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RESEARCH ARTICLE

Do Bank Loans Trigger Imports? An Empirical Analysis for MIST Countries

Sümeyra EVREN [1] , Mehmet MUCUK [2]

Abstract

This paper seeks to investigate the effect of bank loans, economic growth, and exchange rate on imports over the period 1980–2020 for MIST countries (Mexico, Indonesia, South Korea, and Türkiye), using Common Correlated Effect Mean Group (CCEMG) and Augmented Mean Group (AMG) estimators. In addition, the causality linkage between the variables was examined through the Dumitrescu and Hurlin test. The findings showed that bank loans, economic growth, and the exchange rate have a positive and significant effect on imports for the whole panel. According to the AMG estimator, an increase in bank loans leads to an increase in imports, excluding Indonesia. Moreover, the causality test indicated that there is a unidirectional linkage from bank loans to imports. Besides, a bidirectional linkage between economic growth and imports was found.

Keywords: *Bank Loans, Imports, Panel Data Analysis*
Jel Codes: *G21, F14, C33*

Banka Kredileri İthalatı Tetikliyor mu? MIST Ülkeleri İçin Ampirik Bir Analiz

Özet

Bu makale banka kredilerinin, döviz kurunun ve ekonomik büyümenin ithalat üzerindeki etkisini, Ortak Korelasyonlu Ortalama Grubu (CCEMG) ve Artırılmış Ortalama Grubu (AMG) tahmincilerini kullanarak, MIST (Meksika, Endonezya, Güney Kore, Türkiye) ülkeleri için 1980-2020 dönemine ait veriler aracılığıyla araştırmayı amaçlamaktadır. Ayrıca değişkenler arasındaki nedensellik ilişkisi Dumitrescu ve Hurlin testi yardımıyla incelenmiştir. Bulgular, panelin tamamı için banka kredilerinin, ekonomik büyümenin ve döviz kurunun ithalat üzerindeki etkisinin anlamlı ve pozitif olduğunu ortaya koymuştur. AMG tahmincisine göre banka kredilerindeki artış, Endonezya hariç ithalatın da artmasına neden olmaktadır. Ayrıca nedensellik testi banka kredilerinden ithalata doğru tek yönlü bir nedensellik bağıntısının olduğunu göstermiştir. Buna ilave olarak ekonomik büyüme ve ithalat arasında çift yönlü bir nedensellik söz konusudur.

Anahtar kelimeler: *Banka Kredileri, İthalat, Panel Veri Analizi*
Jel Kodu: *G21, F14, C33*

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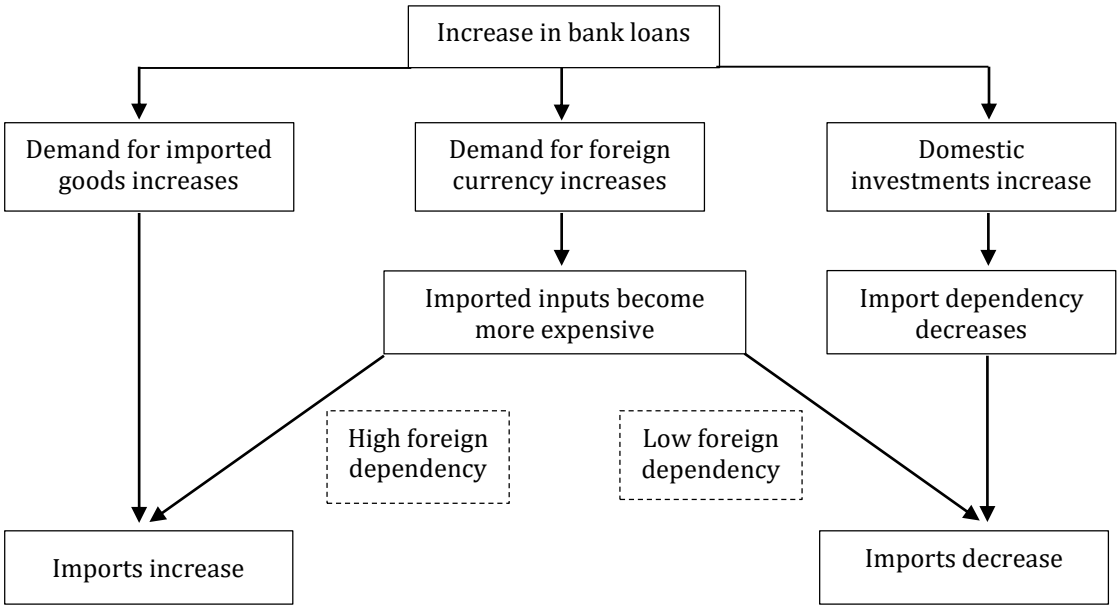
[1] PhD Candidate, Selçuk University/Institute of Social Sciences, Department of Economics, Konya / Türkiye
EMAIL: sumeyra.evren@gmail.com **ORCID:** 0000-0003-2218-9169
[2] Prof. Dr., Selçuk University/Faculty of Economics and Administrative, Department of Economics, Konya / Türkiye
EMAIL: mehmetmucuk@selcuk.edu.tr **ORCID:** 0000-0002-4341-5236

1. INTRODUCTION

The Industrial Revolution led to significant differences in development between countries (Batou, 1992). During and after this period, some countries that improved their production quantitatively and qualitatively managed to reduce their external dependency. Thus, on the one hand, these countries minimized the negative effect of imports on economic growth, and on the other hand, they achieved a strong growth performance by increasing their export revenues. As a result, domestic savings have reached significant levels in developed countries. However, especially in many underdeveloped and developing countries, domestic savings are smaller than investment (Agyapong and Bedjabeng, 2019). Therefore, bank loans play a vital role in enabling economic units to make their planned expenditures. Bank loans can support economic growth by stimulating consumption and investment expenditures (Chavarín Rodríguez and Tlatoa Chávez, 2023; Ho and Saadaoui, 2022), but they also have the potential to increase imports (Omoke, 2012). Because consumers may want to buy more imported final goods and services, such as cars, mobile phones, and computers, with these loans. Similarly, companies may increase their demand for imported inputs in order to maintain their production and/or produce more. All of these cause bank loans to have a positive impact on imports in the short-term. In this context, it is generally accepted that bank loans to the local non-financial private sector stimulate domestic demand and increase imports (Unger, 2017; Ekinci et al., 2015; Karahan et al., 2018). However, if new and domestic production is supported more through bank loans, imports may tend to decrease in the long-term. Additionally, under speculative and uncertain conditions, economic agents may tend to purchase foreign exchange in order to earn more income instead of consuming and producing with bank loans. Thus, the exchange rate may rise, and the cost of imports may increase. Theoretically, it is expected that the depreciation of the national currency due to an increase in the exchange rate will make imported goods more expensive, and thus imports will fall (Usman, 2023). However, contrary to the theory, an increase in the exchange rate may lead to an increase in import expenditures in countries with high external dependence in production and/or consumption. The possible impact channels of bank loans on imports are shown in Figure 1.

Figure 1: The Effect Channels of Bank Loans on Imports



Source: Created by the authors

This study mainly aims to examine the impact of bank loans on imports for MIST countries (Mexico, Indonesia, South Korea, Türkiye) using CCEMG and AMG long-term coefficient estimators and

Dumitrescu-Hurlin panel causality test with the help of annual data for the period 1980-2020. In this context, our main research question is as follows: Do bank loans reduce imports in the long-term by reducing foreign dependency? Since imports are also a function of exchange rate and economic growth, the effect of these variables on imports is also examined. This paper contributes to the literature in three ways: (i) The empirical results produce important findings for policymakers to evaluate credit allocation; (ii) it is the first analysis to investigate the relationship between bank loans and imports for MIST countries; (iii) in addition, not only bank loans but also economic growth and exchange rate are included in the model and advanced panel data techniques are applied.

This paper is structured as follows: Section 2 reviews the relevant literature, Section 3 offers the model specification, Section 4 describes the data collection, and Section 5 presents the econometric methodology. In Section 6, the empirical findings are provided. Finally, Section 7 summarizes the conclusions.

2. RELATED WORKS

There are very limited studies in the literature exploring the effect of bank loans on imports. It is noteworthy that other studies in this context generally test the relationship between bank loans and current account balance. Only Alhatti and Konak (2022) examined the relationship between bank loans and imports and stated that there is no causal relationship between total bank loans and imports in Turkey, based on the findings of the Toda-Yamamoto test. On the other hand, Ekinci et al. (2015), Unger (2017), Karahan et al. (2018), and Hani Selimi and Eliskovski (2018) investigated the relationship between bank loans and current account balance econometrically.

Ekinci et al. (2015) examined the dynamics of the effect of credit growth on the current account balance through annual data covering the period 1991-2011 for 49 countries. In line with the findings, it was seen that the credit growth causes greater degradation in the current account balance, especially for countries in the beginning stages of financial development. Unger (2017) assessed the linkage between current account balance and domestic credit developments for the founding members of the Eurozone and Greece, covering the period 1999–2013. The outcomes from their study disclosed that the flow of domestic credits to the non-financial private sector is an important factor of the current account. In addition, it has been stated that bank loans are the most important factor in the formation of current account imbalances in countries with deficit. Karahan et al. (2018) tested the effect of bank credit expansion on current account balance for Turkey with the help of ARDL and ECM, using quarterly data from 2004 to 2017. Empirical findings showed that there is a causal relationship from credit expansion to current account deficit. Based on this finding, it was stated that credit expansion is among the main causes of the current account deficit in Turkey. Hani Selimi and Eliskovski (2018) analyzed the relationship between private credit components and current account balance using data for the period 2005q1-2017q3 for North Macedonia. Empirical findings showed that credit allocated to households deteriorates the current account balance, while trade credit improves the external balance. Alhatti and Konak (2022) explored the impact of total bank credits on exports and imports in Turkey using the quarterly data for the period between 2008Q1-2021Q1 with the help of the Toda-Yamamoto causality test. The econometric results demonstrated that there is no causality from total bank credits to exports and imports.

Although imports are a positive function of economic growth, there is no consensus among the empirical findings in the literature. Oloba (2014) examined the relationship between imports, exchange rate movements, and economic growth in Nigeria using the Error Correction Model for the period 1986:1-2009:4. Contrary to economic theory, an increase in domestic income has a negative impact on imports. Khan et al. (2019) utilized the Granger causality test and simple regression test to investigate the relationship between economic growth and imports in Pakistan during the period 1975-2014. The empirical findings showed that there is a bidirectional causality between these

variables. Arı (2021) tested the impact of income inequality, economic growth, and the real exchange rate on import demand by employing FMOLS and DOLS estimators for Germany with the help of data covering the period 1979-2018. Based on the findings, it is stated that economic growth has a positive effect on imports while the real exchange rate has a negative effect. Usman and Bashir (2022) analyzed the causality relationship between imports and economic growth for China, India, and G7 countries using the Breitung and Candelon causality test through data for the period 1978-2019. In line with the empirical test results, it was stated that there is a bidirectional causal relationship between imports and economic growth in the short and long-term. Akermi et al. (2023) explored the relation between domestic investment, final consumption, exports, imports, and economic growth in Albania over the period 1996-2021. The WALD test findings revealed that there is no significant causality between these variables.

Similarly, there is no consistency between the findings of studies investigating the relationship between imports and exchange rate. Chaudhary et al. (2016) explored the relationship between foreign trade and exchange rate in the case of major Southeast Asian and South Asian countries over the period 1979-2010 via the ARDL approach, cointegration test, and error correction model. As a result of empirical findings, no statistically significant long-term relationship was found between exchange rate and imports for Bangladesh, India, Indonesia, Malaysia, Pakistan, Singapore, and Thailand. Inyang and Effiong (2021) investigated the effect of the exchange rate on imports in Nigeria for the period 1981-2019 by using the ARDL model. Based on the findings, it was stated that the impact of the exchange rate on imports is statistically insignificant in the short-term, but this effect is negative and significant in the long-term. Zeybek and Kesbiç (2022) tested the effect of economic growth and exchange rate on foreign trade using the panel ARDL model for 17 developing countries during the period 1996-2020. The empirical findings indicated that the impact of the real effective exchange rate and economic growth on imports from developing countries is significant and positive in the long-term.

3. MODEL

This paper attempts to investigate the effect of bank loans on imports for MIST countries. The classification of MIST countries was made by Goldman Sachs economist Jim O'Neill (Tannoury and Attieh, 2017). The common characteristics of these countries include high growth potential, a growing population trend, and large domestic markets supported by purchasing power. In addition, the MIST countries are members of the G20. Private sector investments play an important role for emerging economies to achieve their growth and development targets (Grail Research, 2012). Bank loans are a fundamental instrument that enables the realization of these investments. However, there is also the possibility that bank loans could trigger imports and threaten growth and development objectives. Therefore, in this study, the econometric analysis of the efficiency of bank loans is performed for MIST countries. Another reason for choosing MIST countries is that there is no previous empirical study for these countries in the literature.

Imports depend mainly on domestic income and the exchange rate (Branson, 1976). According to the Keynesian approach, imports are considered a positive function of income because an increase in income stimulates domestic demand and leads to a rise in foreign purchases (Babouček and Jančar, 2005; Baccaro and Pontusson, 2016). On the other hand, the exchange rate is assumed to have a negative effect on imports. Indeed, an increase in the exchange rate results in a decrease in the purchasing power of the national currency (Ziramba and Chifamba, 2014). For these reasons, the following model is used for empirical estimation:

$$IM_{it} = f(BL, ER, EG) \quad (1)$$

where IM denotes imports, BL represents bank loans, ER shows exchange rate, and EG indicates economic growth. The indexes i and t of each variable, respectively, represent the cross-sectional unit

and time period. Alhatti and Konak (2022) included only total loans as an independent variable in the import model. The vast majority of other studies in literature use the current account as the dependent variable instead of imports. Independent variables are also chosen according to the current account. However, in this study, the independent variables are determined according to imports. Therefore, in addition to bank loans, economic growth and exchange rate, which are the basic components of imports, are also included in the model.

4. DATA

In order to analyze the impact of bank loans on imports in MIST countries, the descriptions of the data obtained from the World Development Indicators (WDI) are presented in Table 1.

Table 1: Data description

Variables	Descriptions	Symbols	Expected Sign
Imports	Imports of goods and services (% of GDP)	IM	–
Bank Loans	Domestic credit to private sector by banks (% of GDP)	BL	Negative
Exchange Rate	Official exchange rate (LCU per US$, period average)	ER	Negative
Economic Growth	GDP per capita (constant 2015 US$)	EG	Positive

Note: The study takes the logarithm of all variables

5. METHODOLOGY

The following econometric techniques were used in this study to investigate the effect of bank loans on imports for MIST countries:

- Cross-sectional dependence and homogeneity tests
- Panel unit root test
- Panel cointegration test
- Long-term coefficient estimators
- Dumitrescu–Hurlin panel causality test

5.1. Cross-Sectional Dependence and Homogeneity Tests

The process of economic globalization has caused an increase in interaction between countries. Therefore, ignoring the cross-sectional dependence can lead to biased and inaccurate estimates (Gyamfi et al., 2022). The findings of cross-sectional dependence help determine appropriate unit root and cointegration tests. These results are also useful for the selection of coefficient estimators. In this study, the presence of cross-sectional dependence is investigated with the Breusch-Pagan (1980) LM test, the Pesaran (2004) scaled LM test, and the Pesaran (2004) CD test.

Breusch-Pagan (1980) proposed to examine cross-sectional dependence with the help of the LM test formulated as follows when the time dimension (T) is larger than the cross-sectional dimension (N) (Burdisso and Sangiácomo, 2016):

$$Breusch\ Pagan\ LM = T \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij}^2 \quad (2)$$

where $\hat{\rho}_{ij}^2$ represents the correlation coefficient for the error term (Baum, 2001). If the probability value (P-value) of the test is less than the significance level, the null hypothesis of no cross-sectional dependence is rejected.

Pesaran (2004) argues that the Breusch-Pagan LM test is not appropriate for large panels and proposes the following scaled version of the LM test to deal with this problem (Muduli and Manık, 2020):

$$Pesaran\ scaled\ LM = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} (T\hat{\rho}_{ij}^2 - 1) \quad (3)$$

If the P-value of the test is less than the significance level, the null hypothesis of no cross-sectional dependence is rejected. Then Pesaran (2004) developed the CD test, which can be applied in both T>N and N>T cases and is calculated as follows (Liu et al., 2022):

$$CD = \sqrt{\frac{2T}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \quad (4)$$

If the P-value of the test is less than the significance level, the null hypothesis of no cross-sectional dependence is rejected.

After controlling for cross-sectional dependence, the homogeneity of the slope coefficients was investigated. The homogeneity of slope coefficients was first examined by Swamy (1970). Later, Pesaran and Yamagata (2008) improved Swamy's technique and proposed two test statistics: delta tilde ($\tilde{\Delta}$) for large samples and adjusted delta tilde ($\tilde{\Delta}_{adj}$) for small samples (Yaya, 2020). These statistics are calculated as follows (Musah et al., 2024):

$$\tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - k}{\sqrt{2k}}\right) \quad (5)$$

$$\tilde{\Delta}_{adj} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - E(\tilde{z}_{iT})}{\sqrt{Var(\tilde{z}_{iT})}}\right) \quad (6)$$

where $\tilde{S}$ is the Swamy test statistic and k is the number of explanatory variables (Ghilous and Ziat, 2021). If the P-value of the test statistics is smaller than the significance level, the null hypothesis, which states that the slope coefficients are homogeneous, is rejected.

5.2 Panel Unit Root Test

It is inevitable to test the stationarity of the series to avoid spurious regressions (Wang et al., 2020b). Panel unit root tests are divided into two groups, namely first-generation tests and second-generation tests. Among these, the second-generation unit root tests are robust to cross-sectional dependence. Since empirical findings show the existence of cross-sectional dependence, cross-sectional augmented Im, Pesaran, and Shin (CIPS) and cross-sectional augmented Dickey-Fuller (CADF) tests, which are second generation unit root tests developed by Pesaran (2007), were used in this study (Westerlund and Hosseinkouchack, 2016). The model of the CADF test can be shown as follows (Kar, 2022):

$$\Delta y_{it} = \alpha_i + \rho_i y_{it-1} + \beta_i \bar{y}_{t-1} + \sum_{j=0}^{k} \gamma_{ij} \Delta \bar{y}_{it-1} + \sum_{j=0}^{k} \delta_{ij} y_{it-1} + \varepsilon_{it} \quad (7)$$

where $\bar{y}_{t-1}$ refers to the average of the lagged difference of each cross-section series, k is the lag specification, and $\Delta \bar{y}_{it-1}$ denotes the average of the first difference of each cross-section series (Vo, 2022). Based on the CADF statistics, the CIPS unit root test can be formulated as follows (Pesaran, 2007):

$$CIPS = \frac{1}{N} \sum_{i=1}^{N} CADF_i \quad (8)$$

where $CADF_i$ denotes the mean t-statistics of lagged variables (Han, 2024).

5.3 Panel Cointegration Test

The cointegration test is used to determine whether the variables act together in the long-term. The technique developed by Westerlund (2007) was employed to test whether the variables were cointegrated. This technique was preferred because it takes into account both slope homogeneity and cross-sectional dependence (Wang et al., 2020a). Westerlund (2007) cointegration test includes four test statistics, namely Gt, Ga, Pt, and Pa. Group statistics (Ga and Gt), which examine the presence of cointegration in at least one cross-sectional unit, are calculated as follows (Jakada et al., 2023):

$$G_t = N^{-1} \sum_{i=1}^{N} \frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)} \quad (9)$$

$$G_a = N^{-1} \sum_{i=1}^{N} \frac{T\hat{\alpha}_i}{\hat{\alpha}_i(1)} \quad (10)$$

where $SE(\hat{\alpha}_i)$ expresses the traditional standard error of $\hat{\alpha}_i$ (Westerlund, 2007). The null hypothesis of the Gt and Ga tests states that all cross-sectional units are not cointegrated, while the alternative hypothesis accepts that at least one cross-sectional unit is cointegrated (Anyanwu et al., 2016). If the Robust P-value is smaller than the significance level, the null hypothesis is rejected.

Panel statistics (Pa and Pt) that examine the presence of cointegration in all cross-sectional units are calculated as follows (Jakada et al., 2023):

$$P_t = \frac{\hat{\alpha}}{SE(\hat{\alpha})} \quad (11)$$

$$P_a = T\hat{\alpha} \quad (12)$$

The null hypothesis of the Pt and Pa tests states that cointegration does not exist for the whole panel, while the alternative hypothesis accepts the existence of cointegration for the whole panel (Burret and Feld, 2014). If the Robust P-value is smaller than the significance level, the null hypothesis is rejected.

5.4 Long-Term Coefficient Estimators

In this study, CCEMG by Pesaran (2006) and AMG by Eberhardt and Teal (2010) coefficient estimators were used to investigate the impact of bank loans, exchange rate, and economic growth on imports. In the existence of cross-sectional dependence, traditional panel estimators may produce inconsistent estimates (Kapetanios et al., 2011). Therefore, these estimators, which are robust against cross-sectional dependence, were chosen. The CCEMG estimator is based on the common correlated effect function (CCE), whose equation is given below (Jian et al., 2022):

$$y_{it} = \alpha_{1i} + \beta_i x_{it} + \lambda_i \bar{x}_{it} + \gamma_i \bar{y}_{it} + \theta_i f_t + \varepsilon_{it} \quad (13)$$

where θ_i is a heterogeneous factor loading and f_t is the unobservable common factor (Ditzen, 2018). The CCEMG estimator, which assumes that the slope coefficient is heterogeneous and is calculated by taking the simple average of the individual CCE estimators, can be formulated as follows (Castagnetti et al., 2019):

$$\hat{\beta}_{CCEMG} = \frac{1}{N} \sum_{i=1}^{N} \hat{\beta}_i \quad (14)$$

where $\hat{\beta}_i$ represents the country-specific coefficient in the CCE regression (Jian et al., 2022).

In addition to CCEMG, this study also employs the AMG estimator to estimate the long-term cointegration coefficients. The AMG estimator has a two-step process as follows (Ouattara and Zhang, 2019):

Step 1: $$\Delta y_{it} = \beta' \Delta x_{it} + \sum_{t=2}^{T} \delta_t \Delta D_t + \varepsilon_{it} \quad (15)$$

$$\hat{\delta}_t = \hat{\mu}_t^{\cdot} \quad (16)$$

Step 2: $$y_{it} = \alpha_i + \beta_i' x_{it} + \delta_i t + d_i \hat{\mu}_t^{\cdot} + \varepsilon_{it} \quad (17)$$

$$\hat{\beta}_{AMG} = \frac{1}{N} \sum_i \hat{\beta}_i \quad (18)$$

In the first stage, a pooled OLS model with T-1 year dummies is estimated (Adom et al., 2021). Thus, time dummy coefficients represented by $\hat{\mu}_t^{\cdot}$ are obtained. In the second stage, time dummy coefficients and linear trend are included in the regression for each cross-sectional unit of N numbers

(Ghilous and Ziat, 2021). After this process, the AMG estimator is obtained by taking the averages of the country-specific estimates as in CCEMG (Sayed and Peng, 2021).

5.5 Dumitrescu-Hurlin Panel Causality Test

Coefficient estimators cannot demonstrate causality between variables. However, policy makers also need information about the causal relationship between variables in order to take effective measures (Assi et al., 2021). For this reason, in this study, the direction of causal relationships was investigated by employing the method developed by Dumitrescu and Hurlin (2012). This method considers cross-sectional dependence and slope homogeneity. It also performs well in small samples. Finally, the test can be applied to both balanced and unbalanced panels (Chandio et al., 2022). The causal relationship between the variables is analyzed through the following model (Yang et al., 2021):

$$y_{it} = \alpha_i + \sum_{n=1}^{P} \delta_i^{(p)} y_{i,t-n} + \sum_{n=1}^{P} \beta_i^{(p)} x_{i,t-n} + \varepsilon_{i,t} \quad (19)$$

where P symbolizes the lag length, $\delta_i^{(p)}$ denotes the lag parameters, and $\beta_i^{(p)}$ stands for the slope coefficients (Aluko and Obalade, 2020). The null hypothesis assumes that the slope coefficients are equal to zero. According to this assumption, there is no causal relationship from variable x to variable y in the panel. On the other hand, the alternative hypothesis accepts that slope coefficients vary across cross-sections. In other words, this hypothesis asserts that there is causality in at least one cross-section (Wang et al., 2020a). To test the null hypothesis, the Wald statistic proposed by Dumitrescu and Hurlin is calculated as follows (Le and Van, 2020):

$$\overline{W} = \frac{1}{N} \sum_{i=1}^{N} W_i \quad (20)$$

where W_i are the individual Wald statistics for each section (Lopez and Weber, 2017). In the case of T>N, the Z statistic proposed by Dumitrescu and Hurlin (2012) is formulated as follows:

$$\bar{Z} = \sqrt{\frac{N}{2P}} (\overline{W} - P) \quad (21)$$

If the P-value of the test statistic is less than the significance level, the null hypothesis of no causality is rejected.

6. EMPIRICAL FINDINGS

The descriptive statistics shown in Table 2 give the statistical properties of the variables. The bank loans have the highest standard deviation of 2.094, while imports have the lower standard deviation of 0.14.

Table 2: Descriptive statistics

Variables	Mean	Std. dev.	Min	Max
IM	1.400578	0.1402583	0.953328	1.717908
BL	1.544424	2.094114	-4.118969	4.163823
ER	1.400205	0.1591283	0.7128123	1.73315
EG	3.806522	0.3633775	3.028234	4.500239

The correlation matrix in Table 3 presents how the variables are correlated. According to the obtained results, the independent variables (bank loans, exchange rate, and economic growth) are positively correlated with the dependent variable (imports).

Table 3: Correlation matrix

	IM	BL	ER	EG
IM	1.0000			
BL	0.5233	1.0000		
ER	0.8743	0.6884	1.0000	
EG	0.3360	-0.131	0.2664	1.0000

In this study, Breusch-Pagan LM, Pesaran scaled LM, and Pesaran CD tests are used to investigate cross-sectional dependence, and the findings are reported in Table 4. The common result of these tests is that there is cross-sectional dependence in all variables. This result requires the use of second-generation econometric techniques.

Table 4: Results of cross-sectional dependence tests

	IM		BL		ER		EG	
	Statistic	P-value	Statistic	P-value	Statistic	P-value	Statistic	P-value
Breusch-Pagan LM	50.18603	0.0000	192.0933	0.0000	68.71292	0.0000	212.3312	0.0000
Pesaran scaled LM	11.60071	0.0000	52.56582	0.0000	16.94896	0.0000	58.40798	0.0000
Pesaran CD	3.559378	0.0000	13.81126	0.0000	3.989	0.0000	14.55843	0.0000

After cross-sectional dependence, the homogeneity test developed by Pesaran and Yamagata (2008) is applied, and the results are presented in Table 5. The null hypothesis of slope homogeneity is rejected since the p-values of $\tilde{\Delta}$ and $\tilde{\Delta}_{adj}$ statistics are less than 0.01. This result implies that the slope coefficients vary across cross-sections.

Table 5: Results of homogeneity test

	Statistic	p-value
$\tilde{\Delta}$	11.032	0.000
$\tilde{\Delta}_{adj}$	11.774	0.000

The stationarity of the series is checked with CADF and CIPS panel unit root tests developed by Pesaran (2007) since CD tests indicate the presence of cross-sectional dependence in the data, and the findings are presented in Table 6. The findings of both tests confirm that all variables are not stationary at the level. However, after taking the first difference, it is seen that the series are stationary. This implies that there can be cointegration (Usman and Balsalobre-Lorente, 2022).

Table 6: Results of unit root tests

Variables	CIPS		CADF		Order of Integration
	At level	First Difference	At level	First Difference	
IM	-1.861	-5.509***	-1.769	-3.752***	I(1)
BL	-2.313*	-4.137***	-2.039	-2.698**	I(1)
ER	-2.191	-5.424***	-1.491	-3.965***	I(1)
EG	-1.350	-4.714***	-1.792	-2.613**	I(1)

Note: The superscript of ***/**/* denotes the level of significance at a 1%, 5% and 10%, respectively.

Westerlund (2007) test was applied to investigate whether the series move together in the long-term and the findings are presented in Table 7.

Table 7: Results of cointegration test

Statistic	Value	Z-value	P-value	Robust P-value
Gt	-4.481	-5.414	0.000	0.000
Ga	-16.145	-2.669	0.004	0.000
Pt	-8.780	-4.690	0.000	0.000
Pa	-17.254	-4.112	0.000	0.000

According to Table 7, group and panel statistics reject the null hypothesis of no long-term relationship. Therefore, a long-term equilibrium relationship between imports, bank loans, the exchange rate, and economic growth is confirmed.

The findings of CCEMG and AMG estimators are presented in Table 8. According to these estimators, the direction of the coefficients is the same, but the magnitude and significance levels are different. For the whole panel, the CCEMG estimator shows that a 1% increase in BL, ER, and EG stimulates imports in the long-term by 0.197%, 0.48%, and 1.131%, respectively. From this point of view, it is seen that economic growth is more effective on imports than other variables. This finding is in line with economic theory. Because imports are a positive function of economic growth. In the context of the import function, our evidence contradicts the findings of Olaba (2014) for Nigeria. On the other hand, our findings support Arı (2021), who states that the increase in income stimulates imports.

Differently from the economic theory, the coefficient estimators show that an increase in the exchange rate has a positive effect on imports. This finding can be interpreted as a result of foreign dependency in most of the countries in the panel. However, this is not consistent with the findings of Arı (2021). This is because Arı (2021) found that the demand for imported goods decreased after the depreciation of the national currency. Our last finding for the whole panel is the positive and significant effect of bank loans on imports. This finding of our econometric analysis is somewhat consistent with the results of Ekinci et al. (2015), Unger (2017), Karahan et al. (2018), and Hani Selimi and Eliskovski (2018). Ekinci et al. (2015) obtained a similar empirical result, but they analyzed the impact of credit growth on the current account, not on imports. Based on econometric findings, Unger (2017) also argues that bank lending to the domestic non-financial private sector stimulates domestic demand, increases imports, and leads to a deterioration in the current account. Based on the findings of the ARDL estimator, Karahan et al. (2018) also stated that the increase in bank loans causes deterioration in the current account in the long run. They explained this finding by linking the increase in bank loans with the increase in import demand. In their analysis for the Republic of North Macedonia, Hani Selimi and Eliskovski (2018) showed that the effects of household loans and enterprise loans on the current account differ. Specifically, enterprise loans lead to a reduction in the current account deficit, while household loans cause an increase in the deficit.

The results of the CCEMG estimator by country can be listed as follows:

- The effect of bank loans on imports is statistically significant and positive, except for Indonesia.
- The effect of the exchange rate on imports is statistically significant and positive for all countries.
- The effect of economic growth on imports is statistically significant and positive except for Indonesia and Turkey.

The outcomes of the AMG estimator showed that a 1% increase in BL, ER, and EG raises imports in the long-term by 0.154%, 0.435%, and 1.741%, respectively. According to these findings, the effect of economic growth on imports is greater than others. These results are in line with Zeybek and Kesbiç (2022), who found that the real exchange rate and economic growth have a positive effect on imports in the long-term. The evaluations of the relationship between these results and economic theory are similar as in CCEMG.

The results of the AMG estimator by country can be listed as follows:

- The effect of bank loans on imports is statistically significant and positive, except for Indonesia.
- The effect of the exchange rate on imports is statistically significant and positive, except for Mexico.
- The effect of economic growth on imports is statistically significant and positive, except for South Korea.

Table 8: Long-term estimation

	CCEMG		AMG	
	Coefficients	P>|z|	Coefficients	p-value
BL	0.1979883***	0.004	0.1545384***	0.000
ER	0.4800397***	0.000	0.4352987***	0.001
EG	1.131727***	0.004	0.7416509***	0.001
Mexico				
BL	0.285456***	0.000	0.1794405***	0.000
ER	0.4070831***	0.005	0.0499981	0.657
EG	2.268227***	0.000	1.062979**	0.024
Indonesia				
BL	0.0656371	0.672	0.213857	0.182
ER	0.558172***	0.001	0.5692801***	0.002
EG	0.5623808	0.177	1.008454***	0.003
South Korea				
BL	0.3449379***	0.001	0.1886147**	0.028
ER	0.4165791***	0.005	0.57632***	0.000
EG	1.047293***	0.000	0.1062837	0.121
Turkey				
BL	0.0959222***	0.018	0.0362412**	0.027
ER	0.5383246***	0.000	0.5455968***	0.000
EG	0.6490083	0.213	0.7888871**	0.016

Note: The superscript of ***/** denotes the level of significance at a 1%, and 5%, respectively.

The results of the Dumitrescu and Hurlin panel causality test are represented in Table 9. The outcomes of the findings indicate that there is a unidirectional causality from bank loans to imports. This finding is different from the results of Alhatti and Konak (2022), who report unidirectional causality from imports to total loans. In addition, the finding in Table 9 revealed that there exists a bidirectional causal relationship between economic growth and imports. According to this result, which is consistent with the theory, economic growth is affected by imports and imports, are affected by economic growth. Such results are also supported by Khan et al. (2019) and Usman and Bashir (2022), who observed bidirectional causality. In contrast to these findings, no causal relationship was found running from the exchange rate to imports. However, it has been observed that there is a unidirectional causality relationship from imports to exchange.

Table 9: Results of Dumitrescu-Hurlin panel causality test

Null Hypothesis	W-bar	Z-bar	p-value
BL → IM	6.6127	7.9376	0.0000***
IM → BL	1.4681	0.6620	0.5080
ER → IM	1.1281	0.1812	0.8562
IM → ER	3.3548	3.3302	0.0009***
EG → IM	3.0183	2.8542	0.0043**
IM → EG	3.9851	4.2216	0.0000***
BL → ER	3.5827	3.6525	0.0003***
ER → BL	0.2354	-1.0812	0.2796
BL → EG	1.8993	1.2719	0.2034
EG → BL	1.5757	0.8142	0.4156
ER → EG	1.4924	0.6964	0.4862
EG → ER	4.9343	5.5639	0.0000***

Note: The superscript of ***/** denotes the level of significance at a 1% and 5%, respectively.

7. CONCLUSION

Economic growth has a central position for underdeveloped countries to achieve their ultimate goals. A country's growth process is affected by many variables in the short and long-term. Among the main determinants of growth are different expenditure elements, including imports. Imports to meet the demand for final goods lead to the impoverishment of a country. While imports made to meet the demand for final goods lead to the impoverishment of a country, imports made to establish production infrastructure, maintain production activities, and increase production capacity have a positive impact on the growth process in the medium and long-term. If consumers and producers do not have sufficient savings, they are forced to make these purchases by borrowing. What is important here is whether bank loans have the effect of reducing the import tendency in the long-term by reducing foreign dependency and supporting the permanent growth process. In this study, the long-term effect of bank loans on imports was investigated using CCEMG and AMG estimators for MIST countries during the 1980-2020 period. In addition, the causal relationship between the variables was examined through the Dumitrescu and Hurlin panel causality test. Due to data constraints, total bank loans were used in the empirical model for the countries in the sample instead of sectoral bank loans.

The findings of both coefficient estimators show that the increase in bank loans, exchange rate, and income increased imports for the whole panel. Our finding on the impact of bank loans on imports is consistent to some extent with Ekinci et al. (2015), Unger (2017), Karahan et al. (2018), and Hani Selimi and Eliskovski (2018). The increase in bank loans is expected to trigger imports in the short-term. This is because credit expansion stimulates domestic demand and leads to an increase in foreign purchases. However, the persistence of this effect in the long-term requires a reconsideration of credit allocation. Indeed, the empirical findings of this study revealed that bank loans increase imports instead of decreasing them in the long-term. In this context, a larger share should be allocated to commercial and investment loans in order to achieve a permanent, strong, and rapid growth performance. In addition, access to bank loans should be easy, and credit costs should be lower. There is also a need for strict controls to ensure that loans are used in appropriate places and amounts.

Another finding for the whole panel is the positive and significant effect of economic growth on imports. This finding is consistent with the economic theory that imports are a positive function of income. Therefore, an increase in domestic income stimulates domestic demand and leads to an increase in foreign purchases. Although our evidence is in line with the findings of Arı (2021), it differs from the empirical result obtained by Olaba (2014).

The last finding of the coefficient estimators for the whole panel is that the exchange rate has a positive and significant effect on imports. Moreover, the causality test shows that there is a unidirectional relationship from bank loans to imports. The positive effect, which contradicts economic theory, can be explained by the low elasticity of import demand of the countries in the sample. Increases in exchange rates may lead to an increase in import expenditures of countries with relatively high external dependency. This is because the main way to achieve development goals depends on the uninterrupted continuation of economic activities. Therefore, foreign purchases continue despite an increase in the exchange rate. Thus, an increase in the exchange rate is accompanied by an increase in imports. However, this result is inconsistent with the findings of Arı (2021). Considering the negative effects of imports on growth performance, a gradual decrease in external dependence is a necessity for developing countries. This necessity requires more support for investments and production. In addition, policies that may lead to sudden and sharp exchange rate increases should be avoided. This study can be improved by using different samples and diversifying the types of bank loans. In this way, policymakers will be able to make better decisions on credit allocation, especially in developing countries.

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