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TURKIYE ON THE GROWTH-DEVELOPMENT AXIS: AN EMPIRICAL EXAMINATION OF THE RELATIONSHIP OF INDUSTRY-FOREIGN TRADE

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ABSTRACT

Purpose- This research examines the interplay between the industrial sector and foreign trade in Türkiye, emphasizing their significance in fostering the nation's economic progress and development. By analyzing this dynamic interaction, the research provides insights into Türkiye's economic trajectory toward sustainable development.
Methodology- The analysis employs advanced stationarity and cointegration tests, including the Lee-Strazicich (2003), Narayan-Popp (2010), and Carrion-i-Silvestre et al. (2009) unit root tests, as well as the Hatemi-J (2008) and Maki (2012) cointegration tests.
Findings- The results reveal that industry and foreign trade were cointegrated during the 1923–1979 period, but no such relationship was identified post-1980. Between 1923 and 1979, a 1% growth in exports was associated with a 0.38-unit increase in the share of industry within GDP, whereas a 1% rise in imports resulted in a 0.24-unit reduction in the same metric.
Conclusion- The findings suggest that Türkiye should adopt a development-focused, planned economic system and prioritize export-oriented industrialization policies. This study is distinctive in its use of industry/GDP data, contributing a novel perspective to the literature.

Keywords: Development, economic growth, Industry-to-GDP share, export and import dynamics.
JEL Codes: F14, F43, O11, O14

1. INTRODUCTION

After the destruction in the Second World War, the countries started an intensive development effort with the industrial move. It is seen that foreign trade strategies play a key role in these intensive development moves. In developing countries, exports often serve as a foundation for certain developmental initiatives, while imports play a crucial role in others, particularly in fostering economic development. For instance, the importation of capital goods and advanced technologies can significantly contribute to the modernization and expansion of an economy. By acquiring cutting-edge technologies, a country can enhance its productivity and competitiveness, paving the way for sustainable economic growth. Additionally, the import of essential raw materials or intermediate goods, which may not be available domestically, is vital for supporting the development of specific industries. Such imports enable local enterprises to produce goods and services more efficiently and at competitive standards. Ultimately, these activities aim to elevate social welfare and overall economic well-being.

Developing countries (DCs) are nations undergoing significant economic growth and transformation. These countries typically exhibit characteristics such as high population growth, moderate income levels per capita, and deepening integration into the global economy. Regions like Asia, Latin America, and Africa are home to many DCs. Prominent examples of emerging economies include China, India, Brazil, Russia, South Africa, Mexico, Indonesia, Türkiye, and Thailand. Recent economic progress in these nations has been fueled by factors such as globalization, increased foreign direct investment, and the expansion of their middle-class populations. However, emerging economies also face significant challenges such as corruption, political instability, inadequate infrastructure, and a lack of skilled labor. Despite these challenges, the

growth potential of emerging economies continues to attract investors and businesses from around the world.

The concepts of development and economic growth were used interchangeably until the middle of the 20th century. However, the concept of growth, which explains quantitative changes, is an expression of GDP growth. The concept of development, which explains both quantitative and qualitative changes, includes social changes and renewals as well as economic changes. In addition, *growth* is a concept related to developed and underdeveloped countries. *Development*, on the other hand, relates to underdeveloped or developing countries. Therefore, development is a much broader concept that includes growth and cannot be expressed in monetary terms (Ersungur, 2009:19-20). In this context, it is of vital importance to consider the development phenomenon from a socio-economic perspective, rather than reducing the discussions only to economic growth (Todaro, 2000:17). The negativities experienced especially after the 1970s show that development is a multifaceted event that encompasses all of life, related to culture, politics, and especially the social structure (Brainard, 1975:154). The foundations of the development phenomenon, which is an international problem (Savaş, 1986:183), were laid for the first time in 1776 with Adam Smith's Wealth of Nations (Todaro, 2000:7).

Developing countries (DCs) are nations undergoing substantial economic progress and structural transformation. They are typically defined by features such as elevated population growth, moderate income per capita, and a growing connection to the global economic system.

Emerging economies are predominantly situated in regions like Asia, Latin America, and Africa. Prominent examples include China, India, Brazil, Russia, South Africa, Mexico, Indonesia, Türkiye, and Thailand. These nations have witnessed significant economic expansion in recent years, fueled by globalization, rising foreign investments, and the emergence of a growing middle class. However, emerging economies also face significant challenges such as corruption, political instability, inadequate infrastructure, and a lack of skilled labor. Despite these challenges, the growth potential of emerging economies continues to attract investors and businesses from around the world.

After the destruction in the Second World War, the countries started an intensive development effort with the industrial move. The concepts of development and growth were used interchangeably until the middle of the 20th century. However, the concept of growth, which explains quantitative changes, is an expression of GDP growth. The concept of development, which explains both quantitative and qualitative changes, includes social changes and renewals as well as economic changes. In addition, growth is a concept related to developed countries. Development, on the other hand, relates to underdeveloped or developing countries. Therefore, development is a much broader concept that includes growth and cannot be expressed in monetary terms (Ersungur, 2009:19-20). In this context, it is of vital importance to consider the development phenomenon from a socio-economic perspective, rather than reducing the discussions only to economic growth (Todaro, 2000:17). The negativities experienced especially after the 1970s show that development is a multifaceted event that encompasses all of life, related to culture, politics, and especially the social structure (Brainard, 1975:154). The foundations of the development phenomenon, which is an international problem (Savaş, 1986:183), were laid for the first time in 1776 with Adam Smith's Wealth of Nations (Todaro, 2000:7). Along with the studies of economists such as David Ricardo, Robert Malthus, Karl Marx on development economics, Adam Smith and John Stuart Mill made important contributions. Development economics is a science that emerged during the Second World War (Krueger, 1997:1).

It is seen that foreign trade strategies play a key role in intensive development moves in DCs. Especially in Developing Countries (DCs), it is seen that exports form the basis of some development moves and imports in others. The main purpose of all of them is to increase social welfare. Foreign trade plays a crucial role in the economic development of developing countries by facilitating the exchange of goods and services across borders. Developing countries typically specialize in the production of commodities such as agricultural products, minerals, and natural resources, which they export to developed countries in exchange for manufactured goods and other products that they cannot produce domestically. A key challenge facing the foreign trade sector in developing countries is the insufficient infrastructure and resources needed to support and sustain trade activities. This includes issues such as inadequate transportation networks, limited access to financing, and a lack of skilled labor. In addition, developing countries often face stiff competition from established players in the global market, which can make it difficult to secure favorable trade terms. Despite these challenges, the foreign trade sector in developing countries holds significant potential to promote economic growth and development.

Overall, the stance of emerging economies in the global space has been one of growth and development, with a focus on increasing their presence in international trade and building their manufacturing capabilities. While challenges remain, many of these countries are making significant progress in their efforts to become major players in the global economy.

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Growth, Development and Foreign Trade - It is claimed that foreign trade is effective in growth, development in technology, and increase in welfare (Young, 1991: 369); foreign trade is effective in the development process (Salvatore, 1999:317). It is seen that the studies questioning the relationship between the variables started in the 19th century. In the 20th century, development began to be identified with industrialization. By discussing the roles that foreign trade should undertake to achieve industrialization, a trend towards the use of foreign trade as a tool in the industrialization strategies of developing countries has begun (Krueger, 1990:104-105). Income rises and poverty rates decline as a result of development. Although it is obvious that growth, development, and international trade are strongly correlated, there is ongoing disagreement on the existence and direction of this relationship. According to classical economic theory, foreign trade affects economic development positively. Among the later economists, the debate continues whether foreign trade is the engine or the servant of development. Several economists, including Cairncross, Myrdal, Nurkse, Prebisch, and Singer, have emphasized the negative impact of foreign trade on the economic growth of emerging nations (Doru, 2013: 69). Research exploring the relationship between economic growth and international trade can generally be classified into four main categories:

Exports-led Growth (ELG) - Empirical studies have examined the impact of exports on economic growth, often referred to as *the Export-led Growth (ELG) Hypothesis*. *The ELG Hypothesis* is a development strategy that extends beyond developing countries and encompasses all nations, aiming to enhance production capacity by emphasizing foreign exports (Panta et al., 2022). Researchers such as Balassa (1978), Fajana (1979), Onafowora et al. (1996), Al-Yousif (1997), Bahmani-Oskooee and Oyolola (2007), Narayan et al. (2007), Rani and Kumar (2018), Hagemejer and Mućk (2019), and Arteaga et al. (2020) have provided empirical evidence supporting *the ELG Hypothesis*. Additionally, Raghutla and Chittedi (2020) concluded that *the ELG Hypothesis* holds true for Brazil and Russia.

Imports-led Growth (ILG) - *The Import-led Growth Hypothesis* suggests that imports is a key driver of economic growth. According to this theory, long-term economic growth is fostered through imports, particularly by gaining access to intermediate goods and foreign technology (Coe & Helpman, 1995), as well as by transferring growth-enhancing research and development (R&D) expertise from developed to developing countries (Lawrence & Weinstein, 1999; Mazumdar, 2001). A significant paradigm shift occurred in the 1970s, moving from an Export-led Growth model to an Import-led Growth model. Raghutla and Chittedi (2020) found that *the Import-led Growth (ILG)* Hypothesis holds true for Russia.

Growth-led Exports (GLE) - In contrast to *the Export-led Growth (ELG) Hypothesis, the Growth-led Exports (GLE) Hypothesis*, which is also supported by neoclassical trade theory, posits that an increase in economic growth can lead to higher exports through the realization of economies of scale and a reduction in production costs (Bahmani-Oskooee, 2009). Bhagwati (1988) argues that a rise in GDP typically results in an expansion of trade. A study by Raghutla and Chittedi (2020) found that *the GLE Hypothesis* holds for India, South Africa, and China.

Growth-led Imports (GLI) - The concept where imports drive growth is referred to as *the Import-led Growth (ILG)* strategy. Raghutla and Chittedi (2020) found that *the Growth-led Imports (GLI) Hypothesis* holds for Brazil, China, India, and South Africa.

Development, Planning, and the Planning Period in Turkiye - Preparations are done before acting to accomplish a specified goal is the general definition of planning (TODAIE, 1961). Long-term plans are frequently used by developing or undeveloped nations (Husted&Melvin, 2003:256). The notion that trading with other countries contributes significantly to development led to the creation of development plans based on foreign commerce. According to Saatçioğlu (2001:59), the welfare level can be increased. To achieve this, all development plans aim to transition from an agriculture-based economic structure to an industry, advanced technology, and capital-intensive economic structure (Seyidoğlu, 2001:597). In Turkiye, with the 1961 Constitution, it was decided to carry out the development within the framework of a plan (Hiç, 1993:70). The years 1960-1963 are transition periods, and the planned development period started in

1963. In this process; First Five-Year Development Plan (FYDP) (1963-1967), Second FYDP (1968-1972), the Third FYDP (1973-1977), Fourth FYDP (1979-1983) were formed. The rising trend of planning was realized in Turkiye thanks to the establishment of the DPT and the First Development Plan. While the first cadre was developmental, leftist, and populist at the beginning, then it was shaped in the line of developmentalism, which was shaped in line with class interests, and the Fourth FYDP failed as a result of the Republic People's Party (Cumhuriyet Halk Partisi, CHP)'s withdrawal from the political administration (Boratav, 2010:370-371). Along with this, "The January 24 decisions and the transition to neoliberalism through the September 12 regime have also removed the "developmental" features of planning" (Boratav, 2010:370-371). And also two factors that prevented the anticipated goals from being achieved: the oil crisis and the escalating foreign deficit. These factors had a negative impact on the economy, and one of the consequences was that foreign trade could not play the key role that was expected from it in the industrialization process. This study's goal is to determine whether there is a connection between international commerce and the process of development, which includes the transition to industry, cutting-edge technology, and capital-intensive economic structure, as predicted in earlier research in Turkiye. The study's treatment of the industry-to-GDP ratio as a measure of industrialization will take a different approach from earlier empirical studies that used very different metrics, and it will be the topic of numerous analyses employing import and export data. This study, which takes into account the contribution of industry to Gross Domestic Product (GDP), supports the Export-Led Growth Hypothesis (ELG) and identifies that imports have a negative impact on economic growth. Additionally, it emphasizes the need for Turkiye to transition back to a "developmentalist and populist" planned system for sustainable growth and proposes a strong export promotion policy within the framework of an export-oriented industrialization program. These findings underscore the importance of a comprehensive approach to achieving sustained economic growth in Turkiye.

In this study, the literature on Growth, Development, Foreign Trade, and Planning will be followed by an empirical literature review, and then empirical testing will be conducted. Finally, based on the findings, policy recommendations will be proposed.

In the empirical section, the 1923-1979 period and the post-1980 period will be analyzed separately to investigate the relationship between the variables.

2. EMPIRICAL LITERATURE REVIEW

Studies that empirically contest the link between foreign trade and development and growth will be presented in this section.

Table 1: Literature Summary (Studies Using Development-Specific Indicators)

Researcher	Period/Country	Variables	Methods	Result
Çakmak (1992)	1970-1989, 13 Countries	GDP, Export, Energy, Transportation, Communication, Education.	Least Squares Method (LSM), Granger Causality Analysis	Positive/ Negative
Torres&Mendez (2000)	1973-1995, Colombia	Geography, Infrastructure and Human Capital Variables, Population Density.	Least Squares Method (LSM)	Positive
Aguayo, Exposito&Lamelas (2001)	1990-1999, 22 Countries	Services, Agriculture, Industry, Export.	Least Squares Method (LSM)	Positive
Guisan&Aguayo (2002)	1980-1999, 22 Countries	Export, Education Level, Sectoral Productivity Level and Fertility Rate.	Comparative Analysis	Positive
Guisan&Cancelo (2002)	1960-1997, 25 Countries	Export, GDP, Duration of Education, Price Indicators.	Least Squares Method (LSM) (log-linear model)	Positive
Guisan&Exposito (2002)	1980-1999, 40 Countries	Export, Education Level, Sectoral Productivity Level, and Fertility Rate.	Comparative Analysis	Positive
Aguayo, Alvares&Gardella (2003)	1990-2000, 22 Countries	GDP, Exports.	Least Squares Method (LSM)	Positive

Guisan&Martinez (2003)	1960-2000, Argentina	GDP, Education Level, Imports, Fixed Capital Investments.	Least Squares Method (LSM) (linear and log-linear models)	Positive
Guisan (2005)	1964-2004, 2 Countries	Export, Import, and Education Level.	Least Squares Method (LSM), Granger Causality Test	Positive
Güngör&Kurt (2007)	1968-2003, Turkiye	Export+Import, Import/GDP, HDI, GDP, Education Index.	Johansen Cointegration Test, Error Correction Model	Positive
Dumlupınar (2008)	1981-2005, Turkiye	Foreign Trade/GDP, Education, Health, Transportation, Communication.	Johansen Cointegration Test, Granger Causality Test	Negative
Nourzad&Powell (2003)	1965-1990, 47 Countries	Lots of variables	Panel Regression	Positive

Table 2: Literature Summary (Studies Using GDP as a Growth Indicator) / Foreign Trade-Growth Relationship

Researcher	**Period/Country**	**Variables**	**Methods**	**Result**
Heller&Potter (1978)	1950 – 1973, 41 Countries	Export, GNP	Spearman Rank Correlation	Positive
Tyler (1981)	1960-1977, 55 Middle-Income Developing Countries	Growth, Increases in Manufacturing Output, Investment, Total Exports, and Exports of Manufactured Goods	With the Cross-Sectional Data, a Production Function Model was also defined and estimated.	Explaning the inter-country variation in GDP growth rates required a consideration of export performance.
Jung&Marshall (1985)	1950-1981, 37 Countries	Exports and Growth	Granger Causality Test	Positive relationship for 4 countries, no relationship for 33 countries
Chow (1987)	1960-1970, 8 newly industrialized countries	Economic Growth and Export Growth	Sims and Granger Causality Tests	Bidirectional in 6 countries, positive for one country, no relationship for one country
Afxentious&Serletis (1991)	1950-1985, 16 Countries	GDP, Exports	Engle-Granger EB, Granger Causality Test	Positive for only two countries
Marin (1992)	1960-1987 USA, Germany, Japan and UK	Productivity and Export Growth Rates	Cointegration and Granger Causality Test	Positive
Dutt&Ghosh (1996)	1953-91, 26 Countries	GDP, Exports	Engle-Granger EB, Granger Causality Test	Positive
Henriques&Sadorsky (1996)	1870-19, Canada	Real Canadian GDP, real Canadian terms of trade, and real Canadian exports.	VAR Model	Growth → Exports
Anwer&Sampath (1997)	1960s-1992, 96 Countries	GDP, Exports	Johansen Cointegration Test, Granger Causality Test	Positive in 20 countries
Thornton (1997)	1850'ler-1945, 6 Countries	GDP, Exports	Engle-Granger EB, Granger Causality Test	Positive
Shan&Tian (1998)	1990:1-1996:12 Shanghai	GDP, total employment, imports, FDI, and gross fixed capital expenditures are all indicators of trade.	Toda and Yamamoto Causality Test	Growth → Exports
Ekanayake (1999)	1960-97, 8 Countries	GDP, Exports	Engle-Granger, Johansen Cointegration Test, Error	Positive Relationship

			Correction Model, Granger Causality Test	
Frankel&Romer (1999)	1985, 63 Countries	Same to the data on bilateral trade presented by Frankel et al. (1995) and Frankel (1997)	OLS t-test	Positive Relationship
Afxentiou&serletis (2007)	1970-93, 50 developing Countries	GNP, Export, Import	Engle-Granger Cointegration Test, Granger Causality Test	Negative Relationship
Smith (2001)	1950-97, Costa Rica	GDP, Export Investment, Capital, Population	Engle-Granger, Johansen Cointegration Test, HDM, and VHDM	Positive Relationship
Hatemi-J (2002)	1960-1999 Japan	Export and Economic Growth Rates	Granger Causality Test	Exports↔Growth
Dritsakis (2004)	1991-2001, 2 Countries	GDP, Exports	Johansen Cointegration Test, Granger Causality Test	Positive Relationship
Saatçioğlu&Karaca (2004)	1950-2000, Turkiye	GDP, Exports	Engle-Granger Cointegration Test, Granger Causality Test	No relationship between 1950-1980, positive relationship between 1980-2000
Demirhan (2005)	1990-2004, Turkiye	Export, Import, GDP	Johansen Cointegration Test, HDM	Positive Relationship
Karagöl-Serel (2005)	1955-2002, Turkiye	GDP, Exports	Johansen Cointegration Test, HDM	Positive Relationship Cointegrated in the Long Run
Keong et al. (2005)	1960-2001 Malaysia	Real GDP, real exports, real imports, labour force and exchange rate	Granger Causality Test	Exports-Led Growth (ELG) Hypothesis Accepted
Mamun&Nath (2005)	1976-2003, Bangladesh	Economic Growth and Exports	Granger Causality Test	Positive Relationship
Schneider (2005)	1970-1990, 47 countries (19 developed and 28 developing countries)	Trade in high-technology, IPRs and FDI, innovation, and economic expansion	Least Squares Method (LSM)	Positive Relationship
Shirazi-Manap (2005)	1960'lar-2002, 5 Countries	GDP, Exports, Imports	Johansen Cointegration Test Granger Causality Test	Positive Relationship
Özer&Erdoğan (2006)	1987-2006, Turkiye	GDP, Exports, Imports	Johansen Cointegration Test, Granger Causality Test	Positive Relationship
Siliverstovs&Herzer (2006)	1960-2001, Chile	Real capital stock in Chile, the total number of persons employed annually, real imports of capital goods, real exports of manufactured goods, and real exports of primary goods are all non-export indicators.	Granger Causality Test	Positive Relationship
Yapraklı (2007)	1970-2005, Turkiye	GNP, Export	Johansen Cointegration Test, HDM	Positive Relationship Export → Output Level
Kaushik et al. (2008)	1971-2005, India	Gross fixed capital creation, export expansion, export volatility, and economic growth.	Granger Causality Test	Exports-Led Growth (ELG) Hypothesis Accepted
Kurt&Berber (2008)	1989-2003, 1	Total Foreign Trade, Import,	VAR	Positive Relationship

	country	Export, GNP		
Furuoka (2009)	1985-2002, 5 Countries	GDP, Exports	Panel Regression, Panel Cointegration	Regression Pozitive, Cointegration Negative
Altıntaş&Çetintaş (2010)	1970-2005, Turkiye	Lots of Variables	Johansen Cointegration Test, Granger Causality Test	Positive Relationship
Herrerias&Orts (2010)	1964-2004, China	GDP, investment, exports in FOB terms, Chinese economic R&D expenditure, real exchange rate, and USGDP	Johansen Cointegration Test, ECM	Positive Relationship
Shan&Sun (2010)	1987-1996, China	Real exports, real output (GDP), nonagriculture labour, real imports, industrial production index, and real gross capital formation.	Granger Causality Test, ADF, VAR	Bidirectional Causality
Türedi&Berber (2010)	1970-2007, Turkiye	Total Foreign Trade, GDP, Private Sector Loans	Johansen Cointegration Test, Granger Causality Test	Positive Relationship
Ağayev (2011)	1994-2008, 12 Countries	GDP, Exports	Pedroni Cointegration Test, Granger Causality Test	Negative Relationship
Kılavuz&Topçu (2011)	1998-2006, 22 Countries	Exports, Investments, Population, GDP	Panel Regression	Positive Relationship
Lorde (2011)	1960-2003 Mexico	Real GDP excluding exports, real imports, and real exports, real gross fixed capital formation, and annual employment.	Johansen Cointegration Test, ECM	In the long-term Growth-Led Exports (GLE)
Nişancı et al. (2011)	1970-2009, 6 Countries	National Income Per Capita, Import, Export	Johansen Cointegration Test, Granger Causality Test	Positive Relationship
Sandalcılar (2011)	1975-2010, 4 Countries	GDP, Exports	Pedroni Cointegration Test, HDM	Positive Relationship
Tekin (2011)	1970-2009, 18 Countries	GDP, Exports	Granger Causality Test	Positive in only 3 countries
Uddin et al. (2011)	1973-2006 Bangladesh	Industrial Production Index, Exports	Johansen Cointegration Test, ECM, and Granger Causality Test	A reciprocal relationship between exports and growth
Mangır (2012)	2002-2011, Turkiye	GDP, Exports	Johansen Cointegration Test, Granger Causality Test	Positive Relationship
Hüseyni (2012)	1980-2010, Turkiye	Exports, GDP, Capital, Population	Johansen Cointegration Test, Granger Causality Test	Positive Relationship
Alimi&Muse (2013)	1970-2009 Nigeria	GDP, total exports, oil and non-oil exports	Granger Causality Test	Export-led Growth Hypothesis Rejected
Jawaid & Raza (2013)	1980-2010 India	Trade, Growth	ARDL Bound Testing, Granger Causality, Toda-Yamamoto Modified Wald Causality, Variance Decomposition Tests	Trade ↔Economic Growth
Belloumi (2014)	1970-2008 Tunisia	Trade openness, growth, and foreign direct investment.	Granger Causality Test	No Relationship
Machado et al. (2014)	1995-2013 Brazil, China,	GDP per capita, exchange rate, unemployment rates	Non-dynamics panel with threshold	Positive Relationship

	India, and the Republic of South Africa	and interest rate.		
Nosakhare&Iyoha (2014)	1981:01-2010:04, Nigeria	Exports, FDI, exchange rates, and the real gross domestic products.	Johansen Cointegration Test , Granger	Positive Relationship
Sağlam&Egeli (2015)	1999-2013, Turkiye	Export, Growth	Johansen Cointegration Test and Granger Causality Test	Exports ↔ Growth (In the Short-Term), Exports → Growth (In the Long-Term)
Korkmaz&Aydın (2015)	2002:01-2014:02, Turkiye	GDP, Export and Import Unit Value Indexes	Granger Causality Test	Imports ↔ Economic Growth
Hina et al. (2016)	1974-2016 Pakistan	GDP, FDI, inflation, External debt, capital formation, and trade.	ARDL Bounds Test Approach	Positive Relationship
Şerefli (2016)	1975-2014 Turkiye	Growth, Foreign Trade	Granger Causality Test	No causality
Lawal& Ezeuchenne (2017)	1985-2015 Nigeria	Growth, Foreign Trade	Johansen Co-integration Test, Vector Error Correction Model (VECM), Granger Causality Test	According to the findings, there exists relationship between economic growth and international trade in the long run.
Temiz Dinç et al. (2017)	some developing countries, including Iran and Turkiye	Growth, Foreign Trade	Panel Co-integration Method	Foreign trade has a positive impact on economic growth
Altomonte et al. (2018)	1995-2007	Growth, Foreign Trade	Gravity Models	Trade has a positive effect on GDP per capita
Raza et al. (2018)	1974-2011, United Arab Emirates (UAE)	Growth, Foreign Trade	ARDL Bounds Test Approach, Johansen and Juselius Cointegration	Cointegration between trade and economic growth. Exports have (+), but imports have (-) effect on economic growth
Panta et al. (2022)	1965 – 2020, Nepal	Growth, Trade (Exports+Imports)	Cointegration and the Vector Error Correction Model.	There is no evidence that foreign trade supports growth in the long run.

As can be seen in Table 1-2, many different variables were included in the analysis to test the relationship between foreign trade and development and growth. However, in none of them the data related to the industry, which is the engine of growth and development, was used in the analysis. Therefore, this study differs from other studies in the literature and expands the typology.

3.METHODOLOGY

3.1.Dataset and Method

In this study, the share of industry in GDP was used as an indicator of industrialization. Import and export values were used as foreign trade data. Import and export series were included in the analysis with their logarithmic values. The share of industry in GDP data has been compiled from the studies of TURKSTAT (Turkish Statistics Institution) and Gökçen (2013). Export and import data were obtained from TURKSTAT data. Figure 1,2,3 shows the time-path trajectories of the series.

Figure 1: 1923-1979 Period

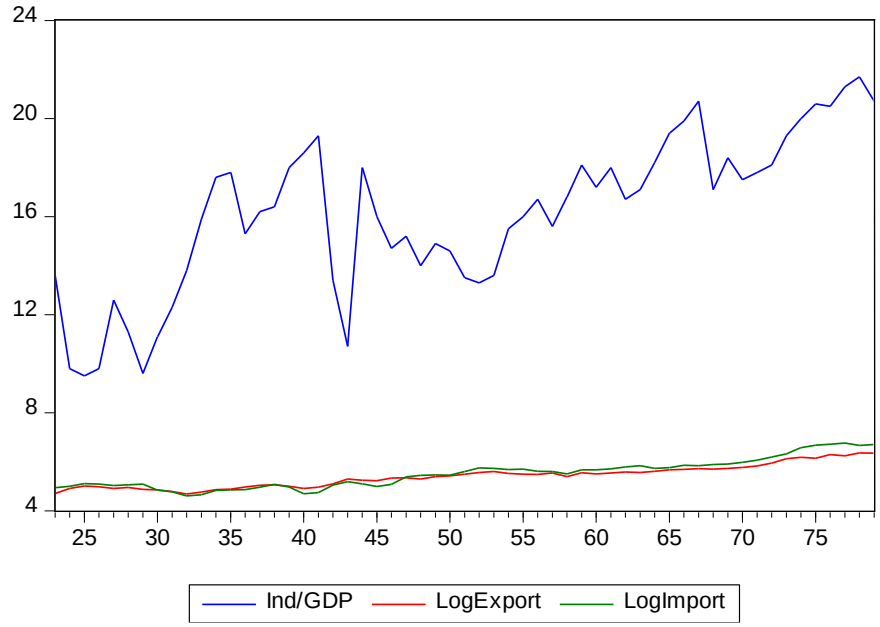


Figure 2: 1980-2021 Period

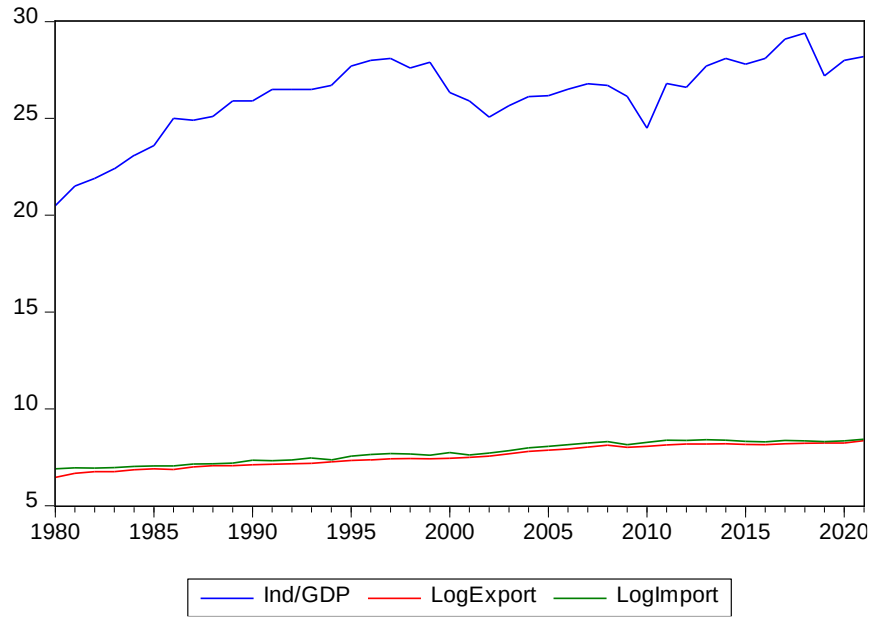
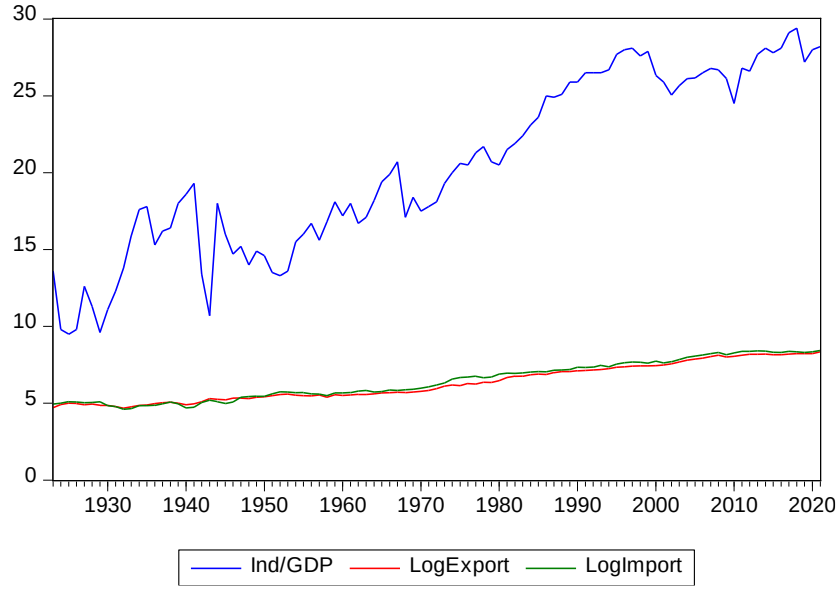


Figure 3: 1923-2021 Period



In the study, the Turkish economy is discussed in two sub-periods. The period of 1923-1979 refers to the period when more statist and import substitution industrial policies were dominant. The second sub-period is the post-1980 period (1980-2021), which is considered the time period when more liberal and open economy policies were implemented. In this context, separate analyzes were made for two sub-periods and the relationship between foreign trade and industrialization was investigated.

The method of the study was determined as the Maki cointegration test. According to the concept of cointegration, even if the series analyzed themselves are not stationary, a linear combination of them can be stationary. Series showing such features are called cointegrated (Maddala and Kim, 2004: 34). Granger and Newbold (1974) showed that when regression analysis is performed with non-stationary time series, significant regression estimations can be obtained even if the series is not related to each other. This situation is known as spurious regression. In cointegration analysis, on the other hand, it is possible to obtain significant and non-spurious results with non-stationary time series. This study, it is aimed to investigate the cointegration relationship between export, import, and industrialization for two sub-periods. For cointegration analysis, the series must be stationary at the same rank. In this context, first of all, unit root tests for the variables were applied.

The unit root tests used in the study were determined as unit root tests that take into account structural breaks. In traditional unit root tests such as Dickey-Fuller (1979), Phillips-Perron (1988), KPSS (1992), shocks in time series are assumed to be temporary. However, Nelson and Plosser (1982) demonstrated in their study that shocks can be permanent. Perron (1989) on the other hand showed that if there is a structural break in the time series and the break is not taken into account, the stationary series can be modeled as if they have unit roots. In this study, structural break unit root tests were preferred considering the structural changes in the Turkish economy data. Unit root tests with structural breaks, such as Perron (1989), Zivot-Andrews (1992), consider only one break. In addition, in the Perron (1989) test, the breaking time is determined exogenously. Lumsdaine-Papell (1997) unit root test, which takes into account the two breaks developed to eliminate these shortcomings, does not take into account the structural breaks in the basic hypothesis, but only includes them in the alternative hypothesis. In this case, rejecting the basic hypothesis means rejecting the unbreakable unit root, not the unit root with a structural break. In line with these criticisms, Lee and Strazicich (2003) developed a new unit root test that allows structural breaks in the basic hypothesis and takes two breaks into account. One of the unit root tests used in this study is the Lee-Strazicich (2003) unit root test. The data generation process in the Lee-Strazicich unit root test, which is based on the Lagrange multiplier developed by Schmidt and Phillips (1992), works as follows;

$$Y_t = \delta' Z_t + \varepsilon_t \quad (1)$$

$$\varepsilon_t = \beta \varepsilon_{t-1} + u_t \quad (2)$$

Z_t in the above equations is defined as the vector of exogenous variables and is expressed as follows for Model C used in this study;

$$Z_t = [1, t, D_{1t}, D_{2t}, DT_{1t}, DT_{2t}] \quad (3)$$

The dummy variables D_{it} and DT_{it} in the above vector are shown as follows;

$$D_{it} = \begin{bmatrix} t - TB_i, & t \geq TB_i + 1 \; then \\ 0, & otherwise \end{bmatrix} \quad (4)$$

$$DT_{it} = \begin{bmatrix} t - TB_i, t \geq TB_i + 1 \; then \\ 0, & otherwise \end{bmatrix} \quad (5$$

The regression equations used for the null hypothesis and counter-hypothesis in Model C are as follows;

$$Y_t = \mu_0 + d_1 B_{1t} + d_2 B_{2t} + y_{t-1} + \varepsilon_{1t} \quad (6)$$

$$Y_t = \mu_1 + \gamma t + d_1 D_{1t} + d_2 D_{2t} + \omega_1 DT_{1t} + \omega_2 DT_{2t} + \varepsilon_{2t} \quad (7)$$

In the Lee-Strazicih unit root test, the test statistic is found using the following regression equation. The null hypothesis used for the unit root test is defined as ∅=0.

$$\Delta y_t = \delta' \Delta Z_t + \emptyset S_{t-1} + \sum \gamma_i \Delta S_{t-i} + u_t \quad (8)$$

The break dates are determined at the point where the t statistic is minimum. If the calculated test statistic is found to be less than the critical value, the unit root hypothesis cannot be rejected under structural breaks. Since the critical values depend on the breakpoints ($\lambda = TB_i/T$), they are used by the estimated breakpoints (Çil, 2018:314).

Another unit root test used in the study is the Narayan-Poop (2010) unit root test. The test developed by Narayan and Poop (2010) allows for two structural breaks and also deals with the structural break in the unit root hypothesis. Two models, M1 and M2, are used in the test, and separate test statistics are calculated for both models. The following regression models are estimated within the framework of the Narayan-Poop unit root test.

$$d_t^{M1} = \propto + \beta t + \varphi^*(L)\left(\theta_1 DU'_{1,t} + \theta_2 DU'_{2,t}\right), \quad (9$$

$$d_t^{M2} = \alpha + \beta t + \varphi^*(L)(\theta_1 DU'_{1,t} + \theta_2 DU'_{2,t} + \gamma_1 DT'_{1,t} + \gamma_2 DT'_{2,t}) \quad (10)$$

In the above equations, $DU'_{i,t} = 1(t > T'_{B,i})$, expresses the structural changes in the constant term while $DT'_{i,t} = 1(t > T'_{B,i})(t - T'_{B,i})$, represents the structural changes in the slope. $(T'_{B,i})$, represents the structural break times. The coefficients θ_i and γ_i express the severity of the structural changes in level and slope. $[\varphi^*(L)]$, ensures that the structural changes in the series occur slowly over time. The test statistics calculated for the M1 and M2 models in the decision process of the test are compared with the critical values obtained by Narayan and Poop (2010). If the calculated test statistic is greater than the critical value, the null hypothesis that the series has unit root cannot be rejected. In other words, it is understood that the series is not stationary.

Another unit root test applied within the framework of this study is Carrion-i Silvestre et al. (2009) is a unit root test that allows up to five structural breaks. Three different models are considered in the Carrion-i Silvestre et al unit root test. Model 0 considers the change in level, while Model 1 takes into account the change in slope. Model 2 models the change in both level and slope. During the testing process, five different test statistics described below were developed.

$$P_T(\lambda^0) = [S(\bar{\alpha}, \lambda^0) - \bar{\alpha} S(1, \lambda^0)]/s^2(\lambda^0) \quad (11)$$

$$MZ_\alpha(\lambda_0) = [T^{-1}\hat{Y}_t^2 - s(\lambda^0)^2](2T^{-2}\sum_{t=1}^{T}\hat{Y}_{t-1}^2)^{-1} \quad (12)$$

$$MSB(\lambda)^0 = [s(\lambda^0)^{-2}T^{-2}\sum_{t=1}^{T}\hat{Y}_{t-1}^2]^{1/2} \quad (13)$$

$$MZ_t(\lambda)^0 = [(T^{-1}\hat{Y}_t^2 - s(\lambda^0)^2)(4s(\lambda^0)^2 T^{-2}\sum_{t=1}^{T}\hat{Y}_{t-1}^2]^{1/2} \quad (14)$$

$$MP_t(\lambda^0) = [c^{-2}T^{-2}\sum_{t=1}^{T}\hat{Y}_{t-1}^2 + (1+\bar{c})T^{-1}\hat{Y}_t^2]/s\lambda^0)^2 \quad (15)$$

The main hypothesis of the test suggests the existence of a unit root under structural breaks. The alternative hypothesis is defined as a trend stationary process with a structural break. The test statistics calculated during the decision process are compared with the critical values produced by Carrion-i Silvestre et al (2009). If the calculated test statistic is greater than the

critical value, the unit root hypothesis cannot be rejected under structural breaks. In other words, it is concluded that the analyzed time series is not stationary under structural breaks.

The Maki cointegration test, which is used as a cointegration test, allows five structural breaks. In the case of structural breaks, traditional cointegration tests such as Engle-Granger (1987) and Johansen (1988) give biased results. The structural break cointegration test was first developed by Gregory and Hansen (1996). The Gregory-Hansen test considers a single structural break. The cointegration test developed by Hatemi-J (2008) allows two structural breaks. Maki (2012) cointegration test used in this study is superior to the previous cointegration tests in terms of analyzing five structural breaks. Four different models are used in the Maki cointegration test process. These models are expressed with the following regression equations.

$$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \beta' x_t + u_t \quad (16)$$

$$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \beta' x_t + \sum_{i=1}^{k} \beta_i' x_t D_{i,t} + u_t \quad (17)$$

$$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \gamma t + \beta' x_t + \sum_{i=1}^{k} \beta_i' x_t D_{i,t} + u_t \quad (18)$$

$$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \gamma t + \sum_{i=1}^{k} \gamma_i t D_{i,t} + \beta' x_t + \sum_{i=1}^{k} \beta_i' x_t D_{i,t} + u_t \quad (19)$$

Models defined above with regression equations; are expressed as Model 0, Model 1, Model 2, and Model 3, respectively. Model 0 and Model 1 are trend-free models. Model 0 only consider a break in level, Model 1 consider a break at a constant level and slope. Model 2 and Model 3 are defined as models with the trend. Model 2 considers breaks in level and slope, while Model 3 considers breaks in trend and slope. D_i variables are dummy variables. Dummy variables take the value 1 if $t > TB_i$, 0 otherwise. The TB_i values show the breaking times. The main hypothesis of the Maki cointegration test is that there is no cointegration relationship between the variables under structural breaks. The alternative hypothesis is that there is a cointegration relationship under structural breaks. If the calculated test statistic is greater than the critical value, the basic hypothesis cannot be rejected. In other words, it is concluded that there is no cointegration between the variables. Critical values table can be obtained from Maki (2012).

3.2.Empirical Findings

First of all, unit root tests for the variables were carried out. Since the Turkish economy is considered as two sub-periods, unit root tests were first applied to the variables for the period 1923-1979. In Table 3, the results of the Lee-Strazich unit root test, which is among the structural break unit root tests, are summarized for the level values of the variables. The model considered in the Lee-Strazich unit root test was determined as Model 2, which allows two breaks in the level and the slope of the trend function.

Table 3: Lee-Strazich Unit Root Test Results with Level Values of Variables (1923-1979)

	Lag Length	Minimum t Statistic	Break Dates		Critical Value (1%)	Critical Value (5%)	Result
Ind/GDP	12	-5.8115	1940, 1956		-6.45	-5.67	Stationary (5%)
LogExport	2	-4.4950	1945, 1963		-6.42	-5.65	Unit Root (1%)
LogImport	5	-5,3469	1941, 1963		-6,42	-5,65	Unit Root (1%)

As seen in Table 3, the unit root hypothesis was rejected at the 5% significance level according to the Lee-Strazicich unit root test regarding the share of industry in GDP variable representing industrialization for the 1923-1979 sub-period. For other variables, the unit root process is valid at both 1% and 5% significance levels. When the breaking dates are examined, it is noteworthy that the years of the Second World War come to the fore. The second breaking year for the export and import series was determined as 1963. In this context, it can be evaluated that a structural change took place in the planned economy period. Narayan-Popp unit root test was applied once to clarify the stationarity situation in the variable regarding the share of industry in GDP. Narayan-Popp unit root test results are summarized in Table 4.

Table 4: Narayan-Popp Unit Root Test Results with Level Values of Variables (1923-1979)

	Industry/GDP M1 Model	Industry/GDP M2 Model	LogExport M1 Model	LogExport M2 Model	LogImport M1 Model	LogImport M2 Model
The 1st Break	1941	1941	1942	1942	1941	1941
The 2nd Break	1943	1944	1957	1957	1946	1946
Optimal Lag	0,000	0,000	0,000	0,000	0,000	1,000
t Statistic	-3,776	-4,227	-2.986	-3,097	-1,692	-2,664
Critical Value (1%)	-5,259	-5,949	-5,259	-5,949	-5,259	-5,949
Critical Value (5%)	-4,514	-5,181	-4,514	-5,181	-4,514	-5,181
Result	Unit Root (1%)	Unit Root (1%)	Unit Root (1%)	Unit Root (1%)	Unit Root (1%)	Unit Root (1%)

As seen in Table 4, the calculated t statistics are greater than the critical values for all three variables in both models at both 1% and 5% significance levels. In other words, the basic hypothesis suggesting that the series have unit roots for all three variables could not be rejected. With the application of the Narayan-Popp unit root test, strong evidence has been obtained that the industry's share of GDP variable, which indicates industrialization, is unit rooted. To perform cointegration analysis, it is important to what extent the variables become stationary. In this context, unit root tests were repeated by taking the first difference of all three variables. In Table 5, the results of the two-break Lee-Strazicich unit root test applied to the series with the first difference are summarized. Model 2 was used as in the test with level values.

Table 5: Lee-Strazich Unit Root Test Results with First Difference Values of Variables (1923-1979)

	Lag Length	Minimum t Statistic	Break Dates		Critical Value (1%)	Critical Value (5%)	Result
Ind/GDP	0	-9,7601	1940, 1943		-6,16	-5,59	Stationary (1%)
LogExport	0	-7,2903	1940, 1958		-6,45	-5,67	Stationary (1%)
LogImport	1	-7,0460	1965, 1972		-6,32	-5,73	Stationary (1%)

As seen in Table 5, the series became stationary when the first difference of all variables was taken for the 1923-1979 sub-period. Since the calculated test statistics are smaller than the critical values at 1% and 5% significance levels, the basic hypothesis suggesting that the series have unit roots for all three variables was rejected, and it was observed that they were stationary under two structural breaks. To make the test results more reliable, the Narayan-Popp unit root test, which takes into account two structural breaks as well as the level values, was applied once. The test results are summarized in Table 6.

Table 6: Narayan-Popp Unit Root Test Results with First Difference Values of Variables (1923-1979)

	Ind/GDP M1 Model	Ind/GDP M2 Model	LogExport M1 Model	LogExport M2 Model	LogImport M1 Model	LogImport M2 Model
The 1st Break	1940	1942	1941	1941	1940	1940
The 2nd Break	1942	1955	1956	1956	1945	1957
Optimal Lag	0,000	0,000	0,000	0,000	0,000	1,000
t Statistic	-10,70	-8,577	-8,569	-8,408	-6,554	-5,956
Critical Value (1%)	-5,259	-5,949	-5,259	-5,949	-5,259	-5,949
Critical Value (5%)	-4,514	-5,181	-4,514	-5,181	-4,514	-5,181
Result	Stationary (1%)	Stationary (1%)	Stationary (1%)	Stationary (1%)	Stationary (1%)	Stationary (1%)

As seen in Table 6, all variables became stationary when the first difference of the variables was taken. The test statistics calculated in both the M1 model and the M2 model are smaller than the critical values. In this case, the basic hypothesis that the series is unit rooted with two structural breaks was rejected for all three series. These results are also compatible with the Lee-Strazich unit root test results. In this context, it is understood that the series for the period considered are I(1). In other words, there is no obstacle to the cointegration test. However, it is important to conduct unit root tests for the 1980-2021 sub-period before proceeding to the cointegration test. First of all, the Lee-Strazich unit root test was applied, and the results summarized in Table 7 were obtained for the period in question. In this test, Model 2, which considers two structural breaks in the level of the series and the slope of the trend function, was used.

Table 7: Lee-Strazich Unit Root Test Results with Level Values of Variables (1980-2021)

	Lag Length	Minimum t Statistic	Break Dates		Critical Value (1%)	Critical Value (5%)	Result
Ind/GDP	12	-7,2643	1998, 2015		-6.42	-5.65	Stationary (1%)
LogExport	11	-6.4612	1996, 2012		-6.42	-5.65	Stationary (1%)
LogImport	5	-5,7837	1996, 2008		-6,42	-5,65	Stationary (1%)

As seen in Table 7, the calculated test statistics are smaller than the critical values. Only the test statistic for the import variable is greater than the critical value at the 1% significance level. In this case, the basic hypothesis suggesting that the series is unit rooted under two structural breaks for all three variables at the 5% significance level was rejected, and it was concluded that the series were trend stationary with two structural breaks. As it was applied from 1923 to 1979, the stationarity of the variables was examined with the Narayan-Popp unit root test for the period of 1980-2021, and the results obtained are presented in Table 8.

Table 8: Narayan-Popp Unit Root Test Results with Level Values of Variables (1980-2021)

	Ind/GDP M1 Model	Ind/GDP M2 Model	LogExport M1 Model	LogExport M2 Model	LogImport M1 Model	LogImport M2 Model
The 1st Break	1999	1999	2003	2003	2000	2000
The 2nd Break	2008	2008	2008	2008	2008	2008
Optimal Lag	0,000	0,000	0,000	0,000	0,000	1,000
t Statistic	-4,440	-4,235	-1.887	-3,796	-1,781	-5,710
Critical Value (1%)	-5,259	-5,949	-5,259	-5,949	-5,259	-5,949
Critical Value (5%)	-4,514	-5,181	-4,514	-5,181	-4,514	-5,181
Result	Unit Root (1%)	Unit Root (1%)	Unit Root (1%)	Unit Root (1%)	Unit Root (1%)	Unit Root (1%)

As seen in Table 8, according to the Narayan-Popp unit root test, all variables were found to have unit root with their level values. This result contradicts the Lee-Strazich test. An important advantage of the Narayan-Popp test over the Lee-Strazicich test is that it maximizes the importance of the coefficients of the dummy variables related to structural breaks (Yurtkuran, 2021: 74). In this context, strong evidence has been obtained that the series are unit rooted. However, to reduce uncertainty, the stationarity of the series was investigated once again with the Carrion-i Silvestre et al unit root test, which can take into account more than two structural breaks, and the test results are presented in Table 9.

Table 9: Carrion-i Silvestre et al Unit Root Test Results with Level Values of Variables (1923-1979)

	Industry/GDP Break in Trend Model	Industry/GDP Break in Level and Slope Model	LogExport Break in Trend Model	LogExport Break in Level and Slope Model	LogImport Break in Trend Model	LogImport M2 Model
PT	11,11 [6,62]	21,11 [6,56]	12,78 [6,97]	0,48 [7,04]	10,37[5,91]	10,8 [6,4]
MPT	11,56 [6,62]	18,22 [6,56]	13,04 [6,97]	0,48 [7,04]	9,98 [5,92]	10,7 [6,4]
MZA	-19,45 [-33,79]	-11,26 [30,70]	-18,69[-33,4]	-515,9 [-33,2]	-19,4[31,5]	-19,3 [-31]
MSB	0,16 [0,12]	0,21 [0,13]	0,16 [0,12]	0,03 [0,12]	0,16 [0,13]	0,16 [0,13]
MZT	-3,11 [-4,09]	-2,37 [-3,92]	-2,95 [-4,08]	-16,05 [-4,07]	-3,1 [-3,95]	-3,1 [-3,9]
Break	1986,97,02	1999,10,18	1982,01,07	1982,02,08	1997,01,08	2000,08,11
Result	Unit Root (5%)	Unit Root (5%)	Unit Root (5%)	Unit Root (5%)	Unit Root (5%)	Unit Root (5%)

The numbers in square brackets in Table 9 show the critical values. Within the framework of the data period, the unit root test was carried out with three structural breaks. When the test results are examined, a stationary process has been determined only for the export variable in the break-in level and slope model. In all other models, the unit root basis hypothesis is rejected. When the break dates are examined, it is seen that the years of 2001 and 2008 crises come to the fore. When the obtained results are combined with the results of the Narayan-Popp unit root test, it is seen that there is strong

evidence that the series are unit rooted. It is important to what extent these variables become stationary. The Narayan-Popp unit root test was applied by taking the first difference of the series and the results are presented in Table 10.

Table 10: Narayan-Popp Unit Root Test Results with First Difference Values of Variables (1980-2021)

	Industry/GDP M1 Model	Industry/GDP M2 Model	LogExport M1 Model	LogExport M2 Model	LogImport M1 Model	LogImport M2 Model
The 1st Break	1998	1998	2001	2001	2002	2002
The 2nd Break	2001	2007	2007	2007	2007	2007
Optimal Lag	0,000	0,000	1,000	1,000	1,000	1,000
t Statistic	-7,420	-7,156	-6.090	-5,989	-6,462	-6,350
Critical Value (1%)	-5,259	-5,949	-5,259	-5,949	-5,259	-5,949
Critical Value (5%)	-4,514	-5,181	-4,514	-5,181	-4,514	-5,181
Result	Stationary (1%)	Stationary (1%)	Stationary (1%)	Stationary (1%)	Stationary (1%)	Stationary (1%)

As seen in Table 10, all three variables became stationary when the first difference of the series was taken. It is seen that the calculated test statistics are smaller than the critical values at the 1% and 5% significance levels. In other words, the basic hypothesis suggesting that the series have unit roots was rejected for all three series. In this context, it was concluded that all variables for the 1980-2021 sub-period were I(1). As in the 1923-1979 period, there is no obstacle to the cointegration test for the 1980-2021 period.

The Maki cointegration test, which considers five breaks, was used as the cointegration test. First of all, the cointegration test was applied for the 1923-1979 sub-period, and the test results presented in Tables 11, 12, 13, and 14 were found.

Table 11: Maki Test Model 0 Results (1923-1979)

	5 Breaks	4 Breaks	3 Breaks	2 Breaks	1 Break
The 1st Break	1964	1964	1964	1964	1964
The 2nd Break	1932	1932	1932	1932	
The 3rd Break	1949	1949	1949		
The 4th Break	1972	1972			
The 5th Break	1954				
t Statistic	-7,002285	-6,0642061	-5,652576	-5,1635438	-4,3709996
Critical Value (1%)	-6,296	-6,075	-5,943	-5,717	-5,541
Critical Value (5%)	-5,760	-5,550	-5,392	-5,211	-5,005
Result	Av (1%)	Av (5%)	Av (5%)	NA	NA

Table 12: Maki Test Model 1 Results (1923-1979)

	5 Breaks	4 Breaks	3 Breaks	2 Breaks	1 Break
The 1st Break	1972	1972	1972	1972	1972
The 2nd Break	1947	1947	1947	1947	
The 3rd Break	1967	1967	1967		
The 4th Break	1941	1941			
The 5th Break	1934				
t Statistic	-6,27094	-6,27094	-6,27094	-6,27094	-5,2276011
Critical Value (1%)	-6,530	-6,329	-6,169	-6,011	-5,840
Critical Value (5%)	-5,993	-5,831	-5,691	-5,518	-5,359
Result	Av (5%)	Av (5%)	Av (1%)	Av (1%)	NA

Table 13: Maki Test Model 2 Results (1923-1979)

	5 Breaks	4 Breaks	3 Breaks	2 Breaks	1 Break
The 1st Break	1943	1943	1943	1943	1943
The 2nd Break	1935	1935	1935	1935	
The 3rd Break	1957	1957	1957		
The 4th Break	1933	1933			
The 5th Break	1947				
t Statistic	-5,9455651	-5,9455651	-4,7436862	-4,6189187	-4,0985624
Critical Value (1%)	-7,839	-7,470	-7,031	-6,628	-5,840
Critical Value (5%)	-7,288	-6,872	-6,516	-6,093	-5,359
Result	NA	NA	NA	NA	NA

Table 14: Maki Test Model 3 Results (1923-1979)

	5 Breaks	4 Breaks	3 Breaks	2 Breaks	1 Break
The 1st Break	1941	1941	1941	1941	1941
The 2nd Break	1945	1945	1945	1945	
The 3rd Break	1953	1953	1953		
The 4th Break	1949	1949			
The 5th Break	1933				
t Statistic	-7,5233701	-7,194978	-7,194978	-6,5758297	-5,9248369
Critical Value (1%)	-8,713	-8,217	-7,673	-7,153	-6,523
Critical Value (5%)	-8,129	-7,636	-7,145	-6,657	-6,055
Result	NA	NA	Av (5%)	NA	NA

Av: Available, NA: Not Available

The above tables show cases where there is a cointegration relationship according to the model and the number of breaks. Accordingly, a cointegration relationship was found in models with three, four, and five breaks for Model 0. According to Model 1, there is a cointegration relationship for cases with one, two, three, and four breaks. According to Model 2, the cointegration relationship could not be determined. In Model 3, on the other hand, there is a cointegration relationship for three breaks spesification. In this framework, strong evidence has been obtained that there is a cointegration relationship between the variables for the period 1923-1979. At this stage, the Maki cointegration test for the period 1980-2021, which is the second sub-period, was conducted and the results summarized in Tables 15, 16, 17, and 18 were obtained.

Table 15: Maki Test Model 0 Results (1980-2021)

	5 Breaks	4 Breaks	3 Breaks	2 Breaks	1 Break
The 1st Break	2007	2007	2007	2007	2007
The 2nd Break	1993	1993	1993	1993	
The 3rd Break	1999	1999	1999		
The 4th Break	1988	1988			
The 5th Break	1983				
t Statistic	-4,8369929	-4,8369929	-4,8369929	-4,8030376	-3,968134
Critical Value (1%)	-6,296	-6,075	-5,943	-5,717	-5,541
Critical Value (5%)	-5,760	-5,550	-5,392	-5,211	-5,005

*Cointegrated, **Not Cointegrated (%5)

Table 16: Maki Test Model 1 Results (1980-2021)

	5 Breaks	4 Breaks	3 Breaks	2 Breaks	1 Break
The 1st Break	2007	2007	2007	2007	2007
The 2nd Break	1991	1991	1991	1991	
The 3rd Break	1995	1995	1995		
The 4th Break	2001	2001			
The 5th Break	1999				
t Statistic	-5,5535359	-5,5535359	-5,3474237	-5,3281812	-3,936335
Critical Value (1%)	-6,530	-6,329	-6,169	-6,011	-5,840
Critical Value (5%)	-5,993	-5,831	-5,691	-5,518	-5,359

*Cointegrated, **Not Cointegrated (%5)

Table 17: Maki Test Model 2 Results (1980-2021)

	5 Breaks	4 Breaks	3 Breaks	2 Breaks	1 Break
The 1st Break	2016	2016	2016	2016	2016
The 2nd Break	1985	1985	1985	1985	
The 3rd Break	2009	2009	2009		
The 4th Break	2007	2007			
The 5th Break	2005				
t Statistic	-4,9581938	-4,8356875	-4,6600079	-4,6600079	-4,0601231
Critical Value (1%)	-7,839	-7,470	-7,031	-6,628	-5,840
Critical Value (5%)	-7,288	-6,872	-6,516	-6,093	-5,359

*Cointegrated, **Not Cointegrated (%5)

Table 18: Maki Test Model 3 Results (1980-2021)

	5 Breaks	4 Breaks	3 Breaks	2 Breaks	1 Break
The 1st Break	1985	1985	1985	1985	1985
The 2nd Break	2000	2000	2000	2000	
The 3rd Break	2004	2004	2004		
The 4th Break	2018	2018			
The 5th Break	2010				
t Statistic	-6,4105701	-6,4105701	-6,4105701	-5,2634075	-5,2634075
Critical Value (1%)	-8,713	-8,217	-7,673	-7,153	-6,523
Critical Value (5%)	-8,129	-7,636	-7,145	-6,657	-6,055

*Cointegrated, **Not Cointegrated (%5)

As seen in the last four tables above, no cointegration relationship was found between the variables for the 1980-2021 sub-period. However, there is a cointegration relationship between the same variables for the 1923-1979 sub-period. When this result is evaluated in the context of opening-up policies implemented after 1980, it reveals that the growth in foreign trade did not cause a structural change in the direction of industrialization. It is understood that the statist and import substitution economic policies that were dominant between 1923-1979 affected industrialization. In the framework of the cointegration relationship obtained for the 1923-1979 sub-period, it is important to determine the long-term coefficients and to study the error correction model. The long-term coefficients for the mentioned period were determined by the DOLS method. With the DOLS method, it is possible to produce effective estimations against varying variance and autocorrelation problems. During the determination of the long-term coefficients, the break dates obtained from the Maki cointegration test Model 3 were also included in the model as a dummy variable. The results of the DOLS method, in which the variable related to industrialization is considered as the dependent variable, are presented in Table 19.

Table 19: Long-Term FMOLS Estimation Results (Dependent Variable: Industry/GDP)

Variable	Coefficient	t Statistic	Probability
LogExport	37,99754	4,975216	0,0000
LogImport	-24,46697	-4,599080	0,0001
K1	-10,35080	-3,927270	0,0004
K2	5,060124	1,862132	0,0715
K3	3,032598	2,514810	0,0170
Constant	-52,06842	-3,970898	0,0004

K1: 1985 Break Date, K2: 2000 Break Date, K3: 2004 Break Date

As seen in Table 19, parameter estimates for independent variables were found to be statistically significant. The sign of the coefficients is in line with the theoretical expectations. In addition, the break dates obtained by the Maki cointegration test are statistically significant. The significance level of only the second break date was found to be 7.15%. Since the model is built as semi-logarithmic, it is important to interpret the parameter estimates obtained within this framework. In the semi-logarithmic model in this study, logarithmic transformation was performed for the independent variables. No transformation was applied for the dependent variable industry/GDP. However, since the dependent variable is considered as a ratio scale, each unit can be interpreted as 0.01. While a 1% increase in exports increases the industry/GDP ratio by 0.38 units, a 1% increase in imports decreases the said ratio by 0.24 units. For these estimates to be valid, the error correction model must also work. To establish the error correction model, the first difference values of the variables and the one-term delayed series of the residuals obtained from the long-term estimation regression equation were analyzed by DOLS method. For the error correction model to work, the coefficient of the one-period lagged series for the residues must be negative and significant. The results of the error correction model are given in Table 20.

Table 20: Error Correction Model

	Coefficient	t Statistic	Probability
Residual (-1)	-0,560582	-2,340378	0,0246

As seen in Table 20, the error correction term was found to be negative and statistically significant. In other words, the error correction model works. The short-term deviations for the 1923-1979 sub-period disappear in the long-term and the equilibrium relationship is restored.

4.CONCLUSIONS

The concepts of growth and development, which were used interchangeably until the mid-20th century, were differentiated with quantitative and qualitative distinctions; while the concept of growth, which is an expression of a monetary phenomenon, represents developing and developed countries, the concept of development, which covers a much wider area than growth, includes developing and underdeveloped countries. There is another variable, which is related to these two important concepts, in which discussions and research about the existence and direction of the relationship are concentrated; foreign trade. Although certain studies assert that international trade drives economic development and growth, others contend that it merely serves as a tool to support such growth. What can be said about these critically important variables in Turkiye, which strives for both development and growth and has different experiences? The aim of this study, which started with this curiosity; is to question the relationship between the development process and the industry, where the transition is aimed, and foreign trade. First of all, two sub-periods, 1923-1979 and after 1980, were determined and different analyzes were applied to the data. Stationary tests in the analyzes were carried out with unit root tests that take into account structural breaks *(Lee-Strazicich (2003) Unit Root Test,* which takes into account two breaks, Narayan-Poop (2010) Unit Root Test, which allows two structural breaks, Carrion-i Silvestre et al. (2009) Unit Root Test, which allows up to five structural breaks). Then, *Hatemi-J (2008) Cointegration Test*, which allows two structural breaks, and *Maki (2012)* Cointegration Test, which allows five structural breaks, were applied to the data. In light of the analyses completed;

1. It has been determined that foreign trade and industry/GDP are cointegrated in the 1923-1979 period. On the other hand, no cointegration relationship was found between the variables in the post-1980 period. The fourth FYDP (1979-1983), “failed with the Republic People's Party (CHP)'s withdrawal from power at the end of 1979; the "developmental" aspects of planning have also been eliminated as a result of the January 24 judgments and the shift to neoliberalism under the September 12 regime (Boratav, 2010:371).
2. It has been determined that a 1% increase in exports increases industry/GDP by 0.38 units. This is a result that supports the Export-led Growth Hypothesis (ELG). The result obtained in this context is the result of

Keong (2005), Kaushik et al. (2008) and Raza et al. (2018) are compatible with the study.

3. A 1% increase in imports reduces industry/GDP by 0.24 units. Owing to the incapacity to incorporate novel technologies into the technology-reliant industry, obstructions and impediments in manufacturing were encountered, and the policy of import substitution industrialization was relinquished. This outcome serves as an empirical marker of said progression. Then, the transition to an export-oriented industrialization policy was made. This result, on the other hand, supports the study result of Sulaiman&Saad (2009) and Raza et al. (2018), which determined that imports affect economic growth negatively.

These findings are crucial for comprehending how the industrial sector and international commerce interact, as well as how this interaction affects economic growth. Furthermore, it may be deduced that these results should be taken into account while developing and putting into practice economic policies.

The proposed export promotion policy in Turkiye is a significant step toward achieving sustainable economic growth. Export-based industrialization has been proven to be an effective strategy for developing countries to boost their economies, as it allows them to tap into global markets and increase their competitiveness. However, to fully realize the benefits of export-based industrialization, a strong policy framework is needed to support and promote exports. The proposed "developmental and populist" planned system can provide a solid foundation for sustained economic growth by promoting industrialization, enhancing the competitiveness of domestic industries, and increasing exports. By doing so, Turkiye can achieve long-term sustainable growth, create employment opportunities, and improve the standard of living for its citizens.

This study, which empirically questions the relationship between foreign trade and industry, which is the engine of growth and development, contributes to the literature by being different from other studies because the share of industry in GDP is used in its analysis. The study recommends implementing a policy aimed at promoting exports in Turkiye as part of an export-based industrialization program. The proposed policy would entail a shift to a developmental and populist planned system for economic development to promote sustainable growth. The implications of this recommendation are significant. A strong export promotion policy would likely involve measures such as financial incentives, trade agreements, and marketing efforts to encourage Turkish businesses to increase their exports. By prioritizing exports, the policy aims to create new markets for Turkish goods and services, which can drive economic growth and create jobs. The switch to a developmental and populist planned system suggests that the policy would prioritize the needs and interests of the Turkish people over those of foreign investors. This approach aims to promote economic development that is inclusive and sustainable, with a focus on creating jobs and increasing wages for Turkish workers. Such an approach could help address some of the social and economic inequalities that exist in Turkiye. Overall, the proposed policy has the potential to significantly impact the Turkish economy, particularly if it is implemented effectively. However, it may also face opposition from those who prioritize foreign investment and free-market principles over developmental and populist policies.

The findings of this study highlight the importance of considering the share of the industrial sector in national income when analyzing the relationship between industry and foreign trade. Additionally, it is recommended that future research explore more comprehensive studies to better understand the impact of the industrial sector on economic growth and development.

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