



DOES GLOBALIZATION HINDER OR INCENTIVE INDUSTRIALIZATION? EMPIRICAL EVIDENCE FROM TURKIYE AND POLAND*

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Abstract

Research background: Globalization has provided both turmoil and opportunities for most developing countries, as well as Turkiye and Poland. It brings about structural transformation in both countries.

Purpose: This paper investigates the effect of economic globalization on industrialization in Turkiye and Poland through annual data covering 1995–2022.

Research methodology: The paper performs fully modified ordinary least squares (FMOLS), dynamic ordinary least squares (DOLS), canonical cointegrating regression (CCR) estimators, and the Toda-Yamamoto causality test.

Results: The empirical results indicate that foreign direct investment (FDI) inward negatively affects manufacturing value-added (MVA), whereas the labour force positively affects it in Turkiye. However, trade openness has an insignificantly positive influence on MVA. Furthermore, FDI, trade openness, and the labour force significantly and positively affect MVA in Poland. Besides, the Toda-Yamamoto causality test results vary for Turkiye and Poland.

Novelty: The work's originality is examining and comparing the role of trade openness and FDI separately on MVA for Turkiye and Poland. Moreover, this study performs three estimators (FMOLS,

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DOLS, and CCR) to obtain robust results and investigate the causality relationship among variables for both countries.

Keywords: Globalization, FDI, trade openness, industrialization, manufacturing value-added, Turkiye, Poland

JEL classification: F15, F41, F62

Introduction

Globalization has transformed the world economy since the 1980s. It has a more dimensional effect on all spheres of life, ranging from the economy, politics, health, and technology to culture. Regarding economic globalization, liberal arguments argue that trade openness incentivizes economic growth and contributes to developing producers and consumers (Mignamissi, Nguekeng, 2022). The continuous integration between regions and countries has altered individuals' lives in several ways. In particular, economic globalization eliminates trade barriers and facilitates the flow of goods and services, investment, and technology across borders (Coulibaly et al., 2018).

One of the substantial effects of globalization emerges in industrialization for both developed and developing countries. It is well known that industrialization has a crucial role in economic growth (Kaldor, 1966). Within the increasing manufacturing sector, the economy's productivity increases as well. Hence, as a significant component of industrialization, the manufacturing sector promotes economic growth (Van der Heijden, 2018). In developed and developing countries, the share industry of the whole economy has decreased over time. In the era of globalization, most developing countries have experienced premature deindustrialization, which is called shifting from industry to the service sector earlier and at a lower income level (Rodrik, 2016; Cengiz, Manga, 2023).

Although industrialization is not a new phenomenon, scientists still debate its role in economic growth. Developing nations have endeavoured to catch up with developed nations since the 1950s. A few countries have reduced the gap between developed countries. Furthermore, from the beginning of the 21st century, most developing countries have experienced remarkable economic growth. However, the industrial sector's share decreased in developing countries during this period (Yu, 2020). Since 1980, there has been a remarkable

transformation in terms of the association between industrial policy and development in most developing countries. The main changes have emerged in shifting from import substitution to export orientation strategy policy. Given the manufacturing sector's continued importance for development, through FDI, technological spillover, and trade openness, the aim was to stimulate economic growth by empowering the manufacturing sector. However, the globalization process accelerated deindustrialization in most developing countries (Joseph et al., 2020).

Theoretically, the impact of globalization on the manufacturing sector occurs through directing FDI and trade policies. From the trade side, globalization increases the demand for foreign goods in the industrial sector (Saud et al., 2018; Cengiz, Manga, 2023). Hence, trade openness may reduce domestic industrial output. In contrast, as stated by Chandran and Munusamy (2009), international trade facilities increase the economic productivity and export capacities of countries. Thus, industrial output rises as well. Likewise, the role of FDI on the manufacturing sector is controversial in the relevant literature. From the point of an optimistic approach, FDI stimulates the capabilities of firms of the firms through technological spillover and reaching capital. Since, firms adopt to use developed technology, the productivity of firms increases and thus the MVA rises (Mano et al., 2025). According to Sjöholm (2018), the promoting effect of FDI on MVA may occur through different channels. The first approach is related to technology, capital, and management processes, which multinational enterprises (MNEs) primarily focus on enhancing and utilising new technologies, leading to an increase in MVA in the host country. The second way is associated with the production types. FDI may cause structural change by promoting the establishment of high-value-added industries covering manufacturing and services. Hence, host economies may shift from low-value-added sectors to high-value-added sectors. The third way is related to the influence of FDI on domestic firms. These effects may have two opposite directions. It may support local linkage industries; however, it also forces firms to operate at a lower scale. On the other hand, from a pessimistic point of view, the FDI effects on the host countries' manufacturing sector may be unproductive. For example, MNEs may crowd out local industries, leading to monopolies. Moreover, MNEs may lead to unemployment, income inequality, and political instability, while also obtaining the advantage of natural resources (Mano et al., 2025).

Overall, structural transformation has occurred through three stages. In the first stage, the share of agriculture is high, with lower productivity. The economy's structure shifts from primary goods to manufacturing in the second stage. In the final stage of structural transformation, the economy's gravity shifts from the manufacturing industry to the service sector, and the service sector dominates the economy (Emako et al., 2022).

Turkiye and Poland are two emerging countries that have experienced structural transformation and globalization. They have similar patterns. For instance, both countries have similar growth regimes. The export orientation policy is the driving force of economic growth. Also, both countries are integrated with the European trading area, and FDI and portfolio investments have a crucial role in the Turkish and Polish economies, respectively (Akçay, Jungmann, 2022).

Our paper aims to determine the role of FDI and trade openness on industrialization in Türkiye and Poland using annual data covering 1995–2022. Türkiye and Poland were selected due to their similar economic liberalization and integration paths into the global economy, yet they exhibit contrasting outcomes in industrial performance. Both countries underwent major structural reforms in the 1980s and 1990s and are strategically positioned within key trade and investment regions. The period of 1995–2022 captures the effects of globalization, European Union (EU) integration (for Poland), and the Customs Union with the EU (for Türkiye), while aligning with consistent macroeconomic data availability. This timeframe allows for a robust analysis of long-term trends and structural changes in industrialization.

Does globalization, through FDI and trade openness, hinder or incentivize industrialization in Türkiye and Poland? This question focuses on whether globalization-related variables – namely, FDI and trade openness – contribute to or detract from the manufacturing value added (MVA), which is used as a proxy for industrialization.

Based on the literature and theoretical framework, the study formulates the following hypotheses for both countries:

- i. H_0 : There is no impact of FDI inward on MVA in Türkiye and Poland.
 H_1 : There is an impact of FDI inward on MVA in Türkiye and Poland.
- ii. H_0 : There is no impact of trade openness on MVA in Türkiye and Poland.
 H_1 : There is an impact of trade openness on MVA in Türkiye and Poland.

The potential contributions of the current study to the existing literature are in two folds: i) To the best of our knowledge, this is the first paper analysing the role of FDI and trade openness on MVA empirically for Türkiye and Poland; ii) We perform fully modified ordinary least squares (FMOLS), dynamic ordinary least squares (DOLS), and canonical cointegrating regression (CCR) estimators to find out the relationship between FDI, trade openness, and MVA.

The following part of the paper is organized as follows: Section 2 explains the association between globalization and industrialization in Türkiye. Section 3 examines the trends of globalization and industrialization in Poland. Section 4 presents an empirical literature review.

Section 5 describes the data, model, and empirical methodology. Section 6 reports empirical outcomes and discussions. Section 7 concludes the study with policy recommendations.

1. An Overview of Globalization and Industrialization in Türkiye

The world economy has witnessed a dramatic transformation since the 1980s. Flows of goods and services, capital, and mobility of people started to increase across countries. Neoliberal globalization gained importance after the 1980s for some reasons. Firstly, with the increase in public debt and economic difficulties, and criticism of Keynesian economics in the 1970s arose. Secondly, New Right parties adopted and implemented neoliberal policies to integrate into the world economy. Thirdly, international organisations have played a crucial role in accelerating liberalization (Ayhan et al., 2016).

The Turkish economy depended on import substitution policies from the early 1960s to the late 1970s. Until the 1970s, this policy was implemented successfully. During the 1960s to the 1970s, the annual growth rate of the Turkish economy, at 7%, was higher than that of most developing countries. However, the oil crisis and recession in the 1970s in advanced countries deteriorated the Turkish economy. Hence, at the end of the 1970s, the Turkish economy faced severe problems with its balance of payments. At the beginning of 1980, Türkiye adopted an export-led growth economic model to establish sustainable economic performance (Mirac, 2012). The beginning of 1980 was one of the vital turning points for the Turkish economy to liberalize it. On 24 January 1980 (called the 24 January Decisions), several policies based on neoliberal globalization were adopted. The main aim of the 24 January decisions was to accelerate the integration of the Turkish economy. It involved reducing state intervention, realizing free market mechanisms, reducing public debt, stabilizing public deficit, liberalizing imports, increasing export incentives, and reducing capital controls (Karluk, Küçüksakarya, 2016).

Öniş and Bakır (2007) assessed that the liberalization process of the Turkish economy has been comprised of three stages since 1980. The first phase covered the period of 1980–1989, the second phase covered the period of 1989–2001, and the third phase started in 2001. The first phase of liberalization represents a deregulation period involving reduced state intervention. In the second phase of liberalization, the regulatory institutions were founded. However, these institutions were not able to achieve a successful opening policy. In the third phase, the 2001 crisis was a turning point for the Turkish economy. Following the crisis, many institutional reforms have been adopted to empower the Turkish economy. Moreover, the International

Monetary Fund (IMF) and European Union (EU) were crucial external factors in terms of implementing and sustaining reforms (Öniş, Bakır, 2007; Aydın, 2014).

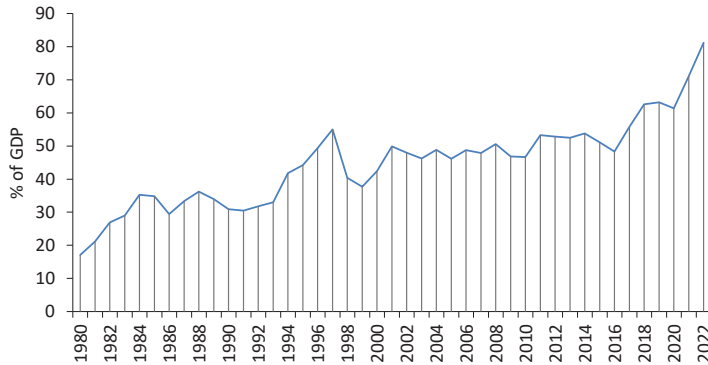


Figure 1. Trade Openness in Türkiye

Source: World Bank (2024).

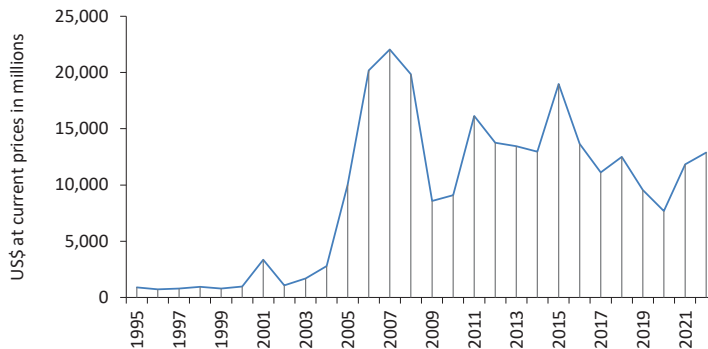


Figure 2. FDI inward (flow) in Türkiye

Source: UNCTAD (2024).

Pursuing neoliberal policies since the beginning of 1980, the integration of the Turkish economy has risen both in terms of trade and investment. In Figure 1, trade openness, measured by the sum of exports and imports as a share of GDP, has increased from 17% to 81.17% from 1980 to 2022. Several mechanisms are behind the increasing integration of the Turkish economy with the world economy. For example, Türkiye is a party to the General Agreement on Tariffs and Trade (GATT), a founding World Trade Organisation (WTO) member, and has a Customs Union Agreement with the EU. Furthermore, Türkiye has free trade agreements

(FTAs) in 38 countries, and 23 FTAs are in force. Besides, there are four Preferential Trade Agreements (PTAs) with Iran, Azerbaijan, Pakistan, and Uzbekistan (Republic of Türkiye Ministry of Trade, 2024).

In addition, financial liberalization was initiated in Türkiye in 1980. The financial development index for Türkiye rose from 0 to 0.50 during the period 1980–2021 (IMF, 2024). As shown in Figure 2, although there was a fluctuation, FDI inflow has increased. The Turkish economy received around \$18 million in 1980. It reached a record level in 2007 with more than \$22 billion and decreased to around \$13 billion. In addition, net portfolio investment was –146 million dollars in 1986. However, it rose to over \$13 billion in 2022 (World Bank, 2024).

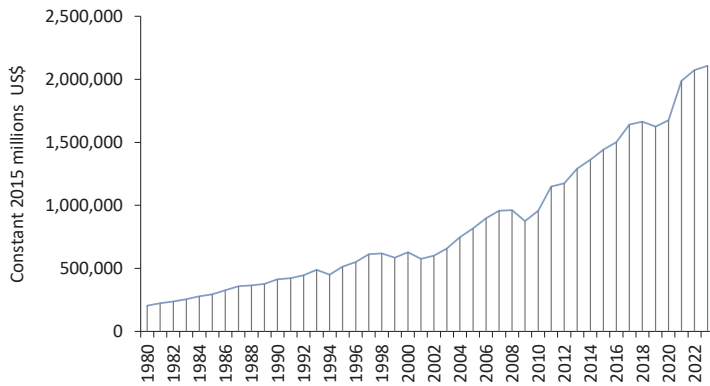


Figure 3. Manufacturing, value-added in Türkiye: 1980–2022 (constant 2015 million US\$)

Source: World Bank (2024).

A remarkable structural transformation and liberalization policies have emerged in the Turkish economy. According to UNCTAD (2024) data, the share of agriculture (with hunting, forestry, and fishing) over GDP was 31.08% in 1970 and shrank to 7.24% in 2022. Moreover, the industry sector's share was 29.21% in 1970 and 34.96% in 2022. In addition, the service sector has a dominant role in the Turkish economy. Its share was 39.71% in 1970, rising to 57.80% in 2022. Manufacturing plays a crucial role in industrialization for developing countries because it has a significant promoting effect on productivity (Tekay, 2018). In the era of globalization, investigating the development trend of manufacturing is crucial for the Turkish economy.

Figure 3 depicts that MVA in the Turkish economy has risen in the last forty years. In 1980, MVA with constant prices was more than \$20 billion, increased more than ten times, and reached over \$200 billion in 2022. It proves that MVA is the driving force of Turkish industry.

It is expected that MVA will increase over time. However, in the age of globalization, it is crucial to consider whether trade openness and FDI inflow transform MVA in the Turkish economy.

2. An Overview of Globalization and Industrialization in Poland

The trade structure has gradually changed from a 19th-century input-output trade, in which developed economies produced manufactured goods and emerging market economies (EMEs) produced primary goods, to a model in which production is located in both developed and emerging economies. Instead of specialising in products, countries specialise in different production tasks and processes. Specialisation aims to improve the efficiency of production and thus can lead to higher productivity and a better allocation of factors of production

Globalization is mostly connected to enlarged trade flows and foreign direct investment (FDI). Also, since the 1990s, thanks to outsourcing and offshoring, production processes have undergone fragmentation. At the same time, the trade structure has stepwise modified from a 19th-century input-output trade, in which developed economies produced manufactured goods and EMEs produced primary goods, to a model in which production is located in both developed and emerging economies. Hence, countries started to specialize in different tasks and production processes instead of specializing in products. Specialization aims to expand manufacturing efficiency, which may lead to increased productivity and the improved distribution of production factors (Baldwin, 2014).

In Poland, as well as in other Eastern European countries, the integration process with the world economy overlapped with the transformation process followed by accession to the EU. The opening was associated with approaching foreign markets and the influx of FDI. FDI brought the missing assets in transition economies and aided the development of Polish export capability. Simultaneously, access to advanced technologies, upgraded organizational structures, awareness of labour discipline, and business culture improved export expansion and contributed to economic progression.

Since the beginning of the 1990s, it has been possible to observe the deepening integration of the Polish economy with the world economy. For instance, as depicted in Figure 4, trade openness, measured by the ratio of exports and imports to GDP, increased from 43.7% in 1990 to 109.5% in 2023. On the one hand, FDI inward is important as a source of investment financing (in addition to domestic savings) and, on the other hand, as a powerful driver of productivity growth. However, it should be noted that thanks to the inflow of foreign capital and the import

of machinery and equipment, Poland's productivity has significantly increased despite the low intensity of domestic research and development (R&D) activity.

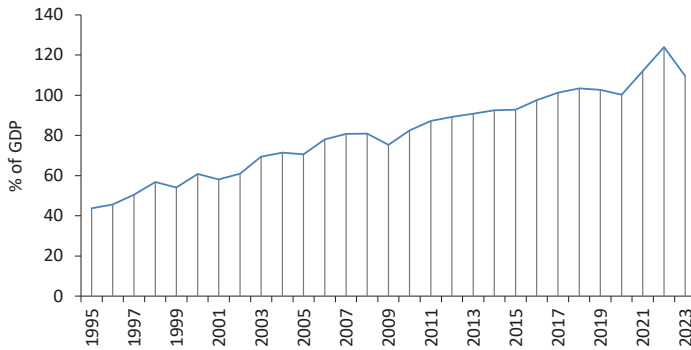


Figure 4. Trade Openness in Poland

Source: World Bank (2024).

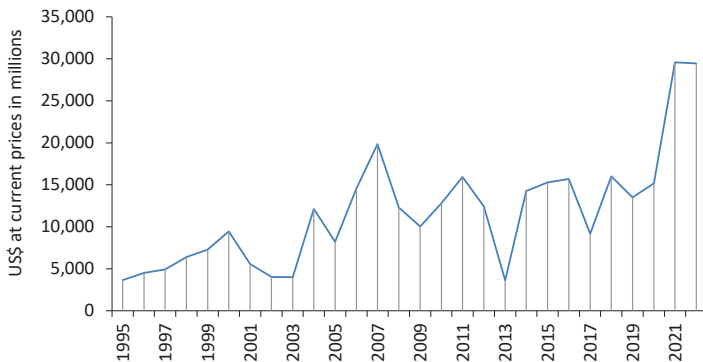


Figure 5. FDI inward (flow) in Poland

Source: UNCTAD (2024).

The financial development index in Poland in the years 1981–2021 ranged from 0.4 to 0.43, which allowed it to be classified in the group of countries with an average level of financial development (in 2022, Poland took 18th place in the group of EU countries) (Narodowy Bank Polski, 2024). As shown in Figure 5, since its economic transformation in 1989, Poland has been a very attractive country for foreign direct investors. The Polish economy received around \$10 billion in 1980 and reached a record level in 2022 with more than \$36,9 billion (5.36% of GDP) (World Bank, 2024). In the past forty years, foreign investment in Poland

accelerated a few times, e.g., 1995–2000, 2004–2007, and 2019–2023. However, a significant decline in FDI in Poland occurred during 2012–2013, which was attributed to several domestic and international factors like the Eurozone crisis, economic slowdown, and the policy and regulatory environment in Poland. A remarkable structural transformation started in the Polish Economy along with the transformation and accession to the EU process.

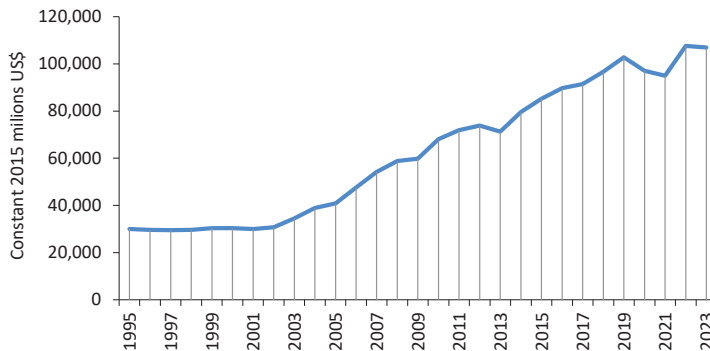


Figure 6. Manufacturing, value-added in Poland (1995–2023; constant 2015 US\$)

Source: World Bank (2024).

Figure 6 depicts that MVA in the Polish economy has risen from the 1990'sc. In 1995, MVA with constant prices was about \$ 30 billion, which increased and reached over \$106 billion in 2023.

3. Empirical Literature Review

Globalization and industrialization are deeply interconnected processes that have shaped the economic landscape over the past few decades. While globalization generally refers to the increasing integration of economies through trade, investment, and technology, industrialization involves the development of industries and manufacturing capabilities. Furthermore, the interaction between these two processes can be both complementary and incompatible, depending on the context and conditions of specific economies (Amable, 2000).

The empirical literature presents a balanced picture of the impact of globalization on industrialization. Whereas globalization can encourage industrialization by providing access to larger markets, facilitating technology transfer, and increasing capital flows, it can also inhibit industrial growth through increased competition, economic vulnerability, and a shift towards non-industrial sectors. Outcomes often depend on country-specific factors such as

the policy framework, institutional quality, and the ability to use globalization strategically (Ikumapayi et al., 2020). The literature summary regarding the variables used in our study is presented in Table 1.

Table 1. Literature Summary

Study	Sample & Period	Methodology	Results
1	2	3	4
Ghosh (2000)	USA 1961–1995	Vector error correction model (VECM)	There exists an association between manufacturing employment and trade. Furthermore, a one-way causal relationship runs from net imports to manufacturing employment
Chandran and Munusamy (2009)	Malaysia 1970–2003	Autoregressive distributed lag (ARDL), Granger causality	TO incentivize manufacturing growth
Onakoya et al. (2012)	Nigeria 1975–2010	Error Correction Model (ECM)	TO has a positive effect on the manufacturing sector
Raj and Sen (2012)	India 1978–1979, 1984–1985, 1989–1990, 1994–1995, and 2000–2001	Factor content, growth accounting, and labour demand model	TO has no significant effect on the manufacturing employment
Nahidi and Seif (2012)	Iran 1961–2006	ARDL	TO is positively associated with MVA
Umoh and Effiong (2013)	Nigeria 1970–2008	ARDL bounds testing	TO positively influences manufacturing productivity
Rahmaddi and Ichihashi (2013)	Indonesia 1990–2008	Pooled OLS, random-effects (RE), fixed-effects (FE)	FDI promotes the manufacturing sector's exports
Mushtaq et al. (2014)	Bangladesh, India, Nepal, Pakistan and Sri Lanka 1980–2011	FE	TO promotes the manufacturing sector
Fauzel et al. (2015)	Mauritius 1980–2010	VECM	FDI in the manufacturing sector has a small positive effect on productivity
Van der Heijden (2018)	40 countries 1960–2010	FE	Globalization enhances industrialization
Idoko and Taiga (2018)	Nigeria 1981–2016	Vector auto regression (VAR), Johansen Co-integration	FDI has a minor positive influence on the manufacturing sector
Orlic et al. (2018)	Czechia, Estonia, Hungary, Slovakia, and Slovenia 2002–2010	System-generalized method of moments (GMM)	FDI spillovers incentivize firms' productivity in the manufacturing sector
Anwar and Sun (2018)	China 2005–2007	Seemingly unrelated regression (SUR)	An increased share of FDI in the manufacturing sector promotes export quality
Rahman and Abu Bakar (2019)	Pakistan 1972–2017	ARDL	FDI and exports have a positive influence on MVA growth

Mazorodze (2020)	28 South African countries 1970–2016	True-fixed-effects (TFE)	TO promotes the manufacturing sector through realizing cost efficiency
Ul-Haq et al. (2021)	1990–2005	Regression technique	TO promotes skilled-labour employment in manufacturing
Petreski (2021)	23 transition economies 2000–2015	Regression technique	Globalization hinders employment in the manufacturing sector
Botta et al. (2022)	36 countries 1980–2017	Panel corrected standard error (PCSE)	Capital inflow negatively influences the manufacturing sector in all panel and developing countries, whereas TO positively affects in all panel and developed countries
Cengiz and Manga (2023)	Five Western Balkan countries 2000–2019	Augmented mean group (AMG)	Economic globalization (ECO) promotes industry employment (INDemp) and MVA. Causality: ECO → INDemp and MVA → TO
Mehta et al. (2023)	India 1991–2020	ARDL, Granger causality	FDI positively influences the manufacturing sector output
Nas (2024)	Türkiye 1990–2020	ARDL bounds testing, Toda-Yamamoto causality	FDI and trade openness have a positive effect on MVA. Causality: FDI → MVA
Iqbal et al. (2025)	Pakistan 1972–2023	ARDL bounds testing	FDI positively influences the manufacturing sector
Olurotimi et al. (2025)	Côte d'Ivoire 2003–2014	FE	Overall, FDI does not affect the productivity of firms in host countries. However, the productivity of firms increases in some cases. For example, firms that are over five years old and have an initial productivity level above the average

Source: authors' compilation.

The empirical literature reveals that globalization can both incentivize and hinder industrialization, depending on the specific economic context, policies, and institutional frameworks of different regions. While globalization offers opportunities for market expansion, technology transfer, and investment, it also poses challenges related to competition, economic vulnerability, and sectoral shifts. Policymakers need to balance these dynamics, fostering competitive industries and resilient economic structures to maximize the benefits of globalization for industrial development.

4. Data, model, and methodology

4.1. Data and model

The main aim of the current paper is to investigate the association between MVA, FDI inward, trade openness, and labour force in Türkiye and Poland using annual data covering the period 1995–2022. The time range of the study is based on data availability. Following the study of Ilyas et al. (2010), Tahir et al. (2016), and Mano et al. (2025), the empirical model is constructed as follows:

$$\text{MVA} = f(\text{FDI}, \text{TO}, \text{LAB}) \quad (1)$$

where:

MVA_t – manufacturing value added at time t (constant 2015 US dollars),

FDI_t – foreign direct investment inward at time t (current US dollars),

TO_t – the sum of exports and imports of goods and services at time t (as a share of GDP),

LAB_t – total labour force at time t (number of people aged 15 and older).

All variables in equation (1) are converted to natural logarithms, and the logarithmic form of the model is as follows:

$$\ln \text{MVA}_t = \beta_0 + \beta_1 \ln \text{FDI}_t + \beta_2 \ln \text{TO}_t + \beta_3 \ln \text{LAB}_t + \varepsilon_t \quad (2)$$

where:

$\ln$ – natural logarithm of the respective variable,

β_0 – Intercept term,

$\beta_1, \beta_2, \beta_3$ – Coefficients indicating the elasticity of MVA with respect to FDI, TO, and LAB,

ε_t – Error term at time t .

The MVA, trade openness and labour force data were retrieved from the World Bank (2024), and FDI inward was retrieved from the UNCTAD (2024) database.

4.2. Empirical methodology

The research design employs a quantitative, econometric analysis using time series data from 1995 to 2022 for Türkiye and Poland. The breakdown of the empirical steps is displayed in Figure 7.

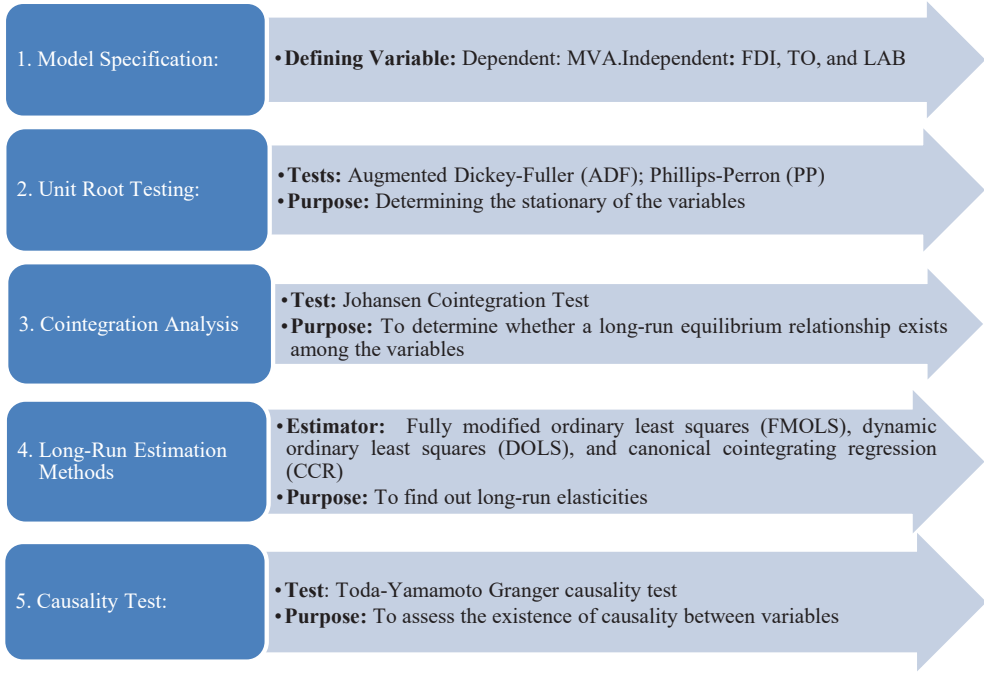


Figure 7. Flow chart of the empirical strategy

Source: authors' compilation.

4.2.1. Long-Run Estimation

In order to find out the impact of FDI, TO, and LAB on MVA, we employ FMOLS, DOLS, and CCR estimation techniques. All these estimators can be used in the case where variables are integrated at I(1) (Cetin et al., 2021).

The FMOLS estimator developed by Phillips and Hansen (1990) is an efficient parameter in the case of endogeneity and serial correlation (Hardi et al., 2023). In other words, the FMOLS solves the autoregression and endogeneity in the model. Furthermore, the DOLS estimator provides reliable results by solving autocorrelation, simultaneity, and endogeneity (Cetin et al., 2021). The FMOLS estimator performs a non-parametric approach and considers the endogeneity and autocorrelation; the DOLS estimator considers the endogeneity and autocorrelation with a parametric approach (Cui et al., 2022). The FMOLS estimator can be expressed as follows (Adom et al., 2015):

$$\theta_{FMOLS} = \left(\sum_{t=1}^T z_t z_t' \right)^{-1} \left(\sum_{t=1}^T z_t y_t^+ - T \begin{bmatrix} \hat{\lambda}_{12}^+ \\ 0 \end{bmatrix} \right) \quad (3)$$

In Eq. [3], y_t^+ and $\hat{\lambda}_{12}^+$ denote correction terms for endogeneity and serial correlation (Adom et al., 2015).

The DOLS estimator proposed by Stock and Watson (1993) can be expressed as an equation as follows (Koçak, Uzey, 2019):

$$X_t = \beta_0 + \beta_1 t + \beta_2 y_t + i = \sum_{i=-q}^q \varphi_i \Delta t_{t-i} + \varepsilon_t \quad (4)$$

where X_t and y_t denote dependent variable and independent variable, respectively. Furthermore, q , t , ε_t , and Δ indicate optimal lag, time, error term, and difference operator, respectively (Koçak, Uzey, 2019).

4.2.2. Toda and Yamamoto Causality Test

In this paper, we perform the Toda and Yamamoto Causality test to reveal the potential causality relationship between variables. This method is based on an augmented VAR model ($k + d_{\max}$). In the VAR model, it is important to determine the optimal lag (k) and maximum integrated order ($k + d_{\max}$). Therefore, the VAR model for the Toda and Yamamoto causality test can be expressed as follows (Dritsaki, 2017):

$$x_t = \gamma_0 + \left(\sum_{i=1}^k \delta_{1t} y_{t-i} + \sum_{i=k+1}^{d_{\max}} \delta_{2t} y_{t-i} \right) + \left(\sum_{i=1}^k \vartheta_{1t} x_{t-i} + \sum_{i=k+1}^{d_{\max}} \vartheta_{2t} x_{t-i} \right) + \varepsilon_{2t} \quad (5)$$

5. Empirical Findings

Our empirical findings start with descriptive statistics, which are provided in Table 2 for Poland.

Table 2. Descriptive statistics for Poland

Variable	lnMVA	lnLAB	lnFDI	lnTO
1	2	3	4	5
Mean	24.725640	16.697790	2.299974	4.343494
Median	24.805900	16.692170	2.502361	4.392826
Maximum	25.399810	16.734320	3.387099	4.819754
Minimum	24.108120	16.667080	1.287854	3.777851
Std. Dev.	0.481663	0.025154	0.605653	0.277922
Skewness	-0.109284	0.081585	-0.211162	-0.413288

1	2	3	4	5
Kurtosis	1.415450	1.246873	2.146884	2.249443
Jarque-Bera	2.985000	3.616756	1.057190	1.454325
Probability	0.224810	0.163920	0.589432	0.483278
Sum	692.318000	467.538000	64.399280	121.617800
Sum Sq. Dev.	6.263972	0.017084	9.904021	2.085504
Observations	28	28	28	28

Source: authors' compilation.

Table 2 depicts a statistical overview of variables utilized in the estimation for Poland. lnMVA has the highest mean, followed by lnLAB, lnTO, and lnFDI. lnFDI has the highest standard deviation with 0.605, followed by lnMVA (0.481), lnTO (0.277), and lnLAB (0.025).

Table 3. Descriptive statistics for Turkiye

Variable	lnMVA	lnLAB	lnFDI	lnTO
Mean	25.310220	17.071490	3.193887	3.937578
Median	25.284500	17.003010	2.581179	3.904389
Maximum	26.057450	17.360240	6.889591	4.396547
Minimum	24.661840	16.880680	0.078811	3.628729
Std. Dev.	0.437793	0.164403	2.017243	0.163289
Skewness	0.120559	0.427479	0.892656	0.838769
Kurtosis	1.663356	1.573444	2.658016	4.047985
Jarque-Bera	2.152213	3.227021	3.855008	4.564475
Probability	0.340920	0.199187	0.145511	0.102056
Sum	708.686100	478.001800	89.428850	110.252200
Sum Sq. Dev.	5.174886	0.729768	109.87020	0.719908
Observations	28	28	28	28

Source: authors' compilation.

Table 3 depicts a statistical overview of variables utilized in the Turkiye estimation. lnMVA has the highest mean, followed by lnLAB, lnTO, and lnFDI. lnFDI has the highest standard deviation with 2.017, followed by lnMVA (0.437), lnLAB (0.164), and lnTO (0.163).

Table 4 shows the results of optimal lag length. It is obtained that the optimal lag is 1 for both Poland and Turkiye. After determining the optimal lag length, we performed unit root tests to examine the properties of the series. For this purpose, the augmented Dickey-Fuller and Phillips & Perron unit test results are utilized, and the results are documented in Table 5.

Table 4. VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SBC	HQC
Poland						
0	86.35442	NA	1.23e-08	-6.862868	-6.666526	-6.810779
1	158.44990	114.15120*	1.18e-10*	-11.537490	-10.55578*	-11.277050*
2	171.20560	15.94462	1.75e-10	-11.267140	-9.500055	-10.798330
3	187.42100	14.86413	2.48e-10	-11.285090	-8.732637	-10.607920
4	206.94060	11.38641	4.48e-10	-11.578380*	-8.240564	-10.692860
Turkiye						
0	10.49449	NA	6.84e-06	-0.541207	-0.344865	-0.489118
1	100.74330	142.89400*	1.44e-08*	-6.728610	-5.746899*	-6.468162
2	115.30860	18.20664	1.85e-08	-6.609053	-4.841972	-6.140246
3	137.48190	20.32551	1.59e-08	-7.123493	-4.571043	-6.446327
4	164.44860	15.73056	1.55e-08	-8.037382*	-4.699563	-7.151858*

Source: authors' compilation.

Table 5. Unit Root Test Results

		ADF	PP	ADF	PP	Order of integration
		I(0) at level		I(1) at first difference		
Turkiye						
lnMVA	Constant	0.090775 (0.9590)	0.188280 (0.9666)	-4.645000 (0.0011)	-4.659499 (0.0010)	I(1)
lnFDI	Constant	-2.498601 (0.1273)	-2.139146 (0.2319)	-4.214002 (0.0030)	-4.220630 (0.0030)	I(1)
lnTO	Constant	1.673704 (0.9992)	0.053964 (0.9557)	-5.782305 (0.0001)	-4.823653 (0.0007)	I(1)
lnLAB	Constant	0.797172 (0.9921)	0.797172 (0.9921)	-4.327680 (0.0023)	-4.328496 (0.0023)	I(1)
Poland						
lnMVA	Constant	0.037933 (0.9543)	-0.037667 (0.9467)	-3.639709 (0.0118)	-3.529449 (0.0152)	I(1)
lnFDI	Constant	-2.472850 (0.1329)	-2.315631 (0.1745)	-6.779054 (0.0000)	-12.93140 (0.0000)	I(1)
lnTO	Constant	-1.178407 (0.6686)	-1.899985 (0.3273)	-4.796466 (0.0008)	-6.176185 (0.0000)	I(1)
lnLAB	Constant	-0.745677 (0.8183)	-0.732886 (0.8217)	-4.988542 (0.0005)	-4.984736 (0.0005)	I(1)

Note: the optimal lag is chosen as 4 based on the Schwarz Criterion. The numbers in parentheses denote the probability value.

Source: authors' compilation.

Table 5 reports the unit root test results. According to the augmented Dickey-Fuller (ADF) and Phillips & Perron (PP) unit test results, all variables for both Türkiye and Poland have a unit root process. However, they become stationary at the first level. Hence, all variables are integrated at order one [I(1)].

Table 6. Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Türkiye				
Hypothesized No. of CE	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob. **
None*	0.515184	47.736280	40.174930	0.0073
At most 1*	0.504091	28.912660	24.275960	0.0121
At most 2	0.258878	10.677250	12.320900	0.0928
At most 3	0.105127	2.887907	4.129906	0.1056
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.515184	18.823620	24.159210	0.2240
At most 1*	0.504091	18.235420	17.797300	0.0429
At most 2	0.258878	7.789338	11.224800	0.1883
At most 3	0.105127	2.887907	4.129906	0.1056
Unrestricted Cointegration Rank Test (Trace)				
Poland				
Hypothesized No. of CE	Eigenvalue	Trace Statistic	0.1 Critical Value	Prob.**
None*	0.637436	64.016630	50.525320	0.0051
At most 1*	0.546828	37.638200	32.268370	0.0267
At most 2	0.305141	17.059630	17.980380	0.1303
At most 3*	0.253301	7.594418	7.556722	0.0984
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.637436	26.378430	26.121220	0.0933
At most 1*	0.546828	20.578570	20.050140	0.0854
At most 2	0.305141	9.465213	13.905900	0.3856
At most 3*	0.253301	7.594418	7.556722	0.0984

Note: trace test indicates 2 cointegrating equations at the 0.05 level for Türkiye and at the 0.10 level for Poland.

Source: authors' compilation.

In the Johansen cointegration test, the null hypothesis of no cointegration among variables is checked against the fact that there is cointegration among variables. When the critical value at 1%, 5%, or 10% is greater than the trace and maximum-eigen statistics value, the null hypothesis of no cointegration is accepted (Sijabat, 2022). Table 6 shows that the trace statistic and maximum eigenvalue are greater than the critical value, with a significance level of 5% for Türkiye and 10% for Poland. Thus, the Johansen cointegration test results indicate that $\ln MVA$, $\ln FDI$, $\ln TO$, and $\ln LAB$ are cointegrated in the long run. In other words, a long-term equilibrium relationship exists between variables.

The next step in determining the existence of a co-integration relationship among variables is to estimate the long-run parameters. Table 7 documents the results of FMOLS, DOLS, and CCR estimators.

Table 7. Long-Run Estimators Results

Dependent Variable: $\ln MVA$	FMOLS	DOLS
Türkiye		
Constant	-13.059580*** (0.0004)	-8.178557 (0.1153)
$\ln LAB$	2.211958*** (0.0000)	1.830147*** (0.0006)
$\ln FDI$	-0.033034** (0.0149)	-0.032427* (0.0558)
$\ln TO$	0.179105 (0.4184)	0.592934 (0.2946)
Poland		
Constant	-163.203100*** (0.0000)	-134.886400*** (0.0012)
$\ln LAB$	11.083730*** (0.0000)	9.362320*** (0.0004)
$\ln FDI$	0.139026** (0.0563)	0.236971* (0.0650)
$\ln TO$	0.584071** (0.0242)	0.635947* (0.0675)

Note: Asteriks *, **, and *** denote for 10%, 5%, and 1% level of statistical significance. The numbers in parenthesis denote the probability value.

Source: authors' compilation.

According to the results of FMOLS and DOLS for Türkiye, trade openness has no statistically significant effect on MVA, whereas FDI inward has a negative effect on MVA. For instance, an increase of 1% in FDI inward declines 0.033% and 0.032% in MVA in FMOLS and DOLS estimators, respectively. The empirical results suggest that an increase in inward FDI may lead to crowding out local firms, resulting in a reduction of manufacturing output. Also, it is a crucial point that as MNEs' role rises in the host countries, their control increases as well over the domestic economy. Overall, it is clear that globalization has no promoting effect on

MVA in Turkiye. Furthermore, the total labour force has a positive effect on MVA. A rise of 1% in the labour force increases 2.211% and 1.830% in MVA in FMOLS and DOLS estimators, respectively.

According to the FMOLS and DOLS results for Poland, both trade openness and FDI inward have a positive effect on MVA. For example, an increase of 1% in trade openness rises 0.584% and 0.635% in MVA in FMOLS and DOLS estimators, respectively. Besides, an increase of 1% in FDI inward stimulates 0.139% and 0.236% in MVA in FMOLS and DOLS estimators, respectively. In terms of both indicators representing globalization, it is possible to point out that globalization enhances MVA in Poland, and the linkage between MNEs and domestic firms is complementary. Specifically, the positive association between globalization and MVA can be attributed to the idea that MNEs increase the productivity of domestic firms.

Moreover, the labour force promotes MVA in Poland. An increase of 1% in the labour force rises 11.083% and 9.362% in MVA in FMOLS and DOLS, respectively.

Table 8. Robustness Check

Dependent Variable: lnMVA	CCR
Turkiye	
Constant	-14.173590*** (0.0001)
lnLAB	2.306322*** (0.0000)
lnFDI	-0.026323*** (0.0096)
lnTO	0.045466 (0.8569)
Poland	
Constant	-146.208300*** (0.0000)
lnLAB	10.041540*** (0.0000)
lnFDI	0.155368* (0.0934)
lnTO	0.669924*** (0.0051)

Note: Asteriks * and *** denote for 10% and 5% levels of statistical significance.

The numbers in parentheses denote the probability value.

Source: authors' compilation.

In order to validate the results of FMOLS and DOLS, we performed a canonical cointegrating regression (CCR) estimator. The results of the CCR estimator from Table 8 support the FMOLS and DOLS estimators' results, indicating that FDI inward negatively affects MVA, whereas trade openness has no statistically significant effect on MVA in Turkiye. Further, the labour force is positively associated with MVA in Turkiye. In addition, FDI inward,

trade openness, and the labour force positively affect MVA in Poland. After estimating the long-run coefficient, the Toda-Yamamoto causality test is used to reveal the potential causality relationship between Turkiye and Poland.

Table 9. Toda-Yamamoto Causality Test Results for Turkiye

Variable	Lag (k)	Lag (k + d _{max})	Chi-sq	Prob.	Result
Dependent variable: lnMVA					
lnFDI	1	2	9.216088	0.002	lnFDI → lnMVA
lnLAB	1	2	3.096957	0.078	lnLAB → lnMVA
lnTO	1	2	0.826883	0.363	No Causality
Dependent variable: lnLAB					
lnMVA	1	2	18.728380	0.000	lnMVA → lnLAB
lnFDI	1	2	8.281988	0.004	lnFDI → lnLAB
lnTO	1	2	2.141094	0.143	No Causality
Dependent variable: lnFDI					
lnMVA	1	2	0.948060	0.330	No Causality
lnLAB	1	2	3.417797	0.064	lnLAB → lnFDI
lnTO	1	2	7.651131	0.005	lnTO → lnFDI
Dependent variable: lnTO					
lnMVA	1	2	0.376674	0.539	No Causality
lnFDI	1	2	0.245919	0.619	No Causality
lnLAB	1	2	3.646777	0.056	lnLAB → lnTO

Source: authors' compilation.

The Toda-Yamamoto causality test results from Table 9 for Turkiye indicate that there is a bidirectional causality relationship between labour force (lnLAB) and manufacturing value-added (lnMVA), and labour force (lnLAB) and FDI inward (lnFDI). Also, there is a one-way causality relationship running from FDI inward (lnFDI) to manufacturing value-added (lnMVA), from trade openness (lnTO) to FDI inward (lnFDI), and from the labour force (lnLAB) to trade openness (lnTO).

The Toda-Yamamoto causality test results from Table 10 for Poland show that there is a feedback causality relationship between FDI inward (lnFDI) and manufacturing value-added (lnMVA) and a one-way causality relationship running from trade openness (lnTO) to manufacturing value-added (lnMVA), from manufacturing value-added (lnMVA) to the labour force (lnLAB), and from labour force (lnLAB) to FDI inward (lnFDI).

Table 10. Toda-Yamamoto Causality Test Results for Poland

Variable	Lag (k)	Lag (k + d _{max})	Chi-sq	Prob.	Result
Dependent variable: lnMVA					
lnLAB	1	2	2.153708	0.142	No Causality
lnFDI	1	2	3.446268	0.063	lnFDI → lnMVA
lnTO	1	2	8.601330	0.003	lnTO → lnMVA
Dependent variable: lnLAB					
lnMVA	1	2	7.075376	0.007	lnMVA → lnLAB
lnFDI	1	2	0.523196	0.469	No Causality
lnTO	1	2	0.574088	0.448	No Causality
Dependent variable: lnFDI					
lnMVA	1	2	5.514692	0.018	lnMVA → lnFDI
lnLAB	1	2	7.492778	0.006	lnLAB → lnFDI
lnTO	1	2	2.302132	0.129	No Causality
Dependent variable: lnTO					
lnMVA	1	2	1.170171	0.279	No Causality
lnLAB	1	2	0.945626	0.330	No Causality
lnFDI	1	2	0.259691	0.610	No Causality

Source: authors' compilation.

6. Discussion of the Empirical Findings

The empirical findings show that inward FDI and trade openness have a positive impact on MVA in Poland. An increase in inward FDI and trade openness contributes to the increase in MVA. This means that in a liberalized economy, countries may get opportunities to access foreign technology, resulting in the adoption of the development of modern production techniques in the economy. Further, in the case of an open economy, firms can operate with economies of scale, and foreign competition forces firms to look for efficiency (Umoh, Effiong, 2013). Furthermore, the positive impact of trade liberalization can depend on some conditions. For example, trade liberalization promotes industrial performance when used in a specific sector instead of a whole sector in the economy, and performed gradually. Besides, trade liberalization should be adopted when the industrial capacity of countries reaches a maturity level (Osakede, Adenikinju, 2022). Likewise, it is expected that inward FDI enhances the growth of the manufacturing sector in developing countries in several ways. Firstly, FDI leads to direct given resources from low-value-added sectors to high-value-added sectors

(Djulius et al., 2019). Secondly, multinational enterprises (MNEs) bring new technologies that upgrade the high value-added to the host economy, making it easier to reach quality inputs and increasing the value added (Sjöholm, 2018). Our findings for the positive effect of trade openness on MVA are supported by the studies of Chandran and Munusamy (2009) for Malaysia, Nahidi and Seif (2012) for Iran, Umoh and Effiong (2013) for Nigeria, Mushtaq et al. (2014) for a panel sample of Bangladesh, India, Nepal, Pakistan and Sri Lanka, Cengiz and Manga (2023) for Western Balkan countries, including Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia, and Nas (2024) for Türkiye. Also, the positive effect of FDI inward on MVA is in line with Onakoya et al. (2012) for Nigeria, Anyanwu (2017) for North Africa, Orlie et al. (2018) for Czechia, Estonia, Hungary, Slovakia, and Slovenia, Rahman and Abu Bakar (2019) for Pakistan, Mehta et al. (2023) for India, and Iqbal et al. (2025) for Pakistan.

Moreover, the impact of FDI inward on MVA is negative in Türkiye, indicating that MNEs' activities impede and crowd out domestic firms, resulting in a slowdown in the manufacturing sector. As discussed above, the well-recognised idea that FDI promotes host economies' economic growth is criticised by heterodox approaches. The adverse effect of FDI inward on MVA is consistent with the study of Botta et al. (2022) and Mano et al. (2025). To mitigate the negative effects of FDI on the manufacturing sector, strengthening the role of domestic firms and reducing reliance on foreign capital are crucial. Furthermore, trade openness does not affect MVA in Türkiye. The insignificant result indicates that integration into the world economy through international trade does not establish a bridge with the host economies' manufacturing sector.

As mentioned above, Türkiye and Poland are two countries that are integrated into the world economy. Türkiye has a long history of liberalizing its economy since the beginning of 1980. In the 1960s, state interventions in the economy were higher. In order to develop a domestic industry, import substitution was used as a critical policy tool. However, the 24th January 1980 decisions were a turning point for the Turkish economy in order to liberalize its economy. The 24th January 1980 decisions transformed almost all spheres of the Turkish economy, and export-oriented industrialization policies were adopted to develop instead of an import substitution strategy (Yucekaya, 2018).

According to Akcay and Jungmann (2022), three waves of market reforms have been adopted in Poland in line with the neoliberal globalization paradigm. In the first wave, the shock therapy mechanism is applied to rapidly transition from a controlled economy to a liberalized economy. In the second stage of market reforms, as members of the EU, Polish policymakers intended to complete the transition process, starting with the first wave. In this

stage, flexing the labour market and opening strategic sectors (coal, shipbuilding, and steel) for international competition were central to the reform agenda. The third wave of market reform occurred between 2007 and 2015. During this period, the Polish economy slowed down, and the government tried to narrow the coverage of social security to keep the competitive power of firms (Akçay, Jungmann, 2022, p. 17).

Concluding Remarks and Policy Recommendations

Due to globalization, the share of MVA has faced challenges, resulting in an increasing share of the service sector economy. However, the manufacturing sector is a driving force in Türkiye and Poland. The current study attempts to examine the impact of economic globalization on MVA for Türkiye and Poland by using annual data from 1995–2022. As mentioned above, these two countries have some common economic patterns. The empirical findings from different estimators show that trade openness has no statistically significant effect on MVA, whereas inward FDI has a negative impact on MVA in Türkiye. Moreover, both trade openness and FDI inward have a positive effect on MVA in Poland. Also, the labour force contributes to MVA in both countries. We can offer policy recommendations for both countries that align with the empirical results. Firstly, Türkiye and Poland have a remarkable and growing global market. Investors can be directed towards these destinations. Specifically, Türkiye's young population and increasing labour force provide unique advantages. Thanks to the EU membership process, Türkiye has adopted many economic reforms for a long time. In the scope of our empirical findings, the negative effect of FDI on MVA indicates that, along with economic globalization, MNEs may strive for the service sector. This can be attributed to establishing a job in the service sector rather than industry. Policymakers should adopt fiscal policies, including tax advantages and credit incentives, in order to pull foreign investment into the manufacturing sector. Secondly, Poland is gradually increasing its power in Europe and the world economy. Although the service sector covers most of the economy, and manufacturing still plays a critical role. However, Poland has faced some demographic challenges. For example, the aging population. This has some risks of impeding productivity. Hence, policymakers should create a new alternative to decrease the population. For instance, the government should mitigate strict migration policies to offset the labour force shortage in the short run. However, in the long run, Poland's government should find permanent solutions.

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