MULTIDISCIPLINARY SCIENCE JOURNAL

RESEARCH ARTICLE
Published Online: June 14, 2023
https://doi.org/10.31893/multiscience.2024002

Econometric analysis of foreign trade and economic growth relationship in Azerbaijan and Italy

Nurkhodzha Akbulaev [a] | **Imangulu Muradzada** [b]

[a]Azerbaijan State University of Economics. Department of Economics and Business Administration.
[b]Azerbaijan State University of Economics and Azerbaijan. Department of Economics and Business Administration.

Abstract The aim of this study, unlike the studies in the literature, is to investigate whether the causal relationship between economic growth, export and import changes over time. In this study, it was analyzed whether the foreign trade of Azerbaijan and Italy had an effect on economic growth between 1992 and 2020. Granger causality and unit root test were used in the study. According to the test results, a causal relationship between growth and foreign trade has been determined for the Azerbaijan economy. However, a causal relationship between growth and foreign trade could not be determined for the Italian economy. According to the results of the analysis, the reason why such a relationship does not exist for Italy is due to the fact that growth is a factor that increases current account deficits and foreign trade deficit. In the relationship between foreign trade and economic growth, the direction and importance of the relationship may change according to the country and period. According to the Granger causality test, it has been determined that Azerbaijan's economic growth is the cause of its exports and imports with Italy with the condition of 10%. However, it has been determined that the foreign trade with Azerbaijan is not the reason for the economic growth of Italy.

Keywords: Granger causality test, foreign trade, economic growth, import, export, Azerbaijan, Italy

1. Introduction

Since the inception of international economy, commerce and growth have been linked. Foreign trade drives economic growth. To establish economic interactions, countries must export goods and services. Foreign trade aims to stimulate economic growth and development. Foreign commerce affects country economies positively and negatively, according to studies (Şerefli 2016).

Since the inception of economics, people have debated how to make economic development regular and continuous. Michaley and Feder also validated Adam Smith's and Ricardo's theories that international commerce drives growth (Gül and Kamacı 2012). From classical economics through the Heckser-Ohlin-Samuelson model, this issue has persisted. Economic experts contend that exports impact growth, whereas some say imports are effective. Due to globalization's increasing efficacy, many developing nations have adopted an export-oriented growth policy. Turkey also joined this caravan and implemented export-oriented policies in 1980. There are two types of strategies that a country can use to industrialize: The first is the outward-looking industrialization strategy, and the other is the import substitution strategy, in which goods are produced domestically without opening up to the outside. Although it is argued that these two strategies are different from each other in the economic literature, it is also claimed that there are two separate strategies that complement each other (Aktaş 2009). The following explanations can be mentioned in the relationship between the export-oriented growth model and growth: The firm that exports to the foreign market will be able to benefit from the economy's prices on a large scale. In addition, production costs will be reduced and efficiency will increase. In addition to the increase in productivity, it will bring foreign trade gains. Moving from the limited domestic market to the foreign market, where borders have vanished, will ensure technological development and export sharing among countries after productivity. It will increase the competition between companies. By increasing foreign exchange revenues, the terms of trade are also improved. Foreign trade will further affect the external balance and growth with the return of benefits and costs (Oktar and Dalyancı 2012). All these items can create opportunities for a country. Better production and management increase efficiency as costs fall, product diversification and quality improve, and technology develops and spreads across countries (Yılmazer 2010). National Competitiveness of Azerbaijan is an important factor in foreign trade (Ahmadov 2010). Inward-oriented industrialization, on the other hand, is a strategy that aims to encourage the growth of national industry, which envisages industrialization by getting rid of foreign dependency by ensuring that the goods that need to be imported from abroad are produced domestically. The government argues that public interventions with trade policy tools such as exchange rate policies, customs tariffs, import and quota bans will increase the

 Received: April 8, 2023 | Accepted: May 5, 2023

level of competition in international trade, by transferring profits from foreign companies to domestic companies, so that the country can gain. The aim of the strategy is to use the savings resulting from the production of the goods to import them into the domestic market. It is thought that trade deficits will not be a problem thanks to the savings to be achieved (Seyidoğlu 2009). In addition, the Friedrich List Infant Industry Thesis predicts that an industry that is in a disadvantageous position against its competitors due to economies of scale, experience, knowledge, and technological superiority should be protected against foreign competition until it reaches the optimum size or optimum production level that will enable it to develop and have a comparative advantage in the future (Ozansoy 2009). However, in the import substitution policy, the country cuts off its ties with the outside world and eliminates the relationship between wages in the domestic sector and prices in the foreign market with excessive protection methods. The main problems caused by this strategy are as follows (Seyidoğlu 2009):

- Excessive use of resources: In industries that try to develop in a closed environment, the price and cost are high compared to the foreign market and the quality is low. In an economy that is closed to the international market, monopolization increases, domestic industry cannot develop and businessmen do not need to progress in their fields. Thus, the efficiency of resource allocation disappears in this economy.
- Foreign dependency: While the import of the product will increase, it is not possible not to be dependent on foreign sources as the export of investment goods, preferred technology and raw materials will increase.
- Reducing exports: In these industries, money is overvalued and the exporter is adversely affected. The lack of incentives for export-oriented production is another reason for the decrease in exports.
- Increasing borrowing: The decrease in exports and the increase in foreign dependency become the country's problem. To fix this, the state turns to external resources. Thus, an increase in foreign debt becomes inevitable.
- Increasing unemployment: The government's over-evaluation of the exchange rate policy brings with it capital intensity. Capital intensity also requires advanced technology. This means labor saving. In other words, job opportunities decrease and unemployment problem increases.

A strong and well-developed SME sector contributes significantly to export, innovation, and the creation of modern entrepreneurial culture, playing at the same time a significant role in achieving prosperity in the country (Ahmadov and Valiyev 2019). Azerbaijan and Italy have a history of economic cooperation and trade ties, particularly in the areas of energy, agriculture, and industry. Azerbaijan is a major supplier of oil and gas to Italy, while Italy is a significant market for Azerbaijani non-oil exports such as agricultural products, textiles, and construction materials.Italy is also a significant investor in Azerbaijan, particularly in the energy sector.In addition to energy, Azerbaijan and Italy have also cooperated in the agricultural sector. Italian companies have been involved in developing Azerbaijan's greenhouse and horticulture industries, while Azerbaijan has exported fruits and vegetables to Italy. Overall, the economic policy and trade ties between Azerbaijan and Italy have been largely positive, with both countries benefiting from their cooperation in various sectors. However, there are still opportunities for further collaboration, particularly in the areas of technology and innovation.

In this study, the relationship between the economic growth of Azerbaijan and Italy and foreign trade was analysed for the years 1992–2020. This study consists of six chapters. In the first chapter, conceptually, the concepts of foreign trade, foreign trade, and the importance of foreign trade are emphasized. In the second part, the relationship between foreign trade and economic growth is explained. In the third chapter, the foreign trade volumes between Azerbaijan and Italy and the main products are examined. In the fourth chapter, a literature review is given in tabular form. In the fourth chapter, the data set and econometric method are explained. In the fifth and last part, the application results of the study are explained and the study is completed.

2. Theoretical Framework of The Relationship of Foreign Trade and Economic Growth

As it is known, foreign trade processes consist of imports and exports. The contribution to economic growth through exports can be expressed in several ways. First of all, it is the use of the inputs of the products that provide growth with the foreign currency entering the country and the use of technology to finance the imports. Export has a positive effect on productivity with its competitive advantage and accelerates economic growth by causing economies of scale. In addition, high exports also regulate income distribution by causing high employment (Demez 2021). Therefore, increasing the level of exports is among the most important foreign trade targets for countries. Imports are effective for economic growth and increase economic performance. With imports, both the technology required for production and the supply of raw materials or intermediate goods that are not available in the country or that are deficient in quantity and quality are provided, contributing to growth. Imports are thought to have a greater impact on economic growth than exports by providing the entry of new technologies into the country (Yurdakul and Aydın 2018). Effective imports contribute to economic development. Imports of education, agriculture, health, labor, infrastructure-oriented capital, and new ideas have a positive impact on economic development. In addition, imports protect the consumer by preventing monopolization and the high prices caused by it (Demez 2021).

Adam Smith first explored overseas commerce and growth in 1776. Smith argued in "The Wealth of Nations" that international commerce drives growth using the Theory of Absolute Advantage. According to this view, a country should specialise in producing inexpensive commodities. It should export low-cost commodities and import expensive ones. Both

countries will benefit. David Ricardo, who followed Adam Smith, argued with his theory of comparative advantages that wellbeing did not stop here. The Theory of Comparative Advantages should supersede Adam Smith's work, he said (Uçan et al 2014). Heckscher-Ohlin-Samuelson then argued that the model affected resource allocation. In his argument, international trade resources have attained pareto optimal. According to Heckscher-Ohlin-Samuelson, emerging countries need a high foreign trade index. Jayme criticises these published theses and says it's unclear if international trade will effect growth in the future. (Saçık 2009). As for neoclassical economics, since the factors of production are external, they do not constitute a basis. Internal growth models suggest that growth is heavily influenced by foreign trade. According to them, continuous and regular growth can be achieved with economies of scale. Foreign trade achieves growth through the distribution and sharing of externalities and technology (Gül and Kamacı 2012). The "New Endogenous Growth Theories" movement emerged in 1980. In the movement that started with Grossman and Helpman, technology was accepted as internal. The reason for this is that technological innovations have emerged as a result of the conscious actions of economic units, not by chance. Economists defending this theory are based on Romer's model. They put forward four basic factors that affect the stability of economic growth. With the increasing competition, the new ideas and growing technology flow that follow, the optimum point of resource allocation, and international integration, the growth will continue regularly and increasingly in the long term (Saçık 2009). With the increase in imports and exports, the increase in technical competition in the market forces companies to find new and advanced technologies (Gül and Kamacı 2012).

Trade is purchasing and selling products and services for money. Domestic and foreign trade are split (Kaya ve Turguttopbaş 2012). Foreign trade encompasses international products exchange. It encompasses services, investments, current transactions, import and export, and products commerce (Utkulu 2008). Foreign trade is import/export. Targets include increasing exports and minimising imports. Foreign trade strategy consists of choices and actions taken to attain these aims. People's needs grow. Countries trade internationally to address these demands. Economic growth is a national priority (Kesgingöz ve Karamelikli 2015). Foreign commerce is crucial to economic prosperity. Foreign commerce drives domestic dynamics. Development requires international trade (Aslan and Yörük 2008). Agriculture, industry, and services facilitate exports. Increasing the industrial sector's contribution on economic growth is vital (Dilek 2016). Underdeveloped countries can develop economically by purchasing industrial and investment commodities in exchange for export money. Since exports finance development initiatives, increasing exports will speed up development (Serin 1981). The direction of exports affects GDP. Exports boost growth. This has two economic effects. First, household income rises, reducing poverty. Second, the rise in output from higher exports allows for higher government spending via raising taxes (Şerefli 2016).

Economic growth refers to an increase in a country's production of goods and services and, hence, an increase in total national income. Foreign trade is the exchange of goods and services between a country and other countries. Therefore, the contribution or non-contribution of foreign trade to a country's economic growth depends on the country's trade volume, production of goods and services, trade policies, and other factors.

The contribution of foreign trade to economic growth is possible by increasing the export of goods and services from a country and reducing the foreign trade deficit. Exports can increase production and employment and lead to an increase in the national income of a country. Foreign trade can also provide technology transfer; imported technological products and production techniques and methods can contribute to the economic growth of the country by increasing production efficiency and quality. However, the impact of foreign trade on economic growth depends on factors such as the country's trade balance, trade policies, and competitiveness. If a country's foreign trade deficit is high, it may be necessary to decrease imports while increasing exports. Trade policies can also determine the impact of foreign trade. For example, trade barriers such as tariffs and quotas can negatively affect economic growth. Similarly, the country's competitiveness will determine the cost and production quality factors required to increase exports.As a result, the effect of foreign trade on economic growth depends on factors such as a country's trade policies, trade balance, and competitiveness level. With the right strategies and policies, foreign trade can increase economic growth. However, the wrong strategies or policies can have negative effects.

3. Azerbaijan and Italy Foreign Trade

Azerbaijan has been increasing its commercial relations with European countries since the day it gained independence. Investments made in Azerbaijan's energy resources, together with the "contract of the century" signed in 1994, led to an even faster increase in foreign trade relations in the following years (Ibadoghlu and Niftiyev 2022). Trade and economic relations between Azerbaijan and Italy have existed since the first years of independence. Especially the agreements on oil and natural gas increased the total foreign trade volume in the two countries and energy products led the increasing foreign trade. As an example of the agreements made in this context, the protocol of intent between the two countries in 1997–1998 and the basic principles of the agreement between the State Oil Company of the Azerbaijan Republic and ENI/Agip on exploration, development, and production sharing of the Kurdas block located in the Azerbaijan part of the Caspian Sea, as well as the commercial terms of the agreement, were signed (Baghrov et al 2020). Another agreement between the two countries is the energy agreement made in 2013 regarding the Trans Adriatic Natural Gas (TAP) pipeline. According to the agreement, Azerbaijan's natural gas exports to Italy are included, and this project is considered the continuation of the Tanap project and strengthens the economic relationship between Azerbaijan and Italy (TANAP n.d.). Italy ranks first among Azerbaijan's

commercial partners. Thus, 32% of Azerbaijan's total foreign trade falls to Italy in 2020. But the same situation does not exist for imports; the share of Italy-Azerbaijan in total imports is 5% (Bağırzadə and Muradov 2021).

The chart below shows the total foreign trade volume of the two countries for the years 1992–2020. We can see that the total foreign trade volume was lower in the early 1990s due to the war. After the mid-90s, when Azerbaijan achieved economic recovery, an increase in trade volume was also observed. The reason for the highest level of total foreign trade in 2008 and its sudden decline in the following year was the global crisis and increasing oil prices. It is observed that especially the commercial relations between the two countries have increased after 2015.

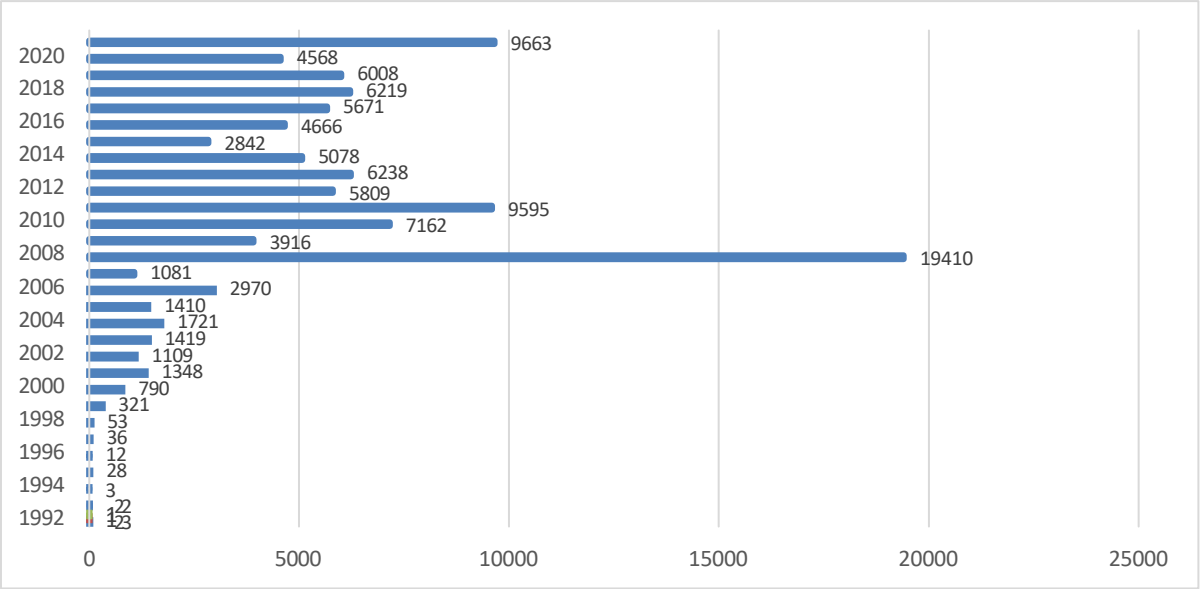

Figure 1 Foreign trade turnover between Azerbaijan and Italy (million dollars) (1992-2020). Source: Azərbaycan Dövlət Statistika Komitəsi, https://www.stat.gov.az/source/trade/ (December 28,2022).

When we look at the graph, we can see that the trade relations between the two countries are variable. The highest volume of trade relations, which increased especially after 2000, was seen in 2008 as 19 billion dollars. Although there has been a decrease in commercial relations after the global crisis, there has been an increase after 2015. Thus, the total trade volume in 2021 was 9 billion dollars. Compared to the previous year, there was an increase of 111% in the total trade volume. When we compare it with 2015, there is an increase of 240%. Azerbaijan's exports to Italy make up 90% of the country's total foreign trade. 4% of the total foreign trade in 2021 will include the export of Italian goods to Azerbaijan. In 2020, Italy's exports to Azerbaijan constituted 8% of the total foreign trade volume (Karaosmanoglu and Baghirov 2022).

3.1. Imports

Furniture, machinery, bakery products, automobiles, plastic pipes, medical products, and various other products constitute the majority of Italian exports to Azerbaijan (Table 1).

Table 1 Products exported by Italy to Azerbaijan (millions of US dollars).

Products	2022*	2021	2020	2019	2018	2017	2016	2015	2014	2013
Chocolate and chocolate products	1,2	1,4	1,5	1,7	1,7	2,2	2,2	2,2	2,5	2,8
Medicines	-	23,5	15	12,8	12,8	10,7	7,4	12,6	5,3	8,3
Metal structures	-	-	-	8,7	4,3	7,4	5,4	4,6	3,2	1,1
Plastic mass pipes, hoses, and their fittings	-	3,2	1,8	1,7	1,3	1,4	1,06	0,2	0,7	0,2
Shoe	4,2	-	4,6	5,6	5,9	5,6	4,8	0,7	2,4	1,5
Pipe fittings made of ferrous metals	-	11,1	21,4	9,8	3,7	4,2	7,6	36,6	12,1	3,1
Seating furniture	9,03	2,6	2,9	3,4	3,5	3,4	4,4	0,9	0,6	1,7
Wooden office, kitchen, bed, and other furniture	-	5	5,04	8,1	9,9	8,9	13,6	6,8	5,8	4,7

Source: Azerbaijan State Statistics Committee, https://www.stat.gov.az/source/trade/ (13.11.2022).
Note* Trade indicators for 2022 cover January-September 2022.

The graphic includes products exported by Italy to Azerbaijan. As can be seen from the chart, the leading products of Italy's export portfolio to Azerbaijan include furniture, plastic products, medical drugs, metals, and other products. Although

there has been an increase in the export of some products over the years, there has also been a decrease in the export of some products. Furniture is included in the products exported in 2021. Different from Azerbaijan, there are various products in the export portfolio of Italy to Azerbaijan.

3.2. Export

The products exported by Azerbaijan to Italy are shown in the Table 2 below. When we look at the Table 2, exports consist of crude oil and petroleum products, natural gas, and agricultural products. Azerbaijan did not export natural gas to Italy until almost 2020. Natural gas exports began in 2021. The main reason for this is that gas transportation to European countries will take place in 2020 in the context of the Tanap project.

Table 2 Products exported by Azerbaijan to Italy (million US dollars).

Products	2022*	2021	2020	2019	2018	2017	2016	2015	2014	2013
Crude oil	5.674	6.064,5	4.121,2	5.536,7	5.834,7	5.292,7	4.274,2	2.137,1	4.538,1	5.812,4
Natural gas	8.821,8	3.079,4	-	-	-	-	-	-	-	-
Shelled hazelnuts	23,5	34,7	28,9	33,2	20,4	51,4	40,1	31,8	10,1	9,2
Heavy distillates or gasoils for other purposes	30,8	35,3	9,8	58	11,4	-	9,5	53,2	136,4	107,3
Liquid fuel	-	1,6	1,9	0,7	-	0,4	4	22,4	94,5	59,7
Acyclic alcohols and their derivatives	9,9	7,8	8,8	8,4	-	0,9	0,8	5,8	-	-

Source: Azerbaijan State Statistics Committee, https://www.stat.gov.az/source/trade/ (13.11.2022). Note* Trade indicators for 2022 cover January-September 2022.

According to the data of the Azerbaijan State Statistics Committee, the total value of exports between Azerbaijan and Italy in 2021 will 9 billion 243 million. Compared to previous years, the total export value in 2021 is 121% higher than in 2020, 63% higher than in 2019, 57% higher than in 2018, 72% higher than in 2017, 113% higher than in 2016, and 310% higher than in 2015 than in 2014. It increased by 92% and 54% compared to 2013. The main reason for the low export value in 2015 is the devaluation of the Azerbaijani economy. Natural gas and crude oil make up a large share of the products that Azerbaijan exports to Italy. When we look at exports in general, oil and natural gas products constitute the main categories. In addition, hazelnut exports among agricultural products are of great importance. In 2021, crude oil and natural gas constitute the main export products with a share of 65% and 33% in total exports. When we look at the export indicators, there has been an increase in natural gas, crude oil, petroleum products, and hazelnut exports over the years, except for the COVID-19 pandemic period.

4. Literature review

Dritsaki (2004) contends that international commerce, FDI, and economic growth in Greece may support each other under an open policy. Sharma and Panagiotidis (2005) examine the link between exports, imports, and economic development in India from 1971 to 2001 using econometric metrics such as the VAR model and the cointegration test. The empirical research shows that export trade does not contribute to India's economic growth over the long term. The link between GDP growth and its influencing elements varies among nations and market systems, according to past studies. Therefore, China must study the three components' interrelation. The influence of exports and FDI on local economic growth varies greatly among nations, according to Kalirajan et al (2009). Tiwari and Mutascu (2011) analyse FDI and economic development in 23 Asian countries using panel data. The results show that FDI, exports, and labour and capital investments boost these Asian countries' economies. These two essays made us consider regional variances. Their studies are country-based, not regional. Comparing China's economic growth variables is theoretically and practically important. The document has 5 sections. The second portion analyses China's predicament. By analysing China's FDI, foreign trade, and economic growth, the country's strengths and shortcomings in international commerce are shown. Third, the theory behind FDI, international commerce, and economic growth. Analyzing prior research introduces FDI, international trade, and economic growth ideas. This study's fourth component provides an empirical investigation of the link between FDI, international trade, and economic development for 30 Chinese regions. The panel data model shows the macro and micro relationships between these three variables. Individualized studies of 30 provinces explore provincial variations. Part 5 focuses on the challenges with China's overseas economy and proposes actions to support its development and economic prosperity. . Belloumi (2014) employed Granger causality to test for dynamic causation between economic growth, FDI, trade openness, labour, and capital investment in Tunisia. There is a long-run link between these variables, but no Granger causation between trade and economic growth or FDI and economic growth. Nguyen (2020) used ordinary least squares to study FDI, exports, and imports in Vietnam. The test found a link between FDI and Vietnam's economic development. Vietnam's economy benefits from FDI and exports. FDI and foreign commerce may have a limited influence on a country's economic progress.

Guan and Hong (2012) examined the relationship between foreign trade and economic growth between 1960 and 2010 with the Granger causality test for US data. As a result of the study, bidirectional causality between export and economic

growth, and unidirectional causality from economic growth to import has been determined. Tapşın (2015), who conducted a similar study for Turkey between 1974-2011, and Turgut and Uçan (2021), who worked on 19 developed countries between 1994-2019, reached the same findings as a result of the causality tests they used. Korkmaz and Aydın (2015) between 2002-2014, Doğan (2021) in Kyrgyzstan between 2000-2019, Demez (2021) for 14 countries from the Middle East and North Africa country group between 2001-2017, As a result of the studies conducted by Kılıç and Beşer (2017) between 1992-2015 on the countries that are members of the Eurasian Economic Union, and especially the Granger causality test performed by Akkaş and Öztürk (2016) on Turkey between the periods 2001:Q3-2014:Q4. As a result of the study, a bidirectional causality relationship was found between imports and growth, while the causality relationship and direction between exports and economic growth differed in related studies. As a result of the Granger causality test used by Ho et al (2015) on China between 2005 and 2013, a one-way causality finding was found from economic growth to exports, while Karakaş and Doğan's (2021) study on Turkey covering the years 1996-2019, it was found that there was a direction from export to economic growth. One-way causality was found. In Demirel and İşcan's (2021) studies covering the period 1987-2018 for Turkey-South Korea, one-way causality from economic growth to exports for Turkey and one-way causality from exports to economic growth for South Korea was determined. In Kızıldere's (2020) study covering the years 1970-2018, it was determined that there is a one-way causality relationship from economic growth to both imports and exports. Contrary to all these findings, as a result of Şerefli's (2016) study covering the years 1975-2014, which has similar variables with this study, it has been determined that there is no causality between foreign trade and economic growth in Turkey (Yılmaz 2022).

Yılmaz (2022) did not examine Turkey's economic growth and foreign trade relationship between 1970 and 2019 in his study. In the analysis part, ADF, PP and Toda-Yamamoto analyzes were used. As a result of the study, the causality relationship from foreign trade to economic growth has been determined. However, no causality was found from economic growth to foreign trade.

5. Method of Research

In this part of the research, the research objectives and scope, the variables used in the research, the research model and the time series analysis models used in data analysis are mentioned. In the study, the Gross Domestic Product of Azerbaijan and Italy between 1992-2020 and the export and import variables between the two countries were used; The relationship between GDP and foreign trade (export and import) variables was tried to be tested by applying Descriptive Statistics, Unit Root Test, Co-Integration Analysis and Granger Causality Analysis methods. EViews12 econometric analysis program was used for the analysis. In this part of the study, firstly, the econometric data model is explained, and information about unit root tests, cointegration tests, and finally Granger causality tests are given.

5.1. Objective and Scope

The aim of the research is to examine the effects of exports and imports between Italy and Azerbaijan on the economies of the countries in terms of short-term, long-term and causality. The scope of the research covers the economies of Azerbaijan and Italy for the period 1992-2020.

5.2. Variables Used in the Research

The variables included in the research for research purposes, explanations of the variables, data sources and symbols to be used in the equations are presented in Table 3.

Table 3 Variables used in the study.

Variable	Description	Symbol
Italy GDP	Italy Gross Domestic Product	IGDP
Azerbaijan GDP	Azerbaijan Gross Domestic Product	AGDP
Export	Export to Italy	ITEXP
Imports	Import from Italy	ITIMP

* The per capita income data of the variables were obtained from the world bank open data bank.

As seen in the table, the data on the Gross Domestic Product, imports and exports of the countries covered in the research were compiled annually between 1992 and 2020 with current prices. It is known that since the variables will be used at an annual frequency, there is no seasonal effect on the variables, so there is no need for seasonality analysis or corrections. The annual import and export volumes of the countries in terms of Gross Domestic Product ($) are compiled in million dollars (M $) in US dollars.

5.3. Research Models

It is desired to estimate the relations between the Gross Domestic Product, import and export volumes in the countries subject to the research on a country basis. In this context, the research is planned to establish and estimate four different models. The economic representations of these research models are as follows:

GAZE = f(EXAZE) (1)
GAZE = f(IMPAZE) (2)
GITA = f(EXITA) (3)
GITA = f(IMPITA) (4)

When equations 1, 2, 3 and 4 are examined, it is seen that there are 4 models with one independent variable and one dependent variable. These models represent measurements of the same data type in different countries. Although the aforementioned analysis in econometrics seems to be solvable with a single model and panel data methods, the low number of countries (i=4) that will form one dimension of the panel data creates a constraint on panel data analysis. On the other hand, the request to analyze the GDP, import and export of the countries separately has been effective in deciding the time series analysis with 4 different models.

Equations 1, 2, 3 and 4 are the economic models of the relations to be examined. Models show GDP in countries as a function of imports and exports. As it is known, GDP is related to many other variables besides imports and exports. However, since these related variables are out of the scope of the research, it was decided to make the estimations only between GDP, imports and exports. In this regard, low explanatory coefficients (R) are expected during future econometric analysis of the equations. Although exports and imports are thought to be effective on GDP, it will not be possible to explain GDP only with Imports and Exports. In this respect, models should not be expected to be highly explanatory, except that parameter estimates are meaningful and compatible with economic theory. When we convert economic models to econometric models, the models will be revised as follows:

GAZE t = β0t + β1t (EXAZE) + £t (5)
GAZE t = β0t + β1t (IMPAZE) + £t (6)
GITA t = β0t + β1t (EXITA) + £t (7)
GITA t = β0t + β1t (IMPITA) + £t (8)

While the t indices in the 5th, 6th, 7th and 8th models represent the t period in the time series data, the lb index represents the error terms (residual terms) of the model. β0t is the cutoff term in the models, and it shows that if exports and imports are zero, per capita national income does not start from zero, more clearly, the equations do not pass through the origin. The parameter to be estimated for each model is β1t. The parameter shows the effect of the increase or decrease in the exports and imports of the countries on the per capita national income. When the models are examined, there is one dependent variable and one independent variable in all three models. Models that are tried to be explained with an independent variable in econometrics are called simple regression models. It is known that there are some advantages to logarithm processing on both sides of the established econometric models. First of all, the variables whose logarithms are taken will get closer to the normal distribution. Secondly, percent change expressions can be easily used when interpreting the estimation parameters of the variables whose logarithms are taken. For this reason, natural logarithm operations were performed for models 5, 6, 7 and 8 and the models were revised as follows:

Log(GAZE t)= β0t + β1t (Log(EXAZE)) + £t (9)
Log(GAZE t)= β0t + β1t (Log(IMPAZE)) + £t (10)
Log(GITA t)= β0t + β1t (Log(EXITA)) + £t (11)
Log(GITA t)= β0t + β1t (Log(IMPITA)) + £t (12)

Models whose dependent and independent variables are logarithmically transformed are called log-log models. In log-log models, it is possible to express the change in the independent variable and the estimation in the dependent variable as a percentage without any transformation after parameter estimation.

5.4. Data Analysis

In the research, the data collected from the data bank were first examined with the help of descriptive statistics and graphics. During the analysis of the descriptive statistics, the data accuracy was checked, and from the graphic analysis, the trend, cut, etc. of the series were determined. properties have been observed. Although a foresight about the stationarity of the series is created with the help of graphics, the decisions about the stationarity are made after the unit root tests. As all the series were stationary at the first difference, the study was continued by taking the first differences of the series, provided that one year of observation was lost. The final models, which were revised as a result of difference operations and logarithmic transformations applied to the series, were first estimated with the least squares estimation technique and short-term relationships were determined, then long-term relationships were determined with co-integration analysis and causality analysis.

6. Results

In this part of the research, the findings obtained as a result of data analysis are presented with tables and comments.

6.1. Descriptive Statistics

The descriptive statistics of the variables used in the research are as in Table 4.

Table 4 Variable Descriptive Statistics.

	AGDP	IGDP	ITEXP	ITIMP
Mean	0.165765	0.016004	0.213375	0.153894
Median	0.140550	0.021774	0.182147	0.066356
Maximum	1.257827	2.387261	5.813450	1.224562
Minimum	-0.349046	-2.332029	-5.122909	-0.797558
Std. Dev.	0.314483	1.075951	1.715821	0.461276
Skewness	1.326910	0.122231	0.292114	0.398393
Kurtosis	6.482786	4.783934	8.041303	3.099647
Jarque-Bera	23.16685	3.917635	31.12190	0.779132
Probability	0.000009	0.141025	0.000000	0.677351
Sum	4.807191	0.464127	6.187871	4.462936
Sum Sq. Dev.	2.769193	32.41479	82.43319	5.957702
Observations	29	29	29	29

The table includes descriptive statistics and Jarque-Berra normal distribution test for research variables. The null and alternative hypotheses for the Jarque-Berra normal distribution test, which is used to control the compliance of the variables with the normal distribution assumption, are as follows:

H0 : The series is normally distributed.
H1 : The series is not normally distributed.

When the probability values (p) of the Jarque-Berra test statistics are examined, it can be said that the AGDP, IGDP, ITEXP and ITIMP variables conform to the normal distribution at the 5% significance level (p>0.05), and the GJA and SJA variables at the 1% significance level (p>0.01). On the other hand, when the skewness coefficients of the variables are examined, it is seen that they have low skewness coefficients that do not distort the normal distribution. The graphs of the annual GDP variables of the countries are as in Figure 2.

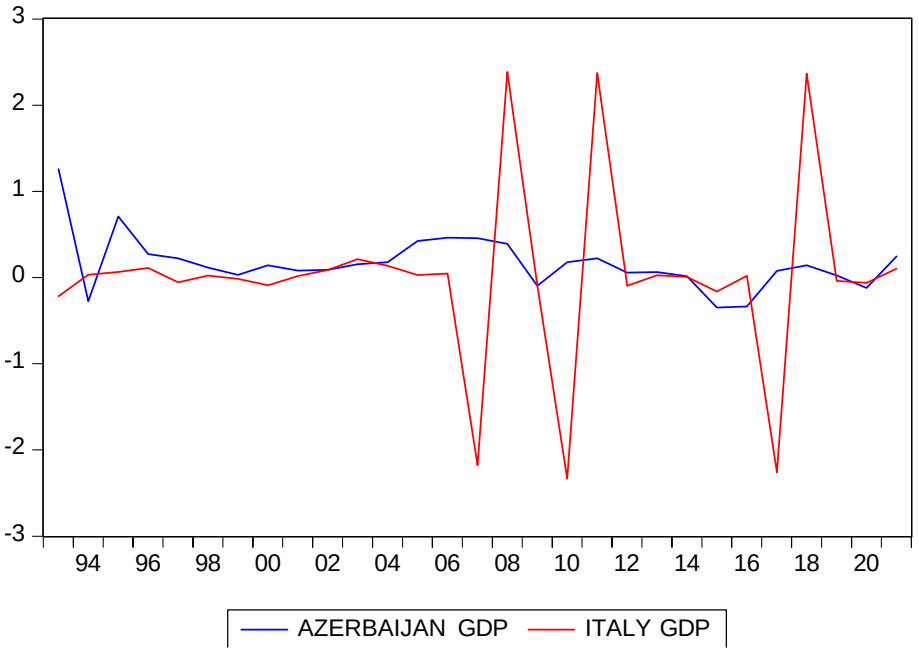

Figure 2 Gross Domestic Product Graphs of Azerbaijan and Italy.

As seen in the graph, the GDP levels of all countries generally have an increasing trend. When the graphs are examined in order to create a hunch about the stationarity of the variables, it is observed that the variables are not stationary at level values. For definitive findings on stationarity, unit root test findings will be examined. The navigation charts of the annual Imports and Exports of the countries are as in Figure 3.

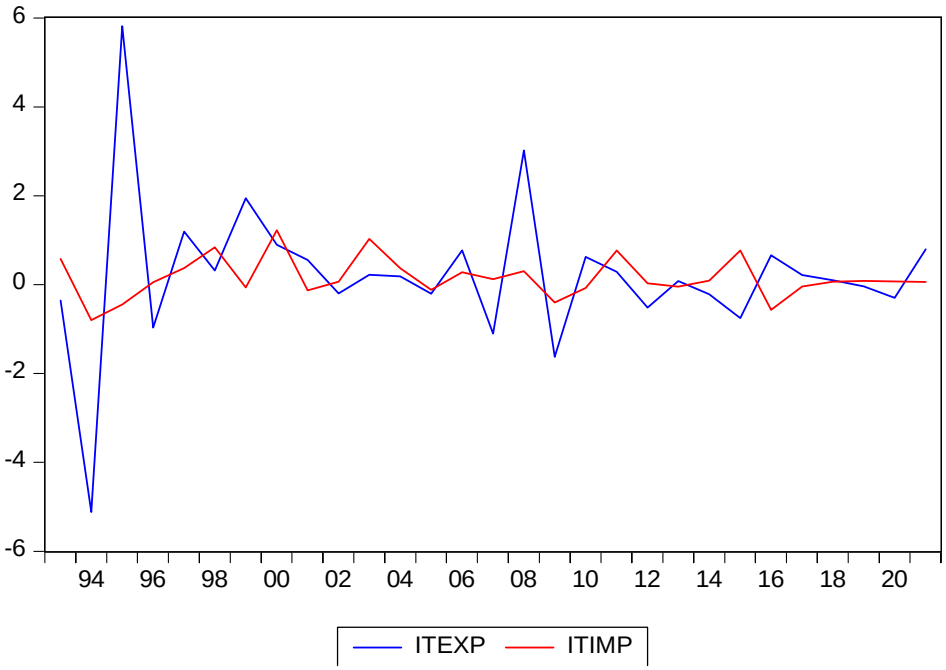

Figure 3 Import and Export Charts of Azerbaijan and Italy

As can be seen in Figure 2, when the graph is examined in order to create a foresight about the stationarity status of the Import and Export variables, it can be said that not all variables are stationary at level values, and that they may become stationary at the first difference for Azerbaijan and Italy. As stated before, the stationarity of the variables and the stationarity of the difference variables will be tested with unit root tests.

6.2. Unit Root Tests

An important assumption in regression analysis involving time series data is that the considered time series are stationary. In the regression analysis to be made with non-stationary series, it is possible to find relationships that do not exist in reality. This situation is called spurious regression. Therefore, the variables to be included in the analysis should be stationary. However, whether the variables are stationary or not should be determined by ADF (Augmented Dickey-Fuller) and PP (Philips-Perron) tests (Gujarati 2004). These tests are applied to equations with and without a trend (equation 1), with a constant and without a trend (equation 2), and with a constant and a trend (equation 3), respectively. But beforehand, whether the variables are stationary or not should be determined by the ADF (Augmented Dickey-Fuller) test. For the ADF (Augmented Dickey-Fuller) test, the equations with and without a trend (equation 3), with a constant and without a trend (equation 2) and with a constant and a trend (equation 3) are given below:

Equation without constant terms and without trend:

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^{p} \Delta Y_{t-i} + \varepsilon_t$$

Constant term equation:

$$\Delta Y_t = \mu + \delta Y_{t-1} + \sum_{i=1}^{p} \Delta Y_{t-i} + \varepsilon_t$$

Equation with constant and trend:

$$\Delta Y_t = \mu + \beta t + \delta Y_{t-1} + \sum_{i=1}^{p} \Delta Y_{t-i} + \varepsilon_t$$

The ADF test requires the estimation of one or more or all of the above regression specifications with Least Squares (Least Squares). The null hypothesis and an alternative hypothesis for the Adf test are as follows:

H0 : There is a unit root in the series. (The series is not stationary at the level.)
H1 : There is no unit root in the series. (It is stationary at the serial level.)

In most specifications, deterministics are constant and trending. Unnecessarily adding a constant or trend variable will reduce the power of the test. This may lead to the decision that the stationary series is not stationary. The dependent variable lags in the equation are intended to eliminate the possible autocorrelation problem in the error terms. As a result of the test, if all three specifications point to the unit root in the same place or if they indicate that there is no unit root, a decision is made (Yamak and Erdem 2017). Otherwise, the mismatch is resolved by deciding between specifications. The cutoff term and the trend of the series can be read from the series chart to decide between specifications. When the graphs of both per capita income and import and export series are examined, it is seen that the series contain cut-off terms (they do not start from the origin) and they contain a trend (increasing trend). In this respect, in case of incompatibility between ADF equation specifications, it would be appropriate to consider the test statistics of the fixed and trended equation. ADF test statistics for all variables in the research, with and without constant, with constant and with constant and with trend, are as in Table 5.

Table 5 ADF Unit Root Test Statistics.

Unıt Root Test Table (PP) At Level					
		AGDP	IGDP	ITEXP	ITIMP
With Constant	t-Statistic	-6.4294	-12.7759	-9.2160	-5.8476
	Prob.	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
With Constant & Trend	t-Statistic	-6.8894	-12.5165	-10.3636	-5.7460
	Prob.	0.0000 ***	0.0000 ***	0.0000 ***	0.0003 ***
Without Constant & Trend	t-Statistic	-5.6599	-13.0049	-9.2589	-5.4386
	Prob.	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
Unıt Root Test Table (ADF) At Level					
		AGDP	IGDP	ITEXP	ITIMP
With Constant	t-Statistic	-6.9622	-4.5792	-9.2160	-5.8631
	Prob.	0.0000 ***	0.0015 ***	0.0000 ***	0.0000 ***
With Constant & Trend	t-Statistic	-7.3983	-4.3834	-9.1365	-4.3931
	Prob.	0.0000 ***	0.0107 **	0.0000 ***	0.0089 ***
Without Constant & Trend	t-Statistic	-5.9838	-4.7173	-9.0786	-1.6524
	Prob.	0.0000 ***	0.0001 ***	0.0000 ***	0.0921 *

Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant. *MacKinnon (1996) one-sided p-values.

When the unit root test statistical significance values of the variables are examined in Table 5; It was determined that all variables were stationary at the 1% significance level in the unconstant model and in the fixed and trended model (Yt ~ I(0) ($p<0.01$), and stationary in the fixed model (Yt ~ I(0)).

6.3. Co-Integration Analysis

In order to examine the long-term course of the relationship between imports, exports and GDP in the economies of Azerbaijan and Italy, long-term co-integration (cointegration) relations can be examined. Cointegration was first introduced by Engle-Granger (1987). Co-integration of variables refers to the equilibrium relationship between variables. Equilibrium relationship means that the variables do not act independently of each other. In the co-integrated relationship, the trends of the variables are related to each other. That is, the scocastic trends of the variables are related to each other. Co-integration means the linear combination of the series and indicates the existence of long-run equilibrium. It is a test based on error terms. It is based on the unit root test of the static least squares error terms of the long-term regression equation and the hypotheses of the test are as follows (Yamak and Erdem 2017); H0: Series are not cointegrated. H1: Series are cointegrated. Co-Integration analysis statistics for model 1, model 2, model 3 and model 4 are presented in Table 6 and Table 7.

When Table 7 is examined, it is seen that there is a long-term co-integration relationship at the 5% significance level between GDP, imports and exports for Model 1, model 2, model 3 and model 4. ($p>0.05$) To put it more clearly, there is a long-term balance between imports, exports and GDP in the economies of Azerbaijan and Italy.

Table 6 Co-integration Analysis Statistics for Azerbaijan Economy

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
AGDP	-5.763233	0.0013	-19.41376	0.0675
ITEXP	-7.529176	0.0000	-36.17643	0.0000
ITIMP	-5.483741	0.0025	-29.50087	0.0017

Table 7 Co-integration Analysis Statistics for the Italian Economy.

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
IGDP	-7.442636	0.0000	-116.2405	0.0000
ITEXP	-9.285293	0.0000	-42.62516	0.0000
ITIMP	-6.004602	0.0008	-31.52704	0.0007

6.4. Causality Analysis

The existence of a long-term equilibrium relationship in the economies of Azerbaijan and Italy was determined by cointegration analysis. The existence of long-term equilibrium allows to examine the causal relationships between these variables. Causal relationships between variables can be examined with the Granger causality test. The hypotheses for the Engle Granger test are as follows:

H0 : X is not the cause of Y.
H1 : X is the cause of Y.

Granger causality test statistics are as in Table 8.

Table 8 Granger Causality Test Statistics.

Null Hypothesis:	F-Statistic	Prob.	Sonuç
ITEXP does not Granger Cause AGDP	2.77897	0.0839	%10'a göre evet
AGDP does not Granger Cause ITEXP	1.68807	0.2080	No
ITIMP does not Granger Cause AGDP	2.56923	0.0994	%10'a göre evet
AGDP does not Granger Cause ITIMP	0.79593	0.4637	No
ITEXP does not Granger Cause IGDP	0.01897	0.9812	No
IGDP does not Granger Cause ITEXP	1.47132	0.2514	No
ITIMP does not Granger Cause IGDP	0.64047	0.5366	No
IGDP does not Granger Cause ITIMP	0.64906	0.5323	No

When Table 8 is examined, the hypothesis suggesting that exports from Azerbaijan to Italy are not the cause of GDP and imports from Azerbaijan to Italy are not the cause of GDP is rejected, and all hypotheses suggesting that exports are not the cause of GDP are rejected, and the hypothesis that there is causality is accepted. ($p<0.10$). On the other hand, when examined, the hypothesis suggesting that Italy's exports from Azerbaijan are not the cause of GDP and Italy's imports from Azerbaijan are not the cause of GDP will be accepted ($p>0.05$).

7. Conclusions and assessment

The econometric section of the study analysed the link between Azerbaijan and Italy's import, export, and GDP (Growth). Foreign commerce contributes significantly to economic growth. Economic expansion raises per capita income. No economic growth means no development. Countries want economic growth and development. Gross domestic product, exports, and imports have been the subject of many empirical and theoretical studies as growth indicators for countries. Within the scope of the studies, the effect on economic growth was investigated, and different dimensions were obtained. While some of the studies reveal the existence of the effect in the context of positive externality, other studies do not mention a relationship between the two variables. In this study, strategic model countries with high commercial relations were selected and the effects of exports and imports on Gross domestic product were analysed in the short term, long term and causality. In order to determine the relationship between the three variables, countries were studied separately, and four different models were established. Since only exports and imports will have an effect on the gross domestic product, the significance of parameter estimations and their compatibility with economic theory have been examined rather than their high explanatory power within the scope of the study. Within the scope of the final models included in the study, when the effect of the change in imports and exports in a certain period of time on the Gross domestic product in that period is desired to be investigated, a one-way effect was found in the Azerbaijan economy, while this effect could not be found for Italy.

Italy is one of the most important foreign trade partners of Azerbaijan, and the trade volume is constantly increasing. Trade between the two countries takes place in various sectors, but it has high potential, especially in sectors such as energy, agriculture, construction, and tourism. The potential for cooperation between the two countries in sectors such as agriculture and tourism is high, and more efforts should be made to focus on these sectors.Investment opportunities in Azerbaijan should

be promoted to Italian companies, and they should be encouraged to invest.Agreements between countries will encourage trade cooperation and create a safer environment for investors.

Ethical considerations

Not applicable.

Conflict of Interest

The authors declare that they have no conflict of interest.

Funding

This research did not receive any financial support.

References

Ahmadov F (2010) Azerbaycan'ın Ulusal Rekabet Gücü: TOWS ve Elmas Modelli Bir Çözümleme. Doctoral Dissertation, Sakarya University.

Ahmadov F, Valiyev J (2019) The evaluation of small and medium enterprises role in economic development of Azerbaijan. Economic and Social Development: Book of Proceedings 397-408.

Akkaş I, Öztürk M (2016) Türkiye'de ihracat, ithalat ve ekonomik büyüme arasındaki nedensellik ilişkilerinin analizi. DOI: 10.17719/jisr.20164216244

Aktaş C (2009) Türkiye'nin İhracat, İthalat ve Ekonomik Büyüme Arasındaki Nedensellik Analizi, Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü Dergisi 2:35-47.

Aslan N, Yörük D (2008) Teori ve Uygulamada Dış Ticaret Hadleri ve Kalkınma İlişkisi. Marmara Üniversitesi İİBF Dergisi 27.

Belloumi M (2014) The relationship between trade, FDI and economic growth in Tunisia: An application of the autoregressive distributed lag model. DOI: 10.1016/j.ecosys.2013.09.002

Bağırzadə E, Muradov A (2021) Azərbaycan İqtisadiyyatı (infoqrafika). Şərq-Qərb Nəşriyyatı, Bakı, pp. 196-198.

Demez S (2021) Mena ülkelerinde dış ticaret ve ekonomik büyüme ilişkisi: Panel nedensellik analizi yaklaşımı. Akademik Yaklaşımlar Dergisi 12:137-153.

Demirel T and İşcan İH (2021) Dış ticaretin ekonomik büyüme üzerine etkisi: Güney kore ve Türkiye örneğiyle bir eşbütünleşme analizi. DOI: 10.17130/ijmeb.794267

Dilek S (2016) Oyun Teorisi Eşliğinde Sanayi Ekonomisi (Endüstriyel Ekonomi). Seçkin Yayıncılık, Ankara.

Doğan B (2021) Kırgızistan'da Diş Ticaret İle Ekonomik Büyüme Arasındaki Nedensellik İlişkisi. Kirgizistan Araştırmaları 91.

Dritsaki M, Dritsaki C, Adamopoulos A (2004) Acausal relationship between trade, foreign direct investment and economic growth for Greece. DOI: 10.3844/ajassp.2004.230.235

Engle RF, Granger CW (1987) Cointegration and error correction representation, estimation, and testing. DOI: 10.2307/1913236

Guan JL, Hong Y (2012) An empirical analysis on U.S. foreign trade and economic growth. DOI: 10.1016/j.aasri.2012.09.011

Gujarati D (2004) Basic Econometrics, Fourth Edition. McGraw Hill Companies, New York.

Gül E, Kamacı A (2012) Dış Ticaretin Büyüme Üzerine Etkileri: Bir Panel Analizi. Uluslararası Alanya İşletme Fakültesi Dergisi 3:81-89.

Ho K. Y, Wang K, & Wang W (2015) Foreign trade and economic growth in recent China: A granger causality analysis. In A New Paradigm for International Business: Proceedings of the Conference on Free Trade Agreements and Regional Integration in East Asia pp. 91-96. Springer Singapore.

Şerefli M (2016) Dış ticaretin ekonomik büyüme üzerine etkisi: Türkiye örneği. DOI: 10.1007/978-981-287-499-3_4

Kalirajan K, Miankhel AK, Thangavelu SM (2009) Foreign Direct Investment, Exports, and Economic Growth in Selected Emerging Countries: Multivariate VAR Analysis. DOI: 10.2139/ssrn.1526387

Karakaş M, Doğan BB (2021) Gümrük birliği sonrasında Türkiye'de dış ticaret ve ekonomik büyüme arasındaki nedensellik ilişkisi (1996-2019). DOI: 10.53092/duiibfd.984781

Kaya F, Turguttopbaş N (2012) Dış Ticaret İşlemleri. T.C. Anadolu Üniversitesi Yayını, 2526.

Kesgingöz H, Karamelikli H (2015) Dış Ticaret-Enerji Tüketimi ve Ekonomik Büyümenin CO2 Emisyonu Üzerine Etkisi. Kastamonu Üniversitesi İktisadi ve İdari Bilimler Dergisi 9.

Kılıç NÖ, Beşer M (2017) Relationship of foreign trade and economic growth in Eurasian economy: Panel data analysis. DOI: 10.5539/ijef.v9n9p1

Kızıldere C (2020) Dış ticaret-ekonomik büyüme ilişkisi: Türkiye örneğinde bir nedensellik analizi. DOI: 10.17498/kdeniz.679869

Korkmaz S, Aydın A (2015) Türkiye'de dış ticaret-ekonomik büyüme ilişkisi: Nedensellik analizi. Eskişehir Osmangazi Üniversitesi İİBF Dergisi 10:47-76.

Nguyen HH (2020) Impact of Foreign Direct Investment and International Trade on Economic Growth: Empirical Study in Vietnam. DOI: 10.13106/jafeb.2020.vol7.no3.323.

Oktar S and Dalyancı L (2012) Dış Ticaret Hadlerinin Cari İşlemler Dengesi Üzerindeki Etkisi. Marmara Üniversitesi İ.İ.B. Dergisi 2:1-18.

Ozansoy A (2009) 2008-2009 Küresel Krizine Karşı Ülkelerin Gösterdikleri Korumacılık Refleksleri. Lebib Yalkın Dergisi 69:300-316.

Şerefli M (2016) Diş Ticaretin Ekonomik Büyüme Üzerine Etkisi: Türkiye Örneği. Kastamonu Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi 13:136-143.

Serin N (1981) Dış Ticaret ve Kalkınma. Ankara Üniversitesi Yayınları, Ankara.

Seyidoğlu H (2009) Uluslararası İktisat, Teori Politika ve Uygulama, 17 baskı. Güzem Can Yayınları, İstanbul, pp. 511-529.

Sharma A, Panagiotidis T (2005) An analysis of exports and growth in India: cointegration and causality evidence (1971-2001). DOI: 10.1111/j.1467-

9361.2005.00273.x

Tapşın G (2015) The relationship between foreign trade and economic growth in Turkey. International Review of Research in Emerging Markets and the Global Economy 1:417-429.

Tiwari AK, Mutascu M (2011) Economic Growth and FDI in Asia: A Panel-Data Approach. DOI: 10.1016/S0313-5926(11)50018-9.

Azerbaijan State Statistics Committee (2022) Trade. Available in: https://www.stat.gov.az/source/trade/. Accessed on: April 28, 2023.

Ibadoghlu G, Niftiyev IM (2022) Retrospective Analysis of the Azerbaijani Economy During 30 Years of Independence. Post-Soviet Issues 59. Available in: https://www.tanap.com/en/southern-gas-corridor.

Baghrov A, Aghayeva X, Aliyeva Sh, Rzayeva L (2020) Bilateral Trade Intensity between Azerbaijan and Italy. II. International Scientific Conference of Masters and Doctoral Students in Economics and Management, pp. 1160-1174 Baku: UNEC, BMDM.

TANAP (n.d). Güney Gaz Koridoru. TANAP. Available in: https://www.tanap.com/guney-gaz-koridoru. Accessed on: April 28, 2023.

OEC. (n.d). Italy/Azerbaijan. Available in: https://oec.world/en/profile/bilateral-country/ita/partner/aze. Accessed on: April 28, 2023.

Karaosmanoğlu EAİ and Baghirov A (2022) İkili Ticari İlişkilerin İhracat ve İthalat Yoğunluk Endeksi ile İncelenmesi: Azerbaycan ve Kırgızistan Örneğinde (2010-2019). InTraders International Trade Academic Journal 4:128-148.

Pashayev F (2014) Economic cooperation between Azerbaijan and Italy.

Gasan AA (2021) The Role of Foreign Economic Activity in The Development of The National Economy of Azerbaijan. In Colloquium-journal 20:32-35.

Turgut E, Uçan O (2021) Dış ticaret ve büyüme ilişkisi: Gelişmiş ülkelerden bulgular. DOI: 10.25287/ohuiibf.875522

Uçan O, Koçak E (2014) Türkiye'de dış ticaret ve ekonomik büyüme arasındaki ilişki. Niğde Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi 7:51.

Utkulu U, Özdemir D (2004) Does Trade Liberalizasyon Cause a Long Run Economic Growth in Turkey?. DOI: 10.1007/s10644-005-8080-8

Yamak R, Erdem HF, Koçak S (2017) Relative Price Variability and Inflation in Turkey: Results From Kalman Filter Estimation. Financial Studies 1:28-40.

Yapar SS (2009) Dış Ticaret Politikası ve Büyüme İlişkisi: Teorik Açıdan Bir İnceleme. Karamanoğlu Mehmetbey Üniversitesi İİBF Dergisi 11:162-171.

Yılmaz F (2022) Ekonomik Büyüme ve Dış Ticaret Bağıntısı: Türkiye Örneği. Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi 8:21-32.

Yılmazer M (2010) Doğrudan Yabancı Yatırımlar, Dış Ticaret ve Ekonomik Büyüme İlişkisi: Türkiye Üzerine Bir Deneme". Sosyal Bilimler 1:241-160.

Yurdakul F, Aydın M (2018) Ekonomik büyüme ve dış ticaret.