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Macroeconomic determinants of MIR interest rate margin in the euro area[1]

Abstract: This study aims to examine the determinants of the MIR interest rate in the Euro area for the period 2003Q1-2015Q3. By employing Fixed and Random Effects as econometric methodologies, I examine whether the MIR rate is affected by the following macroeconomic factors: unemployment rate, inflation rate, GDP growth, political stability index, and wages as percentage of GDP. All these factors have been found to be significant drivers of the MIR rate and thus, they have to be taken into consideration when designing macro-prudential policies. The findings in this paper provide alternative explanations for the empirical evidence concerning interest rate spreads behaviour.

Keywords: MIR interest rate, Interest rate margin, euro area, European Central Bank.

JEL classification: C33, C51, E40, E43, E58, G2.

1. Introduction

The theme of the MIR rate is relatively new in the literature of interest rates determinants despite the fact that it exists since 2003. In particular, in January 2003, the Eurosystem started compiling harmonized statistics on euro-denominated lending and deposits of domestic credit institutions (the largest component of

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MFIs) vis-à-vis households and non-financial corporations resident in the euro area. Previously, retail interest rate statistics were not harmonized, which hampered comparison across countries. The new framework introduced in 2003 addressed these drawbacks and therefore represented an important step towards better describing the retail banking system across euro area countries. As far as I know, Anastasiou, Louri and Tsionas (2019)[2] is the only study that first examined the theme of the MIR rate employing it as a potential determinant of the European non-performing loans (NPLs). Also, to the best of my knowledge, there has never been any study that examines the potential drivers of MIR interest rate.

In the literature of interest rate margins' determinants exists a plethora of both research and theoretical papers, some of which are briefly presented below. First, Wong (1997) studied the determinants of optimal bank interest margins based on a simple firm-theoretical model under multiple sources of uncertainty. Saunders and Schumacher (2000) studied the determinants of the net interest margin taking as sample banks from both the EU and the USA for the period 1988-1995. They found that the major determinants of the net interest margin are capital to asset ratio, implicit interest payments, market power, opportunity cost and interest rate volatility. Brock and Suarez (2000) stated that bank spreads in the 1990s are influenced by inflation and GDP growth.

Fungacova and Poghosyan (2011) investigated the interplay between bank interest margins and bank ownership in Russia between 1999 and 2007. They found that bank ownership has to be considered when analysing the determinants of interest margins since bank ownership was found to affect them significantly.

Hainz, Horvath, and Hlavacek (2014) studied the determinants of interest rate spreads of different loan categories in the Czech Republic during 2004–2011. According to their results, both bank-specific and macroeconomic-specific variables that they employed matter more for setting the spreads for small corporate loans and mortgages rather than for large corporate loans and consumer loans.

Barjaktarović, Dimić, and Ječmenica (2014) concluded that the level of lending and deposit interest rates in the Serbian banking sector is high, i.e. the indicator of interest rate spread is on the low competitiveness level. Moreover, they found that the general decrease in interest rates is determined by the economy's stability, particularly by the level of inflation and the level of the trade balance.

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[2] According to Anastasiou, Louri and Tsionas (2019), MIR interest rate margin found to be a crucial determinant of European NPLs (positively affecting them).

Almeida and Divino (2015) examined for the period 2001-2012 the determinants of the banking spread in the Brazilian economy. They found that administrative expenses, the Herfindahl-Hirschaman concentration index, and the total output measured by GDP are the main factors that influence interest rate spreads in Brazil.

Perera and Wickramanayake (2016) examined the determinants of commercial bank retail interest rate adjustments in the period 1996-2010, having as sample 122 countries. According to their findings, both macroeconomic-governance and financial factors affect commercial bank retail interest rate adjustments. Other studies that have attempted to identify the factors that affect the interest rate adjustments are those of Mojon (2000); Sander and Kleimeier (2004); Wang and Lee (2009); Mishra, Montiel, and Spilimbergo (2010); Gigineishvili (2011).

Islam and Nishiyama (2016) investigated the factors affecting bank net interest margins for the period 1997-2012 for the following counties: Bangladesh, India, Nepal, and Pakistan. They found that the inflation rate and economic growth significantly negatively influence the interest margins.

Other studies that have examined which macroeconomic variables affect interest rate margins are (Cottarelli and Kourelis, 1994; Sander and Kleimeier, 2004; Égert Crespo-Cuaresma, and Reininger, 2007) who tested the inflation rate as potential determinant, (Sander and Kleimeier, 2006; Égert, Crespo-Cuaresma, and Reininger, 2007; Claeys and Vennet, 2008) who examined the economic growth as potential determinant, (Cottarelli and Kourelis, 1994; Mojon, 2000; Sander and Kleimeier, 2006; Claeys and Vennet, 2008; Wang and Lee, 2009) who investigated whether interest rate volatility influences interest rate margins adjustments.

A different goal was set by Krušković (2017), who advocated that there is a certain correlation between foreign exchange reserves, exchange rate, and interest rate. The intercorrelation between the exchange rate and monetary policy can be displayed through the exchange rate volatility. Moreover, he found that an increase in the domestic interest rate relative to the foreign interest rate leads to inflows of foreign capital that result in the exchange rate appreciation.

Another recent study is that of Louri and Migiakis (2015) who studied which variables affect the margins that the Euro-area non-financial corporations (NFCs) pay for their bank loan for 2003 - 2014. In particular, Louri and Migiakis examined the determinants of bank lending margins for distressed and non-distressed euro area countries. Their central finding is that prudence of banks' management and market concentration are two significant factors that positively affect the bank lending margins in the euro area.

The aim of this paper is to investigate the relationship between European MIR interest rate margin and the general macroeconomic environment, proxied by country-level determinants.

Consequently, based on the above literature and arguments, I suggest the following hypothesis for this study:

Hypothesis 1: *MIR interest rate margin is negatively related to real GDP growth, political stability index and wages as % to GDP.*

Hypothesis 2: *MIR interest rate margin is positively related to unemployment rate and inflation rate.*

The remainder of the paper is structured as follows. In chapters 2 and 3, I present the data description and the employed econometric methodology, respectively. Chapter 4 presents the estimation results. Finally, Chapter 5 concludes.

2. Data Issues and Description of Variables

In the present study, I explore whether some macroeconomic determinants are potential factors that influence the European MIR margin. The MIR interest rate is a new type of interest rate-margin derived from the ECB Data Warehouse for the period 2003Q1-2015Q3. MIR rate (or margin) is defined as the difference between interest rates on consumer loans without guarantee or collateral and consumer loans with guarantee or collateral. This difference-margin comprises information about the assessment of borrowers' credit risk. As a consequence, a greater (lower) MIR rate implies that we have borrowers with lower (higher) credibility. A rise in MIR rate will also signify that borrowers will have to undergo greater net costs because such borrowers are "riskier". At this point, it has to be noted that the MIR rate captures only a narrow section of borrowers, since it does not capture those who take out mortgages or corporate borrowers.

As far as I know, this is the first empirical study that examines some macroeconomic factors as potential variables that affect the MIR rate. Given that the MIR rate is provided on a country level basis, I deem it appropriate to explore only country-specific (that is, macroeconomic determinants) as its possible drivers.

Figures 1 and 2 show a pictorial presentation of the evolution of MIR rate in the euro area countries for the period 2003Q1-2015Q3. To have more presentable graphs, I plotted the MIR rate for two distinct country groups, country group A

and B, where countries that are characterized as core (periphery) euro area countries belong in the country group A (B).[3]

Figure 1: The evolution of MIR rate in the euro area countries – Country Group A (2003Q1-2015Q3)

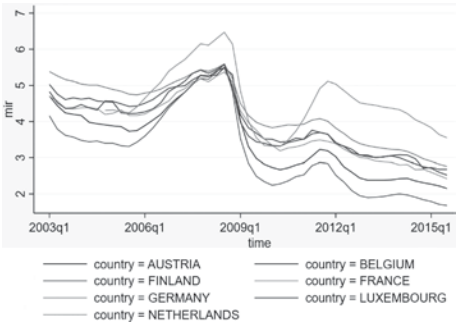
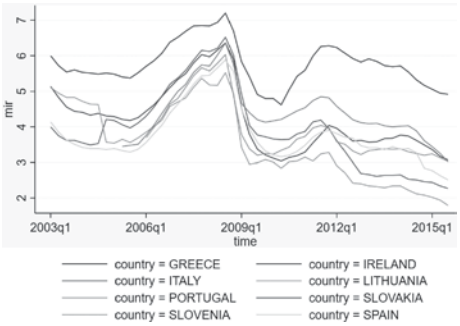


Figure 2: The evolution of MIR rate in the euro area countries – Country Group B (2003Q1-2015Q3)



Moreover, given the definition of the MIR rate that I provided above, from both figures, we can depict that for all countries of the sample, the difference between consumer loans without collateral and consumer loans with collateral hit a pick just exactly before the outburst of the recent financial crisis[4] and then starts to decline. Such finding implies that probably one reason of the outburst of the 2008 economic crisis was the excessive amounts of the MIR rate (that is, before the 2008 financial crisis there existed more less-credible borrowers who might have led to the outburst of the crisis).

The macroeconomic variables that were employed as explanatory variables are specified as follows:

- **unemp**: *unemp* stands for the unemployment rate. Data for the unemployment rate were collected from the OECD database. A country with a high unemployment rate suggests that more people are unable to meet their debt obligations and hence this country will typically have more risky borrowers with less collateral. Thus, *unemp* is expected to have a positive sign.

[3] Fifteen countries were selected for the purposes of this analysis on the basis of data availability.

[4] According to Fabris (2018), traditional monetary policy is based on the approach involving one instrument (reference interest rate) and one goal (price stability). Such framework is efficient when you have to combat inflation. However, during a financial crisis, solvency and liquidity of the financial sector are bigger problems and they call for different approaches to the implementation of monetary policy.

- **growth**: This variable denotes the GDP growth rate. The data for GDP growth were also collected from the OECD database. GDP growth rate is expected to have a negative sign since an economy with a high growth rate is expected to have less risky borrowers. GDP growth rate directly influences the supply and demand of loans and deposits and, therefore, banks' activities. Demigurc-Kunt and Huizinga (1999) and Tarus, Chekol, and Mutwol (2012) found an inverse relationship between the economic growth rate and bank interest margins.

- **inflrat**: *inflrat* stands for inflation rate. Because of the lack of data, I utilized the percentage change of CPI as a proxy for the inflation rate and collected from the OECD. Inflation rate is expected to has either a positive (Demirguc-Kunt and Huizinga, 1999) or a negative sign (Boyd, Levine, and Smith, 2001; Abreu and Mendes, 2003; Islam and Nishiyama, 2016).

- **politic_stab**: *politic_stab* is an index obtained from the Datastream database and denotes the political stability of a country. The higher the index is, the greater political stability prevails in the country. A more politically stable country is expected to have fewer risky-borrowers than other politically unstable countries and thus, *politic_stab* is expected to have a negative impact on the MIR interest rate. As far as I know this is the first empirical study examining the variable *politic_stab* as a potential macroeconomic determinant of interest rate margin.

- **wage**: As *wage*, I utilized wage as % to GDP. Data for *wage* were collected from the Datastream database. As *wage* increases, borrowers will have higher income and probably more collateral. Thus, borrowers with higher wages will seem more credible to banks and thus, a lower MIR rate is expected. So, *wage* coefficient is expected to be negative. This is the first empirical study that examines the variable wage as a potential macroeconomic determinant of interest rate margin to the best of my knowledge.

From Table 1, we can see a correlation matrix of all of our variables. From the correlation matrix, we observe that no extreme correlations are recorded between the under-examination variables and hence multicollinearity problems will not exist.

Table 1: Correlation Matrix

	mir	unemp	inflrat	growth	politic_stab	wage
mir	1.000	-	-	-	-	-
unemp	0.074	1.000	-	-	-	-
inflrat	0.235	-0.301	1.000	-	-	-
growth	-0.126	-0.166	0.130	1.000	-	-
politic_stab	-0.241	-0.201	-0.017	0.220	1.000	-
wage	-0.295	-0.095	-0.051	0.119	0.522	1.000

Notes: unemp, inflrat, growth, politic_stab and wage stand for unemployment rate, inflation rate, GDP growth rate, political stability and wage %GDP respectively.

In Table 2 both the available sources from which I collected the data and the expected signs of the explanatory variables are reported.

Table 2: Data Sources and Expected Signs

Panel A: Data Sources	
mir	ECB DATA WHAREHOUSE
unemp	OECD
inflrat	OECD
growth	OECD
politic_stab	DATASTREAM
wage	DATASTREAM
Panel B: Expected Signs	
unemp	(+)
inflrat	(+)/(-)
growth	(-)
politic_stab	(-)
wage	(-)

Notes: unemp, inflrat, growth, politic_stab and wage stand for unemployment rate, inflation rate, GDP growth rate, political stability and wage %GDP respectively.

In Table 3, I provide the descriptive statistics for all the variables and in Table 4 the descriptive statistics of all the variables for each country are presented. The countries that I included in my analysis are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Portugal, Slovakia, Slovenia, and Spain.

Table 3: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
mir	4.044	1.141	1.630	7.200
unemp	10.318	4.817	1.800	29.100
inflrat	0.596	0.498	-1.709	7.762
growth	0.322	0.941	-12.399	7.352
politic_stab	5.324	0.658	4.070	6.717
wage	33.706	5.882	22.300	48.900

Notes: unemp, inflrat, growth, politic_stab and wage stand for unemployment rate, inflation rate, GDP growth rate, political stability and wage %GDP respectively.

Table 4: Descriptive Statistics by Country

Country	stats	mir	unemp	inflrat	growth	politic_stab	wage
Austria	mean	3.489	4.782	0.478	0.438	6.075	39.151
	min	2.100	3.100	-0.305	-1.988	5.909	37.200
	max	5.490	6.000	1.506	2.010	6.447	41.700
Belgium	mean	3.936	7.919	0.464	0.440	6.061	36.850
	min	2.440	6.200	-0.577	-2.093	5.662	35.700
	max	5.490	9.400	1.604	1.635	6.383	38.500
Finland	mean	3.107	8.712	0.462	0.426	6.550	38.954
	min	1.630	5.600	-0.673	-6.892	6.214	36.500
	max	5.590	13.300	1.537	3.090	6.717	45.200
France	mean	3.813	9.709	0.414	0.374	5.857	37.460
	min	2.420	6.700	-0.366	-1.582	5.595	35.800
	max	5.370	29.100	1.219	1.242	6.178	39.200
Germany	mean	4.261	8.191	0.356	0.316	6.000	41.631
	min	2.680	4.800	-0.487	-4.454	5.682	36.600
	max	5.590	18.800	1.088	2.026	6.317	48.900
Greece	mean	5.749	14.062	0.717	0.218	4.747	25.422
	min	4.620	7.400	-1.709	-4.770	4.369	22.300
	max	7.200	28.000	2.160	3.066	5.001	28.600
Ireland	mean	4.193	8.177	0.489	1.095	5.894	36.412
	min	2.940	3.700	-0.898	-4.071	5.604	31.900
	max	6.360	15.400	1.676	6.211	6.133	40.900
Italy	mean	3.899	9.410	0.647	0.119	4.696	27.840
	min	2.200	5.700	-0.187	-2.910	4.256	26.500
	max	6.520	13.700	1.824	1.556	5.042	29.400

Country	stats	mir	unemp	inflrat	growth	politic_stab	wage
Lithuania	mean	3.504	11.775	0.772	1.068	4.716	31.850
	min	1.780	3.900	-1.541	-12.399	4.070	29.600
	max	5.520	18.500	4.370	4.835	5.193	35.600
Luxembourg	mean	3.939	4.709	0.534	0.655	6.183	42.374
	min	2.590	1.800	-1.187	-5.709	5.905	38.700
	max	5.570	7.300	1.620	5.291	6.464	46.000
Netherlands	mean	4.575	4.373	0.495	0.460	6.283	39.550
	min	3.310	2.000	-0.617	-3.315	6.028	37.400
	max	6.470	8.200	1.763	1.762	6.543	43.100
Portugal	mean	4.364	9.111	0.723	0.300	5.291	37.085
	min	2.790	4.000	-0.724	-2.300	5.059	33.900
	max	6.360	18.400	3.204	2.229	5.473	38.900
Slovakia	mean	.	14.828	1.110	0.908	4.890	29.500
	min	.	8.700	-0.569	-9.225	4.649	27.100
	max	.	19.900	7.762	7.352	5.125	33.000
Slovenia	mean	3.881	7.182	1.050	0.621	5.138	43.595
	min	2.780	4.200	-1.288	-4.518	4.873	41.500
	max	6.030	11.200	3.395	3.633	5.428	45.900
Spain	mean	3.753	15.840	0.660	0.517	5.624	38.114
	min	2.380	8.000	-0.683	-1.597	5.069	36.200
	max	5.880	27.100	1.747	1.592	6.279	40.500

Notes: unemp, inflrat, growth, politic_stab and wage stand for unemployment rate, inflation rate, GDP growth rate, political stability and wage %GDP respectively.

3. Econometric Methodology

I utilized quarterly data for 15 euro area countries for the period 2003Q1-2015Q3. I have an unbalanced panel dataset that includes 732 observations.

As a first step, I examined the variables for unit root existence. I tested for unit roots with the Augmented Dickey-Fuller (ADF) test. ADF test, which was firstly proposed by Dickey and Fuller (1979), has as a null hypothesis that all panels contain a unit root. From table 5 we perceive that all of our variables are found to be stationary at level.

Table 5: ADF Unit root tests

VARIABLES	P_values	Statistics
mir	0.000	-19.048
unemp	0.000	-18.997
inflrat	0.000	-41.629
growth	0.000	-42.621
politic_stab	0.000	-16.763
wage	0.000	-20.584

Notes: (a) ADF test has as a null hypothesis that there is unit root, (b) unemp, inflrat, growth, politic_stab and wage stand for unemployment rate, inflation rate, GDP growth rate, political stability and wage %GDP respectively, (c) The null hypothesis of unit root is rejected at the 1% significance level for all variables.

Given that i, t, *unemp*, *inflrat*, *growth*, *politic_stab* and *wage* denote country, time, unemployment rate, inflation rate, GDP growth rate, political stability and wage % GDP respectively, I employ the following econometric model:

$$mir_{it} = \alpha + \beta_1 unemp_{it} + \beta_2 inflrat_{it} + \beta_3 growth_{it} + \beta_4 politic_{stab_{it}} + \beta_5 wage_{it} + u_{it} \qquad (1)$$

In order to estimate the above econometric specification, I employed both Fixed and Random Effects with robust standard errors as econometric methodologies[5].

4. Estimation Results

Tables 6 and 7 include the estimated coefficients with their corresponding robust standard errors after the Fixed and Random Effects estimation methods. It has to be noted that the probability value of the Hausman test (1978) is found to be equal to 0.000, rejecting the null hypothesis, and thus Fixed Effects is a more appropriate method than the Random Effects method. However, I also provide the estimation results from the Random Effects approach in order to give additional robust econometric evidence.

[5] As an alternative econometric methodology, the model was also estimated with the Pooled Ordinary Least Squares panel data methodology. The results are in line with these of both Fixed and Random Effects estimation methods and can be provided upon request.

Table 6: Estimation Results with Fixed Effects, 2003Q1-2015Q3

VARIABLES	mir
$unemp_{it}$	0.116***
	(0.009)
$inflrat_{it}$	0.231***
	(0.035)
$growth_{it}$	-0.225***
	(0.023)
$politic\_stab_{it}$	-1.470***
	(0.163)
$wage_{it}$	-0.334***
	(0.037)
Constant	24.110***
	(1.882)
Diagnostics	
Observations	732
Number of countries	15
R^2	0.350

Notes: (a) *, **, *** denote statistical significance at the 10, 5, and 1 percent level respectively, (b) numbers in parentheses denote robust standard errors, (c) unemp, inflrat, growth, politic_ stab and wage stand for unemployment rate, inflation rate, GDP growth rate, political stability and wage %GDP respectively.

Table 7: Estimation Results with Random Effects, 2003Q1-2015Q3

VARIABLES	mir
$unemp_{it}$	0.087***
	(0.008)
$inflrat_{it}$	0.301***
	(0.038)
$growth_{it}$	-0.165***
	(0.019)
$politic\_stab_{it}$	-0.512***
	(0.097)
$wage_{it}$	-0.109***
	(0.015)
Constant	11.233***
	(0.457)
Diagnostics	
Observations	732
Number of countries	15
R^2	0.285

Notes: (a) *, **, *** denote statistical significance at the 10, 5, and 1 percent level respectively, (b) numbers in parentheses denote robust standard errors, (c) unemp, inflrat, growth, politic_ stab and wage stand for unemployment rate, inflation rate, GDP growth rate, political stability and wage %GDP respectively.

All variables are found to exert a great significance on the MIR rate. Also, all variables found to have the proper sign as we expected. Specifically, regarding the Fixed Effects approach, the unemployment rate coefficient is positive and equal to 0.116, implying that higher unemployment levels lead to more risky borrowers with less collateral. Variables *growth*, *politic_stab* and *wage* found to exert a great negative impact on MIR rate with estimated coefficients equal to -0.225, -1.470 and -0.334, respectively denoting that a politically stable country with high economic growth along with high wages has fewer risky borrowers (that is, lower levels of MIR rate). The results related to the variable *growth* are in line with these of Valverde and Fernandez (2007) and Claeys and Vennet (2008).

The inflation rate is found to be significant and positive, supporting the study of Demirguc-Kunt and Huizinga (1999). The same results were also found with the Random Effects approach regarding the signs and the statistical significance and hence we could infer that our results are robust to alternative econometric methodologies.

5. Conclusions

The objective of this study is to examine the main drivers of MIR rate in the euro area for the period 2003Q1-2015Q3. By employing Fixed and Random Effects as econometric methodologies, I found that MIR rate is explained by the following macroeconomic factors: unemployment rate, inflation rate, GDP growth, political stability index, and wages as % to GDP. All of these factors are found to have a great effect on the MIR rate. The estimation results between Fixed Effects and Random Effects are very similar and thus, my results provide robust econometric evidence. Such findings can be helpful when designing macroprudential policies. Moreover, such findings could be useful for economic policymakers (in particular for monetary authorities).

In terms of directions for future research, other extra independent variables could be examined such as the tax on personal income, corruption index, business cycle and money supply. Because of the lack of data and a potential multicollinearity problem, I could not delve into the literature and examine further potential factors that affect MIR rate. However, a step as such could broaden the horizon for further research.

References

1. Abreu, M. and Mendes, V. (2003). "Do macro financial variables matter for European bank interest margins and profitability". Paper presented at EcoMod Network Conference, Istanbul Financial Management Association International.
2. Almeida, F.D. and Divino, J.A. (2015). "Determinants of the Banking Spread in the Brazilian Economy: The Role of Micro and Macroeconomic Factors". *International Review of Economics and Finance* 40: 29–39.
3. Anastasiou, D., Louri, H., and Tsionas, M. (2019). "Nonperforming loans in the euro area: A re core–periphery banking markets fragmented?". *International Journal of Finance and Economics* 24: 97–112.
4. Barjaktarović, L., Dimić, M., and Ječmenica, D., (2014). "Assesment of the Interest Rates in the Serbian Banking Sector", *Journal of Central Banking Theory and Practice*, 2:21-35.
5. Boyd, J.H., Levine, R., and Smith, B.D., (2001). "The impact of inflation on financial sector performance". *Journal of Monetary Economics* 47: 221–248.
6. Brock, P.L. and Suarez, L.R., (2000). "Understanding the behavior of bank spreads in Latin America". *Journal of Development Economics* 63: 113–134.
7. Claeys, S. and Vennet, R.V. (2008). "Determinants of bank interest margins in Central and Eastern Europe: A comparison with the West". *Economic Systems* 32: 197–216.
8. Cottarelli, C. and Kourelis, A. (1994). "Financial structure bank lending rates and the transmission mechanism of monetary policy". *Staff Papers of International Monetary Fund Washington D.C.* 41: 587-623.
9. Demigurz-Kunt, A. and Huizinga, H. (1999). "Determinants of commercial bank interest margins and profitability: Some international evidence". *The World Bank Economic Review* 13: 379-408.
10. Dickey, D. A. and Fuller, W. A. (1979). "Distribution of the estimators for autoregressive time series with a unit root". *Journal of the American Statistical Association* 74: 427–431.
11. Égert, B., Crespo-Cuaresma, J. and Reininger, T. (2007). "Interest rate pass-through in central and Eastern Europe: Reborn from ashes merely to pass away?", *Journal of Policy Modeling* 29: 209-225.
12. Fabris, N., (2018). "Challenges for Modern Monetary Policy", *Journal of Central Banking Theory and Practice*, 2: 5-24.
13. Fungacova, Z. and Poghosyan, T. (2011). "Determinants of bank interest margins in Russia: Does bank ownership matter?". *Economic Systems*, 35: 481–495.

14. Gigineishvili, N. (2011). "Determinants of interest rate pass-through: Do macroeconomic conditions and financial market structure matter?". *Working Papers of International Monetary Fund Washington D.C.* 11.
15. Hainz, C., Horvath, R., and Hlavacek, M., (2014). "The interest rate spreads in the Czech Republic: Different loans, different determinants?". *Economic Systems*, 38: 43-54.
16. Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, 46: 1251–1271.
17. Islam, S. and Nishiyama, S. (2016). "The determinants of bank net interest margins: A panel evidence from South Asian countries". *Research in International Business and Finance* 37: 501-514.
18. Krušković, B., (2017). "Exchange Rate and Interest Rate in the Monetary Policy Reaction Function", *Journal of Central Banking Theory and Practice*, 1: 55-86.
19. Louri, H. and Migiakis, P. (2015). "Determinants of Euro-Area Bank Lending Margins: Financial Fragmentation and ECB Policies". Bank of Greece Working Paper series, No. 198.
20. Mishra, P. Montiel, P. J. and Spilimbergo, A. (2010). "Monetary transmission in low income countries". *IMF Economic Review*. International Monetary Fund Washington D.C. 60: 270-302.
21. Mojon, B. (2000). "Financial structure and the interest rate channel of ECB monetary policy". Working Papers of European Central Bank Frankfurt 40.
22. Perera, A. and Wickramanayake, J. (2016). "Determinants of commercial bank retail interest rate adjustments: Evidence from a panel data model". *Journal of International Financial Markets Institutions and Money* 45: 1-20.
23. Sander, H. and Kleimeier, S. (2006). "Convergence of interest rate pass-through in a wider euro zone?". *Economic Systems* 30: 405-423.
24. Sander, H. and Kleimeier, S. (2004). "Convergence in euro-zone retail banking? What interest rate pass-through tells us about monetary policy transmission competition and integration". *Journal of International Money and Finance* 23: 461-492.
25. Saunders, A. and Schumacher, L. (2000). "The determinants of bank interest margins: an international study". *Journal of International Money and Finance* 19: 813-832.
26. Tarus, D.K. Chekol, Y.B., and Mutwol, M. (2012). "Determinants of net interest margins of commercial banks in Kenya: A panel study". *Procedia Economics and Finance* 2: 199-208.
27. Valverde, S. C. and Fernandez, F.R. (2007). "The determinants of bank margins in European banking". *Journal of Banking and Finance* 317: 2043-2063.

28. Wang, K.-M., and Lee, Y.M. (2009). "Market volatility and retail interest rate pass-through". *Economic Modelling*, 26: 1270-1282.
29. Wong, K. P. (1997). "On the determinants of bank interest margins under credit and interest rate risks". *Journal of Banking and Finance* 212: 251-271.