Investigating Asymmetric Relationship between Financial Development and Global Competitiveness in Developed and Developing Countries

Maida Amjad[1] ID , Nabila Asghar[2] ID

[1] PhD Scholar, Department of Economics, Division of Management and Administrative Science, University of Education Lahore, Pakistan. Email: maidaamjad7788@yahoo.com
[2] Associate Professor, Department of Economics, Division of Management and Administrative Science, University of Education Lahore, Pakistan. Email: nabeela.asghar@ue.edu.pk

ARTICLE INFO

ABSTRACT

Globalization led to economic integration, which increased the competitiveness of economies through interconnection and interdependence. Financial Development (FD) is considered as an engine of Economic Growth (EG) that significantly contributes in economic productivity and raising prosperity in an economy. This study aims to analyze the relationship between FD and global competitiveness from a global perspective. For this purpose, panel data of 87 developed and 60 developing countries have been used for the period 2000- 2020. The Panel Quantile Regression (PQR) estimation technique has been used for the analysis. The results demonstrate that sustainable FD significantly increases the competitiveness of all countries. However, this impact is non-linear across different quantile groups which suggests evidence of an inverted U-shaped relationship. The linearized marginal effect indicates that all developed economies lie before the maturity of the inverted U-shaped curve. In contrast, except Bolivia, Cabo Verde, Egypt, India, Indonesia, Korea Rep of, Lebanon, Mongolia, Morocco, Nigeria, Pakistan, Philippines, Siri Lanka, Tunisia, and Vietnam, all remaining developing nations also lie before the maturity of an inverted U-shaped curve. This indicates that FD accelerates global competitiveness up to a certain optimal point, and excessive financialization may lead to the misallocation of resources and raising financial risk. The study suggests that developing countries need to implement policies to attain optimal level of sustainable FD, which boosts their competitiveness. The major contribution of the present study is to help the policy makers to formulate proper policies to increase global competitiveness.

OPEN ACCESS

Corresponding Author's Email: nabeela.asghar@ue.edu.pk

1.   Introduction

In the contemporary era of globalization, each country tries to produce quality products by using modern technologies that reduce production, reap economies of scale, and generate competitiveness in the international market. Through competitiveness, a country tries to acquire market share in the international trade market (Klemetti, 1989).

The World Economic Forum (WEF) has developed a composite index named the Global Competitiveness Index (GCI) to measure economic performance which is based on set of policies, institutions, and factors determining a country's productivity level. The countries with more competitiveness grow faster than the less competitive economies (Elfaki, Handoyo, & Ibrahim, 2021). GCI can be measured by assigning different weights to the 12 pillars of competitiveness like institutions, macroeconomic environment, higher education and training, health, infrastructure, labour market, the goods market, financial market, technological readiness, business sophistication, market size and innovation (World economic forum, 2023).

FD is considered as a fundamental determinant of GC. A strong and healthy financial sector enhances economic activities through encouraging saving and investment (Alomari, Marashdeh, & Bashayreh, 2019). According to the financial development report (2020), FD depends on the working of numerous markets and institutions that make the availability of credit facilities for possible commercial use. World Bank (2022) defines financial development as the long-term availability of loans, payments, and insurance to fulfil the transaction requirements of individuals & businesses for the production process. Hence, it plays an important role in achieving sustainable development goals.

FD and global competitiveness are closely related to each other. The robust financial sector motivates more production for exports of goods in the international market, increasing competitiveness (Anton & Bostan, 2017; Nawaz, Ahmad, Hussain, & Bhatti, 2020).
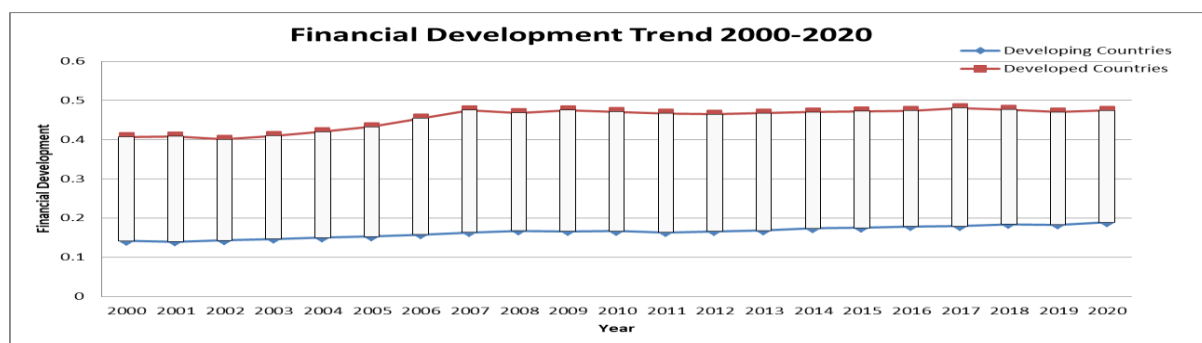
Figure 1: Shows the Trend of FD in Developed and Developing Nations

It can be observed that there is a noticeable gap in financial progress across different countries. The developed nations often have sophisticated economic structures with high levels of financial literacy, access to capital, and robust regulatory frameworks, which leads to a well-established and vigorous financial system. According to the underlying observations, industrialized nations have shown more financial progress as compared to developing countries.

The nexus between FD and EG has been extensively studied, but most existing literature considers the linear relationship between them. This understanding oversimplifies the complexity of this relationship as it tends to overlook that FD can have different effects according to the stages of EG or the structure of the financial system. This creates a significant gap in understanding the dynamics of this relationship. This study strives to bridge this gap and examines the non-linear relationship between FD and global competitiveness in the context of the Financial Kuznets curve (FKC) hypothesis (Khatatbeh & Moosa, 2023). Understanding these dynamics is particularly important in the face of global challenges such as post-pandemic recovery and instability in both developed and developing economies. Moreover, this study employs an advanced non-linear modeling technique, which provides new insights that uniquely contribute to the literature. The findings of this study may provide guidelines to policymakers for promoting sustainable economic development through reform in the financial system.

2. Literature Review

Several studies have discussed the impact of financial development on economic growth and confirmed that a well-established financial sector accelerates global competitiveness.

Sundari and Alfatihah (2023) examined the effect of FD on global competitiveness in Indonesia from 2007-2017. The study used panel ARDL approach, which highlighted that global competitiveness was significantly increased by easy access to capital and financial stability. Hodijah and Hastuti (2023) examine the financial-growth nexus during the COVID-19 pandemic in ASEAN countries from 2010-2020. The study uses VECM model and finds out that the adverse effect of the pandemic can be overcome by financial stability and encouraging government spending which is crucial to maintaining the health of people and economic growth. Zanella, Oyelere, and McMillan (2021) studied the impact of FD on competitiveness in 108 countries from 1980-2017. The empirical findings showed that a well-established financial sector brought financial stability and increased the competitiveness of a country. Alomari et al. (2019) assessed the efficiency of the financial sector to enhance EG in 21 developed nations from 2009-2017. Using the GMM econometric technique, the results revealed that financial access significantly contributes to economic growth. Prochniak and Wasiak (2017) utilized the GMM approach to test the finance-growth nexus. The study used panel data set of 28 EU and 34 OECD countries for the period 1993-2013. The findings showed the existence of non-linear pattern among the variables. Özdemir (2017) estimated the impact of financial access on global competitiveness using sample data from 101 countries in 2012. Using the PLS-SEM model, the findings show that a stable financial environment has developed intense competition among nations(Bhatti, Raheem, & Zafar, 2020). Anton and Bostan (2017) investigated the contributions of financial progress in entrepreneurial activities in 25 EU countries from 2007-2013. The results revealed that a robust financial sector positively increases entrepreneurial activities and GC. Fuinhas, Marques, and Carreira (2015) focused on the impacts of financial evolution on economic expansion using panel data from 25 high-income countries for the period 1996- 2011. The study demonstrated that financial growth has a positive and significant effect on GDP growth.

Urbanization has a mixed effect on EG. Mahtta et al. (2022) explored the link between urbanization and EG using the data set of 300 cities in China from 1970-2014. The results indicated that urbanization is positively correlated to economic growth. Ahmed and Ahmad (2016) conducted similar research on Pakistan during the period 1981-2010 and pointed out that overpopulation in a country disrupts the path of economic progress. Arouri, Youssef, Nguyen-Viet, and Soucat (2014) investigated the dynamic impact of the urban population on economic development using a panel dataset from 1990-2020. The findings showed the existence of a significant relationship between urban concentration and EG.

The research work published on the association between trade liberalization and competitiveness is scanty. Erkisi and Ceyhan (2019) investigated the effect of trade openness on EG in 13 EU countries from 1995 to 2016. The study used the PDOLS approach and found a positive impact of trade openness on EG. Paudel (2014) examined the effect of trade on economic growth in 193 countries from 1985-2010. Using the dynamic growth model, the study demonstrated that lower-income countries can get significant benefits from trade liberalization than other developing countries. Salvatore (2010) also confirmed positive relationship between trade liberalization and EG in 52 countries from 2000-2007.

Industrialization is also considered an essential determinant of economic growth. Elfaki et al. (2021) utilized the ARDL model to securitize the impact of industrialization on economic growth in Indonesia from 1984-2018. The findings confirmed the existence of positive relationship among variable. Opoku and Yan (2019) tested the correlation between industrialization and EG. The study used panel data consisting of 37 African countries from 1980-2014. Using GMM econometrics approaches, the study showed that industrialization contributed

positively to economic performance. Jelilov, Enwerem, and Isik (2016) also investigated a similar study in Nigeria from 2000-2013 and showed a negative impact of Industrialization on economic development in the long run.

3.   Theoretical Framework

This study uses Schumpeter (2008) theory of FD to highlight the importance of financial development and examines its impact on a nation's competitiveness. Schumpeter established a direct and crucial role of financial expansion on EG through innovation, capital allocation, creative destruction, financial stability, and support for international economic activities. The theory states that financial institutions are an integral part of EG that fosters innovation and EG by promoting savings and investments.

This study extends Schumpeter's arguments by hypothesizing that although financial growth certainly increases economic growth, but their relationship is not necessarily linear. In the early stages of economic development, FD may increase the inventive and productive capacity of the economy However, at higher levels of financial growth, diminishing returns and instability may impede which indicates the non-linear relationship between FD and EG.

The Financial Kuznets curve (FKC) further supports the non-linear view and demonstrates the inverted U-shaped relationship between FD and EG. The idea of FKC is based on Kuznets's income inequality hypothesis (1955) which proposes the relationship between EG and income inequality. it states that in the initial stage of development due to industrialization, income inequality may increase. However, after that, it started to decline gradually as the economy grew. The present study is motivated by this analogous idea of Kuznets and tries to examine the finance-growth nexus. This inverted U-shaped relationship shows that initially, global competitiveness is enhanced with FD up to a certain threshold level; after that, it starts to decline because of excessive financialization which leads to misallocation of resources and rise in systematic risk. The empirical results provide understanding of the finance-growth nexus by capturing this non-linearity and examining the turning points in developed and developing countries. This study links this theoretical perspective with a non-linear model and tries to understand the complex dynamics between FD and global competitiveness.
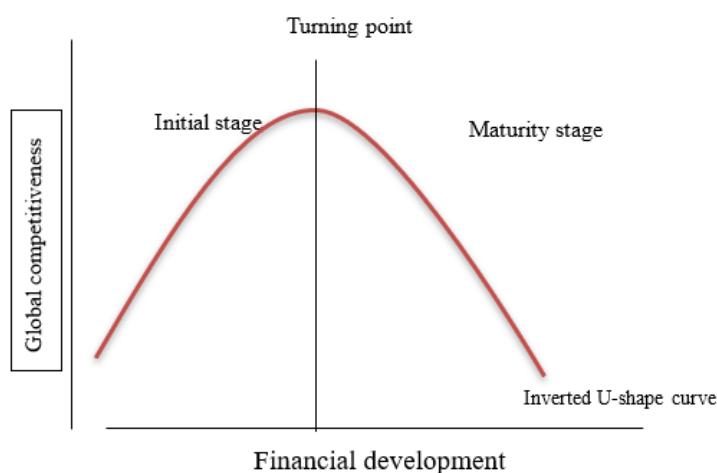
Figure 2: The Theoretical Framework of the FKC

4.   Data and Methodology

The present study uses panel data of 87 developed and 60 developing economies, covering the period 2000 - 2020. The study utilizes the Global competitiveness index as a dependent variable, while the financial development index is a key independent variable. The

study uses a set of control variables including urbanization, trade liberalization, and industrialization. These control variables are chosen because they are structural factors that directly capture economic structure and influence the relationship between FD and global competitiveness. The World Bank (2022) categorizes, high-income and higher-middle-income nations as developed countries. On the other hand, lower-income and lower-middle-income nations as developing countries. The data of selected economies is collected from World Economic Forum (WEF), International Monetary Fund (IMF), and World Development Indicators (WDI).

Table 1
Study Variables, Description, and their Measurement

Variables	Definition	Measurement	Sources
Global competitiveness index	Global competitiveness index (GCI) determines productivity level of a country which is computed by the 12 pillars of competitiveness.	Index (0-100)	WEF
Financial development	The FD Index has been constructed by combining the four dimensions: financial depth, financial access, efficiency, and stability.	Index	IMF
Urbanization	Urbanization is the proportion of the population live in urban areas	Total urban population	WDI
Trade liberalization	Trade liberalization reflects the integration of an economy into global markets. It is the ratio of total exports and imports of a country.	% of GDP	WDI
Industrialization	Industrialization serves as a driver of economic growth that captures the industrial value-added and represents the structural shift from agriculture to industry.	% of GDP	WDI

This study uses the Global competitiveness index as a dependent variable for empirical analysis. Based on existing literature, several studies have used GC as a dependent variable (Sundari & Alfatihah, 2023). The FD is a key independent variable for determining a nation's competitiveness, while urbanization, trade liberalization, and industrialization are used as control variables.

The functional form of the model can be written as:

$$GC = (FD, UR, TRADE, INDUS) \quad (1)$$

Based on eq (1), the regression equation is written as:

$$GCI_{i,t} = \beta_0 + \beta_1 FD_{i,t} + \beta_2 LNUR_{i,t} + \beta_3 LNTRADE_{i,t} + \beta_4 LNINDUS_{i,t} + (\varepsilon)_{i,t} \quad (2)$$

For the non-linear analysis, the model is given below:

$$GCI_{i,t} = \beta_0 + \beta_1 FD_{i,t} + \beta_2 FD^2{}_{i,t} + \beta_3 LNUR_{i,t} + \beta_4 LNTRADE_{i,t} + \beta_5 LNINDUS_{i,t} + (\varepsilon)_{i,t} \quad (3)$$

Where β's are parameters of variables, and ε is the error term. Equation 3 represents the non-linear behaviour of the model. In non-linear analysis, a cut-off value is required that highlights the threshold value to identify the maximum and minimum values of an inverted U-shaped curve (Wang, Zhang, Li, & Li, 2022).

Equation 4 shows the cut-off value of FD:
$$\frac{\partial GCI}{\partial FD} = \beta_1 + 2\beta_2 FD = 0$$
$$FD^* = -\frac{\beta_1}{2\beta_2} \quad (4)$$

4.1. Methodology
4.1.1. Panel Quantile Regression Approach

To identify the role of financial development on global competitiveness, the study uses a panel quantile regression model Koenker and Bassett Jr (1978) across the panel of developed and developing countries. PQR is a sophisticated econometric approach that has been given a lot of priority in recent econometric analyses. The key feature of this model is that it handles the complexities and variations in the panel data effectively and offers various advantages. It detects the problem of heteroscedasticity by recognizing and accommodating the difference between individual units or groups in the dataset. In addition, it also considers the non-linear relationship of variables that are not captured by the straight or linear pattern. It is also effectively performed and robust in the presence of outliers in the data. The traditional OLS and fixed effect regression model provide estimates of the average effects. The PQR approach has room to minimize the influence of outliers in the model. PQR can distribute the data into different quantiles, i.e. 25%, 50% and 75%. The purpose of this distribution is to capture the variation in the data across different levels and provide in-depth analysis by examining how the relationship between the variables varies at diverse points in data. Ultimately, PQR provides a more detailed, deep, and comprehensive tool for analyzing the complex dynamics in panel data.

5. Results and discussion

Table 2 summarizes the descriptive statistics. It can help to understand the nature of data, its distribution, and the presence of outliers. The high value of kurtosis provides evidence of outliers in the data. In contrast, the value of the Jarque-Bera test and the significance of probability values provide evidence that series are not normally distributed. So, both conditions fulfill the application of the PQR approach (Rani, Amjad, Asghar, & Rehman, 2023).

Table 2
Descriptive Statistics of Developed Countries

	GC	FD	LNUR	LNTRADE	LNINDUS
Mean	4.1563	0.4559	15.8496	4.4391	3.3071
Median	4.488	0.4307	15.7649	4.4406	3.2610
Maximum	4.6016	1.0000	21.0675	6.0806	4.4621
Minimum	3.3414	0.0636	11.3038	2.9734	1.8133
Std.Dev.	0.1545	0.2321	1.7492	0.5111	0.3686
Skewness	-0.3995	0.3389	0.1268	0.1640	0.4509
Kurtosis	3.5707	2.1018	3.1537	3.6505	3.4916
Jarque Bera	71.6469	94.0618	6.5355	39.4449	102.4258
Probability	0.0000	0.0000	0.0000	0.0000	0.0000
Observation	1783	1783	1783	1783	1783
Descriptive statistics of developing countries					
Mean	3.8923	0.1662	15.7017	4.1441	3.1936
Median	3.9280	0.1285	15.5856	4.1367	3.2274
Maximum	4.8177	0.5158	20.0052	5.1951	4.2783
Minimum	2.1024	0.0260	11.9134	3.0428	1.4881
Std.Dev.	0.2080	0.0959	1.4421	0.4267	0.3912
Skewness	-2.2622	1.1655	0.1604	-0.0498	-0.7245
Kurtosis	16.1271	3.4950	3.6123	2.4576	4.7077
Jarque Bera	8603.352	253.4152	21.3308	13.5696	223.8676
Probability	0.0000	0.0000	0.0000	0.0000	0.0000
Observation	1071	1071	1071	1071	1071

To check the level of integration of selected variables, the present study uses two separate panel unit root tests. Table 3 summarizes ADF and IPS test findings. In developed countries, the IPS test reveals GC, LNUR, and LNINDUS are stationary at level, whereas FD and LNTRADE become stationary at the first difference. The ADF test indicates that, except for GC, all other variables become stationary at the first difference. In developing countries, IPS shows

that GC, LNUR, and INDUS are stationary at the level, and FD and LNTRADE become stationary at the first difference. Whereas ADF shows GC and LNUR are stationary at a level and FD, LNTRADE, and LNINDUS become stationary at I (1).

Table 3
Unit Root Test

Variables Developed countries	IPS At Level	IPS At 1st difference	ADF At Level	ADF At 1st difference
GC	-6.9363*	-	407.267*	-
FD	-5.1691*	-	491.442	-
LNUR	-18.0065*	-	2624.57	-
LNTRADE	0.7219	-27.4943*	203.464	1073.36*
LNINDUS	-0.0543*	-28.8063*	235.652	1138.00*
Developing countries				
GC	-4.5160*	-	280.696*	-
FD	0.5346	-29.956*	113.831	860.757*
LNUR	-9.1002*	-	1958.86	-
LNTRADE	0.4639	-20.7704*	138.202	649.4660*
LNINDUS	-2.0886*	-22.5269*	149.724	739.094*

∗ **and ** show levels of significance of 1% and 5%, respectively**
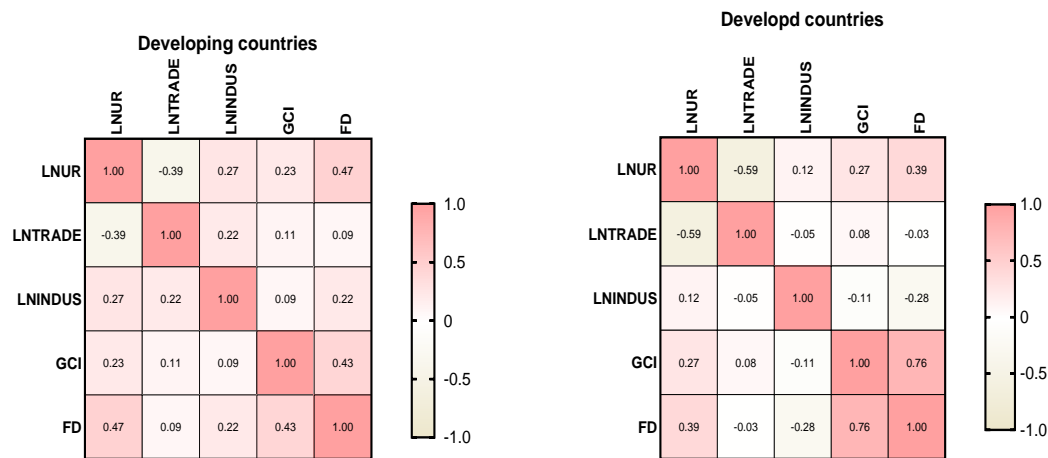
Figure 3: Correlation Plots

Table 4
Variance Inflation Factor

Variable	Developed countries		Developing countries	
	VIF	1/VIF	VIF	1/VIF
FD	1.51	0.6640	1.56	0.6391
LNUR	2.20	0.4549	1.91	0.5223
LNTRADE	1.70	0.5879	1.31	0.7651
LNINDUS	1.17	0.8523	1.26	0.7962
Mean VIF	1.64		1.51	

The correlation plots are present in Figure 3. The light color indicates the weak correlation among independent variables and no issue of multi-collinearity. Table 5 illustrates the VIF results of both developed and developing nations. It has been observed that all independent variables have tolerance values less than 10, which suggests the absence of multi-collinearity among variables (Asteriou & Kadzutu, 2024). The study employs the Panel Quantile Regression (PQR) method and reports its findings in Table 6. The research model incorporates the FD Index to assess its influence on global competitiveness. Moreover, both linear and non-linear aspects of FD are integrated into the model to examine the nonlinear affiliation between FD and global competitiveness.

Table 6
The Results of PQR

	Developed countries			Developing countries		
	Lower GC	Middle GC	Higher GC	Lower GC	Middle GC	Higher GC
FD	0.7924*	0.6777*	0.8247*	2.6346*	1.9083*	1.4828*
	(0.0586)	(0.0436)	(0.0529)	(0.2621)	(0.2149)	(0.1973)
FD^2	-0.2752**	-0.1486*	-0.3034*	-3.7839*	-2.8037*	-2.0878**
	(0.0571)	(0.0425)	(0.0512)	(0.5852)	(0.4797)	(0.4406)
LNUR	0.0026**	0.0029	0.0009	0.0230*	0.0263*	0.0146*
	(0.0024)	(0.0018)	(0.0021)	(0.0054)	(0.0044)	(0.0041)
LNTRADE	0.0173*	0.0258*	0.0160**	0.0894*	0.0737*	0.0235
	(0.0077)	(0.0057)	(0.0069)	(0.0155)	(0.0127)	(0.0117)
LNINDUS	0.0507*	0.0473*	0.0487*	0.0012	0.0030	0.0610**
	(0.0087)	(0.0065)	(0.0078)	(0.0156)	(0.0128)	(0.0118)
Cons	3.7226*	3.5702*	3.7007*	2.7799*	2.9436*	3.2785*
	(0.0638)	(0.0475)	(0.0544)	(0.1279)	(0.1049)	(0.0963)
Pseudo R^2	0.3940	0.4295	0.4193	0.2317	0.2006	0.1539

Note: *and** show levels of significance 1% and 5%, respectively

The findings of the study demonstrate that the level coefficient of FD considerably raises global competitiveness in all quantile groups for developed nations. Meanwhile, the quadratic coefficient of financial development at lower, middle, and high quartile groups significantly declines global competitiveness. The level and quadratic coefficient of FD are utilized to propose the inverted U-shaped curves through its constant term, mean, and standard deviation, as shown in Figures 5, 6, and 7.

Similarly, for developing countries, the level coefficient of financial development (FD) positively influences global competitiveness. Meanwhile, the square term of FD is negatively related to global competitiveness (GC) across the lower, middle, and high quantile groups. When the level and quadratic coefficients of FD are traced by using its constant term, mean, and standard deviation, the inverted U-shaped link is proposed, which is presented in Figures 8, 9, and 10. It should be noted that the inverted U-shaped association between variables considers the stages of economic development. It is stated that at the early stage, FD positively impacts global competitiveness through easy access to capital, technological advancement, and institutional efficiency up to a certain level. However, as financial systems mature, potential challenges or risks may arise, which demonstrates the native relationship between both (Prochniak & Wasiak, 2017).

The path of economic growth will be slowed down when FD is low in a country. Increase in FD, on the other hand, makes the world more competitive. Developed nations have well-established financial structures as compared to developing countries. These nations reach the optimal level of FD earlier in their financial process and increase their competitiveness. However, the financial structures of developing countries are not sustainable and often face challenges such as inadequate infrastructure and weak regulatory frameworks throughout their financial progress. These uncertainties harm the economic program of developing countries as they are unable to maintain their global competitiveness.

The results show that urbanization has a multi-dimensional effect on GC. For both developed and developing nations, it positively enhances GC for all quartile groups (Tang, Li, Hu, & Wu, 2020). In developed countries, urbanization creates a sense of specialization in the production process through the division of labour and technological innovation. These elements enhance the quality of life and competitiveness of developed countries (Njoh, 2003). Similarly, in developing nations, urbanization promotes structural changes when it is properly planned and

managed. It helps to increase employment opportunities and provide better health and quality education (Arouri et al., 2014).

Quadratic effect of FD on GC

Developed Countries   **Developing countries**
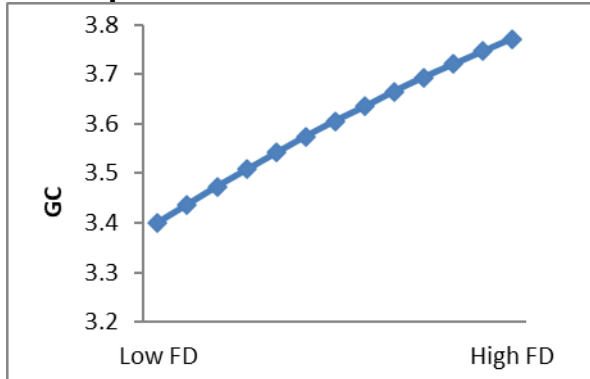
Figure 5: Quadratic effect of FD at lower GC
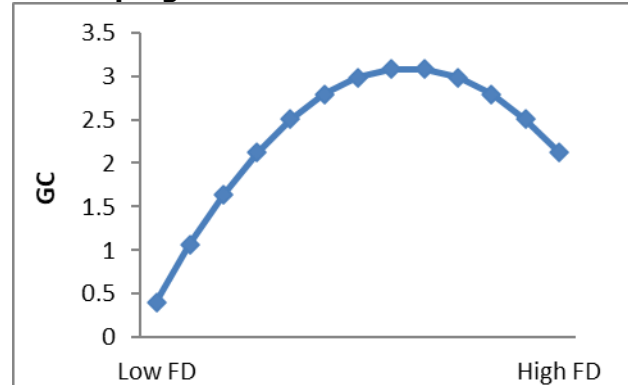
Figure 8: Quadratic effect of FD at lower GC
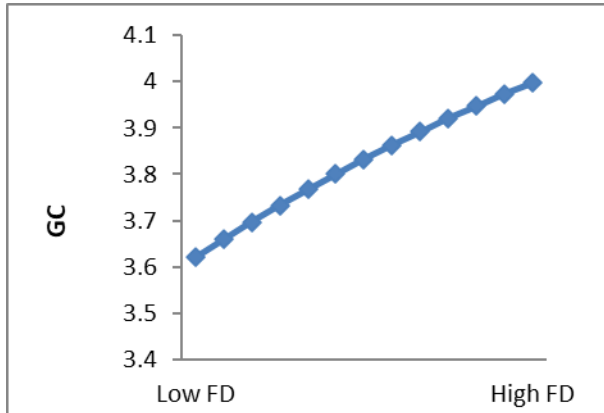
Figure 6: Quadratic effect of FD at Middle GC
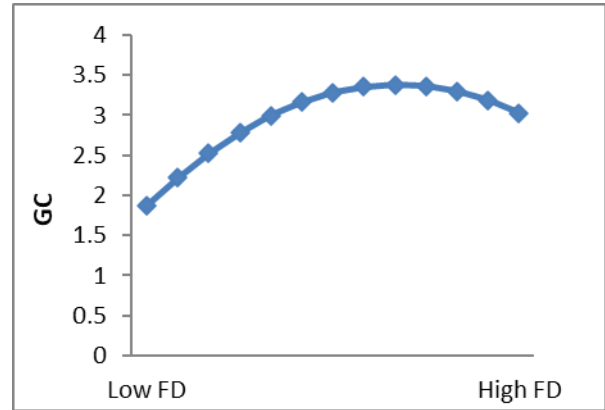
Figure 9: Quadratic effect of FD at Middle GC
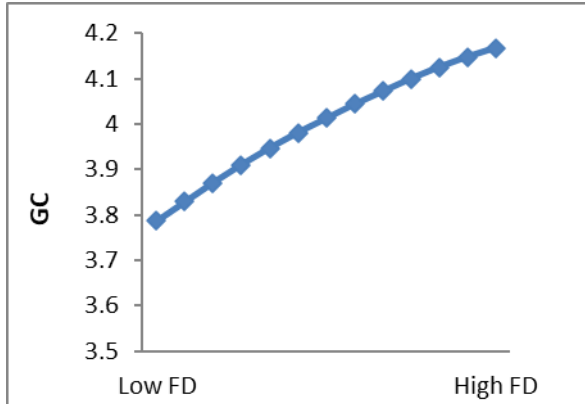
Figure 7: Quadratic effect of FD at higher GC
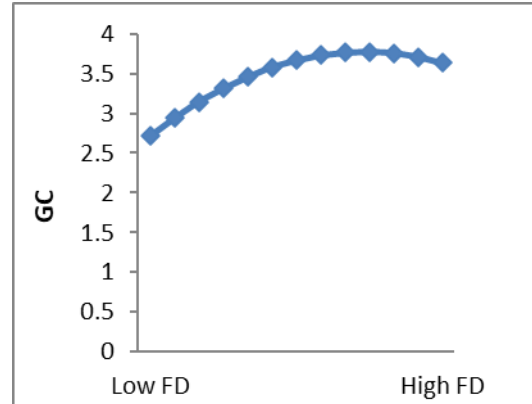
Figure 10: Quadratic effect of FD at higher GC

Trade liberalization and global competitiveness (GC) also have positive associations across different nations. Trade liberalization expands the markets by exchanging goods and services, which promotes FDI, accelerates capital formation, and enhances economic productivity through the multiplier effect. This result is aligned with Samimi and Jenatabadi (2014). Industrialization also imposes favorable effects on GC for developed and developing nations. It

created economies of scale, sparked technological advancement, produced a skilled labor force, and developed infrastructure, which led to economic expansion in developed nations. Meanwhile, for developing countries, industrialization helps to increase economic productivity, diversification, capital formation, employment, and economic growth (Dreher, 2006).

Table 7 presents the cut-off value to recognize the optimum point of the inverted U-shaped curve for developed and developing nations. The cut-off value is computed from the level and the quadratic coefficient of FD. In developed nations, the cut-off values do not lie between the minimum and maximum values of FD across all quantile groups. It indicates that all the developed countries lie below the cut-off values, and the inverted U-shaped Kuznets curve is not validated in the case of developed nations. Meanwhile, in developing nations, the cut-off values lie between the minimum and maximum values of FD. It confirms the validity of the inverted U-shaped Kuznets curve in the case of developing nations.

Furthermore, the linearized marginal effect identifies whether each country lies before or after the maturity of the inverted U-shaped curve (Amjad & ur Rehman, 2023). It has been predicted that all the developed nations lie before the maturity of an inverted U-shaped curve. The most of the developing countries show the same trend except Bolivia, Cabo Verde, Egypt, India, Indonesia, Korea Rep of, Lebanon, Mongolia, Morocco, Nigeria, Pakistan, Philippines, Siri Lanka, Tunisia, and Vietnam (see Appendix Table).

The results reveal the diverse relationship between FD and global competitiveness across different countries. In some economies, financial growth initially promotes competitiveness and then declines eventually after a point due to the misallocation of resources, rising cost of capital, and economic crisis, but this trend is not observed in developed countries. These countries have well-balanced economic structures with highly diversified financial services, solid regulatory environments, technological innovation, and where FD continues to support competitiveness and does not follow the inverted U-shaped relationship (Ibrahim & Alagidede, 2018; Nguyen & PHAM, 2021). However, the dynamics between FD and competitiveness are different in developing countries. Developing nations such as Nigeria and Sri Lanka continuously struggle for sustainable competitiveness in the initial stage of economic development. In this stage, financial institutions and markets are expanding and evolving positive outcomes. However, excessive financialization without appropriate regulations or in the presence of systemic issues such as political instability, corruption, and inflation lead to financial turmoil and halt the path of sustainable development in these countries. At this juncture, developed countries need to regulate fintech and digital financial growth to maintain financial stability and competitiveness. Whereas, developing countries should focus on strengthening their financial regulations, fostering financial literacy, and encouraging productive investments to attain optimal levels of sustainable financial growth, which boosts their competitiveness (Samargandi, Fidrmuc, & Ghosh, 2015).

Table 7
Cut-off Values of the Inverted U-shaped Curve

Coefficient	Developed countries			Developing countries		
	Lower GC	Middle GC	High GC	Lower GC	Middle GC	High GC I
Level coefficient	0.6671	0.6777	0.7924	2.6346	1.9083	1.4828
Quadratic coefficient	-0.1401	-0.1486	-0.2752	-3.7839	-2.8037	-2.0878
Cut off	4.7614	2.2800	1.4397	0.3481	0.3403	0.3551

6. Conclusion and policy recommendations

Presently, all the countries primarily focus on global competitiveness for achieving SDGs. FD is core indicator that enables nations to maintain economic growth. The present study tries to investigate the influence of FD on a nation's competitiveness in 87 advanced and 60 emerging economies from 2000 to 2020. This study uses a comprehensive index called Global

competitiveness as a dependent variable representing economic prosperity and growth accurately.

Furthermore, the present study estimates the non-linear relationship among variables using the PQR approach, which has lower, middle, and higher quantile groups. The empirical results of the PQR approach suggest that FD is critical in accelerating economic productivity and boosting economic growth globally. At the same time, it can be observed the non-linear behavior of FD, due to the fluctuation of the business cycle is caused by the financial crisis. The quadratic term of FD is used to capture the non-linear relationship.

The results showed that an inverted U-shape relationship is not validated between FD and GC for lower, middle, and higher quantile groups. In comparison, developing countries show inverted U-shaped relationship across all quantile groups. In addition, linearized marginal effects are also calculated for future implications which demonstrated that all developed countries lie before the maturity of an inverted U-shaped curve. In developing nations, Bolivia, Cabo Verde, Egypt, India, Indonesia, Korea Rep of, Lebanon, Mongolia, Morocco, Nigeria, Pakistan, Philippines, Siri Lanka, Tunisia, and Vietnam lie after the maturity of the inverted U-shaped curve. It reveals that FD positively impacts a nation's competitiveness and further financialization may hurt the competitiveness of countries.

This analysis indicates that an optimal level of FD is needed for sustainable global competitiveness, especially for developing nations. A comprehensive set of policies and strategies are necessary to boost global competitiveness through sustainable financial growth in developing countries. Some general policy recommendations are presented below.

➢ Investment should be made to strengthen the financial infrastructure, regulate the banking sector, create efficient payment systems, and promote digital financial services to enhance financial inclusion through easy access to bank services, mobile baking, and microfinancing. Easy access to bowering and lending can also improve financial inclusion.
➢ Financial literacy programs can help individuals to make financial decisions as the investment in education helps in promoting financial literacy among people to understand complex financial dealings.
➢ The study suggests that there is a need to strengthen the institutional framework for financial stability and integrity with the formulation of regulatory measures. It includes improving the rule of law through the legal system, controlling corruption through anti-corruption measures, and enhancing the overall business environment by protecting investor rights. Furthermore, investments should be made in the transportation, telecommunications, and energy sectors as these sectors embrace the advancement in technology, enhance efficiency, and reduce costs associated with the financial system.
➢ Developing countries such as Pakistan, Sri Lanka, Indonesia, and Egypt need to shift their focus from financial expansion to financial efficiency to prevent overleverage by tightening macroprudential policies.

The study provides guidelines to the policymakers and financial institutions' to uderstand and multifaceted relationship between FD and global competitiveness. It may provide guidelines in shaping the policies and regulations to enhance financial efficiency. To improve productivity and increase EG, this study also suggests that government and monetary authorities should consider the need for frequent conversations about financial matters.

Authors' Contribution

Maida Amjad: Conceptualization, Methodology, Formal analysis, writing-original draft.
Nabila Asghar: Conceptualization, Supervision, Writing- review and editing

Conflict of Interests/Disclosures
The authors declared no potential conflict of interest w.r.t the research, authorship and/or publication of this article.

References

Ahmed, R. N., & Ahmad, K. (2016). Impact of Population on Economic Growth: A Case Study of Pakistan. *Bulletin of Business and Economics (BBE), 5*(3), 162-176.

Alomari, M. W., Marashdeh, Z., & Bashayreh, A. G. (2019). Contribution of Financial Market Development in Competitiveness Growth. *Cogent Economics & Finance*. doi:https://doi.org/10.1080/23322039.2019.1622483

Amjad, M. A., & ur Rehman, H. (2023). The Long Run Dynamics of Sustainable Economic Development on Ecological Footprint in Developed and Developing Countries: Panel Quantile Regression. *Review of Education, Administration & Law, 6*(2), 191-210. doi:https://doi.org/10.47067/real.v6i2.322

Anton, S. G., & Bostan, I. (2017). The Role of Access to Finance in Explaining Cross-National Variation in Entrepreneurial Activity: A Panel Data Approach. *Sustainability, 9*(11), 1947. doi:https://doi.org/10.3390/su9111947

Arouri, M. E. H., Youssef, A. B., Nguyen-Viet, C., & Soucat, A. (2014). Effects of Urbanization on Economic Growth and Human Capital Formation in Africa.

Asteriou, D., & Kadzutu, R. (2024). The Effects of Non-Trade Non-Rent Barriers on Intra-Africa Trade. *Economics & Politics*. doi:https://doi.org/10.1111/ecpo.12317

Bhatti, M. A., Raheem, F. u., & Zafar, M. A. (2020). Environmental Kuznets Curve (Ekc): Empirically Examined Long Run Association between Globalization, Financial Development and Co2 Emission for Asean Countries. *iRASD Journal of Energy & Environment, 1*(1), 01-13. doi:https://doi.org/10.52131/jee.2020.0101.0001

Elfaki, K. E., Handoyo, R. D., & Ibrahim, K. H. (2021). The Impact of Industrialization, Trade Openness, Financial Development, and Energy Consumption on Economic Growth in Indonesia. *Economies, 9*(4), 174. doi:https://doi.org/10.3390/economies9040174

Erkisi, K., & Ceyhan, T. (2019). Trade Liberalization and Economic Growth: A Panel Data Analysis for Transition Economies in Europe. *Journal of Economics Finance and Accounting, 6*(2), 82-94. doi:https://doi.org/10.17261/Pressacademia.2019.1047

Fuinhas, J. A., Marques, A. C., & Carreira, R. (2015). A Different Look over the Financial Depth Nonlinearity: Evidence from Europe. *Revista de Estudos Sociais, 17*(35), 120-135. doi:https://doi.org/10.19093/res.v17i35.2543

Hodijah, S., & Hastuti, D. (2023). Financial Development and Economic Growth of Asean Countries During the Covid-19 Pandemic. *Urbanizing the Regional Sector to Strengthen Economy and Business to Recover from Recession*, 21.

Ibrahim, M., & Alagidede, P. (2018). Effect of Financial Development on Economic Growth in Sub-Saharan Africa. *Journal of Policy Modeling, 40*(6), 1104-1125.

Jelilov, G., Enwerem, H. I., & Isik, A. (2016). The Impact of Industrialization on Economic Growth: The Nigeria Experience (2000-2013). *British Journal of Advance Academic Research, 5*(1), 11-20.

Khatatbeh, I. N., & Moosa, I. A. (2023). Financialisation and Income Inequality: An Investigation of the Financial Kuznets Curve Hypothesis among Developed and Developing Countries. *Heliyon, 9*(4).

Klemetti, T. (1989). International Competitiveness and Business Strategies Golf Industry. *(No Title)*.

Koenker, R., & Bassett Jr, G. (1978). Regression Quantiles. *Econometrica: journal of the Econometric Society*, 33-50.

Mahtta, R., Fragkias, M., Güneralp, B., Mahendra, A., Reba, M., Wentz, E. A., & Seto, K. C. (2022). Urban Land Expansion: The Role of Population and Economic Growth for 300+ Cities. *Npj Urban Sustainability, 2*(1), 5. doi:https://doi.org/10.1038/s42949-022-00048-y

Nawaz, M. A., Ahmad, T. I., Hussain, M. S., & Bhatti, M. A. (2020). How Energy Use, Financial Development and Economic Growth Affect Carbon Dioxide Emissions in Selected Association of South East Asian Nations? *Paradigms*(S1), 159-164.

Nguyen, P. T., & PHAM, T. T. T. (2021). The Impact of Financial Development on Economic Growth: Empirical Evidence from Transitional Economies. *The Journal of Asian Finance, Economics and Business, 8*(11), 191-201.

Opoku, E. E. O., & Yan, I. K.-M. (2019). Industrialization as Driver of Sustainable Economic Growth in Africa. *The Journal of International Trade & Economic Development, 28*(1), 30-56. doi:https://doi.org/10.1080/09638199.2018.1483416

Özdemir, L. (2017). Relationship between Financial Development and Logistics Performance and Their Effects on the Competitiveness: An Empirical Cross-Country Study.

Paudel, R. (2014). Trade Liberalisation and Economic Growth in Developing Countries: Does Stage of Development Matter? *Available at SSRN 2545735*.

Prochniak, M., & Wasiak, K. (2017). The Impact of the Financial System on Economic Growth in the Context of the Global Crisis: Empirical Evidence for the Eu and Oecd Countries. *Empirica, 44*, 295-337. doi:https://doi.org/10.1007/s10663-016-9323-9

Rani, T., Amjad, M. A., Asghar, N., & Rehman, H. U. (2023). Exploring the Moderating Effect of Globalization, Financial Development and Environmental Degradation Nexus: A Roadmap to Sustainable Development. *Environment, Development and Sustainability, 25*(12), 14499-14517. doi:https://doi.org/10.1007/s10668-022-02676-x

Salvatore, D. (2010). Globalisation, International Competitiveness and Growth: Advanced and Emerging Markets, Large and Small Countries. *Journal of International Commerce, Economics and Policy, 1*(01), 21-32.

Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the Relationship between Financial Development and Economic Growth Monotonic? Evidence from a Sample of Middle-Income Countries. *World development, 68*, 66-81. doi:https://doi.org/10.1016/j.worlddev.2014.11.010

Samimi, P., & Jenatabadi, H. S. (2014). Globalization and Economic Growth: Empirical Evidence on the Role of Complementarities. *PloS one, 9*(4), e87824. doi:https://doi.org/10.1371/journal.pone.0087824

Schumpeter, J. A. (2008). The Theory of Economic Development.

Sundari, B., & Alfatihah, P. (2023). Impact of Financial Market Development on Global Competitiveness and Foreign Direct Investment. *International Journal Management and Economic, 2*(1), 41-45.

Tang, M., Li, Z., Hu, F., & Wu, B. (2020). How Does Land Urbanization Promote Urban Eco-Efficiency? The Mediating Effect of Industrial Structure Advancement. *Journal of Cleaner Production, 272*, 122798. doi:https://doi.org/10.1016/j.jclepro.2020.122798

Wang, Q., Zhang, F., Li, R., & Li, L. (2022). The Impact of Renewable Energy on Decoupling Economic Growth from Ecological Footprint–an Empirical Analysis of 166 Countries. *Journal of Cleaner Production, 354*, 131706. doi:https://doi.org/10.1016/j.jclepro.2022.131706

Zanella, F., Oyelere, P., & McMillan, D. (2021). Is Financial Development Crucial for All Economies? *Cogent Economics & Finance, 9*(1). doi:https://doi.org/10.1080/23322039.2021.1923883

Appendix
Table A
Linearized Marginal Effect of Developed Countries

Sr	Developed countries	Mean value of FD	Low Quantile group τ = 30th	Middle Quantile group τ = 50th	High Quantile group τ = 75th
1	Albania	0.1666	0.6204	0.6282	0.7007
2	Argentina	0.2999	0.5831	0.5886	0.6274
3	Armenia	0.1737	0.6185	0.6261	0.6968
4	Australia	0.9148	0.4108	0.4058	0.2889
5	Austria	0.6372	0.4886	0.4883	0.4417
6	Azerbaijan	0.1369	0.6288	0.6370	0.7171
7	Bahamas, The	0.4182	0.5500	0.5534	0.5623
8	Bahrain	0.4227	0.5487	0.5521	0.5598
9	Barbados	0.4012	0.5547	0.5585	0.5716
10	Belgium	0.6546	0.4837	0.4832	0.4321
11	Belize	0.2135	0.6073	0.6143	0.6749
12	Bosnia and Herzegovina	0.2045	0.6098	0.6170	0.6799
13	Botswana	0.3270	0.5755	0.5805	0.6124
14	Brazil	0.5666	0.5084	0.5093	0.4806
15	Brunei Darussalam	0.3149	0.5789	0.5841	0.6191
16	Bulgaria	0.3502	0.5690	0.5737	0.5997
17	Canada	0.8460	0.4301	0.4263	0.3268
18	Chile	0.4836	0.5316	0.5340	0.5262
19	China	0.3777	0.5613	0.5655	0.5846
20	Colombia	0.3347	0.5734	0.5782	0.6082
21	Costa Rica	0.2391	0.6001	0.6067	0.6608
22	Croatia	0.4463	0.5421	0.5451	0.5468
23	Cyprus	0.5501	0.5130	0.5142	0.4897
24	Czechia	0.4245	0.5482	0.5515	0.5588
24	Denmark	0.6824	0.4759	0.4749	0.4168
25	Dominica	0.2267	0.6036	0.6104	0.6677
26	Dominican Republic	0.1485	0.6255	0.6336	0.7107
27	Ecuador	0.1390	0.6282	0.6364	0.7159
28	Jordan	0.4483	0.5415	0.5445	0.5457
29	Estonia	0.2850	0.5873	0.5930	0.6356
30	Finland	0.6025	0.4983	0.4986	0.4608
31	France	0.7692	0.4516	0.4491	0.3690
32	Gabon	0.1005	0.6390	0.6479	0.7371
33	Georgia	0.1845	0.6154	0.6229	0.6909
34	Germany	0.7385	0.4602	0.4582	0.3860
35	Greece	0.5468	0.5139	0.5152	0.4915
36	Guatemala	0.1954	0.6124	0.6197	0.6849
37	Guyana	0.1413	0.6276	0.6357	0.7147
38	Hungary	0.4695	0.5356	0.5382	0.5340
39	Iceland	0.5530	0.5122	0.5134	0.4881
40	Ireland	0.7098	0.4682	0.4667	0.4017
41	Israel	0.5587	0.5106	0.5117	0.4849
42	Italy	0.7592	0.4544	0.4521	0.3745
43	Jamaica	0.2818	0.5882	0.5940	0.6373
44	Japan	0.8157	0.4386	0.4353	0.3435
45	Kazakhstan	0.2957	0.5843	0.5898	0.6297
46	Kuwait	0.4183	0.5499	0.5534	0.5622
47	Latvia	0.2510	0.5968	0.6031	0.6543
48	Libya	0.1256	0.6319	0.6404	0.7233
49	Lithuania	0.2236	0.6045	0.6113	0.6694
50	Luxembourg	0.7292	0.4628	0.4610	0.3911
51	Malaysia	0.6277	0.4913	0.4912	0.4470
52	Maldives	0.1585	0.6227	0.6306	0.7052
53	Malta	0.5143	0.5230	0.5248	0.5093
54	Mauritius	0.3881	0.5584	0.5624	0.5788
55	Mexico	0.3612	0.5659	0.5704	0.5936
56	Moldova	0.2134	0.6073	0.6143	0.6750
57	Morocco	0.3107	0.5801	0.5854	0.6214
58	Namibia	0.4278	0.5473	0.5506	0.5570
59	Netherlands	0.7753	0.4499	0.4473	0.3657
60	New Zealand	0.5604	0.5101	0.5112	0.4840
61	Norway	0.6755	0.4778	0.4769	0.4206

62	Oman	0.3633	0.5653	0.5697	0.5925
63	Panama	0.3785	0.5611	0.5652	0.5841
64	Paraguay	0.1211	0.6332	0.6417	0.7258
65	Peru	0.2961	0.5842	0.5897	0.6294
66	Poland	0.4163	0.5505	0.5540	0.5633
67	Portugal	0.6921	0.4732	0.4720	0.4115
68	Qatar	0.5152	0.5228	0.5246	0.5088
69	Romania	0.2215	0.6051	0.6119	0.6705
70	Russian Federation	0.5006	0.5268	0.5289	0.5169
71	Saudi Arabia	0.4263	0.5477	0.5510	0.5578
72	Serbia	0.2328	0.6019	0.6085	0.6643
73	Seychelles	0.3322	0.5741	0.5790	0.6096
74	Singapore	0.7261	0.4637	0.4619	0.3928
75	Slovak Republic	0.2600	0.5943	0.6005	0.6493
75	Slovenia	0.4419	0.5433	0.5464	0.5492
76	South Africa	0.5562	0.5113	0.5124	0.4863
77	Spain	0.8502	0.4289	0.4250	0.3245
78	Suriname	0.1732	0.6186	0.6262	0.6971
79	Sweden	0.7659	0.4525	0.4501	0.3708
80	Switzerland	0.9425	0.4030	0.3976	0.2737
81	Thailand	0.6109	0.4960	0.4962	0.4562
82	Trinidad and Tobago	0.3303	0.5746	0.5796	0.6106
83	Turkiye	0.4627	0.5375	0.5402	0.5378
84	United Arab Emirates	0.4269	0.5475	0.5508	0.5575
85	United Kingdom	0.8900	0.4177	0.4132	0.3026
86	United States	0.9046	0.4137	0.4089	0.2945
87	Uruguay	0.2066	0.6092	0.6163	0.6787

Table B
Linearized Marginal Effect of Developing Countries

Sr	Developing countries	Mean value of FD	Low Quantile group τ = 30th	Middle Quantile group τ = 50th	High Quantile group τ = 75th
1	Algeria	0.1246	1.6917	0.5535	0.9625
2	Angola	0.1285	1.6624	0.5245	0.9463
3	Bangladesh	0.2098	1.0465	-0.0850	0.6065
4	Benin	0.1003	1.8758	0.7357	1.0641
5	Bhutan	0.1682	1.3618	0.2270	0.7805
6	Bolivia*	0.2126	1.0260	-0.1053	0.5952
7	Burkina Faso	0.0954	1.9123	0.7718	1.0842
8	Burundi	0.1051	1.8392	0.6995	1.0439
9	Cabo Verde*	0.2101	1.0445	-0.0871	0.6054
10	Cambodia	0.1086	1.8124	0.6729	1.0291
11	Cameroon	0.0817	2.0162	0.8747	1.1416
12	Chad	0.0737	2.0772	0.9350	1.1752
13	Congo, Dem. Rep. of the	0.0379	2.3478	1.2029	1.3245
14	Congo, Rep. of	0.0759	2.0602	0.9182	1.1658
15	Cote d'Ivoire	0.1450	1.5369	0.4003	0.8771
16	Egypt Arab Rep.*	0.3190	0.2207	-0.9024	0.1509
17	Ethiopia	0.1131	1.7787	0.6396	1.0105
18	El Salvador	0.1801	1.2714	0.1375	0.7306
19	Gambia The	0.0861	1.9829	0.8417	1.1232
20	Ghana	0.1372	1.5964	0.4592	0.9099
21	Guinea	0.0745	2.0710	0.9289	1.1718
22	Haiti	0.0875	1.9724	0.8313	1.1174
23	Honduras	0.1806	1.2678	0.1340	0.7286
24	India*	0.4373	-0.6745	-1.7884	-0.3431
25	Iran	0.3362	0.0901	-1.0317	0.0788
26	Indonesia*	0.3246	0.1784	-0.9442	0.1276
27	Kenya	0.1539	1.4697	0.3338	0.8400
28	Korea, Rep. of*	0.8160	-3.5409	-4.6253	-1.9246
29	Kyrgyz Republic	0.0969	1.9011	0.7607	1.0780
30	Leo PDR	0.1348	1.6143	0.4769	0.9198
31	Lebanon*	0.2943	0.4076	-0.7174	0.2540
32	Lesotho	0.1383	1.5878	0.4507	0.9052
33	Liberia	0.1340	1.6208	0.4834	0.9234

708

34	Madagascar	0.0929	1.9318	0.7911	1.0950
35	Malawi	0.0776	2.0474	0.9055	1.1588
36	Mali	0.1006	1.8735	0.7334	1.0628
37	Mauritania	0.0965	1.9045	0.7641	1.0799
38	Mongolia*	0.2639	0.6376	-0.4898	0.3809
39	Morocco*	0.3107	0.2833	-0.8404	0.1854
40	Mozambique	0.1097	1.8040	0.6647	1.0245
41	Myanmar	0.1018	1.8646	0.7246	1.0579
42	Nepal	0.1414	1.5648	0.4278	0.8925
43	Nicaragua	0.1205	1.7229	0.5843	0.9797
44	Nigeria*	0.2087	1.0548	-0.0769	0.6111
45	Pakistan*	0.2624	0.6490	-0.4785	0.3872
46	Philippines*	0.3293	0.1424	-0.9799	0.1077
47	Rwanda	0.1039	1.8486	0.7088	1.0491
48	Senegal	0.0951	1.9146	0.7741	1.0855
49	Sierra Leone	0.0585	2.1919	1.0485	1.2385
50	Siri Lanka*	0.2499	0.7431	-0.3854	0.4391
51	Syrian Arab Republic	0.0993	1.8833	0.7431	1.0682
52	Tajikistan	0.1009	1.8707	0.7306	1.0613
53	Tanzania	0.0942	1.9218	0.7812	1.0895
54	Timor-Leste	0.0861	1.9831	0.8419	1.1233
55	Tunisia*	0.2001	1.1206	-0.0118	0.6474
56	Uganda	0.0855	1.9874	0.8462	1.1257
57	Ukraine	0.1953	1.1563	0.0236	0.6671
58	Vietnam*	0.3674	-0.1460	-1.2653	-0.0515
59	Yemen Rep.	0.1049	1.8404	0.7006	1.0445
60	Zambia	0.1767	1.2970	0.1629	0.7447