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The Effects of Macroeconomic Indicators on Lending Interest Rates: Evidence from BRICST, MINT, and Fragile Five Countries

Makroekonomik Göstergelerin Borç Faiz Oranları Üzerindeki Etkileri: BRICST, MINT ve Kırılgan Beşli Ülkelerinden Kanıtlar

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ABSTRACT

This study analyzes the effects of the macroeconomic indicators on the lending interest rates in the leading emerging countries by considering the significance of the interest rates for economic growth since high-level interest rates decrease economic growth and volatile interest rates deteriorate economic stability. In this context, the lending interest rate is considered as the dependent variable; foreign exchange (FX) rates, gross domestic product (GDP), and inflation are included as the independent variables that are the main macroeconomic indicators; annual data from 1990 to 2019 are used, and the panel data analysis is applied. The empirical analysis results reveal that (i) FX rates, GDP, and inflation have a significant effect on the lending interest rates at the panel level; (ii) the significance of these macroeconomic indicators vary at the country level; (iii) GDP is the most influential factor on the lending interest rates at both panel and the country level. The analysis results underline the effects of macroeconomic factors on the lending interest rates. Therefore, countries should apply appropriate policies to lessen the adverse effects of the macroeconomic indicators on the interest rates so that economic growth can be supported by low-level lending interest rates. Hence, emerging countries can benefit from low-level lending interest rates.

KEYWORDS

Lending Interest Rate; Macro Factors; Emerging Countries; Panel Data.

ÖZ

Bu çalışma, faiz oranlarının ekonomik büyüme açısından önemini göz önünde bulundurarak, önde gelen gelişmekte olan ülkelerde makroekonomik göstergelerin borç verme faiz oranları üzerindeki etkilerini analiz etmektedir. Bu kapsamda, borç verme faiz oranı bağımlı değişken olarak kabul edilmekte; temel makroekonomik göstergeler olan bağımsız değişkenler arasında döviz kurları, gayri safi yurtiçi hasıla (GSYİH) ve enflasyon yer almakta; 1990'dan 2019'a kadar olan yıllık veriler kullanılmış ve panel veri analizi uygulanmıştır. Ampirik analiz sonuçlarına göre, (i) döviz kurları, GSYİH ve enflasyonun panel düzeyinde borç verme faiz oranları üzerinde önemli bir etkiye sahiptir; (ii) bu makroekonomik göstergelerin önemi ülke düzeyinde farklılık göstermektedir; (iii) GSYİH, hem panel hem de ülke düzeyinde borç verme faiz oranları üzerinde en etkili faktördür. Analiz sonuçları, makroekonomik faktörlerin borç verme faiz oranları üzerindeki etkilerini vurgulamaktadır. Bu nedenle, ekonomik büyümenin düşük seviyeli borç verme faiz oranları ile desteklenebilmesi için, makroekonomik göstergelerin faiz oranları üzerindeki olumsuz etkilerini azaltacak uygun politikaların uygulanması gerekmektedir. Bu nedenle, gelişmekte olan ülkeler düşük seviyeli borç verme faiz oranlarından yararlanabilirler.

ANAHTAR KELİMELER

Borçlanma Faiz Oranı; Makroekonomik Faktörler; Gelişmekte Olan Ülkeler; Panel Data.

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INTRODUCTION

While developed countries aim to sustain economic development, emerging countries desire to take place among developed countries (Kartal, 2019). In this context, economic growth is so crucial because it is highly related to the economic development and sustainability that affect the life quality of citizens (Kartal, 2020). Moreover, macroeconomic indicators are significant for sustainable economic growth and development as well.

The stability of macroeconomic indicators is a key point in terms of economic growth and development since it affects both real and financial sectors that are the two main sources of economic activities (Depren et al., 2021a). Especially, main macroeconomic indicators like FX rates, GDP, inflation, and interest rate serve as a mirror that reflects economies (Kartal, 2019). Therefore, achievements in these indicators can significantly affect economic growth.

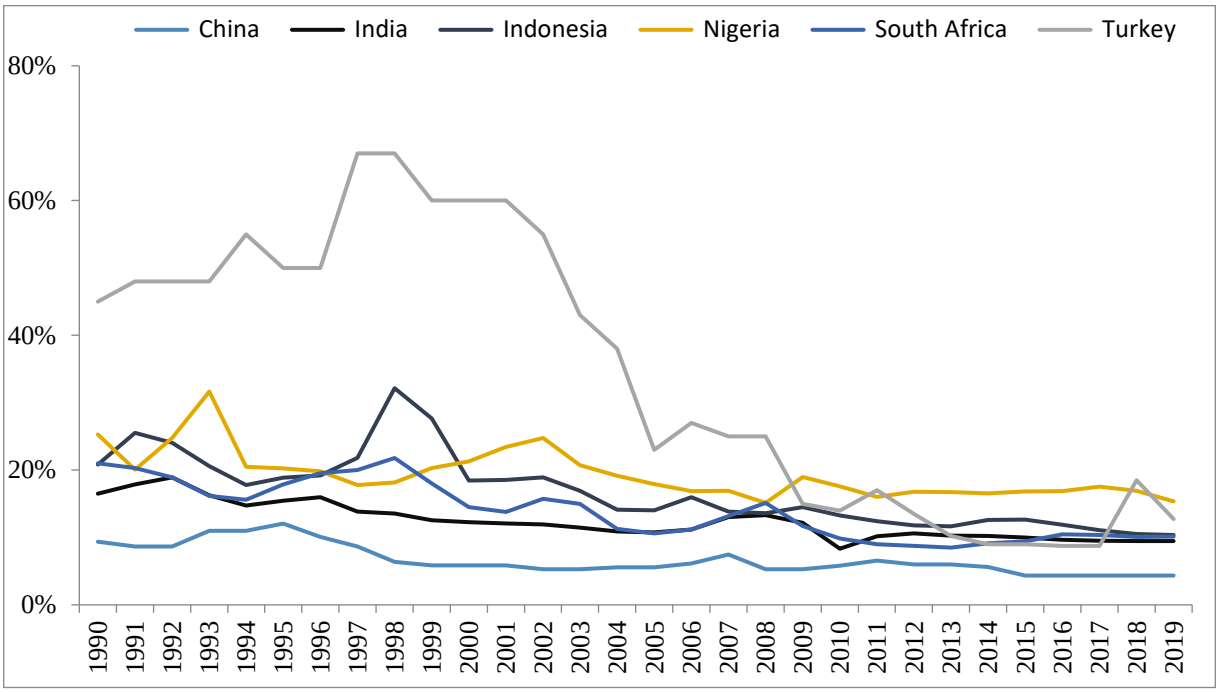
Although there are a variety of macroeconomic indicators that can be treated as main indicators, interest rates are among the most important ones. That is why because interest rates are the unique indicators that reflect the value and cost of money (Özdemir & Altınöz, 2012; Lyashenko & Mercurio, 2019; Kartal, 2020; Depren et al., 2021a). Besides, there is a nexus from macroeconomic indicators to interest rates (Chirwa & Mlachila, 2004; Perera & Wickramanayake, 2016; Liu, 2019). Naturally, there is a relationship between interest rates to macroeconomic indicators (Kartal, 2020). In addition, interest rates have an impact on investments and savings (Lin et al., 2018; Depren et al., 2021a; Kartal et al., 2021). Moreover, other economic activities like production and consumption are affected by interest rates.

Interest rates have importance for countries, especially emerging countries. Most emerging countries have insufficient savings, which is crucial for the financing of economic growth, and a bank-based financial infrastructure where interest rates are the main intermediary tools in such a system (Kartal et al., 2018a). Accordingly, the level and progress of interest rates are key for such countries in terms of economic stability, growth, and development, and countries desire to have low-level interest rates (Tumwine et al., 2018). However, high-level interest rates can be necessary when an increase in FX rates, inflation, and inflation expectations is examined so that such increases can be stabilized (Entrop et al., 2017). Hence, interest rates can be positioned as one of the main macroeconomic indicators that should be considered by policy-makers in directing economic policies and activities.

Although it is mentioned generally from the interest rate concept, in practice, there are various interest rate types. Central bank repo interest rates (i.e., one-week repo interest rate as a monetary policy indicator), credit interest rates deposit interest rates, interbank interest rates, reference interest rates, and Treasury bond/bill interest rates are some types of interest rates (Dinçer et al., 2019; Kartal, 2019; Salim, 2019; Kartal, 2020; Depren et al., 2021a; Depren et al., 2021b). Each type of interest rate is used in different economic and financial activities. When considering the economic and financial structures of emerging countries, which are the bank-based infrastructure, lack of savings for the financing of economic activities, and the funded by mainly banks' financing (Kaufmann & Valderrama, 2008; Kartal et al., 2018a), lending interest rates can be evaluated as the most important interest rate type.

Developed countries benefit from the low-level interest rates. However, emerging countries have a volatile trend in terms of interest rates. Figure 1 represents the progress of interest rates in the selected emerging countries.

Figure 1. The Progress of Lending Interest Rates (%).



Source: World Bank (WB), 2021.

As Figure 1 presents, some emerging countries like Turkey and Nigeria have quite high-level interest rates while some others have relatively low-level interest rates. Nevertheless, emerging countries have higher interest rates than developed countries that have generally 1%-5% intervals (WB, 2021).

By considering that most emerging countries have a bank-based financial system, banks collect deposits and provide credit through the lending mechanism, and interest rates are crucial for economic growth, development, and stability, we prefer to focus on the lending interest rate as the interest rate indicator because we focus on the cost of money providing of banks. In this context, we aim to examine the effects of the main macroeconomic indicators on the lending interest rates. Hence, we can determine the influential macroeconomic indicators so that some policy proposals can be developed and emerging countries can benefit from them by applying policies that help achieve low lending interest rates.

In this study, we examine the emerging countries that take place in BRICST, MINT, and Fragile Five groups because they are leading countries that have a high share among emerging countries in the global economy. Besides, the most recent annual data from 1990 to 2019 and three macroeconomic indicators (e.g., FX rates, GDP, inflation) are used. Moreover, panel data analysis is performed for examination at the panel and country level. Hence, we try to specify the issues (i) when lending interest rates change; and (ii) how macroeconomic indicators affect the lending on interest rates (e.g., which has positive effects and which has negative effects). The analysis results show that three macroeconomic indicators have a significant effect on the interest rates at the panel level whereas the results differ at the country level. These results highlight that emerging countries should customize the policies by considering their economic realities when designing policy frameworks regarding the interest rates and main macroeconomic indicators.

The contributions of this study are as follows: (i) the study aims at analyzing the sensitivity of the countries against the lending interest rates; (ii) the study focuses on the most important and main macroeconomic indicators as FX rates, GDP, and inflation to examine the lending interest rates in pioneering emerging countries taking place in BRICST, MINT, and Fragile Five groups; (iii) the study handles the most recent annual data between 1990 and 2019; (iv) the study applies panel data analysis to presents the results both at the panel and country levels; (v) the study provides comparative results regarding lending interest rates for leading emerging countries; (vi) the study recommends some policy proposals based on the outcomes obtained.

The study consists of 5 sections. Section 2 summarizes the literature. Section 3 includes the scope, data, and methodology. Section 4 presents the analysis results and discussion. Section 5 concludes.

1. LITERATURE REVIEW

In the current literature, there are various studies regarding interest rates. In these studies, different types of interest rates are examined, and a variety of macroeconomic explanatory variables like FX rates, GDP, consumer prices index (CPI) are included to examine the interest rates. Macroeconomic conditions of countries proxied by macroeconomic indicators are much related to the progress of the interest rates and changes in macroeconomic indicators can make either positive or negative effects on the interest rates (Chirwa & Mlachila, 2004; Perera & Wickramanayake, 2016; Liu, 2019). Moreover, several statistical and econometric models like autoregressive models (vector autoregression, vector error correction model), causality and cointegration (Granger, Johansen), generalized method of moments, regression (multivariate adaptive regression splines, ordinary least square, quantile) are applied.

The first group of studies takes FX rates into account in the examination of the interest rates. Hol (2006), Sever & Mızrak (2007), Paramati & Gupta (2013), Gupta & Goyal (2015), Ekinci et al. (2016), Maitra (2017), Obeng & Sakyi (2017), Kartal et al. (2018b), Gopinathan & Durai (2019), and Kartal (2019) are some examples of the studies that investigate the relationship between interest rates and FX rates for Italy, Ghana, Turkey, Sri Lanka, India, and selected countries (Norway, Sweden, Denmark). We use the value of the United States dollar (USD) against the local currency units of the countries. Moreover, we expect either a positive or an inverse nexus between interest rates and FX rates as in line with the researches.

The second group of studies includes GDP as an explanatory variable in the examination of the interest rates. In this context, studies consider either GDP (economic) growth or GDP amount to examine the nexus with the interest rates for countries like Turkey (Akıncı & Yılmaz, 2016; Torun & Karanfil, 2016), selected 4 economies like The United States of America (USA), Canada, Euro Area, United Kingdom (UK) (Holston et al., 2017), Ghana (Obeng & Sakyi, 2017), selected 38 transitory economies (Shaukat et al., 2019). These studies show mostly a negative relationship between interest rates and GDP. We use the GDP amount as a variable and expect a negative relationship as in line with the studies.

The third group of studies uses inflation as a significant variable. There are various studies concerning the nexus between interest rates and inflation. Some of these studies are prepared for the USA, Turkey, UK, and Brazil (Mehra, 1996; Berument, 1999; Berument & Malatyalı, 2001; Berument et al., 2004; Muinhos & Nakane, 2006; Sever & Mızrak, 2007; Torun & Karanfil, 2016; Dinçer et al., 2019; Kartal, 2019). Almost fully unanimous, these studies conclude that there is a positive connection between interest rates and inflation. We use the CPI as a variable and expect a positive relationship by considering a high positive correlation between interest rates and inflation and the results of these studies.

Besides these researches, the relevant literature also has different studies that investigate the nexus of the interest rates with different factors. For example, Arora & Tanner (2013), Gupta & Goyal (2015), Ratti & Vespignani (2016) examine the relationship between oil prices and interest rates for the USA, Euro Region, China, India, and Japan. Also, Cottarelli & Kourelis (1994) consider the effects of economic openness while Mojon (2000) examine banking concentration and competition, Egert et al. (2007) study financial sector development, Özdemir & Altınöz (2012) review banking sector stability, and Kartal et al. (2021) investigate the effects of loan/deposit ratio on the interest rates.

To sum up, it can be concluded that FX rates, GDP (proxied by either amount or growth rate), and inflation (proxied by mainly CPI) are the main macroeconomic indicators, which can be used to examine the progress of the lending interest rates. As a result of the literature review, three main macroeconomic indicators are selected to examine their effects on the lending interest rates. Table 1 gives a brief description of the variables.

Table 1. Descriptions of the Variables

Variable	Symbol	Description	Nexus
Interest Rate*	i	Lending Interest Rate (Annual,%)	
FX Rates	I	Official Exchange Rate (Local Currency Unit per USD)	+,-
GDP	Y	GDP (current US$)	-
Inflation	π	Consumer Prices (annual %)	+

Notes: ** denotes the dependent variable.*

2. SCOPE, DATA, AND METHODOLOGY

2.1. Scope

We aim at examining the progress of the lending interest rates in emerging countries. In this context, we select BRICST, MINT, and Fragile Five countries as the target scope. The following countries are in these groups:

- BRICST: Brazil, Russia, India, China, South Africa, Turkey.
- MINT: Mexico, Indonesia, Nigeria, Turkey.
- Fragile five: Brazil, India, Indonesia, South Africa, Turkey.

We targeted a total of nine countries as Brazil (BRA), China (CHN), India (IND), Indonesia (IDN), Mexico (MEX), Nigeria (NGA), Russian Federation (RUS), South Africa (ZAF), and Turkey (TUR). However, Russian Federation is excluded because there is so much deficiency in data for variables, and Brazil and Mexico are excluded since the lending interest rate data for these countries are not accessible. Hence, we can analyze six countries although we aimed at examining nine countries at the beginning due to the data availability.

2.2. Data

The study covers the period between 1990 and 2019. Data for the dependent and independent determinants are mainly gathered from WB (2021) except for India's CPI data that is gathered from Statista (2021), and Turkey's lending interest rate data that is retrieved from the Central Bank of the Republic of Turkey (CBRT) (2021).

2.3. Panel Data Analysis

The presence of cross-section dependence should be investigated to select the analysis that will be used to investigate the long-term relationship, and accordingly, the unit root test and cointegration test should be selected when working with panel data. For this purpose, firstly, the cross-section dependence is investigated in the study. The existence of cross-sectional dependence is investigated with Breusch & Pagan's (1980) LM test or the Pesaran (2004) CD test since there are cross-sectional dimensions (N=6) and time dimension (T=30) in this study. If the group mean is zero and on the contrary, the individual mean is not equal the zero, we think that the tests are biased. These tests are biased It is assumed that there is no cross-sectional dependence under the null hypothesis at the test. The test statistic of the LM test is as follows (Pesaran, 2004):

$$LM = T\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{i,j}^{2}\right) \quad (1)$$

Here $\hat{\rho}_{i,j}$ shows pairwise correlation between units. When N is fixed and $T \to \infty$ with N(N-1)/2 degree of freedom, LM statistic has χ^2 distribution. Pesaran (2004) proposes the CDLM test and the statistics for this test is as follows (Pesaran, 2004):

$$CDLM = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{i,j}\right) \quad (2)$$

This test statistic has a standard normal distribution. However, this test is not strong when the mean pairwise correlations for the population are zero. In a case where N and T are constant, the average of this test is zero in panel models including the heterogeneous, nonstationary and dynamic model categories.

Pesaran (2007) suggests the Cross-Sectionally Augmented IPS (CIPS) panel unit root test, which allows cross-sectional dependence between series and can yield significant results in both N>T and N<T cases. In this test, first, the CADF test statistics values are calculated for all the units that make up the panel, then the arithmetic average of these tests is taken and the CIPS test statistics values are calculated for the panel as a whole. In addition, the results of the CADF test perform stability analysis for each country that makes up the panel while the results of the CIPS test perform stability analysis for the panel as a whole. The statistical values of CIPS are calculated as follows:

$$CIPS = N^{-1}\sum_{i=1}^{n} t(N,T) \quad (3)$$

The obtained values of CIPS test statistics are matched with the critical table values created by Pesaran with Monte Carlo simulations, and hypotheses are checked for stationarity (Pesaran, 2007).

Another important issue in investigating the long-run relationship is the investigation of the homogeneity assumption. Depending on whether the relevant assumption is met or not, the cointegration test to be used in the study is decided. The homogeneity assumption, which is first discussed by Swamy (1970), is examined with the Swamy test. In this test;

$$Y_{it} = \propto + \beta_{it}X_{it} + \varepsilon_{it} \quad (4)$$

β_i slope coefficients are examined to control whether they are not equal from one cross-section to another in this type of cointegration equation. The hypotheses of the test are $H_0: \beta_i = \beta$ slope coefficients are homogenous and $H_1: \beta_i \neq \beta$ slope coefficients are heterogeneous. Pesaran & Yamagata (2008) develop two different testing statistics in order to check the hypotheses:

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

$$\tilde{\Delta}_{adj} = \sqrt{N}\frac{N^{-1}\tilde{S}-k}{\sqrt{Var(t,k)}} \quad (6)$$

N symbolizes the number of cross-sections, S symbolizes the Swamy test statistics, k symbolizes the number of independent variables, and Var(t,k) shows the standard error in equations (5) and (6)(Pesaran & Yamagata, 2008).

The study aims to investigate the cointegration connection between variables by applying the Durbin Hausman test. With this aim, the model is determined as follows:

$$i = \beta_{0it} + \beta_{1it}\pi_{it} + \beta_{2it}I_{it} + \beta_{3it}Y_{it} + \varepsilon_{it} \quad (7)$$

Here, β and ε show the coefficients and error term, respectively. The cointegration nexus is examined with the help of the Durbin Hausman panel cointegration test. Durbin Hausman's cointegration test permits panel cointegration analysis if the explanatory variables are I(1) or I(0), while the dependent variable is l(1). Moreover, the test regards the common factors. With the Durbin Hausman method, the presence of the cointegration nexus applying two different tests is investigated (Westerlund, 2008). The first is the Durbin Hausman group test andthe second is the Durbin-Hausman panel test. Westerlund (2008) permits for the variance of the autoregressive parameter from one section to another with the Durbin Hausman group test. The Durbin Hausman tests are predicted utilization of the following equation:

$$DH_G = \sum_{i=1}^{n}\tilde{S}_i(\tilde{\emptyset}_i - \hat{\emptyset}_i)^2 \sum_{t=2}^{T} e_{it-1}^2 \quad (8)$$

$$DH_p = \tilde{S}_n(\tilde{\emptyset}_i - \hat{\emptyset}_i)^2 \sum_{i=1}^{n}\sum_{t=2}^{N} e_{it-1}^2 \quad (9)$$

The Durbin-Hausman group statistics show to test results being examined if cross-sections are heterogeneous. Although the Durbin-Hausman panel statistics apply if the cross-sections are homogeneous. If there is a long-run connection between the variables, long-run coefficients need to be calculated. In this context, the AMG estimator is used to obtain individual long-term coefficients (Eberhardt & Bond, 2009). This estimator accounts for cross-section dependence by including a 'common dynamic process' in the country regression.

3. ANALYSIS, DISCUSSION AND IMPLICATIONS

3.1. Empirical Analysis

The study includes annual data between 1990 and 2019 that includes a total of 30 observations for each variable on a country basis. Annex-1 presents descriptive statistics of the variables based on each country. In the empirical analysis, firstly cross-section dependence is examined and the outcomes are shown in Table 2.

Table 2. Tests of Cross-section Dependence for Variables

Variables	LM	CDLM
i	54.955***	7.295***
	(0.0000)	(0.0000)
I	141.739**	23.139***
	(0.0450)	(0.0000)
Y	46.076***	5.674***
	(0.0000)	(0.0000)
π	131.444***	21.260***
	(0.0000)	(0.0000)

Notes: ****, ** and * show the significance level at the 1%, 5% and 10%, respectively. LM Breusch & Pagan (1980) and CDLM (Pesaran, 2004) are tests of cross-section dependence.*

According to Table 2, the null hypotheses of the no dependence are rejected at the 1% level. As known, the heterogeneity of slope coefficients should be used. So, Slope Homogeneity Test, which is developed by Pesaran & Yamagata (2008), is used. The results of homogeneity and cross-dependency for the model are presented in Table 3.

Table 3. Homogeneity and Cross-Dependency Test Results for Model

	LM	CDLM	$\tilde{\Delta}$	$\tilde{\Delta}_{adj}$
Model	42.0368***	4.936***	9.697***	10.623***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Notes: ****, ** and * show the significance level at 1%, 5% and 10%, respectively.* $\tilde{\Delta}$ *and* $\tilde{\Delta}_{adj}$ *show the homogeneity tests. LM Breusch & Pagan (1980) and CDLM (Pesaran, 2004) are tests of cross-section dependence.*

According to Table 3, the null hypotheses of the slope coefficient implying homogeneity and no dependence are rejected at the 1% level. According to the results, we decide the using the unit root test of Pesaran (2007) as a second-generation unit root test, and the results of the test are shown in Table 4.

Table 4. Panel Unit Root Test Results

Variables		Constant	Constant and Trend
		CIPS-stat	CIPS-stat
$\boldsymbol{\pi}$		-3.173	-3.877
$\Delta\boldsymbol{\pi}$		-6.055***	-5.922***
I		-3.995**	-5.774***
Y		-5.74***	-5.887**
i		-3.129	-3.172
Δi		-5.822***	-5.740***
Critical Values	**1%**	-5.73	-5.73
	5%	-3.97	-4.87
	10%	-3.26	-4.00

Notes: ****, ** and * show the significance level at 1%, 5% and 10%, respectively. Critical values are obtained from Pesaran (2007).*

$\boldsymbol{\pi}$ and **i** variables are found to be I(1) while the other variables are found to be I(0) in the unit root test results. The Westerlund-Durbin-Hausman (2008) cointegration test is used to show the cointegrating relationship among the variables regarding the integration levels of the variables and the results are presented in Table 5.

Table 5. Durbin-Hausman Cointegration Test Results

	Statistics
Durbin-Hausman Group Statistics	102.496***
	(0.0000)
Durbin-Hausman Panel Statistics	160.129***
	(0.0000)

Note: ****, ** and * show the significance level at 1%, 5% and 10%, respectively.*

According to the Durbin-Hausman group and panel statistics, the null hypothesis is rejected at a 1% significance level and we find that there is a cointegrating relationship among the variables. By considering the presence of cross-sectional dependence and heterogeneity, the cointegrating coefficients are calculated with an AMG estimator and the results are presented in Table 6.

Table 6. The Long-Term Coefficients

Variable	CHN	IND	IDN	NGA	ZAF	TUR	Panel
$\boldsymbol{\pi}$	0.2254***	0.1368	0.2405***	0.0254	0.3047***	0.1737	0.1915***
	(0.0000)	(0.1460)	(0.0000)	(0.4420)	(0.0010)	(0.1480)	(0.0000)
I	-0.2440*	-0.0690	-0.0002*	0.0074	-0.2360*	-1.3473	-0.1075*
	(0.0870)	(0.1300)	(0.0710)	(0.4290)	(0.0630)	(0.4350)	(0.0810)
Y	-1.006***	-0.6888**	-0.4691***	-2.9917***	-0.5331***	-6.4785***	-2.9169***
	(0.0000)	(0.0150)	(0.0000)	(0.0010)	(0.0000)	(0.007)	(0.0001)
$\boldsymbol{\beta_0}$	36.2410***	60.9567***	108.9311***	94.9129***	158.022***	470.1371***	91.4649***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0050)	(0.0000)

Notes: ****, ** and * show the significance level at 1%, 5% and 10%, respectively.* β_0 *shows the constant term.*

As Table 6 presents, inflation, FX rates, and GDP have a significant effect on the lending interest rates for countries at the panel level. While GDP has the highest (negative) effect on the interest rates, it is followed by

inflation (positive effect) and FX rates (negative effect), respectively. Moreover, the results highlight that the effects of the explanatory variables on the lending interest rates vary according to the countries. In other words, the results vary at the country level. For example, inflation and FX rates do not affect the interest rates for India, Nigeria, and Turkey.

3.2. Discussion

The results obtained from the panel data analysis show that all explanatory variables (e.g., FX rates, GDP, inflation) and constant term have a significant effect on the interest rates at the panel level. In detail, the effects of these variables can be ordered as GDP, inflation, and FX rates. On the other hand, the results present that all these explanatory factors can have a different effect on the lending interest rates on a country basis. Even, some of them do not affect. In other words, inflation and FX rates do not affect the lending interest rates in India, Nigeria, and Turkey. Also, FX rates have a higher effect than inflation on the lending interest rates in China.

When examining analysis results by considering country groups, it can be seen that;

- All determinants affect some BRICST countries like China and South Africa whereas the only GDP affects India and Turkey.
- All determinants affect some MINT countries like Indonesia whereas the only GDP affects Nigeria and Turkey.
- All determinants affect some Fragile Five countries like Indonesia and South Africa whereas the only GDP affects India and Turkey.
- Hence, we can conclude that China, Indonesia, and South Africa are in a group whereas India, Nigeria, and Turkey are in another group according to the results obtained.

The results gathered from the panel data analysis are consistent with the pre-expectations and the literature as summarized in the literature review part. Hence, we can recommend some policy recommendations based on the result.

The main priority of the emerging countries should be focusing on the most important macroeconomic indicators foremost. In this context, the countries should focus on firstly achieving sustainable economic (GDP) growth. Therefore, they can achieve low-level lending interest rates and this can support and stimulate economic growth in turn.

Secondly, the countries should forward by considering which explanatory macroeconomic indicators have the higher effect. In other words, after achieving success for economic (GDP) growth, the countries can deal with the inflation and FX rates, respectively.

Thirdly, the countries should consider the results at the country level as well as at the panel level. Because country-level results prove that although their main macroeconomic indicators have a significant effect on the lending interest rates, some of these indicators are not effective on the interest rates for some countries. Therefore, each country should consider its economic structure and realities in developing and applying policies.

Lastly, all recommended policies and developed policies by decision-makers (e.g., central banks and central governments) in these countries should be harmoniously applied so that macroeconomic indicators can contribute to decreasing the lending rates.

We try to present some policy proposals based on the analysis results that we obtained. However, emerging countries can develop much more policies by utilizing high-frequency data that is not publicly available. Even, the countries can evaluate positioning interest rates as a macro-prudential concern if this has not been done yet. An important point is that necessary measures should be taken on time.

CONCLUSION

We aim at investigating the effects of macroeconomic indicators on the lending interest rates by considering the relatively high importance of this interest rate for economic growth and development in emerging countries. In this context, we include BRICST, MINT, and Fragile Five countries because these groups of countries represent the most important and leading emerging countries. We complete the analysis by using three main macroeconomic indicators, including the yearly data from 1990 to 2019, excluding Brazil, Mexico, and Russian Federation due to the data availability, and performing panel data analysis.

In a summary, three main macroeconomic indicators as FX rates, GDP, and inflation have a significant effect on the lending interest rates at the panel level while GDP has the highest effect. However, the results vary based on each country. The results gathered from the panel data analysis are consistent with the literature and our pre-expectations. Hence, the results highlight that although these emerging countries take place in the

same country groups, their economic structures are different from each other and only some of them are similar to some others. Therefore, the countries should customize the policies by considering their economic realities when designing policy frameworks. Based on the analysis results, we present some policy proposals by acknowledging that decision-makers of these countries can develop more policies by utilizing high-frequency data. Naturally, other emerging countries can benefit from the examples of BRICST, MINT, and Fragile Five countries.

In the study, we examine the selected emerging countries by using main macroeconomic indicators and using data between 1990 and 2019 that can be evaluated as limitations. Therefore, future studies can include more emerging countries, consider more macroeconomic indicators that are not included in this study due to the being out-of-scope, and use more recent data, especially including the COVID-19 pandemic times. Moreover, new methods like quantile-on-quantile regression, wavelet coherence approach, and machine learning algorithms can be applied in future studies. Hence, the relevant literature can be enriched.

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APPENDIX

Annex-1. Descriptive Statistics

Country/ Panel	Variable	Unit	Mean	Min	Max	SD
CHN	i	%	6.70	4.35	12.06	2.19
	I	Point	7.18	4.78	8.62	1.11
	Y	Billion USD	4,592.72	360.86	14,279.94	4,633.01
	π	%	4.07	-1.40	24.26	5.54
IND	i	%	16.86	10.37	32.15	5.43
	I	Point	8,236.03	1,842.81	14,236.94	4,079.24
	Y	Billion USD	468.35	95.45	1,119.19	355.55
	π	%	9.26	2.82	58.02	9.91
IDN	i	%	12.42	8.33	18.92	2.73
	I	Point	45.75	17.50	70.42	13.60
	Y	Billion USD	1,123.14	270.11	2,868.93	845.09
	π	%	7.32	3.33	13.87	3.25
NGA	i	%	19.37	15.14	31.65	3.62
	I	Point	123.75	9.91	306.92	86.78
	Y	Billion USD	222.10	27.75	546.68	177.58
	π	%	18.14	3.72	72.84	16.99
ZAF	i	%	13.90	8.50	21.79	4.22
	I	Point	7.60	2.59	14.71	3.56
	Y	Billion USD	238.53	115.48	416.42	103.86
	π	%	6.83	-0.69	15.33	3.47
TUR	i	%	34.35	8.75	67.00	20.33
	I	Point	1.44	0.00	5.67	1.42
	Y	Billion USD	499.11	130.69	957.80	304.03
	π	%	36.62	6.25	105.22	32.82
Panel	i	%	17.26	4.35	67.00	12.37
	I	Point	1,403.28	0.00	14,236.94	3,476.83
	Y	Billion USD	1,190.66	27.75	14,279.94	2,460.25
	π	%	13.72	-1.40	105.22	19.24