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Exploring the Bidirectional Causality between Foreign Direct Investment and Economic Growth: Panel Data Evidence from MINT Countries*

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ABSTRACT

This study aims to reveal the direction and nature of the relationship between foreign direct investment (FDI) and economic growth in MINT countries (Mexico, Indonesia, Nigeria and Türkiye). In this study, annual data for the period 1970–2023 were analyzed using the Bootstrap Panel Causality test developed by Kónya (2006). According to the results of the analysis, there is a statistically significant and positive causality relationship from economic growth to FDI in Indonesia, Nigeria and Türkiye. In the analysis conducted for Mexico, no statistically significant relationship was found. On the other hand, a statistically significant and positive causal relationship from FDI to economic growth was found only in Nigeria. The results of the study provide noteworthy implications for both policymakers and investors and emphasise that the impact of FDI on growth should be evaluated in line with country dynamics. These findings underline the importance of aligning FDI policies with each country's structural characteristics and ensuring that foreign capital flows are directed toward productive sectors in order to support sustainable growth.

***Keywords**: MINT Countries, Foreign Direct Investment, Economic Growth, Bootstrap Panel Causality Test.*

***Jel Classification:** B22, C33, F21*

Doğrudan Yabancı Yatırımlar ile Ekonomik Büyüme Arasındaki Çift Yönlü Nedenselliğin İncelenmesi: MINT Ülkeleri Üzerine Ampirik Bir Panel Veri Analizi

ÖZET

Bu çalışma, MINT ülkelerinde (Meksika, Endonezya, Nijerya ve Türkiye) doğrudan yabancı yatırımlar (FDI) ile ekonomik büyüme arasındaki ilişkinin yönünü ve niteliğini ortaya koymayı amaçlamaktadır. Bu çalışmada, 1970-2023 dönemine ait yıllık veriler, Kónya (2006) tarafından geliştirilen Bootstrap Panel Nedensellik testi kullanılarak analiz edilmiştir. Analiz sonuçlarına göre, Endonezya, Nijerya ve Türkiye'de ekonomik büyümeden FDI'ya doğru istatistiki olarak anlamlı ve pozitif yönlü bir nedensellik ilişkisi tespit edilmiştir. Meksika için yapılan analizde ise istatistiksel olarak anlamlı bir ilişki bulunmamıştır. Öte yandan, FDI'dan ekonomik büyümeye doğru istatistiksel olarak anlamlı ve pozitif bir nedensellik ilişkisine yalnızca Nijerya'da rastlanmıştır. Çalışmanın sonuçları hem politika yapıcılar hem de yatırımcılar açısından dikkate değer çıkarımlar sunmakta; özellikle FDI'ın büyüme üzerindeki etkisinin ülke dinamikleri doğrultusunda değerlendirilmesi gerektiğine vurgu yapmaktadır. Bu bulgular, doğrudan yabancı yatırım politikalarının her ülkenin yapısal özellikleriyle uyumlu hâle getirilmesinin ve yabancı sermaye akımlarının sürdürülebilir büyümeyi destekleyecek üretken sektörlere yönlendirilmesinin önemini ortaya koymaktadır.

***Anahtar Kelimeler**: MINT Ülkeleri, Doğrudan Yabancı Yatırımlar, Ekonomik Büyüme, Bootstrap Panel Nedensellik.*

***JEL Sınıflandırması**: B22, C33, F21*

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1. INTRODUCTION

The relationship between FDI and economic growth has gained increasing attention due to their potential mutual reinforcement. In neoclassical models, FDI is treated similarly to domestic investment, while endogenous growth models view it as a more efficient driver of long-term growth through technology transfer and productivity gains (Borensztein, 1998: 115–135). Particularly in developing countries, FDI by multinational firms facilitates the diffusion of advanced technologies and skills. Supporting this view, Tanaya and Suyanto (2022: 57–69) and Al-Sadig (2013: 1267–1275) emphasize that FDI enhances productivity by intensifying competition and fostering capital renewal in host economies.

Since FDI is widely recognized as a key driver of economic growth, policies that encourage its inflow are critically important. Chakrabarti (2001: 89–114) highlights that FDI is influenced not only by economic growth but also by factors such as taxation, trade barriers, inflation, and domestic investment. Political factors also matter; Schneider and Frey (1985: 161–175) emphasize political stability as a major determinant of FDI inflows. According to Dunning's (1981: 30–64) eclectic theory (OLI model), FDI decisions rely on three elements: ownership-specific, location-specific, and internalization advantages. These include natural resources, market size, and government incentives. Balasubramanyam et al. (1996: 94–96) argue that export-oriented, liberalized markets are essential for maximizing the growth-enhancing effects of FDI. Similarly, de Mello (1997: 4–30) stresses the importance of outward-oriented trade regimes, institutional quality, and human capital in ensuring the effective absorption of foreign investment.

In contrast, Caves (1971) emphasizes that oligopolistic markets, where product differentiation is one of the factors encouraging FDI to enter the country, are also important. According to this view, foreign firms need oligopolistic structures to effectively use assets that generate profits, such as brand recognition, patents, and brand knowledge. Participating in competitive markets, on the other hand, can be more costly and disadvantageous (Caves, 1971: 5). A comparison of the studies shows that country-specific policies and practices can have different effects on FDI.

Overall, FDI is widely regarded as a key driver of economic growth in developing countries through capital accumulation, technology transfer, and employment generation. However, empirical findings on the FDI–growth relationship remain mixed and country-specific. Against this backdrop, the present study aims to examine the direction and nature of this relationship in MINT countries, which have drawn global investor interest due to their growth potential, strategic location, and natural resource endowments. These countries offer a compelling context to assess the heterogeneity of FDI impacts.

MINT (Mexico, Indonesia, Nigeria and Türkiye group), an acronym coined by Jim O'Neill, consists of 4 countries that are thought to be the center of attraction of the global economy (Kangal et al., 2018:22). There are many factors why MINT countries are considered together in the studies. First of all, although there are many factors that hinder economic growth in these countries, they are on their way to becoming a potential economic power with their young population structure (Balsalobre-Lorente et al., 2023: 81496). Mexico's advantage of cheap labor and being a link between North America and South America are among the factors that can accelerate its development. Indonesia's political importance due to its location, the value of Nigeria's oil and Türkiye's important geostrategic position are among the reasons that increase the importance of the countries (Kokotović and Kurečić, 2016: 30).

The main objective of this study is to empirically examine the causality between FDI and economic growth in Mexico, Indonesia, Nigeria and Türkiye, which are referred to as MINT countries. In this context, using annual data for the period 1970-2023, a robust analysis method that takes into account cross-country heterogeneity is adopted through the Bootstrap Panel Causality test developed by Kónya (2006: 978-992).

The importance of the study lies in its contribution to better understanding the role of MINT countries, which stand out as emerging economies, in global investment dynamics. The fact that these countries have similar structural characteristics but different economic contexts makes it necessary to analyze the FDI–growth relationship on a country-by-country basis. In this context, the study contributes to the literature by applying the Kónya (2006) bootstrap panel causality test in a country-specific framework using **a** long time span (1970–2023)**.** This approach enhances the empirical robustness of the analysis and offers new insights into

regional heterogeneity in FDI–growth dynamics. Moreover, the focus on the possibility of bidirectional causality provides a more holistic perspective by revealing not only the effects of FDI on growth but also the effects of economic growth on FDI.

2. LITERATURE REVIEW

The relationship between economic growth and FDI has been extensively examined in the literature, with a particular emphasis on emerging markets and developing economies. Numerous studies have sought to determine the direction and strength of causality between these two variables, producing mixed and country-specific results. Studies on Chile and Malaysia (Chowdhury and Mavrotas, 2006: 9-19), Pakistan (Iqbal et al., 2010:82-89), India (Samad and Akhtaruzzaman, 2014: 202-213), 30 developing countries (Adalı and Yüksel 2017: 109-118), Cabo Verde (Duarte et al., 2017: 132-142), ASEAN 5 countries (Ahmad et al., 2018: 685-700) and G20 (Özmerdivanlı and Akgün, 2024: 41-57) have revealed a bidirectional causality relationship between FDI and economic growth. On the other hand, unidirectional causality from FDI to economic growth has been found for Thailand (Chowdhury and Mavrotas, 2006:9-19), BRICS countries (Agrawal, 2015: 421-424) and Africa (Sunde, 2017:434-444). Unidirectional causality from growth to FDI was found in the cases of China, Malaysia and Singapore (Samad and Akhtaruzzaman, 2014: 202-213) and China, Brazil and India (Gupta and Singh, 2016:179-202). Some studies have reported no significant causality relationship between the variables, for example, Brazil (Shahzad, 2019: 118-127) and Russia and South Africa (Gupta and Singh, 2016).

In this study, we focus exclusively on empirical research that presents both panel-level and individual country-level analyses for MINT countries. This dual approach enables us to capture both common patterns across the group and unique dynamics within each country, offering a more comprehensive perspective on the FDI–growth nexus in the MINT context.

Sanchez-Loor and Zambrano (2015: 746–753) explored the relationship between foreign direct investment (FDI) and economic growth in Latin American countries, specifically Colombia, Ecuador, and Mexico, from 1980 to 2012. Their findings varied by country, revealing a unidirectional causality where economic growth leads to FDI in Mexico.

Among the studies conducted for Türkiye, Acaravcı and Akyol (2017: 17–33) examined the relationship between FDI and economic growth over the period 1998–2015 using the Granger causality test, and reported a unidirectional causality running from FDI to economic growth. Similarly, Koyuncu (2017: 17–24) confirmed this direction of causality for the longer period of 1990–2015. In contrast, Kahveci and Terzi (2017: 135–154) identified a unidirectional causality in the opposite direction—from economic growth to FDI. Meanwhile, Benghoul and Aydin (2019:1181–1194), analyzing data from 1984 to 2017, found no evidence of a causal relationship between the two variables in the case of Türkiye. These divergent findings underscore the complexity and context-specific nature of the FDI–growth nexus in the Turkish economy.

For the case of Indonesia, Lee and Fernando (2021: 68–82) examined the relationship between FDI and economic growth using the VECM Granger causality test and found no causal link between the two variables. In contrast, Tanaya and Suyanto (2022: 57–69) applied the standard Granger causality test to annual data spanning the period 1970–2018 and reported a unidirectional causality running from GDP to FDI, suggesting that economic expansion plays a key role in attracting foreign investment. More recently, Fazaalloh (2024: 1–22) conducted a sectoral-level analysis using province-level data to assess the impact of FDI on economic growth. Based on fixed effects estimations, the study finds that FDI has a statistically significant and positive effect on economic growth across Indonesian provinces. Notably, FDI inflows into the manufacturing, mining, water, gas and electricity, hotels and restaurants, and real estate sectors were found to contribute positively and significantly to regional economic growth, highlighting the sector-specific nature of the FDI–growth relationship in Indonesia.

In the case of Nigeria, Ogunjobi et al. (2024:513-518) analyzed the relationship between foreign direct investment (FDI) and economic growth using annual data from 1990 to 2020, and identified a unidirectional causality running from economic growth to FDI. This finding is corroborated by Aina et al. (2025), who employed monthly data covering the period from April 2016 to June 2023 and reached the same conclusion. On the other hand, Uwazie et al. (2015), using annual data from 1970 to 2013, and Agbailu (2025), using quarterly data from 2015 to 2022, found evidence of a bidirectional causality between FDI and economic

growth. These varying results highlight the sensitivity of causality outcomes to data frequency, time periods, and estimation techniques in the Nigerian context.

Specific to MINT countries, Lin and Benjamin (2018: 708–720) analyzed the relationship between FDI and economic growth for the period 1990–2014. The findings indicate bidirectional causality between the variables both individually in all countries and on a panel basis. Another study that analyzes the relationships between the same variables in MINT countries with Granger causality test belongs to Sabharwal (2019: 35–41). Using data for the period 1981–2015, the results obtained for the panel show that there is a causality from GDP to FDI. While the same result is also valid for Mexico, Nigeria, and Türkiye, no causality relationship was found between the variables in Indonesia. Uçar (2025: 481–495) reached similar results for the period 1974–2021 in MINT countries, confirming the presence of bidirectional causality between FDI and economic growth.

Table 1 presents a summary of the literature. A significant portion of the studies utilized Granger causality analysis; additionally, causality tests based on the Toda-Yamamoto approach and VECM, ECM, and VAR models were also applied in some studies. This table reports only the findings related to causality in the aforementioned studies.

Table 1. Summary of Literature

Authors/Year	***Countries***	***Period***	***Causality***
Chowdhury and Mavrotas (2006)	Chile, Malaysia	1969-2000	FDI ⟷ EG*
Iqbal et al. (2010)	Pakistan	1998-2009	
Samad and Akhtaruzzaman (2014)	India	1980-2010	
Adalı and Yüksel (2017)	30 developing countries	1991-2015	
Duarte et al. (2017)	Cabo Verde	1987-2014	
Ahmad et al. (2018)	ASEAN 5 countries	1981-2013	
Özmerdivanlı and Akgün (2024)	G20	2010-2021	
Chowdhury and Mavrotas (2006)	Thailand	1969-2000	FDI → EG
Agrawal (2015)	BRICS countries	1989-2012	
Sunde (2017)	Africa		
Samad and Akhtaruzzaman (2014)	China, Malaysia, Singapore	1980-2010	EG → FDI
Gupta and Singh (2016)	China, Brazil India	1992-2013	
Shahzad (2019)	Brazil	1986-2014	No causality
Gupta and Singh (2016)	Russia, South Africa	1992-2013	No causality
Sanchez-Loor and Zambrano (2015)	Mexico	1980-2012	EG → FDI
Acaravcı and Akyol (2017)	Türkiye	1998–2015	FDI EG
Koyuncu (2017)		1990–2015	
Kahveci and Terzi (2017)		1984-2015	EG → FDI
Benghoul and Aydin (2019)		1984- 2017	No causality
Lee and Fernando(2021)	Indonesia	1981-2018	No causality
Tanaya and Suyanto (2022)		1970–2018	EG → FDI

Fazaalloh (2024)	Nigeria	2010-2019	FDI → EG
Ogunjobi et al. (2024)		1990- 2020	EG → FDI
Aina et al. (2025)		2016- 2023 (Monthly)	
Uwazie et al. (2015)		1970-2013	FDI ↔ EG
Agbailu (2025)		2015-2022 (Quarterly)	
Lin and Benjamin (2018)	MINT countries	1990-2014	FDI ↔ EG Both separate and panel
Sabharwal (2019)		1981-2015	EG → FDI
Uçar (2025)		1974-2021	FDI ↔ EG

In general, in the literature, both the direction and the strength of causality relations between FDI and economic growth in MINT countries vary across countries. While some studies identify a unidirectional causality running from foreign direct investment to economic growth, others detect causality in the opposite direction — from economic growth to foreign direct investment; moreover, certain studies reveal a bidirectional relationship or no significant causality at all. This situation reflects the impact of differences in the economic structures of the countries in question, the policies implemented and the investment climate. This diversity in the literature makes it necessary to analyze the FDI-growth relationship on a country-by-country basis with detailed and up-to-date data.

3. DATA AND MODEL

The dataset of the study consists of annual real GDP growth rate (GRW) and FDI data for Mexico (MEX), Indonesia (IDN), Nigeria (NGA) and Türkiye (TUR) for the period 1970-2023. All data were retrieved from the World Bank's World Development Indicators database, ensuring consistency and comparability across countries and over time. In this study, the GRW variable represents the annual growth rate of GDP calculated at market prices (The World Bank, 2025a). The FDI variable indicates the percentage share of foreign direct investment inflows in gross domestic product (GDP) (The World Bank, 2025b).

The GRW and FDI data for MINT countries are given in Figure 1 and Figure 2.

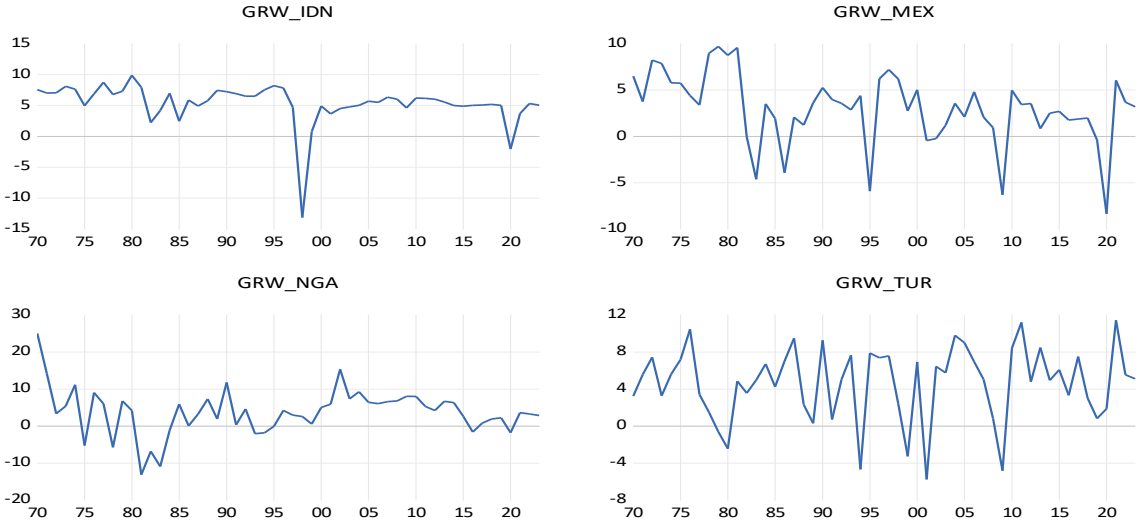

Figure 1. Growth Rates of MINT Countries

As illustrated in Figure 1, the economic growth rates of MINT countries have exhibited considerable fluctuations over the observed period. These fluctuations largely reflect the impact of both domestic economic cycles and external shocks, including periodic financial crises, global recessions, and commodity price volatility. All four countries experienced notable downturns in growth rates at various points, underscoring their vulnerability to global economic dynamics.

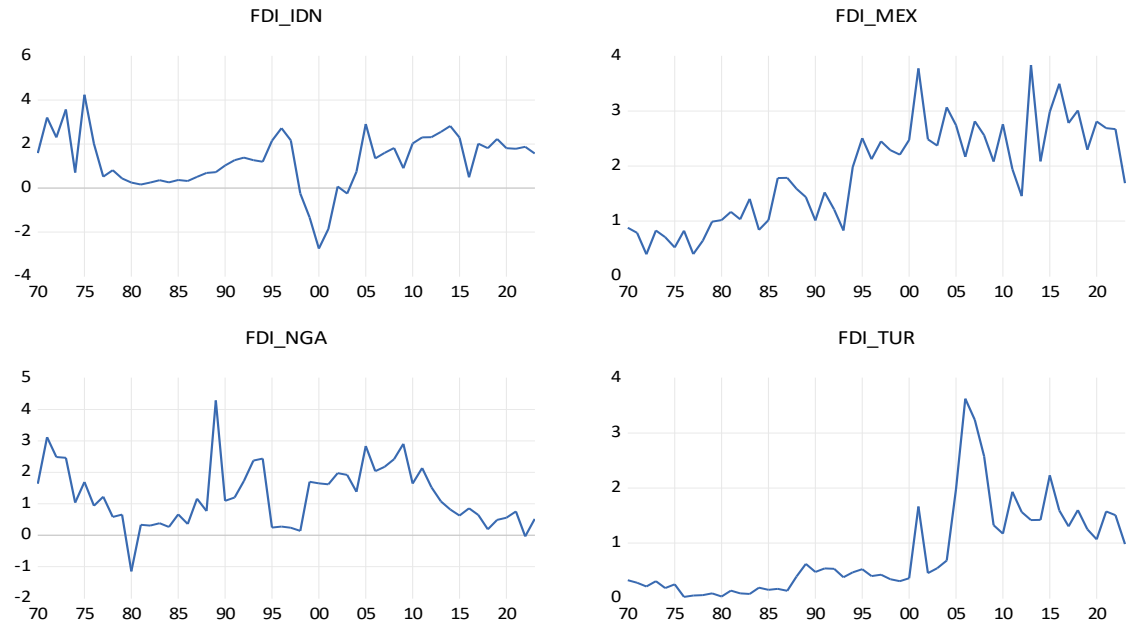

Figure 2. MINT Countries FDI

FDI trends in MINT countries differ over the years. While FDI in Mexico and Indonesia has generally been on an upward trend, a sudden and high increase in Türkiye in the early 2000s is noteworthy. In Nigeria, on the other hand, FDI rates have followed a highly fluctuating course, showing a decreasing trend over time. The relatively stable increases in Mexico and Indonesia, especially in the post-1980 period, suggest that these countries offer a more predictable environment for foreign investors. While the sudden spikes in Türkiye may reflect cyclical policy effects, the irregularities in Nigeria may indicate structural and security-related problems. These differences reveal that FDI is sensitive to country dynamics.

4. METHODOLOGY

In this study, the bootstrap panel causality test developed by Kónya (2006:978-983) will be used. This test can examine the causality relations between countries separately without the need for unit root and cointegration tests. However, there are two basic conditions for the test to be applied: horizontal cross-section dependence between models and heterogeneity of the models. Therefore, these two conditions should be checked before the test.

The most frequently used methods in the literature to test cross-sectional dependence are Breusch and Pagan's (1980:239-251) BP_{LM} test, Pesaran's (2004:1-37) CD_{LM} test, Pesaran et al. (2008:108) LM_{adj} test and Baltagi's (2012:167) LM_{BC} test. These tests show whether the error terms are independent of each other among the units in the panel data set. In other words, they determine whether the shock in one unit affects the other units. If the test result is significant, there is cross-sectional dependence and this should be taken into account in the analysis.

On the other hand, the $\tilde{\Delta}$ and $\tilde{\Delta}$_adj tests developed by Pesaran and Yamagata (2008:50-93) test whether the coefficients of the countries included in the panel data models are homogeneous (equal). If the tests are significant, this indicates that the coefficients are different from each other, that is, the model has a heterogeneous structure.

The presence of both cross-sectional dependence and heterogeneous structure in the models makes it possible to apply the panel bootstrap causality test developed by Kónya (2006). This test is based on the Seemingly Unrelated Regression (SUR) method developed

by Zellner (1962:348-368). Kónya claims that this method is more successful than the Ordinary Least Squares (OLS) estimator.

The direction of causality between the variables was tested separately on an individual country basis.

$$\left.\begin{aligned} FDI_{1,t} &= \varphi_{1,1} + \sum_{l=1}^{ml\_FDI_1} \alpha_{1,1,l} FDI_{1,t-1} + \sum_{l=1}^{ml\_GRW_1} \beta_{1,1,l} GRW_{1,t-1} + \xi_{1,1,t} \\ FDI_{2,t} &= \varphi_{1,2} + \sum_{l=1}^{ml\_FDI_1} \alpha_{1,2,l} FDI_{2,t-1} + \sum_{l=1}^{ml\_GRW_1} \beta_{1,2,l} GRW_{2,t-1} + \xi_{1,2,t} \\ &\vdots \\ FDI_{N,t} &= \varphi_{1,N} + \sum_{l=1}^{ml\_FDI_1} \alpha_{1,N,l} FDI_{N,t-1} + \sum_{l=1}^{ml\_GRW_1} \beta_{1,N,l} GRW_{N,t-1} + \xi_{1,N,t} \end{aligned}\right\} \quad (1)$$

$$\left.\begin{aligned} GRW_{1,t} &= \varphi_{2,1} + \sum_{l=1}^{ml\_GRW_2} \beta_{2,1,l} GRW_{1,t-1} + \sum_{l=1}^{ml\_FDI_2} \alpha_{2,1,l} FDI_{1,t-1} + \xi_{2,1,t} \\ GRW_{2,t} &= \varphi_{2,2} + \sum_{l=1}^{ml\_GRW_2} \beta_{2,2,l} GRW_{2,t-1} + \sum_{l=1}^{ml\_FDI_2} \alpha_{2,2,l} FDI_{2,t-1} + \xi_{2,2,t} \\ &\vdots \\ GRW_{N,t} &= \varphi_{2,N} + \sum_{l=1}^{ml\_GRW_2} \beta_{2,N,l} GRW_{N,t-1} + \sum_{l=1}^{ml\_FDI_2} \alpha_{2,N,l} FDI_{N,t-1} + \xi_{2,N,t} \end{aligned}\right\} \quad (2)$$

Model 1 is designed to examine the causality relationship between the effect of GRW on FDI, and Model 2 is designed to examine the causality relationship between the effect of FDI on GRW. The t symbol in the equation indicates the analysis period (1970–2023), the N symbol indicates the number of countries (i = 1, ..., 4), and ml indicates the lag length that minimizes the Akaike (AIC) and Schwartz (SC) information criteria.

5. FINDINGS

In line with the Kónya (2006) methodology, the optimal lag length was selected separately for each country using the Akaike Information Criterion (AIC). This country-

specific lag structure allows for heterogeneity in the VAR system and improves the accuracy of the causality test. The bootstrap procedure was performed with 10,000 replications.

Table 2 presents the findings of the cross-sectional dependency test.

Table 2. Cross-Section Dependence Test

Tests	Cross-section dependence			
Models	BP_{LM}	CD_{LM}	LM_{BC}	LM_{adj}
Model 1	27.483* (0.001)	3.177* (0.001)	6.164* (0.001)	6.201* (0.001)
Model 2	6.172 (0.404)	2.309** (0.020)	0.011 (0.990)	0.049 (0.960)
* = 1%, ** = 5%, *** = 10%				

According to the cross-sectional dependency test results presented in Table 2, all of the BPLM, CDLM, LMBC, and LMadj tests for Model 1 were statistically significant at the 1% level, indicating a strong cross-sectional dependence and a high degree of interaction among countries. In contrast, only the CDLM test was significant at the 5% level in Model 2, while the other tests were not statistically significant. Although the CDLM test is generally considered more suitable for panels with a large number of cross-sectional units and a relatively short time dimension (Pesaran, 2004), the panel structure used in this study (N=4, T≈54) does not fully meet those conditions. Therefore, the significance of the CDLM test alone in Model 2 should be interpreted with caution, as it may reflect limited evidence of cross-sectional dependence and a relatively weak degree of interaction among the countries.

The findings of the homogeneity tests are given in Table 3.

Table 3. Slope Homogeneity Test Results

$\tilde{\Delta}$	$\tilde{\Delta}_{adj}$
-0.995 (0.320)	-1.991** (0.046)
-0.971 (0.331)	-1.942*** (0.052)
* = 1%, ** = 5%, *** = 10%	

$\tilde{\Delta}$_adj tests developed by Pesaran and Yamagata (2008) test whether the coefficients are homogeneous among units (e.g. countries) in panel data models. As seen in Table 2, while the $\tilde{\Delta}$_adj test for Model 1 was found to be significant at the 5% level, the same test for Model 2 was found to be significant at the 10% level. Although the $\tilde{\Delta}$ test was not significant in both models, it is stated in the literature that the $\tilde{\Delta}$_adj test provides more reliable results in smaller

samples (Pesaran and Yamagata, 2008). Therefore, the analysis is based on the results of the $\tilde{\Delta}_{adj}$ test and it is accepted that there is coefficient heterogeneity in the models.

In line with these findings, it was concluded that the Kónya (2006) panel bootstrap causality test is applicable for both models. This method provides the opportunity to evaluate causality relationships separately by taking into account country-based structural differences.

The findings of the panel bootstrap causality test are given in Table 4.

Table 4. Panel Bootstrap Causality Test Findings

(Model 1)					
Countries	**Coefficients**	**Test Statistics**	**Critical Values**		
	β(GRW → FDI)	Wald	10%	5%	1%
IDN	**0.078****	**5.384****	**3.472**	**5.313**	**10.572**
MEX	-0.006	0.655	3.448	5.140	9.203
NGA	**0.048*****	**4.786*****	**3.554**	**5.107**	**9.382**
TUR	**0.045***	**9.239***	**3.245**	**4.606**	**8.155**
(Model 2)					
Countries	**Coefficients**	**Test Statistics**	**Critical Values**		
	β(FDI → GRW)	**Wald**	10%	5%	1%
IDN	-0.319	0.767	3.609	5.625	11.451
MEX	-0.941	2.306	3.529	5.099	8.926
NGA	**2.764***	**18.430***	**3.494**	**5.055**	**9.320**
TUR	-0.017	0.640	3.454	5.018	8.919

* = 1%, ** = 5%, *** = 10%

Note: Bootstrap replications were set to 10,000. The optimal lag length was determined as 6 for all countries using the Akaike Information Criterion (AIC).

As a result of the analysis, a significant and positive causality relationship from GRW to FDI was found for IDN, NGA, and TUR. This finding suggests that improved economic performance in these countries may create a more attractive environment for foreign investors. No statistically significant relationship was observed in this direction for MEX. In the opposite direction, causality from FDI to GRW was found to be significant only for NGA. However, given the relatively weak cross-sectional dependence in Model 2, this result should be interpreted with caution. While it may indicate that FDI plays a role in supporting growth in the case of NGA, the robustness of this relationship remains limited under the current panel structure.

6. CONCLUSION

In this study, which examines the causality relationship between FDI and economic growth in MINT countries for the period 1970-2023, a significant and positive causality relationship from economic growth to FDI was found for Indonesia, Nigeria and Türkiye, while no causality relationship was observed for MEX. On the other hand, the causality from FDI to economic growth is significant only for Nigeria.

In developing countries, economic growth is considered as one of the main components of the development process and therefore, it is adopted as a priority target by policy makers. Indeed, as emphasized by Alfaro et al. (2004: 111), countries that increase their growth performance implement various structural and economic policies in order to attract FDI. The findings reveal that economic growth functions as an incentive for FDI in Indonesia, Nigeria and Türkiye. One of the important factors determining FDI is the domestic market of the host country (Asiedu, 2002: 109). Indonesia, which has become one of the largest markets in Asia thanks to its large population, and Nigeria with its population of over 200 million and rapid urbanization (The World Bank, 2025c) have created an attractive investment environment for multinational companies. In Türkiye, it can be stated that economic structural reforms, which have increased in number and diversified by sector in the post-1990 period, have made significant contributions to economic growth (Yalçınkaya et al., 2024: 427-428). In this context, the fact that these reforms support growth may play an indirect but important role in attracting FDI by paving the way for a stronger investment climate. This suggests that growth in these other countries, as in Türkiye, may positively affect foreign capital inflows by increasing investor confidence. On the other hand, the lack of a significant effect of economic growth on FDI in Mexico suggests that the determinants of FDI in this country may be non-growth factors such as political stability, institutional structure or foreign economic relations.

On the other hand, Nigeria was the only country where a statistically significant causal relationship was identified from FDI to economic growth. This may indicate a potential bidirectional causality between FDI and growth in the case of Nigeria, which is broadly consistent with the findings of Uwazie et al. (2015) and Agbailu (2025). The result suggests that employment and technology transfer channels might be functioning more effectively in

Nigeria compared to other countries (Taiwo and Olofin, 2024: 2). While this may imply that policies designed to increase Nigeria's capacity to attract FDI could play a role in supporting long-term development, it is important to note that the overall strength of this relationship should be interpreted with caution, particularly given the relatively weak cross-sectional dependence observed in Model 2.

The lack of a similar causality in Indonesia, Mexico, and Türkiye might be attributed to the concentration of FDI in low value-added sectors such as consumption, financial speculation, or extractives. Moreover, structural factors such as institutional quality, investment climate, and technological absorption capacity may have limited the growth-enhancing effects of FDI. Overall, the findings suggest that FDI does not automatically lead to growth and its effectiveness is likely to depend on country-specific structural conditions.

Based on the findings, policy recommendations that can be developed on a country-by-country basis are presented below:

• In India, capital market inefficiencies and institutional deficiencies must be addressed so that foreign direct investment, which may increase alongside growth, can contribute to growth. Furthermore, developing policies that align with international standards to gain investors' confidence will also contribute to positive effects on growth (Jain et al. 2022: 708-731).

• In order to effectively evaluate foreign direct investment directed towards Turkey, it is necessary to develop appropriate policies that will strengthen local suppliers associated with foreign companies and include local companies that are not yet integrated into this supply chain. Furthermore, training programs for domestic firms should be expanded to increase technological and management capacity, thereby ensuring that incoming investments' technological and managerial competencies are effectively assimilated (Fatima, 2016: 314-316).

• In Mexico, the relationship between suppliers and foreign firms is similar to that in Turkey. As stated in Jordaan (2011: 626-629), the main factors affecting supplier firms in Mexico are production style and export-oriented policies. There is no direct relationship

between foreign investments and suppliers. In this context, supplier-foreign firm relationships should be developed.

In summary, while this study provides valuable insights into the country-specific dynamics of the FDI–growth relationship using the Kónya (2006) approach, it also has several limitations that should be acknowledged. These include the small number of cross-sectional units, the unavailability of sectorally disaggregated FDI data, and the constraints related to sub-period analysis. Future research can extend the current framework by incorporating sector-level data, applying alternative causality techniques, and exploring the effects of global economic shocks across different time blocks.

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