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# THE RELATION BETWEEN FINANCIAL, ECONOMIC INDICATORS AND FOREIGN TRADE-RELATED LOANS: THE CASE OF TURKEY

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## ABSTRACT

*The purpose of this paper is to examine the relation between inflation, exchange rate (USD/TL, EUR/TL) and TRLIBOR (interest rate), which are among the main economic/financial indicators, and export loans related to foreign trade financing with particular reference to the Covid-19 Pandemic. Data is retrieved from BRSA, BIST-Connect Data Platform. The study covers Turkey for the years between 2015-2021. OLS method is employed. Findings of this paper is as follows; with some lag, the increase in export credits causes a decrease in the EUR exchange rate, while interest rates increase in parallel with the growth in export credits in the same period.*

***Key Words***: *Foreign Trade, Export Loans, Financial and Economic Indicators.*

***JEL Classification***: *F40, F44, F49.*

# FİNANSAL VE EKONOMİK GÖSTERGELER İLE İHRACAT KREDİLERİ ARASINDAKİ İLİŞKİ: TÜRKİYE ÖRNEĞİ

## ÖZET

*Makalenin hedefi, temel ekonomik/finansal göstergeler arasında yer alan enflasyon, döviz kuru (USD/TL, EUR/TL) ve TRLIBOR faizi ile dış ticaretin finansmanı ile ilintili olan ihracat kredileri arasında istatistiki anlamda ilişki olup olmadığını incelemektir. Veriler, BDDK ve BIST-Connect'ten alınmıştır. Türkiye'ye ait 2015-2021 yılları arasındaki veriler kullanılmıştır. Çalışmanın ekonometrik analizinde OLS metodolojisi kullanılmıştır. Çalışmadaki sayısal analiz bulguları şunlardır; ihracat*

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*kredilerindeki artış, EUR/TL'de (döviz kuru) anlamlı bir düşüşe neden olmaktadır, faiz oranları ise ihracat kredilerindeki artışla paralel hareket etmektedir.*

***Anahtar Kelimeler:*** *Dış Ticaret, İhracat Kredileri, Finansal ve Ekonomik Göstergeler.*

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## 1. INTRODUCTION

The positive relationship between economic growth and foreign trade performance is widely found in the literature. As the driving factor of economic growth, the direct and indirect contributions of foreign trade and thus exports to the country's economy are quite high. Studies on this subject can be traced back to the classical economists, Adam Smith and David Ricardo. These thinkers defended the effects of international trade on economic growth with the theories of specialization and comparative advantage. Traditional and modern foreign trade theories have also revealed the importance of exports for countries with different models.

In the case of Turkey, export-oriented economic growth is the basis of the economic policy especially in 2021. From this point of view, since increasing exports with competitive exchange rates form the basis of the economic growth plan, financing the development of exports has become increasingly important. According to 'Balance of Trade' (in Million USD, monthly data from 2018 to 2021) provided by Directorate of Strategy and Budget of Presidential Office of Republic of Turkey, it can be seen that after 2020, especially after 2021, the increase in exports (and imports) gained momentum. Despite the competitive exchange rate increasing the export amount, the import amount is still at a very high level. As can be clearly seen in Table 1, the rate of increase in exports reached 32.8 annually in 2021. On the other hand, for the same period, the rate of increase in imports was 23.6%.

**Table 1. Foreign Trade Data (Million USD) (Turkey)**

| Foreign Trade | Export | Change (%) | Import | Change (%) | Foreign Trade Volume | Balance of Foreign Trade | Export/ Import (%) |
|---|---|---|---|---|---|---|---|
| **2015** | 150,982.11 | -9.3 | 213,619.21 | -14.9 | 364,601.32 | -62,637,09 | 70,7 |
| **2016** | 149,246.99 | -1.1 | 202,189.24 | -5.4 | 351,436.24 | -52,942.24 | 73,8 |
| **2017** | 164,494.62 | 10.2 | 238,715.13 | 18.1 | 403,209.75 | -74,220.51 | 68,9 |
| **2018** | 177,168.76 | 7.7 | 231,152.48 | -3.2 | 408.321,24 | -53,983.73 | 76,6 |
| **2019** | 180,832.72 | 2,1 | 210,345.20 | -9.0 | 391,177.92 | -29,512.48 | 86,0 |
| **2020** | 169,637.75 | -6.2 | 219,516.81 | 4.4 | 389,154.56 | -49,879.05 | 77,3 |
| **2021** | 225,214.46 | 32.8 | 271,425.55 | 23.6 | 496,640.01 | -46,211.09 | 83,0 |

**Source**: Turkish Statistical Institute ('TUIK'), Ministry of Trade

The motivation of this study was influenced by the increasing importance of both exports and export financing in the economy. The theoretical argument and research question that forms the basis of the study is: Are export credits used for export financing affected by inflation, exchange rate and interest variables, which are among macroeconomic and financial indicators? In this context, the aim of the article is to determine the effects of inflation, USD/TL, EUR/TL and TRLIBOR variables on export and

import credits. Data source is BRSA and 'BIST-Connect' data; The study covers the period 2015-2021 and is related to Turkey. The contribution of this study to the literature is that it reveals the main macroeconomic-financial variables that have a significant effect on export loans, with the latest updated data.

The rest of the study consists of the following parts: The first part is introduction. The second part includes theoretical framework between foreign-trade related loans (export and import loans) and inflation, exchange rates and Interest; additionally, foreign trade and its financing in Turkey are discussed in the second part. The third part covers the literature findings on the subject. Econometric analysis is carried out in the fourth part. The fifth section includes the analysis findings. The last section is the conclusion section.

## 2. THEORETICAL FRAMEWORK, FOREIGN TRADE AND FINANCING

### 2.1. Theoretical Framework in Regard to the Relation Between Inflation, Exchange Rates, Interest Rate and Foreign-Trade Related Loans

This part provides insight into the theoretical context pertaining to the association between inflation, USD/TL, EUR/TL, interest rates and export & import loans that are provided by banking industry. To this end, theoretical framework is examined in this section.

There is a broad agreement upon the view that inflation, exchange rates and interest rates are monetary phenomena (or variables), whilst export is considered to be real. It is believed that there is no complete consensus on the view that inflation has lasting and systematic effects on (economic) growth, part of which is net-export (Gylfason, 1997: 29). In view of this very fact, here it can be argued that export related loans are associated with export volumes since export loans provided by banks (commercial or other types of banks) give rise to increase in total export growth.

In theory, exchange rate is a significant variable in developing economies. The effectiveness of economic policies can also be easily influenced by exchange rate variability. As such, determining the variables that will have an impact on the exchange rate will contribute to the development of exchange rate strategies. For the formation of exchange rates under liberal economies (free market conditions), the supply and demand elements of the market are to be examined. It is a well-known fact that Turkey has been seriously affected by exchange rate changes over the years and continues to be affected as of 2021 (Eryüzlü and Aşkar, 2021).

Bank credits (loans) are considered to be negatively influenced by inflation, while inflation is positively affected by bank credits in the long term; there is bi-directional causality between banks credits (loans) and inflation (Arslan and Yapraklı, 2008). A significant association between inflation rate, current deficit, unemployment rate and bank loans is considered to be existing (Avcı, 2020).

Nalın and Taşdelen (2016) carried out estimation by using monthly data between 2005 and 2012 with unit root tests and simple regression model in order to determine the factors affecting credit supply in the banking sector. As a result of the study, a positive and statistically significant relationship was determined between the loan volume and the loan disbursement capacity in the banking sector. A negative and statistically significant relationship was found between loan volume and central bank interest income, rediscount income and consumer loan interest rate.

### 2.2. Foreign Trade and Financing

Today, countries are trying to export their products to international markets and gain competitiveness in their economic development and growth processes. Export incentive constitutes an important source of finance, especially for developing countries, as it is the most stable foreign currency inflow (Tomanbay, 2014: 134-5). Countries that manage the development process correctly in East Asia have grown under the leadership of exports -with the industrialization policies they have implemented- and have gained a competitive advantage in the global economy. In the 1980s, the most important political development of the period and its effect on the economy was undoubtedly Thatcher's coming to power in England and Reagan in the USA. In this process, many countries abandoned protectionist policies and liberalized their economic structures and thus their foreign trade in order to be more integrated with the world economy. With the economic stability program, which was accepted in 1980 and known as the January 24 Decisions, in order to integrate into the global economy, Turkey tried gradually transition to a free market economy by applying free trade policies instead of import substitution industrialization policies.

Turkey has tried to gain competitive advantage in foreign trade via transition to export-led industrialization. In accordance with its export-oriented growth strategy, various incentive policies have been implemented in order to increase exports and thus finance foreign trade. In this period, primarily, support was given to the exporter such as making cash payments to the exporter or meeting the exporter's expenditures. However, as a result of Turkey's membership to the World Trade Organization in 1995 and the signing of the Customs Union agreement with the European Union, direct monetary incentives were abolished and instead state aid programs were put into practice (Şaşmaz and Karamıklı, 2018: 2847; Atayeter and Erol, 2011: 2-3). Thus, incentives have been tried to be disciplined in order to ensure that world trade is based on rules and to protect the competitive environment (Tomanbay, 2014: 136).

In many countries of the world, countries have developed tools to support exports through their own official organizations. It provides active financial support to exporters through organizations such as USA Eximbank, Germany Euler Hermes, Japan Nexi, France Coface, Italy SACE and Canada EDC. In order to support and finance exports in Turkey, various incentive mechanisms have been implemented, Eximbank has assumed an important role. With liberalization of foreign trade, Türk Eximbank was established in 1987 as an export credit bank with the aim of supporting exports

(Eximbank, 2022).[1] The aim of Eximbank has been to develop and diversify Turkey's exports and export markets, to encourage exporters in international trade and to increase their market shares, to gain global competitive advantage, to support investments in foreign markets and to encourage export-oriented production and sales. After the establishment of Eximbank, direct incentive tools were used and Eximbank's cash (loan) and non-cash(insurance and bank programs) support filled an important gap. Eximbank supported approximately 20% of exports in 1989 and its weight in foreign trade has increased significantly (Eximbank, 2022).

Eximbank provides loans to exporters with lower interest rates than commercial banks, and also offers insurance and guarantee programs. Eximbank has played an important role in the financing of exports since its establishment. Although its role seems to have increased especially during crisis periods, the increase in the volume of commercial bank loans and the decrease in interest rates with the economic stability program that was started to be implemented in the early 2000s eased the burden of Eximbank in financing exports and the burden was shared by commercial banks (Atayeter and Erol, 2011: 21). Continuing the financing and insurance support of exporters, Eximbank provides credit support to exporters both through commercial banks and directly. Apart from Eximbank and the state aids that have started to be implemented, among the export incentive methods; there are 'inward processing regimes' and export processing regimes, tax, duty and fee exemption, and VAT exemption in exports (Atayeter and Erol, 2011: 3).

The course of short, medium and long-term loans extended by Eximbank to exporters has increased significantly over the years. While the loans extended in 2003 were 3.2 billion dollars, this figure increased to 22.5 billion dollars in 2021 and reached 28.5 in 2020, reaching the highest loan amount by the end of 2021. In addition, when foreign trade data is examined, a positive relationship was found between export credits and export growth (Soylu and Demirci, 2021: 30).

Export, which is defined as the process of selling goods to the outside world, and the exporter (seller) who performs this transaction, prefers to collect the price of the products they export in the fastest way and with the least risk. On the other hand, the importer (buyer) of the goods at least wants to trade in a way that the goods reach him, the risk is low and the payment period is long. Among the various payment methods preferred by foreign trade companies; advance payment, letter of credit payment, acceptance credit payment, cash against documents and cash against goods. Among the payment methods used in the financing of exports in Turkey, 66% of exports are made by cash against goods (TÜİK, 2021). It is observed that two-thirds of exports are made cash against goods, which is considered the riskiest payment method. Similarly, 61% of Turkey's imports are carried out with 'cash against goods', 24% are advance payment and 5.8% are deferred letters of credit (TÜİK, 2021).

[1] The State Investment Bank, which was established in 1986, was reorganized and started to operate as Eximbank.

Advance payment, which is among the payment types, is the most advantageous payment method for the exporter and there is almost no risk. The exporter, who prefers cash payment, receives the money in advance before shipping the goods. However, the same is not the case for the importer and the advance payment is the riskiest payment for him. Here, he has to undertake a wide variety of risks such as the shipment of the goods and the failure to arrive in the desired quality and quantity. The most advantageous and least risky payment method for the importer is cash against goods. It is a transaction in which the importer pays after receiving the goods, and here, unlike the advance payment, a financing source is created by the exporter to the buyer. Since the risk taken by the exporter for cash against goods is very high, a letter of guarantee is generally requested from the importer.

In case the importer chooses a transaction (such as cash against goods or acceptance credit) after receiving the goods, there is a need for financing for exporters whose own resources are not sufficient and there is a need for external funds. Here, the activities between the supply or production of the goods to be exported by the exporters and the collection of the sales price are included in the financing of exports (Kaya, 2013: 4). One of the safest payment methods that protects both the exporter and the importer in foreign trade is the letter of credit payment. Although it is a secure payment method through banks, its cost and technical expertise limit its use.

On the other hand, export financing is divided into three types: according to maturity (short, medium and long), according to the stage of export (pre-shipment and post-shipment), and according to the party where the risk is taken (seller and buyer loans) (Kaya, 2013: 4). While exporters in Turkey should primarily use their own resources in financing, many studies show that enterprises experience capital insufficiency (Işık and Delice, 2007; Karakılıç and Açıkgözüoğlu, 2007). Businesses can benefit from financing other than their own resources; there are Eximbank loans, financial leasing, factoring and forfaiting institutions and commercial bank loans. It is also pointed out that most of the enterprises cannot benefit from Eximbank loans or they do not have enough information (Delice, 2001; Güneş and Uğur, 2007). In addition, export financing is riskier than other financing; Export loans are riskier than domestic loans due to various risks such as the risk of non-collection of the cost of the goods, exchange rate and transfer risks (Tomanbay, 2014). Leasing, factoring and forfaiting, which are among the important instruments in foreign trade finance, are provided by specialized institutions as a financial service. Such instruments make it easier for SMEs to compete, especially since they have difficulty in finding the financing they need (Tomanbay, 2014: 257).

Banks are important in foreign trade financing as they provide the financing needed by the exporter and being an element of trust between the importer and the importer. Although it is an important advantage for exporters that banks provide quick and easy loans, high interest rates lead them to different alternatives. Among these alternatives, the low interest advantage of loans offered by government-supported institutions such as Eximbank may be more attractive for exporters.

In many countries, export financing is of great importance for the exporters of that country to gain competitive advantage. With the effect of the incentives provided and the importance given to exports, the share of exports in GDP increased from 5% (around 2.9 billion dollars) in the 1980s to 30% (225 billion dollars) today, and while the ratio of exports to imports was 37% in 1980, with a record increase, it exceeded 80% in 1988 (Tomanbay, 2014: 237). In addition, the composition of exported products has changed and the share of industrial products has increased. Although Turkey has been affected by internal and global crises, Turkey's exports have increased significantly in the last 40 years. In this process, various incentive policies were implemented in order to increase exports and gain competitive power to exporters in international markets.

Turkey's increasingly diversified imports and exports bring the importance of foreign trade financing to the fore. Unlike domestic trade, the distribution of risk, cost and responsibility in foreign trade is important and the use of correct payment and financing methods is of great importance for companies. The Covid-19 pandemic, the first effects of which emerged at the beginning of 2020, caught the national economies off-guard and created supply, demand and financial shocks on the world economy (Gür, Tatlıyer and Dilek, 2020).

Various policies have been implemented to combat the pandemic, which has deeply shaken the global value and supply chain as well as the health systems of countries. Governments tried to keep the economy afloat with the huge bailout packages they announced. Turkey has experienced the effects of the pandemic from different aspects. In the first quarter of 2020, due to the pandemic, Turkey's export revenue decreased by 30% compared to the previous year (Altinkaya, 2020). Kurter (2020: 1), studies the opportunities and threats related to international trade and globalization after the pandemic, and argues that the international community needs to unite with all international organizations in a concerted effort to effectively and successfully control pandemics like Covid19.

## 3. LITERATURE REVIEW

In the literature review, due to the limited number of direct studies on this subject, studies dealing with export credits from different aspects are summarized.

Soylu and Demirci (2021) analyzed the effects of export incentive methods and Eximbank credits on the development of exports, by using data on textile and metal products between 2001-2019. As a result of the analysis made using the Pearson correlation analysis, relationship between the share of textile products in exports and the share of textile products in short-term Eximbank loans was found to be positive at the 1% significance level, and a positive relationship between the share of the basic metal industry in exports and the share of metal products in short-term Eximbank loans was identifed at the 5% significance level.

The causality relationship between economic growth, exports and Eximbank loans for Turkey was examined by Bülbül and Demiral (2016) for the years between 2002 and 2015. Stationary with Augmented Dickey-Fuller (ADF) unit root test, the long-term relationship with the Johansen cointegration test and the causality relationship with the Granger test were investigated. In the study, a unilateral causality relationship from exports to Eximbank loans was determined and no long-term relationship was found between the variables.

Hepaktan, Çinar & Dündar (2011) investigated the relationship between exchange rate systems and foreign trade for the years between 1982 and 2011. As a result of the analysis made with Johansen cointegration and Granger causality test; it was found that while the effect of exports and imports on the real effective exchange rate was limited, the effect of the real effective exchange rate on exports and imports was found to be significant.

Altan (2016) investigated the effect of banks on foreign trade in Turkey: In the research, between 1990 and 2015, the volume of the instruments used by the bank in the financing of foreign trade and the foreign trade volume data were used, the data were analyzed with SPSS and a simple regression model was established and a correlation analysis was made. As a result of the study, a positive and significant relationship was found between the total volume of the instruments used by the banks in financing foreign trade and total foreign trade volume. In addition, it has been determined that the tools used by banks to finance foreign trade contributed to the increase in Turkey's foreign trade volume.

Metin and Küçükbay (2019) tried to determine the methods most used by companies in export financing and export financing criteria. The data were obtained as a result of face-to-face interviews with semi-structured questions in February-March 2019. The Promethee method, one of the multi-criteria decision-making methods, was used in the analysis. In the study, it was stated that the export credits of commercial banks were in the first place among the methods used in export financing, and it was concluded that leasing credits, company equities (firms' own funds) and finally the credits provided by Turk Eximbank took place respectively.

Haykır and Aydın (2019) examined the relationship between exports and loans extended by banks to the manufacturing industry in Turkey. Quarterly data between 2005 and 2018 were analyzed through Granger causality and impulse-response test. It has been determined that there is a unilateral causality relationship from loans extended by banks to the manufacturing industry sector to exports.

Şahin and Baş (2018), in order to determine the relationship between syndication loans and foreign trade in Turkey, syndicated loans between 2000-2016 were analyzed with the import and export data set. As a result of the analysis using unit root tests, Johansen Cointegration and Error correction model, it has been determined that syndication loans have a positive effect on foreign trade and foreign trade has a positive effect on syndicated loans.

The causality relationship between loans and exports in Turkey was analyzed by Ergeç and Kaytancı (2021) by comparing Islamic and conventional banks. The causality relationship between banking funds and exports between 2006-2019 was examined using the monthly data with Toda-Yamamoto method. The number of statistically significant causal relationships between the loans provided by Islamic banks and exports between these years was found to be more significant for medium and long-term loans compared to conventional banks.

The relationship between Turkey's foreign trade and Eximbank loans was examined by Ünvan and Nahmatli (2021). Using the data for import, export and Eximbank loans between 2003 and 2020, the long-term relationship with the Augmented Dickey-Fuller unit root test, Johansen cointegration test, and then the causality relationship with the Granger test were investigated. It has been determined that there is no causal relationship between Eximbank loans and import and export variables at the 1% and 5% significance level.

Ceylan and Durkaya (2010) analyzed the causality relationship between domestic bank loans and economic growth in Turkey with quarterly data for 1998-2008 period. As a result of the study using Granger causality test and error correction model, one-way causality relationship from loans to growth rate was found.

Tutar and Ünlüleblebici (2014) analyzed the economic growth effect of SME loans. Between 2006 and 2011, he used unit root tests, cointegration test and Granger causality test with monthly data. A relationship has been found between loans extended to SMEs and economic growth.

Basarir and Sarihan (2018) analyzed the effect of export credits and investment incentives provided by banks on the country's exports. ARDL approach was used with monthly data between 2002-2016 period. It has been determined that there is a long-term positive relationship between export credits and investment incentives and country exports.

Apan and İslamoğlu (2017) examined the causal relationship between SME loans extended by banks and export and loan interest rates. Stationary with Augmented Dickey-Fuller unit root test, long-term relationship with Johansen cointegration test between 2009-2017 period, and then causality relationship with Granger test were investigated. As a result of the study, it has been determined that there is a relationship between the interest rate and SME loans, and between exports and SME loans. In the cointegration analysis, it has been determined that there is a long-term relationship among SME loans, export and loan interest rate.

Taşseven and Yılmaz (2021) use Johansen Co-Integration and Toda-Yamamoto causality test to analyze the causality between economic growth and credit and export growth in Turkey; as a result of the study, a long-term relationship is found between economic growth, increase in credit volume and increase in export volume.

## 4. DATA, MODEL AND METHODOLOGY

In this section, the effect of foreign exchange rate (EUR/TL) and Government Domestic Debt Securities Index (DIBS) upon export credits (IHR) is analyzed. Data is retrieved from official website of Banking Regulatory and Supervisory Board of Turkey and BIST-Connect (a software product of Borsa-Istanbul, Istanbul Stock Exchange). The period covers the years from 2015 to 2021.

As we use time series in the analysis, we have to test whether the series involved in the analysis are stationary or not. Granger and Newbold in their study proved that a spurious regression problem can be encountered in the results obtained using non-stationary time series (Granger and Newbold, 1974). We perform Augmented Dickey Fuller Unit Root Test to examine stationarity of the series. Dickey Fuller tests known as $\tau$ – tests can be conducted allowing for an intercept, or an intercept and deterministic trend or none, in the test regression. The model for unit root test in each case is:

$$Y_t = \Phi\, Y_{t-1} + \mu + \lambda_t + U_t \quad (1)$$

If the series are stationary at level, we will estimate the model below:

$$LNIHR = \beta_1 EUR + \beta_2 * LNDIBS + \varepsilon_1 \quad (2)$$

The model above will be estimated by using VAR (Vector Auto Regressive) Specification. VAR models were popularized in Econometrics by (Sims, 1980) as a natural generalization of univariate autoregressive models.

The simplest case that can be entertained is a bivariate VAR, where there are only two variables $Y_{1t}$ and $Y_{2t}$, each of whose current values depend on different combinations of the previous k values of both variables and error terms (Brooks, 2014).

$$Y_{1t} = \beta_{10} + \beta_{11} Y_{1t-1} + \ldots.. + \beta_{1k} Y_{1t-k} + \acute{\alpha}_{11} Y_{2t-1} + \ldots + \acute{\alpha}_{1k} Y_{2t-k} + U_{1t} \quad (3)$$

$$Y_{2t} = \beta_{20} + \beta_{21} Y_{2t-1} + \ldots.. + \beta_{2k} Y_{2t-k} + \acute{\alpha}_{21} Y_{1t-1} + \ldots + \acute{\alpha}_{2k} Y_{1t-k} + U_{2t} \quad (4)$$

Where $U_{it}$ is a white noise disturbance term with $E(U_{it}) = 0$, $(i=1,2)$, $E(U_{1t}\, U_{2t}) = 0$

If the series are integrated of the same order, we can implement Johansen Co-integration test to detect long run association among series involved in the analysis. Implementing difference process to the series causes data loss and can also remove the relationship among the series. The co-integration theory allows testing whether the linear combinations of non-stationary series are stationary or not and investigating long-run equilibrium relationships in case of a stationary relationship. The co-integration analysis is based on the assumption that even when the series are not stationary, there may be a long-term relationship between the series and this relationship can be stationary. In other words, the co-

integration of the series shows that each variable in the system is under the influence of a common stochastic trend instead of its own exogenous and permanent shocks (Tarı and Yıldırım, 2009).

When there is a long-term relationship among series, error correction models are used. These models show us the deviation from the long-run relationship or equilibrium. In order to test the co-integration relationship among the series, the series must be integrated of the same order. To ensure stationarity, when the difference process is applied to the series, lacking of data occur in the long-term information of the variables. Therefore, we use error correction models to remove these imbalances.

## 5. EMPIRICAL FINDINGS

Unit root test results for the series are given in Table 2 below. When the Augmented Dickey-Fuller test results in the table are examined, it is observed that series aren't stationary at level. In order to ensure the stationarity of the series, the first differences of series are taken. However, for the series to be stationary, first difference may not always ensure stationarity. As a result, it was decided that all series became stationary at I(1).

**Table 2. Augmented Dickey Fuller Unit Root Test Results**

| | **Constant** | | **Constant and Trend** | | **None** | |
|---|---|---|---|---|---|---|
| | **t-statistic** | **Prob.** | **t-statistic** | **Prob.** | **t-statistic** | **Prob.** |
| LNIHR | 0.926 | 0.99 | -1.661 | 0.76 | 3.621 | 0.99 |
| D(LNIHR) | -6.658 | 0.00 | -6.757 | 0.00 | -5.829 | 0.00 |
| LNDIBS | -0.282 | 0.92 | -2.297 | 0.43 | 1.754 | 0.98 |
| D(LNDIBS) | -8.401 | 0.00 | -8.351 | 0.00 | -8.119 | 0.00 |
| EUR | 2.226 | 0.99 | 0.319 | 0.99 | 3.264 | 0.99 |
| D(EUR) | -4.045 | 0.00 | -4.373 | 0.00 | -3.580 | 0.00 |

As the series became stationary at first difference, in Table 3, the descriptive statistics regarding the variables involved in the analysis are displayed.

**Table 3. Descriptive Statistics**

| | DLNIHR | DLNDIBS | DEUR |
|---|---|---|---|
| Mean | 0.021433 | 0.006445 | 0.145873 |
| Median | 0.019516 | 0.008276 | 0.070450 |
| Maximum | 0.271103 | 0.102291 | 3.6883 |
| Minimum | -0.097643 | -0.098216 | -0.714500 |
| Std. Dev. | 0.054147 | 0.033114 | 0.518246 |
| Skewness | 1.76866 | -0.316467 | 4,326839 |
| Kurtosis | 10.11041 | 5.094457 | 29.25917 |

| | | | |
|---|---|---|---|
| Jarque-Bera | 215.4911 | 16.35679 | 2611,804 |
| | | | |
| Probability | 0.000000 | 0.000281 | 0.000000 |
| Sum | 1.75754 | 0.528512 | 11.9616 |
| | | | |
| Sum Sq. Dev. | 0.237485 | 0.088818 | 21.75491 |
| Observations | 82 | 82 | 82 |

After it is observed that the series are stationary of the same order, we can perform co-integration analysis. Before proceeding to the Johansen co-integration test, we need to identify the optimum lag length required for the test. However, we found two optimum lag lengths according to the statistical outcomes involved in Table 4, where FPE (Final Prediction Error) Statistic indicates 3rd lag and Sequential Modified LR points out 8th as optimum lag. So we examined 3rd lag and 8th lag in existence for a co-integration vector but there was no co-integration equation in the 3rd lag. Finally, we proceed with the 8th lag.

**Table 4.VAR Lag Order Selection Criteria**

| Lag | LogL | LR | FPE |
|---|---|---|---|
| 1 | 257.0666 | NA | 2.46e-07 |
| 2 | 263.0693 | 11.03193 | 2.67e-07 |
| 3 | 275.2009 | 21.31243 | 2.46e-07* |
| 4 | 278.9275 | 6.244560 | 2.85e-07 |
| 5 | 282.6598 | 5.951474 | 3.31e-07 |
| 6 | 287.6324 | 7.526082 | 3.74e-07 |
| 7 | 296.9334 | 13.32301 | 3.78e-07 |
| 8 | 317.7726 | **28.16116*** | 2.81e-07 |

When Johansen co-integration Test results in Table 5 are examined, according to both the maximum eigenvalue and trace test, the existence of a long-run association among the series are identified. In the table, Either Maximum Eigenvalue or Trace Statistics indicate 2 co-integrating equations.

For the first co-integrating equation, hypothesis(r=0) indicates absence of co-integrating vector. As the maximum eigenvalue is 35.90958, the critical value at the 5% significance level value is greater than 25.82321. Trace test statistic for the main hypothesis is 67.20111, 5% significance at level, so the critical value of the trace test is greater than 42.91525.

For the second co-integrating equation, (r=1) indicates absence of co-integrating vector. However, as the maximum eigenvalue t-statistic value is 22.34765 which is greater than Critical Value 19.38704 at %5 significance level, we reject (r=1) and accept (r=2). Similarly, in trace test (r<=1) hypothesis claims the absence of co-integrating vector. Trace test statistic for the main hypothesis is 31.29153, 5%

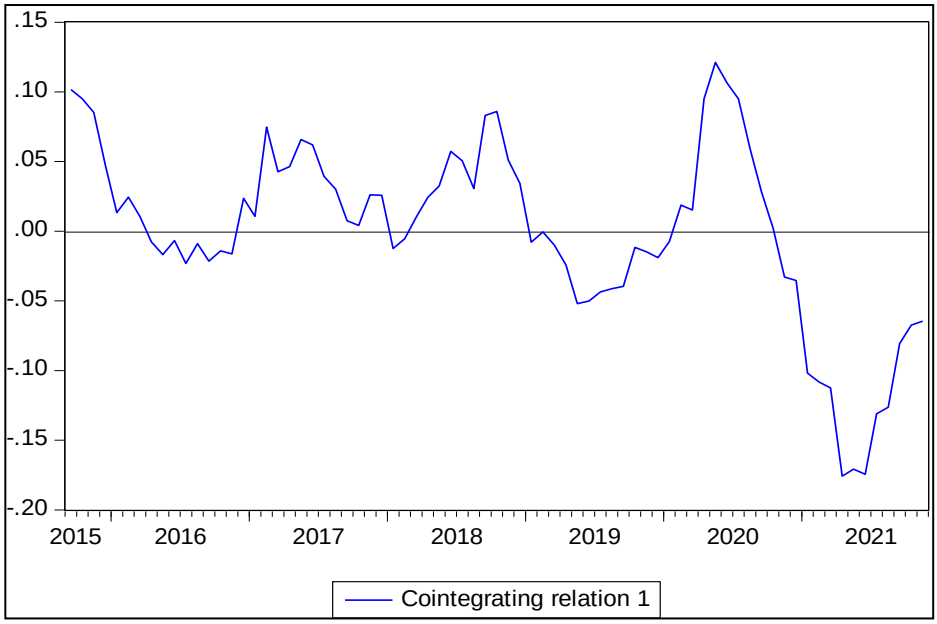
significance at level, so the critical value of the trace test is greater than 25.87211. Therefore, we reject (r<=1) and accept (r>1).

**Table 5. Johansen Co-Integration Test Results**

| **Maximum Eigenvalue Test** | | | | **Trace Test** | | | |
|---|---|---|---|---|---|---|---|
| $H_0$ Null Hyphotesis | $H_1$ Alternative Hyphotesis | t-statistics | % 5 Critical Value | $H_0$ Null Hyphotesis | $H_1$ Alternative Hyphotesis | t-statistics | % 5 Critical Value |
| *r* = 0 | *r* = 1 | 35.90958 | 25.82321 | r= 0 | *r* > 0 | 67.20111 | 42.91525 |
| *r =1* | *r = 2* | 22.34765 | 19.38704 | *r* <= 1 | *r* >1 | 31.29153 | 25.87211 |
| *r = 2* | *r = 3* | 8.943880 | 12.51798 | *r* <= 2 | *r* >2 | 8.943880 | 12.51798 |

The co-integration relation among the series involved in the analysis is shown in Figure 1 below.

**Figure 1. Co-integration Relation Graph**




The Vector Error Correction model is displayed in Table 6.

**Table 6. Vector Error Correction Model**

| **Error Correction:** | **LNIHR** | **LNDIBS** | **EUR** |
|---|---|---|---|
| | | | |
| CointEq1 | 1.000 | 0.421 | -0.085 |
| | | (0.11214) | (0.01696) |
| | | [ 3.75620] | [-5.05192] |

In the long run (2015M01-2021M11), with a 7-month lag length, the increase in export credits caused a decrease in the EUR exchange rate, while interest rates increased in parallel with the growth in export credits in the same period. The target model in which export credits are considered as the dependent variable is presented below.

D(LNIHR) = C(1)*( LNIHR(-1) - 0.085*EUR(-1) + 0.421*LNDIBS(-1) - 13.7240879446

## 6. CONCLUSION

For a sustainable economy, foreign financing loans for export and import have a vital importance. For Turkey, export-oriented economic growth can be considered as the basis of the economic policy especially starting from 2021. From this standpoint, as increasing exports with competitive exchange rates form the basis of the economic growth plan, financing the development of exports has become significant in an increasing manner.

In Turkish finance industry, Eximbank can be regarded as the leading financial institution, bank that provide a variety of finance facilities in an effort to increase export volume of the country. In addition to Eximbank, which was founded for specifically financing export, other public and private banks provide loans to clients in order to enhance exports. Commercial banks, participation banks (non-interest banks) and development banks supports export activities through loans.

This paper reviews the relation between the main economic/financial indicators (inflation, exchange rate (USD/TL, EUR/TL) and TRLIBOR (interest rate) and export credits related to foreign trade financing. Years between 2015-2021 are covered for Turkey. Monthly data is retrieved from BRSA, The Bank Association of Turkey and BIST-Connect. Time series analysis is employed.

Empirical findings indicate that in the long run (2015M01-2021M11), with a 7-month lag length, the increase in export credits caused a decrease in the EUR exchange rate, while interest rates increased in parallel with the growth in export credits in the same period.

## REFERENCES

Altan, M. (2016) “The Role of Banks Funding and Promoting the Foreign Trade: Case of Turkey”, International Journal of Economics and Management Engineering, 10(7): 2438-2441.

Altinkaya, Z. (2020) “Financing Foreign Trade in Turkey under 2020 Coronavirus Covid-19 Pandemics”, PressAcademia Procedia, 11(1): 185-188.

Apan, M. and İslamoğlu, M. (2017) “KOBİ Kredileri ile İhracat ve Faiz oranı arasındaki Nedensellik İlişkisinin Ampirik Analizi”, İnsan ve Toplum Bilimleri Araştırmaları Dergisi, 6(5): 3291-3302.

Arslan, İ. and Yapraklı, S. (2011) “Banka Kredileri ve Enflasyon Arasındaki İlişki: Türkiye Üzerine Ekonometrik Bir Analiz (1983-2007)”, Istanbul University Econometrics and Statistics e-Journal, 0(7): 88-103.

Atayeter, C., ve Erol, A. (2011) “Türkiye’de Uygulanmakta olan İhracat Teşvikleri”, Kahramanmaraş Sütçü İmam Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 1(1): 1-26.

Avcı, T. (2020) "Makroekonomik Faktörler ve Banka Kredilerinin Enflasyon Üzerindeki Etkisi: Türkiye Örneği", Finans Ekonomi ve Sosyal Araştırmalar Dergisi, 5(1): 98-107.

Başarır, C., and Sarıhan, A. (2018) "The Effect of Investment Incentives and Export Credits on Country Export: The Case of Turkey", MANAS Sosyal Araştırmalar Dergisi, 7(3).

Brooks, C. (2014) "Introductory Econometrics For Finance", New York: Cambridge University Press.

Bülbül, S. E., and Demiral, A. (2016) "Türkiye Ekonomisinde Ekonomik Büyüme, İhracat ve Eximbank Kredileri Arasındaki Nedensellik İlişkisi: 2002-2015", Öneri Dergisi, 12(46): 21-40.

Ceylan, S., and Durkaya, M. (2010) "Türkiye'de Kredi Kullanımı-Ekonomik Büyüme İlişkisi", Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi, 24(2): 21-35.

Delice, G. (2001) "KOBİ'lerin İhracata Yönlendirilmesinde Finansman Destekleri: Türk Eximbank Kredileri Üzerine Bir Uygulama", Orta Anadolu Kongresi-KOBİ'lerin Finansman ve Pazarlama Sorunları, Nevşehir, 269-281.

Ergeç, E., and Kaytancı, B. G. (2021) "Relationship Between Loans and Export in Turkey: Comparative Analysis of Islamic and Conventional Banks", Optimum Ekonomi ve Yönetim Bilimleri Dergisi, 8(1): 43-58.

Eryüzlü, H. and Aşkan, Ş. (2021) "Reel Efektif Döviz Kuru ve Ticari Krediler Arasındaki İlişki: Türkiye Örneği", Nazilli İktisadi ve İdari Bilimler Fakültesi Dergisi, 2(2): 65-71.

Eximbank (2022) "Türk Eximbank Tarihçe", https://www.eximbank.gov.tr/content/files/d24882ab-3498-4d65-909a-4f56662eeeed/turk-eximbank-tarihce, (10.01.2022).

Fuller, W. A. (1976) "Introduction to Statistical Time Series", New York: John Wiley and Sons. ISBN 0-471-28715-6.

Granger, C.W.J. and Newbold P. (1974) "Spurious Regressions in Economics", Journal of Econometrics, 2(2): 111-120.

Güneş, R., and Uğur, A. (2007) "Kobi'lerin İhracat Finansmanında Eximbank Kredileri: Malatya ilinde Bir Araştırma", Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 12(2): 21-40.

Gür, N., Tatlıyer, M., and Dilek, Ş. (2020) "Ekonominin Koronavirüsle Mücadelesi", İstanbul: SETA Araştırma Raporu.

Gylfason, T. (1997) "Export, Inflation and Growth", International Monetary Fund, Working Paper 97/119.

Haykır, Ö., and Aydın, M. (2019) "Türkiye'de Banka Kredilerinin İhracat üzerine Etkileri; Ekonometrik Analiz", Nevşehir Hacı Bektaş Veli Üniversitesi SBE Dergisi, 9(2): 515-533.

Hepaktan, C. E., Çinar, S., and Dündar, Ö. (2011) "Türkiye'de Uygulanan Döviz Kuru Sistemlerinin Dış Ticaret ile İlişkisi", Akademik Araştırmalar ve Çalışmalar Dergisi (AKAD), 3(5): 62-82.

Işık, N., and Delice, G. (2007) "Küreselleşme Sürecinde Kobi'lerin İhracat Sorunları ve E-Ticaret Uygulamaları", Selçuk Üniversitesi Karaman İİBF Dergisi, (3): 75-89.

Kaya. F. (2013) "Dış Ticaret ve Finansman", İstanbul: Beta.

Kurter, O. (2020) "International Trade and Globalization after Covid-19 Pandemic: Challenges and Opportunities", In M. A. Yetgin, O. Kurter and V. Temizkan (eds), Inferences from the COVID-19 Pandemic, 6-21.

Metin, İ., and Küçükbay, F. (2019) "İhracatta Finansman Kaynaklarının Değerlendirilmesine Yönelik çok Kriterli Bir Yaklaşım: Promethee Yöntemi", Bingöl Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 9(18): 931-948.

Nalin, H. T., and Taşdelen, S. (2016) "Bankalarda Kredi Arzını Ekileyen Faktörler", Finans Politik ve Ekonomik Yorumlar, 615: 65-75.

Sims, C. A. (1980) "Macroeconomics and Reality", Econometrica: Journal of the Econometric Society, 48(1): 1-48.

Soylu, C., and Demirci, A. (2021) "İhracat Teşvik Yöntemleri ve Eximbank Kredilerinin İhracat Üzerindeki Rolü", Gümrük ve Ticaret Dergisi, 8(23): 22-33.

Şahin, Z., and Baş, M. (2018) "Sendikasyon Kredileri Dış Ticaret İlişkisi: Türkiye Örneği", Uluslararası Afro-Avrasya Araştırmaları Dergisi, 3(6): 105-114.

Şaşmaz, M. Ü., and Karamıklı, A. (2018) "Türkiye'de İhracatı Teşvik Uygulamaları ve İhracat Potansiyelinin Artırılmasına Yönelik Değerlendirmeler", İnsan ve Toplum Bilimleri Araştırmaları Dergisi, 7(4): 2837-2867.

T.C. SBB (2022) "Dış Ticaret Verileri", https://www.sbb.gov.tr/2021-aralik-ayi-gecici-dis-ticaret-verileri/, (05.01.2022).

T.C. Ticaret Bankalığı (2021) "Dış Ticaret İstatistikleri", https://ticaret.gov.tr/istatistikler/dis-ticaret-istatistikleri, (05.01.2022).

Tarı, R. and Yıldırım, D. Ç. (2009) "Döviz Kuru Belirsizliğinin İhracata Etkisi: Türkiye İçin Bir Uygulama", Yönetim ve Ekonomi Dergisi, 16(2): 95-105.

Taşseven, Ö., and Yılmaz, N. (2021) "Türkiye Ekonomisinde Banka Kredisi, İhracat ve Ekonomik Büyüme Arasındaki Nedensellik İlişkisi", Akademik Hassasiyetler, 8(16): 429-455.

TCMB (2021) "Financial Stability Report", October 2021, https://www.bddk.org.tr/BultenAylik, (15.01.2022).

Tomanbay, M. (2014) "Uluslararası Ticaret ve Finansman", Ankara: Gazi Kitabevi.

Tutar, F., and Ünlüleblebici, Y. (2014) "Türkiye'de KOBİ Kredilerinin Ekonomik Büyümeye Etkisi (2006-2011)", Global Journal of Economics and Business Studies, 3(5): 1-14.

TÜİK (2021) "Turkish Statistical Institute", Ministry of Trade.

Ünvan, Y. A., and Nahmatli, U. (2021) "Causality Relationship Between Import, Export and Exim Bank Loans: Turkish Economy", In (ed), Computational Statistics and Applications [Working Title]. IntechOpen. https://doi.org/10.5772/intechopen.101733.

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