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ECONOMIC GROWTH AND FINANCIAL DEVELOPMENT IN DEVELOPING COUNTRIES: AN EMPIRICAL INVESTIGATION USING PANEL CAUSALITY ANALYSIS OF CANNING AND PEDRONI

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Abstract

This study aims to investigate the causal relationship between financial development (FD) and economic growth (EG) from 1990 to 2022. 45 developing countries and the approach recommended by Canning and Pedroni (2008) has been applied to determine this link. Based on the result of Unit Roots tests, the variables are first-order integrated. The cointegration connection indicates that, despite ongoing external shocks, the time series are linked in a long-term equilibrium. For the whole panel, the causality results show a long-run, unidirectional causal relationship. The long-run causal link from EG to FD is not supported by panel causality data. Examining group averages, there is no long-term causal relationship from FD to EG or EG to FD. The results demonstrate the validity of the supply-leading viewpoint and demonstrate that financial market reforms, financial market liberalization policies, and improved financial intermediation services all have a favorable impact on EG in the economies under discussion.

Keywords: Developing Countries, Economic Growth, Financial Development
JEL Classification: C33, G18, O16

GELİŞMEKTE OLAN ÜLKELERDE EKONOMİK BÜYÜME VE FİNANSAL GELİŞME: CANNİNG VE PEDRONİ'NİN PANEL NEDENSELLİK ANALİZİ İLE AMPİRİK BİR ARAŞTIRMA

Öz

Bu çalışma, 1990-2022 dönemi için finansal gelişme (FD) ile ekonomik büyüme (EG) arasındaki uzun vadeli nedensel bağlantıyı incelemektedir. Bu çalışmada 45 gelişmekte olan ülke için finansal gelişme (FD) ile ekonomik büyüme (EG) arasındaki ilişki Canning ve Pedroni (2008) panel nedensellik testi ile incelenmiştir. Birim Kök testleri sonucuna göre değişkenler birinci dereceden eşbütünleşiktir. Eşbütünleşme bağlantısı, devam eden dış şoklara rağmen zaman serilerinin uzun vadeli bir dengede bağlantılı olduğunu göstermektedir. Panelin tamamı için nedensellik sonuçları uzun vadeli, tek yönlü bir nedensellik göstermektedir. EG'den FD'ye uzun vadeli nedensellik bağlantısı panel nedensellik verileri tarafından desteklenmemektedir. Grup ortalamalarına bakıldığında FD'den EG'ye veya EG'den FD'ye uzun dönemli bir nedensellik ilişkisi bulunmamaktadır. Sonuçlar, arz odaklı bakış açısının geçerliliğini ortaya koymakta ve finansal piyasa reformlarının, finansal piyasa liberalizasyon politikalarının ve iyileştirilmiş finansal aracılık hizmetlerinin tamamının, tartışılan ekonomilerde EG üzerinde olumlu bir etkiye sahip olduğunu göstermektedir.

Anahtar Kelimeler: Gelişmekte Olan Ülkeler, Ekonomik Büyüme, Finansal Gelişme
JEL Sınıflandırması: C33, G18, O16

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1. INTRODUCTION

Financial systems are effective factors in the process of EG, as they perform the function of providing funds for the diffusion of new technologies and the realization of capital accumulation. With the liberalization process in the world, especially since 1980, restrictions between countries have decreased, trade has become easier, and capital flows have accelerated. As a result, the financial system has grown and become more complex. Financial expansion can be defined as the diversification of financial services across a number of industries and an increase in the number of financial institutions.

Since Schumpeter (1911) there have been considerable disagreements regarding the existence of the relationship between FD and EG in the literature on economics. While early studies concentrated on the role of FD in EG, more recent studies have paid more attention to the direction of this link. In the context of causality between the investigated variables, Patrick (1966) while classifying the causality of the relationship, also distinguishes between leading supply and trailing demand.

Most developing countries are looking for ways to develop financial markets and increase EG. Developing the financial sector is one of the most important tools to increase EG. According to classical growth theories, FD affects EG through increasing capital and technological innovation. The further development of financial markets provides the possibility of wider participation of the population in economic activities and increases the production of the society. However, due to the fact that financial markets in developing countries are not developed or very little developed, a large number of people cannot access financial resources, and on the other hand, resources and savings are not properly equipped. As a result, because the financial system does not have enough efficiency in allocating savings to productive investments, these savings become unproductive investments. The process of capital accumulation is also delayed and the fields of creating new job opportunities are limited.

In this study, the theoretical aspects of the relationship between research variables have been discussed first. After reviewing the literature, with the help of Canning and Pedroni's (2008) panel causality test, the causality between FD and EG is investigated considering the annual observations of 45 selected developing countries between 1990 and 2022. Considering the importance of the impact of FD on EG and considering the disagreement from the empirical and theoretical aspects, it seems necessary to conduct a research for developing countries in order to reach a decisive conclusion about the direction of the relationship. The current research tries to investigate the nature of the long-term causal relationship between the variables in addition to the direction of the causal relationship. Previous research (Dritsakis and Adamopoulos (2004), Thangavelu and Ang (2004), Shahbaz et al. (2008), Wolde-Rufael (2009), Eita and Jordan (2010), Gounder (2012), Kar et al. (2014), Ofori-Abebrese et al. (2017), Pradhan et al. (2017), Tunalı and Onuk (2017), Pata and Ağca (2018), Ismail et al. (2019), Perera and Paudel (2019), Tadesse and Abafia (2019), Mike and Alper (2021), Dahmani et al. (2022)) has examined this relationship in a specific country or the world as a whole, but in this study developing countries were specifically examined. Also, previous research (Table 1) has used the Granger causality test to investigate the causal relationship. However, in this research, the method suggested by Canning and Pedroni (2008) has been used.

2. LITERATURE

The functions of financial systems have a major role in the interaction between FD and EG. According to Tobin and Brainard (1963) resource allocation is more effective when financial systems are sophisticated and run well. Financial intermediaries assess the risks associated with various investment possibilities and focus resources on the most lucrative ones, improving investment quality

and speeding EG. The growth of financial institutions and markets provides market players with timely, reliable information, finances cutting-edge investment projects, and improves resource allocation.

With better access to the services of financial intermediaries, the costs of business will fall. If the cost to outside investors of verifying investment returns is high, their willingness to lend will decline, and productive investment will be discouraged by these costs. In an advanced financial system, these monitoring costs are reduced by financial regulation. The reduction in monitoring costs is expected to have a directly proportional effect on EG as investors' control over the firm increases (Bernanke and Gertler, 1990). In other ways, according to Levine (1997) financial systems ensure the flow of savings from different households so that they can be used to finance investment. More saving deposits are made available and more funding for investment is produced as financial systems develop. Growing investment as a result of more available finance also hastens the accumulation of fixed capital and aids in EG.

Schumpeter (1911) accepts technological innovation as the engine of EG. Innovation is achieved through technology-oriented research and investments. Therefore, the factors that facilitate technological innovation will also accelerate EG. Although the literature focus attention about the function of financial markets as a middleman between savings and investments, King and Levine (1993) concentrate on how FD affects productivity using the endogenous growth model as a framework. According to this approach, FD will positively affect EG. As a result, it is clear that there should be a single direction of causality from FD to EG. Robinson claimed in 1952 that a growth in demand for the services determined by financial intermediaries is necessary with relation to the financial system to develop. The need for financial services grows along with the expansion of industries that rely on them. In other words, the financial sector grows when EG rises, and EG and FD are causally related in only one direction. According to Patrick (1966) with EG, new opportunities are also provided for entrepreneurs. But, in order to raise their demand for financial services, entrepreneurs want outside funding. Consequently, a causal connection exists between EG and FD. Additionally, the financial sector may develop into a development engine if the financial system gets better. Advanced financial systems have more effective performance and transfer the resources of financial investors from traditional sectors to modern sectors and thus increase productivity.

In making policy decisions related to economic development, the causality between FD and EG is very important. Therefore, understanding the causality's direction is crucial. Regarding the relationship between these two variables, economists have presented different theories. These studies can be divided into 4 perspectives: Some researchers such as Lucas (1988), Stern (1989), Meier and Seers (1984) and Dawson (2003) believe that financial development has no effect on EG.

Another point of view is called the demand side point of view and was first proposed by Patrick (1966). Proponents of this view believe that EG leads to FD and the direction of causation is from EG to FD (demand leadership view). According to this view, along with EG, technology advances and labor productivity increases, as a result, there is a rise in the demand for financial services, leading to the expansion of the financial industry. Proponents of this view include Robinson (1952), Gurley and Shaw (1955), Friedman and Schwartz (1963), Jung (1986) and Irland (1994) and Khan (2001).

Another point of view is called the supply side point of view. This view was also proposed by Patrick (1966). In this view, the finance industry is advanced first, then the real sector of the economy. Therefore, policymakers should implement policies to increase financial institutions and provide the basis for increasing EG with policies to increase savings and investment. However, in contrast, the removal of government restrictions on the banking system increases investment. This view sees financial

institutions as intermediaries between savers and investors and believes that if financial repression is reduced, these institutions can play their real role in terms of meeting the needs of the production sector. This viewpoint contends that easing regulations like the maximum interest rate and the large legal reserve will promote economic growth. Proponents of this point of view include Boyd and Prescott (1968), Goldsmith (1970), Mckinnon (1973), Shaw (1973), Townsend (1979), King and Levine (1993), Levine and Zervos (1997), Levine et al. (2000) and Levine (2005).

The last point of view suggests the relationship between FD and EG simultaneously. Stated differently, there exists a two-way causal relationship between EG and FD. In this perspective, when EG is in the early stages, financial markets expand, the supply of financial assets increases, and therefore, EG results from the financial sector's expansion (Supply-Leading). At higher levels of EG, economic growth increases FD (demand side view). Greenwood and Smith (1997), Levintel and Khan (1999) and Demetriades and Hussain (1996) support this view. Greenwood and Smith (1997), Luintel and Khan (1999) and Demetriades and Hossein (1996) support this view.

The experimental studies conducted in this field are also divided into 4 groups. The results of some research show that FD has no effect on EG. In several cases, financial development is the cause of EG, whereas in other cases the reverse is true. Finally, some researches indicate a two-way causality.

Table 1. Causality Studies

Authors	Sample	Period	Causality
Ahmed and Ansari (1998)	Pakistan, Sri Lanka, India	1974-1991	FD → EG
Luintel and Khan (1999)	10 countries	1960-1996	FD ↔ EG
Gursoy and Al-Aali (2000)	Bahrain, Kuwait and Saudi Arabia	1973-81	Kuwait: FD → EG Other countries: EG → FD
Calderón and Liu (2003)	108 developing countries	1960-1994	FD → EG
Dritsakis and Adamopoulos (2004)	Greece	1960:I-2000:IV	FD ↔ EG
Thangavelu and Ang (2004)	Australia	1970-1980	FD ↔ EG
Habibullah and Eng (2006)	A number of Asian countries	1991-1998	FD → EG
Shahbaz et al. (2008)	Pakistan	1971-2006	FD ↔ EG
Enisan and Olufisayo (2009)	7 African countries	1980-1985	FD → EG
Wolde-Rufael (2009)	Kenya	1966-2005	FD ↔ EG
Eita and Jordan (2010)	Botswana	1977-2006	FD → EG
Gounder (2012)	Fiji	1970-2005	FD ↔ EG
Yildirim et al. (2013)	10 Developing European countries	1990-2012	EG → FD
Kar et al. (2014)	Turkey	1989-2007	EG → FD
Menyah et al. (2014)	A number of African countries	1966-2008	No causal association
Ofori-Abebrese et al. (2017)	Ghana	1970-2013	FD → EG
Pradhan et al. (2017)	ASEAN	1991-2011	FD ↔ EG
Tunalı and Onuk (2017)	Turkey	2003-2015	EG → FD
Bist (2018)	16 low-income countries	1995-2014	FD → EG
Swamy and Dharani (2018)	24 Developed countries	1983-2013	FD ↔ EG
Pata and Ağca (2018)	Turkey	1982-2016	FD → EG
Ismail et al. (2019)	Malaysia	1990-2013	EG → FD
Perera and Paudel (2019)	Sri Lanka	1955-2005	No causal association
Tadesse and Abafia (2019)	Ethiopia	1975-2016	FD → EG
Mike and Alper (2021)	Fragile Five	1980-2017	FD → EG (Indonesia, South Africa)
Dahmani et al. (2022)	Tunisia	1995-2018	FD ↔ EG

3. DATA, ECONOMETRIC APPROACH, AND ASSESSMENT OF RESULTS

3.1. Data and Model

In this study, 45 countries with the highest economic growth have been selected from developing countries for the period of 1990-2022 and the causal relationship between FD and EG has been investigated in these countries.

For this purpose, Canning and Pedroni (2008) panel causality test was used. The required data is also taken from the World Bank. The model used for empirical analysis is as follows:

$$GDP_{it} = \beta_{0+} \beta_1 FD_{it} + \varepsilon_{it} \quad (1)$$

GDP_{it} = Real Gross Domestic Product per capita (2015 US dollars constant).

FD_{it} = Financial development. It is measured by the quantity of domestic credit extended to the private sector (as a share of GDP).

ε_{it} = error term

i = country i = 1, 2, …, 45

t = time t = 1990-2020

3.2. Empirical Findings

3.2.1. Cross-sectional Dependence

If there is a cross-sectional dependence between the series, ignoring this may lead to biased results and as a result wrong interpretations (Pesaran, 2004; Chudik and Pesaran, 2011). Cross-sectional dependence is decisive for the selection of panel unit root tests, cointegration tests, and causality tests. Therefore, obtaining reliable results requires starting the analysis by examining the cross-sectional dependence. Cross-sectional dependence is investigated with the help of Lagrange multiplier (LM) tests by Breusch and Pagan (1980) and cross-sectional dependence (CD) by Pesaran (2004). If the time dimension (T) of the panel is larger than the cross-sectional dimension (N), the LM test is used, and when the cross-sectional dimension is larger, the CD test is used (Pesaran, 2004). Accordingly, within the scope of the present study, the presence or absence of Cross-sectional Dependence was tested with the CD test. Pesaran's (2004) test statistic is in equation (2) and when T is large enough, CD → $N(0,1)$ is the limit of the function N → ∞.

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{P}_{ij} \right) \quad (2)$$

$\hat{P}$ is the sample estimate of the test pairwise correlation of the residuals.

CD test was applied separately for both variables and research model. Table 2 contains the findings of this experiment.

Table 2. Tests for cross-sectional dependencies

Test / Variables	CD_{LM1}	CD_{LM2}	CD_{LM3}	CD_{LM-adj}
	Statistics	Statistics	Statistics	Statistics
GDP	22.89 (0.880)	19.57 (0.320)	20.14 (0.201)	17.36 (0.501)
FD	10.17 (0.321)	9.87 (0.290)	14.48 (0.300)	12.38 (0.571)
Model				
	25.206 (0.203)	7.421 (0.739)	2.490 (0.440)	9.540 (0.301)

Source: Author's findings
Note: The probability values are shown by the values in parenthesis.

According to the results of the CD test in Table 2, the null hypothesis that there is no cross-sectional dependence is not rejected. Therefore, it was found that economic growth or financial development of the countries investigated in this research are not affected by each other.

3.2.2. Slope Homogeneity

Most panel data programs assume that the series are homogeneous. However, this assumption is not very realistic. If heterogeneity of slope coefficients is discovered, tests that account for heterogeneity should be performed. For this purpose, Pesran and Yamagata (2008) slope homogeneity test was used. This test provides results based on two different statistics as $\tilde{\Delta}$ and $\tilde{\Delta}_{adj}$ for large and small samples and is calculated as follows:

$$\tilde{\Delta}= \sqrt{N}\left(\frac{N^{-1}\tilde{S}-k}{\sqrt{2k}}\right) \quad (3)$$

$$\tilde{\Delta}_{adj}= \sqrt{N}\left(\frac{N^{-1}\tilde{S}-E(\tilde{z}_{iT})}{\sqrt{Var(\tilde{z}_{iT})}}\right) \quad (4)$$

N, cross-section size

S, Swamy test statistic

k, number of explanatory variables

E brackets, expected value

Var brackets, variance

Table 3 shows the results of the slope homogeneity test.

Table 3. Slope Homogeneity Test Results

Tests	Statistics
$\tilde{\Delta}$	7.018 (0.300)
$\tilde{\Delta}_{adj}$	8.648 (0.290)

Source: Author's findings
Note: The probability values are shown by the values in parenthesis.

According to the results of delta tests in Table 3, the null hypothesis that the model is homogeneous is not rejected.

The results of the cross-sectional dependence test and the slope homogeneity test allow the first-generation panel unit root, cointegration and causality tests.

3.2.3. Test For Panel Unit Roots

Tests suggested by Choi (2001), Levin et al. (2002) (LLC), Im et al. (2003) (IPS) have been used to determine if the time series is stationar and whether the unit root is present or absent. LLC assumes that all units have the same autoregressive parameter and that the cross-sectional units of the test are independent. IPS uses average likelihood ratio and Dickey-Fuller tests for the panel unit root test. These tests are based on more general assumptions than the LL test, and according to the simulation results in IPS, they show better performance than the LL test in limited samples. The Choi test can be applied to infinite or finite N observations. It takes into account that there is a different deterministic structure for each unit and that there may be a different time dimension. It also does not ignore that some of the series forming the panel data may be stationary and some may be non-stationary. Table 4 contains the findings of this experiment.

Table 4. Panel Unit Root Test

Test / Variable	LLC	IPS	Choi
GDP	5.23 (0.180)	5.62 (0.240)	5.78 (0.210)
FD	6.67 (0.491)	7.34 (0.121)	7.39 (0.360)
dGDP	-6.80*** (0.000)	-6.32*** (0.000)	-7.29*** (0.000)
dFD	-7.83*** (0.000)	-7.65*** (0.000)	-8.37*** (0.001)

Source: Author's findings

*** indicates 1% level significance.

The probability values are shown by the values in parenthesis.

The right lag length was chosen using Schwartz's criterion.

H_0: A unit root exists.

H_1: No unit root exists.

dGDP: First-order difference of GDP

dFD: First-order difference of FD

As Table 4 shows, at the time series level, the null hypothesis cannot be ruled out, indicating the presence of a unit root. For this reason, the time series were re-examined after differentiating once. The findings show that there is no unit root and that the null hypothesis is rejected with a 1% confidence level. Therefore, all variables are first-order, or I(1), integrations.

3.2.4. Test of Panel Cointegration

The cointegration connection indicates that, despite ongoing external shocks, the time series are linked in a long-term equilibrium. The long-term connection between the variables and the presence of cointegration were examined using the cointegration tests developed by Pedroni (1999) and Kao (1999). Pedroni's test provides the possibility of heterogeneity in the covariance vector. Not only does it allow the dynamic and fixed effects to vary across panel segments, but it also allows the cointegral vector to

vary across segments under the alternative hypothesis. The Pedroni test allows for individual heterogeneity of fixed effects and trend conditions in the panel. It recommends seven test statistics for hypothesis testing, of which four are within-group statistics and three are between-group statistics. Another cointegration test is the Kao cointegration test. Kao in 1999 proposed a cointegration test for panel data analysis using DF and ADF tests. The results are collected in Table 5.

Table 5. Test of Panel Cointegration

Pedroni (1999)	
Test	t-statistic
Panel	
V	5.34** (0.042)
PP	5.32*** (0.000)
ρ	3.81** (0.039)
ADF	7.12*** (0.001)
Group	
PP	3.21*** (0.000)
ρ	2.21** (0.033)
ADF	5.15*** (0.002)
Kao (1999)	
ADF	2.85*** (0.000)

Source: Author's findings

A significance level of 1% or 5% is indicated by the symbols *** and **, respectively.

The probability values are shown by the values in parenthesis.

The right lag length was chosen using Schwartz's criterion.

H_0: Cointegration does not exist.

H_1: Cointegration exists.

Considering the results of the Pedroni cointegration test panel, the H_0 hypothesis is rejected for all panel statistics at the significance level of 1% and 5%. Therefore, there is cointegration between the variables. In group statistics, For all groups, the H_0 hypothesis is rejected at the significance levels of 1% and 5%. Accordingly, all seven Pedroni tests show that FD and EG have high cointegration.

H_0 hypothesis is rejected based on the results of the Kao cointegration test at a significance level of 1%, this further demonstrates the long-term link and cointegration between the factors. The findings indicate that FD and EG have a long-term cointegrated relationship in 45 selected developing countries.

3.3.5. Long-run Panel Causality Tests

The conventional Granger causality test or other techniques are typically employed to look into the short-term causal link between variables. But in this research, unlike usual, the long-term causality between the variables has been investigated. On the basis of this, the long-term causality link between the variables and the coefficient of this relationship was displayed using the approach Canning and Pedroni (2008) developed. From this perspective, this approach is significant since it offers details on

both the direction and the causation of the long-term connection between the variables. Table 6 contains a list of the test findings.

Table 6. Long-Run Panel Causality Tests

	$\lambda_2 = FD_{it} \rightarrow GDP_{it}$		$\lambda_1 = GDP_{it} \rightarrow FD_{it}$		λ_2/λ_1
	coefficient	t-statistics	coefficient	t-statistics	median
Lambda-Pearson		47.53** (0.050)		51.52 (0.180)	0.29
Group mean	1.85	1.71 (0.140)	4.15	2.26 (0.110)	0.62

Source: Author's findings

** denotes 5% level significance.

The probability values are shown by the values in parenthesis.

H_0: There is no causality.

H_1: There is causality.

According to the Lambda-Pearson statistic, there is a one-way causal link from FD to EG, according to the panel's overall causality conclusions. Because, at a significance level of 5%, the H_0 hypothesis is rejected across the board in the panel. Thus, it is verified that there is a long-term causal link between FD and EG. But on the other hand, in examining the causality from EG to FD in the entire panel, the H_0 hypothesis is not rejected. Thus a long-run causal link from EG to FD is not supported by panel causality data. Examining the group average, the H_0 hypothesis is not disproved. As a result, there is no long-term causal relationship from FD to EG or EG to FD.

4. Results and Conclusion

Financial markets increase EG by directing savings to the most productive areas and increasing investment and by providing various financial instruments. An issue that has become very controversial in recent years is whether FD affects EG or whether EG leads to financial development. The causal relationship between the level of FD and EG, depending on the direction of the causal relationship, is expressed in the form of leading supply and demand hypotheses. According to the demand-following view, EG leads to financial growth by raising demand for the services offered by the financial sector. According to the supply-oriented view, the direction of causality is from FD to EG.

In this study, the causality relationship between FD and EG in 45 developing countries between 1990 and 2022 has been done using the long-term Canning and Pedroni (2008) causality test.

First, the CD test was applied to both variables and the research model. Considering the non-rejection of cross-sectional dependence, it was found that the economic growth or financial development of the countries investigated in this research are not affected by each other. The results of the slope homogeneity test also show the homogeneity of the research model. Based on the results of these two tests, the tests used in this research are the first-generation tests. Then, the stationarity test was performed for the variables and the results of the tests of Choi (2001), Im et al. (2003) (IPS), and Levin et al. (2002) (LLC) showed that all variables are cointegrated from degree 1. Next, Pedroni (1999) and Kao (1999) cointegration tests were used to assess the cointegration and long-term association between the variables. The obtained findings demonstrate the long-term link and cointegration between the variables. FD and EG have a long-term cointegration relationship and a common trend for the research period. Lastly, the Canning and Pedroni (2008) technique was used to examine the causal link between FD and EG. For the whole panel, the causality results show a long-run, unidirectional causal relationship between FD and EG. The outcomes show that the supply-leading position is correct. In examining

causality from EG to FD across the entire panel, the long-run causal link from EG to FD is not supported by panel causality data. Examining group averages, there is no long-term causal relationship from FD to EG or EG to FD. The results demonstrate the validity of the supply-leading viewpoint. These findings are consistent with Ahmed and Ensari (1998), Calderón and Liu (2003), Habibullah and Eng (2006), Enisan and Olufisayo (2009), Eita and Jordan (2010), Ofori-Abebrese et al. (2017), Bist (2018), Pata and Ağca (2018), Tadesse and Abafia (2019), Mike and Alper (2021).

The results indicate that FD is the root cause of EG. Since the actual sector and the financial sector frequently interact, the growth of the financial industry, diversification of financial instruments, and the development of resources to meet the demands of the private sector would all increase EG.

The results demonstrate the validity of the supply-leading viewpoint and demonstrate that financial market reforms, financial market liberalization policies, and improved financial intermediation services all have a favorable impact on EG in the economies under discussion. The existence and nature of the interaction between FD and EG become crucial factors in formulating policies intended to accelerate EG, particularly for developing nations. In this context, policies that promote and preserve macroeconomic stability, expand the economy's openness to international trade, and boost human and physical capital through making the most efficient use of resources will all have a favorable impact on FD and, consequently, EG.

The study's conclusions suggest that the financial sector needs to be developed and improved in order for it to participate actively in the EG process and for the best possible allocation of financial resources. Therefore, it is advised that emerging nations upgrade their banking infrastructure in order to aid in the efficient distribution of financial resources and to channel more money toward profitable investment projects.

Ethical Statement

In this research, ethical rules have been observed. Ethics committee approval is not necessary for the study.

Contribution Rate Statement

The contribution of the author is 100%.

Conflict Statement

This study has no personal or organizational conflicts of interest.

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Extended Abstract

Economic Growth And Financial Development In Developing Countries: An Empirical Investigation Using Panel Causality Analysis Of Canning And Pedroni

In this study, the theoretical aspects of the relationship between research variables have been discussed first. After reviewing the literature, with the help of Canning and Pedroni's (2008) panel causality test, the causality between FD and EG was investigated considering the annual observations of 45 selected developing countries between 1990 and 2022. Considering the importance of the impact of FD on EG and considering the disagreement from the empirical and theoretical aspects, it seems necessary to conduct a research for developing countries in order to reach a decisive conclusion about the direction of the relationship. The current research also examined the nature of the long-term causal relationship between the variables in addition to the direction of the causal relationship. Previous research has examined this relationship in a specific country or the world as a whole, but in this study developing countries were specifically examined. Also, previous research has used the Granger causality test to investigate the causal relationship. However, in this research, the method suggested by Canning and Pedroni (2008) has been used.

Since Schumpeter (1911) there have been considerable disagreements regarding the existence of the relationship between FD and EG in the literature on economics. While early studies concentrated on the role of FD in EG, more recent studies have paid more attention to the direction of this link. According to classical growth theories, FD affects EG through increasing capital and technological innovation. Financial intermediaries assess the risks associated with various investment possibilities and focus resources on the most lucrative ones, improving investment quality and speeding EG. Regarding the relationship between these two variables, economists have presented different theories. These studies can be divided into 4 perspectives: some researchers such as Lucas (1988), Stern (1989), Meier and Seers (1984) and Dawson (2003) believe that financial development has no effect on EG. Another point of view is called the demand side point of view. Proponents of this view believe that EG leads to FDand the direction of causation is from EG to FD (demand leadership view). Another point of view is called the supply side point of view. In this view, the finance industry is advanced first, then the real sector of the economy. The last point of view suggests the relationship between FD and EG simultaneously. Stated differently, there exists a two-way causal relationship between EG and FD.

From the tests proposed by Choi (2001), Levin et al. (2002) (LLC), Im et al. (2003) (IPS) was used to determine if the time series is stationar and whether the unit root is present or absent. The findings show that there is no unit root and all variables are first-order, or I(1), integrations. The long-term connection between the variables and the presence of cointegration were examined using the cointegration tests developed by Pedroni (1999) and Kao (1999). According to the results, there is cointegration between the variables. Accordingly, all seven Pedroni tests show that FD and EG have high cointegration. Results of the Kao cointegration test demonstrates the long-term link and cointegration between the factors. The findings indicate that FD and EG have a long-term cointegrated relationship in 45 selected developing countries. The long-term causality link between the variables and the coefficient of this relationship was displayed using the approach Canning and Pedroni (2008) developed. According to the Lambda-Pearson statistic, for the whole panel, the causality results show a long-run, unidirectional causal relationship between FD and EG. In examining causality from EG to FD across the entire panel, the long-run causal link from EG to FD is not supported by panel causality data. Examining group averages, there is no long-term causal relationship from FD to EG or EG to FD. The results demonstrate the validity of the supply-leading viewpoint.

The results indicate that FD is the root cause of EG. Since the actual sector and the financial sector frequently interact, the growth of the financial industry, diversification of financial instruments, and the development of resources to meet the demands of the private sector would all increase EG. Therefore, financial market reforms, financial market liberalization policies, and improved financial intermediation services all have a favorable impact on EG in the economies under discussion. Also suggest that the financial sector needs to be developed and improved in order for it to participate actively in the EG process and for the best possible allocation of financial resources.