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How does the sectoral composition of FDI induce economic growth in developing countries? The key role of business regulations

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ABSTRACT

The prior empirical outcomes on the FDI-growth relationship are vastly conflicting. The key possible reason for these conflicting findings is the use of aggregate FDI, while FDI impacts largely depend on the receiving sectors of the host country. This study empirically estimated the influence of sectoral FDI on the economic growth and the role of business regulations in influencing the FDI-growth connection of 85 developing countries, for the time 1996–2019 and applied 2SLS method. The outcomes indicate the significant contribution of sectoral FDI inflows to economic growth. In contrast, the interaction of regulations with sectoral FDI negatively impacted host countries' economic growth. Furthermore, in low income countries, only agriculture and industry FDI have growth promoting effect, while manufacturing and services FDI are insignificant. Similarly, FDI inflows to all sectors positively affect middle income countries' economic growth except services FDI. However, FDI inflows to all sectors enhance high income countries economic growth. The regulations' interaction with all types of FDI adversely affects the economic growth across all income groups, except agriculture and services FDI in the case of low and high income countries, which are found insignificant. The outcomes are consistent by employing diverse econometric techniques and model specifications.

1. Introduction

Over the previous three decades foreign direct investment (FDI) considered to be an essential factor in facilitating growth, and economic transformation in developing as well as in developed economies. FDI has turned into a substantial source of outer finance for the less-developed economies around the world, more importantly (Wu

et al., 2022). FDI is considered the essential vehicle for technological transfer from advanced to less-developed economies, stimulates domestic investment, and facilitates host countries' human capital stock and institutions (Ibrahim & Acquah, 2021). Alongside capital enlargement, overseas firms in a country are supposed to create spillovers through technology and knowledge transfer, improving total productivity and economic growth (de Mello, 1997).

A huge amount of empirical literature emphasizes the important and positive role of inward FDI in stimulating economic growth (Ahmad et al., 2018; Qureshi et al., 2021). This positive relationship is linked with the influence of inward FDI in capital formation, which is often associated with the development of international business networks, transfer of knowledge and technology diffusion. It might also stem from surges in competition brought by foreign affiliation of Multinational Enterprises (MNE's) by inducing domestic firms to introduce new technologies and innovate (Dada & Abanikanda, 2021). These predictions have motivated governments of several countries to implement FDI promoting policies (e.g., subsidies, tax breaks) and to develop better economic environments for foreign investors (e.g., development in infrastructure, liberalization of the business atmosphere) over the previous few years. As emerging and developing countries are on track to economically catch up with advanced economies, FDI is often considered one of the core instruments to attain this objective (Ibrahim & Acquah, 2021; Lacroix et al., 2021).

The FDI inflows to developing economies are a very significant and crucial factor in enhancing their economic growth. Most developing economies have a shortage of capital and an increased aggregate demand of goods and services because of their large share of the global population. Although on the one side, the developing countries are facing a capital shortage, on the other side, developing countries are providing incentives for MNE's around the world for their potential investment due to the large consumer market, cheap labor resources and raw materials, that is raising the intentions of overseas investors to increase investment. Even though FDI inflows signify an important sum for several developing economies, many of them are recorded with a higher amount of FDI inflow than their economy's size, which dominates the many developed economies. Furthermore, the inflow of FDI to developing countries comprehensively supports the development process, further stressing the utilization of FDI inflows as a tool for economic growth (Hayat, 2019). The regions of Asia, Latin America & Caribbean (LAC), and Sub-Saharan Africa (SSA) are top FDI recipient developing regions agreeing to the World Investment Report 2020, and the rationale for sample selection of our study.

So far, growth effects from FDI inflows continue to be evident in growth models than in the empirical literature. Although, large empirical research is directed to examine the effect of FDI inflows on the host country's economic growth, however outcomes are still conflicting, and there is room for further research to exactly identify nexus among the FDI and economic growth. To quote few examples, Ahmad et al. (2018) stated that FDI inflow seems to boost economic growth in ASEAN developing countries; however, Borensztein et al. (1998) found that inflow of FDI contributes negatively to the economic growth in countries having a low level of human capital particularly. Similarly, Qureshi et al. (2021) explained that FDI does not have

an unconditional impact, a positive effect of FDI on economic growth is dependent on the control of corruption. Bye and Faehn (2022) identified that FDI does not affect economic growth, even when certain countries' economic, institutional, policy or financial characteristics are controlled. Similarly, Durham (2004) explained that FDI does not have unmitigated, direct positive impacts on economic growth, his empirical findings provide confirmation of only a fragile association. In a metadata study, Iamsiraroj and Ulubaşoğlu (2015) found that only 43% of empirical studies concluded a growth promoting effect of FDI, while 17% of studies revealed an adverse, and 40% revealed that FDI inflow is an insignificant factor that effect economic growth of a host country. This leads to an interesting question that why there is so much diversity exists in FDI-growth nexus in the empirical research?

The first possible cause for this conflicting empirical association among FDI inflows and economic growth can be using aggregated data on FDI inflows. In contrast, the growth impacts of FDI are expected to depend upon the sectors which receive FDI. This is because the potential for spillover impacts, technological transmission, and linkages between overseas and local firms vary across different sectors, as Alfaro (2003) argued. Consequently, FDI host sectors are likely to be different in prospective of FDI-influenced production and growth (Chakraborty & Nunnenkamp, 2008). Secondly, the spillover influence could only be effective if certain economic factors in the host economy are present or work effectively. Therefore, FDI can only influence economic growth if the host country has adequate absorptive potential. Regarding developing economies, research on the FDI-growth connection has revealed the presence of several critical conditions to have an influence of FDI on economic growth, such as international trade, human resources, financial soundness, institutions quality and market efficiency in the host country (Bailey, 2018; Dinh Su & Phuc Nguyen, 2022; Hayat, 2019; Ullah et al., 2022; Wang & Kafouros, 2020). These factors highlight the critical role in allowing FDI to respond to economic growth through spillovers, and the variations in conditional factors can have a crucial influence on FDI inflows and, as well as on the FDI-growth connection in a host country.

Against this background, the current study aims to fill these gaps by empirically examining the growth impacts of sectoral FDI and the role of host country's business regulations in moderating the effect of sectoral FDI on the economic growth of developing countries. The study contributes to the prevailing empirical literature on the FDI-growth relationship in two ways. First, we undertook the sectoral level FDI inflows to impact the aggregate economic growth of host countries. As the influence of sectoral FDI inflows on economic growth has not been analyzed empirically enough, most of the previous studies are sector or country specified. Secondly, we included the business regulations of FDI recipient country as a conditional variable to influence the FDI-growth nexus. We did not find any empirical study on the role of host county regulations in sectoral FDI inflows in the economic growth nexus. In addition, we further contribute to the literature by investigating the sectoral FDI and economic growth nexus and the mediating role of regulations in sectoral FDI-growth association for the sample countries classified on their income level, i.e., 'low income countries (LIC's)', 'middle income countries (MICS's)' and 'high income countries (HIC's)'. Studies on the growth effects of sectoral FDI inflows for countries with different income levels were also missing in

the empirical literature. Thus, the present study is a crucial step to filling these gaps and estimated a large dataset of 85 developing countries from three developing regions, Asia, LAC and SSA for the period of 1996 to 2019.

The study employed the Two-stage (2SLS) instrumental variable technique to estimate the empirical model of the study considering the problem of endogeneity. The findings of this study are robust by applying different model specifications, estimation techniques, and alternative variables. The remaining structure of the paper follows; section 2 is about empirical literature; section 3 is about model specification, description of data, and estimation methods; next section 4 is about the analysis of empirical outcomes, and at the end, section 5 concludes the whole study and provide some policy suggestions.

2. Empirical evidence

2.1. FDI and economic growth nexus

Theoretically, the inflows of FDI are considered to have enhancing effect on the aggregate growth of a host country, but empirical research provides conflicting results. Several empirical studies cited FDI inflows as a promoter of economic growth (Ahmed, 2018; Ibrahim & Acquah, 2021; Rao et al., 2020). Similarly, some researchers (Golitsis et al., 2018; Jilenga et al., 2016; Musibah et al., 2015) have found the negative effects of FDI inflow on the economic growth of recipient countries. At the same time, some studies argue that FDI inflows have an insignificant role in affecting the economic growth of a country (Alvarado et al., 2017; Carkovic & Levine, 2005; Zhang et al., 2014).

The likely interpretation for the contradictory empirical results on the FDI-growth nexus is the use of total FDI inflows, as discussed in the studies of Alfaro and Charlton (2013), and Nunnenkamp and Spatz (2004). The majority of empirical examine aggregate FDI inflows, although the growth impacts of FDI are expected to vary depending on the sector receiving FDI. For instance, FDI-related know-how and technology transfers, and the introduction of new methods occur largely in manufacturing sector than other sectors of the country (Chakraborty & Nunnenkamp, 2008). Possible foreign investment growth impacts are likely to vary among primary, secondary, and territory sectors (Wang, 2009).

Alfaro (2003) explained that foreign technological and know-how transfers, and newly product take place largely in the manufacturing. Thus, manufacturing-FDI is more significant in promoting economic growth. Manufacturing-FDI mostly transmits 'hard technology,' such as equipment and industrial activities, that is expected to enhance aggregate productivity by generating positive externalities (Doytch & Uctum, 2011). Chakraborty and Nunnenkamp (2008) explored the growth effect of services-FDI and explained, compared with the manufacturing sector, prospective for spillover and linkages among local and overseas firms are restricted in services sector because of the limited scope for distributing production into different stages. However, Aykut and Sayek (2007) explained that if services sector FDI mends the services quality in a country, it is anticipated to affect positively to productivity level of all other linked sectors in that country. There are very limited empirical studies focused on analyzing

the growth impacts of agriculture-FDI, which are also unclear. For example, Hallam (2011) argued that positive impacts of agriculture-FDI depend on several factors, including the agricultural commodity type, and institutional and regulatory structures. If agricultural-FDI projects are enclave-like, spillover and multiplier effects are unlikely to happen. Similarly, Alfaro (2003) explained that in the agriculture sector, the possibilities for spillover potential and linkages between native and foreign firms are very limited compared to manufacturing or industrial sector, which tends to minimize the scope of agricultural-FDI impacts on the economic growth.

In short, limited empirical research is available on the growth impacts of sectoral FDI inflows. Additionally, most of the studies are sector specified or country specified or have a limited panel group. For example, Alfaro (2003) for 47 economies, Wang (2009) estimated manufacturing-FDI for the economic growth of Asian economies, Aykut and Sayek (2007) used cross-country. Doytch and Uctum (2011) examined the growth impacts of manufacturing and services FDI, Chakraborty and Nunnenkamp (2008) estimated growth impacts of manufacturing-FDI for Indian economy. Massoud (2008) estimated growth impacts of agriculture-FDI for Egypt, Nunnenkamp and Spatz (2004) estimated growth effect of industrial-FDI, and Hallam (2011) estimated for agriculture sector impacts. None of the abovementioned studies have estimated the growth impacts of FDI in all sectors of the economy and for a large panel of countries. Thus, there is a gap in empirical literature to find out the growth impacts of FDI by including all sectors and the large panel.

2.2. How does host country's regulations influence the FDI-growth nexus?

The numerous empirical studies also explained that influence of FDI inflows on the economic growth is significant only, if there exist some certain level of absorptive capabilities in term of financial development, human resources, institutional quality, trade openness, market size and so on, in the host country (Alfaro et al., 2010; Belloumi & Alshehry, 2018; Dinh Su & Phuc Nguyen, 2022; Gaur et al., 2019; Hayat, 2019; Lacroix et al., 2021). Similarly, many empirical studies explained the significance of business regulations in a country for the inflow of FDI, as the efficiency of these regulations seen to be an attracting factor for MNE's investment choice which ultimately affect the aggregate economic growth of the host country (Cebula et al., 2016; Choi et al., 2016; Contractor et al., 2020; Jandhyala, 2013).

Regarding the empirical studies on the significance of regulations, Contractor et al. (2020) explained that some of the countries have more rapid measures of policy change, overall making them business-friendly towards the Multinational companies as well to the other countries to attract higher amount of FDI and to enhance economic growth. Tamazian et al. (2009) explained that if the government has rigid policies, marked with lower incentives, higher regulations and restrictions, it not only hinders the FDI inflows but also the economic growth of a host country. Hence, the role of regulations in attracting and enhancing capital inflows from foreign investors is vital in relation to the impact it might have on economic prospective of a country.

As per World Bank statistics, it needs approximately 52.3 days to initiate a new business in the case of India, whereas it requires hardly 5.7 days only to begin an

equivalent business in the United States. The regulations regarding starting a business like this might substantially raise the cost of entrance which leads to reduce the investment from MNE's. Santangelo and Meyer (2011) stated due to complicated regulations the cost of establishing a new business in developing countries is considerably higher than in advanced countries like United States, which reduces the general investment level and consequently economic growth. Jandhyala (2013) also explained that increased regulations in the country create a hurdle for the investing entities, which ultimately decline the economic growth of that country in the long run. Ahlquist and Prakash (2010) argued that when regulations regarding the contract enforcement become more complicated and time-consuming, future earnings are reduced, and FDI inflows are discouraged which is not beneficial for economic growth of that country. According to World Bank's doing business statistics, it takes approximately 471 days for the enforcement of a contract in the Indian economy, but an identical contract can be executed in the United States in around 43 days only. Assumed the differences in the expense of contract enforcing between nations, one could rationally deduce that, all else being equivalent, an MNE will be largely keen to invest in such country that have stronger profit adaptation regulations.

Similarly, Sauvant (2016) stated that individuals and enterprises are more inclined to begin their firms if, they are not subject to restrictive and tax regulations. They argued that a country with easy exit regulations is likely to attract more FDI, which is obviously beneficial for the economic growth of such a country than the countries with strict regulations. Prasad et al. (2014) argued that the efficiencies in ports and infrastructural facilities, as well as the regulations of undertaking trade between countries, are critical factors in selecting a country for FDI. The ease of cross-border trade regulations has been investigated as a significant driver of FDI decisions and on the growth rate of FDI receiving countries. Cebula et al. (2016) elucidate that strong property rights protection leads to the inflow of FDI, and promoter of economic growth. Choi et al. (2016) argued that variation in economic regulations on the product, quantity, and price or market structure generally can influence the investment decision of foreign firms. These all studies indicate that variations in the regulations condition of a host country could significantly influences the FDI inflows and later their economic growth. Thus, we believe that, based on the host regulatory system, the amount and the growth impacts of FDI in a host country can vary significantly.

3. Model description, data and estimation method

3.1. Description of the model

The model applied in our study is constructed on the hypothesis of de Mello (1997), and was stated by Alfaro et al. (2010):

$$Y = Ef(K, L, FDI) \tag{1}$$

where term Y signifies the growth of real GDP, term E denotes the state of environment including different control and policy variables that effect the economic activities. Term K stand for the physical capital, term L denotes the labor force, and FDI

is the foreign direct investment inflows. The total production is attained in the host country by combing two types of capitals foreign and domestic, and the labor, where foreign capital is generated by the FDI inflows. Let H denotes the human capital in receipt country and represented in the Cobb-Douglas production form is as following.

$$Y = Ef(K_d, H) = EK_d^{\beta}H^{1-\beta} \tag{2}$$

where β indicates the domestic capital share. To confirm the presence of diminishing return for domestic capital, let suppose $\beta < 1$. Assume H is depending on foreign and domestic capital and presented by Cobb-Douglass function in following form.

$$H = (K_d, K_f^{\vartheta})^{\gamma} \tag{3}$$

where in Equation (3) ϑ and γ are respectively intertemporal and marginal elasticities of substitutions among foreign, and domestic capital. If Equations (2) and (3) are combined, the new equation can be rewritten as following.

$$Y = EK_d^{\beta+\eta(1-\beta)}Y = EK_f^{\gamma\eta(1-\beta)} \tag{4}$$

Taking the natural logarithm of Equation (4) we get

$$lnY - lnE + [\beta + \eta(1-\beta)]lnK_d + [\gamma\eta(1-\beta)]lnK_f \tag{5}$$

Taking the time-derivative of the Equation (5)

$$\frac{1dY}{Ydt} = \frac{1dE}{Edt} + [\beta + \eta(1-\beta)]\frac{1dK_d}{K_ddt} + [\gamma\eta(1-\beta)]\frac{1dK_f}{K_fdt} \tag{6}$$

Equation (6) can be written as follows:

$$G_Y = G_{TFP} + \beta + [\eta(1-\beta)]G_{DI} + [\gamma\eta(1-\beta)]G_{FDI} \tag{7}$$

where 'G_Y' represents the growth rate of GDP, G_{TFP} stands for the growth rate of TFP, G_{DI} is the growth rate of domestic investment (DI), and G_{FDI} represents the growth rate of FDI. So finally in our study we estimate the following econometric model to examine the FDI-growth nexus.

$$g_{it} = \alpha + \beta_1 FDI_{it} + \beta_2 logY_{io} + \beta_3 H_{i0} + \beta_4 X_{it} + \varepsilon_{it} \tag{8}$$

where g_{it} denotes GDP growth, 'Y_0' shows the initial GDP in host country that is the proxy for N/N^*; H_0 is indicates human capital; and term X represents the set of control variables, X = domestic investment, R&D expenditures, labor force and financial development.

Next, to estimate the influence of host country's Regulations in FDI-growth nexus. The following Equation (9) is estimated, where abbreviation 'Reg' indicates the

regulations index.

$$g_{it} = \alpha + \beta_1 FDI_{it} + \beta_2 FDI*Reg_{it} + \beta_3 logY_{io} + \beta_4 H_{i0} + \beta_5 X_{it} + \varepsilon_{it} \qquad (9)$$

3.2. Description and source of variables

Economic growth typically states the growth of prospective output, i.e., production at 'full employment level' that is affected by the growth of observed output or aggregated demand. It's generally measured as the percentage rise in the real value of gross domestic products (GDP), thus we have taken the data of a country's GDP growth rate as our dependent variable, to indicate the aggregate economic growth level in a country, similar to the studies of (Wang, 2009; Wu et al., 2022). For the primary independent variable FDI inflow, the economy is divided into four sectors: agriculture, industrial, manufacturing, and services. Then aggregate FDI inflows are decomposed to these four sectors of the economy by using the decomposition method. Several studies have used the decomposition method in the literature, and we follow the method of Wang et al. (2015) to decompose the total FDI in different sectors.

Secondly, to measure regulations in host country we used the Doing Business database, which provides the most significant measures on business regulations. We have selected six sub-components closely linked with the MNE's investment choices, named, registering business, enforcing contracts, trading across borders, getting credit, protecting investors, and paying tax. Each sub-component scale from 0 to 100, where lower value indicates complicated or high regulations and a component value closer to 100 indicates easy or less regulations. Then, to have a single value from these six components, we calculated a composite index (Regulations) through Principle Component Analysis (PCA). The PCA results are given in Appendix Table A1. Finally, agreeing with previous empirical studies on FDI and economic growth (see, Hayat, 2019; Ibrahim & Acquah, 2021), we used initial GDP, human capital, R&D expenditures, domestic investment, financial development, and labor force as control variables of the economic growth.

The data for the GDP growth rate, FDI inflow, financial development, labor force, and domestic investment have been collected from the World Bank and International Financial Statistics dataset. Human capital statistics have collected from WDI and United Nations, and Research and development (R&D) expenditures data is taken from UNESCO. The description and source of selected variables is given in Appendix Table A2. The sample countries include 85 developing countries from three regions including from Asia, LAC and SSA for the period of 1996 to 2019. The time period for the estimation and number of sample countries are subject to the availability of data for all variables. The sample countries included in this research are listed in Appendix Table A3.

3.3. Method of analysis-instrumental variable (IV) strategy and GMM method

In our model, FDI inflow could be endogenous or simultaneously determined with economic growth. Therefore, there are opposing force at play regarding reverse

causality from the economic growth to inflow of FDI. This force confounds with the direct impacts of FDI inflows on the economic growth. It causes the coefficient of Ordinary Least Square (OLS) estimates, including country and time fixed effect model to be large in magnitude and become inconsistent and biased. 'To address these endogeneity and measurement error biases, we rely on the Two-stages least square (2SLS) instrumental variable' (IVs) technique which isolates the direct influence of FDI inflows on the economic growth. The IVs should be jointly significant in explaining FDI inflow with meaning first-stage coefficients and F-statistics to obtain consistent estimates. At the same time, IVs should be uncorrelated with the second-stage regression error. In addition, discovering external instruments for FDI inflow has seemed difficult; therefore, the previous studies on FDI and economic growth nexus mostly rely on internal instruments, see for instance (Hayat, 2019). Thus, we used lagged differences and lagged values of explanatory as internal instruments in this study. The method that uses lagged values of independent variables as internal instruments for the estimation was first introduced by Arellano and Bond (1991). The study also applied the Generalized Method of Moment (GMM) presented by Arellano and Bond (1991) to validate the consistency of the results attained through IV method. The GMM method is selected to test the robustness of outcomes because this model supports countering cross country effects by employing first order differentiation and controlling for possible endogeneity issue of the explanatory variables. As a result, we will acquire reliable and consistent estimation outcomes.

4. Empirical results & discussion

4.1. Pre-regression statistics

Tables 1 and 2 are respectively showing the summary statistics and the correlation matrix of the selected variables. It is obvious from the minimum and maximum value of each variable in Table 1 that there are many variations in each variable and economic situations across different countries. For example, a country that reported the minimum value of FDI inflow explains that this country is not sufficiently open and not attracting the FDI inflow through different policy measures and vice versa for the country having a maximum value of FDI inflow. The same is true for all other variables can be assumed in this analysis. The results of the correlation matrix also indicate that most of the independent variables are positively whereas regulations are negatively correlated with economic growth (GDP growth rate) of the panel countries, as given in Table 2.

4.2. Regression results

We applied the Two-Stage Least Square (2SLS) method to our benchmark model. The regression outcomes are presented in Table 3 in 4 different columns by taking FDI inflow to each sector individually as a main independent variable in four different columns. The outcomes in Table 3 indicate that different sectoral FDI inflows are significantly and positively affecting the economic growth. However, a higher growth promoting influence is found for manufacturing-FDI with a coefficient value of 0.642,

Table 1. Summary statistics.

Variables	Obsr.	Mean	Strd. Dev.	Min.	Max.
GDP growth	2108	−0.04	1.728	−4.68	4.207
FDI-Agriculture	1855	17.77	2.203	8.746	23.936
FDI-Industry	1815	18.53	2.686	7.727	25.648
FDI-Manufacture	1734	17.87	2.566	7.996	24.793
FDI-Services	1788	19.38	2.603	9.143	25.906
Regulations (PCA index)	2134	0	1.074	−3.372	3.484
Human capital	2134	3.965	0.630	1.174	5.3013
R&D expenditure	1808	0.451	0.616	0.014	3.1661
Initial GDP	2134	7.892	1.357	5.338	11.184
Labor force	2088	15.22	1.902	10.348	20.484
Domestic investment	1766	22.68	2.125	17.541	29.262
Financial development	2136	39.40	39.32	0.4032	235.51
Mediating variables					
FDI-agriculture*Regulations	1747	8.771	11.95	0.144	62.918
FDI-industry*Regulations	1707	8.594	11.79	0.157	71.731
FDI-manufacturing* Regulations	1760	9.099	13.67	0.134	71.166
FDI-services* Regulations	1704	10.18	14.53	0.146	74.583

Source: Author's own calculation.

revealing the manufacturing sector's higher linkages and spillovers potential from FDI inflows for the host country. These outcomes regarding sectoral FDI impacts on growth are very much in line with other major studies, for example (Alfaro & Charlton, 2013; Chakraborty & Nunnenkamp, 2008; Massoud, 2008). The rest of the coefficients of the control variables are also significant in most of the models. The outcomes of Sargan over-identification restrictions tests indicate that the instruments taken into regression are not correlated with the disturbance term; hence there is no problem of endogeneity.

Many studies in the FDI literature revealed that the effect of FDI inflows over economic growth is significantly influenced by different conditions of the host country. These conditions have substantial influence on the amount of inward FDI to a specific country (Gaur et al., 2019). Several researchers also argue that variations in FDI inflows, and its effect on economic growth are largely influenced by the business regulations set by the host country (Cebula et al., 2016; Contractor et al., 2020). Thus, we investigated the growth effect of sectoral FDI inflow by introducing host country's business regulations as a mediating variable in our benchmark model and the outcomes are given in Table 4 below. The outcome indicates the negative and significant mediating role of regulations with FDI inflow in all sectors to affect the economic growth of host countries, similar to the outcomes of Choi et al. (2016) and Contractor et al. (2020). Though, we found an interesting fact that the extent of the effect of sectoral FDI inflows on economic growth has decreased after the moderation of regulations.

4.3. Sub-sample analysis

The impact of FDI inflows also has heterogeneous impacts on host countries' economic growth based on their income levels. Blomström et al. (2003) and Hayat (2019) explained that, inflow of FDI induces positive economic growth only in countries having higher income level, but not in case of low income or less developed countries. Therefore, to check for such differences in FDI-growth association, and

Table 2. Correlation matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
GDP growth	1															
FDI-Agriculture.	0.082*	1														
FDI-Industry.	0.217*	0.566*	1													
FDI-Manufacture	0.191*	0.533*	0.376*	1												
FDI-Services	0.223*	0.642*	0.476*	0.259*	1											
Regulations	−0.746*	−0.455*	−0.517*	−0.635*	−0.452*	1										
Human capital	0.407*	0.223*	0.470*	0.469*	−0.501*	0.364*	1									
R&D	0.267*	0.195*	0.423*	0.441*	0.458*	0.453*	0.305*	1								
Initial GDP	0.634*	0.110*	0.493*	0.483*	0.543*	−0.467*	0.744*	0.311*	1							
Domestic investment	0.244*	0.686*	0.554*	0.657*	0.838*	−0.364*	0.516*	0.588*	0.552*	1						
Labor force	−0.120*	0.734*	0.600*	0.610*	0.581*	0.327*	−0.022*	0.313*	−0.142*	0.718*	1					
Financial development	0.372*	0.248*	0.458*	0.455*	0.539*	−0.548*	0.534*	0.647*	0.634*	0.548*	0.169*	1				
FDI-agriculture*Regulations	0.250*	0.274*	0.487*	0.476*	0.506*	−0.564*	0.308*	0.292*	0.516*	0.615*	0.363*	0.650*	1			
FDI industry * Regulations	0.360*	0.245*	0.485*	0.465*	0.519*	0.273*	0.302*	0.594*	0.516*	0.595*	0.337*	0.692*	0.794*	1		
FDI-manufacturing* Regulations	0.237*	0.182*	0.443*	0.484*	0.479*	−0.384*	0.315*	0.496*	0.536*	0.612*	0.280*	0.633*	0.595*	0.699*	1	
FDI-services* Regulations	0.251*	0.237*	0.479*	0.482*	0.505*	−0.218*	0.319*	0.396*	0.525*	0.608*	0.328*	0.653*	0.694*	0.799*	0.599*	1

Note: * indicating $p < 0.1$.
Source: Author's own calculation.

Table 3. Sectoral FDI impacts on economic growth-full sample estimation, GDP growth is the dependent variable, 2SLS Method.

Variables	(1) Agriculture	(2) Industry	(3) Manufacturing	(4) Services
FDI-Agriculture	0.135**			
	(0.065)			
FDI-Industry		0.394**		
		(0.184)		
FDI-Manufacturing			0.642**	
			(0.303)	
FDI-Services				0.319***
				(0.0586)
Initial GDP	−0.929**	−0.444***	−0.320***	−0.360***
	(0.462)	(0.0914)	(0.0916)	(0.0978)
Human capital	0.848***	0.518**	0.294**	0.607***
	(0.100)	(0.232)	(0.142)	(0.0825)
R&D expenditure	0.442**	0.788**	0.607***	0.647**
	(0.219)	(0.395)	(0.0825)	(0.323)
Labor force	−0.748***	−0.396**	−0.406**	−0.233**
	(0.160)	(0.196)	(0.199)	(0.0924)
Domestic investment	0.573**	0.858**	0.654**	0.795***
	(0.281)	(0.439)	(0.337)	(0.0951)
Financial development	0.0113**	0.0037***	−0.0029**	−0.00156
	(0.0560)	(0.0012)	(0.00139)	(0.00148)
Constant	0.446	−7.708***	−3.216***	−9.621***
	(2.180)	(0.941)	(0.979)	(0.945)
No. of observations	1,698	1,698	1,698	1,698
R-square	0.251	0.747	0.724	0.662
Sample countries	85	85	85	85
No. of years	24	24	24	24
Country-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
First-stage F-stat	16.85	10.695	18.77	30.29
Stock-Yogo weak ID test	10.27	13.96	16.85	16.85
Kleibergen-Paap rk Wald Test	16.85	10.695	18.77	30.29
Anderson-Rubin Wald test	23.43	23.43	35.45	21.03
p-Values	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Sargan test	5.518	8.415	8.920	8.287
p-Values	(0.812)	(0.396)	(0.472)	(0.518)

Note: Values in in parentheses are robust standard error, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's own calculation.

further, the mediating role of regulations win sectoral FDI-growth nexus, we divided the whole sample into three different sub-samples, i.e., LIC's, MIC's and HIC's as per World Bank income classification and estimated the regression model for each of the group individually. The outcomes of the regression for each income group of countries are respectively presented in Tables 5–7.

Results given in Table 5 for LIC's shows that agriculture-FDI and industry-FDI have significant and growth enhancing impact, while manufacturing-FDI and services-FDI were found insignificant in influencing the economic growth. However, the mediation of regulations found adverse to influence the FDI inflow impacts on economic growth, which confirmed the presence of increased and complicated regulations in LIC's, as shown in Table 5. The services-FDI is still found insignificant in influencing the economic growth of LIC's even with inclusion of regulations. Likewise, Table 6 shows the results of MIC's indicated that all the sectoral FDI inflows have significant and growth increasing influence, except services-FDI found insignificant to alter the economic growth of MIC's. In addition, regulations in MIC's

Table 4. Mediating role of regulations in FDI-growth nexus-full sample estimation, GDP growth is the dependent variable, 2SLS method.

Variables	(1) Agriculture	(2) Industry	(3) Manufacturing	(4) Services
Initial GDP	−0.471***	−0.421**	−0.191*	−0.162
	(0.117)	(0.221)	(0.114)	(0.106)
Human capital	1.207***	0.475**	0.204**	0.262**
	(0.0737)	(0.226)	(0.0870)	(0.137)
Domestic investment	0.167**	0.351***	0.137**	0.199**
	(0.076)	(0.103)	(0.062)	(0.099)
Labor force	0.598**	0.786**	0.430*	0.474**
	(0.238)	(0.388)	(0.236)	(0.230)
Financial development	0.00777***	0.00289**	−0.00412**	0.00317**
	(0.00211)	(0.00129)	(0.00174)	(0.00147)
R&D expenditure	0.489**	0.963**	0.162**	0.527**
	(0.251)	(0.511)	(0.098)	(0.263)
FDI-Agriculture	0.347**			
	(0.171)			
FDI-Industry		0.578***		
		(0.0491)		
FDI-Manufacturing			0.829**	
			(0.417)	
FDI-Services				0.775**
				(0.375)
FDI-Agriculture*Regulations	−0.143**			
	(0.080)			
FDI-Industry*Regulations		−0.320**		
		(0.161)		
FDI-Manufacturing*Regulations			−0.392***	
			(0.0595)	
FDI-Services*Regulations				−0.266**
				(0.129)
Constant	−9.317***	−7.591***	−5.156***	−9.179***
	(0.816)	(0.827)	(0.916)	(0.755)
No. of observations	1,661	1,618	1,6813	1,610
R-square	0.626	0.778	0.691	0.693
Sample countries	85	85	85	85
No. of years	24	24	24	24
Country-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
First-stage F-stat	25.84	25.60	26.16	21.96
Stock-Yogo weak ID test	17.85	10.27	16.85	16.85
Kleibergen-Paap rk Wald F statistic	25.84	25.60	26.16	21.96
Anderson-Rubin Wald test	32.94	22.78	47.74	27.06
p-Values	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Sargan test	5.34	8.531	8.666	4.365
p-Values	(0.435)	(0.831)	(0.534)	(0.858)

Note: Values in in parentheses are robust standard error, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's own calculation.

are estimated to have an adverse role in sectoral FDI and economic growth nexus, but they also decline the FDI influence on economic growth. Lastly, for the HIC's, the outcomes are presented in Table 7. FDI inflows to all sectors have a statistically significant and growth promoting influence in HIC's. In contrast to these positive impacts, the mediating effect of regulations with agriculture-FDI and services-FDI was found insignificant, whereas with industry-FDI and manufacturing-FDI found to have a lower significance in influencing the economic growth of HIC's. These results regarding regulations role endorse that HIC's are mostly inclined toward easy or lower regulations, as the significance level of regulations is either lower or insignificant to affect the FDI-growth nexus.

Table 5. Low income countries (LIC's).

Variables	(1) Agriculture	(2) Industry	(3) Manufacturing	(4) Services
Initial GDP	−0.818***	−1.081***	−1.365***	−1.055***
	(0.164)	(0.222)	(0.250)	(0.222)
Human capital	0.132**	0.220**	0.995***	0.014**
	(0.062)	(0.108)	(0.098)	(0.007)
Domestic investment	0.567***	0.840***	0.602**	0.519**
	(0.132)	(0.194)	(0.292)	(0.205)
Labor force	0.986**	0.538***	0.616***	0.342**
	(0.436)	(0.161)	(0.183)	(0.165)
Financial development	−0.00239	−0.00433	0.00757*	0.00677*
	(0.00384)	(0.00344)	(0.00408)	(0.00394)
R&D expenditures	0.043***	0.536	0.216	−0.612
	(0.003)	(0.506)	(0.542)	(0.493)
FDI-Agriculture	0.695***			
	(0.0542)			
FDI-Industry		0.963***		
		(0.0695)		
FDI-Manufacturing			0.0156	
			(0.113)	
FDI-Services				0.174
				(0.120)
FDI-Agriculture*Regulations	−0.504***			
	(0.0467)			
FDI-Industry*Regulations		−0.287***		
		(0.0988)		
FDI-Manufacturing*Regulations			−0.361**	
			(0.178)	
FDI-Services*Regulations				0.158
				(0.175)
Constant	−8.999***	−17.95***	−21.30***	−19.47***
	(1.325)	(1.484)	(1.523)	(1.294)
No. of observations	753	753	753	753
R-square	0.657	0.450	0.451	0.434
Sample countries	47	47	47	47
No. of years	24	24	24	24
Country-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
First-stage F-stat	57.49	38.37	34.73	27.17
Stock-Yogo weak ID test	16.85	10.27	24.58	10.27
Kleibergen-Paap rk Wald F statistic	57.49	38.37	34.73	27.17
Anderson-Rubin Wald test	27.51	27.51	22.00	17.46
Prob.	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Sargan Test	6.49	9.106	5.254	3.955
Prob.	(0.795)	(0.412)	(0.262)	(0.831)

Note: Values in in parentheses are robust standard error, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's own calculation.

4.4. Robustness check

After getting the results through 2SLS technique, we also applied the Generalized Method of Moment (GMM) to our benchmark model and compared its results with the results attained by 2SLS method for robustness checks. In addition, the robustness of the outcomes is also validated by taking total FDI inflow instead of sectoral FDI. The results of GMM estimation presented in Tables 8 and 9 are very similar to those attained with the 2SLS method for the whole panel and different income groups, confirming the stability and reliability of our benchmark model results. The Hansen test for over-identify restriction is performed to check the validity of instruments for each regression, and results are provided at the end of both tables.

Table 6. Middle income countries (MIC's).

Variables	(1) Agriculture	(2) Industry	(3) Manufacturing	(4) Services
Initial GDP	−0.114	−0.010***	−0.581**	−0.716**
	(0.234)	(0.002)	(0.279)	(0.342)
Human capital	0.760***	0.813***	1.240***	0.803***
	(0.114)	(0.0969)	(0.221)	(0.0980)
Domestic investment	0.648***	0.181**	0.142**	0.359***
	(0.246)	(0.082)	(0.064)	(0.028)
Labor force	0.502*	0.179**	0.450	0.960***
	(0.281)	(0.081)	(0.554)	(0.280)
Financial development	0.0060***	0.0051***	0.0013	0.0054***
	(0.0021)	(0.0014)	(0.0025)	(0.0016)
R&D expenditures	0.440**	0.984***	0.101**	0.965***
	(0.211)	(0.265)	(0.049)	(0.260)
FDI-Agriculture	0.610***			
	(0.0757)			
FDI-Industry		0.397*		
		(0.205)		
FDI-Manufacturing			0.882***	
			(0.280)	
FDI-Services				0.00638
				(0.245)
FDI-Agriculture*Regulations	−0.162***			
	(0.0606)			
FDI-Industry*Regulations		−0.172**		
		(0.0858)		
FDI-Manufacturing*Regulations			−0.289**	
			(0.144)	
FDI-Services*Regulations				−0.0147**
				(0.00678)
Constant	−8.446***	−15.17***	−1.068	−13.06***
	(1.014)	(1.558)	(3.269)	(1.426)
No. of observations	528	528	528	528
R-square	0.817	0.749	0.344	0.748
Sample countries	22	22	22	22
No. of years	24	24	24	24
Country-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
First-stage F-stat	21.84	11.19	1 6.61	16.64
Stock-Yogo weak ID test	10.27	10.27	10.27	16.85
Kleibergen-Paap rk Wald F statistic	21.84	11.19	16.61	16.64
Anderson-Rubin Wald test	32.48	29.68	19.94	29.68
Prob.	(0.0000)	(0.0000)	(0.415)	(0.438)
Sargan Test	6.168	6.467	7.474	6.506
Prob.	(0.601)	(0.420	(0.0000	(0.0000

Note: Values in in parentheses are robust standard error, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's own calculation.

5. Conclusion and policy implications

This previous literature on the FDI-growth nexus indicated different results, including positive, negative and insignificant. The one most discussed possible reason for mixed results on FDI and economic growth nexus is the use of total FDI, which can blur the actual effect of FDI on economic growth. Each sector has a different extent of impact on economic growth. Agreeing with such arguments, the current study estimated the growth effects of sectoral level FDI inflows, and the mediating role of the host country's business regulation in the sectoral FDI-growth nexus. The study has taken the larger dataset of 85 developing countries from three developing regions,

Table 7. High income countries (HIC's).

Variables	(1) Agriculture	(2) Industry	(3) Manufacturing	(4) Services
Initial GDP	−0.890***	−0.820**	−0.172	−0.0128***
	(0.335)	(0.337)	(0.227)	(0.0033)
Human capital	0.171	0.461*	0.443**	0.455*
	(0.222)	(0.250)	(0.215)	(0.235)
Domestic investment	0.112	2.848***	1.671***	1.614***
	(0.308)	(0.348)	(0.216)	(0.212)
Labor force	−0.645**	−0.594***	−0.631**	−0.604***
	(0.297)	(0.195)	(0.314)	(0.208)
Financial development	0.0275***	0.00401	0.0169***	0.0230**
	(0.00414)	(0.00575)	(0.00448)	(0.0112)
R&D expenditures	0.624**	0.0902**	0.539**	0.833***
	(0.311)	(0.0448)	(0.265)	(0.157)
FDI-Agriculture	0.494**			
	(0.243)			
FDI-Industry		0.549***		
		(0.103)		
FDI-Manufacturing			0.649***	
			(0.0956)	
FDI-Services				0.519**
				(0.259)
FDI-Agriculture*Regulations	−0.0075			
	(0.0121)			
FDI-Industry*Regulations		−0.236*		
		(0.115)		
FDI-Manufacturing*Regulations			−0.170**	
			(0.0851)	
FDI-Services*Regulations				−0.0261
				(0.0229)
Constant	−2.834	−4.312*	−5.475**	−4.701*
	(2.968)	(2.484)	(2.458)	(2.626)
No. of observations	408	408	408	408
R-square	0.531	0.754	0.740	0.728
Sample countries	16	16	16	16
No. of years	24	24	24	24
Country-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
First-stage F-stat	35.33	52.10	76.58	11.26
Stock-Yogo weak ID test	16.85	16.85	16.85	16.85
Kleibergen-Paap rk Wald F statistic	35.33	52.10	76.58	11.26
Anderson-Rubin Wald test	28.13	71.07	32.00	32.00
Prob.	(0.0000)	(0.0000)	(0.426)	(0.0000)
Sargan Test	6.706	9.369	4.83	7.297
Prob.	(0.716)	(0.486)	(0.0000)	(0.253)

Note: Values in in parentheses are robust standard error, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's own calculation.

Asia, LAC and SSA, from 1996 to 2019 and applied the 2SLS estimation method, considering the endogeneity issue in the model.

First, for the whole sample, it is found that FDI inflows to all sectors have a significant and promoting influence on the aggregate economic growth of host countries, however, manufacturing-FDI has a larger impact on the economic growth. Though we introduced the regulations as moderating variable with sectoral FDI inflows, the growth effects of sectoral FDI were found adverse. Next, for the sub-sample analysis, LIC's results revealed a significant positive impact of agriculture-FDI and industrial-FDI while an insignificant impact of manufacturing-FDI and services-FDI on the economic growth. The results of MIC's provide significant and growth promoting influence of FDI to all sectors except services-FDI which is insignificant.

Table 8. Full sample estimation-GMM results.

Variables	(1)	(2)	(3)
Initial GDP	−0.686***	−0.688***	−0.724**
	(0.0538)	(0.0603)	(0.357)
Human capital	0.419***	0.581***	0.301**
	(0.115)	(0.125)	(0.118)
Domestic investment	0.0297	0.387***	0.0787**
	(0.0748)	(0.117)	(0.0354)
Labor force	0.036**	0.094**	0.0151**
	(0.017)	(0.047)	(0.0074)
Financial development	0.0077***	0.0046**	0.00242
	(0.0020)	(0.0022)	(0.00226)
R&D expenditures	0.220***	0.675***	0.795***
	(0.036)	(0.175)	(0.139)
FDI inflow	0.336***	0.113***	
	(0.0891)	(0.0092)	
Regulations		−0.232***	
		(0.0642)	
FDI Inflow*Regulations			−0.315**
			(0.155)
Constant	−14.13***	−12.07***	−13.65***
	(0.799)	(0.925)	(0.972)
No. of observations	1,802	1,889	1,815
No. of years	24	24	24
Sample countries	85	85	85
Country-FE	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes
AR(1)	−10.50	−10.84	−10.33
Prob.	(0.0000)	(0.0000)	(0.0000)
AR(2)	1.57	0.90	0.57
Prob.	(0.116)	(0.366)	(0.310)
Hansen J statistic	8.82	5.32	7.59
Prob.	(0.285)	(0.537)	(0.497)

Note: Values in in parentheses are robust standard error, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's own calculation.

Lastly, FDI inflows to all sectors were statistically significant and growth promoting in HIC's. The role of regulations in FDI-growth nexus was found adverse, however, the level of significance varies across different sectors and in different income groups, such as in LIC's, services-FDI was found insignificant to affect economic growth with regulations mediation. Similarly, in MIC's FDI inflows to all sectors found significant to impact economic growth with inclusion of regulations as a mediating factor. Finally, in HIC's, industry and manufacturing FDI were found significant, while agriculture and services FDI were found insignificant to influence the economic growth with regulations mediation.

However, the findings of this study are limited to the developing countries from three regions, including Asia, Latin America and the Caribbean, and Sub-Saharan Africa only. The estimated results of the study are based on annual data ranging from 1996 to 2019. This research can be extended to other developing economies from the rest of the countries groups, for example, ASEAN, European Union, developed countries etc. Furthermore, the role of other conditional variables such as financial development, institution quality, human capital, etc., can also be analyzed in sectoral FDI and economic growth nexus.

Our outcomes have significant implications for both investing entities and governments to take advantage of FDI inflow by enhancing their profit and economic growth. The precise policy suggestions of these outcomes are that the growth influences of FDI

Table 9. Sub-sample estimation-GMM results.

Variables	(1) LIC's	(2) MIC's	(3) HIC's
FDI	0.0663	0.248***	0.0451**
	(0.0502)	(0.0765)	(0.0219)
Initial GDP	−0.438**	−0.282	−0.271
	(0.218)	(0.319)	(0.277)
Human capital	0.134***	0.796***	0.314**
	(0.0095)	(0.108)	(0.108)
Domestic investment	0.603***	−0.145	0.492**
	(0.213)	(0.269)	(0.244)
Labor force	0.706**	0.959***	−0.013**
	(0.353)	(0.198)	(0.007)
Financial development	−0.00452	0.00399**	0.0206***
	(0.00382)	(0.00175)	(0.00583)
R&D expenditures	0.971	0.545**	0.191*
	(0.686)	(0.274)	(0.0104)
FDI inflow*Regulations	−0.141***	−0.0816***	−0.102***
	(0.0203)	(0.0139)	(0.0187)
Constant	−23.31***	−15.05***	−8.987***
	(2.009)	(1.489)	(3.075)
No. of observations	753	528	408
No. of years	24	24	24
Sample countries	47	22	16
Country-FE	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes
AR (1)	−11.41	−10.16	−12.38
Prob.	(0.000)	(0.000)	(0.000)
AR (2)	3.21	3.36	3.44
Prob.	0.423	0.435	0.256
Hansen J statistics	8.910	6.22	7.872
Prob.	(0.966)	(0.511)	(0.685)

Note: Values in in parentheses are robust standard error, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's own calculation.

should not be consider homogeneous across different sectors by the governments. Instead, FDI policies should be sector-specific and skewed towards those sectors with more potential for linkages and spillovers effects, such as manufacturing and industrial sectors, which contribute more to economic growth. Moreover, governments in FDI host countries should also revise their regulations accordingly, which favors the MNE's to set up and run their business with easy regulations regarding registering new businesses, enforcing contract, tax payments and trading their products across borders etc. These incentives are likely to attract higher investment, ultimately enhancing the host country's economic growth. In addition, the MNE's or investing entities must look over the regulation's situation of a particular country before investing and consider investing in those countries with easy regulation. Easy regulation saves their time and cost and is likely to increase the overall production and profit of the MNE's.

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Availability of data

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

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Appendix A

Table A1. PCA results.

	Eigen values	Percentage explained	Prime indicators	Eigen vector	Correlation coefficients
Regulations	1.19536	0.8732	(i) Registering property	0.6976	0.7162
			(ii) Protecting investors		0.6836
			(iii) Getting credit		0.6473
			(iV) Paying Taxes		0.7928
			(V) Enforcing contracts		0.7182
			(Vi) Trading across borders		0.5273

Source: Author's own calculation.

Table A2. Description of variables.

Variables	Description	Source
Economic growth	GDP growth rate (% annual)	WDI
FDI inflow	FDI, net inflows (% of GDP and in million $)	WDI
Regulations	A composite index for 'Regulations' is calculated using PCA method, which comprises six sub-components such as regulations regarding registering property, paying tax, trading across borders, enforcing contracts, getting credit, and protecting investors.	Doing Business Dataset
Initial GDP	Gross domestic per capita at the start of the period of data	WDI
Domestic investment	Gross capital formation (% of GDP)	WDI
Labor force	Total labor force (in million)	WDI
Financial development	Domestic credit to private sector (% of GDP)	Global Financial Development
Human capital	School enrollment, secondary (% gross)	WDI
R&D	Research and development expenditures (% of GDP)	UNESCO

Source: Author's own calculation.

Table A3. Sample countries (85).

Argentina	Peru	Sri Lanka	Lesotho
Aruba	Trinidad and Tobago	Singapore	Liberia
Bahamas	Uruguay	South Korea	Madagascar
Barbados	Venezuela	Thailand	Malawi
Belize	Bangladesh	Vietnam	Mali
Bolivia	Bhutan	Angola	Mauritania
Brazil	Brunei	Benin	Mozambique
Chile	Cambodia	Botswana	Niger
Columbia	China	Burkina Faso	Nigeria
Cost Rica	Hong Kong	Burundi	Rwanda
Dominican Rep.	India	Cameroon	Senegal
Ecuador	Indonesia	Cabo Verde	South Africa
El Salvador	Japan	Chad	Sudan
Guatemala	Lao PDR	Central African Rep.	Seychelles
Grenada	Maldives	Cote d'Ivoire	Tanzania
Haiti	Malaysia	Congo D.R.	Togo
Honduras	Mongolia	Ethiopia	Uganda
Jamaica	Myanmar	Eritrea	Zambia
Mexico	Nepal	Gambia	Zimbabwe
Nicaragua	Pakistan	Ghana	
Panama	Papua New Guinea	Guinea	
Paraguay	Philippines	Kenya	

Source: Author's own calculation.