



Capital Flow, Capital Control, and Economic Growth: Evidence from Developed & Developing Economies

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ABSTRACT

Purpose: The current paper analyzes the effects of capital flow and capital control on economic growth in developed and developing countries. We used four main components of capital flow such as, FDI, exports, remittances and external debt

Design/Methodology/Approach: The econometric models are tested by using the annual data of 1995-2017 from 54 countries, classified as developed (high-income) and developing (middle-income) economies.

Findings: Empirical estimation of PMG revealed that all four components of capital flow augment the economic growth in both developed and developing countries. However, restrictions on these flows reduces the impact of FDI, external debt and exports but raises the influence of remittances on the economic growth.

Implications/Originality/Value: The findings of this paper also provides some useful insights for policymakers to use capital control as a tool for economic progress.



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Introduction

Foreign capital flow plays a crucial role in the global economy. It closely ties the countries financial and economic conditions. Country embraces foreign capital to supplement its domestic investment. It is used as a growth catalyst, which raises national income and improves economic performance (Ahmed & Zlate, 2014). Several past studies suggest that free capital flow across countries not only improves domestic businesses, but also increases labor efficiency and technological advancements (Cleeve, Debrah, Yiheyis, 2015; & Others). In order to understand the effects of capital flow on global economy, past studies discuss four main drivers of foreign capital that may affect economic activities of the country, which are; foreign direct investment,

remittances, exports and external debt.

Over the past few decades, foreign direct investment is found one of the key determinants of economic growth. Numerous past studies suggest that FDI influences economy by enlarging labor capabilities, encouraging good governance and bringing technological advancements (Turnbull, Sun & Anwar, 2016; & others). Moreover, it also assists local business to perform well by creating competitive learning environment (Debrah et al., 2015 & Chen and Zulkifli, 2012). According to World Investment Report (2017), global FDI flows across countries are expected to increase by five percent in 2018 up to \$1.85 trillion, from which \$660 to \$740 billion is expected to flow to developing countries. In addition to that, remittances play an essential role in strengthening the financial condition of economy. It perceives as a major source of funding for the developing countries. Several studies identified that remittances improves literacy rate and reduces poverty in the host countries (see for example, Jawaid and Raza, 2012 & Mohapatra, 2011). Migration and Development report (2016) revealed 0.4 percent increase in remittances to developing countries, amounted as \$431.6 billion in 2015.

Another important driver of international capital flow is exports. It is viewed as an economic engine, because it effects country's balance of payments, employment and ultimately growth. By increasing productivity, exports help local firms to grow. Previous researches corroborate that exports increases the local business efficiency by introducing them in to the global market (Dritsaki, 2013 & Kim et al., 2011). Furthermore, external debt is also an important factor of foreign capital that assumes as a source of funding as well as liability. State borrows money from another state to fix their financial issues. From the past literature, it is found that external debt has a mixed relationship with economic growth. If the money is borrowed for development purpose, it is favorable, otherwise, gives deleterious effect on the economy (Delong & Summers; Ajayi & Oke, 2012, among others).

Despite the increasing trend of capital flow across countries, the relationship between capital flow and economic growth is highly controversial. More specifically, in the wake of global financial crisis (2008-2009), an excess amount of capital flown from developed markets to emerging markets that drives attention of several researchers and policymakers towards this subject. Excess flow of capital across boundaries seriously distort the economies by creating asset price bubbles. It is recently noted that countries (especially developed) started imposing restrictions on the capital inflows (capital control) in the aftermath of the financial crisis in order to safeguard their economies from destabilization and currency appreciation. Thus, this current study is highly motivated by the surge and sudden stop of capital flow across countries. Though, numerous studies have been conducted in this area but rather focused on the determinants that attract capital flow in the country (De Vita and Kyaw, 2008; Fedderke and Liu 2002; & many others) or studies which are more focused on the individual analysis of capital flow and economic growth (Iamsiraroj and Ulubaşoğlu, 2015; Ali and Mustafa; 2012; Jouini, 2015; Almfraji & Almsafir; 2013, among others). However, the current study tries to investigate the effect of four main components (FDI, remittances, exports & external debt) of capital flow on the economic growth and also studies the same relationship in the presence of capital control, specifically in the advanced and emerging countries. We have used high-income and middle-income level regions, because as per the aforementioned statistics, vast amount of capital flow noted across these regions.

The rest of the paper is organized in the following manner: Section II highlights the theoretical background and empirical evidences. Section III explains the methodology of the study. Section

IV reveals the empirical results and discussion, and finally, section V summarizes the concluding remarks and policy implications.

Related Literature

Economic theory states that free flow of capital across countries carries several mutual benefits; it raises productivity, leads to effective use of resources and ultimately boosts economy. However, the large and volatile flow of capital sometimes harm the economic system. Due to which, this complex relationship of capital flow, capital control, and economic growth have derived great attention of several researchers and policymakers in both developed and developing nations. In the present paper, we have used four components of capital flow comprises *FDI*, external debt, remittances, and exports. Theoretically, capital flow can contribute to the economy in several ways. Neoclassical theory depicts that foreign inflow raises capital stock and hence foster economic growth by funding investments (Solow, 1956). Additionally, the new growth theory claims that foreign flow is more useful than local investment because it brings technological advancements that reduce negative returns on investments and lead to long-run economic development. According to endogenous growth theory, capital flow benefits the economy in two ways, directly by high investments and technological improvement and indirectly by human development, quality institutions, and good infrastructures.

In the empirical literature, several studies have supported the positive linkage between foreign direct investment and economic growth (Iamsiraroj and Ulubaşoğlu, 2015; Sbia, Shahbaz, and Hamdi, 2014; Omri, Ngugen and Rault, 2014; Antwi, Mills, Mills and Zhao, 2013; Tekin, 2012; among many more). It is also found that *FDI* not only good for the economy, but it also improves human development, domestic firm performances, innovations and labor force (Yiheyis, Debrah, and Cleeve, 2015 & Ahmed, 2012). Conversely, Saini, Baharumshah, and law (2010) stated that independent economic policies influence *FDI* and found the inverse relationship between *FDI* and economic growth in their study. Temiz and Gokmen (2013) study resulted that *FDI* inflow and gross domestic product have not correlated to each other due to some insignificant investment. On the other hand, very few authors have studied the effect of capital control in the context of *FDI* and stated that restriction on a direct investment reduces the flow of *FDI* in the economy, which subsequently detriments the economic system (Elo, 2007 & Asiedu, 2004).

In addition to the above, external debt plays a key role in the development of the economy, financing domestic projects that lead to economic progress. By reviewing past literature, it is identified that external debt and economic growth both have a mixed relationship; it considers good in the short-run but deleterious in the long-run. Voluminous studies have been published on the nexus between external debt and economic growth (Malik, Hayat, and Hayat, 2010; Kumar and Woo, 2010; Johansson, 2010; Fosu, 2007 and many more). Ali and Mustafa (2012) declared that higher international borrowing carries serious troubles for the economy. Contrary, Daud, Azman-Saini, and Ahmad (2013) found a positive association between external debt and economic growth, by reforming and diversifying debt policies, external debt can remarkably contribute to the economic growth.

Extensive literature illustrates the positive contribution of remittances in the economic growth of the country (Jouini, 2015; Kumar, 2013, Jawaid and Raza, 2012, Fayissa and Nsiah, 2008, etc). Nyamongo, Misati, Kipyegon, and Ndirangu (2012) cited that the flow of remittances through legitimate channels can lead to financial development. Free flow of remittances reduces the need for international aid and increase the probability of investments (Anzoategui, Kunt and Peria, 2014 & Ambrosius, and Cuezuecha, 2013). Adams and Cuezuecha (2013) explicated that

remittances play an integral role in alleviating poverty and boosting investment. Hatmi and Uddin (2013) reported that remittances and poverty both are interlinked with each other. In addition, a study investigates worker's behavior towards remittances; it is found that most people send their money back home in order to fulfill educational purposes (Arcangelis et al., 2015). Contrary to the above literature, Abdih, Chami, Dagher, and Montiel (2015) declared remittances inflow as a curse for the country, according to them, remittances deteriorate the quality of institutions.

Furthermore, several past studies have also been extensively discussed exports as a crucial determinant of economic growth. As Medina- Smith (2001) mentioned that exports are one of those determinants that accelerate economic growth. It raises productivity and enhances competition among domestic businesses. According to a trade theory, exports can strengthen the economic system through different channels. There are two groups of literature, one supports the relationship and the other opposed. In the first group, Dritsaki (2013) found bidirectional causality between exports and economic growth and stated that both exports and economic growth are important for each other. More investment opportunities in exports sector act as a catalyst for economic development (Stiakakis & Dritsaki, 2014). Empirical evidence shows that physical infrastructure enhances exports and subsequently spurs growth (Portugal-Perez & Wilson, 2012). Schneider (2005) asserted that high-technology increases trade which might lead to economic expansion. On the contrary, in the second group, Gokmenoglu, Sehnaz, and Taspinar (2015) examined that sustainable economic growth attracts exports of the country. On the other hand, in the wake of financial crisis, the debate on the restriction of capital flow has reinvigorated and hence several past studies conducted based on capital control and its effects on the economy (Korinek, 2017; Forbes, Fratzscher, and Straub, 2015, etc.).

Methodology

The objective of the current study is to empirically analyze the role of capital flow and capital control in economic growth. The basic assumption of economic growth is that the country's national output is determined by its foreign and domestic capital, labor force and other productive factors. In order to explain the theoretical phenomenon of economic growth, we construct the model by using Cobb-Douglas production function;

$$Y = f(K, L, A) \quad \text{eq (1)}$$

Where, Y is the total output, K is the domestic and foreign capital, L is the labor force and A is the other productive factors. We also follow the endogenous growth theory from the study of Barro (1990) and used some determinants of economic growth. The above function can further be specified as follows;

$$LGDP_{it} = \beta_0 + \sum_{i=1}^4 \beta_i J_{it} + \alpha_j K_{jt} + e_t \quad \text{eq.... (2)}$$

and

$$LGDP_{it} = \beta_0 + \sum_{i=1}^4 \beta_i J_{it} + \alpha_j K_{jt} * CC + e_t \quad \text{eq.... (3)}$$

From the above equation 1, $LGDP_{it}$ is the natural logarithm of gross domestic product, used as a proxy of economic growth. Here, J_{it} refers to the control variables used in the study where $i=1, 2, 3, 4$ and t denotes the number of years. The control variables are labor force, capital formation, and government expenditures and domestic credit in the financial sector named as financial development. In addition, K_{jt} describes the explanatory variables i.e. capital flow variables, where $j=1, 2, 3, 4$, it comprises of foreign direct investment, external debt, worker's remittances, and exports. However, the description of equation 2 is same as above except one variable, i.e. $K_{jt} * CC$. It is the interaction term of capital flow and capital control. Basically, capital control is the restriction on the amount of assets flow into the country. In this study, we developed an interaction term in order to determine the effects of capital flow on economic growth in the

presence of capital control, and e_t refers to the error term.

Data Source and Estimation Process

The data series of variables used in the study was extracted from *World Bank (World Development Indicators)* excluding capital control, which was taken from *IMF's Annual Report on Exchange Arrangements and Exchange Restriction (2018)* and binary tabulated by Fernández, Klein, Rebucci, Schindler and Uribe (2016). We used annual time series data of 54 countries from the period of 1995-2017. We use the time span till 2017 because there is no data available of capital control after the given time. The selected data set is further comprised of two sub-samples, such as, developed and developing countries. Developed countries entail 20 high-income classified economies, whereas, developing countries entail 34 upper and lower-middle income classified economies (Countries list is attached in Appendix). For estimation, we run the model individually for focused variables using pooled Mean group estimation (PMG). Moreover, the same technique was used in the interaction term model. Prior to that, the homogeneity of the was test by cross-section dependence (CD) test, second-generation Unit root (CIPS test) and latter checked the long-run association between variables using Pedroni Cointegration test.

Empirical Results and Discussion

Cross-Sectional Dependence and CIPS Unit Root Test

Before investigating the stationary property of the data series, we check the cross-section dependence among panel. According to Bhattacharya et al. (2016), cross-sectional dependence exists among countries due to geographical and macroeconomic policies (such as, financial crisis, monetary and fiscal policies, trade policies, the great depression, and others), which may have a spillover effect. Therefore, it is better to measure an appropriate homogeneity among variables. Otherwise, the panel unit root gives biased results. To examine the cross-section dependence, we test Pesaran (2004) CD test. As expected, it is confirmed by the rejection of the null hypothesis that the cross-section dependence exists among the panel. *Table 1* illustrates the statistics of CD test, which shows the rejection of null hypothesis of all the considered variables at the significance level of 1%.

Table 1: Test for cross-sectional dependence & CIPS unit root

Variables	GDP	FDI	ED	REM	EXP	LF	CF	GC	FD
Pesaran CD test	206.18*	78.03*	17.53*	26.60*	144.79	153.09*	125.91*	190.84*	72.75*
*P- value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
The unit root test with cross-sectional dependence									
CIPS (Level)	-1.100	-3.120	-2.010	-1.760	-1.560	-2.060	-1.290	-1.240	-2.120
CIPS (first difference)	-3.14*	-5.13*	-3.66*	-3.37*	-3.26*	-3.49*	-3.45*	-3.43*	-3.58*

*, ** indicates significance level respectively at 1% and 5%.

Source: Authors' estimation.

The presence of cross-section dependence among panel encourages us to test the stationary property of variables by using second-generation unit root test i.e. CIPS, proposed by Pesaran (2007). We used second generation unit root test because the first-generation unit root has some shortcomings. It gives spurious results with slight distortions especially when it is applied on a dataset that contains cross-sectional dependence (Bhattacharya et al., 2016; Alam, Paramati, Shahbaz and Bhattacharya, 2016; others). The results of CIPS unit root test is shown in *table 1*, confirm that the variables are non-stationary at level and stationary at first difference. Hence, we conclude that all the variables are integrated at order one i.e. $I(1)$.

Panel Cointegration

Stationary property of the data series suggests an expected long-run relationship between variables. In order to confirm the association, we perform Pedroni (Engle-Granger based) panel cointegration for both developed and developing countries. A panel cointegration test is essential because it prevents OLS from spurious results mainly when variables are cointegrated (Engle-Granger, 1987). Numerous past studies have also used this approach (instance: Paramati and Alam, 2015; Brahmastreene and Lee; 2013 & others). *Table 2* shows the results of Pedroni cointegration test of each model, respectively and revealed that all the focused and control variables are cointegrated with economic growth at the significance level of 5%.

Table-2: Results of Pedroni ((Engle-Granger based) Panel Cointegration

Estimates	Stats.	Prob.
$GDP = f(LF+K+GC+FD+FDI*CC)$		
Panel v-statistic	-0.934	0.825
Panel rho-statistic	6.120	1.000
Panel PP statistic	-7.253	0.000
Panel ADF statistic	-7.939	0.000
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	9.733	1.000
Group PP statistic	-12.722	0.000
Group ADF statistic	-11.669	0.000
$GDP = f(LF+K+GC+FD+ED*CC)$		
Panel v-statistic	-0.883	0.811
Panel rho-statistic	5.093	1.000
Panel PP statistic	-5.485	0.000
Panel ADF statistic	-6.505	0.000
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	7.649	1.000
Group PP statistic	-12.054	0.000
Group ADF statistic	-9.524	0.000
$GDP = f(LF+K+GC+FD+REM*CC)$		
Panel v-statistic	-0.856	0.804
Panel rho-statistic	6.486	1.000
Panel PP statistic	-8.128	0.000
Panel ADF statistic	-9.307	0.000
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	10.470	1.000
Group PP statistic	-11.701	0.000
Group ADF statistic	-11.427	0.000
$GDP = f(LF+K+GC+FD+EXP*CC)$		
Panel v-statistic	-1.393	0.918
Panel rho-statistic	6.074	1.000
Panel PP statistic	-6.741	0.000
Panel ADF statistic	-7.568	0.000

Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	9.643	1.000
Group PP statistic	-13.210	0.000
Group ADF statistic	-10.069	0.000

The null hypothesis of Pedroni's (1997) panel cointegration procedure is no cointegration
Source: Authors' estimation.

Variables	Model I			Model II			Model III		
	Coef.	t-stats	Prob.	Coef.	t-stats	Prob.	Coef.	t-stats	Prob.
LF	-0.003	-0.040	0.971	0.569	8.410	0.000	-0.004	-0.080	0.935
K	0.290	12.770	0.000	0.035	1.890	0.059	0.182	14.510	0.000
FD	0.566	9.800	0.000	0.012	2.780	0.005	-0.083	-6.410	0.000
GC	-0.166	-6.850	0.000	0.389	12.280	0.000	0.375	16.830	0.000
FDI	0.019	5.670	0.000	-	-	-	-	-	-
ED	-	-	-	-	-	-	-	-	-
REM	-	-	-	0.039	7.710	0.000	-	-	-
EXP	-	-	-	-	-	-	0.083	11.430	0.000

Pooled Mean Group Estimation

We proceed further to estimate the econometric models by using pooled mean group (PMG) estimator. PMG estimator is a useful approach, proposed by Pesaran et al. (1999). It allows heterogeneity in the short-run, while restricting coefficient to be same in the long run across countries. Contrary to the conventional techniques, such as, fixed and random effect models, where all slopes and intercepts are same across panel. PMG provides consistent and efficient results when the panel contains homogeneity. Therefore, for this study, PMG is considered the most appropriate approach. To report PMG estimations, we perform Hausman test under the null hypothesis of PMG results efficiency against MG results efficiency. The statistics of the Hausman test accept the null hypothesis. Thus, we conclude that PMG estimations are consistent and efficient for estimating the studied models.

In this study, we categorized our panel data into two income level regions, i.e. high income and middle-income. Under the middle income, upper middle and lower-middle-income level countries are combined. However, the low-income countries are not selected due to the unavailability of data. *Table 3, 4, 5 and 6* present the long run PMG estimations from high and middle-income countries, respectively.

Table 3 illustrates the long run coefficients of high-income countries, which shows that the flow of foreign direct investment in high-income countries significantly contributes to the economy. Whereas, the finding supports the notion that remittances are an important element of economic growth. It is also evident that exports boost the national output of developed countries.

Hausman test Statistics	H=0.45, p-value=0.998	H=1.13, p-value=0.980	H= 0.50, p-value= 0.997
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Notes: There is only one country of higher income class of external debt, therefore, the external debt model has been removed from the high-income countries.

Source: Authors' estimation.

Table 4 highlights the relationship of capital flow with economic growth in the presence of capital control. The statistics prove that the restriction on foreign direct investment inversely affects the economy. While limited remittances positively contribute to the economic growth. This indicates that money transfer through unfair channels raises corruption, therefore, restricted remittances through proper channels can only increase the national income of the country. Conversely, restrictions on exports negatively affect the economic growth. Exports are considered one of the important determinants of economic growth; specifically in developed countries, exports contribute the largest proportion of the economy.

Table 4: PMG Estimates for Higher Income Countries (Interaction with Capital Control)

GDP	Model I			Model II			Model III		
	Coef.	t-stats	Prob.	Coef.	t-stats	Prob.	Coef.	t-stats	Prob.
LF	-0.267	-2.640	0.008	1.291	6.440	0.000	0.142	2.560	0.010
K	0.315	0	0.000	0.209	7.680	0.000	0.134	27.590	0.000
FD	0.661	0	0.000	0.014	-1.280	0.202	0.162	20.270	0.000
GC	-0.200	-6.910	0.000	0.715	16.290	0.000	0.691	48.630	0.000
FDI*CC	-0.002	-1.250	0.211	-	-	-	-	-	-
ED*CC	-	-	-	-	-	-	-	-	-
REM*CC	-	-	-	0.007	3.590	0.000	-	-	-
EXP*CC	-	-	-	-	-	-	0.007	-5.510	0.000
Hausman Test Statistics	H=1.67, p-value=0.947			H=5.23, p-value=0.514			H=0.50, p-value=0.997		

Notes: There is only one country of higher income class of external debt, therefore, the external debt model has been removed from the high-income countries.

Source: Authors' estimation.

The PMG estimations for middle-income countries are reported in *Table 5* and *6*. In *Table 5*, it is noticed that free flow of foreign investment across borders significantly increases economic growth of the developing countries. It is because foreign direct investment brings technology, expertise, investment and many other productive things, which ultimately benefit the economy. The coefficients of external debt also prove that the increase in external debt will increase the economic progress. External debt plays an important role in the economy, if it is used for the development purpose. The positive and significant findings of exports confirmed that it is an important determinant of economic growth. However, the relationship between growth and remittances turns significantly negative in middle-income regions. It might be due to the reason that remittance-receiving households usually spend the remitted amount on the consumption rather than investments.

	<i>Model I</i>			<i>Model II</i>			<i>Model III</i>			<i>Model IV</i>		
<i>GDP</i>	<i>Coef.</i>	<i>t-stats</i>	<i>Prob.</i>	<i>Coef.</i>	<i>t-stats</i>	<i>Prob.</i>	<i>Coef.</i>	<i>t-stats</i>	<i>Prob.</i>	<i>Coef.</i>	<i>t-stats</i>	<i>Prob.</i>
LF	-0.312	-6.390	0.000	6.063	23.254	0.000	0.012	0.220	0.825	0.294	6.270	0.000
K	0.362	15.640	0.000	0.028	5.991	0.000	0.514	22.600	0.000	0.350	17.490	0.000
FD	-0.051	-3.860	0.000	0.004	3.413	0.000	-0.141	-9.330	0.000	-0.060	-5.780	0.000
GC	0.545	22.660	0.000	-0.098	-6.968	0.000	0.400	12.890	0.000	0.303	12.350	0.000
FDI	0.014	5.500	0.000	-	-	-	-	-	-	-	-	-
ED	-	-	-	0.093	2.799	0.005	-	-	-	-	-	-
REM	-	-	-	-	-	-	-0.006	-2.210	0.027	-	-	-
EXP	-	-	-	-	-	-	-	-	-	0.066	5.720	0.000
<i>Hausman Test Statistics</i>	H=2.25, p-value=0.894			H=3.82, p-value=0.7013			H=2.77, p-value= 0.837			H=1.37, p-value= 0.967		

Table 6 illustrates the results of middle-income countries with the interaction term of capital control. We noted that the imposition of capital control on foreign direct investment inversely affects economic growth in middle-income countries. Whereas, restriction on foreign debt remains positive but insignificant with economic growth. The impact of remittances on economic growth remains the same even after imposing the restriction. However, the influence of limited exports turns negative on economic growth in the developing countries.

Table 6 PMG Estimates for Middle-Income Countries (Interaction with Capital Control)

	<i>Model I</i>			<i>Model II</i>			<i>Model III</i>			<i>Model IV</i>		
<i>GDP</i>	<i>Coef.</i>	<i>t-stats</i>	<i>Prob.</i>	<i>Coef.</i>	<i>t-stats</i>	<i>Prob.</i>	<i>Coef.</i>	<i>t-stats</i>	<i>Prob.</i>	<i>Coef.</i>	<i>t-stats</i>	<i>Prob.</i>
LF	0.328	7.950	0.000	0.065	-1.390	0.164	0.238	6.100	0.000	0.271	6.880	0.000
K	0.378	23.320	0.000	0.522	22.450	0.000	0.396	25.130	0.000	0.389	24.960	0.000
FD	-0.086	-7.860	0.000	0.136	-9.600	0.000	-0.051	-4.570	0.000	-0.063	-5.600	0.000
GC	0.371	13.820	0.000	0.415	15.580	0.000	0.358	13.170	0.000	0.351	13.340	0.000
FDI*CC	-0.003	-2.660	0.008	-	-	-	-	-	-	-	-	-
ED*CC	-	-	-	0.002	1.590	0.112	-	-	-	-	-	-
REM*CC	-	-	-	-	-	-	-0.008	-3.920	0.000	-	-	-
EXP*CC	-	-	-	-	-	-	-	-	-	-0.005	-2.850	0.004
<i>Hausman Test Statistics</i>	H=2.38, p-value= 0.912			H= 3.51, p-value= 0.742			H=0.66, p-value= 0.995			H=0.60, p-value= 0.996		

Source: Authors' estimation.

Heterogeneous Panel Non-Causality Test:

To test the bivariate causality, we used heterogeneous panel non-causality test proposed by Dumitrescu and Hurlin (2012). A simple approach assumes heterogeneous coefficients across all cross-sections. This test requires data series of all the variables to be stationary, we, therefore, use the first and the second difference of the series. The null hypothesis of no causality is tested against the alternate hypothesis of causality among all the cross-sections. If the null hypothesis of homogeneous non-causality is rejected, then we can conclude that a causal relationship exists among the variables.

Table 7: Heterogeneous Non-Causality for higher Income Countries

	W-Stat.	Zbar-Stat.	Prob.	Lag
LFDI does not homogeneously cause LGDP	1.390	0.759	0.001	2
LGDP does not homogeneously cause LFDI	3.524	7.616	0.000	2
LREM does not homogeneously cause LGDP	2.257	3.335	0.001	1
LGDP does not homogeneously cause LREM	3.202	6.194	0.000	1
LEXPS does not homogeneously cause LGDP	3.745	7.836	0.000	1
LGDP does not homogeneously cause LEXPS	2.797	4.969	0.000	1
LFDILCC does not homogeneously cause LGDP	1.584	1.381	0.068	2
LGDP does not homogeneously cause LFDILCC	2.413	4.047	0.000	2
LREMLCC does not homogeneously cause LGDP	1.555	1.214	0.225	1
LGDP does not homogeneously cause LREMLCC	2.639	4.492	0.000	1
LEXPSLCC does not homogeneously cause LGDP	1.625	1.426	0.154	1
LGDP does not homogeneously cause LEXPSLCC	1.830	2.045	0.041	1

Source: Authors' estimation.

The results of the panel non-causality test are reported in *Table 7* and *8* for high and middle-income regions, respectively. The findings of *Table 7* established a bidirectional causal relationship between foreign direct investment, exports, and remittances with the gross domestic product in high-income countries. However, a bidirectional causality is also noticed among foreign investment and GDP in the presence of a capital control. Whereas, a unidirectional causal relationship observed among GDP to controlled remittances and GDP to controlled exports in developed countries. On the other side, *Table 8* illustrates the results of panel non-causality for middle-income countries. We noted that all the variables have a bidirectional relationship with the gross domestic product. Similarly, the restricted capital flows also have a bidirectional causal relationship with GDP in the middle-income level nations.

Table 8: Heterogeneous Non-Causality for Middle-Income Countries

	W-Stat.	Zba0072- Stat.	Prob.	Lag
LFDI does not homogeneously cause LGDP	1.882	2.428	0.015	1
LGDP does not homogeneously cause LFDI	4.293	10.484	0.000	1
LED does not homogeneously cause LGDP	2.465	4.273	0.000	1
LGDP does not homogeneously cause LED	3.299	6.991	0.000	1
LREM does not homogeneously cause LGDP	2.625	4.863	0.000	1
LGDP does not homogeneously cause LREM	3.991	9.373	0.000	1
LEXPS does not homogeneously cause LGDP	1.947	2.621	0.009	1
LGDP does not homogeneously cause LEXPS	4.345	10.544	0.000	1
LFDILCC does not homogeneously cause LGDP	1.699	1.815	0.070	1
LGDP does not homogeneously cause LFDILCC	4.361	10.710	0.000	1
LEDLCC does not homogeneously cause LGDP	2.262	3.612	0.000	1
LGDP does not homogeneously cause LEDLCC	3.236	6.786	0.000	1
LREMLCC does not homogeneously cause LGDP	1.884	2.411	0.016	1
LGDP does not homogeneously cause LREMLCC	4.640	11.518	0.000	1
LEXPSLCC does not homogeneously cause LGDP	1.868	2.360	0.018	1
LGDP does not homogeneously cause LEXPSLCC	5.495	14.345	0.000	1

Source: Authors' estimation.

Conclusion

After the liberalization policies, capital is allowed to flow freely around the globe. But, simultaneously create several problems for the countries. Capital control policies have been introduced by many countries to prevent their economies from disaster. Therefore, in the current

study, we aimed to investigate the effect of capital flow and capital control on economic growth in high and middle-income regions. We selected four types of capital flows that highly contribute to economy, they are FDI, exports, remittances and external debt. Before estimating models, we assessed cross-section dependence, integration property and the long-run relationship of the variables. Empirical results showed that all four components of capital flow have a positive and significant impact on the economic growth. Similarly, the interaction term of remittances, exports and external debt also revealed positive and significant impact on economic growth except for foreign direct investment, which shows a negative effect. That means, the restricted capital flow not only boost the economy but also safeguard it from creating asset bubbles and price boom. However, the restricted flow of direct investment in the country reduces the pace of economic growth. In addition, this study also investigates the positive association of labor force, capital and government consumption with economic growth. Similar to that, financial development also has a positive impact on economic growth. Consequently, these findings confirmed the importance of these determinants in stimulating the economic growth in the selected regions. On the basis of empirical findings, it is suggested that free flow of foreign direct investment benefits the economy. Therefore, policymakers or state should create such desirable environment that attracts direct investment such as well functioned financial markets, etc. According to Alfaro et al. (2004), less developed financial markets and undesirable environment repel foreign direct investment to flow into the country. However, restrictions on foreign direct investment should only impose on the short-term flow, so that economy prevents from distortions. Additionally, the flow of remittances should be encouraged because it reduces poverty and improves the well-being of the society but the flow through illegal channels should be banned or restricted. Furthermore, exports are considered the engine of the economic development, but it sometimes causes problems such depreciate the currency. So policymakers should make certain exports restricted policies that make a balance between imports and exports. Likewise, external assistance in the form of aid or debt resolves the country economic and financial issues, but overwhelming aid creates problems. The extra amount of foreign debt increases the sovereign risk of the country and domestically increases corruption. The state should formulate certain policies that minimize the amount of external debt which can only use for the development purpose. For the future research, more factors of capital flow should include to the study to get more insights about the capital flow and restricted flow impact on the economic growth of specifically selected regions. Moreover, the comparative study could also be conducted on pre and post circumstances of recession using the same variables and time period. More importantly, capital control measures given by IMF is not completely defined the restrictions on fewer factors which changed over the period of time, so alternate measure should be used.

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Appendices

Country	Income Classification	Country	Income classification
Argentina	High Income	Algeria	Upper middle income
Australia	High Income	Bangladesh	Lower middle income
Chile	High Income	Bolivia	Lower middle income
Cyprus	High Income	Brazil	Upper middle income
Czech Republic	High Income	Bulgaria	Upper middle income
Denmark	High Income	Costa Rica	Upper middle income
Guatemala	High Income	Dominican Republic	Upper middle income
Hong Kong	High Income	Ecuador	Upper middle income
Hungary	High Income	Egypt	Lower middle income
Iceland	High Income	El Salvador	Lower middle income
Israel	High Income	India	Lower middle income
Japan	High Income	Indonesia	Lower middle income
Korea	High Income	Kazakhstan	Upper middle income
Poland	High Income	Kenya	Lower middle income
Singapore	High Income	Kyrgyz Republic	Lower middle income
Sweden	High Income	Malaysia	Upper middle income
Switzerland	High Income	Mauritius	Upper middle income
United Kingdom	High Income	Mexico	Upper middle income
United States	High Income	Moldova	Lower middle income
Uruguay	High Income	Morocco	Lower middle income
		Nigeria	Lower middle income
		Pakistan	Lower middle income
		Panama	Upper middle income
		Paraguay	Upper middle income
		Peru	Upper middle income
		Philippines	Lower middle income
		Romania	Upper middle income
		South Africa	Upper middle income
		Sri Lanka	Lower middle income
		Thailand	Upper middle income
		Tunisia	Lower middle income
		Turkey	Upper middle income
		Ukraine	Lower middle income
		Venezuela	Upper middle income

