Deciphering the Global Private Financial Flows

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ARTICLE DETAILS

ABSTRACT

Cross border and inter country financial recourse is like a civilization hold. It is fundamentally important phenomenon to study. Purpose of this study is to investigate inter country global private financial flows in context of current financial regimes. Design of the study is quantitative based on a secondary data taken from website of World Development Indicators (WDI) 2020. A literature review of relevant studies extracted from renowned research databases is also integral part of the overall design of the study. For the purpose of analysis and investigation the study uses Grey Relational Analysis (GRA). GRA is a mathematical technique capable of handling a multitude of alternatives with plenty of criteria simultaneously. It is a ranking technique that generates the reference series, normalizes the data and compares the weighted average grey coefficients with reference series. GRA is a popular methodology espoused in grey systems theory. It is the study of eighty-three countries on the basis of five different criteria. The countries have been ranked according to Grey relational grades by using rank function of excel and are divided into seven different categories on the basis of intensity of financial flows. The categories have been made on the basis of ordinal scale e.g. exceptionally high level of private global financial flows, excellent, very good, good, fair, poor and very poor. Results show that China, Niger, Brazil, Mozambique, Mongolia, St. Vincent and the Grenadines, Cambodia, Grenada, Thailand, Indonesia, Argentina and Maldives have exceptionally high private financial flows, whereas, countries namely Lesotho, Kazakhstan, Uzbekistan, Botswana, Guatemala, Solomon Islands, Afghanistan, Bolivia, Bhutan, Angola and Russian Federation have poor financial flows. Majorly, Arabian Countries (AC), Organization for Economic Co-operation and Development (OECD) and Union of South American Nations (UNASUR) countries fall under exceptionally high ensign, whereas, member countries of Economic Cooperation Organization (ECO) and Southern Africa Development Community (SADC) countries fall under very poor ensign. This study is useful for political governments, international agencies, researchers and academia.

Keywords
Global, grey relational grade, GRA, Pakistan, private financial flows.

JEL Classification:
M40, M49
Global private financial flows are recognition of a country’s ensuing transparency, accountability, policy credibility, confidence building, regulatory and supervisory arrangements, and stability of economic environment and strength of monetary systems. This stream of financial flows is extremely important for a country and considered as a hallmark of economic development. Private financial flows are appendage to the financial resources of an economy. It is current and hot topic being researched by the management scientists and economists. There is plenty of existing literature in this behalf that accounts for variety of aspects global private financial flows and uses different techniques/methodologies viz: Bazilian et al. (2011) carried a comprehensive research on estimation of power sectors’ macro financial flows of developing countries and provided evidence to improve decision/policy making for energy poverty. Binici et al. (2010) concluded that capital controls have impact on composition and volume of capital flows; particularly, equity and debt controls markedly decreases outflows.

Cova and Natoli (2020) claimed that during global financial crises foreign financial flows were playing a key role. Carnevali et al. (2020) proposed a model to investigate financial flows, ecosystem & society and economy and found that there is significant role of cross-border financial flows in economic growth. Literature is rich on global private financial flows but still there is dearth of country level comparative studies. It is an evergreen research area and there is always a room for further research. The importance, sufficiency, patterns and benefits of global private financial flows for a country can only be understood in contrast with that of its rivals. In view of the above representation the problem of research is construed as need of country level analysis of private financial flows. Objective of this research is to decipher the global private financial flows of eighty three countries. There are numerous methodological options available in literature that have clear based on econometric, statistical and mathematical models. Wide array of methodological options was considered to achieve objective of the study. Grey Relational Analysis (GRA) is opted as a research methodology. GRA is methodology that is espoused in grey systems theory and this methodology is capable of accommodating wide variety of variables pertaining to a multitude of cross-sections. Rest of the paper is arranged into survey of literature, research design & method, results & discussion and concluding remarks.

2. Survey of Literature
In order to set out set of the study a survey of contemporary literature has been conducted by exploring the databases like Wiley-Blackwell, Taylor & Francis, Springer Link, Emerald, Elsevier (Science Direct) and Ebrary. Relevant literature is reported here to espouse the study within the current literature. Anwar and Cooray (2015) buttressed that official development and government spending plans indirectly impact on per capita income; whereas, foreign direct investment and remittances directly impact on income per capita. Bayoumi et al. (2015) proclaimed that extent of capital substantially affect net official flows that impact on current account balances. Cavallaro and Cutrini (2019) analyzed emerging economies’ cross-border bank flows and claimed that global precariousness magnifies demand for institutional quality which suggested emerging economies having feeble institutional settings that are
open to capital retrenchments. Combes et al. (2019) argued that financial flows have substantial direct and indirect effect on economic growth. Dieleman et al. (2016) affirmed that HIV/AIDS, tuberculosis, DAH and Malaria have significant effect on health systems of low income countries that envisages coordination and cooperation in terms of international financial flows for health. Glomsrød and Wei (2018) stated that green financing has gained reasonable importance that reflects higher GDP, decreases coal consumption, shifting capital owners’ income to wage earners and increase in non-fossil electricity consumption. Guthrie et al (2015) claimed that it is call of the day to enhance track immunization financial flows to improve performance, accountability and sustainability. Hobza and Zeugner (2014) emphasized that financial inter-linkages play a pertinent role in bilateral financial flows stocks and data transmission. Lim and Mohapatra (2016) buttressed that heterogeneity across different types of financial flows and portfolio flows (particularly bond) tend to be more subtle than foreign direct investment to quantitative easing. Obstfeld (2012) highlighted that global current account imbalances impact on financial flows which imitates in macroeconomics. Young and Tackett (2018) stated that there is a negative relationship between economic flows and labor relations; and a positive relationship between social globalization and labor relations. These studies have used wide range different datasets and different methodologies to reach to these conclusions but a study addressing directly the issue in hand could not be found. Theoretical foundations of this study can be supported from the framework of World Bank.

3. Theoretical Foundations
This study is theoretically espoused in the framework of World Development Indicators (WDI), 2020. The variables used to evaluate the global private financial flow have been adopted from WDI (2020). There are five variables used in this study to viz: 1) equity flows in form of foreign direct investment (net inflows in million US Dollars) having ‘larger is the best characteristic’, 2) equity flows in form of foreign direct investment (net inflows in % of GDP) having ‘larger is the best characteristic’, 3) equity flows in form of portfolio (equity in million US Dollars) having ‘larger is the best characteristic’, 4) debt flows in form of bonds (in million US Dollars) having ‘larger is the best characteristic’ and 5) debt flows in form of commercial bank and other lending (in million US Dollars) having ‘larger is the best characteristic’.

4. Research Design and Method
It is a quantitative research study that follows deductive approach. Design of the research study includes survey of literature, secondary data extraction and mathematical analysis. Method used in this research is Grey Relational Analysis (GRA). The country level data has been obtained from World Development Indicators (WDI), 2020. Population under study is eighty three countries. Unit of analysis is country and economic bloc. GRA is a unique mathematical method from within the multitude of multi-criteria-decision-making techniques. It has privileges over statistical techniques (Hamzaçebi & Pekkaya, 2011; Kuo et al., 2008; Tayyar et al., 2014; Wu, 2002; Zhang et al., 2011). Analysis under this method progresses stepwise. The stepwise procedure, formulas, notations have been adopted from Qazi et al., (2020) and (Ertuğrul, et al. 2016).

Step 1: Created a data set and established decision matrix (1).

\[ x_i(k) = \begin{bmatrix} x_1(1) & x_1(2) & \cdots & x_1(m) \\ \vdots & \vdots & & \vdots \\ x_n(1) & x_n(2) & \cdots & x_n(m) \end{bmatrix} \] (1)

| Sr. | Country | 1     | 2     | 3     | 4     | 5     |
|-----|---------|-------|-------|-------|-------|-------|
| 1   | Afghanistan | 119   | 0.6   | 0     | 0     | -5    |
| 2   | Albania  | 1,204 | 8     | -3    | 340   | -130  |
|     |          |       |       |       |       |       |
|     |          |       |       |       |       |       |

Table 1: Original Dataset of Global Private Financial Flows
Step 2: Generated reference series and comparison matrix (2)

\[ x_0 = [x_0(k) \ldots x_0(n)] \]  \hspace{1cm} (2)

Table 2: Reference and Comparable Sequences

| Sr. | Country | 1   | 2   | 3   | 4   | 5   |
|-----|---------|-----|-----|-----|-----|-----|
| 0   | Reference Sequence | 203492 | 21.5 | 60668 | 68614 | 29749 |
| 1   | Afghanistan | 119 | 0.6 | 0 | 0 | -5 |
| 2   | Albania | 1,204 | 8 | -3 | 340 | -130 |
| ... | ......... | ... | ... | ... | ... | ... |
| 58  | Pakistan | 2,354 | 0.7 | -528 | 0 | 1,596 |
| 59  | Peru | 6,488 | 2.9 | -442 | -1,077 | 455 |
| ... | ......... | ... | ... | ... | ... | ... |
| 82  | Uzbekistan | 625 | 1.2 | 13 | 0 | -51 |
| 83  | Zambia | 408 | 1.5 | -5 | 0 | 1,495 |

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

Step 3: Normalized the matrix for larger the better (3).

\[ x^*_t(k) = \frac{x_t^{(0)}(k) - \min x_t^{(0)}(k)}{\max x_t^{(0)}(k) - \min x_t^{(0)}(k)} \]  \hspace{1cm} (3)

Table 3: Normalized Matrix

| Sr. | Country | 1    | 2    | 3    | 4    | 5    |
|-----|---------|------|------|------|------|------|
| 0   | Reference Sequence | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1   | Afghanistan | 0.0280 | 0.2230 | 0.1048 | 0.1093 | 0.6521 |
| 2   | Albania | 0.0332 | 0.4981 | 0.1047 | 0.1137 | 0.6506 |
| ... | ......... | ... | ... | ... | ... | ... |
| 58  | Pakistan | 0.0386 | 0.2268 | 0.0970 | 0.1093 | 0.6708 |
| 59  | Peru | 0.0584 | 0.3086 | 0.0983 | 0.0953 | 0.6574 |
| ... | ......... | ... | ... | ... | ... | ... |
| 82  | Uzbekistan | 0.0304 | 0.2454 | 0.1050 | 0.1093 | 0.6515 |
| 83  | Zambia | 0.0293 | 0.2565 | 0.1047 | 0.1093 | 0.6696 |

Step 4: Computed deviation sequence (4), (5) and (6)

\[ \Delta_{0i}(k) = |x_0^{(i)}(k) - x^*_t(k)| \]  \hspace{1cm} (4)

For biggest deviation:

\[ \Delta_{\text{max}} = \max_{\forall j \in I} \max_{\forall k} |x_0^{(i)}(k) - x^*_j(k)| \]  \hspace{1cm} (5)

For smallest deviation:

\[ \Delta_{\text{min}} = \min_{\forall j \in I} \min_{\forall k} |x_0^{(i)}(k) - x^*_j(k)| \]  \hspace{1cm} (6)

Table 4: Deviation Sequences

| Sr. | Country | 1    | 2    | 3    | 4    | 5    |
|-----|---------|------|------|------|------|------|
Step 5: Computed grey relational co-efficient (7) using 0.5 ($\xi$) as distinguishing co-efficient between 0 and 1.

$$\gamma[x_0^*(k), x_i^*(k)] = \frac{\Delta_{\text{min}} + \xi \Delta_{\text{max}}}{\Delta_{\text{max}}}, \quad 0 < \gamma[x_0^*(k), x_i^*(k)] \leq 1$$  \hspace{1cm} (7)

Table 5: Grey Relational Co-efficient

| Sr. | Country     | 1    | 2    | 3    | 4    | 5    |
|-----|-------------|------|------|------|------|------|
| 0   | Reference Sequence | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1   | Afghanistan | 0.3397 | 0.3916 | 0.3584 | 0.3595 | 0.5897 |
| 2   | Albania     | 0.3409 | 0.4991 | 0.3584 | 0.3607 | 0.5886 |
| ... |            | ...   | ...   | ...   | ...   | ...   |
| 58  | Pakistan    | 0.3421 | 0.3927 | 0.3564 | 0.3595 | 0.6030 |
| 59  | Peru        | 0.3468 | 0.4197 | 0.3567 | 0.3559 | 0.5934 |
| ... |            | ...   | ...   | ...   | ...   | ...   |
| 82  | Uzbekistan  | 0.3402 | 0.3985 | 0.3584 | 0.3595 | 0.5893 |
| 83  | Zambia      | 0.3400 | 0.4021 | 0.3583 | 0.3595 | 0.6021 |

Step 6: Computed weighted sum of grey relational co-efficient i.e. Grey Relational Grade (8) and (9). Equal weight has been used for variables i.e. 1 divided by number of variables.

$$\gamma(x_0^*, x_i^*) = \sum_{k=1}^{n} \beta_k \gamma [x_0^*(k), x_i^*(k)]$$  \hspace{1cm} (8)

$$\sum_{k=1}^{n} \beta_k = 1$$  \hspace{1cm} (9)

Table 6: Grey Relational Grades (GRG)

| Sr. | Country     | GRG   |
|-----|-------------|-------|
| 0   | Reference Sequence | 1.0000 |
| 1   | Afghanistan | 0.4078 |
| 2   | Albania     | 0.4295 |
| ... |            | ...   |
| 58  | Pakistan    | 0.4107 |
| 59  | Peru        | 0.4145 |
| ... |            | ...   |
| 82  | Uzbekistan  | 0.4092 |
| 83  | Zambia      | 0.4124 |

5. Results and Discussion

Results of GRA are presented in Table 7. Results of GRA are clustered into groups against ensigns to make the results GRA more meaningful, understandable, interpretable and comparable. The scheme of ensigns entails as: Exceptionally High (countries having grey relational grade ranging from 0.4379 to 0.8017 are considered as countries having exceptionally high private financial inflows), Excellent (countries having grey relational grade ranging from 0.4211 to 0.4333 are considered having excellent
private financial inflows). *Very Good* (countries having grey relational grade ranging from 0.4156 to 0.4208 are considered as having very good private financial inflows), *Good* (countries having grey relational grade ranging from 0.4135 to 0.4151 are considered having good private financial inflows). *Fair* (countries having grey relational grade ranging from 0.4120 to 0.4133 are considered reasonable private financial inflows), *Poor* (countries having grey relational grade ranging from 0.4105 to 0.4117 are considered poor private financial inflows) and *Very Poor* (countries having grey relational grade ranging from 0.3522 to 0.4096 are considered as countries having very poor private financial inflows).

China, Niger, Brazil, Mozambique, Mongolia, St. Vincent, Grenadines, Cambodia, Grenada, Thailand, Indonesia, Argentina and Maldives are the countries having exceptionally high GRG ranks. India, Montenegro, Serbia, Lebanon, Albania, Lao PDR, Egypt, Arab Representative, Mexico, Georgia, Colombia, Belize, and Sao Tome and Principe have excellent GRG ranks. But the range of countries having very Good rank is: Jamaica, Cabo Verde, Costa Rica, North Macedonia, Uganda, Madagascar, Dominican Republic, Philippines, Belarus, Kosovo, Morocco and Romania. Likewise, countries having good GRG & rank are Azerbaijan, South Africa, Senegal, Burkina Faso, Rwanda, Peru, Tonga, Nigeria, Guinea, Ecuador, Ukraine and Tajikistan. The fair rank category includes countries such as Jordan, Congo, Dem, Rep, Bosna and Herzegovina, Moldova, Mali, Mauritius, Tunisia, Benin, Zambia, Bulgaria, Dominica and Bangladesh. Correspondingly, poor rank includes countries such as Armenia, St. Lucia, Cameroon, Samoa, Timor-Leste, Myanmar, Tanzania, Pakistan, Sri Lanka, El Salvador, Turkey and Kyrgyz Republic and very poor rank includes countries like Lesotho, Kazakhstan, 238

| Table 7: Results of Grey Relational Analysis |
|---------------------------------------------|
| **Country**                                      | **GRG** | **Rank** |
| Reference Sequence                             | 1.0000  | 0        |
| **Exceptional**                                |         |          |
| China                                          | 0.8017  | 1        |
| Niger                                           | 0.5299  | 2        |
| Brazil                                         | 0.5207  | 3        |
| Mozambique                                     | 0.4929  | 4        |
| Mongolia                                       | 0.4653  | 5        |
| St. Vincent and the Grenadines                 | 0.4554  | 6        |
| Cambodia                                       | 0.4548  | 7        |
| Grenada                                        | 0.4520  | 8        |
| Thailand                                       | 0.4478  | 9        |
| Indonesia                                     | 0.4477  | 10       |
| Argentina                                     | 0.4472  | 11       |
| Maldives                                       | 0.4379  | 12       |
| **Excellent**                                  |         |          |
| India                                          | 0.4333  | 13       |
| Montenegro                                     | 0.4328  | 14       |
| Serbia                                         | 0.4310  | 15       |
| Lebanon                                        | 0.4300  | 16       |
| Albania                                        | 0.4295  | 17       |
| Lao PDR                                        | 0.4279  | 18       |
| Egypt, Arab Rep.                               | 0.4271  | 19       |
| Mexico                                         | 0.4269  | 20       |
| Georgia                                        | 0.4261  | 21       |
| Colombia                                       | 0.4241  | 22       |
| Belize                                        | 0.4237  | 23       |
| Sao Tome and Principe                          | 0.4211  | 24       |
| **Very Good**                                  |         |          |
| Jamaica                                        | 0.4208  | 25       |
| Cabo Verde                                    | 0.4208  | 26       |
| **Country**                                    | **GRG** | **Rank** |
| Costa Rica                                     | 0.4203  | 27       |
| North Macedonia                                | 0.4198  | 28       |
| Uganda                                         | 0.4190  | 29       |
| Madagascar                                     | 0.4178  | 30       |
| Dominican Republic                             | 0.4172  | 31       |
| Philippines                                    | 0.4171  | 32       |
| Belarus                                        | 0.4167  | 33       |
| Kosovo                                         | 0.4164  | 34       |
| Morocco                                        | 0.4158  | 35       |
| Romania                                        | 0.4156  | 36       |
| Azerbaijan                                     | 0.4151  | 37       |
| South Africa                                   | 0.4149  | 38       |
| Senegal                                        | 0.4149  | 39       |
| Burkina Faso                                   | 0.4148  | 40       |
| Rwanda                                         | 0.4146  | 41       |
| Peru                                           | 0.4145  | 42       |
| Tonga                                          | 0.4144  | 43       |
| Nigeria                                        | 0.4143  | 44       |
| Guinea                                         | 0.4142  | 45       |
| Ecuador                                        | 0.4141  | 46       |
| Ukraine                                        | 0.4137  | 47       |
| Tajikistan                                     | 0.4135  | 48       |
| Jordan                                         | 0.4133  | 49       |
| Congo, Dem. Rep.                               | 0.4131  | 50       |
| Bosnia and Herzegovina                         | 0.4131  | 51       |
| Moldova                                        | 0.4131  | 52       |
| Mali                                           | 0.4129  | 53       |
| Mauritius                                      | 0.4128  | 54       |
| Tunisia                                        | 0.4126  | 55       |
| Benin                                          | 0.4124  | 56       |
| Zambia                                         | 0.4124  | 57       |
| Bulgaria                                       | 0.4121  | 58       |
| Dominica                                       | 0.4121  | 59       |
| Belize, Kosovo, Morocco, Romania                | 0.4120  | 60       |
| Armenia                                       | 0.4117  | 61       |
| St. Lucia                                      | 0.4113  | 62       |
| Cameroon                                       | 0.4112  | 63       |
| Samoa                                         | 0.4111  | 64       |
| Timor-Leste                                    | 0.4108  | 65       |
| Myanmar                                        | 0.4108  | 66       |
| Tanzania                                       | 0.4108  | 67       |
| Pakistan                                       | 0.4107  | 68       |
| Sri Lanka                                      | 0.4106  | 69       |
| El Salvador                                    | 0.4105  | 70       |
| Turkey                                         | 0.4105  | 71       |
| Kyrgyz Republic                               | 0.4105  | 72       |
| Lesotho                                        | 0.4096  | 73       |
| Kazakhstan                                     | 0.4096  | 74       |
| Uzbekistan                                     | 0.4092  | 75       |
| Botswana                                       | 0.4091  | 76       |
| Guatemala                                      | 0.4087  | 77       |
| Solomon Islands                                | 0.4084  | 78       |
| Afghanistan                                    | 0.4078  | 79       |
| Bolivia                                        | 0.4076  | 80       |
| Bhutan                                         | 0.4066  | 81       |
| Angola                                         | 0.3964  | 82       |
| Russian Federation                             | 0.3522  | 83       |
Uzbekistan, Botswana, Guatemala, Solomon Islands, Afghanistan, Bolivia, Bhutan, Angola and Russian Federation. Majorly, Arabian Countries (AC), Organization for Economic Co-operation and Development (OECD) and Union of South American Nations (UNASUR) countries fall under exceptionally high ensign, whereas, member countries of Economic Cooperation Organization (ECO) and Southern Africa Development Community (SADC) countries fall under very poor ensign.

6. Concluding Remarks

Global private financial flows are a vital phenomenon to be investigated at country levels. It has fundamental importance for a country to stabilize its economy. This study, therefore, has opted to investigate the subject phenomenon. It uses quantitative deductive approach and applies GRA on a country level secondary data. The data has obtained from WDI 2020 and countries having included in investigation on the basis of availability of data. Findings of the study show that China, Niger, Brazil, Mozambique, Mongolia, St. Vincent, Grenadines, Cambodia, Grenada, Thailand, Indonesia, Argentina and Maldives are the countries having exceptionally high GRG and rank. Whereas Lesotho, Kazakhstan, Uzbekistan, Botswana, Guatemala, Solomon Islands, Afghanistan, Bolivia, Bhutan, Angola and Russian Federation are the countries having very low GRG & rank consequently have very poor private financial flows. The other countries fall within the bracket of exceptionally high and very poor. If we talk of bloc level results, it can be observed that majorly Arabian Countries (AC), Organization for Economic Co-operation and Development (OECD) and Union of South American Nations (UNASUR) countries fall under exceptionally high ensign, whereas, member countries of Economic Cooperation Organization (ECO) and Southern Africa Development Community (SADC) countries fall under very poor ensign. This study contributes into the literature grey relational co-efficient, grey relational grades, country level and bloc level discussion. This study has theoretical and practical implications for political governments, researchers and international institutions. This study also has certain limitations i.e. it is secondary database study and data has been elicited from WDI 2020 therefore, the results can be generalized accordingly and it is recommended that future researchers should build their studies on different datasets. There are other ranking techniques available in literature we have used GRA therefore it is suggested to use some methodology to validate the results. Scheme of equal weights to evaluate the variables compositely has been employed this combination can also be rationalized on the basis of some other method like Entropy, AHP etc.

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