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Article

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Article

Reflections of the “Export-Led Growth” or “Growth-Led Exports” Hypothesis on the Turkish Economy in the 1999–2021 Period

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Abstract: Various factors determine and affect economic growth, one of which is exports. Trade theory also states that exports increase the growth of the domestic economy in various ways. For this reason, the effect of exports on economic growth is a long-term area of research. In addition to the studies examining the effect of foreign trade on economic growth in the literature, some studies investigate the effects of economic growth on export capacity. These studies suggest that the export-based economic growth hypothesis is valid when the causality relationship between exports and growth is from exports to growth, and the growth-led export hypothesis is valid when it is from growth to exports. To this end, the primary purpose of this study is to investigate the validity of the new economic model for Turkey in two different periods. In this context, this study comparatively focuses on the 1999:Q1–2013:Q4 and 2014:Q1–2021:Q4 periods to test the validity of the export-led growth hypothesis and the growth-led export hypothesis. According to the analysis results for the 1999:Q1–2013:Q4 periods, only the growth-led export hypothesis is valid, and a 1% increase in the economic growth rate in this period increases exports by 0.42%. Considering the 2014:Q1–2021:Q4 period, the hypotheses of “Economic growth is not the cause of exports and exports are not the cause of economic growth” are rejected, and according to these test results, it was determined that both the export-led growth hypothesis and the growth-led export hypothesis are valid. In the results of this period, a 1% increase in economic growth rate increases exports by 0.38%, and a 1% increase in exports increases economic growth by 1.36%.

Keywords: export-led growth; growth-led export; new economic model; causality



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1. Introduction

Despite foreign trade, which is defined as the purchase or sale transactions for a certain amount outside a country’s borders, economic growth is defined as an increase in the final volume of goods and services produced (Parasız 2008, p. 9). In the economics literature, the relationship between foreign trade and economic growth is a long-debated issue, and it is explained with different theories in the process. While mercantilism advocates for protectionism in foreign trade, classical economists Adam Smith and David Ricardo argue that free trade increases the welfare of countries and leads to economic growth. The Heckscher–Ohlin–Samuelson Model states that free trade is essential for developing countries’ economic growth and increasing real wages (Jayme 2001, p. 11). In the internal growth model, foreign trade provides technology transfer through the import of advanced capital goods, enabling economic growth with a positive impact on human capital (Razzaque et al. 2003, p. 18). According to Grossman and Helpman, foreign trade ensures the spread of new technologies with increased productivity and growth (Rivera-Batiz and Romer 1991).

According to orthodox policymakers and the related literature, the growth of exports in developing countries directly contributes to economic growth. From a theoretical point of view, there are many studies in the relevant literature. In the mainstream economic theory, the argument that the increase in growth due to open competition leads to increased welfare in the medium term is dominant. Sustainability of diversified and increased foreign trade encourages expertise by contributing positively to efficiency (Ghartey 1993, p. 1145). In short, the export-based growth strategy encourages concentrating on producing specialized goods and services and increasing production, as mentioned in the comparative advantages theory. In this context, the question of what the contribution of the increasing export rates in the Turkish economy is to economic growth is discussed in this research with the data obtained in the 1999–2021 period. The answer to this question relates to the economy's investment appetite and level. Therefore, the more the domestic investments of the sectors producing the goods subject to foreign trade are supported, the more permanent the increase in GDP will be.

One of the main macroeconomic goals of countries is to increase economic growth. To this end, foreign trade is one of the most critical factors in increasing economic growth. The export-led growth strategy is based on the production model. In the production phase, technological innovations increase efficiency and contribute to production. As the exports increase, the production of goods and services in the country's economy rises. This idea is known in the literature as the export-led growth hypothesis. In this hypothesis, the causality relationship between exports and economic growth is from exports to economic growth (Greenaway and Sapsford 1994, p. 153). According to the supporters of the export-led growth hypothesis (ELG), including Krueger (1978), Feder (1983), Thornton (1996), Bhagwati (1978), and Balassa (1978), exports are a tool of economic growth. These scholars asserted that a country's economy as a whole is stimulated by arguing that exports significantly contribute to economic growth.

On the other hand, Barro and Xavier (1995) argued that countries that follow an export-led growth policy are more inclined to adopt the technological developments produced in developed countries. The benefits obtained through exports are considered to be expertise, full capacity utilization, benefiting from economies of scale, increasing the investment rate, and enabling technological development (Krueger 1978; Kavoussi 1984; Ram 1985). Besides, exports provide foreign exchange, allowing for more imports of intermediate goods, thereby increasing capital formation, and thus encouraging output growth in developing countries. Several reasons support the effects of exports on economic growth in foreign trade theory. These mainly involve increasing competition and productivity, increasing economic growth by acquiring and spreading new technologies (technology importing), developing economies of scale with the export of certain goods, increasing domestic demand, and providing an inflow of foreign currency into the country (Giles and Williams 2000, p. 263).

The exports are determined by the demand of the foreign country savers. The increase in exports supports the encouragement of the relevant demand and increases the savings and capital accumulation of the residents and the import capacity (Thirlwall 1994, p. 365). The export-led growth model is accepted as the main argument that causes an increase in the level of welfare by triggering growth in the neoclassical theory.

Contrary to the export-led growth approach, another approach that defends that an increase in growth rates leads to an increase in exports is discussed in the literature. It is proposed that countries engaged in foreign trade can significantly increase exports with the growth rates they have achieved. In other words, the author argues that causality runs from growth to exports (Vernon 1966, p. 195). This hypothesis, accepted by Krugman (1984) and Lancaster (1980), is known as the growth-led export hypothesis (GLE). According to the advocates of this hypothesis, Krugman (1984) and Lancaster (1980), the increase in economic growth increases technological investments and, as a result, increases productivity. Increased efficiency leads to an increase in a country's export quantity (Giles and Williams 2000, pp. 264–65). In the relationship between foreign trade and growth, it is

generally accepted that the export-based growth approach provides rapid economic growth (Osei-Assibey and Dikgang 2020, p. 572). The growth demonstrates a linear pattern to the efficiency of export supply from factory equipment. If productivity increases, this results in a reduction in costs, and exports increase. Additionally, adaptation to new technologies and an increase in skills accelerate the orientation of the trade sector to exports and lead to gaining competitive power with advanced markets. In this case, growth performance affects exports positively. There are many studies examining the relationship between exports and economic growth. Although some studies focus on the validity of the export-led growth hypothesis and the growth-led export hypothesis together, they are usually discussed separately in the literature.

The bidirectional relationship between growth and exports is widely researched in the literature (Helpman and Krugman 1985, p. 96). The approach mentioned above claims that economies of scale as a result of productivity turn their earnings into investments and increase their orientation to exports. Increasing exports reduces costs and increases production gains. On the other hand, the income obtained from the increase in exports positively affects the increase in foreign trade. The income and export growth cycle are also indicators of bidirectional causality.

Developing countries have begun to shift international trade from labor-intensive modes of production to technology-producing sectors. Turkey aims to make exports and growth sustainable by determining a new growth strategy. In the model called the new economy model, low interest rates, high exchange rates, low current account deficits, and especially as a result of the model, increasing exports with growth gained importance. For this reason, the Turkish economy has adopted a production style that is compatible with international competition and produces a high added value by increasing its growth performance within the framework of its policy of supporting the R&D-intensive sectors and prioritizing the export–growth relationship. In this process, the main target is to increase international competitiveness as a result of effective growth by acting quickly and accordingly the preferred export policy. One of the most important contributions of the strategy in question is that the impact of external shocks in the economy will be minimal (Balassa 1985). In this context, the main purpose of this study is to show comparatively whether the hypotheses are valid for the 1999:Q1–2013:Q4 period, in which the export-led growth hypothesis is adopted, and the 2014:Q1–2021:Q4 period, when the growth-based export hypothesis is adopted in Turkey, in line with the new economic model, within the scope of the causality relationship. In addition, the exports–economic growth–exports relationship and economic growth–exports–economic growth relationship were also discussed. The difference and originality of this study from other studies is that the low interest rate and high exchange rate for high export, employment, and growth targets have been newly adopted for Turkey, and therefore, it is one of the first studies conducted in line with this understanding. In this direction, the main hypothesis in the study is that the expected increase in exports and growth as a result of the new economic model will be consistent with the results of the study, and the results of the study will support the validity of the new economic model. For this purpose, this paper is organized as follows: Section 1 is the introduction, and Section 2 includes the literature review of existing studies on the topic. Section 3 explains the data set and methodology. Lastly, Section 4 provides the results, evaluates the findings, and presents policy recommendations.

2. Literature Review

In the literature, there are many studies investigating the export-led growth hypothesis and the growth-led export hypothesis. Studies carried out in this context are presented in Tables 1–3.

Table 1. Studies examining the validity of the export-led growth hypothesis.

Authors	Sample and Period	Method	Result
Emery (1967)	50 countries; 1953–1963	Multiple Correlations, Regression Analysis	The export-led growth hypothesis is valid.
Michael Michaely (1977)	41 developing countries; 1950–1973	Correlation Analysis	The export-led growth hypothesis is valid.
Balassa (1978)	Developing countries	Correlation Analysis, Least Squares	The export-led growth hypothesis is valid.
Tyler (1981)	55 developing countries; 1960–1977		It is stated that there is a relationship between exports and economic growth.
Ram (1985)	73 less-developed countries; 1960–70 and 1970–77	Section Data Analysis	The export-led growth hypothesis is valid.
Balassa (1985)	43 developing countries; 1973–78	Section Data Analysis	The export-led growth hypothesis is valid.
Jung and Marshall (1985)	37 developing countries; 1950–1981	Granger Causality	The export-led growth hypothesis is valid for Ecuador, Indonesia, and Costa Rica.
Hsiao (1987)	4 Asian countries (Hong Kong, South Korea, Singapore, Taiwan); 1960–1982	Granger Causality, Sims Causality	As a result of the Granger causality test, there is no relationship between exports and GDP for South Korea, Taiwan, and Singapore, while there is a unidirectional relationship from GDP to exports for Hong Kong. According to the Sims causality test, there is a bidirectional relationship between exports and GDP for South Korea, Taiwan, and Singapore and a unidirectional relationship from GDP to exports for Hong Kong.
Sung-Shen et al. (1990)	Japan, South Korea, Taiwan, 1957–1984 quarter data	Granger Causality	The export-led growth hypothesis is valid.
Marin (1992)	United Nations, Germany, Japan, and the United Kingdom; 1960 (1)–1987(2)	Cointegration, Granger Causality	The export-led growth hypothesis is valid.
Serletis (1992)	Canada; 1870–1985	Causality	In the short term, the export-led growth hypothesis is valid, and in the long term, there is no relationship between exports and economic growth.
Sengupta and Espana (1994)	South Korea; 1961–1986	Cointegration	The export-led growth hypothesis is valid.
Kwan and Kwok (1995)	China; 1952–1985	Weak and Super Externality Test	The export-led growth hypothesis is valid.
Thornton (1996)	Mexico	Cointegration, Granger Causality	Findings determined that there is a significant relationship from exports to economic growth for Mexico.
Riezman et al. (1996)	126 countries; 1950–1990	Granger Causality	Findings for 72 countries, there is a unidirectional relationship from exports to income, a unidirectional relationship from income growth to exports for 38 countries, a bidirectional relationship between exports and income for 3 countries, and no relationship between exports and income for 13 countries.

Table 1. Cont.

Authors	Sample and Period	Method	Result
Anwer and Sampath (1997)	96 countries; 1960–1992	Cointegration	The analysis results show that there is a unidirectional causality for 20 countries, a unidirectional relationship from GDP to exports for 12 countries, a relationship from exports to GDP for 6 countries, bidirectional causality for 2 countries, and no relationship between exports and economic growth for 11 countries.
Al-Yousif (1997)	Saudi Arabia, United Arab Emirates, Kuwait, and Oman of Gulf countries; 1973–1993	Bruesch-Godfrey, White and Hausman and Farely-Hinich	In this study, the author examined the effect of exports on economic growth for 4 countries. As a result, the export-led growth hypothesis is valid.
Islam (1998)	15 East Asian Countries (Japan, South Korea, Sri Lanka, Indonesia, Fiji, Bangladesh, Singapore, Malaysia, Philippines, Thailand, India, Nepal, Pakistan, Papua New Guinea, and Hong Kong; 1967–1991	Cointegration, Granger Causality, Error Correction Model	In this study, the author examined the relationship between exports and economic growth. As a result, it was determined that exports were effective on economic growth in Japan, Sri Lanka, Indonesia, Fiji, and Bangladesh.
Ekanayake (1999)	India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Sri Lanka, and Thailand; 1960–1997	Cointegration, Error Correction Model	The empirical results found that there is bidirectional causality between export and economic growth in India, Indonesia, Korea, Pakistan, Philippines, Sri Lanka, and Thailand and a unidirectional causality in Malaysia.
Afxentiou and Serletis (2000)	50 developing countries; 1970–1993	Engle-Granger Cointegration, Granger Causality	The export-led growth hypothesis is not valid.
Medina-Smith (2001)	Costa-Rica; 1950–1997	Johansen Cointegration, Engle-Granger Cointegration	It is stated that there is a relationship between exports and economic growth in the short term.
Abual-Foul (2004)	Jordan; 1976–1997	VAR, Error Correction Model	The export-led growth hypothesis is valid for Jordan.
Love and Chandra (2004)	Sri Lanka (1965–1997), India (1950–1998), and Pakistan (1970–2000)	Cointegration, Granger Causality	They found a bidirectional relationship between exports and economic growth for India and no relationship between variables for Sri Lanka and Pakistan.
Al Mamun and Nath (2005)	Bangladesh; 1976–2003	Vector Error Correction Model	They stated that there is a causality relationship from exports to economic growth.
Choong et al. (2005)	Malaysia; 1960–2001 Annual data	Granger Causality	The export-led growth hypothesis is valid.
Shirazi and Abdul Manap (2005)	5 South Asia countries (India, Sri Lanka, Pakistan, Nepal, and Bangladesh)	Cointegration, Granger Causality	They found a bidirectional causality for Bangladesh and Nepal and unidirectional causality from exports to GDP for Pakistan. On the other hand, the causality results for Sri Lanka and India found no causality relationship between exports and GDP.

Table 1. Cont.

Authors	Sample and Period	Method	Result
Kónya (2006)	24 OECD countries; 1960–1997	Granger Causality	He found a unidirectional causality from exports to GDP in Sweden, Spain, New Zealand, Italy, Ireland, Iceland, Denmark, and Belgium; a unidirectional causality from GDP to exports in Portugal, Norway, Mexico, Japan, Greece, France, and Austria. The relationship between exports and growth in the Netherlands, Finland, and Canada has proven to be bidirectional.
Siliverstovs and Herzer (2006)	Chile;	Toda Yamamoto	According to the analysis results, the export-led growth hypothesis is valid in Chile's economic growth.
Yao (2006)	China; 1978–2000	GMM	The export-led growth hypothesis is valid.
Ljungwall (2007)	China; 1978–2001	Granger Causality, Vector Autoregressive	The export-led growth hypothesis is valid.
Kaushik and Klein (2008)	India; 1971–2005 Annual data	Granger Causality	The export-led growth hypothesis is valid.
Maneschiöld (2008)	Argentina, Brazil, and Mexico;	Cointegration, Causality	The export-led growth hypothesis is valid for Argentina and Mexico.
Siddiqui et al. (2008)	Pakistan; 1971–2005	ARDL Limit Test	The findings indicate that the export-led growth hypothesis is valid in Pakistan in the short and long term.
Agosin (2009)	Emerging Market Economies/1980–2003	Panel Regression Data Analysis	Technology-intensive exports have a positive effect on economic growth.
Awokuse and Christopoulos (2009)	5 developed countries (Canada, Italy, Japan, England, and the USA); 1960–200	STAR Model, Nonlinear Causality	The export-led growth hypothesis is valid for Canada, Italy, England, and the USA, and for Italy and Japan, the export-led growth hypothesis is not valid.
Galimberti (2009)	For 72 countries; 1974–2003	Panel Regression	It is determined that there is a positive relationship between exports and growth.
Liu et al. (2009)	10 Asia countries; 1970–2002	Causality	The findings determined that there is a relationship between export and economic growth.
Rangasamy (2009)	South Africa; 1975(1)–2007(3)	VAR, Cointegration, Granger Causality	The export-led growth hypothesis is valid.
Ullah et al. (2009)	Pakistan; 1970–2008	Johansen Cointegration, Granger Causality	The export-led growth hypothesis is valid.
Andraz and Rodrigues (2010)	Portugal; 1977–2004	Cointegration, Error Correction Model, Granger Causality	The export-led growth hypothesis is valid.
Herrerias and Orts (2010)	China; 1964–2004		According to the findings, the export-led growth hypothesis is valid for China. Besides, it is stated that other variables also have an effect on economic growth.
Tabrizy and Trofimenko (2010)	India; 1998–2008		According to the findings, the export-led growth hypothesis is valid.

Table 1. Cont.

Authors	Sample and Period	Method	Result
Biyase and Zwane (2011)	30 African countries; 1990–2005	Panel Data Analysis	The export-led growth hypothesis is valid for African countries.
Lorde (2011)	Mexico; 1961–2014	Johansen Cointegration	The export-led growth hypothesis is rejected.
Paul (2011)	Bangladesh; 1979–2010	Vector Error Correction Model, VAR	The export-led growth hypothesis is valid.
Rahmaddi and Ichihashi (2011)	Indonesia; 1971–2008	Vector Error Correction Model, VAR	The export-led growth hypothesis is valid.
Waithe et al. (2011)	Mexico; 1960–2003	Johansen Cointegration, Granger Causality	In the short term, the export-led growth hypothesis is valid, but not in the long term.
Allaro (2012)	Ethiopia; 1974–2009	Granger Causality	It is determined that there is a unidirectional relationship between exports and economic growth. The increase in exports affects economic growth.
Bajo-Rubio and Díaz-Roldán (2012)	Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia, Slovakia; 1996(1)–2009(4)	Cointegration, Granger Causality	The export-led growth hypothesis is valid for the Czech Republic. They found that there is no causality relationship between the variables for other countries
Dreger and Herzer (2012)	45 developing countries; 1971–2005	Panel Cointegration	The export-led growth hypothesis is valid for 45 countries.
Saad (2012)	Lebanon; 1970–2010	Cointegration, Error Correction Model, Granger Causality	The export-led growth hypothesis is valid.
Seabra and Galimberti (2012)	72 countries; 1974–2003		The export-led growth hypothesis is valid.
Shan and Jusoh (2012)	Malaysia; 1970–2011	Cointegration, Granger Causality	The findings indicate that exports affect economic growth.
Zang and Baimbridge (2012)	South Korea; 1963–2003		It is concluded that economic growth has a negative effect on exports.
Aditya and Acharyya (2013)	65 selected countries; 1965–2005	Dynamic Panel Data Analysis	The export-led growth hypothesis is valid.
Hamdi (2013)	Tunisia and Morocco; 1961–2011	Toda Yamamoto test	The export-led growth hypothesis is valid for Tunisia and Morocco.
Zeren and Savrul (2013)	15 European Union countries;	Cointegration	The export-led growth hypothesis is valid.
Rahmaddi and Ichihashi (2011)	Indonesia; 1971–2008	VAR, Vector Error Correction Model	The export-led growth hypothesis is valid.
Niishinda and Ogbokor (2013)	Namibia;	Johansen Cointegration, Vector Error Correction Model, Granger Causality	The export-led growth hypothesis is valid for Namibia.
Tiwari and Ludwig (2014)	India; 1960–2011		According to the results, it is stated that the export-led growth hypothesis was valid in the long term (1997–2009 period) and in the short term (1998–2003 period).
Bilas et al. (2015)	Croatia; 1996–2012	Granger Causality	The export-led growth hypothesis is valid.

Table 1. Cont.

Authors	Sample and Period	Method	Result
Ee (2016)	Sub-Saharan African countries (Botswana, Equatorial Guinea, Mauritius); 1885–2014	Panel Cointegration	It was investigated whether the export-led growth hypothesis is valid in the three countries included in the study. According to the findings, the export-led growth hypothesis is valid for three countries.
Nguyen (2016)	Vietnam; 1990–1995		The export-led growth hypothesis is valid.
Trošt and Bojnec (2016)	Slovenia and Estonia; 2000:1–2014:4	Johansen Cointegration, Granger Causality	The export-led growth hypothesis is valid for Slovenia and Estonia.
Mendoza-Cota (2017)	Mexico; 2007–2014	Panel Cointegration	The export-led growth hypothesis is valid.
Dura et al. (2017)	Turkey; 1992–2014	Diks Panchenko	The export-led growth hypothesis is valid.
Çetin and Ackrill (2018)	Slovakia; 1997–2014	Toda Yamamoto Causality	The export-led growth hypothesis is valid.
Ali and Li (2018)	Pakistan and China; 1980–2015	ARDL Limit Test, Johansen Cointegration	The export-led growth hypothesis is valid for China and Pakistan.
Mishu et al. (2020)	Bangladesh; 1980–2017	Granger Causality	The export-led growth hypothesis is valid.
Seok and Moon (2021)	OECD countries; 1997–2016	Dumitrescu and Hurlin Panel Causality, Granger Causality	The export-led growth hypothesis is valid.

Table 2. Studies examining the validity of the growth-led export hypothesis.

Authors	Sample and Period	Method	Result
Ahmad and Kwan (1991)	47 African countries.	Granger Causality	According to the results, they concluded that there is unidirectional causality from economic growth to exports.
Henriques and Sadorsky (1996)	Canada; 1870–1991	VAR	The growth-led export hypothesis is valid.
Ukpolo (1998)	For South Africa 1964–1993	Granger Causality, Cointegration	The growth-led export hypothesis is valid.
Shan and Tian (1998)	Shanghai; 1990 M1– 1996 M12	Toda Yamamoto Causality	The growth-led export hypothesis is valid.
Glasure and Lee (1999)	Korea; 1973 M1–1994 M4	Granger Causality, Vector Error Correction Model	The growth-led export hypothesis is valid.
Vohra (2001)	India, Pakistan, Philippines, Malaysia, and Thailand; 1973–1993		It was determined that exports play an important role in the economic growth of countries.
Omotor (2008)	Nigeria; 1979–2005	Unconstrained Error Correction Model, ARDL Limit Test	The growth-led export hypothesis is valid.
Nain and Ahmad (2010)	India; 1996–2009	VAR	The growth-led export hypothesis is valid for India.
Nasreen (2011)	8 developing Asia countries; 1975–2008	Panel Regression Data Analysis	There is a relationship from economic growth towards exports.

Table 2. *Cont.*

Authors	Sample and Period	Method	Result
Alimi and Muse (2013)	Nigeria; 1970–2009	VAR Causality	It was determined that economic growth affects exports for Nigeria.
Shihab et al. (2014)	Jordan; 2000–2012	Granger Causality	It was determined that there is a relationship from economic growth towards exports.
Ajmi et al. (2015)	South Africa: 1911–2011	Linear Causality, Nonlinear Hiemstr-Jones Granger Causality, Diks-Panchenko Granger Causality	As a result of the linear causality test, it was stated that there was no causality relationship between the variables. According to the nonlinear Hiemstr-Jones Granger causality test, they found a unidirectional relationship from growth to exports and a bidirectional relationship between the variables according to the Diks-Panchenko Granger causality test.
Bahramian and Saliminezhad (2020)	Turkey; 1960(1)–2018(2)	Linear Granger Causality, Nonlinear Granger Causality	It was determined that economic growth affects exports for Turkey.

Table 3. Studies examining the bidirectional causality relationship between exports and growth.

Authors	Sample and Period	Method	Result
Chow (1987)	8 newly industrialized countries; 1960–1970	Sims Causality Test	The export-led growth hypothesis and the growth-led hypothesis are valid.
Bahmani-Oskooee and Domaç (1995)	Turkey; 1923–1990	Johansen Cointegration, ECM	The export-led growth hypothesis and the growth-led hypothesis are valid for Turkey.
Shan and Sun (1998)	China	Toda Yamamoto Causality	There is a bidirectional relationship between exports and economic growth for China.
Shan and Sun (1999)	USA	Toda Yamamoto Causality	There is a bidirectional relationship between exports and economic growth for the USA.
Ramos (2001)	Portugal; 1865–1998	Cointegration, Granger Causality	For the long- and short term, there is a bidirectional relationship between exports and economic growth
Hatemi-J (2002)	Japan; 1960–1999	Granger Causality	There is a bidirectional relationship between exports and economic growth.
Chandra (2003)	India; 1950–1996	Causality	There is a bidirectional relationship between exports and economic growth.
Awokuse (2005)	Japan;	VAR, Directed Acyclic Graph	There is a bidirectional relationship between exports and economic growth.
Mah (2005)	China; 1979–2001	ARDL Limit Test, Cointegration	The export-based and growth-led export hypotheses are valid for China.
Tang (2006)	Hong Kong; 1973(1)–2005(1)	Error Correction Model, ARDL, Granger Causality	There is a bidirectional relationship between the variables.
Jordaan and Eita (2007)	Botswana; 1996–2007 quarterly data	Cointegration, Granger Causality	There is a bidirectional relationship between exports and economic growth.

Table 3. *Cont.*

Authors	Sample and Period	Method	Result
Mahadevan (2009)	Singapore; 1974–2004	Toda Yamamoto Causality, Error Correction Model	There is a bidirectional relationship between exports and economic growth.
Uddin and Norman (2009)	Bangladesh; 1973(7)–2006(8)	Johansen Cointegration, ECM, Granger Causality	The export-led and the growth-led hypotheses are valid for Bangladesh
Ray (2011)	India; 1972–2011	Granger Causality	There is a bidirectional relationship between exports and growth.
Guru-Gharana and Adhikari (2011)	China; 1979–2008	Expanded VAR, Toda Yamamoto Dolado-Lütkepohl Causality	There is a bidirectional relationship between exports and growth.
Guru-Gharana (2012)	India: 1971–2008	Toda-Yamamoto-Dolado-Lütkepohl (TYDL), Granger Causality	There is a bidirectional relationship between the variables.
Mensah and Okyere (2020)	Ghana; 2010–2019	Granger Causality, Cointegration	There is a bidirectional relationship between exports and growth.

3. Data Set and Method

This study analyzed the relationship between exports and economic growth with the Granger Causality test, using the data between 1999:Q1–2013:Q4 and 2014:1Q–2021:4Q periods. The export rates of change and economic growth rates used in the study were obtained from the database of the Turkish Statistical Institute. Descriptive statistics of the data set are presented in Table 4.

Table 4. Descriptive statistics of variables.

	1999:Q1–2013:Q4 Descriptive Statistics		2014:1Q–2021:4Q Descriptive Statistics	
	Exports	Economic Growth	Exports	Economic Growth
Average	6.574	4.691	3.508	4.879
Median	6.618	6.791	3.492	5.407
Maximum	26.787	11.801	22.636	21.893
Minimum	−15.48761	−14.540	−20.833	−10.404
Standard Error	8.888	5.991	9.959	5.266
Skew	−0.233	−1.252	−0.453	0.128
Lowness	3.430621	3.946	3.087	6.511
Jarque-Bera	1.010 (0.603)	17.923 (0.000128)	1.104 (0.575)	16.528 (0.000258)

In order to achieve meaningful and reliable results among the variables used in the time series, the variables should not contain unit roots. It is a fact that the variables containing a unit root cause a spurious regression problem, which does not reflect the real relationship between the variables ([Gujarati and Porter 1999](#), p. 726). Therefore, determining whether the variables are stable constitutes the first stage of the econometric analysis. In this sense, the Augmented Dickey-Fuller (ADF, [Dickey and Fuller 1981](#)) and Phillips-Perron (PP) unit root tests are often used to test the stationarity of series in econometric analyses. In this context, whether the variables are stationary or not was analyzed with the Augmented Dickey-Fuller (ADF, [Dickey and Fuller 1981](#)) and Phillips-Perron (PP) tests. Test results are presented in Table 5.

Table 5. ADF and Phillips-Perron unit root test results (level).

		Exports			Economic Growth Rates		
		With Constant	With Constant and Trend	(Without Constant and Trend)	With Constant	With Constant and Trend	(Without Constant and Trend)
1999Q1:2013Q4	ADF Test	Level	−4.094 ***	−4.030 **	−2.616	−3.483 **	−3.532 **
	PP Test	Level	−4.051 ***	−3.982 **	−3.033 ***	−3.094 **	−3.065
		Exports			Economic Growth Rates		
		With Constant	With Constant and Trend	(Without Constant and Trend)	With Constant	With Constant and Trend	(Without Constant and Trend)
2014Q1:2021Q4	ADF Test	Level	−3.786 ***	−4.142 **	−3.504 ***	−3.954 ***	−3.915 **
	PP Test	Level	−3.097 **	−3.045	−3.038 ***	−4.062 ***	−8.993 ***

* Note: ** and *** denote %5 and %1 significance levels, respectively.

Table 5 presents that exports and economic growth rates are stationary at level according to the ADF and PP unit root test results. After the unit root analyzes were completed, the Granger causality test was applied to examine whether there was a causality relationship between the variables.

Granger Causality Test

Granger used the causality test in economics for the first time in 1969 (Granger 1969, p. 431). Since then, the test has been developed in many different studies. This causality test can be applied to long-term time series. In order to do this test, the variables must be stationary, but there is no condition to be stationary at the same level (Tari et al. 2019). In addition, in this test, while the mutual relations of the variables are determined simultaneously, there is no distinction between dependent and independent variables. In Granger and other causality tests, four different results can be achieved between the X and Y variables. These include a unidirectional relationship from X to Y or from Y to X, no causality relationship between the X and Y variables, and finally, a bidirectional causality between the X and Y variables.

In this study, the adapted form of the Granger test, which was conducted to determine whether there is a causality relationship between the variables, is presented in Equations (1) and (2).

$$X_t = \sum_{i=1}^m \beta_i X_{t-i} + \sum_{i=1}^m \vartheta_i Y_{t-i} + \varepsilon_t \quad (1)$$

The hypothesis of the model:

H_0 : Growth is not the cause of exports.

H_1 : Growth is the cause of exports.

$$Y_t = \sum_{i=1}^m \delta_i Y_{t-i} + \sum_{i=1}^m \partial_i X_{t-i} + \varepsilon_t \quad (2)$$

The hypothesis of the model:

H_0 : Exports are not the cause of growth.

H_1 : Exports are the cause of growth.

Here, β_0 and δ_0 represent invariable, m represents lag length, and ε_t represents the error term.

Granger causality test hypotheses are as follows:

H_0 : $\gamma_i = 0$ (There is no causality from X to Y).

H_1 : $\gamma_i \neq 0$ (There is causality from X to Y) tested with these hypotheses. If the probability values achieved from the test results are less than 0.05, H_0 is rejected, and there is causality between the variables. If the probability value is greater than 0.05, H_0 cannot be rejected, and there is not any causality. Depending on these equations, the causality relationship results between exports and economic growth variables are presented in Table 6.

Table 6. Granger causality test results for periods.

1999Q1:2013Q4 Results				
H_0 Hypothesis	F-stat.	Probability	Decision	Result
"Economic Growth does not Granger cause Exports" and not "Granger reason".	6.110	0.016	REJECTION	GROWTH \Rightarrow EXPORTS
"Exports does not Granger cause Economic Growth" and not "Granger reason".	1.8227	0.182	APPROVAL	EXPORTS \neq GROWTH
2014Q1:2021Q4 Results				
H_0 Hypothesis	F-stat.	Probability	Decision	Result
"Economic Growth does not Granger cause Exports" and not "Granger reason".	6.495	0.0026	REJECTION	GROWTH \Rightarrow EXPORTS
"Exports does not Granger cause Economic Growth" and not "Granger reason".	5.594	0.0052	REJECTION	EXPORTS \Rightarrow GROWTH

Note: 1999:Q1–2013:Q4 Lag length is 1, 2014:Q1–2021:Q4 Lag length is determined as 3.

Looking back at 1999:Q1–2013:Q4, the "Economic growth is not the cause of exports" H_0 hypothesis is rejected, while the hypothesis "Exports are not the cause of economic growth" H_0 cannot be rejected. In other words, according to the analysis results for the 1999:Q1–2013:Q4 periods, only the growth-led export hypothesis is valid, and a 1% increase in the economic growth rate in this period increases exports by 0.42%. Considering the 2014:Q1–2021:Q4 period, the hypotheses of "Economic growth is not the cause of exports and exports are not the cause of economic growth" are rejected, and according to these test results, it was determined that both the export-led growth hypothesis and the growth-led export hypothesis are valid. In the results of this period, a 1% increase in economic growth rate increases exports by 0.38%, and a 1% increase in exports increases economic growth by 1.36%.

4. Conclusions

It was concluded that exports have an important place in economic growth. International trade increases the foreign currency inflow and production efficiency of the countries. Furthermore, economic growth occurs. One of the factors affecting the level of development of a country is exports. The effects of exports on economic growth are increased national income, foreign currency inflow into the country, a positive effect on the balance of payments, efficient and rapid production of financial investments, and technological transfers. Increasing exports has gained particular importance for Turkey, which wants to realize export-led growth within the new economic model. In this context, this study investigates the validity of the export-led growth hypothesis and the growth-led export hypothesis for Turkey in the periods 1999:Q1–2013:Q4 and 2014:Q1–2021:Q4 within the scope of a causality relationship. In the literature, previous studies generally indicated that the export-led growth hypothesis is valid for the Turkish economy. Export rates of change and economic growth rates were used as variables for the validity of the export-led growth hypothesis and the growth-based export hypothesis in Turkey. In order to correctly interpret the causal relationship between the variables in the study, first of all, the variables must be stationary. The stationarities of the variables were investigated with ADF and PP unit root tests. It was determined that both variables were stationary at their level, and analysis was performed using the variables at their level for the Granger causality test. When the result of the analysis is examined, in this study, we found that, for the period 1999:Q1–2013:Q4, the growth-led export hypothesis was valid, while both the export-led growth hypothesis and the growth-led export hypothesis were valid for the period 2014:Q1–2021:Q4. When we examine it periodically, in the period 1999:Q1–2013:Q4, a 1% increase in the economic growth rate increases exports by 0.42%. Considering the 2014:Q1–2021:Q4 period, in the results of this period, a 1% increase in economic growth rate increases exports by 0.38%, and a 1% increase in exports increases economic growth by 1.36%. The results of this study are in line with the studies such as [Chow \(1987\)](#), [Bahmani-Oskooee and Domag](#)

(1995), [Shan and Sun \(1999\)](#), [Hatemi-J \(2002\)](#), [Awokuse \(2005\)](#), [Uddin and Norman \(2009\)](#), [Ray \(2011\)](#), and [Mensah and Okyere \(2020\)](#).

International trade has evolved into a new situation, especially with the development of logistics, technological progress, and communication networks in the evolving world. In particular, communication networks are increasing trade communications day after day. In the past, while the industrial sector was dominant in the most developed countries, the agriculture and services sectors were prioritized in developing countries, and foreign dependency was increased. Developing countries aiming to overcome this spiral have started to shift international trade from labor-intensive production styles to technology-producing sectors. Turkey has set a new growth strategy in this process, taking the position of sustainable export growth. Defense industry and energy investments, information technologies, and logistics infrastructure are the foundation of this strategy. The process adopts an understanding that forces the competitive conditions of international trade. This process also aims to close the distance with developed countries in line with the objectives of accessing information, decision-making efficiency, and efficient production. The Turkish economy has adopted a production style suitable for international competition, which produces high added value by increasing its growth performance within the policy that prioritizes the export–growth relationship and the policy of supporting R&D-intensive sectors that produce advanced technology to close the current account deficit. This approach, which focuses on the country’s development in the medium and long term, creates an advanced industrial structure and effective public control. However, efforts to create an institutional structure continue. In this context, it would be correct to adopt economic policies to ensure structural transformation. Not ignoring the progress achieved through structural reforms in the last two decades is vital for the sector to reach its current state.

In this process, the main goal is to act quickly on the decision-making mechanism to bring permanent international direct investments to Turkey. Despite the economic effects of the COVID-19 pandemic and the Ukraine–Russia war, Turkey has taken a significant step towards becoming one of the critical partners of global trade with the growth-led export model, which it has put into practice. The export sector causes a significant increase in the scale of domestic output. This situation triggered sustainable quality employment and brought society up to a high consumption level. The expectation for the future is to expand the scale of local production with the effective export policy, which has been followed, to contribute to the clustering of economies of scale and to create a policy that affects the decrease in costs. Effective growth and, accordingly, the preferred export policy cause an increase in international competitiveness in producing comparatively superior goods and services ([Tyler 1981](#)). One of the most important contributions of the strategy in question is that the effect of external shocks will be minimal in economic terms ([Balassa 1985](#)).

With this model that Turkey has implemented, it only has problems with energy as an import-dependent input. While high exports contribute positively to growth, it also positively affects the increase in exports in a growing economy. However, the current account deficit problem persists. To develop this model in practice, Turkey should turn its comparative advantage into an absolute regional advantage. The diversity experienced in industrial production provides an advantage to Turkey in this particular subject. On the other hand, to avoid being affected by the difficult economic spiral that the world economy is experiencing, Turkey should turn from an “Aggressive Exports Policy” to a “Balanced Exports Policy” to balance domestic prices for a short period. Finally, it should make the balanced employment policy sustainable without falling into the “Illusion of Prosperity Increase” that may emerge when it is considered that the high advantages obtained after exports reflect positively on the income groups of the country.

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