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Ease of Doing Business: Analysis of Trade Facilitations of One Hundred Twenty-Seven Countries of the World

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ARTICLE DETAILS	ABSTRACT
History <i>Revised format: February 2021</i> <i>Available Online: March 2021</i>	Aim of the study is to evaluate ease of doing business through analysis of trade facilitations by different countries. The scope of the study involves one hundred and twenty-seven countries of the world and uses secondary data taken from World Development Indicators (WDI) 2020. Overall design of study consists of review of literature, data extraction and analysis. This study uses Grey Relational Analysis (GRA) as research methodology. Results show that member countries of OECD performed exceptionally well, whereas, member countries of SADC have exceptionally poor performance on agenda of ease of doing business and trade facilitations. The study is useful for existing and potential business owners/managers, policy makers and researchers. It uses reliable country level original dataset therefore findings of the study are valuable for stakeholders.
Keywords <i>Business, countries, GRA, Pakistan, trade facilitation, ease of business.</i>	
JEL Classification: <i>M0, M1</i>

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1. Introduction

Inter-country trade can be relegated back to the history of hundreds of years. There are numerous explanations of international trade advanced by main stream economists by way of introducing international trade theories viz theory of absolute advantage, theory of comparative advantage and theory of mercantilism, etc. The literature is rich on theoretical explanations of international trade, however, the question of trade facilitation is a relative term investigated from time to time by wide range of researches in a wide variety of contexts. For example: Tang (2020) claimed that increase in level of trade facilitation has significant importance. Ismail (2020) proclaimed that having internet played significant role in trade facilitation; however it raised concerns about internet security and intensity of

use. Martínez-Zarzoso and Rudolf (2020) found that co-ethnic Chinese networks have positive impact on China's bilateral trade including machinery equipment, food sector, transport and raw material. Park and Park (2018) examined that financial investment on Authorized Economic Operator (AEO) certification has positive effect on performance through trade facilitation and public-private partnership. Sakyi et al. (2018) and Shepherd (2016) documented that better trade facilitation results in significant improvement in institutions, infrastructure and market efficiency. However, there is a dearth of a literature concerning comparison and/or ranking of the countries based on multiple variables in general and comprehensive study envisaged on data of whole world or at least envisaged on the countries whose data is conveniently and comprehensively available on websites of international institutions in particular. Trade facilitation is equally beneficial for businessmen and governments to particularly eliminate corruption. It is also beneficial for businesses and countries by way of accessing markets (both international supplier markets and consumer markets). It is also beneficial to support and participate in global value chains. It is call of the day to assess the country level position in terms of trade facilitation qua rivals. Therefore, the problem under investigation here is, assessing the ease of doing business, particularly international trade and country level analysis of trade facilitation which has not been addressed in contemporary literature as such. Objectives of the study include ranking 127 countries on the basis of Grey Relational Grades (GRGs) based on seven different criteria. Further, to classify the countries on the continuum of ordinal scale divided into seven items viz *exceptionally good*, *very good*, *good*, *fair*, *poor*, *very poor* and *exceptionally poor*. For achieving these objective wide varieties of methodologies was considered e.g. ANP, FANP, DEMATEL, AHP, PROMETHEE, TOPSIS, DEA, GRA, VIKOR, SWARA, ISM, TISM, MICMAC, FMICMAC, IPA, ELECTRE, NSGA-II, MADM, MAGDM, ARAS-F, FMEA-Model, ELECTRE-III, COPRAS-G, MULTI-MOORA, ARAS, WASPAS, MOORA, LP, IRP, SEM and Regression. GRA was found to be the most appropriate methodology; therefore, this study uses GRA. Rest of the paper is arranged as literature review, methodology, results & discussions and conclusion.

2. Literature Review

We have searched the literature in research data bases like Emerald, Elsevier (ScienceDirect), Wiley-Blackwell, Springer and Taylor & Francis, etc. using key words 'trade facilitations', 'ease of business', 'international trade', etc. and found plethora of research. Some highly relevant studies are reported here to set the outset of study e.g. the studies on trade facilitation policies of Shenzhen and Hong Kong (Cheng et al. 2018), role of trade facilitation in Central Asia-Azerbaijan and Tajikistan (Felipe & Kumar, 2012), trade facilitation agreement policies in French firms (Fontagné et al., 2020), impact of trade facilitation on trade of developing countries (Indicators, 2013), impact of trade facilitation of South Africa's exports (Jordaan, 2014), cross-border trade and trade facilitation in Sub-Saharan Africa (Lesser & Moisé-Leeman, 2009), prominent role of trade facilitation in Middle-East (Marti et al., 2014), impact of trade facilitation on tourism in Japan (Tang, 2020), Chinese diaspora and trade facilitation in Australia (Tung & Chung, 2010), examine the trade policy of India (Ural Marchand, 2019), trade-facilitated technology across EU countries (Wan et al., 2015), trade facilitation and corruption Egyptian model (Zaki, 2013). Feenstra and Ma (2014) determined positive significant impact of trade between OECD (Organization for Economic Cooperation and Development) & non-OECD member countries and countries without common borders. Gnangnon (2017) analyzed that trade facilitation reforms that have positive impact on tax revenue. Hoekman and Nicita (2010) asserted that less attention on facilitation of trade has adverse impact on trade expansion initiative. Martinez-Zarzoso and Márquez-Ramos (2008) affirmed that initiatives taken in better trade facilitations policies have significant positive impact on increasing trade and building trust among trading partners. Shepherd (2016) asserted that APEC (Asia Pacific Economic Cooperation) has taken constructive initiatives to reduce trading costs, border procedures and customs to facilitate trade across borders. Valensisi et al. (2016) argued that there is negative effect of trade-related costs on trade facilitation and positive significant effect of trade free area on trade facilitation. Dennis & Shepherd (2011); Iwanow & Kirkpatrick (2007) and Wilson et al. (2005) bolstered that trade facilitation reforms is likely to be associated with export expansion. Lot of research, in fact, has surpassed on trade facilitation and export expansion that is reviewed but not being reported here to maintain brevity of the study.

3. Theoretical Framework

Theoretical framework of the study fixes limits of study and underlines approach and methodology including dataset & probable solution to the research problem. In general this study relies on the theoretical foundations of WDI (2020). The variable specification and definitions have also been adopted from WDI (2020). Variables of the study thus have been specified as follows.

Table 1: Description of Variables

Code	Variable of Trade Facilitation	Scale of Measurement	Criteria
1	Logistics performance index	1-5 (worst to best)	Larger is the best
2	Burden of customs procedures	1-7 (worst to best)	Larger is the best
3	Lead Time to Export	No. of Days	Smaller is the best
4	Lead Time to Imports	No. of Days	Smaller is the best
5	Documentary Compliance Cost to Export	US Dollars	Smaller is the best
6	Documentary Compliance Cost to Import	US Dollars	Smaller is the best
7	Quality of port infrastructure	1-7 (worst to best)	Larger is the best

For further strengthening the theoretical foundations, findings of few studies are reported here. Cheng et al. (2018) and Feenstra and Ma (2014) concluded that development of efficient port infrastructure has potential impact on increase in exports. Jordaan (2014); Messerlin & Zarrouk (2000) and Seck (2016) reported that improvement in customs procedures and government regulations lead to gain better importing policy that results in increase in trade flows. Manzoor et al. (2019) identified some major challenges in embarking on regime of trade facilitation e.g. poor infrastructure, prolonged customs procedure, poor trade logistics, high import duties and high tariffs in regional trade. Marti et al. (2014) highlighted the importance of trade facilitation in Middle-East exporters and revealed that logistics index performs well in complex goods transportation. Felipe and Kumar (2012) stated that development of infrastructure; improve logistics and efficient customs policies have great importance for trade facilitation. Lorz (2020) bolstered that cooperation between different trading countries in development of infrastructure can decrease cost of logistics, cost to import, cost to export and facilitate trading. Dennis (2010) and Nguyen Viet (2015) argued that lead time to imports & exports and complexity of documentation are major determinants of levels of trade facilitation. Fontagné et al. (2020) buttressed that automation and simplification of documents have positive impact on large firms' trade.

4. Methodology

It is a quantitative research study following positivism as research philosophy that uses statistical secondary data of population of 127 countries for deducing inference on country level trade facilitation. Methodology entails on literature review, extraction of data and mathematical analysis. The methodology of the study is espoused in grey system theory. Grey system theory consists of five parts: grey prediction, grey relational analysis, grey decision, grey programming and grey control (Ju-Long, 1989; Wei, 2011). We used Grey Relational Analysis (GRA) for evaluating the trade facilitations. Classical procedure of GRA (Hamzaçebi & Pekkaya, 2011; Kuo et al., 2008; Tayyar et al., 2014; Wu, 2002) is applied. GRA has also been amplified with classification of countries (Qazi et al., 2020). The process and symbols used in the study have been adopted from Ertuğrul et al. (2016).

Step 1: Created a dataset and established decision matrix *Eq. (1)*

$$x_i(k) = \begin{bmatrix} x_1(1)x_1(2) & \cdots & x_1(m) \\ \vdots & \ddots & \vdots \\ x_n(1)x_n(2) & \cdots & x_n(m) \end{bmatrix} \quad \text{Eq. (1)}$$

Table 2: Trade Facilitation Data of Countries

Sr.	Country	1	2	3	4	5	6	7
1	Albania	2.66	4	10	14	10	10	4.1

2	Algeria	2.45	3.4	4	5	374.4	399.8	3.4
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
91	Pakistan	2.42	3.7	4	8	118	130	4
92	Panama	3.28	4.5	3	2	60	50	6.2
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
126	Zambia	2.53	3.7	9	6	200	175	2.3
127	Zimbabwe	2.12	2.9	5	10	170	150	3.1

Source of Data: [World Development Indicators (WDI), 2020]

Step 2: Created reference series and comparison matrix Eq. (2)

$$x_0 = [x_0(k) \dots \dots \dots x_0(n)] \quad \text{Eq. (2)}$$

Table 3: Reference Sequence and Comparable Sequences

Sr.	Country	1	2	3	4	5	6	7
0	Reference Sequence	4.2	6.3	1	1	0	0	6.8
1	Albania	2.66	4	10	14	10	10	4.1
2	Algeria	2.45	3.4	4	5	374.4	399.8	3.4
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
91	Pakistan	2.42	3.7	4	8	118	130	4
92	Panama	3.28	4.5	3	2	60	50	6.2
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
126	Zambia	2.53	3.7	9	6	200	175	2.3
127	Zimbabwe	2.12	2.9	5	10	170	150	3.1

Step 3: Created a normalized matrix for larger and smaller acceptable as the case may be Eq. (3) and Eq. (4)

1- For larger the better

$$x_i^*(k) = \frac{x_i^{(0)}(k) - \min x_i^{(0)}(k)}{\max x_i^{(0)}(k) - \min x_i^{(0)}(k)} \quad \text{Eq. (3)}$$

2- For smaller the better

$$x_i(k) = \frac{\max x_i^{(o)}(k) - x_i^{(o)}(k)}{\max x_i^{(o)}(k) - \min x_i^{(o)}(k)} \quad \text{Eq. (4)}$$

Table 4: Normalized Comparable Sequences

Sr.	Country	1	2	3	4	5	6	7
0	Reference Sequence	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1	Albania	0.2837	0.4889	0.5714	0.5806	0.9800	0.9902	0.5000
2	Algeria	0.1860	0.3556	0.8571	0.8710	0.2512	0.6100	0.3704
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
91	Pakistan	0.1721	0.4222	0.8571	0.7742	0.7640	0.8732	0.4815
92	Panama	0.5721	0.6000	0.9048	0.9677	0.8800	0.9512	0.8889
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
126	Zambia	0.223256	0.4222	0.6190	0.8387	0.6000	0.8293	0.1667
127	Zimbabwe	0.032558	0.2444	0.8095	0.7097	0.6600	0.8537	0.3148

For example, calculation of Albania, “logistics performance index” (1), larger is the best.

$$x_1^*(1) = \frac{x_1^0(1) - \min x_1^0(1)}{\max x_1^0(1) - \min x_1^0(1)} = \frac{2.66 - 2.05}{4.20 - 2.05} = 0.2837$$

Step 4: Obtained absolute values by calculating deviation sequence Eq. (5)

$$\Delta_{0i}(k) = |x_0^*(k) - x_i^*(k)| \quad Eq. (5)$$

For biggest deviation Eq. (6)

$$\Delta_{max} = \max_{\forall j \in i} \max_{\forall k} |x_0^*(k) - x_j^*(k)| \quad Eq. (6)$$

For smallest deviation Eq. (7)

$$\Delta_{min} = \min_{\forall j \in i} \min_{\forall k} |x_0^*(k) - x_j^*(k)| \quad Eq. (7)$$

Table 5: Deviation Sequences

Sr.	Country	1	2	3	4	5	6	7
0	Reference Sequence	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	Albania	0.7163	0.5111	0.4286	0.4194	0.0200	0.0098	0.5000
2	Algeria	0.8140	0.6444	0.1429	0.1290	0.7488	0.3900	0.6296
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
91	Pakistan	0.8279	0.5778	0.1429	0.2258	0.2360	0.1268	0.5185
92	Panama	0.4279	0.4000	0.0952	0.0323	0.1200	0.0488	0.1111
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
126	Zambia	0.7767	0.5778	0.3810	0.1613	0.4000	0.1707	0.8333
127	Zimbabwe	0.9674	0.7556	0.1905	0.2903	0.3400	0.1463	0.6852

For example, calculation of deviation of Algeria for “burden of customs procedures” (2)

$$\Delta_{02}(2) = |x_0^*(2) - x_2^*(2)| = |1 - 0.3556| = 0.6444$$

Step 5: Grey relational co-efficient is calculated Eq. (8). Term ξ is distinguishing co-efficient between 0 and 1 the usual value of which is 0.5 in literature.

$$\gamma[x_0^*(k), x_i^*(k)] = \frac{\Delta_{min} + \xi \Delta_{max}}{x_{0i}(k) + \xi \Delta_{max}}, \quad 0 < \gamma[x_0^*(k), x_i^*(k)] \leq 1 \quad Eq. (8)$$

Table 6: Grey Relational Co-efficient

Sr.	Country	1	2	3	4	5	6	7
0	Reference Sequence	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1	Albania	0.4111	0.4945	0.5385	0.5439	0.9615	0.9809	0.5000
2	Algeria	0.3805	0.4369	0.7778	0.7949	0.4004	0.5618	0.4426
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
91	Pakistan	0.3765	0.4639	0.7778	0.6889	0.6793	0.7977	0.4909
92	Panama	0.5388	0.5556	0.8400	0.9394	0.8065	0.9111	0.8182
...		...	...	...	...	...	...	...
...		...	...	...	...	...	...	...
126	Zambia	0.3916	0.4639	0.5676	0.7561	0.5556	0.7455	0.3750
127	Zimbabwe	0.3407	0.3982	0.7241	0.6327	0.5952	0.7736	0.4219

For example, calculation of grey relational of Algeria co-efficient for “burden of customs procedures” (2)

$$\gamma[x_0^*(2), x_2^*(2)] = \frac{\Delta_{min} + \xi \Delta_{max}}{\Delta_2(2) + \xi \Delta_{max}} = \frac{0 + (0.5) \times 1}{0.6444 + (0.5) \times 1} = 0.4369$$

Step 6: Weighted sum of grey relational co-efficient (Grey Relational Grade) Eq. (9) and Eq. (10).

$$\gamma(x_0^*, x_i^*) = \sum_{k=1}^n \beta_k \gamma[x_0^*(k), x_i^*(k)] \quad Eq. (9)$$

$$\sum_{k=1}^n \beta_k = 1 \quad \text{Eq. (10)}$$

Table 7: Grey Relational Grade (GRG)

Sr.	Country	GRG
0	Reference Sequence	1.0000
1	Albania	0.6329
2	Algeria	0.5421
...		...
...		...
91	Pakistan	0.6107
92	Panama	0.7728
...		...
...		...
126	Zambia	0.5507
127	Zimbabwe	0.5552

For example, calculation of GRG for Algeria:

$$\gamma(x_0^*, x_2^*) = \sum_{k=1}^n \beta_k \gamma[x_0^*(2), x_2^*(k)]$$

$$= 0.1429 \times (0.3805 + 0.4369 + 0.7778 + 0.7949 + 0.4004 + 0.5618 + 0.4426) = 0.5421$$

GRA has been amplified with a classification (Niazi et al., 2020) in order to assemblage the results of GRA (i.e. GRG) on a continuum of scale of seven items viz *exceptionally good*, *very good*, *good*, *fair*, *poor*, *very poor* and *exceptionally poor*. This augmentation of methodology facilitates the interpretations and adds value to the understanding of readers.

Table 8: Scheme of Classification

Sr.	Scale	Description
1	Exceptionally Good	Countries having GRG between 0.9411 - 0.8141 are considered having exceptionally good level of trade facilitations.
2	Very Good	Countries having GRG between 0.8097 - 0.7555 are considered having very good level of trade facilitations.
3	Good	Countries having GRG between 0.7508 - 0.7112 are considered having good level of trade facilitations.
4	Fair	Countries having GRG between 0.7106 - 0.6634 are considered having level of fair level of trade facilitations.
5	Poor	Countries having GRG between 0.6620 - 0.6368 are considered having poor level of trade facilitations.
6	Very Poor	Countries having GRG between 0.5934 - 0.5934 are considered having very poor level of trade facilitations.
7	Exceptionally Poor	Countries having GRG between 0.5794 - 0.4166 are considered having exceptionally poor level of trade facilitations.

Readers will find classification significantly helpful in making an informed opinion about trade facilitations by different countries.

5. Results & Discussions

5.1 Results

Inter-country trade and its facilitation have fundamental importance for economic growth and harmonization of political relationship. This study has addressed the problem of putting the countries into an order on the basis of their performance on trade facilitation. It is a study of 127 countries accounting for seven different criteria as proxy to trade facilitation. Aim of the study is to evaluate ease of doing business through analysis of trade facilitations by different countries. Grey relational analysis has been conducted to rank the countries result of which is given as Table 9.

Table 9: Results of GRA of Trade Facilitation

Country	GRGs	Rank	Country	GRGs	Rank	Country	GRGs	Rank
Reference Sequence	1.0000	0	Georgia	0.7395	42	Kyrgyz Republic	0.6391	85
Exceptionally Good			Czech Republic	0.7388	43	Montenegro	0.6379	86
Netherlands	0.9411	1	Bulgaria	0.7348	44	Cambodia	0.6379	87
Singapore	0.9226	2	North Macedonia	0.7347	45	Qatar	0.6376	88
Finland	0.8888	3	South Africa	0.7257	46	Guatemala	0.6376	89
Hong Kong SAR, China	0.8871	4	Brunei Darussalam	0.7203	47	Mozambique	0.6368	90
Belgium	0.8764	5	Dominican Republic	0.7163	48	Very Poor		
Germany	0.8667	6	Ecuador	0.7157	49	Lao PDR	0.6358	91
Sweden	0.8661	7	Serbia	0.7152	50	Albania	0.6329	92
Norway	0.8527	8	Bosnia and Herzegovina	0.7124	51	Mongolia	0.6317	93
United Kingdom	0.8510	9	China	0.7122	52	Iran, Islamic Rep.	0.6304	94
Denmark	0.8492	10	Oman	0.7118	53	Burkina Faso	0.6304	95
Austria	0.8338	11	Turkey	0.7112	54	Sri Lanka	0.6283	96
Estonia	0.8328	12	Fair			Uruguay	0.6263	97
Spain	0.8289	13	Canada	0.7106	55	Senegal	0.6261	98
Luxembourg	0.8278	14	Morocco	0.7073	56	Ukraine	0.6211	99
Iceland	0.8245	15	Philippines	0.7024	57	Kazakhstan	0.6183	100
United States	0.8235	16	Gambia, The	0.7017	58	Kuwait	0.6147	101
France	0.8231	17	India	0.6975	59	Pakistan	0.6107	102
Poland	0.8141	18	Rwanda	0.6957	60	Egypt, Arab Rep.	0.6065	103
Very Good			Mauritius	0.6940	61	Libya	0.5982	104
Switzerland	0.8097	19	Peru	0.6893	62	Myanmar	0.5980	105
Slovenia	0.8095	20	Thailand	0.6865	63	Brazil	0.5956	106
Portugal	0.8090	21	Lebanon	0.6853	64	Nicaragua	0.5936	107
United Arab Emirates	0.8079	22	Jamaica	0.6833	65	Tunisia	0.5934	108
Malta	0.8006	23	Colombia	0.6803	66	Exceptionally Poor		
Japan	0.7984	24	Madagascar	0.6724	67	Tanzania	0.5794	109
Korea, Rep.	0.7928	25	Mexico	0.6672	68	Uganda	0.5766	110
Hungary	0.7897	26	Nepal	0.6666	69	Benin	0.5734	111
Malaysia	0.7798	27	Indonesia	0.6664	70	Bangladesh	0.5701	112
Latvia	0.7795	28	Costa Rica	0.6638	71	Nigeria	0.5640	113
Italy	0.7767	29	Vietnam	0.6634	72	Liberia	0.5573	114
Ireland	0.7759	30	Poor			Zimbabwe	0.5552	115
Panama	0.7728	31	Jordan	0.6620	73	Zambia	0.5507	116
Cyprus	0.7694	32	Bolivia	0.6601	74	Trinidad and Tobago	0.5440	117
Lithuania	0.7675	33	Haiti	0.6527	75	Algeria	0.5421	118
Croatia	0.7659	34	Russian Federation	0.6526	76	Malawi	0.5307	119
Romania	0.7598	35	Namibia	0.6510	77	Cameroon	0.5096	120
Israel	0.7555	36	Cote d'Ivoire	0.6492	78	Tajikistan	0.4755	121
Good			Argentina	0.6424	79	Congo, Dem. Rep.	0.4633	122
Bahrain	0.7508	37	Honduras	0.6423	80	Mauritania	0.4593	123
Australia	0.7498	38	Azerbaijan	0.6406	81	Angola	0.4417	124
Slovak Republic	0.7498	39	Kenya	0.6402	82	Venezuela, RB	0.4399	125
Chile	0.7487	40	Saudi Arabia	0.6402	83	Burundi	0.4331	126
Greece	0.7403	41	Ghana	0.6394	84	Chad	0.4166	127

Result of GRA reveals that Netherlands, Singapore, Finland, Hong Kong SAR, China, Belgium, Germany, Sweden, Norway, United Kingdom, Denmark, Austria, Estonia, Spain, Luxembourg, Iceland, United States, France and Poland have *exceptionally good* level trade facilitations. Most of the countries under this ensign are member countries of Organization for Economic Co-operation and Development (OECD). Switzerland, Slovenia, Portugal, United Arab Emirates, Malta, Japan, Korea, Rep. Hungary, Malaysia, Latvia, Italy, Ireland, Panama, Cyprus, Lithuania.

Croatia, Romania and Israel are *very good*. Most of which are again member countries of OECD.

Bahrain, Australia, Slovak Republic, Chile, Greece, Georgia, Czech Republic, Bulgaria, North Macedonia, South Africa, Brunei Darussalam, Dominican Republic, Ecuador, Serbia, Bosnia and Herzegovina, China, Oman and Turkey are *good*. Canada, Morocco, Philippines, Gambia, India, Rwanda, Mauritius, Peru, Thailand, Lebanon, Jamaica, Colombia, Madagascar, Mexico, Nepal, Indonesia, Costa Rica and Vietnam are *fair*, most of which are member countries of Asia Pacific Economic Cooperation (APEC). Jordan, Bolivia, Haiti, Russian Federation, Namibia, Cote d'Ivoire, Argentina, Honduras, Azerbaijan, Kenya, Saudi Arabia, Ghana Kazakhstan, Kuwait, Pakistan, Egypt, Arab Rep., Libya, Myanmar, Brazil, Nicaragua, and Tunisia *poor* in trade facilitation most of which are member countries of Arabian Countries (AC).. Tanzania, Uganda, Benin, Bangladesh, Nigeria, Liberia, Zimbabwe, Zambia, Trinidad and Tobago, Algeria, Malawi, Cameroon, Tajikistan, Congo, Dem. Rep., Mauritania, Angola, Venezuela, RB Burundi and Chad have *exceptionally poor* trade facilitation according to GRA. Most of these countries are member countries Southern Africa Development Community (SADC).

6. Discussion

Objectives of the study include ranking 127 countries on the basis of Grey Relational Grades (GRGs) based on seven different criteria. This objective has been achieved through GRA and GRA per se is different a type of methodology from contemporary methodologies. Scope of the study is also different and wider than previous literature. Number of variables accommodated within the methodology is also a distinctive feature of the current study. However, the results are synchronized and espoused in the existing literature. A contrast of current study with some of highly relevant studies from literature is represented below to enrich the understanding Table 10.

Table 10: Comparison with Contemporary Studies

Studies	Focus	Variables/Factors	Methodology	Results
Current		Logistics performance index, quality of port infrastructure, burden of customs procedures, lead time to export & imports, documentary compliance cost to export & import	Grey relational analysis	
Fontagné et al. (2020)	Heterogenous effects of trade facilitation measures	time to export into a given market, number of documents needed to be allowed to export into a country	Estimation method	Automation and simplification of <i>documents compliance</i> potentially positive impact on large firms' trade
Cheng et al. (2018)	port-based evaluation framework of trade facilitation policies	Supply chain dimensions, port, trade facilitation policies	Exploratory	efficient port infrastructure has potential impact on increase in exports
Seck (2016)	Trade facilitation and trade participation	Customs, import, export, regulation, finance, equity, share of trading firms in industry, share of foreign firms in industry	Benchmark model (mathematical equation), pair wise correlation	Customs procedures and government regulations lead to gain better importing policy that results in increase in trade flows

7. Conclusion

Object under study is that of fundamental importance for business communities & political governments. It is directed concern with economic growth of countries. Problem under investigation is estimation of rank of different countries from within their counterparts. The scope of the problem includes variety of variables viz Logistics performance index, quality of port infrastructure, burden of customs procedures, lead time to export & imports, documentary compliance cost to export & import. It is an analysis of 127 countries using the secondary data taken from WDI 2020 using GRA as methodology. It also assemblages the countries on a continuum of a scale of seven items viz exceptionally good, very good, good, fair, poor, very poor and exceptionally poor. Results of GRA show

that member countries of Organization for Economic Co-operation and Development (OECD) have *exceptionally good* performance on trade facilitation. Some of member countries of OECD have of *very good*, some have *good* performance on trade facilitation. Member countries of Asia Pacific Economic Cooperation (APEC) have *fair* performance on agenda of trade facilitation. Arabian Countries (AC) have *poor* trade facilitation. Southern Africa Development Community (SADC) have *exceptionally poor* trade facilitation. This study contributes towards the body of knowledge by way of ranking of 127 countries with grey relational grades, new additional information by way of grey relational co-efficients and assemblages giving insights and comments at regional bloc levels. It has profound implications for businesses, political governments, researchers and international community because it provides deeper insights and lot of information and facilitates the comparisons. This study also has few limitations. Firstly, cross sectional study in future studies may be longitudinal using time series/panel data. Secondly, this study uses GRA the hierarchical technique there are other hierarchical techniques as well e.g. RIDIT, AHP, TOPSIS, SWARA, VIKOR, ISM future studies may use these methodologies. Thirdly, we have given equal weight to all variables it may be changed on some other basis say on the basis's expert opinion etc. it is considered that different weights specific to the system can be selected for GRA using the multi criteria decision making methods.

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