant with ROA, at 5% level of significance. The correlation coefficient between ROA & AIP is -0.254, which shows that longer the average inventory period tends to decrease profitability and AIP is significant with ROA, at 5 % level of significance. The correlation coefficient between ROA & APP is 0.464, which shows that longer the average payable period tends to greater the profitability and APP is significant at 1% level of significance with ROA, but APP is not significant at 5% level of significance. The correlation coefficient between ROA & CCC is -0.069, which shows that longer the CCC period will decrease the profitability of the firm and CCC is significant with ROA, at 5% level of significance. This indicates that companies can upsurge profitability by dropping the days of CCC, AIP and ARP.

**Table # 9: Pearson's Correlation**

		ROA	ARP	AIP	APP	CCC
ROA	Pearson Correlation	1	-.350**	-.254*	.464**	-.069
	Sig. (2-tailed)		.006	.047	.087	.011
	N	60	60	60	60	60
ARP	Pearson Correlation	-.350**	1	.176	-.108	.766**
	Sig. (2-tailed)	.006		.178	.411	.000
	N	60	60	60	60	60
AIP	Pearson Correlation	-.254*	.176	1	-.341**	.727**
	Sig. (2-tailed)	.047	.178		.008	.000
	N	60	60	60	60	60
APP	Pearson Correlation	.464**	-.108	-.341**	1	-.393**
	Sig. (2-tailed)	.087	.411	.008		.002
	N	60	60	60	60	60
CCC	Pearson Correlation	-.069*	.766**	.727**	-.393**	1
	Sig. (2-tailed)	.011	.000	.000	.002	
	N	60	60	60	60	60

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
\* . Correlation is significant at the 0.05 level (2-tailed).

## 5. Conclusion

Cash conversion cycle shows the liquidity stance of the firm. In finance, the management of current assets as well as current liabilities is important to handle for both small and large firms. The cash cycle is a main factor of cash management and it is very important to enhance the profitability of the firms. However, it shows how efficient a firm in its payments of bills, collection of receivables and inventory converted it into cash (Anser & Malik, 2013). The enterprises can get greater profitability by lowering the time period of CCC through decreasing the collection period of receivables, decreasing or lowering the selling period of inventory and lengthening the period of credit payment. After applied the regression and correlation analysis, the researcher found the results that ARP and AIP have significant negative connection with firm's profitability, which measured by ROA. Whereas, an average payable period has positive connection with ROA, but has not shown a substantial association with ROA, proxy for profitability. Also, foremost, there exists a exceedingly negative substantial connection of CCC with ROA. The results showed that less the number of days to convert the sales into cash, firm have greater profitability. The study is limited to the Pakistan manufacturing sector where there are very few researches have been done on CCC. Many researchers can use this study for further analysis by using gross profit, net profit margin or EBIT.

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## Political Stability and its Impact on Economic Growth of Pakistan (1988-2018): A Time Series Analysis

<sup>1</sup>Majid Hussain Phul, <sup>2</sup>Muhammad Saleem Rahpoto, <sup>3</sup>Ghulam Muhammad Mangnejo

<sup>1</sup> Ph.D Scholar, Department of Economics, Shah Abdul Latif University Khairpur, Pakistan

<sup>2</sup> Professor, Department of Economics, Shah Abdul Latif University Khairpur, Pakistan

<sup>3</sup> Assistant Professor, Department of Economics, Shah Abdul Latif University Khairpur, Pakistan:  
mangnejogm81@gmail.com

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p>This research paper empirically investigates the outcome of Political stability on economic growth (EG) of Pakistan for the period of 1988 to 2018. Political stability (PS), gross fixed capital formation (GFCF), total labor force (TLF) and Inflation (INF) are important explanatory variables. Whereas for model selection GDP<sub>r</sub> is used as the dependent variable. To check the stationary of time series data Augmented Dickey Fuller (ADF) unit root (UR) test has been used, and whereas to find out the long run relationship among variables, OLS method has been used. The analysis the impact of PS on EG (EG) in the short run, VAR model has been used. The outcomes show that all the variables (PS, GFCF, TLF and INF) have a significantly positive effect on the EG of Pakistan in the long run period. But the effect of PS on GDP is smaller. Further, in this research we are trying to see the short run relationship between GDP and other explanatory variables. The outcomes show that PS does not have such effect on GDP in the short run analysis. While GFCF, TLF and INF have significantly positive effect on GDP of Pakistan in the short run period.</p>
<p><b>Keywords</b> Political Stability, GDP, ADF, OLS, Gross Fixed Capital Formation, Labor Force, Inflation</p>	
<p><b>JEL Classification:</b> P10, O10, C10, E22, E24, E31</p>	



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Corresponding author's email address: [mangnejogm81@gmail.com](mailto:mangnejogm81@gmail.com)

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### 1. Introduction

A Favorite subject of economists is to find out the relationships between economy and politics. These two have a strong relationship as revealed by history of Asian countries. Even that relationship is not always constant due to the change in the pattern of government and politics. It is truth that irregular EG intensely caused by political instability (PI). Lipstel was the first economist who described the term PS in 1960. He explained that a country has consistent dictatorship or democracy for 25 years is considered as a stable country. However the concept of PI has redefined and changed in the recent political and economic conditions. Whatever the logic may be but the tendency to fall down by any government is PI.

Economic activities as well as EG are increased by PS so that foreign and local financiers can invest in a better safe environment. The purchasing power of masses increase earning capacity as preceded by the rise in investment which in turn also increases consumption level, savings and productivity. Unemployment and inflation slowed down due to the PS because uncertainty and social un-rest among the public is created by high inflation and unemployment; that unrest could direct towards violence and general strikes against government policies and employers. There is deep correlation between EG and PS. On the one side, uncertainty connected with the PI environment which can decrease the pace of economic development and investment. On the other side, Political unrest and government collapse both preceded by poor economic performance. But PS is achieved through domination or an elected political party has not to compete for re-elected. In that situation, PS considered as such type of sword which has two edges.

Societies with multiethnic or having diverse cultural attributes generates the serious problem of PI. All the society sections contributed their share in the politically stable state and they are fully satisfied this attitude acts as nation building attitude. In a politically stable situation society are exerted and empowered its capabilities for the nation development. In instability situation the conditions are vice versa, because in instability peoples are without power and unsatisfied, they are losing trust on their institutions and peoples give importance to their interest rather than state ultimately themselves leads to split. So many nations which are underdeveloped in Africa and Asia, including Pakistan are keen to know that how to solve the uncertainty of social welfare to modernize the society, political participation, national integration, economic development and centralization of authority, these uncertainties have grown in the political systems of underdeveloped countries. By explaining the instability causes PS can be known in underdeveloped nations. Leonard Binder founded five areas which are issue based, these five issues are faced by many states when these states try to manage PS in their system. These five issues based areas are "Distribution crisis, dispersion crises, authenticity crisis, participation crises, as well as identity crisis" (Lucian, 1971). History shows that the countries with PI are considered economically poor along with decision making and policies uncertainty. The financiers observed that change in government again and again results in strategies and resultantly, investors want to invest in safe states and also these states have less political uncertainty. (Alesina & Perotti, 1996).

It is stated that, in the Solow model of growth considered as a traditional model explains EG relies on building capital, growth and savings. On the other hand modern theories about the growth state that human capital formation and technology are the key factors in EG (Sato, 1964). Like that a country's political situation is also shows that country's growth level, such as consistent government policies with implementation leading to EG (Baro,2013). According to the political scenario of Pakistan since creation, it could not celebrated politically stable scenario. Almost All kinds of parliamentary to relaunched military coups and democracy-presidential political controls has been experienced along with economic theories from socialism to capitalism and mix of these theses. Twenty four political governments have been past in sixty five years in Pakistan, including; 33 years of military regime which was under different four leaders, fifteen appointed or elected prime ministers and five governments were based on UK terms. Both models were experienced socialist economics and liberal economics. Mostly the liberal economic model sustained successfully in our country Pakistan. The Pakistan's history is full of governance failures.

Pakistan has so many different ethnic as well as regional groups, on these groups Pakistan's economy is based but these groups live a life for their particular interest; that was the main concern so that East Pakistan was separated. In 1951 soon after the independence Prime Minister Liaquat Ali Khan was assassinated and thus instability started. Ayub regime lasted for ten years, which led disturbance and Yehya khan in 1968 imposed martial law. At the time of Zulifqar Ali Bhutto, opposition political parties increased PI again this led another martial law imposed by Zia ul Haq (Army General). In 1960s

growth rate was six percent that fell to 3.7 percent. In the period of Zia ul Haq Jihadi organization and Kilashinkove culture was at the peak and supported by government ultimately PI followed (Hussain 2010). Zia ul Haq was died In a plane crash after then Benazir Bhutto has taken the office of the Prime Minister. In the era of 1990s, PI was very high in Pakistan. Benazir Bhutto and Nawaz Sharif exchanged the government frequently and therefore again martial law was imposed by Parvez musharaf on 12 October 1999. Musharaf regime continued nine years and in the election of 2008, PPP hold the government. At this time terrorism was in the high range in the country. First time in the history elected government succeeded to complete its time period and left the office to Nawaz Sharif as he won the election of 2013. PI witnessed in the country again at this time as Pakistan Tahreek e Insaf started an agitation in Islamabad the capital city of Pakistan. The government was formed by Pakistan Tehrik e Insaf after the winning of the majority seats in general election of 2018. The government again faced the hurdles for to smooth run created by the opposition parties after uniting themselves (Khan, 2018). This research empirically investigates the effect of PS on the EG of Pakistan in long run. This research empirically investigates the effect of PS on the EG of Pakistan in short run.

## **2. Literature Review**

The literature, especially related to Pakistan, has shockingly revealed that only a small number of researchers explored the impact of political factors on economic development. Many researchers had concentrated on determining the economic development, inflation and investment. As per Qureshi (2010), the Pakistan's economy has impacted by PI to a great extent since its formation. Since formation, thirty three years have been under military martial law and rest under unstable political systems. PI can lead unwanted basic leadership condition for strategy makers and authorities, it would consequence in short term judgments rather than an attractive long term arrangement. According to Aisen and Veiga (2010) uncertainty in politics decreases the ability of accurate forecasting so that it leads to short term economic policy making.

The research regarding the correlation between EG and PI reveals two main problems; from them the first one is related to the defining of PI. Robock (1971) argued that PI is such type of issue which relies on how to define it. Where as the second phenomena is related to the correlation between EG and PI. Does PS preceded by EG or EG preceded by PS or these two major issues comes simultaneously? To analyze above conditions contradictionary reacts has been highlighted by research. The first issue is about EG in which high income is generated for citizens which ultimately leads them to government approval and that results in PS (good growth hypothesis) (Paldam, 1996). Another or second issue was the series of constrains was formulated by complex changes in society which changes and dissatisfies the political conditions that lead towards PI (destabilizing growth hypothesis) (Paldam, 1996).

In Pakistan PI observed through non democratic and democratic government, it is also a fact that this criteria is failed to identify PS in Pakistan. PS has only one factor that there is any democracy or not. Earlier it is mentioned that Pakistan has a more EG in military rule than the democratic rule. That is believed it was due to a long run of government in military regime, so long run in government concluded as another factor of PS. Some believe, that PI is due to frequent change in government. Therefor one of these issues is not justified by us. If we want to measure proper PS we have to use the index of PS for the period of 1988 to 2018 given by ICRG (International Country Risk Guide).

Mahmood Azid and Siddiqui (2010), investigated the connection between democracy and EG in Pakistan. They used the year based data and found the conclusion that the democratic system is so much significant for EG especially in Pakistan. They further concluded that continuous government change must impact on the EG; therefore to obtain good gross domestic product and growth in economy the PS is must be ensured. Paolo Mauro (1995), researched that if anyone has various proxies regarding PS is positively connected with private investment and EG. Haan and Siermann (1996) evaluated the negative relationship

among lack of political freedom and lack of PS with EG. Authors anticipated cross section model relied on simple neoclassical production function for the 1963- 1988 period in which 97 countries used as sample. In this estimation it was found that in Africa PI is reduced due to EG but in Asia investment is reduced by PI. As stated by Sato, 1964 EG depends on capital buildup, savings and growth this is according to traditional growth model (e.g. Slow growth model). No doubt theories about modern growth are based on human capital formation and technology.

Alesina (1990) explained when a government has low chances to be in power and it would become unstable it starts borrowing money so extra expenditure has been created. Thus debt payments and inflation are increasing ultimately problem has been raised for new elected government. The Budget deficit and inflation conditions have been faced by unstable government. Grossman (1991) has a logic, that is not similar with previous ones regarding the co-relation between EG and PI. He said that if the political system is weak the chances of revolution are also high and also motivation for public is high in involve them in revolutionary as well as anarchist actions. On the other side the nations with strong regime society does not involve in activities which are unproductive and unhealthy. Nasir et al (2008) examined political behavior in various countries about macroeconomic indicators. The study given results that during the autocratic rule achieved aggregate growth in the economy is better than the democratic government. This study is conducted in Pakistan. He argued that autocratic rule perform more better than democratic rule. He further said that the average growth rate and GDP remains always high at the period of autocratic rule.

**3. Model Specification**

The Solow growth model has been used to check the correlation between PS and the EG of Pakistan. The model was also applied by Abeyasinghe (2004) and Fethi (2007), to analysis the long run and the short run relationship between PS and the EG.

$$GDP_{it} = \beta_0 + \beta_1 PS_{it} + \beta_2 GFCF_{it} + \beta_3 TLF_{it} + \beta_4 INF_{it} \dots \dots \dots (1)$$

$$\Delta LGDP_{it} = \beta_0 + ECT_1 + \beta_1 \Delta LPS_{it} + \beta_2 \Delta LGFCF_{it} + \beta_3 \Delta LTLF_{it} + \beta_4 \Delta LINF_{it} + ut \dots \dots \dots (2)$$

In slow growth model, Where, GDP is real Gross Domestic Product, GFCF is gross fixed capital formation, TLF is total labour force, PS is political stability and INF is inflation, Ut is Error Term., Δ and L are explained as disparity and logarithms correspondingly and ECT is the error correction term. One of the major causes of PI is inflation. Rapid inflation guides the country towards unexpected future investment. One of the main cause of PI is political inflation. Future investment uncertainties are because of high rate of inflation. This leads to political unrest created due to conservative investment’s planning. The Political system is affected by inflation in many ways; it restricts exports, which impacts on countries efficiency. Exports of the country are become more expensive as created by inflation. Inflation can also affect on the system of tax. Coefficient is negative high inflation affect negatively on growth Edison et al. (2002) and Elder (2004).

**3.1 Hypotheses Development**

The hypotheses are formulated for estimation and testing. The Majority of the researcher noted that PS has a significantly positive effect on the EG. We have developed following hypothesis.

- H1: There is a negative connection between EG and PS.
- H2: There is a positive connection between EG and GFCF.
- H3: There is a positive connection between EG and TLF.
- H4: There is a negative connection between EG and INF.

**3.2 Data**



The data used in this paper are time series data for Pakistan for the period of 31 years between 1988 and 2018 annually. According to our empirical model, we reflect on five variables: GFCE, TLF, GDP, INF and PS. PS is measured on the basis of Government Stability, Socioeconomic situation, Bribery, Investment Profile, Interior Conflict, Exterior Conflict, Military in Politics, Law and Order, Tribal Tensions, Religion in Politics, Democratic responsibility, Bureaucracy Quality. The data of variables are obtained from OECD National Accounts data files, World Bank (WB) national accounts data, Worldwide Governance Indicators and ICRG.

### **3.3 Research Methodology**

#### **3.3.1 Stationarity and Non-Stationarity**

Price, money consumption, income and trade are the few from many macroeconomic variable of time series; these variables in practical life are non-stationary by nature. In 1986 Philips has given report when he was given treatment to the non-stationary series along with OLS as misinterpret results will be brought for to achieve economic investigations. The research model can include several confusion after developing problems such as spurious regressions with R square which is very high approximately unity as well as significantly F-statistics value and t value (Newbold- Granger, 1974). If there was no any difference in the stationary series, then it could be integrated as I(0) stationary at level. After taken difference if series is stationary, then it can be called as I(1) integration. In (1979-1981) Dicky and Fuller have given the ADF model and this model is often used in the economics literature, so that the time series stationary can be examined.

#### **3.3.2 Ordinary Least Squares Method:(OLS)**

The Simple OLS model has been utilized for since quite a long run investigate. OLS is a procedure for linear regression model for to discovering the parameters that are obscure. This strategy is utilized for to lessen the whole of the squared vertical separation between anticipated reactions and watched the reactions through direct estimation in a specific informational collection. When regressor will be the right hand side as by a simple formula estimator will be shown. There is no perfect multicollinearity is found favor in exogenous regressors then a reliable model OLS estimator is to be used.

#### **3.3.3 Vector Autoregressive Model: (VAR)**

For to finding the short run correlation between the different variables, this model is effectively used. This model is also used for to finding the linear interdependence among several time series.

## **4. Estimation Of Data And Empirical Results**

### **4.1 Econometric Analysis**

In this study E-views software has been used for estimation purpose. R<sup>2</sup> has been used to analysis the overall robustness of the model. If R<sup>2</sup> is near to one it means the model is robust, but if R<sup>2</sup> is near to zero, then, it shows that the model is not robust for estimation purpose. It means the relationship between the variables is weak. T stats and F stats have been used for the checking overall significance of the model. On the other hand to check the probability of rejecting the null hypotheses we have been used P values. If the P value is less than 0.05, it means we are 95% confident to reject null hypotheses. But if the P value is bigger than 0.05, so in this case we cannot discard the null hypothesis.

### **4.2 ADF Unit Root (UR) Test**

To check the stationary of the variables, the ADF UR test has been used. There are three ways to check the stationary by applying ADF. 1. Without Trend and Constant 2. With Trend and Constant 3. With Constant. The hypothesis is,  $H_0 = 0$  UR Problem,  $H_1 \neq 0$  No UR Problem. Decision rules are The null hypotheses cannot be rejected if computed T- value is larger than its critical value. It means the data has faced a problem of a UR. If calculated T-value is lesser than its critical value, in this case we are able to reject the null hypotheses and accept the alternative hypotheses. It means data do not face the problem of

a UR. In this research study, stationary of study variables has been checked through the ADF UR test, the Schwarz information measure is applied for receiving the lag selection. So we are able to reject the null hypothesis if variables are non-stationary at 5% level of significance in time series data.

**Table 1 Unit Root Test At Level**

Variables	Without Trend And Constant		With Trend And Constant		With Constant	
	T-Stat	P.value	T-Stat	P.value	T-Stat	P.value
GDP	3.452874	0.9996	-4.411417	0.0088	-0.086562	0.9407
PS	0.543307	0.8277	-1.692405	0.7296	-1.784892	0.3804
GFCF	2.670183	0.9973	-2.844565	0.1940	-0.564981	0.8636
TLF	19.53650	1.0000	-2.529982	0.3125	0.380594	0.9787
INF	-0.739626	0.3876	-2.091940	0.5292	-2.004866	0.2833

#### 4.2.1 Without Trend and Constant

In the above table, at the 5% significance level, the calculated ADF test-stats values are bigger than the critical value, respectively, so we do not have sufficient evidences to discard the null hypotheses. It explains that there is a UR problem in the variables (GDP, PS, GFCF, TLF and INF). Therefore, it concludes that at level without trend and constant all the variables are non-stationary.

#### 4.2.2 With Trend and Constant

In the above table, at the 5% significance level, the calculated ADF test-stats values are bigger than the critical value, respectively, so we do not have sufficient evidences to discard the null hypotheses. It explains that there is a UR problem in the four variables (PS, TLF, GFCF and INF). While GDP does not have a UR problem because of smaller t-value than its critical value. So in the case of GDP, we can discard the null hypotheses. Therefore, it concludes that at level with trend and constant the four variables are non-stationary and one variable is stationary.

#### 4.2.3 With Constant

In the above table, at the 5% significance level, the calculated ADF test-stats values are bigger than the critical value, respectively, so we do not have sufficient evidences to discard the null hypotheses. It explains that there is a UR problem in the variables (GDP, PS, GFCF, TLF and INF). Therefore, it concludes that at level with constant all the variables are non-stationary.

**Table 2 Unit Root Test at 1st Difference**

Variables	Without Trend And Constant		With Trend And Constant		With Constant	
	T-Stat	P-value	T-Stat	P-value	T-Stat	P-value
GDP	-6.541273	0.0000	.....	.....	-3.4246	0.0196
PS	-3.980597	0.0003	-3.950712	0.0225	-3.9668	0.0050
GFCF	-3.628158	0.0007	-3.632622	0.0443	-4.2562	0.0024
TLF	-6.790759	0.0000	-3.538362	0.0545	-3.5743	0.0131
INF	-5.932538	0.0000	-5.741970	0.0003	-5.8351	0.0000

#### 4.2.4 Without Trend And Constant

In the above given table, at 5% significance level, the calculated ADF test-stats values are lesser than the critical values, respectively, so null hypotheses can be rejected. It explains that there is no UR problem in the variables (GDP, PS, GFCF, TLF and INF). Therefore, it concludes that after taking first difference without trend and constant all the variables are stationary.

#### 4.2.5 With Trend And Constant

In the above given table, at 5% significance level, the calculated ADF test-stats values are lesser than the critical values, respectively, so null hypotheses can be rejected. It explains that there is no UR problem in the variables (PS, TLF, GFCF and INF). Therefore, it concludes that after taking first difference with trend and constant all the variables are stationary.

#### 4.2.6 With Constant

In the above given table, at 5% significance level, the calculated ADF test-stats values are lesser than the critical values, respectively, so null hypotheses can be rejected. It explains that there is no UR problem in the variables (GDP, PS, GFCF, TLF and INF). Therefore, it concludes that after taking first difference with constant all the variables are stationary.

#### 4.3 Ordinary Least Square Method (OLS METHOD)

In the above table OLS model has utilized to check the long run connection among GDP and other explanatory factors. The outcomes show that all the factors (PS, GFCF, TLF and INF) in the long run investigation have shown a positively significant impact on the EG of Pakistan. The GDP growth increased by 0.036 units, if on average one unit raise in PS. The positive link among PS and GDP growth was also varified by Alesina et al. (1996), Bashir and Xu (2014), Siemann (1996) . GFCF and TLF have also a positively significant effect on GDP. The GDP growth increased by 0.273 units, if one unit increase in GFCF on average. The positive link among GDP growth and GFCF was also varified by Barro (1996, 1999). One unit rise in TLF on average will leads to raise GDP growth by 1.073 units. Inflation has also positively significant effect on the GDP. The GDP growth increased by 0.020 units, if one unit raises in INF on average. The positive link among inflation and GDP growth was also varified by Awan (2012). To check the overall robustness of the model R2 has been used. The R2 value is 99.862, which indicates that model is robust.

**Table 3 Ordinary Least Square Method (OLS METHOD)**

Variables	Coefficients	t-Statists	Probability
C	0.040186	0.274621	0.7858
PS	0.036685	1.989249	0.0573
GFCF	0.27771	9.422434	0.0000
TLF	1.073026	45.69657	0.0000
INF	0.020386	3.788259	0.0008
R2 = 0.99862, Adj. R2 = 0.99842, F-stat = 4767.90, Prob. (F-statistics) = 0.0000			

**Table 4 Alternative Hypotheses**

H1	There is a negative connection between EG and PS.	Rejected
H2	There is a positive connection between EG and GFCF.	Accepted
H3	There is a positive connection between EG and TLF.	Accepted
H4	There is a negative connection between EG and INF.	Rejected

#### 4.4 VAR Model

Further, in this research we are trying to see the short run connection between GDP and other explanatory variables. The results show that PS does not have an impact on the GDP of Pakistan in the short run investigation. While GFCF, TLF and INF has a positive impact on the growth rate of Pakistan in the short run investigation.

**Table 5 Vector Autoregression Estimates**

Variables	Coefficients	S.E	T-statistics
GDP(-1)	0.668927	(0.28552)	[2.34284]
GDP(-2)	-0.439359	(0.17693)	[-2.48330]

C	0.209598	(0.16946)	[ 1.23686]
PS	0.031946	(0.02376)	[ 1.34426]
GFCF	0.170820	(0.06387)	[ 2.67458]
TLF	0.851998	(0.24345)	[ 3.49963]
INF	0.015541	(0.00808)	[ 1.92270]

## 5. Conclusion

The connection between PS and GDP is one of the major points in discussion among researchers involved in field of political economy. EG and PS are genuinely interrelated which develop importance of PS in economic development of any state. This research study explores the impact of PS on EG in Pakistan from the time period of 1988 to 2018. Political stability, gross capital formation, total labour force and Inflation are important explanatory variables, where as for as concern about model specification GDP<sub>r</sub> has been chosen as a DV (Dependent Variable). To check the stationary of time series data Augmented Dickey Fuller (ADF) unit root test has been used, and whereas to find out the long run relationship among variables, OLS method has been used. The analysis the impact of political stability on EG in the short run, VAR model has been used.

The outcomes show that all the variables (PS, GFCF, TLF and INF) have a significantly positive effect on the EG of Pakistan in the long run period. But the effect of PS on GDP is smaller. Further, in this research we are trying to see the short run association between EG as well as other descriptive variables. The results show that PS has no effect on EG. While GFCF, TLF and INF has a positively impact on EG of Pakistan. PS enhances the EG and economic activity, also be enhanced to benefit the foreign and local investors so that investment would be in a safe hands. So that savings will be boosted, consumption level, as well as productivity; this is because of purchasing power and earning capacity of the masses. Unemployment and inflation are decreased due to PS because unemployment and high inflation create unrest and uncertainty in society and that unrest and uncertainty can create violence and general strikes against employers and Government policies. For the betterment of Pakistan let the political system to prosper; political system will not be discontinued because some time is needed to grow up for anything. For the betterment of Pakistan, unstable political system is harmful. As we know the political system is the center of decision making. Therefore, for the long term betterment of the country political system must be stable.

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## The Moderating Effect of OPEC and Non-OPEC on the Relationship Between Oil Price Volatility and Accrual Earnings Management in the Oil and Gas Industry

<sup>1</sup> Viveksarati Sandrasigaran, <sup>2</sup> Jalila Binti Johari, <sup>3</sup> Soh Wei Ni, <sup>4</sup> Bany-Arifin A.N

<sup>1</sup> Ph.D Scholar, Department of Economics, Universiti Putra Malaysia, vivek1119@hotmail.com

<sup>2</sup> Department of Accounting and Finance, Universiti Putra Malaysia, jjohari@upm.edu.my

<sup>3</sup> Department of Accounting and Finance, Universiti Putra Malaysia, sohweini@upm.edu.my

<sup>4</sup> Department of Accounting and Finance, Universiti Putra Malaysia, bany@upm.edu.my

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p> <hr/> <p><b>Keywords</b> Political Costs, Price Setter, Price Taker, Oil Price Volatility, Accrual Earnings Management</p> <hr/> <p><b>JEL Classification:</b> D72, D79, E64</p>	<p>This study is an empirical examination on the relationship between oil price volatility and earnings management in the oil and gas industry, moderated by dominant-firm, OPEC (Organization of Petroleum Exporting Nations), and fringe competition of Non-OPEC countries. This study tests current and non-current accruals as the proxy of accrual earnings management. A total sample of 209 firm-year observations from 2008 to 2018 of listed oil and gas firm collected from the Thomson Data stream database. To proxy the moderation effect, the samples divided into two sub-groups, OPEC and Non-OPEC. The initial results show that, overall, the interaction effect between OPEC/Non-OPEC and oil price volatility is significant to discretionary and income-decreasing discretionary accrual. This study contributes to existing earnings management literature regarding political cost, which remains a significant concern to oil and gas companies worldwide.</p>



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Corresponding author's email address: vivek1119@hotmail.com

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### 1. Introduction

Oil price volatility and its significant effect on the oil market has been an essential subject of academic interest. Many macroeconomic factors trigger oil price volatility, such as oil supply- oil demand, market speculation, geopolitical events, natural disasters (Kaufman et al.,2008; Florini and Sovacool, 2009; Martina et al., 2011). One of the frequently cited macroeconomic factors is the influence of OPEC (Organization of Petroleum Exporting Countries) as a unified group, widely viewed as the market power and Non-OPEC oil producers as the fringe competitors in the oil market (Rolf Golombek et al.,2018; Fattouh,2012; Bremond et al., 2012).

OPEC member countries generate about 40 percent of the world's crude oil, and their oil exports roughly represent 60 percent of the total oil exported in the world (Energy Information Administration, 2019). The extent of OPEC's available production and spare capacity generally used as an indicator of influence on crude oil prices (Energy Information Administration, 2019). Given OPEC's market significance and geopolitical events deemed to cause potential loss of crude oil production can produce a sharp increase in oil prices (Energy Information Administration, 2019). Meanwhile, non-OPEC oil producers only respond to market prices rather than attempting to influence prices by managing production. As a result of their independent decision, they are unable to control the market as they need to produce at full capacity. (Energy Information Administration, 2019). From the mid-2014 to early-2015, the price of Brent crude oil per barrel significantly dropped to \$46. This downfall attributed to the USA's increased shale production and OPEC's decision to keep its crude oil production stable.

Therefore, these current issues on the influence of OPEC and Non-OPEC on the crude oil market do raise serious questions about oil price volatility impact on the financial performance of oil and gas firms. Thus, this creates a motivation to analyze accrual earnings management in the oil and gas industry. Unlike cooking of the books, earnings management conforms to accounting standards procedures (Rahman & Ali, 2006). Our research seeks to analyze the moderating effect of a dominant firm (OPEC) and fringe competitor (Non-OPEC) on the relationship between oil price volatility and accrual earnings management.

## **2. Literature Review**

### **2.1 Political Cost Theory**

The theory states that companies at heightened political scrutiny will engage in accounting choices that decreases reported earnings, as an attempt to reduce political sensitivities such as taxes or penalties (Watts and Zimmerman, 1978). After Watts and Zimmerman (1978), empirical studies have suggested a more extensive range of measures to proxy for political cost such as geopolitics, profits, rates of return, risk, capital intensity, industry concentration, industry membership, effective tax rates, number of employees, number of shareholders, labour intensity, press coverage, and even social responsibility disclosures (Zmijewski and Hagerman, 1981; Holthausen and Leftwich, 1983; Watts and Zimmerman, 1986; Deegan and Hallam, 1991; Panchapakesan and McKinnon, 1992; Deegan and Carroll, 1993; Lemon and Cahan, 1997; Han and Wang, 1998; Byard et al., 2007; Hsiao et al., 2016). In short, earnings are reduced downwards when there are political reasons to do so: e.g., firms in a politically sensitive industry such as the oil and gas industry are vulnerable to environmental concerns, antitrust allegations, and public perceptions of "excess profitability" (Ammr Kurdi, 2010). Significantly, the problem is complicated further by global geopolitical instability that causes crude oil supply disruptions, such as production cuts by OPEC (Ammr Kurdi, 2010).

Most previous studies on the oil industry examine the effect of a positive change in oil prices. Studies on the Persian Gulf crisis (Han and Wang, 1998), hurricanes Katrina and Rita (Byard, Hossain and Mitra, 2007), and the Arab Spring (Hsiao, Hu, and Lin, 2016) signal to income decreasing earnings management following several oil price shocks. Byard, Hossain, and Mitra (2007) and Han and Wang (1998) attribute their findings to the political cost hypothesis (Watts and Zimmerman, 1986). Cormier and Magnan (2002) analyze Canadian oil and gas firms for 12 years (1985-1996) using oil price volatility, found some evidence of systematic earnings management through nondiscretionary accruals. These studies signal that oil companies are willing to engage in earnings management, but their research is based on a specific country, e.g., North America. Thus, there is a significant gap in the works of literature as to how they would react to oil price volatility caused by the influence of OPEC as a dominant firm and Non-OPEC as the fringe competitor.



## 2.2 Dominant- Competitive Fringe Theory

In a traditional Hotelling model of dominant-competitive fringe (1931), the crude oil market is positioned as a non-cooperative oligopoly market dominated by a few large suppliers with several small producers (David Newberry, 1981; R.Golombek et al., 2018). In the crude oil market, non-OPEC oil production driven by competitive behavior, and they are inelastic to oil price changes (Dées et al. 2007). Non-OPEC producers are typically reflected as the price taker, and thus produce at near full capacity with limited spare capacity (R.Golombek et al.2018). An increase in non-OPEC production will cause the oil price to decrease, and a decrease in their output causes the global aggregate output to fall.

On the other hand, OPEC plays the market balancing role and has the incentive to exercise market power and to reduce or increase crude oil production based on the market needs (von der Fehr, Nils-Henrik M., 2010; McKinsey Energy Insight, 2018). OPEC's behavior can be explained further by target revenue theory coined by (Ezzati,1976; Cremer and Isfahami, 1980; Teece, 1982), suggesting that target revenue is determined by the organization's ability to constraint production and maintain the production ceiling based on its reserves.

The theory ties with a study conducted by Dées et al. (2007), reveals that OPEC's behavior based on spare capacity utilization that significantly affects crude oil prices. Additionally, OPEC's price-setting ability depends on the elasticity of crude oil demand and supply, interest rates, and reserve level (Reza, 1984).

## 3. Methodology

### 3.1 Data and Sampling

Our sample is extracted from the Datastream- Public listed oil and gas companies covering the period of 2008 to 2018 through the Thomson Reuters Database. The sample followed two fundamental rules of thumb as per accordance with Sekaran (2003, p.295). Firstly, sample sizes should be larger than 30 and less than 500 firms. Secondly, a minimum sample size of 30 for each variable is necessary for sub-sampling. The initial sample of this study consists of 242 firm-year observations. Companies included in the final sample of 131 firm-year observations followed the conditions of (1) All financial data needed for the analysis are available (2) Meets the Jarque-Bera and Skewness/Kurtosis (3) No multicollinearity problems (4) White's test of Heteroscedasticity. Table 1 shows the final sample consists of listed oil and gas companies from Canada, Croatia, France, Indonesia, Netherlands, Thailand, the US, Gabon, Kuwait, Nigeria, and Saudi Arabia. These companies are divided into two separate dummy groups of OPEC and Non-OPEC based on reserves to production ratio of each selected countries.

**Table 1:** Distribution of listed oil and gas companies across countries

groupdummy = NONOPEC

Domicile   Country	Freq.	Percent	Cum.
Canada	12	13.04	13.04
Croatia	8	8.70	21.74
France	10	10.87	32.61
Indonesia	7	7.61	40.22
Netherlands	10	10.87	51.09
Thailand	7	7.61	58.70
US	38	41.30	100.00

Total	92	100.00
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groupdummy = OPEC

Domicile   Country	Freq.	Percent	Cum.
Gabon	2	5.13	5.13
Kuwait	8	20.51	25.64
Nigeria	11	28.21	53.85
Saudi	18	46.15	100.00
Total	39	100.00	

#### 4. Earnings management measurement

In this study, total discretionary, current, and non-current accruals are used as the primary proxy of accruals earnings management following a previous earnings management study (Hsiao et al., 2016). We apply Han and Wang's and Byard's model for the computation of accruals as it captures the actual attributes and the industry specificity of oil and gas firms compared to other earnings management model (Hsiao et al.2016; Byard et al., 2007; Han and Wang, 2005). Specifically, discretionary, income decreasing, current and non-current accruals are calculated as follows:

- Discretionary accrual measurement:  $TTAC_{i,t}/TA_{i,t} = \beta_0 + \beta_1 (\Delta REV_{i,t}/TA_{i,t}) + \beta_2 (PPE_{i,t}/TA_{i,t}) + \beta_3 (\ln Size_{i,t}) + \beta_4 (ROA_{i,t}) + \beta_5 (Leverage_{i,t}) + \beta_6 (Market\ to\ Book\ ratio_{i,t}) + \epsilon_{it}$
- Income decreasing discretionary accrual measurement:  $TTAC_{i,t}/TA_{i,t-1} = \beta_0 + \beta_1 (\Delta REV_{i,t} - \Delta REC_{i,t} / TA_{i,t-1}) + \beta_2 (PPE_{i,t}/TA_{i,t-1}) + \beta_3 (CF_{i,t}/TA_{i,t-1}) + \beta_3 (\ln Size_{i,t}) + \beta_4 (ROA_{i,t}) + \beta_5 (Leverage_{i,t}) + \beta_6 (Market\ to\ Book\ ratio_{i,t}) + \epsilon_{it}$
- Current accrual measurement:  $CAC_{i,t}/TA_{i,t-1} = \beta_0 + \beta_1 (REV_{i,t} - REC_{i,t} / TA_{i,t-1}) + \beta_2 (CF_{i,t}/TA_{i,t-1}) + \beta_3 (\ln Size_{i,t}) + \beta_4 (ROA_{i,t}) + \beta_5 (Leverage_{i,t}) + \beta_6 (Market\ to\ Book\ ratio_{i,t}) + \epsilon_{it}$
- Non-current accrual measurement:  $NCAC_{i,t}/TA_{i,t-1} = \beta_0 + \beta_1 (PPE_{i,t}/TA_{i,t-1}) + \beta_2 (CF_{i,t}/TA_{i,t-1}) + \beta_3 (\ln Size_{i,t}) + \beta_4 (ROA_{i,t}) + \beta_5 (Leverage_{i,t}) + \beta_6 (Market\ to\ Book\ ratio_{i,t}) + \epsilon_{it}$

Thus, our current study result should be consistent with prior earnings management studies (Hsiao et al.,2016; Byard et al.,2007; Kothari et al., 2005; Asbaugh et al.,2003; Cormier and Magnan,2002; Han & Wang, 1998). Hence, we use the following model to analyze whether OPEC or Non-OPEC affects the relationship between oil price volatility and accrual earnings management.

$$DACC_{it} = \beta_1 + \beta_2 (OPV_{t-1}) + \beta_3 (\text{group dummy}) + \beta_4 (\text{int\_groupdummy\_OPVT}) + \beta_5 (NEG\_CFO) + \beta_6 (LOSS) + \beta_7 (MeetBeat) + \beta_8 (CurrentRatio) + \beta_9 (Price) + \beta_{10} (EBITDA\ margin) + \beta_{11} (FCF) + \beta_{12} (Sales\ Growth) + \beta_{13} (Growth) + \epsilon_{it}$$

$$DACC_{iit} = \beta_1 + \beta_2 (OPV_{t-1}) + \beta_3 (\text{group dummy}) + \beta_4 (\text{int\_groupdummy\_OPVT}) + \beta_5 (\text{NEG\_CFO}) + \beta_6 (\text{LOSS}) + \beta_7 (\text{MeetBeat}) + \beta_8 (\text{CurrentRatio}) + \beta_9 (\text{Price}) + \beta_{10} (\text{EBITDA margin}) + \beta_{11} (\text{FCF}) + \beta_{12} (\text{Sales Growth}) + \beta_{13} (\text{Growth}) + \varepsilon_{it}$$

$$CACCI_{iit} = \beta_1 + \beta_2 (OPV_{t-1}) + \beta_3 (\text{group dummy}) + \beta_4 (\text{int\_groupdummy\_OPVT}) + \beta_5 (\text{NEG\_CFO}) + \beta_6 (\text{LOSS}) + \beta_7 (\text{MeetBeat}) + \beta_8 (\text{CurrentRatio}) + \beta_9 (\text{Price}) + \beta_{10} (\text{EBITDA margin}) + \beta_{11} (\text{FCF}) + \beta_{12} (\text{Sales Growth}) + \beta_{13} (\text{Growth}) + \varepsilon_{it}$$

$$NCACCI_{iit} = \beta_1 + \beta_2 (OPV_{t-1}) + \beta_3 (\text{group dummy}) + \beta_4 (\text{int\_groupdummy\_OPVT}) + \beta_5 (\text{NEG\_CFO}) + \beta_6 (\text{LOSS}) + \beta_7 (\text{MeetBeat}) + \beta_8 (\text{CurrentRatio}) + \beta_9 (\text{Price}) + \beta_{10} (\text{EBITDA margin}) + \beta_{11} (\text{FCF}) + \beta_{12} (\text{Sales Growth}) + \beta_{13} (\text{Growth}) + \varepsilon_{it}$$

Where<sup>1</sup>

Total Accrual	(Net result – Operating Cash Flow) / Total Assets
Discretionary Accrual	Modified Jones Model Cross Sectional
Current Accrual	(Income before extraordinary items + depreciation and amortization minus operating cash flow/beginning of the year total assets)
Non- Current Accrual	Total Accrual- Current Accrual
Price	Indicator variable that equals one if the oil price is above USD50 for the current year and zero, otherwise
LOSS	Indicator variable that equals one if the Net result is negative in the current year and zero, otherwise
NEG_CFO	Indicator variable that equals one if operating cash flow is negative in the current year and zero, otherwise
EBITDA margin	The EBITDA margin for firm i, at the end of the fiscal year. (Extracted from Datastream)
Current Ratio	Current Asset divided by Current Liability
Meet/Beat	Indicator variable that equals one if the firm's income before extraordinary income at the time t equals or greater than the previous year and zero, otherwise
Group dummy	Dummy variable that indicates OPEC is equaled to 1 and Non-OPEC is equaled to 0 based on ratio to production ratio yearly
Oil price volatility	Oil Price volatility is converted into annual data of (Dubai, WTI, and Brent). Secondly, it is calculated using Ln (Current year/ Previous year). Finally, it is computed using the standard deviation of T-1 (Previous year to current)
Growth	Entity I's total assets in the year t divided by the total assets in year t-1

Sales Growth	Entity I's sales in the year t divided by the sales in year t-1
Market to Book ratio	Market capitalization divided by the book value of Equity. Book value of equity is computed using the formula (Total assets minus Total liabilities minus Intangible assets minus Preferred Stock)
Ln Size	Firm size is computed using a log value of total assets in year t

## 5. Descriptive statistics and correlation results

Table 2a and 2b present the descriptive statistics and T-test statistics for model variables. Table 2a shows summary statistics for all the oil and gas listed companies, divided by OPEC and Non-OPEC firms. OPEC and Non-OPEC firms have 39 and 92 listed firms respectively. As presented in Table 2a, that Non-OPEC firms are larger in size (measured by Growth) compared to OPEC firms. They also have a significant mean value for Current Ratio (1.214) as compared to OPEC firms (1.119).

For the test of differences in Table 2b, all stated t-test values of each variable are two-sided. The results show that firms in the OPEC have higher discretionary (t-value = -4.1370) and current accruals (t-value = -3.6972) compared to Non-OPEC indicates that there is a high number of small oil and gas firms within the sample. Meanwhile, T-stat reveal that income decreasing (T-value= 4.2695) and non-current discretionary accruals (T-value= 6.0828) is highly associated with large-size Non-OPEC firms. The rest of the results are presented below.

**Table 2a:** Descriptive Statistics

### i) OPEC

Variable	Obs	Mean	Std. Dev.	Min	Max
-----+-----					
DACCI	39	-.0346691	.0664695	-.2202415	.167804
CACCI	39	.0184406	.0264222	-.0577226	.0634416
NCACCI	39	-.0601063	.0752331	-.2431977	.1445365
OPVT1	39	.3691973	.2787955	.0184871	.7616988
NEG_CFO	39	.1025641	.3073547	0	1
-----+-----					
LOSS	39	.0512821	.2234559	0	1
MeetBeat	39	.4615385	.5050354	0	1
CurrentRatio	39	1.11917	.7126017	.2673075	4.142798
Price	39	.8461538	.3655178	0	1
EBITDAMargin	39	.1535128	.1466889	.002	.581
-----+-----					
FCF	39	.0074219	.0616038	-.1160168	.1598501
SalesGrowth	39	.0273189	.2932285	-.8275258	.5141564
Growth	39	1.050815	.1181631	.6853893	1.42528

## ii) Non- OPEC

Variable	Obs	Mean	Std. Dev.	Min	Max
DACCI	92	.0125481	.0538858	-.129971	.175115
CACCI	92	-.0030575	.0319569	-.1043114	.067966
NCACCI	92	.0118151	.0553577	-.1426652	.1721547
OPVT1	92	.3484187	.2645081	.0184871	.7616988
NEG_CFO	92	0	0	0	0
LOSS	92	.1521739	.3611576	0	1
MeetBeat	92	.5326087	.5016695	0	1
CurrentRatio	92	1.254024	.7162283	.3853866	4.333069
Price	92	.9021739	.2987072	0	1
EBITDAMargin	92	.2875652	.2250335	-.069	.802
FCF	92	.0144935	.0578205	-.1713978	.1716925
SalesGrowth	92	-.0309035	.3034702	-.7777702	.4883773
Growth	92	1.066921	.1445025	.7644978	1.571944

Table 2b: T-Test of differences comparing OPEC and Non-OPEC

Variables	OPEC		NON-OPEC		Test of Differences
	N	Mean	N	Mean	T-Stat
DACC	39	0.02184	92	-0.01315	-4.1370***
DACCI	39	-0.03466	92	0.01254	4.2695***
CACCI	39	0.01844	92	-0.003057	-3.6972***
NCACCI	39	-0.06010	92	0.011815	6.0828***
OPVT1	39	0.3692	92	0.3484	-0.4046
NEG_CFO	39	0.1026	92	0.00	-3.2177***
LOSS	39	0.05128	92	0.1522	1.6163
MEETBEAT	39	0.4615	92	0.5326	0.7399
CURRENT RATIO	39	1.1192	92	1.2540	0.9869
PRICE	39	0.8462	92	0.9022	0.9166
EBITDA MARGIN	39	0.1535	92	0.2876	3.4208***
FCF	39	0.00742	92	0.0145	0.6277
SALES GROWTH	39	0.02731	92	-0.03090	-1.0140
GROWTH	39	1.051	92	1.067	0.6140

\*\*\* Significant at a two-tailed  $\leq 0.01$

Table 3 represents the contemporaneous accrual correlations between oil price volatility and accrual earnings management. As seen in Table 3, Non-OPEC exhibits a high correlation at a five and ten percent confidence for discretionary, income decreasing and non-current accrual. Meanwhile, OPEC is not correlated with discretionary, income decreasing accrual, current, and non-current accrual.

**Table 3:** Contemporaneous accrual correlation at 5 percent confidence level

Discretionary Accrual and OPVT1		Income Decreasing Discretionary Accrual and OPVT1		Current Accrual and OPVT1		Non-Current Accrual and OPVT1	
OPEC	NON-OPEC	OPEC	NON-OPEC	OPEC	NON-OPEC	OPEC	NON-OPEC
0.0337	0.2436**	-0.0782	-0.2386**	0.1623	-0.1054	-0.0995	-0.1816*
-	0.0193	-	0.0220	-	-	-	0.0832

\*\*, \* Significant at a two-tailed  $\leq 0.05, 0.10$

Before running the primary regression, we have made sure that we ran several tests such as the Jarque-Bera normality test, skewness, and kurtosis test of normality, White's test of heteroscedastic and Variance Inflation Factor for multi-collinearity. All the results revealed that our data is free from outliers, and they are normally distributed, homogenous, and free from multi-collinearity. The results are enclosed in the Appendix.

## 6. Empirical Results

We hypothesize that OPEC and Non-OPEC are able to moderate the relationship between oil price volatility and accrual earnings management. We test the hypothesis using the models as discussed in Section 4. We follow the similar research methods steps from Hsiao et al., (2016); Byard et al., (2007); Cormier et al., (2003); Han and Wang (1998) to estimate earnings management equations. We find that it is reasonable to examine the firm-level earnings management behavior based on market grouping as there is a significant difference in terms of geopolitical effect between OPEC and Non-OPEC in the crude oil market.

As shown in Column (a) and (b) of Table 4, the coefficient estimate of OPEC's moderation effect with oil price volatility with discretionary accrual (coefficient= -0.0658) and income decreasing discretionary accrual (coefficient= 0.753) is significant at one and five percent level indicates that OPEC firms predict higher negative discretionary accruals compared to Non-OPEC firms during crude oil price volatility. These findings are fair with the dominant-competitive fringe theory. Hochman and Zilberman (2011) explain that OPEC is seen as the dominant price-setter with high proven crude oil reserves compared to Non-OPEC firms, and able to impose production quotas to its member countries and also non-member countries. OPEC are able to target revenue-based through spare capacity utilization compared to Non-OPEC, who required to produce at full capacity in order to bring production costs lower (Kaufman et al., 2008; R.Golombek et al.2018). Thus, this strengthens the notion that OPEC firms engage in negative and income decreasing accruals higher compared to Non-OPEC firms to manage oil price volatility as Non-OPEC firms produce at full capacity to reduce production costs. This analysis also provides substantial evidence that oil price volatility is highly significant with accrual earnings management behavior amongst

oil and gas firms as a whole. The majority of predicted control variables are relatively significant in explaining the strength of the accruals method used.

**Table 4:** Regression result of Accruals

a) Discretionary Accrual		b) Income Decreasing Discretionary Accrual	c) Current Accrual	d) Non-Current Accrual
Variables	P-value	P-value	P-value	P-value
OPVT1	0.003***	0.003***	0.073*	0.022**
Groupdummy-OPEC	0.003***	0.003***	0.202	0.000***
Groupdummy_OPEC*OPVT1	-0.008***	0.048**	0.149	0.143
Groupdummy_NONOPEC*OPVT1	0.008***	-0.048**	-0.149	-0.143
NEG_CFO	0.027**	0.574	0.000***	0.004***
LOSS	0.000***	0.003***	0.001***	0.001***
MeetBeat	0.533	0.700	0.081*	0.285
Current Ratio	0.481	0.818	0.001***	0.352
Price	0.030**	0.793	0.762	0.874
EBITDA Margin	0.000***	0.000***	0.003***	0.000***
FCF	0.000*** *	0.015**	0.130	0.008***
Sales Growth	0.166	0.075*	0.002***	0.347
Growth	0.000***	0.181	0.169	0.783

\*\*\*, \*\*, \* Significant at a two-tailed p-value  $\leq$  0.01, 0.05, 0.10

## 7. Conclusion

This paper examines the use of discretionary, income decreasing discretionary, current and non-current accruals as a proxy of accrual earnings management to explain earnings management prevalence to manage oil price volatility. This study also looks into the geopolitical effect by introducing group classification of OPEC and Non-OPEC as the moderator effect. Specifically, most of the prior earnings management works of literature are based on the notion that earnings management is merely focused on a firm and industry level. Thus, the study initially posits that firms in either OPEC or Non-OPEC have an inverse moderating effect on the relationship between oil price volatility and earnings management and vice versa. This research, therefore, provides a basis for accepting the null hypothesis that presumed that OPEC or Non-OPEC is significant in strengthening or weakening the effect of oil price volatility and earnings management for the discretionary and income-decreasing discretionary accrual model. Meanwhile, the rest of the accruals model is insignificant in affecting the relationship.

Additionally, it must be noted that we are only using the reserve to production ratio as a proxy for OPEC and Non-OPEC, a country level variable rather than a firm-level variable to explain the effect of OPEC and Non-OPEC. We agree that additional indicators required to capture the true essence of the impact of OPEC and Non-OPEC, for instance, supply and demand for crude oil and interest rate exchange (Reza,1984). Extending with the prior research conducted by Hsiao et al., (2016), this study provides evidence that oil and gas firms in OPEC and Non-OPEC have an inverse relationship in explaining the

association between oil price volatility and earnings management via current accruals. The rest of the control variable results are in line with previous studies (Hsiao et al., 2016; Ammr Kurdi, 2010; Byard et al., 2007; Han and Wang, 1998)

The findings of this paper contribute to the earnings management research that examines the political cost hypothesis by showing how OPEC and Non-OPEC group classification affects the relationship between oil price volatility and accrual earnings management. These results are of interest to regulators that are interested in understanding how oil and gas companies manage oil price volatility through reported earnings.

### 8. Limitation of research

This research is limited by sample constraints while engaging in a comparison study. There was a limited number of listed firms in the OPEC region, and they are moderately small in size in terms of market capitalization as compared to Non-OPEC firms. Therefore, results may significantly limit the generalization of the presented results per the group classification of OPEC and Non-OPEC. Further research needed with an equal extensive sample to model all known and relevant variables for the moderation effect of OPEC and Non-OPEC.

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**Appendix****i. Test of Normality:**

a) Jarque-Bera Normality test

Jarque-Bera normality test: 3.173 Chi(2) .2047

Jarque-Bera test for Ho: normality:

b) Shapiro-Wilk W test for normality

Variable	Obs	W	V	z	Prob>z
residstd	131	0.98437	1.620	1.086	0.13872

c) Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
residstd	131	0.0717	0.5859	3.61	0.1645

**ii. Heteroskedasticity test:**

White's test for Ho: homoskedasticity  
against Ha: unrestricted heteroskedasticity

chi2(113) = 129.25

Prob &gt; chi2 = 0.1408

Cameron &amp; Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	129.69	113	0.1348
Skewness	32.38	15	0.0057
Kurtosis	5.14	1	0.0233
Total	167.22	129	0.0133

-----

**iii. Test of Multi-Collinearity Variance Inflation Factor**

**a) DACC**

Variable	VIF	1/VIF
OPVT1	2.03	0.492256
1.groupdummy	3.23	0.309812
groupdummy#		
c.OPVT1		
1	3.87	0.258172
NEG_CFO	1.19	0.838222
LOSS	1.32	0.757647
MeetBeat	1.57	0.635057
CurrentRatio	1.11	0.898744
Price	1.43	0.697584
EBITDAMargin	1.42	0.705273
FCF	1.64	0.611518
SalesGrowth	1.59	0.630412
Growth	1.52	0.658003
Mean VIF	1.83	

**b) DACC<sub>i</sub> (INCOME DECREASING)**

Variable	VIF	1/VIF
OPVT1	2.03	0.492256
1.groupdummy	3.23	0.309812
groupdummy#		
c.OPVT1		
1	3.87	0.258172
NEG_CFO	1.19	0.838222
LOSS	1.32	0.757647
MeetBeat	1.57	0.635057
CurrentRatio	1.11	0.898744
Price	1.43	0.697584
EBITDAMargin	1.42	0.705273
FCF	1.64	0.611518
SalesGrowth	1.59	0.630412

Growth	1.52	0.658003
-----+-----		
Mean VIF	1.83	

**c) CACCI (Current Accrual)**

Variable	VIF	1/VIF
-----+-----		
OPVT1	2.03	0.492256
1.groupdummy	3.23	0.309812
groupdummy#		
c.OPVT1		
1	3.87	0.258172
NEG_CFO	1.19	0.838222
LOSS	1.32	0.757647
MeetBeat	1.57	0.635057
CurrentRatio	1.11	0.898744
Price	1.43	0.697584
EBITDAMargin	1.42	0.705273
FCF	1.64	0.611518
SalesGrowth	1.59	0.630412
Growth	1.52	0.658003
-----+-----		
Mean VIF	1.83	

**d) Non-Current Accrual**

Variable	VIF	1/VIF
-----+-----		
OPVT1	2.03	0.492256
1.groupdummy	3.23	0.309812
groupdummy#		
c.OPVT1		
1	3.87	0.258172
NEG_CFO	1.19	0.838222
LOSS	1.32	0.757647
MeetBeat	1.57	0.635057
CurrentRatio	1.11	0.898744
Price	1.43	0.697584
EBITDAMargin	1.42	0.705273
FCF	1.64	0.611518
SalesGrowth	1.59	0.630412
Growth	1.52	0.658003
-----+-----		
Mean VIF	1.83	

#### iv. Regression result

##### a) OLS Regression Discretionary Accrual

Source	SS	df	MS	Number of obs	=	131
				F(12, 118)	=	13.41
Model	.165264108	12	.013772009	Prob > F	=	0.0000
Residual	.121208647	118	.001027192	R-squared	=	0.5769
				Adj R-squared	=	0.5339
Total	.286472755	130	.002203637	Root MSE	=	.03205

DACC	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
OPVT1	.045287	.0149533	3.03	0.003	.0156753	.0748987
groupdummy						
OPEC	.0337326	.0110024	3.07	0.003	.0119449	.0555203
groupdummy#c.OPVT1						
OPEC	-.0658289	.0243925	-2.70	0.008	-.1141326	-.0175251
NEG_CFO	.0398014	.0177767	2.24	0.027	.0045988	.075004
LOSS	-.0377784	.0098247	-3.85	0.000	-.057234	-.0183229
MeetBeat	.0043971	.0070296	0.63	0.533	-.0095233	.0183176
CurrentRatio	.0029296	.0041464	0.71	0.481	-.0052814	.0111407
Price	-.0230734	.010529	-2.19	0.030	-.0439238	-.0022231
EBITDAMargin	-.0906461	.0156876	-5.78	0.000	-.1217117	-.0595804
FCF	-.4731177	.061109	-7.74	0.000	-.5941301	-.3521053
SalesGrowth	-.0164058	.0117805	-1.39	0.166	-.0397345	.0069229
Growth	-.1000676	.0253051	-3.95	0.000	-.1501786	-.0499566
_cons	.1307974	.030816	4.24	0.000	.0697733	.1918215

##### b) OLS Regression Income Decreasing Discretionary Accrual

Source	SS	df	MS	Number of obs	=	131
				F(12, 118)	=	6.99
Model	.204848064	12	.017070672	Prob > F	=	0.0000
Residual	.288341723	118	.002443574	R-squared	=	0.4154
				Adj R-squared	=	0.3559
Total	.493189787	130	.003793768	Root MSE	=	.04943

DACCI	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
OPVT1	-.0704997	.0230635	-3.06	0.003	-.1161716	-.0248277
groupdummy						
OPEC	-.0521169	.0169696	-3.07	0.003	-.0857214	-.0185124
groupdummy#c.OPVT1						
OPEC	.0753092	.0376221	2.00	0.048	.0008072	.1498112
NEG_CFO	.0154469	.0274181	0.56	0.574	-.0388484	.0697421
LOSS	.045242	.0151533	2.99	0.003	.0152344	.0752496
MeetBeat	.0041877	.0108421	0.39	0.700	-.0172826	.0256581
CurrentRatio	.0014786	.0063953	0.23	0.818	-.0111858	.0141431
Price	.0042796	.0162396	0.26	0.793	-.0278792	.0364385
EBITDAMargin	.1277528	.024196	5.28	0.000	.0798383	.1756674
FCF	.2338003	.0942523	2.48	0.015	.047155	.4204455
SalesGrowth	.0326858	.0181699	1.80	0.075	-.0032956	.0686671
Growth	.0525543	.0390297	1.35	0.181	-.0247352	.1298437
_cons	-.0729058	.0475295	-1.53	0.128	-.1670272	.0212156

### c) OLS Regression of Current Accrual

Source	SS	df	MS	Number of obs	=	131
				F(12, 118)	=	9.72
Model	.065663331	12	.005471944	Prob > F	=	0.0000
Residual	.066457061	118	.000563195	R-squared	=	0.4970
				Adj R-squared	=	0.4458
Total	.132120392	130	.001016311	Root MSE	=	.02373

CACCI	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
OPVT1	-.0200047	.0110724	-1.81	0.073	-.0419311	.0019216
groupdummy						
OPEC	.0104569	.0081468	1.28	0.202	-.0056761	.0265899
groupdummy#c.OPVT1						
OPEC	.0262416	.0180618	1.45	0.149	-.0095256	.0620088
NEG_CFO	-.053405	.013163	-4.06	0.000	-.0794712	-.0273387
LOSS	-.0253809	.0072748	-3.49	0.001	-.039787	-.0109748
MeetBeat	-.0091595	.0052051	-1.76	0.081	-.0194671	.001148
CurrentRatio	.0100951	.0030703	3.29	0.001	.0040151	.0161751
Price	.0023661	.0077964	0.30	0.762	-.0130729	.017805
EBITDAMargin	-.0357216	.0116161	-3.08	0.003	-.0587246	-.0127186
FCF	.0689445	.045249	1.52	0.130	-.0206608	.1585498
SalesGrowth	.0282565	.0087231	3.24	0.002	.0109825	.0455306
Growth	.0259492	.0187375	1.38	0.169	-.0111562	.0630546
_cons	-.0196802	.0228181	-0.86	0.390	-.0648664	.0255059

**d) OLS Regression of Non- Current Accrual**

Source	SS	df	MS	Number of obs	=	131
				F(12, 118)	=	9.26
Model	.308215915	12	.02568466	Prob > F	=	0.0000
Residual	.32740781	118	.002774642	R-squared	=	0.4849
				Adj R-squared	=	0.4325
Total	.635623726	130	.004889413	Root MSE	=	.05267

NCACCI	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
OPVT1	-.057028	.0245762	-2.32	0.022	-.1056957	-.0083604
groupdummy						
OPEC	-.0758829	.0180827	-4.20	0.000	-.1116916	-.0400742
groupdummy#c.OPVT1						
OPEC	.0591088	.0400898	1.47	0.143	-.02028	.1384975
NEG_CFO	.0860821	.0292165	2.95	0.004	.0282256	.1439387
LOSS	.0571229	.0161472	3.54	0.001	.0251471	.0890987
MeetBeat	.0124028	.0115533	1.07	0.285	-.0104759	.0352814
CurrentRatio	-.0063708	.0068148	-0.93	0.352	-.019866	.0071243
Price	.0027508	.0173048	0.16	0.874	-.0315174	.0370189
EBITDAMargin	.1381052	.025783	5.36	0.000	.0870479	.1891626
FCF	.2731661	.1004345	2.72	0.008	.0742785	.4720537
SalesGrowth	.0182807	.0193617	0.94	0.347	-.0200607	.0566221
Growth	.01148	.0415897	0.28	0.783	-.070879	.093839
_cons	-.033463	.0506471	-0.66	0.510	-.1337579	.066832

**i. Pearson Correlation**

	DACC	DACCI	CACCI	NCACCI	OPVT1	groupd~y	NEG_CFO
LOSS MeetBeat							
DACC	1.0000						
DACCI	-0.5809*	1.0000					
CACCI	-0.1366	-0.0842	1.0000				
NCACCI	-0.5352*	0.9184*	-0.3999*	1.0000			
OPVT1	0.1647	-0.1824*	-0.0211	-0.1487	1.0000		
groupdummy	0.3422*	-0.3519*	0.3095*	-0.4721*	0.0356	1.0000	
NEG_CFO	0.3123*	-0.1218	-0.1245	-0.0122	-0.0038	0.2726*	1.0000

LOSS | -0.1181 0.1825\* -0.4205\* 0.2701\* -0.0740 -0.1409 -0.0662 1.0000  
 MeetBeat | -0.1278 0.1104 -0.0071 0.1277 0.1818\* -0.0650 -0.1816\* -0.1485  
 1.0000  
 CurrentRatio | -0.1011 0.0706 0.2833\* -0.0132 0.0075 -0.0866 -0.0482 -0.1122  
 -0.0440  
 Price | -0.2518\* 0.1335 0.1337 0.0809 -0.4629\* -0.0804 -0.0755 -0.1587 -  
 0.0157  
 EBITDAMargin | -0.3769\* 0.4843\* -0.2780\* 0.4514\* -0.0237 -0.2884\* -0.1861\*  
 0.0573 0.1349  
 FCF | -0.3305\* 0.0354 0.2576\* 0.0583 0.0536 -0.0552 -0.0998 -0.1159  
 0.2393\*  
 SalesGrowth | -0.1582 0.1446 0.2629\* 0.0696 0.2110\* 0.0889 0.0826 -  
 0.2607\* 0.4458\*  
 Growth | -0.1144 0.1029 0.0984 -0.0012 0.1187 -0.0540 0.0316 -0.2755\*  
 0.0420

| CurrentRatio Price EBITDAMargin FCF SalesGrowth Growth  
 -----+-----  
 CurrentRatio | 1.0000  
 Price | 0.0298 1.0000  
 EBITDAMargin | 0.0262 0.0590 1.0000  
 FCF | 0.2284\* 0.0297 -0.3284\* 1.0000  
 SalesGrowth | 0.0276 0.1035 0.1126 0.1411 1.0000  
 Growth | 0.0182 0.0446 0.2635\* -0.3513\* 0.2720\* 1.0000





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Journal homepage: [www.publishing.globalcsrc.org/jafee](http://www.publishing.globalcsrc.org/jafee)**International Financial Integration through Depository Receipts (DRs)**<sup>1</sup> Obiyathulla Ismath Bacha, <sup>2</sup> Norhazlina Ibrahim, <sup>3</sup> Mansor H. Ibrahim<sup>1</sup> International Centre for Education in Islamic Finance (INCEIF) Malasia: [obiya@inceif.org](mailto:obiya@inceif.org)<sup>2</sup> Universiti Sains Islam Malaysia: [norhazlina@usim.edu.my](mailto:norhazlina@usim.edu.my)<sup>3</sup> International Centre for Education in Islamic Finance (INCEIF) Malasia: [mansorhi@inceif.org](mailto:mansorhi@inceif.org)

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p> <hr/> <p><b>Keywords</b> Depository Receipts (Drs), Cross-Listing, OIC Countries, Islamic Finance, Cointegration</p> <hr/> <p><b>JEL Classification:</b> G21, P33, P39</p>	<p>The issue of liquidity and underdevelopment of the Organisation of Islamic Cooperation (OIC) stock markets has caused problems to companies in those countries that seek higher equity capital. One way out of this problem is to employ international markets more intensively by seeking cheaper cost of capital through Depository Receipts (DRs). Many studies on DRs focused on emerging and developed countries, leaving many OIC countries behind. Thus, this study investigates the financial implication by examining the integration of returns of local and foreign stock markets via American Depository Receipts (ADRs) and Global Depository Receipts (GDRs) of OIC countries. Techniques employed in this study are cointegration and the speed of adjustments to examine the existence of integration between the local and foreign stock markets. The study covers a sample of 146 firms from 17 OIC countries that are cross-listed as ADRs or GDRs from 1992 to 2011. The findings show mixed results when some markets provide evidence of integration while others show evidence of segmentation. The study on the integration between DR and home equity markets has practical implications for both the international as well as domestic investors especially on portfolio selection, asset pricing and risk management</p>



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Corresponding author's email address: [norhazlina@usim.edu](mailto:norhazlina@usim.edu)

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**1. Introduction**

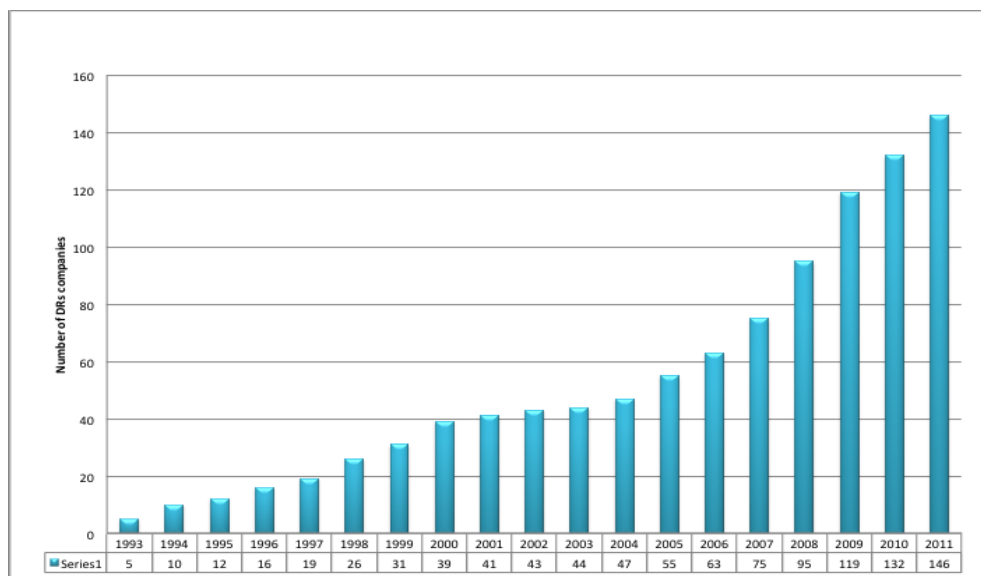
The capital markets around the world tend to harmonise their policies and regulations due to the pressure of global competition in the last few decades. This financial globalisation is also affecting stock markets within the Organisation of Islamic Cooperation (OIC)<sup>28</sup>. Despite this exposure, a study by the World Bank

<sup>28</sup> The Organisation of Islamic Cooperation (OIC), formerly known as the Organisation of the Islamic Conference. It is the second-largest intergovernmental organisation after the United Nations which has a membership of 57 states spreading over four continents. The Organisation is the collective voice of the Muslim world in ensuring to safeguard and protect the interests of the Muslim world in the spirit of promoting international peace and harmony among various people of the world.

reveals that many capital markets of the OIC countries remain highly illiquid and segmented, with trading capitalisation concentrating on a few stocks. Out of the total of 57 constituent countries, only 21 stock markets fall under the purview of World Development Indicators (World Bank, 2006). The universal reasons that hinder these stock market developments are the weak legal system and regulations, a limited supply of institutional investors, less support from the private sector, and the lack of transparency and accountability. Besides, most companies in the OIC countries with less developed capital markets have not participated in global consolidation waves and are still pursuing a homemade strategy in developing their own stock market (Hassan & Suk-Yu, 2007). Apart from that, most OIC stock markets are illiquid and relatively small to most emerging markets and tailing even further behind the developed markets.

Some of these companies need liquidity and enhance their value but are being held down by their domestic stock markets. One of the easiest solutions to this problem is to employ international markets more intensively. In some emerging markets, this internationalisation process is the outcome of companies trying to break away from poor domestic environments with poorly functioning markets and weak institutions (Karolyi, 2004; Torre et al., 2005). Claessens et al. (2003) proposed some form of cross-border linkages with other exchanges to attain cost savings from numerous sources, for example sharing system for equity trading, economy of scale and harmonising rules and requirements between the exchanges with respect to trading and membership. Over the last decades, there has been an increase in the movement of securities market activities to key global financial exchanges, such as London and New York. Many large corporations try to expand their investors' base by listing their stock and raising capital in the market that can offer financing with the lowest costs.

Many approaches have been taken to enhance the capacity and integration of stock markets to promote intra-investment among the OIC countries and the most popular instrument used is Depositary Receipts (DRs). The importance of DR is that it represents ownership of equity shares in a foreign company and it is also one of the popular means to access the international markets. Over the last decade, global trading in DRs has increased dramatically to an all-time high of 150 billion DRs, with a value of \$3.4 trillion, in 2010 (JP Morgan, 2010). Throughout this period, the number of firms listing their securities via DRs has also increased in the OIC countries (refer to Figure 1). In 1993, only five companies from OIC countries subscribed to DRs, but the number has increased to 146 companies in 2011.



**Figure 2: Number of companies that subscribed to DRs (OIC countries)**  
**Source: Bank of New York Mellon, 2011**

The critical question is whether these instruments promote integration between the local and foreign stock market. Financial integration has positive impacts on financial stability in the region through more effective distribution of capital, a lower probability of asymmetric shocks, a more robust market. Moreover, it would help to increase the capacity of the economies to absorb shocks and promote growth. On the negative side, intensified financial connections in a area of high investment movement may also instigate the risk of cross-border financial contagion, especially in the interdependent region's (Yu et al., 2010). According to migration view, internalisation through cross-listing will induce a shift of trade from local market to major international financial market. This condition inevitably hurts the trading and liquidity of the local stock market. As a result, it is vital to have appropriate measures or indicators to monitor the development and assess the progress of financial integration in the region.

Based on the law of one price (LOOP), cross-listed shares represent the same assets and therefore should have identical prices if they are converted into the same currency. Based on this analogy, one frequently used definition of financial integration is that financial markets are said to be integrated when the LOOP holds. As with so many techniques available, several studies uphold the LOOP and conclude no arbitrage opportunities exist (Alaganar & Bhar, 2002; Kato et al., 1991; Rosenthal & Young, 1990; Wahab et al., 1992). Kato et al. (1991) directly compared the market prices of ADRs with their underlying foreign stocks (eight from Australia and Japan and seven from England) for differences and correlations. They found no significant differences between the prices of the two identical types of claims and concluded that no arbitrage opportunities exist between international capital markets encompassed by their study.

However, Wahab et al. (1992) differed and found clashing evidence of this LOOP. They found that there are possible differences in return volatilities of ADRs and their respective underlying shares due to market imperfections, differential trading frequency, and market microstructure effects. Although several empirical studies support the notion of LOOP with or without the aid of arbitrage process; nevertheless, not all studies reach the same conclusion. Some studies discover the LOOP is often violated (Chan et al., 2008; Froot & Dabora, 1999; Gagnon & Karolyi, 2010).

Thus, the objective of this study is to examine from an empirical standpoint the impact of DRs on the integration between the OIC and foreign stock markets. Most of the studies concentrated on emerging and developed countries but did not look into the DR activities of OIC countries. This means that there is still a lack of knowledge towards the impact of DR activities on this particular group of cross-listed shares.

## **2. Methodology**

The financial integration between these markets is determined by two methods. The first method is by examining the cointegration between the price of cross-listed and home-market shares, whilst the second methods measure the speed of convergence of the price deviations from the parity back to the equilibrium of these shares.

### **2.1 Price Parity for Cross-Listed Pairs Across Time and Cointegration**

As mentioned earlier, one frequently used definition of financial integration is when the LOOP holds. Theoretically, since a DR and its underlying share are identical and comparable assets, logically the price of a DR in the foreign market should be similar to the value of its underlying share in home market. Any identical or comparable assets that trade across different markets should produce a similar price, measured by cross-market premium (DR price minus home-market share price). Consequently, in a fully integrated market, the value of cross-market premium should be nil or zero.

Since the home-market prices use home markets' currency, thus we need to firstly convert these home-market prices into US dollars at the exchange rate. For the purpose of this study, PH is equivalent to the

price of home share value after converting the home market shares in home currency (PHLC) to US dollar using the exchange rate ( $S_t$ ).

$$PH_t = PHLC_t * S_t$$

$PDR_t$  on the other hand is the price of DRs expressed in US dollar (PD) after being adjusted for the DR ratio (R).

$$PDR_t = R * PD_t$$

In this study, the price differences for each pair are being analysed in detail. First, the absolute price discrepancy is simply the measure in dollars of the difference between prices of domestic market and DRs  $(PH - PDR)_t$ . Then, the log-price differences are calculated by taking the natural logarithm of price ( $PH_t$ ) expressed in US dollars divided by DRs price ( $PDR_t$ ) and can be expressed in this formulae  $(\ln(PH/PDR)_t)$ .

$$\text{Price Difference} = \ln(PH_t/PDR_t) = \text{DR Discount(Premium)}$$

If the theory of LOOP holds, the price and return of these cross-listed shares should be similar. However, in some cases, this theory is not applicable as a DR may be sold at either a discount or a premium to the value of the underlying asset mostly due to exchange rate anticipations and the transaction costs linked to conversion of the DR (Arquette et al., 2008). If the cross-market difference is positive, we denote it DR discount. It means that the DR shares trade lower than the values attached to the underlying shares in the home market. Otherwise, it is denoted DR premium, meaning that the DR shares selling abroad have higher prices than the similar home-market shares.

Following the LOOP, these shares that trade across different economies should generate not only similar price but also the same return. If there is a small deviation or discrepancy across economies as calculated by the cross-market return dispersion, it will imply that the equity markets are fully integrated in the sense of return convergence. For this analogy, the daily changes in  $\ln(PH/PDR)_t$ , or the daily return differences in the price deviations are computed as well.

$$\Delta \ln(PH/PDR)_t = [\ln(PH_t/PDR_t)]_t - [\ln(PH_t/PDR_t)]_{t-1}$$

There is evidence of integration if the prices of the DR and underlying shares are cointegrated. This means that the difference between these two prices is a mean-reverting,  $I(0)$  process. Based on the above, the first hypothesis can be formally stated as follows:

*H1: If the prices of the DR and its underlying shares are cointegrated, there is an indication that the markets are integrated.*

All these data on DRs prices, underlying share prices, and price differences will be tested on several tests such as stationary test and cointegration test. The cointegration test would test whether or not the prices of the DR and home-market shares will go back to the equilibrium. However, the determination of unit root or stationary test is important before the cointegration test is performed.

The unit root test is very important in the context of time series analysis so as to check the level of stationarity of the data as to advance further in testing the cointegration. Furthermore, it is also a well-known fact that almost all financial data are non-stationary in their original form (Doidge et al., 2009). Thus, Augmented Dickey Fuller (ADF) was applied in this study.

## 2.2 The Speed of Convergence

In addition to using the cointegration technique, we also applied another technique to assess integration. Another approach to measuring this is by capturing the speed of adjustment coefficients. As to measure this speed of adjustment of the deviations from parity, rolling and recursive regressions procedures (Autoregressive Model) were applied. Higher convergence speeds reflect a quicker convergence to LOOP, hence stronger financial integration. The persistence of shocks is estimated using the Augmented Dickey–Fuller model, with one autoregressive component and other lagged differences. That is, we estimate the following model ( $x = \text{Ln}(\text{PH}/\text{PDR})_t$ ):

$$\Delta x_t = \beta x_{t-1} + \sum_{j=1}^k \phi_j \Delta x_{t-j} + \varepsilon_t$$

The equation measures the change in the premium/discount the differences between the price of the underlying stock and the price of the DR. Put differently,  $\beta$  provides a measure of the speed of convergence of the premium back to its mean. The higher values of these coefficients, as the sample rolls forward, can be interpreted as a higher degree of financial integration (Pascual, 2003; Yeyati et al., 2009).

The value of  $\beta$  is a greater contributor to the degree of financial integration and thus the hypothesis is stated as follows:

*H2: If the value of  $\beta$  is increasing, there is an indication that the markets are integrated.*

## 2.3 Data Descriptions and Model Specification

For this study, we used time-series data from 1992-2011. This information is derived from the "DR Directory" of the Bank of New York Mellon<sup>29</sup> as of 31 December 2011 and the numbers are gathered from the active DRs. These data collections start from the Bank of New York<sup>30</sup> since it has a rather complete DR Directory that contains information on current DR activities.

## 3. Analysis and Findings

The summary statistics of DRs in the OIC countries as of 2011 are presented in Table 1. Overall, Turkey led the pack by having 46 DRs, followed by Indonesia (36), Kazakhstan (26), and Egypt (25). The breakdown by DRs comprising of ADRs and GDRs are clearly laid out in Table 1. Generally, the pattern varied by country. Specifically, by looking at the pattern in Table 1, all non-Asian countries were likely to subscribe to GDRs<sup>31</sup>, except for Turkey. On the other hand, Asian countries such as Malaysia and Indonesia dominated the issuance of ADRs, with the exception of Bangladesh and Pakistan.

<sup>29</sup> Retrieved October 20, 2011 from <http://www.adrbnymellon.com/>.

<sup>30</sup> These data can be retrieved October 20, 2011 from [http://www.adrbnymellon.com/dr\\_directory.jsp?paramUserType=broker](http://www.adrbnymellon.com/dr_directory.jsp?paramUserType=broker) and according to Kim, BNY database was substantially more reliable and comprehensive than that of Citibank.

<sup>31</sup> The exchanges involved in GDR are London and Luxemburg Stock Exchanges.

**Table 3: The Summary of DRs as at December 2011**

No	Country	Companies	ADRs	GDRs	Total DRs	Effective year of DR listing
1	Bahrain	3	0	6	6	2006
2	Bangladesh	1	0	1	1	2005
3	Egypt	13	5	20	25	1996
4	Indonesia	36	36	0	36	1994
5	Jordan	3	2	2	4	1997
6	Kazakhstan	15	2	24	26	1999
7	Kuwait	1	0	2	2	2008
8	Lebanon	4	1	5	6	1997
9	Malaysia	10	10	0	10	1983
10	Morocco	1	0	2	2	1996
11	Nigeria	6	0	10	10	1998
12	Oman	1	0	2	2	2005
13	Pakistan	9	2	14	16	1994
14	Qatar	2	0	4	4	1999
15	Tunisia	1	0	2	2	1998
16	Turkey	37	26	20	46	1993
17	UAE	3	1	3	4	2006
	<b>TOTAL</b>	<b>146</b>	<b>85</b>	<b>117</b>	<b>202</b>	

**Source: Bank of New York Mellon and Datastream**

In Table 1, the number of companies taking up DRs may not be equal to the number of DRs. This is because the same companies may have subscribed to both ADR and GDR at the same time. For example, in Egypt there were 13 companies that subscribed to DRs and yet they issued 5 ADRs and 20 GDRs. Meanwhile, the effective start-up year for DR varied across countries, as early as 1983 for Malaysia and as late as 2008 for Kuwait.

Based on the total issues of 202 DRs, more than half of DRs were GDRs. The higher number of GDR issues compared to ADRs indicated that these foreign companies preferred London or Luxembourg to the US. According to Doidge et al. (2009), by 2005 New York's shares exceeded London cross-listings by only 59% compared to 78% in 1998. Many argued that London has become more competitive in attracting foreign listings than New York. A popular justification for this decrease in foreign listings is that the introduction of the Sarbanes-Oxley Act (SOX) in 2002 that imposed severe costs on companies and their managers and thus made the US listings significantly less attractive to these foreign firms. Nonetheless, by referring to Table 1, countries such as Indonesia, Malaysia, and Turkey still preferred ADRs compared to GDRs. This is because the US market is known for their legal structure, stringent nature of SEC of USA requirements, and most importantly higher transparency in financial disclosure (Doidge et al., 2009; Martin, 1995; Sevic et al., 2010).

### 3.1 Price Parity for Cross-Listed and Home-Market Shares

As to arrive at the final sample, the screening of data was implemented<sup>32</sup>Initially, the number of companies was 146, but after applying these screens, we identified a subset of 34 potential home and cross-listed pairs. The list of companies used for this analysis is in Appendix 1. Out of these 34 home and cross-listed pairs, almost 85% of these companies subscribed to ADR, whilst the rest were dominated by GDR issuance with a share of 25%. ADR/GDR Level I clearly led with a 71% (24 companies), whilst 11% (4 companies) were GDR Regulation S, 9% of ADR Rule 144A (3 companies) and ADR Level III (3 companies) respectively. Moreover, all the samples used US dollar as the currency although a few of them traded on the Stock Exchange Automated Quotation (SEAQ) International, London.

Tables 2 and 3 present the summary statistics of the daily price discrepancy for each company and country. In Table 2, the absolute price discrepancy was simply the measure in dollars of the difference between prices in host and domestic markets  $(PH-PDR)_t$ . For the final sample, the average price differences was negative USD1.2, which implied that, on average, DRs traded at a small premium relative to their home-market share counterparts. Across countries, we observe interesting patterns in the mean and median price differences. For countries such as Egypt, Indonesia, Lebanon, Nigeria, and Qatar, the mean prices of DR were higher than their underlying share prices in home market. The highest difference came from Egyptian companies, at -USD4.77. Indonesia had the lowest value of almost zero in their price differences. On the other hand, relative to their home shares, DRs from Malaysia and Turkey were selling at a discount averaging of USD 0.26 and 0.8 respectively. Across countries, Egypt had the highest standard deviation of USD6.07, whilst Indonesia had the lowest standard deviation of price differences of USD0.03.

Table 2: The Exact Value of the Daily Price Discrepancies  $(PH-PDR)_t$

	Mean	Median	Maximum	Minimum	Std. Dev.
<b>ALL AVERAGE</b>	<b>-1.21</b>	<b>-0.28</b>	<b>5.14</b>	<b>-7.61</b>	<b>2.60</b>
Egypt	-4.77	-1.56	5.33	-23.91	6.07
Indonesia	-0.01	-0.01	0.15	-0.12	0.03
Malaysia	0.26	0.15	1.41	-1.17	0.47
Turkey	0.80	0.82	2.04	-0.41	0.52
Other - Lebanon	-0.40	-0.38	0.65	-1.40	0.32
Other - Nigeria	-0.02	-0.02	0.02	-0.08	0.02
Other - Qatar	-4.36	-0.93	26.38	-26.19	10.77

Table 3 shows the relative price differences. The average relative price difference was zero, which implied that, on average, DRs trade at a similar value relative to their home-market share counterparts. Across countries, we observe interesting patterns in the mean price differences. For Malaysia and Turkey, their DRs trade at discounts of 43% and 23% respectively. On the other hand, relative to their home shares, DRs from Egypt, Lebanon, Nigeria, and Qatar trade at premiums of 64%, 6%, 22%, and 10% respectively. Indonesia, on the other hand, produced zero relative price differences, implying that all cross-listed share prices were trading at the same price to their underlying shares in home market. Across countries, Malaysia had the highest standard deviation of 67%.

Table 3: The Relative Value of the Daily Price Discrepancies  $[\ln(PH/PDR)_t]$

<sup>32</sup> The same rules by Yeyati et al. (2009) were being applied.

	Mean	Median	Maximum	Minimum	Std. Dev.
<b>ALL AVERAGE</b>	0.000	0.000	0.000	0.000	0.000
Egypt	-0.644	-0.601	-0.176	-1.105	0.182
Indonesia	-7E-03	-5E-03	2E-01	-2E-01	5E-02
Malaysia	0.438	0.092	2.061	-0.479	0.665
Turkey	0.231	0.233	0.486	-0.030	0.114
Other - Lebanon	-0.057	-0.055	0.146	-0.191	0.045
Other - Nigeria	-0.219	-0.239	0.198	-0.689	0.171
Other - Qatar	-0.098	-0.031	3.137	-1.063	0.520

Based on the summary of the exact and relative value of the daily price discrepancy, the prices of cross-listed and home market shares were trading at more or less similar value. However, there is a need to conduct more tests to confirm this descriptive finding. In the next section, the test of cointegration, the speed of convergence, and concordance index are being explored in great detail as to examine the existence of integration.

However, before delving into the cointegration test, it is best to have a first glance at the price differences for each country shown in Figures 2 to 6.

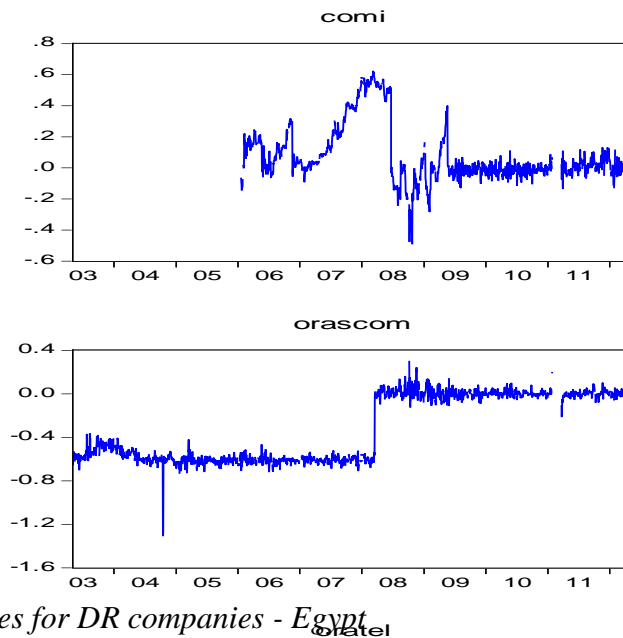


Figure 2: Price differences for DR companies - Egypt

Figure 2 presents the graphical illustration of price differences for Egypt. It seems that Oratel company had a rather smaller standard deviation in price deviation compared to Comi and Orascom, but the average price differences oscillated around 1.8, higher than the other two companies. Figure 3 displays the price differences for Indonesian companies and the volatility of the price differences were less compared to the Egyptian companies. Most of the price differences for Indonesian companies moved around zero with a small standard deviation.



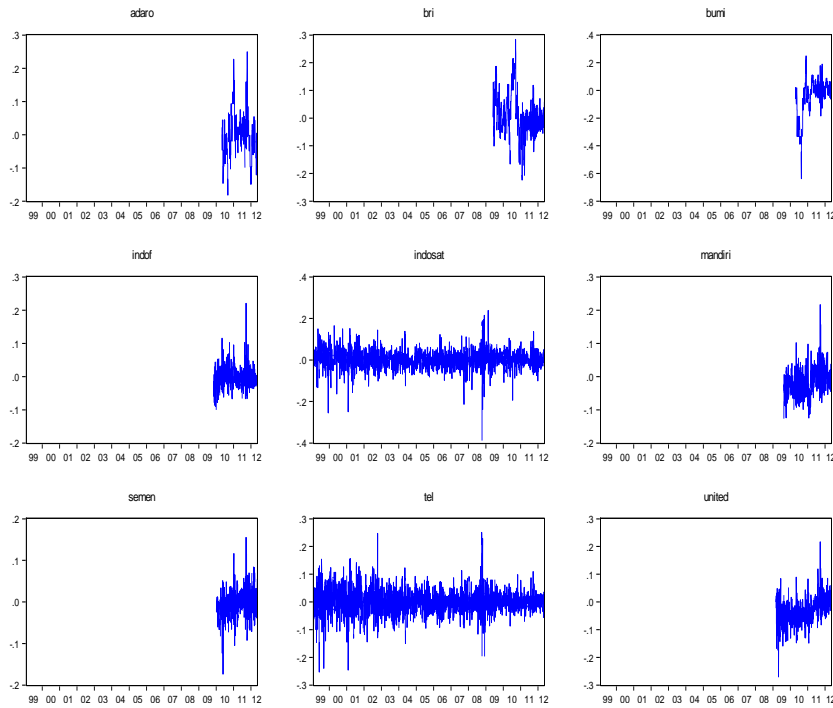


Figure 3: Price differences for DR companies - Indonesia

Malaysia, on the other hand, showed a rather different story. Out of all these countries, Malaysia probably had the highest volatility in terms of price differences. All companies showed a wide standard deviation of price differences in Figure 4. The same patterns applied to Turkish companies in Figure 5. Most companies had a wide standard deviation except for two companies, Turkcel and Koc. For these two firms, the price differences oscillated around zero with a small standard deviation.

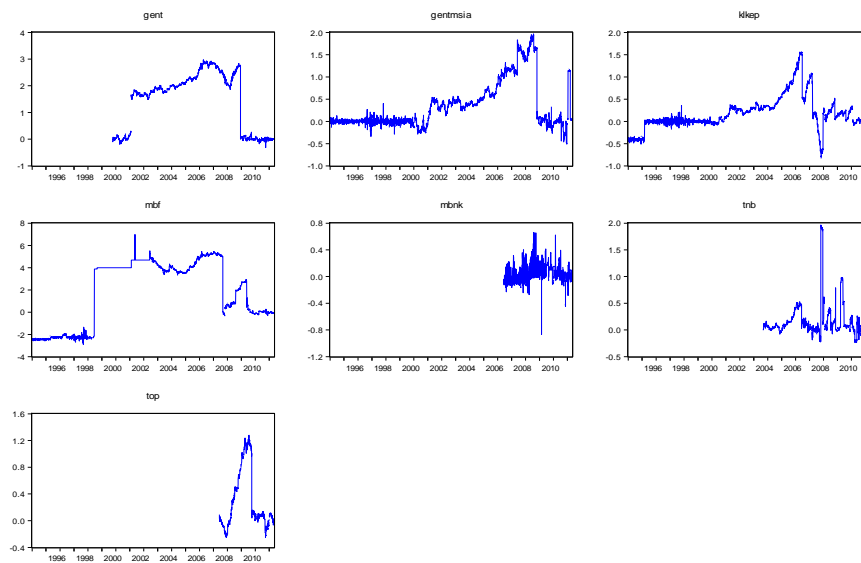


Figure 4: Price differences for DR companies - Malaysia

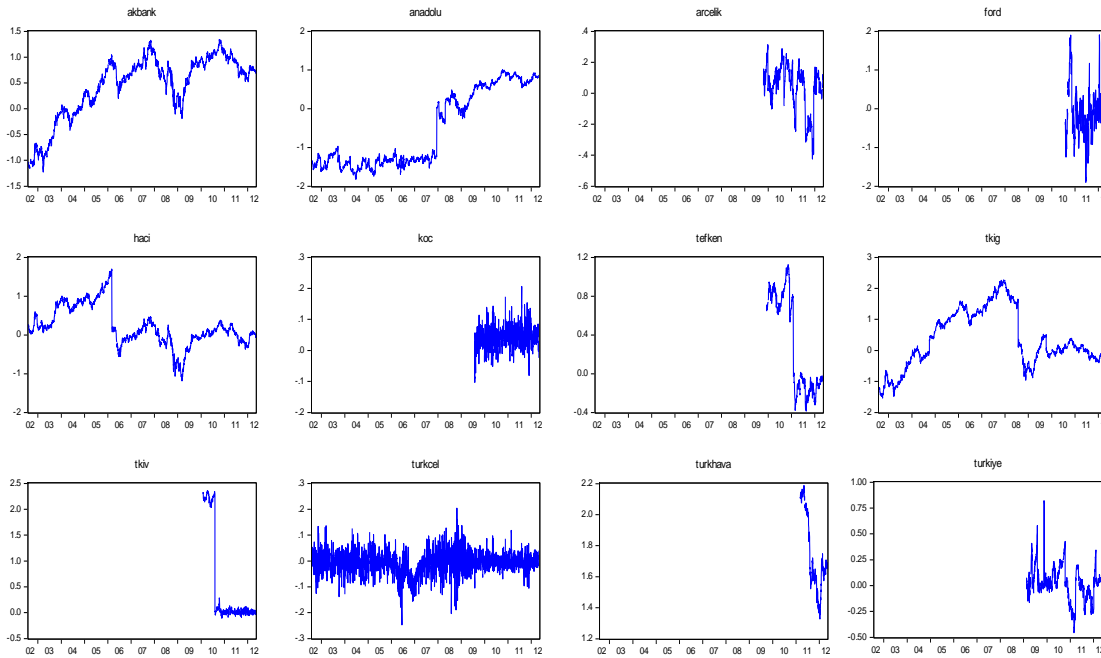


Figure 5: Price differences for DR companies - Turkey

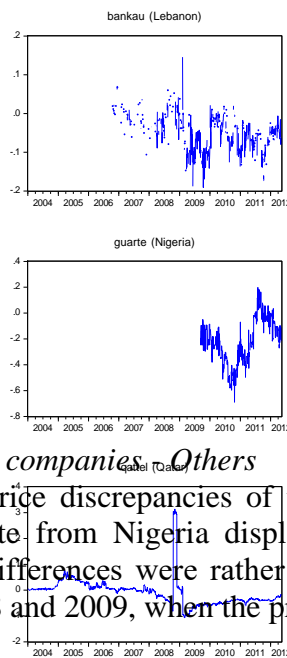


Figure 6: Price differences for DR companies - Others

Figure 6 shows the patterns of price discrepancies of three companies from three different countries. Bankau from Lebanon and Guarte from Nigeria displayed rather high volatility compared to Qatari company, Qattel. Qattel’s price differences were rather stable throughout 2004 until 2011. However it experienced high volatility in 2008 and 2009, when the price differences jumped to 3.

### 3.2 Cointegration Test

Before establishing whether or not the daily stock prices are indeed cointegrated, first there is a need to prove that each of these daily prices is non-stationary with a unit root or I(1) when tested individually. Table 4 presents the necessary evidence to support these claims. Using Augmented Dickey-Fuller (ADF) statistics, we tested all the variables by setting the null hypothesis of the series of having a unit root. We found that they were non-stationary in the level form (both for home and DRs’ share prices in Columns 1 and 2) and stationary in the first difference. It can be seen that all variables were stationary in the first difference or simply were I(1) process.

Table 4: Non-Stationary and Cointegration Tests for the Daily Stock Prices

	ADF Level (Home) (1)	ADF Level (DR) (2)	ADF First Difference (Home) (3)	ADF First Difference (DR) (4)	Cointegration at 5% (5)
<b>EGYPT (3)</b>					
Comi	0.952	0.386	0.0001	0.0001	Yes
Orascom	0.824	0.307	0.0000	0.0001	No
Oratel	0.230	0.678	0.0001	0.0001	Yes
<b>INDONESIA (9)</b>	ADF Level (Home)	ADF Level (DR)	ADF First Difference (Home)	ADF First Difference (DR)	Cointegration (5%)
Adaro	0.487	0.993	0.0000	0.0000	No
Bri	0.802	0.490	0.0001	0.0000	Yes
Bumi	0.899	0.989	0.0000	0.0000	No
Indof	0.675	0.651	0.0001	0.0000	Yes
Indosat	0.293	0.264	0.0001	0.0001	Yes
Mandiri	0.793	0.283	0.0001	0.0000	Yes
Semen	0.989	0.216	0.0001	0.0000	Yes
Tel	0.588	0.589	0.0001	0.0000	Yes
United	0.943	0.310	0.0001	0.0000	Yes
<b>MALAYSIA (7)</b>	ADF Level (Home)	ADF Level (DR)	ADF First Difference (Home)	ADF First Difference (DR)	Cointegration (5%)
Gent	0.782	0.479	0.0001	0.0000	No
Gentmsia	0.273	0.015	0.0001	0.0010	Yes
Klkep	0.787	0.959	0.0001	0.0001	Yes
Mbf	0.615	0.070	0.0000	0.0000	Yes
Mbnk	0.196	0.019	0.0001	0.0000	Yes
Tnb	0.131	0.0001	0.0001	0.0000	Yes
Top	0.445	0.578	0.0001	0.0000	No
<b>TURKEY (12)</b>	ADF Level (Home)	ADF Level (DR)	ADF First Difference (Home)	ADF First Difference (DR)	Cointegration (5%)
Akbank	0.194	0.000	0.0001	0.0001	No
Anadolu	0.436	0.349	0.0001	0.0001	No
Arcelik	0.083	0.582	0.0000	0.0000	-
Ford	0.222	0.555	0.0001	0.0000	No
Haci	0.155	0.577	0.0001	0.0001	No
Koc	0.441	0.636	0.0001	0.0000	Yes
Tefken	0.356	0.622	0.0000	0.0000	No
Tkig	0.361	0.083	0.0001	0.0001	No
Tkiv	0.211	0.497	0.0000	0.0000	No
Turkcel	0.138	0.003	0.0001	0.0001	Yes
Turkhava	0.541	-	0.0001	-	-
Turkiye	0.308	0.336	0.0000	0.0000	Yes
<b>LEBANON</b>	ADF Level (Home)	ADF Level (DR)	ADF First Difference (Home)	ADF First Difference (DR)	Cointegration (5%)
Bankau		0.485		0.0000	No

<b>NIGERIA</b>	ADF Level (Home)	ADF Level (DR)	ADF First Difference (Home)	ADF First Difference (DR)	Cointegration (5%)
Guarte	0.027	0.798	0.0000	0.0001	Yes
<b>QATAR</b>	ADF Level (Home)	ADF Level (DR)	ADF First Difference (Home)	ADF First Difference (DR)	Cointegration (5%)
Qattel	0.058	0.255	0.0001	0.0001	No

All the values are *p* value

In the last column 5, the results of the Johansen–Juselius likelihood cointegration test showed the existence of long run co-movement between home and DR market shares at 5% significance level for certain companies. Evidence of cointegration implied that the relationship among the variables was not spurious, evidentially there were in equilibrium in the long run. In other words, even though these variables may have diverged in the short run, in the long run however they would converge. Table 6 shows rather mixed results across countries. It shows that out all of these 34 companies, only 53% (18 companies) show evidence of cointegration. Most of these companies came from Egypt (2), Indonesia (7), Malaysia (5), Turkey (3), and Nigeria (1). The test found that there is a cointegrating vector at 95% significance level on the basis of Maximal Eigenvalue and Trace Stochastic Test. Indonesia dominated with 78% of the subsample showing evidence of integration. Malaysia came in second with 71%, while Egypt came in third with 67%. However, Turkey had only 25% companies that were cointegrated.

Table 5: Summary of Companies – Cointegration Test

<b>Country</b>	<b>Total Number of Companies</b>	<b>Number of Companies Cointegrated</b>	<b>Percentage (%)</b>
Egypt	3	2	<b>67%</b>
Indonesia	9	7	<b>78%</b>
Malaysia	7	5	<b>71%</b>
Turkey	12	3	<b>25%</b>
Others	3	1	<b>33%</b>
<b>TOTAL</b>	<b>34</b>	<b>18</b>	<b>53%</b>

Basically, the results in Table 5 show that 47% of the DRs in the sample violated the LOOP and there was no integration between these markets. Instead of analysing the cointegration, it would be interesting to examine the speed of convergence. The speed of convergence will be discussed in great detail in the next section.

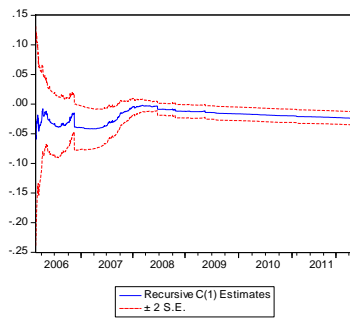
### 3.3 The Speed of Convergence

As mentioned earlier in the research design section, the speed of adjustment of the deviations from parity was measured using rolling and recursive regressions procedures (Autoregressive Model). Higher convergence speeds reflect a quicker convergence to LOOP, hence stronger financial integration. In order to measure this, the ADF model with one autoregressive component and other lagged differences were applied.

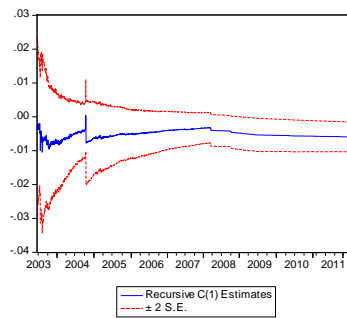
$$\Delta x_t = \beta x_{t-1} + \sum_{j=1}^k \phi_j \Delta x_{t-j} + \varepsilon_t$$

The main interest is to calculate the value of  $\beta$ . This coefficient provides a measure of the speed of convergence of the premium back to its mean.

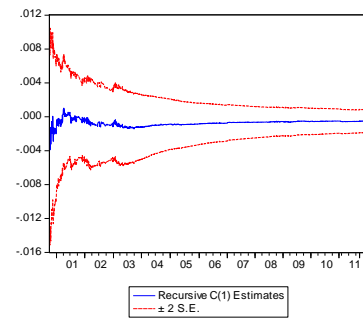
Graphically, a greater speed of adjustment should be reflected if the value of  $\beta$  keeps on increasing (regardless of the positive and negative value). Figures 7 to 11 show the estimates for those coefficients for each company in various countries. Overall, the process of integration did not experience any significant changes for all the countries. For example, none of the Malaysian companies showed a greater speed of adjustment except for KLKep but only for a period of six years, from 1995 until 2002. The coefficient estimates started at 0 and then increased to almost 30% in year 2002. But then the coefficient estimates for company KLKep reduced after the turning point in 2002 and remained rather stable around zero after 2007.



**Comit**

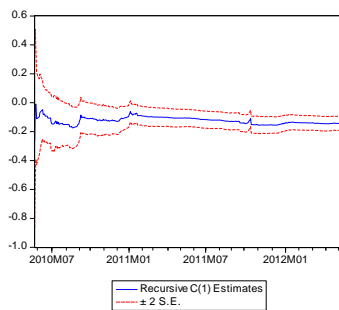


**Orascom**

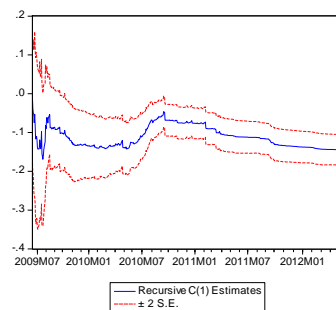


**Oratel**

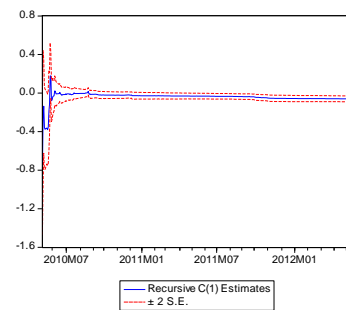
Figure 7: The speed of adjustment coefficients (B) - Egypt



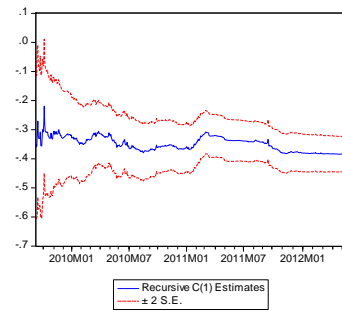
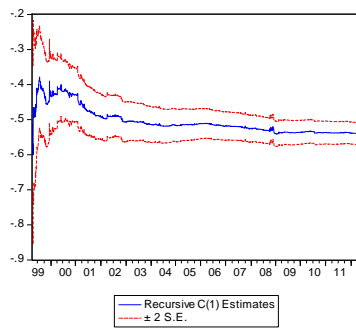
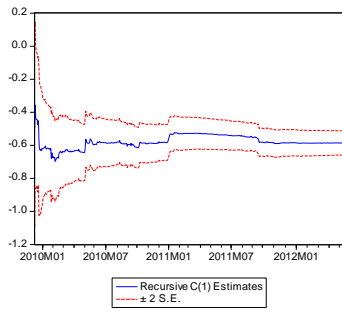
**Adaro**



**Bri**



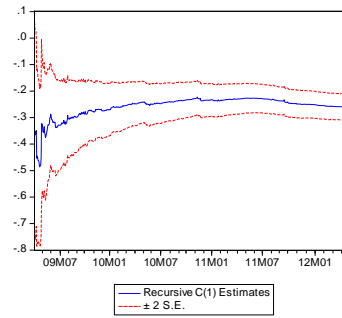
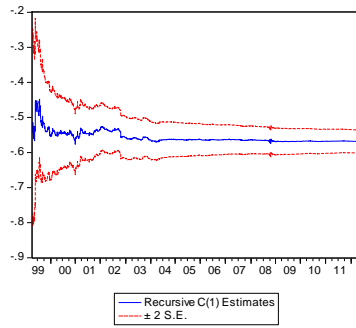
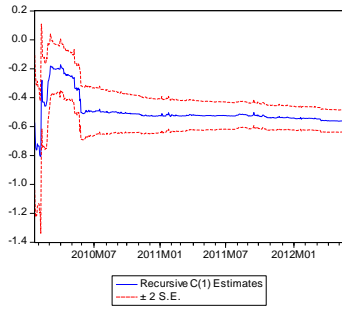
**Bumi**



**Indof**

**Indosat**

**Mandiri**

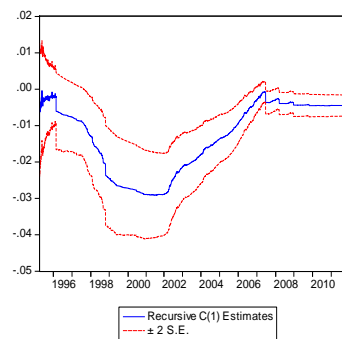
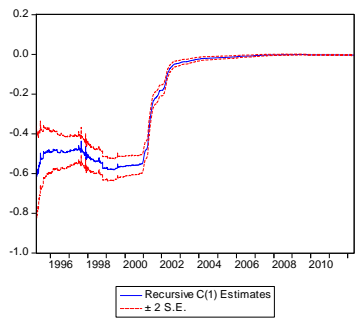
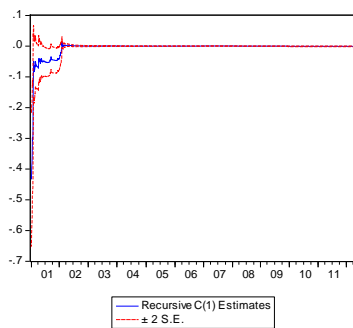


**Semen**

**Tel**

**United**

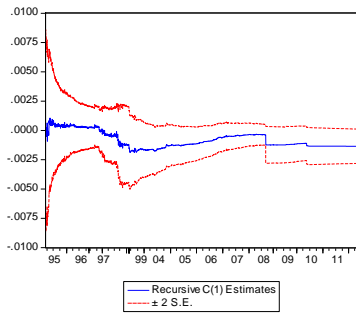
Figure 8: The speed of adjustment coefficients (B) - Indonesia



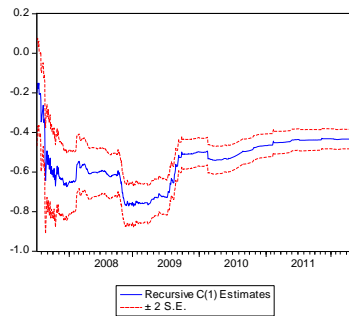
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**Gentmsia**

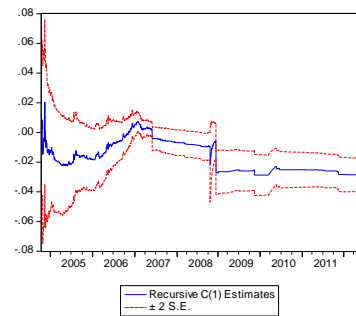
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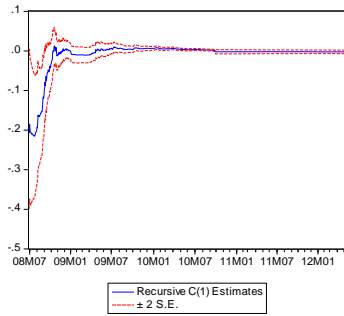
**MBF**



**Mbnk**

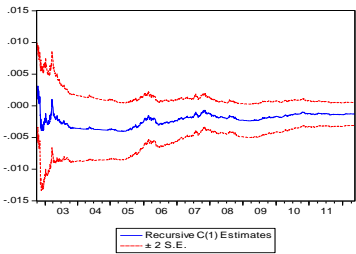


**TNB**

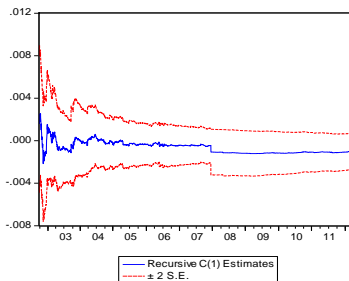


**Top**

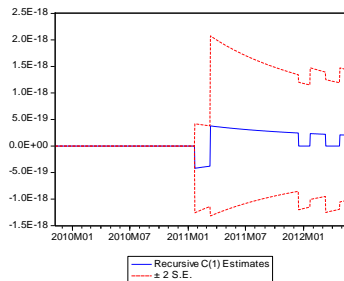
Figure 9: The speed of adjustment coefficients (B) - Malaysia



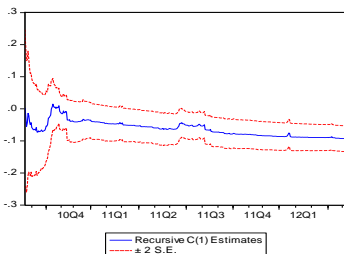
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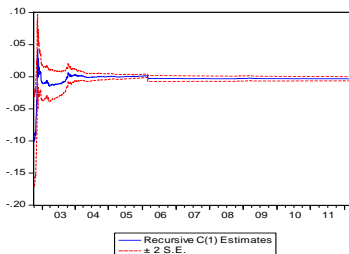
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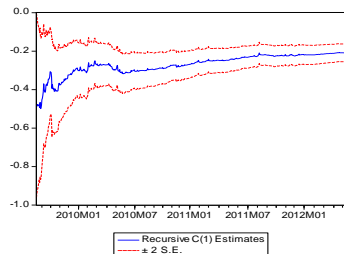
**Arcelik**



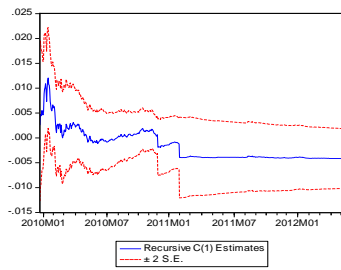
**Ford**



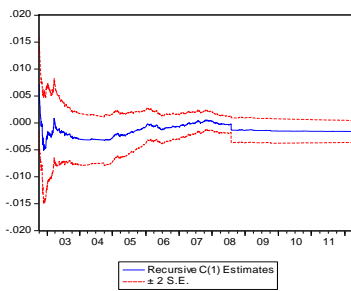
**Hacı**



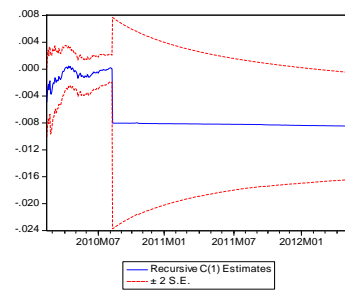
**Koc**



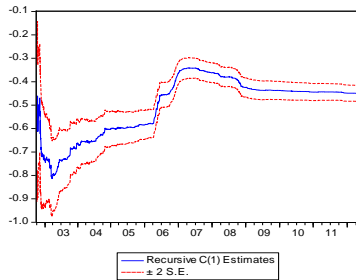
**Tefken**



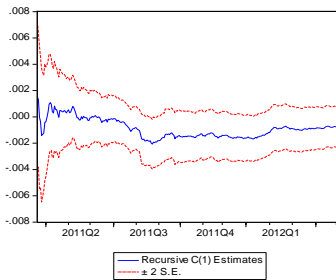
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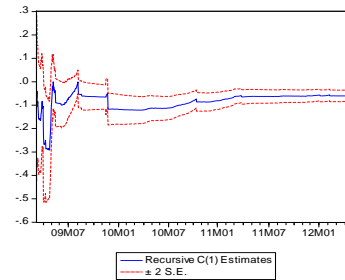
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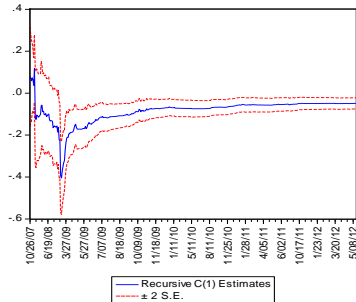


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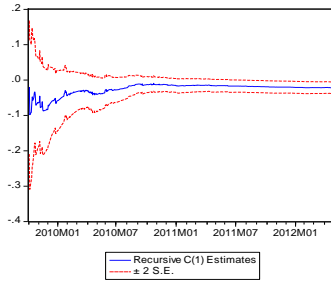


**Turkiye**

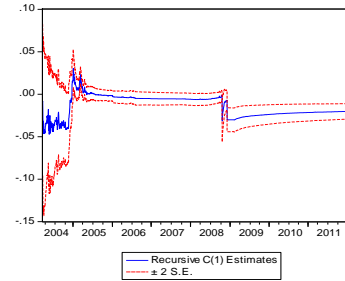
Figure 10: The speed of adjustment coefficients (B) - Turkey



**Bankau (Lebanon)**



**Guarte (Nigeria)**



**Qattel (Qatar)**

Figure 11: The speed of adjustment coefficients (B) - Others

In sum, all these graphical evidence did not indicate a greater speed of financial integration between these home markets and cross-listed markets. This finding is similar to the research done by Gagnon and Karolyi (2010). They found that the convergence process was faster for countries with higher per-capita GDP, stronger investor protection, higher accounting standards, fewer short sale restrictions, and greater institutional ownership. Since most of the elements stated above were mainly qualities found in developed markets, this could be one of the plausible justifications of why there was no evidence of integration in these OIC markets (usually they fall under emerging markets).

Table 6: Summary Results on Integration

Test of Integration	Findings/Results
Cointegration	Only 53% of the companies showed evidence of



	cointegration. The companies were mainly from Egypt, Indonesia, and Malaysia.
Speed of convergence	None of the companies showed any indications of integration.

In summation, there were somewhat mixed results of this analysis (Refer to Table 6). One of the reasons for differing findings is because our studies had limitations in terms of data used in this study. The data were small in scale<sup>33</sup> and more likely affected the quality of data<sup>34</sup>. This notion is fully supported by Karolyi (2006). Some evidence point to integration, while others indicate that the markets are segmented. Both outcomes have their own positive and negative effects. For example, firms in the markets that are not integrated or segmented will undoubtedly have more investment barriers. This will translate to higher risk, price, and cost of capital. The way to mitigate these adverse effects is to adopt policies (in this case, cross-listing) that promote the positive impact of international diversification (Arouri & Foulquier, 2012; Leuz, 2003). If there is integration, the region will benefit through more efficient capital allocation, less probability of asymmetric shocks, a more robust market framework, and help improve the capacity of the economies to absorb shocks and foster development.

Nonetheless, without integration or when the markets are segmented, does have its benefits. These markets (OIC markets) posit to have better diversification and reduce risk of cross-border financial contagion, especially in the situation when the region's economies are dependent on one another (Yu et al., 2010). The less developed markets such as OIC markets are expected to provide better diversification opportunities compared to other developed markets since there is an option to invest in different markets, different securities, and different currencies. Claessens et al. (2002) stated that emerging stock markets have more appealing features in providing investment and diversification opportunities to investors. In another spectrum, the lack of integration could also be a reflection of a hindrance to access these markets.

#### 4. CONCLUSION

In summary, the cross-listing via DRs produce some evidence of integration. In the case of OIC stock markets, the integration is preferred because if the markets are integrated, the cost of raising capital for the companies is low. Integration can improve local stock market liquidity. If markets are segmented, only local investors can trade in the local markets, whereas all international investors can trade in the local markets if the markets are integrated. Nonetheless, the evidence of integration can be seen either based on the countries or the type of company. A study by Sabri (2002) discovered that there are still major obstacles concerning the ability and willingness of Arab stock markets to attract international investors. He further suggested that Arab stock markets remove restrictions on foreign investment, improve the regulatory conditions, and reduce fees and bureaucracy to attract foreign investors. DRs could be one of the means to increase competition for these firms internationally.

Additionally, for international investors, investing shares via DRs could provide a platform for diversifying their portfolio. As mentioned earlier, the OIC countries are in a dire need to come up with a mechanism for enhancing cooperation and intra-investment among them. By having the DRs, these companies can tap into foreign markets with a lower cost of capital and increase competition.

#### ACKNOWLEDGEMENT

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<sup>33</sup> In this case due to the unavailability of data, we were only able to extract a small number of firms and also several countries.

<sup>34</sup> There were many missing data and some of these prices were unchanged for some time and maybe due to less trading days. The possible explanation could be that these prices were updated and followed the last price of trading day that was available.

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## APPENDIX 1

*Sample of Home and Cross Listed Shares Used in Price Parity Analysis*

Company	Abbreviation	Type of DRs	Exchange	Currency
<b>EGYPT (3)</b>				
Commercial International Bank (Egypt)	Comit	ADR Level I	Non NASDAQ <sup>35</sup> OTC (US)	US Dollar
Orascom Construction	Orascom	GDR Reg S	London	US Dollar
Orascom Telecommunication	Oratel	GDR Reg S	SEAQ Int <sup>36</sup> (London)	US Dollar
<b>INDONESIA (9)</b>				
PT Adaro Energy	Adaro	ADR Level I	Non NASDAQ OTC (US)	US Dollar
PT Bank Rakyat Indonesia	BRI	ADR Level I	Non NASDAQ OTC (US)	US Dollar
PT Bumi Resources Tbk	Bumi	ADR Level I	Non NASDAQ OTC (US)	US Dollar

<sup>35</sup> It is one of American [stock markets](#). "NASDAQ" originally stands for National Association of Securities Dealers Automated Quotations. It is the second largest stock market compared to official stock exchanges by [market capitalization](#) in the world, after the [New York Stock Exchange](#). Retrieved April 13, 2013 from <http://en.wikipedia.org/wiki/NASDAQ>

<sup>36</sup> The Stock Exchange Automated Quotation system (or SEAQ) is a system for trading [mid-cap London Stock Exchange](#) (LSE) stocks. Retrieved April 13, 2013 from <http://en.wikipedia.org/wiki/SEAQ>

Indofood Sukses Makmur	Indof	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Indosat	Indosat	ADR Level III	New York Stock Exch (US)			US Dollar
PT Bank Mandiri (Persero)	Mandiri	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
PT Semen Gresik (Persero)	Semen	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Telekomunikasi Indonesia	Tel	ADR Level III	New York Stock Exch (US)			US Dollar
PT United Tractors	United	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
<b>MALAYSIA (7)</b>						
Genting	Gent	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Genting Malaysia Berhad	Gentmsia	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Kuala Lumpur Kepong	KLKep	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Malayan Banking	Mbnk	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
MBf Holdings	MBF	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Tenaga Nasional	TNB	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Top Glove	Top	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
<b>TURKEY (12)</b>						
Akbank	Akbank	ADR Rule 144A	Non (US)	NASDAQ	OTC	US Dollar
Anadolu Efes	Anadolu	ADR Rule 144A	Non (US)	NASDAQ	OTC	US Dollar
Arcelik A.S.	Arcelik	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Ford Otomotiv Sanayi A.S.	Ford	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Haci Omer Sabanci	Haci	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Koc Holding	Koc	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Tekfen Holding A.S.	Tefken	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Turkiye Garanti Bankasi	Tkig	ADR Rule 144A	Non (US)	NASDAQ	OTC	US Dollar
Turkiye Vakiflar Bankasi T.A.O.	Tkiv	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar
Turkcell Iletisim Hizmetleri	Turkcel	ADR Level III	New York Stock Exch (US)			US Dollar
Turk Hava Yollari A.O.	Turkhav	ADR Level I	Non (US)	NASDAQ	OTC	US Dollar

Turkiye Halk Bankasi A.S.	Turkiye	ADR Level I	Non NASDAQ OTC (US)	US Dollar
<b>LEBANON</b>				
Banque Audi	Bankau	GDR Level I	SEAQ Int (London)	US Dollar
<b>NIGERIA</b>				
Guaranty Trust Bank	Guarte	GDR Reg S	SEAQ Int (London)	US Dollar
<b>QATAR</b>				
Qatar Telecom	Qattel	GDR Reg S	SEAQ Int (London)	US Dollar





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Journal homepage: [www.publishing.globalcsrc.org/jafee](http://www.publishing.globalcsrc.org/jafee)**What motivates and deters the ‘crowd’ in crowdfunding in Malaysia?**<sup>1</sup>Shaista Wasiuzzaman, <sup>2</sup>Hemalatha A/P Pannir Chelvam<sup>1</sup>Senior Lecturer, Faculty of Management, Multimedia University, Malaysia: shaista@mmu.edu.my<sup>2</sup>MPhil student, Faculty of Management, Multimedia University, Malaysia: herishnavibala95@gmail.com

ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: February 2020 Available Online: March 2020</p>	<p><b>Objective:</b> This study intends to theorize about how values and the perception of risk of the supporters of a crowdfunding project affect the success of the project.</p> <p><b>Methodology:</b> A review of prior literature is carried out to identify the different dimensions of the decision making process.</p> <p><b>Implication:</b> This research presents a conceptual framework to describe the influence of perceived values and risk on the success of crowdfunding in Malaysia. The crowdfunding phenomenon is relatively new in Malaysia and there is a lack of knowledge about the decision making of the ‘crowd’. The success and sustainability of the crowdfunding phenomenon depends on the supporters of the funds.</p>
<p><b>Keywords</b> Crowdfunding, Perceived Values, Perceived Risk, Small And Medium Enterprises (Smes), Malaysia</p>	
<p><b>JEL Classification:</b> G29, A13, A19</p>	

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Corresponding author’s email address: shaista@mmu.edu.my

**Recommended citation:** Wasiuzzaman, S., Chelvam, H. A/P. P., (2020). What motivates and deters the ‘crowd’ in crowdfunding in Malaysia? *Journal of Accounting and Finance in Emerging Economies*, 6 (1), 323-330**DOI:** 10.26710/jafee.v6i1.1095**1. Introduction**

Entrepreneurship plays a big role in economic growth as it reduces poverty through wealth creation, innovation and technology deployment. It has been found that countries experience higher economic growth when there is a focus on entrepreneurship and self-employment (Soete and Stephen, 2004). It is essential to maintain and propagate a country’s competitiveness especially with the increasing trend of globalization (Venkatachalam and Waqif, 2005). Identifying entrepreneurship as one of the key drivers of Malaysia’s progression, the Malaysian government introduced several initiatives in its 2015 budget, where several perks were introduced to start and support entrepreneurial ventures and to boost research and development. In its 2016 budget, RM100 million was allocated to Agensi Inovasi Malaysia (AIM) and an automatic double reduction of RM50,000 in R&D expenses for SMEs to encourage the entrepreneurial spirit in Malaysia (<http://www.nst.com.my/news/2015/10/2016-budget-encourages-entrepreneurship-and-innovation>). Based on a statistical report from the Malaysia Labor Force Survey in 2014, the number of entrepreneurs has shown a marginal increase between 1982 and 2012. During this period, the number of entrepreneurs increased from 1.3 million to 2.6 million, respectively.

Despite the various initiatives introduced by the Malaysian government, census by the Department of Statistics shows that the prime source of SME financing is via their own funds or internally generated funds (including borrowing from friends or families). Only about 20% financing comes from financial institutions and government loans due to the various constraints faced, such as lack of collateral, insufficient documents and no financial track record to support loan application, etc. However, with the increasing number of web-based platforms, entrepreneurs are able to reach investors on a wider scale. One major financing source is crowdfunding. In recognition of the importance of ECF (equity crowdfunding) as an alternative early-stage financing avenue, Malaysia was the first country in ASEAN to introduce a regulatory framework to facilitate equity crowdfunding in 2015, whereby it made amendments to its Capital Markets and Services Bill (CMSB). 6 registered equity crowdfunding operators were licensed in June 2015 and were fully operational by 2016. Unlike Singapore where only accredited and institutional investors are allowed to participate in securities-based funding, in Malaysia, the ECF is an investment product made available to, not just registered angel investors and sophisticated investors, but also to retail investors. However, various regulations have been set to protect the investors, especially the unsophisticated ones. Despite these measures, there are still risks involved in ECF since it is a new social phenomenon and information about it is still limited. These risks and other social, emotional and other factors may affect the decision making process of the crowdfunder hence affecting the success of a crowdfunding project. However, literature on this is still quite limited and therefore, this study aims to understand the motivations and deterrents for participation in crowdfunding projects.

Given the current financial landscape for entrepreneurs in Malaysia, it is vital that greater effort is put into implementing the right assistance to ensure successful entrepreneurial venture which results in the firms not only growing in size but also helping to boost the country's revenue. Failing to acquire adequate assistance, first-time entrepreneurs are unable to tap into their potential properly in order to grow and contribute to the economy. Various government initiatives have extended financial assistance to SMEs and entrepreneurs but the assistance does not suffice as it is difficult to fulfill the requirements for financing, especially for first-time entrepreneurs. Crowdfunding is touted to be one of the possible solutions to the financing gap but the success of any crowdfunding project depends on the funding it receives from its supporters/investors and it is therefore important to understand what motivates and deters these supporters/investors from investing in any project. This research is thus aimed at augmenting the effort of the Malaysian government by providing further insight into the crowdfunding phenomenon in Malaysia and the community supporting this phenomenon in order to ensure sustained participation in this new and rapidly growing phenomenon.

## **2. Literature Review**

Studies by the Asian Development Bank reveal a funding gap in almost all SEA economies: only 18.7% of total bank lending were to SMEs in Asia, and there has been a decreasing trend since the global financial crisis of 2009. According to David Rose of Rose Tech Ventures, VCs typically invest in 1 out of every 400 companies they evaluate whilst angel investors have a higher hit rate of 1 in 40 companies. Around 9 million SMEs in Asia do not have sufficient access to financing and this lack of financing inhibits their growth. Entrepreneurs embarking on a new venture, especially during the start-up phase of their business, face many obstacles in raising finance due to limited business operating history and the riskiness of the business, which is a result of their ideas being too innovative or complex. Therefore, they mostly rely on friends, family and fools (Kotha and George, 2012) for their financing.

Crowdfunding is defined as “an open call, mostly through the internet, for the provision of financial resources either in the form of donation or in exchange for the future product or some form or reward and/or voting rights” (Belleflamme et al, 2014). Crowdfunding is growing rapidly around the world. One of the biggest platforms in the world, kickstarter.com, collected \$529 million single-handedly in 2014 by



raising funds through relatively small contributions from a large number of people. There were more than 700 crowdfunding platforms around the world in 2012 and this number has increased to more than 1250 online crowdfunding platforms in 2015, with an estimated over 2000 platforms by early 2016 given the trend. Crowdfunder.com estimated the total fundraising volume in 2015 to be approximately \$34 billion, out of which \$5.5 billion was raised via reward and donation crowdfunding and \$2.5 via equity crowdfunding. Of the \$34 billion, \$10.54 billion was raised in Asia and crowdfunder.com estimates the growth in crowdfunding in Asia to be approximately 210%, the highest for any region in the world. The total transaction value in the reward-based crowdfunding segment amounts to \$2.8 billion in 2017 in Asia and an approximately 31.2% annual growth is estimated until year 2021. For the case of Malaysia, the transaction value amounts to US\$0.5 million with growth estimated to be 15.4% by year 2021. However, according to the Asian Institute of Finance (2017) report, the only 10% of the public has invested in crowdfunding in year 2015 and 70% of the public were only willing to spend RM100 per project. To ensure the growth and sustainability of the crowdfunding phenomenon, it is essential to understand the psychology and the decision making process of the investors in crowdfunding, also known as the ‘crowd’.

Despite the growing popularity of crowdfunding, little scholarly research can be found in this domain. Crowdfunding avoids some of the barriers that can impede offline financial transactions and enables the dissemination of product information, increase consumer awareness, and estimate consumer willingness to pay (Belleflamme et al., 2010). Prior studies have investigated the link between motivations and contributions to online communities (Kraut and Resnick, 2012) but only few scholars have investigated the motivations for crowdfunding through online platforms. Studies examining the crowdfunding phenomenon (Belleflamme et al, 2010; Kraut and Resnick, 2012; Schwienbacher and Larralde, 2012; Kuppaswamy and Bayus, 2015; Xu et al, 2014) assert that crowdfunding needs to be sustainable in order to grow and benefit a larger group of entrepreneurs. The success of the phenomenon depends on the supporters of the funds, i.e. the crowd. Investor are purported to be rational decision makers but prior studies have found that investors allow their emotions and mind to influence their investment decisions (Kraut and Resnick, 2012).

In a case study of a company that raised money using crowdfunding techniques, Schwienbacher and Larralde (2012) found that supporters were motivated to participate in the project because of the excitement and the adventure related to building a startup and so that they could expand their network with other supporters. Most crowdfunding platforms facilitate interactivity between project initiators and crowdfunders by allowing crowdfunders to comment on, ‘like’, rank, or even report a project. In order to increase their likelihood of success, project creators or initiators are able to take advantage of this interactivity by communicating through project actions such as providing videos and posting project updates (Mollick, 2014). Kuppaswamy and Bayus (2015) and Xu et al. (2014) find that the number of project updates posted by a fund-seeker posts has a positive impact on the project’s campaign success while Verheart and Van den Poel (2012) find that the chance of success is higher if project’s creator or initiator announce the amount of seed fund raised during the funding process. There is also evidence of a herd effect in crowdfunding. Accordingly, Lin et al. (2013) found that information of prior contribution and other crowdfunders’ choices influence a project’s success.

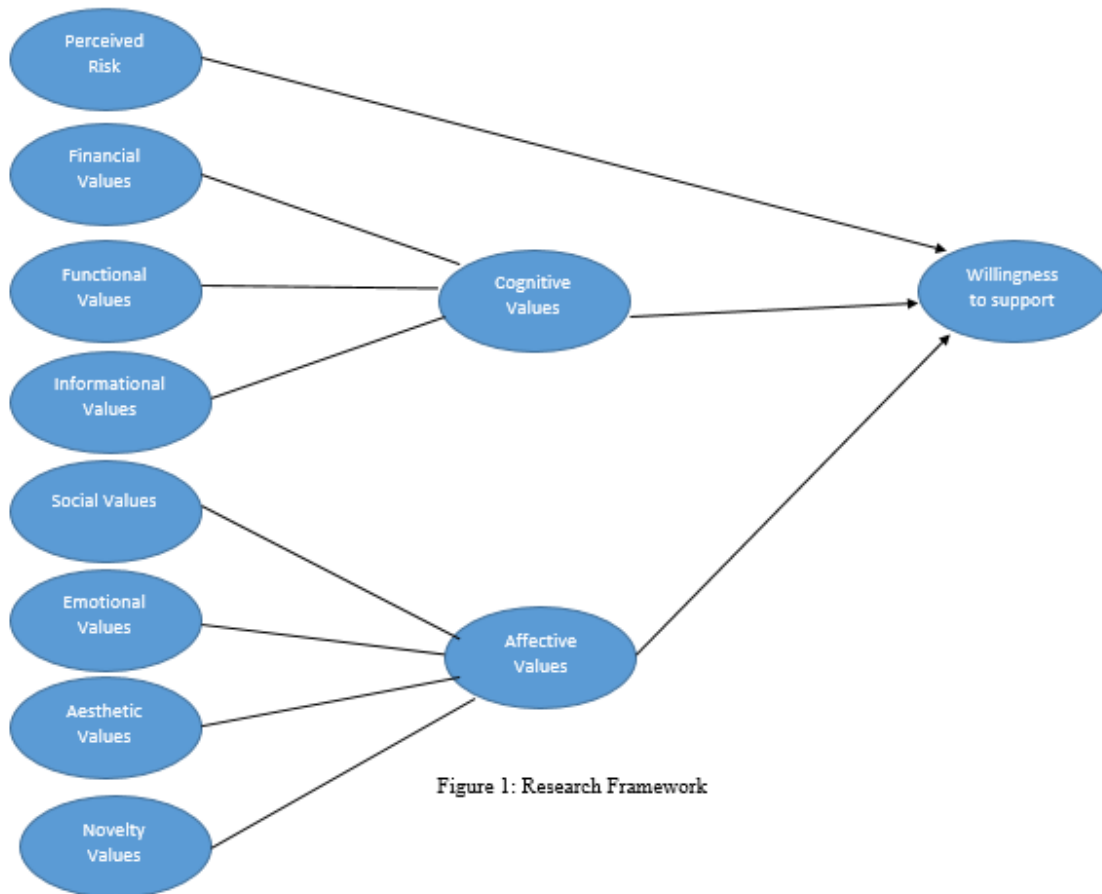
In consumer behavior literature, decision making is considered from several perspectives – the ‘information processing perspective’, the ‘affective perspective’, and the ‘value perspective’. From the information processing perspective (Bettman, 1979), consumers are logical thinkers who solve problems rationally in order to make decisions (Blackwell et al., 2001). However, according to the affective perspective, consumer decision making is very much affected by their affections and emotional responses. A more holistic approach to consumer decision making is offered by the value perspective, which posits that consumers are “value driven” (Holbrook, 1996). According to Sheth et al. (1991), the factors that contribute to consumer decision making can be classified into five values – functional value, social value,

emotional value, epistemic value and conditional value. Functional value reflects whether or not a product is able to perform its attribute-related, utilitarian, or physical purposes while social value refers to the social and symbolic benefits offered by the product (Moysidou and Spaeth, 2016). Emotional value reflects the experiential or emotional benefits derived from a product while epistemic value is caused by a desire for knowledge which may be due to intellectual curiosity or novelty-seeking objectives. Conditional value is based on situations or set of circumstances faced by the consumers which have an influence on the consumer's desire to purchase a product (Moysidou and Spaeth, 2016). The various perceived values that research has identified can be further categorized into two generic dimensions, namely the cognitive value dimension and the affective one (Roig et al., 2006). Roig et al. (2006) for instance, identify four significant perceived values, namely quality of product, quality of service, emotional and social value and these values are considered a synthesis of the two generic dimensions above. The cognitive value refers to people's rational and economic evaluations and incorporates the quality of product and service value while the affective dimension captures the feelings or emotions generated and can be divided into emotional and social values.

The main reason why entrepreneurs and small and medium enterprises (SMEs) face difficulty in securing funds from financial institutions is their opaque nature. Their opaque nature is a result of their poor record keeping and insufficient documentation. The high levels of information asymmetry makes it difficult for banks and non-bank financial institutions to assess their credit risk. Crowdfunding is based on social capital and according to Agarwal et al. (2015), social capital reduces uncertainties and perceived information asymmetries and is a perceived sign of credibility. Therefore, increased availability of information improves credibility and reduces information asymmetry and this reduces the risk related to a crowdfunding project hence improving the success of the project. However, crowdfunding as an investment option has its risks. Companies seeking funds through crowdfunding are usually high-risk companies and are not required to provide financial or operational data since they are unlisted companies (Turan, 2015). The companies may not be audited properly and there may not be enough information for investors to compare with to make their decisions. The crowdfunder/investor also faces the risk of losing all the invested capital as there is a high probability for start-ups and early businesses to fail. In terms of dividends, the companies being growth companies would prefer reinvest the profits for growth and to build value and hence may not pay dividends for many years. Additionally, since there is no secondary market for the investments, it may be difficult or even impossible to sell the investment in the future. Even if the investor does not wish to sell the investment, there is the risk of dilution of the shares of the investor if the company decides to raise more capital in the future (Turan, 2015).

This study therefore focuses on the decision making process of the crowdfunder via these two dimensions, i.e. the cognitive and affective dimensions. It also considers the risk associated with a crowdfunding project which has been found to influence the decision to support a project. Based on the discussions above, the following propositions are put forward:

- P1: The cognitive dimension will influence the crowdfunder's decision to support a project.
- P2: The affection dimension will influence the crowdfunder's decision to support a project.
- P3: Perceived risk of the project or the crowdfunding platform will influence the crowdfunder's decision to support a project.

**Figure 1:** Below Presents The Research Framework of this Study:

### 3. Proposed Methodology

To achieve the objectives of this study, a survey questionnaire will be developed and distributed. Since this study is about crowdfunder's (or supporter's) decision making, the respondents will be those who have or are considering supporting request for funds on a crowdfunding platform hence the research uses purposive sampling method. There are 6 licensed crowdfunding operators in Malaysia and agencies involved in this are MDEC and MAGIC. MDEC and MAGIC and the 6 licensed crowdfunding companies will be approached to get the list of respondents. The appropriate sample size will be decided based on statistical recommendations, although a minimum of 100 responses is expected. As the research questions in this study pertain to crowdfunding supporters, they form the unit of analysis. Past literature will be referred to and small group of around 5 respondents will first be interviewed in order to understand the issues properly to develop the questionnaire. The developed questionnaire will be pilot-tested to confirm the validity of the questionnaire. Data collected will be entered and analyzed using structural equation modelling so that the relationships can be evaluated.

### 4. Conclusion

Early-stage entrepreneurs find it difficult to obtain funding for their businesses which are considered risky

and their ideas being too innovative and complex. They are also unable to fulfill most of the requirements imposed by financiers. However, with the increasing number of web-based platforms, entrepreneurs are able to reach investors on a wider scale and crowdfunding is one of the new major sources of financing. However, being a new system which is online, there are certain risks associated with crowdfunding. Aside from this, the crowdfunding phenomenon needs to be sustainable in order to grow and benefit more entrepreneurs. The success of the phenomenon depends on the supporters of the funds. It is therefore important to study the decision making process and perception of risk of these crowdfunders (or supporters).

The results from this study are expected to influence government policy with regards to the alternative avenues for financing available, i.e. crowdfunding, to entrepreneurs and the provision of incentives to encourage supporters of projects to participate in crowdfunding activity for the success of entrepreneurial ventures in Malaysia, thus leading to the growth of the country. By understanding the psychology of the supporters, further steps can be taken to strengthen the regulations pertaining to crowdfunding to enable increased trust and participation in this growing industry. Results from this research is expected to benefit the crowdfunding community as well. It will provide insight into the decision making process of the project supporters providing project creators the knowledge to allow them to redesign their projects to successfully attract funding for their projects. Also, crowdfunding operators can redesign and refine their platforms to improve user interface and to better recruit and sustain participation in the crowdfunding community. Therefore, the increase in successful projects will result in a spur in entrepreneurial efforts and increased employment opportunity. Finally, this study would help both policy-makers and educators to identify non-traditional sources of financing for entrepreneurs and its viability. It is also hoped that the identification of various issues related to 'crowdfunder' psychology can help improve further the crowdfunding industry allowing it to grow so that entrepreneurs can have improved access to finance and hence, improve their chances of business survival and result in increased growth.

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Journal homepage: [www.publishing.globalcsrc.org/jafee](http://www.publishing.globalcsrc.org/jafee)**Impact of Foreign Remittances on Financial Development of Pakistan**<sup>1</sup> Ghulam Mustafa, <sup>2</sup> Said Zamin Shah, <sup>3</sup> Asim Iqbal<sup>1</sup> Department of Economics and Business Administration, Division of Arts and Social Sciences, University of Education, Lahore, Punjab, Pakistan. ghulam.mustafa@ue.edu.pk<sup>2</sup> Department of Economics, Islamia College University, Peshawar, KPK, Pakistan. syed\_economist1983@yahoo.com<sup>3</sup> Department of Economics and Business Administration, Division of Arts and Social Sciences, University of Education, Lahore, Punjab, Pakistan. asim.iqbal@ue.edu.pk**ARTICLE DETAILS****History**

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**ABSTRACT****Purpose:** Mostly developing countries are not receiving the remittances with same speed as compared to workers' outflow. This cumbersome situation allows developing countries to go to external source of funding (debt) for economic and financial development-FD. Thus, the purpose of this paper is to investigate the nexus between FD and remittances in Pakistan for the period 1976-2015.**Design/Methodology/Approach:** The study utilizes the time series annual data for the period 1976-2015. Data were taken from different sources like world bank data source and different economic surveys of Pakistan. To evaluate the long run relationships between FD and remittances, Auto Regressive Distributed Lag (ARDL) strategy is utilized.**Findings:** The empirical results indicate that remittances have a significant positive impact on FD (M2/GDP) except for CPS/GDP measure of FD which has insignificant positive coefficient.**Implications/Originality/Value:** Most of previous literature measured FD with the ratio of money supply to GDP (M2/GDP) however, the current study measured with two indicators i.e. the ratio of money supply to GDP (M2/GDP) and the ratio of bank credit to GDP (CPS/GDP). This is the main contribution in the literature. The study recommends that remittances channelize financial segment of the country in augmented manner and government should encourage Pakistani expatriates to send the remittance through formal sources (e.g. banks). Financial institutions and intermediaries working in Pakistan should exaggerate the recruitment of remittances with the purpose to make them significant source for loanable funds. In addition to this, the concern department should simplify the procedure for sending remittances.

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Corresponding author's email address: ghulam.mustafa@ue.edu.pk

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## **1. Introduction**

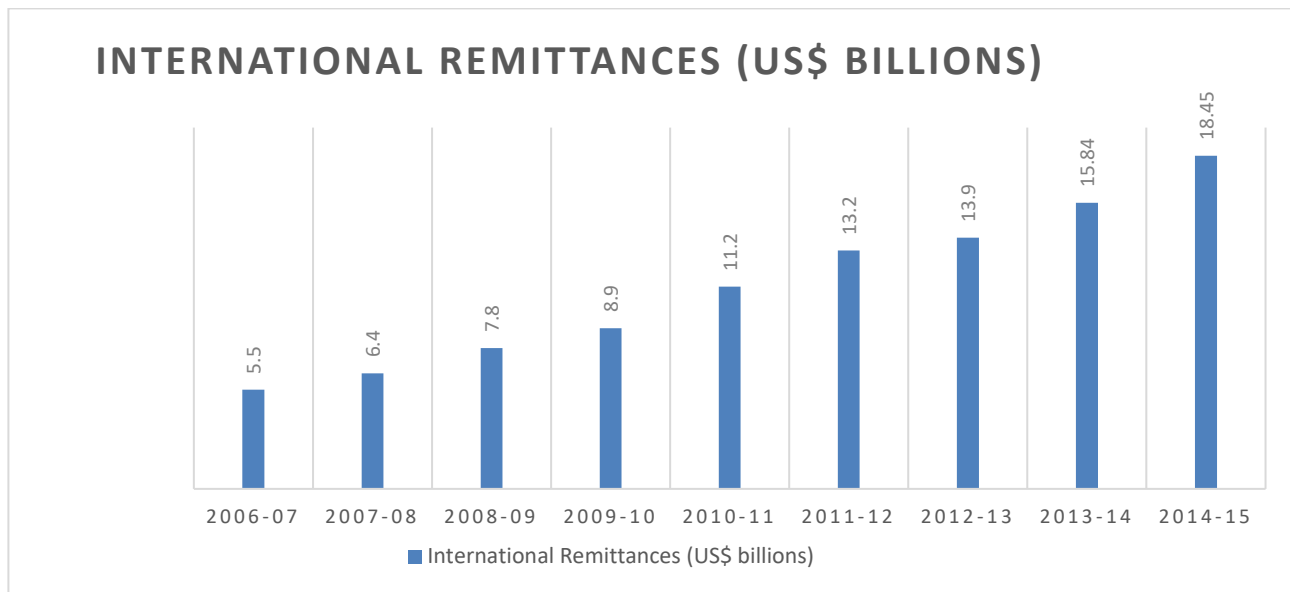
Flows of remittances are increasingly attracting attention into developing countries due to their growing capacity and their effect on recipient countries. Thus, researchers are on the opinion that remittances have the key role to play in the development of households, businesses and even for economic systems of developing countries. Remittances are overseas earnings, sent back from the host-country of employment to the country of origin (Kapur, 2003; Oke, 2011). As per International Organization for Migration (2006) remittances are the product of income earned connected with migration and defined as the cash transferred by immigrant or migrated worker in his country of origin to his relatives. Migrants send remittance to their family for routine (monthly) consumption purposes and to support them in their bad times.

Migrants' remittances have been growing extremely over the last twenty years. Since 2009, keeping the importance of remittances in consideration, the World Bank has acknowledged them in its measure of creditworthiness (Connor et al., 2013). Developing countries without having enough remittances level force to borrow otherwise from external sources like IMF (International Monetary Fund etc.) on restrict conditions. Workers' remittances, now a day, are the rudiments of emergent economies as these have proved to be more stable than other external inflows like foreign direct investment-FDI. Many researchers are on the opinion that for transitional countries most significant source of income is remittance, which comes after FDI (Ratha, 2005; Bettin and Zazzaro, 2011; Oke, 2011; Sirkeci, Cohen, & Ratha, 2012). Consequently, these remittances can be used in numbers of way like poverty reductions, education, economic and financial development. Remittances also save the economies from different financial shocks and help in natural hazards. For instance, Pakistan received a lot of remittances during 2005 earth quick in Northern Pakistan and 2009 flood in Southern Punjab. However, this kind of increase in remittances depend on intentions and self-interest of remitters. Among others, financial development is most important one.

Among the top ten world countries receiving remittances Pakistan is one and in Asian countries it is on number fifth Asian ranking scale (Canuto & Ratha, 2011, Mughal, 2013; Abbas et al., 2017). In 1982–83, the inflow was \$2.88 billion and in next five years it fluctuated (Abdel-Rahman, 2006). Again, it shoot up and inflows increased to \$7 billion in 2008 in Pakistan and accounted 4.2% of total GDP (Kock & Sun, 2011). In contrast with 2009–10 the quantity of remittances grew to 25.8% in Pakistan in 2010–11 (SBP, 2011). In July to December 2012 the flows of remittances were 12% greater than previous year i.e. \$7 billion. Overseas Pakistanis sent remittances in 2012–13 to their residence were US\$13.2 billion (Sohaib, 2013). The workers' remittances have been made marvelous involvement in Pakistan to overall overseas' earnings of the nation (Mughal, 2013). The tremendous increase in flow of remittance to Pakistan consist of; raises number of immigrant, the increase of skilled-overseas to abroad that received high wages and incomes and shift of official channel (Arif & Irfan, 2012).

Pakistan is facing upward trends in remittances from abroad (State Bank of Pakistan, 2015). In 2006 to 2007, Pakistan take delivery of \$5.5 billion overseas remittances. Pakistan got \$6.4 billion inflow of remittances in 2007-08 and \$7.8 billion in 2008-09. After that this trend increases remarkably with the passage of time as \$8.9 in 2009-10, \$11.2 billion in 2010-11, \$13.2 billion in 2011-12, \$13.9 billion in 2012-13, \$15.84 billion in 2013-14 and in 2014-15 \$18.45 billion respectively (figure 1).



**Figure 1: Overseas Remittances Trend in Pakistan**

Source: State Bank of Pakistan (2015)

Studies have found that it is financial development-FD that decides to get advantage from remittances. Further these ensure adequate growth for any country particularly those countries who heavily rely on the inflows in the form of remittances. The development through remittance could be use in several ways. First, as is sound predictable, approach to credit is the main restraint for enterprising activities in transitional countries (Biggs and Shah, 2006; World Bank, 2009; Woodruff and Zenteno, 2007; Beck and Demirgüç-Kunt, 2006; Bettin and Zazzaro, 2011). Second, remittances appear to additional FD in countries of origin play an important role in reducing inequality, poverty and promotion of economic growth (Demirgüç-Kunt et al., 2010; Gupta et al., 2009; Beck et al., 2007; Aggarwal et al., 2006 and Bettin and Zazzaro, 2011). Lastly, remittances should be used in a way that abolish liquidity constraints and promote access to credit for the remitters' families. Further these inflows should allow the funding for that businesses which boost growth by talented but financially poor individuals, if it would efficiently intermediated (Bettin and Zazzaro, 2011)

Although nexus between economic growth and remittance has been covered in literature but impact of remittances on FD is still theoretically unclear. The effort to inspire remittance receiver to lay remittances in the financial system by financial intermediaries showed the importance of inflows to the financial sector (Orozco and Fedewa, 2005). The fact is that while doing so, they covered the way for the consumers to approach to other financial services and products. So for as, remittances are considered to be stung up and established the banks, are able to give loans to the people and this will definitely put a strong and positive effect on the economy and development of the country. Furthermore, when the deposits of bank directly related to remittances flow will increase, then banks will be able to increase the loanable funds and this will positively soil the foundation in the growth of country's economy. In fact, in transitional economies remittances are helpful to reduce credit constraints (Woodruff and Zenteno, 2004 and Funkhouser, 1992). On the other hand, if recipient does not believe on financial institutions or consumed all remittance then the result would be contraction in bank deposits or loanable funds. Moreover, if bank favor to retain liquid assets relative to lending then remittances may not be helpful to increase private sector credit (Oke, Uadiale and Okpala 2011, Aggarwal, Demirguc-Kunt and Peria 2006, and Orozco and Fedewa, 2005).

After discussing remittances and FD in detail, it is derived that not only they boost economic growth but they also interrelated with each other. It is examined that commercial banks grow with increased remittances. A lot of financial services are acquired by the families of remitter as they invest their savings in new businesses and banks. In this way enormous profit earned by the families of remittance recipient country and as a result country's financial sector also developed. This is the reason behind that scholar and researcher examine the association between remittances of workers and FD in transitional countries. However, how to quantify accurately the FD of a country is still need to be covered. For instance, Aggarwal et al. (2011) and Oke et al. (2011) argued that FD is computed usually by investigating the level and size of financial intermediaries in a country while it can also be measured with the help of FD index. This part still need to be addressed particularly with regard to developing countries like Pakistan.

The previous literature on remittances have center of attention on their impacts on entrepreneurial activity, poverty and economic growth in Pakistan, whereas that on FD is scarce. So, this study discovers out this gap (to the best of researcher knowledge) and aims to investigate the impact of remittances on FD. Therefore, the study in hands is design to evaluate the nexus between remittances and FD and to found out whether remittances has any effect on the prevailing financial performance of Pakistan. Different from existing studies, we utilize more efficient measures for FD (e.g. measured by 1. domestic credit to private sector as percentage of GDP and 2. Money supply M2 as percentage of GDP in Pakistan). Moreover, while considering the recent financial situation of Pakistan's economy, it is evident that the role of foreign financial inflow to domestic country has gained immense importance. The few developing countries including Pakistan whose important contributor in term of foreign exchange reserve is remittances, mostly rely on the inflow of their workers' remittances. Presently, as the country is facing chronic financial crises in terms of foreign exchange reserves, remittances are the only source to tackle the financial situation including terms of trade and overall balance of payment.

The remaining part of the paper is formed as follows. The second section is related to existing literature on nexus between remittances and various macroeconomics Third section presents a concise explanation of the data and methodology. Empirical results and investigation can be seen in the fourth section and the fifth section consists of conclusion and policy recommendation.

## 2-Literature Review

This section overviews literature review about the impact of remittances on FD, economic growth, terrorism and poverty reduction. Tahir (2008) analyzed, by taking time series data from 1973-2006, an investigation of the effectiveness of FD in Pakistan. To recognize the causality among economic and FD and the exogeneity of the variables in the model vector error-correction modeling is applied. It is concluded economic development is the basis of FD in the long-run. Another study checked the effect of workers' remittance on FD in Nigeria (Oke et al., 2011). The study used the time-series data from 1977-2009. The GMM (Generalized Method of Moments) and OLS (ordinary least square) techniques were applied to incorporate effect of explanatory variables on endogenous variable. It has been found that remittances impact significantly and directly on FD in Nigeria, apart from GMM in which worker remittances was insignificant. Aggarwal et al., (2011) explored the relationship between FD and remittance and aimed to find the role of remittances in FD in developing countries. In order to investigate this association fixed effects estimations and dynamic GMM system is employed on group panel of 109 developing countries from the period of 1975 to 2007. After controlling the reverse causality and measurement errors effects it is estimated that worker remittances and FD are directly and significantly associated with each other in the recipient developing countries.

Javid et al. (2012) shed light on the positive role of foreign remittances on uplifting Pakistan economy by eliminating poverty. By applying ARDL technique on the data of 1973-2010 shows that inflows through remittances have significantly positive effect on Pakistan's economic growth. The impact can be seen through regional economic growth of various districts of Baluchistan, Punjab and Sindh but the situation

of Khyber Pakhtunkhwa (North-West-Frontier province-NWFP- at that time in 2010) is ambiguous. Pakistan can increase and utilize foreign remittances by formulating such policies that will enhance foreign remittance amount and motivate Pakistanis to transfer amount through proper channel by reducing transaction cost. Ahmad et. Al. (2013) figure out the foreign remittances on financial growth of Pakistan by adopting secondary time series data from 1978-2011. Utilizing the multiple regression analysis, the affiliation among the variables is depicted. Estimated results showed that foreign remittances and GDP of Pakistan have been positively correlated whereas negative association existed between inflation and exchange rate on economic growth. To improve investment and FD Pakistan needs stable and creative government to boost economic growth and foreign investment inflows.

Sharif et al. (2013) intended to study the effect of inflows on FD on Latin America and Caribbean region. They used panel data from 1991-2010 for 29 countries. Fixed and random effect panel regression methodology is used to check the bump of remittances. Empirical results indicated that FD positively and significantly affected by remittances. Valahzaghard & Kashfi (2014) presented the picture of Iran during the period 2006-2011 aimed to check the impact of different variables including GDP, the rate of inflation, the depth of the financial market, the number of bank branches and interest charged by the banks on bank deposits. By employing regression analysis, it is indicated that there exist positive and significant correlation among GDP, rate of inflation, financial market depth and the number of bank-branches on bank deposits. Jawad & Qayyum (2015) designed the collusion of policy environment and other macroeconomic determinants like GDP, interest rates, exchange rate and labor force participation rate on worker's remittances in Pakistan. The results revealed that there prevailed negative link in between growth of worker remittances and policy index and the GDP. At policy recommendation level, it has been recommended that there should be sound economic policies which attract flows of foreign remittances. Luqman & Huq (2015) analyzed that whether remittances response to economic growth affected by a country's absorption capacity or not? To test that hypothesis ARDL Bound testing approach has been employed for the period of 1972-2011. Empirical results showed that economic growth has not significantly influenced by remittances attributed to local financial sector development. Mubeen et. al (2016) inspected the remittances impact on FD of Pakistan utilizing the data from 1980 to 2011. To express the relationship between variables multiple regression model has been adopted. The results revealed that workers' remittances, agriculture growth and FDI have positive impact on Pakistan's economic growth. It has been also suggested that for more development Pakistan should focus on large quantity of raw material and money goods trade. Abbas et al., (2017) studied the effect of macroeconomic (political and financial) factors on remittances for Pakistan by employing data from 1972 to 2012. The GMM methodology was applied to find out the impacts. Results indicated that due to unstable macroeconomic conditions remittances significantly and negatively affected by inflation and financial liberalization but positively affected by dummy variable of 2001 terrorist attacks. Qwader & Alawneh (2017) in Jordan during the period of 2000-2015 measured the impact of earnings from remitters and economic stability on bank deposits. To check this bump multiple regression model has been used, which indicated that inflation rate and workers' remittances have been positively and significantly correlated with bank deposits, while rate of economic growth is negatively and significantly correlated with bank deposits. For policy recommendation, it is suggested that economic variables that sentiment the bank deposits in Jordan, should be given attention by the local bank administration. And also, local bank administration should provide honest and genuine programs that pull overseas workers' remittances and give both of them benefits alike.

After analyzing the above literature, it has been observed that most of the studies are related to the impact analysis of remittances with regard to economic growth and entrepreneurial activities (Hanson & Woodruff, 2003; Adams & Page, 2005; Yang, 2006; Barajas et al., 2009; Anyanwu & Erhijakpor, 2010) whereas research on financial development is scarce. So, this study will try to fill this gap.

### 3. Methodology

The secondary data is taken from World Bank data and international monetary fund. For this purpose, the study utilizes the time series annual data for the period 1976-2015. To ascertain the desired linked among variables the model is follow:

$$FD = \emptyset_0 + \beta_1(PREM) + \beta_2(GDP) + \beta_3(INF) + \beta_4(FDI) + \beta_5(TO) + \mu_t \dots \dots \dots (1)$$

Where;

FD is the financial depth (the ratio of money supply-M2- to GDP i.e. M<sub>2</sub>/GDP) and measures the size of financial intermediaries as well as the level of financial intermediation. The second indicator of FD is the ratio of credit to private sector to GDP i.e. CPS/GDP. PREM is the current private transfers from migrant workers' resident in the host country to recipients in their home country for more than a year (Aggarwal, Oke, Uadiale and Okpala 2011; Sharif, Tufail and Amjad 2013). GDP is the growth variable which depicts the country size and measured by yearly GDP growth in terms of percentage (Aggarwal et al., 2011 and Fayissa and Nsiah, 2012). INF is inflation which quantifies by the annual customer prices in terms of percentage (Nyamongo, Misati, Kipyegon, & Ndirangu, 2012; Giuliano & Ruiz-Arranz, 2009). TO is the trade openness and will measure through ratio of imports and exports to GDP in terms of percentage. FDI is the foreign direct investment and it is the ratio of net inflows of foreign direct investment to GDP in terms of percentage. These are control variables and literature also showed the greater influence of these variables on FD. The aim, to include them is to explore the accurate impact of remittances on FD.

In this study ARDL model, presented by Pesaran et al. (2001), is applied because this estimation technique is suitable for small sample. Also, the unit root test of the study supports this technique. Through ARDL model long-run and short-run coefficients are computed simultaneously. The models are as:

$$\Delta X_t = \delta_{0i} + \sum_{i=1}^k \alpha_i \Delta X_{t-i} + \sum_{i=1}^k \alpha_2 \Delta Y_{t-i} + \delta X_{t-1} + \delta Y_{t-1} + v_{1t} \dots \dots \dots 2.$$

$$\Delta Y_t = \delta_{0i} + \sum_{i=1}^k \alpha_i \Delta Y_{t-i} + \sum_{i=1}^k \alpha_2 \Delta X_{t-i} + \delta Y_{t-1} + \delta X_{t-1} + v_{1t} \dots \dots \dots 3$$

Where k shows the maximum lag order of ARDL model. F-statistic approved the joint null hypothesis that the coefficients of the lagged variables ( $\delta_1 X_{t-1} \delta_1 Y_{t-1}$  or  $\delta_1 Y_{t-1} \delta_1 X_{t-1}$ ) are zero. ( $\alpha_1 - \alpha_2$ ) represent the short-run dynamics while, ( $\delta_1 - \delta_2$ ) correspond to the long-run relationship in the model. Thus, the hypothesis of the long-run relationship is formulated as given below:

Ho:  $\delta_1 = \delta_2 = 0$  (no long-run association)

H1:  $\delta_1 \neq \delta_2 \neq 0$  (long-run association)

On the other hand, to check the short-run analysis vector error correction model was used which can be devised as follows;

$$\Delta Y_t = -\emptyset EC_{t-1} + \sum_{i=1}^k \beta_{i0} \Delta X_{it} + \delta \Delta w_t - \sum_{j=1}^{p-1} \emptyset \Delta_{t-j} - \sum_{i=1}^k \sum_{j=1}^{q-1} \beta_{ij} \Delta x_{i,1-j} + \mu_t \dots \dots \dots 4$$

ECt is the error correction term defined by;

$$EC_t = \varepsilon_t = y_t - \sum_{i=1}^k \phi_i x_{it} - \Psi w_t \dots \dots \dots 5$$

Where  $EC_{t-1}$  represents the lag value of error correction drew from the long-run coefficients. The coefficient of error correction ‘ $\beta$ ’ calculates the speeds of adjustment in which equilibrium is achieved.

**4. Empirical Results**

**4.1 Unit Root Test**

Augmented Dickey Fuller (ADF) and Phillips Perron (PP) unit root test are applied on the data to examine the stationarity and order of integration. Stationarity is important in the data, because, if trend exist spurious results created which are harmful. ADF and PP test involves fitting regression model:

$$\Delta Y_t = \alpha_0 + \delta Y_{t-1} + \alpha_1 t + \sum_{i=1}^m \beta_i \Delta Y_{t-1} + \varepsilon_t \dots \dots \dots 6$$

- $\varepsilon_t$ = white noise
- $\alpha_0$ = intercept
- $\delta, \alpha_1$  and  $\beta_i$  = coefficients

Results of unit root test are presented in table 1. It shows that FD, PREM and FDI are stationary at first difference, i.e. I(1) while GDP, INF and TO are stationary at level, I(0). This established order of integration is benchmark to use the ARDL approach to find associations among macroeconomic variables through cointegration. Software Eviews 9 automatically select the optimal lag length for the variables through Akaike Information Criteria.

**Table 1: Unit Root Test**

Variables	ADF		PP	
	Levels	First difference	Levels	First difference
<i>FD(M<sub>2</sub>/GDP)</i>	-1.615517	-5.276116	-1.633525	-6.687586*
<i>FD(CPS/GDP)</i>	-1.505626	-4.994417	-1.387306	-4.994417*
<i>PREM</i>	-1.446256	-5.879476	-1.768467	-5.935833*
<i>GDP</i>	-4.010413*	----	-4.025204*	----
<i>FDI</i>	-2.724214	-4.092987	-1.832116	-3.935959*
<i>INF</i>	-5.723545*	----	-5.768580*	----
<i>TO</i>	-4.437799*	-----	-4.514215*	-----

Note: \*shows significance at 1%. Null Hypothesis: There is unit root; Alternative Hypothesis: There is no unit root

**4.2 Cointegration Analysis**

Through Bound test analysis cointegration among variables is investigated. This is presented in table 2:

**Table: 2 ARDL Bound Test**

F-statistic	FD(cps/gdp)	FD(M <sub>2</sub> /gdp)
		7.1947
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18

1%	3.41	4.68
----	------	------

The results depict that F-statistics are 7.1947 and 5.3014 respectively which are greater than upper bound critical value at 10%, 5%, 2.5% and 1% level of significance. This means that alternative hypothesis of cointegration is accepted and it is concluded that there is cointegration among macroeconomic variables. So ARDL technique can be employed to estimate the long-run associations.

### 4.3 Long-run Estimated Results

After estimating the cointegration among coefficients long-run relationship is computed through ARDL technique. Table 3 portray the relationship.

**Table: 3 ARDL: Long Run estimated results**

<b>Dependent Variable: FD</b>		
<b>Variables</b>	<b>FD<sub>1</sub>(cps/gdp)</b>	<b>FD<sub>2</sub>(M<sub>2</sub>/gdp)</b>
<b>PREM</b>	1.482360 (1.019167)	1.366038** (0.569832)
<b>GDP</b>	7.283390** (1.534895)	-2.124570** (0.882644)
<b>FDI</b>	1.972564 (0.951290)	7.563867* (1.558973)
<b>INF</b>	-2.689720* (0.256718) {0.0019}	-0.529306 (0.362257)
<b>TO</b>	1.768809*** (0.741235)	0.046776 (0.684972)
<b>C</b>	27.567503** (6.508267)	47.848197* (5.294091)
<b>Observations</b>	40	40

\*shows variables are significant at 1%, \*\* shows variables are significant at 5%, \*\*\* shows variables are significant at 10%

The results delineate that in the long-run FD is significantly affected by workers' personal remittances when computed by the ratio of money supply to GDP. But when FD is computed as the ratio of credits to private sector, financial development is not significantly but positively influenced by remittances in Pakistan. This might be due to the reason that most of Pakistanis living abroad send remittance through informal sources (Hundi and friends). If they send through banking sectors, then remittances can be used for development of the country. Therefore, study recommends that government of Pakistan should encourage Pakistani expatriates to send the remittances through formal sources (e.g. banks). It is concluded that a 1% increase in remittances would enhance financial development by 1.4823 % and 1.3660%, respectively as indicated by the results in Table 3. The results are in agreement with previous literature (Chowdhury, 2011; Esteves and Khoudour-Castéras, 2011; Fayissa and Nsiah, 2012).

Theoretically, higher amount of remittances increases the consumption level of the recipient country that results in higher economic growth by inducing more investment. It is evident from our results (Table 3; Model 1) that FD positively affected by economic growth of the country in column 2 but negatively influenced by growth in column 3 (Model 2). The results are supported by previous study for first model (Ubreen and Nawaz, 2014).

As expected, inflation has negative impact on financial development in both models and with both

financial development indicators. However, in first model it has significant impact while in second model it opposite case is true. Generally, as noted by (Rashid and Husain, 2013), more capital inflows (in form of remittances) to the domestic country generates inflation. In this case our results are contradicts. This might be due the reason that outflows (through money laundering) from the country is very higher and remittance has insignificant impact on financial development (model 1). It means that financial development of the country is more determined by other macroeconomics factors such as inflation, FDI and trade openness as compared to remittance. Policy here, again, to channelize the remittances through formal sectors. This is evident from our results (Table 3) that foreign direct investment and trade openness have positive but inflation has negative impact on financial development.

#### 4.4 Short-run Estimated Results

While considering the short run estimated results, we get some important conclusions. The estimated results of table 4 are derived through running our ARDL model through econometric software reviews. In short period of time, remittances have positive impact on FD whether it is measured by broad money or credit to private sector.  $M_2$  to GDP and credit to private sector have significant positive effect on FD. As workers' remittances boost one percent financial development also boost by 0.5154 and 0.5558 percent, respectively. Same as in the long run, also, in the short-run financial development positively affected by foreign direct investment and trade openness while inversely influenced by inflation and country size. Country size has opposite sign according to the expectation but supported by the literature (Oke et al., 2011; Sharif et al., 2013).

The coefficient of  $ECM_{t-1}$  implies that how quickly or slowly variables return to equilibrium and it should be highly significant with negative sign. The model fulfils this property of error correction term. Error correction term indicates modification speed which is required to re-established equilibrium in short-run model. The coefficient of  $ecm_{t-1}$  is -0.2594 for short-run model. It narrates that deviation from the long run financial development is corrected by 25.94 % over each year. The value of coefficient ( $R^2$ ) is .9197 which depict that 91 percent deviation in dependent variable is because of independent variable and the rest is because of error term. F-Statistics tell the significance of whole model. This model is significant at 5% level of significance with value 432.59.

**Table: 4. Short-run Dynamics based on ARDL**

<b>Dependent Variable: FD</b>		
<i>Variables</i>	<b>FD<sub>1</sub>(cps/gdp)</b>	<b>FD<sub>2</sub>(M<sub>2</sub>/gdp)</b>
<i>D(PREM)</i>	0.515404** (0.138830)	0.555839** (0.285072)
<i>D(GDP)</i>	-0.015639 (0.086371)	-0.239091 (0.314561)
<i>D(GDP(-1))</i>	-0.070478 (0.085956)	0.090820 (0.237057)
<i>D(GDP(-2))</i>	-0.924714* (0.132866)	0.477679** (0.204192)
<i>D(FDI)</i>	2.290517* (0.265532)	3.077727* (0.858864)
<i>D(INF)</i>	-0.478212* (0.035393)	-0.215374*** (0.118048)
<i>D(TO)</i>	0.164491*** (0.057110)	0.019033 (0.279198)

<b>CointEq(-1)</b>	-0.259472* (0.032383)	-0.406899* (0.130564)
Cointeq = DCPS - (-4.4824*PREM + 7.2834*GDP + 1.9726*FDI -2.6897*INF + 1.7688*TO + 27.5675 )	Cointeq = BRMO - (1.3660*PREM - 2.1246*GDP + 7.5639*FDI -0.5293*INF + 0.0468*TO + 47.8482 )	
<b>R-Squared</b>	0.919756	0.862315
<b>Adjusted R-Squared</b>	0.905265	0.816420
<b>Akaike Inf Criterion</b>	-1.108258	4.759957
<b>Schwarz Criterion</b>	0.313775	5.195340
<b>Durbin-Watson Stat</b>	2.257380	1.974015
<b>F-statistic</b>	432.5988	18.78890
<b>Prob(F-statistic)</b>	0.000157	0.000000

The overall results depict that financial development positively and significantly affected by workers' remittances. Literature support these findings as positive relation among financial development and remittances has been proved by many studies (Gupta et al., 2009; Esteves & Khoudour-Castéras, 2011; Oke et al., 2011; Aggarwal et al., 2011; Fayissa & Nsiah, 2012).

#### 4.5 Diagnostic tests

Various diagnostic tests are applied to check serial correlation, conditional heteroscedasticity and normality for the model as can be seen in Table 5 which is derived by performing the post-estimations diagnostics checks in eviews software.

**Table: 5 Diagnostic Tests**

<b>Diagnostics</b>	<b>FD(cps/gdp)</b>	<b>FD(M<sub>2</sub>/gdp)</b>
<b>Breusch-Godfrey Serial Correlation LM Test</b>	(0.347883) {0.0549}	(1.384075) {0.1581}
<b>Heteroskedasticity Test: Breusch-Pagan-Godfrey</b>	(0.345852) {0.6546}	(1.559495) {0.1788}
<b>Normality Test: Jarque-Bera Test</b>	(0.742659) {0.6898}	(0.307982) {0.8572}

For auto-correlation Breusch-Godfrey LM test is applied and the test confirm the absence of auto-correlation. Breusch-Pagan-Godfrey test is applied for testing heteroscedasticity in which null hypothesis of homoscedasticity is accepted against the alternative hypothesis in both models. To test the normality of both models Jarque-Bera Test is estimated and it also ensures that the residuals are normally distributed. So the empirical results demonstrate that short-run models surpass all the diagnostic tests.

#### 5. Conclusion & Policy Recommendations

The nexus among financial development-FD and workers remittances have been investigated in the present study. ARDL bound testing approach to co-integration is employed to check the nature and magnitude of correlation between running macro-economic variables. Annual time series data is utilized over the period of 1976 to 2015. Furthermore, to discover adequacy of the model various diagnostic techniques are operated. Empirical results of the study reveal that worker's remittances have significant positive influences on FD when measured by the ratio of money supply to GDP. But the remittances have insignificant impact on credit to private sector in terms of GDP. The fact behind this result is that in Pakistan liquid liabilities are more enhanced by remittances than loanable funds. What it means that in



Pakistan remittances are more likely to exploit for consumption intention than for productive endeavors. Moreover, our study recommend is that the concerned institutions should expedite the channels of incurring remittances to the country. In this regard, the government should re-structure the transmission channels of foreign remittances in order to avoid the loss of financial revenue

It is obvious, after analyzing the finding, that if Pakistan channelizes his inflow of remittances then financial segment of the country will improve. Financial institutions and intermediaries working in Pakistan should also exaggerate the recruitment of remittances with the purpose to make them significant source for loanable funds. Now the big challenge faced by Central Bank of Pakistan is to efficiently use these augmented inflows that significantly effect financial development.

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