Kurdish Studies
Mar 2024
Volume: 12, No:2, pp. 6326-6339
ISSN: 2051-4883 (Print) | ISSN 2051-4891 (Online)
www.KurdishStudies.net

Received: January 2024 Accepted: February 2024
DOI: https://doi.org/10.58262/ks.v12i2.469

Russia Loan Supply and Monetary Policy Transmission Mechanism

Mohammad Farajnezhad[1]*, Ma Junzhe[2], Durrishah Idrus[3,4], Jason See Toh Seong Kuan[2]*

Abstract

The purpose of this study is to determine the extent to examine a credit channel of the monetary policy transmission mechanism in emerging economies, such as Russia from the BRICS countries using panel data. The findings of this study comprise the conclusion that there is a highly significant and positive between total assets and amount loans (0.42). Also, there is a significant but negative relationship between bank liquidity and loan amount (-1.69). In addition, there is a significant and positive relation between interaction macroeconomic variables interest rate with bank characteristic capital ratio on amount loan (0.06).

Keywords: *Monetary Policy Transmission Mechanism; Loan Supply; Panel Data, Russia.*

JEL Classification: C23; E51; E52

Introduction

Monetary policy transmission is a complex and interesting topic in macroeconomic literature. The Monetary policy transmission theory explains that an increase in the money supply should lead to an increase in price level and potentially increase the real output. There are many transmission channels through which monetary policy operates, including the credit channel, interest rate channel, exchange rate channel, and asset price channel (Mishkin, 2006). Among all channels, the credit channel can play a significant part in addressing the issue of monetary policy transmission mechanisms (MPTM). The credit channel has two sub-channels, the bank lending channel (BLC) and the balance sheet channel (BSC). The bank lending channel influences the capability of bank loan supply to a firm. On the other hand, the balance sheet channel describes the financial situations of firms and households and their capability to access the credit market (Bernanke and Gertler, 1995). Thus, credit channels show an essential role in the study of the macroeconomics phenomenon.

The credit channel emerges as a critical instrument in the macroeconomic variables used in the monetary policy transmission mechanism. Furthermore, monetary policy transmission is a powerful asset for influencing the economy. The channel serves as a crucial mechanism that explains the influence of monetary approaches in the economy by employing bank advance supply. (Mishkin, 1996). Furthermore, a more comprehensive credit channel exists, and that credit itself is dependent on the degree of financial activities. This implies the existence of a

[1]Azman Hashim International Business School, Universiti Teknologi Malaysia, 54100 Kuala Lumpur, Malaysia, Emails: taban1010@gmail.com
[2]Faculty of Business and Communication, Inti International University, 71800 Nilai, N. Sembilan, Malaysia, Emails: junzhema@sina.com, Jason See Toh Seong Kuan, Emails: jasonsee.toh@newinti.edu.my
[3]Engineering Department, Razak Faculty of Technology & Informatics, Universiti Teknologi Malaysia, 54100, Kuala Lumpur, Malaysia, dr.durrishah@ijn.com.my, Emails: durrisha@gmail.com

significant formal division in the economy that relies on money associated with many countries for commercial activity. In this context, it refers to the fact that the key role of bank loans and financial markets in bank advances and money market advancements (money division and capital market advancements) have serious effects on the secure banking sector and credit markets (Altunbas et al., 2009),(Singh et al., 2008) . According to the findings (Farajnezhad et al., 2020), the monetary transmission mechanism has a positive and insignificant effect on the Gini coefficient as an inequality index in OECD countries (probability is 0.18 with a coefficient of 0.004), and that raising interest rates would increase inequality in these countries. Similarly, in the study of (Farajnezhad and Suresh, 2019), the study's findings indicate that there is a credit channel in Malaysia. In other words, policymakers could use monetary policy to reduce inflation by modifying the credit supply. Furthermore, capital markets also have a positive effect on inequality, with a coefficient of 0.001 and a significant probability of 0.002. This article illustrates the positive impact of bank deposits on income inequality. In this regard, it is essential to understand how monetary policy is transmitted in an economy. Similar study in China scope (Farajnezhad, 2023), the capital ratio, GDP, inflation, and ROA interactions have a statistically significant but negative impact on the loan amount. The hypothesis is that capital ratio, total assets, and return on assets have a statistically significant and positive effect on the amount of the loan.

The investigation of monetary policy in Russia was first finished by Drobyshevsky and Kozlovskay (2002). Following Clarida et al. (1999), the authors utilized a generalized method of moments technique. The researchers utilized short-run interbank rates as a tool. One weakness of their study is the low consistency of assessed coefficients because the short time used from 1999 to 2001. The result showed that the extremely delicate is output/inflation trade-off to equally the step and nature of the strength in inflation. Therefore, it is the rapidity at which monetary policy would try to influence the optimal inflation rate. The observed strength in inflation is a great significance.

Since bank credits and deposits account for a sizable portion of overall financial assets and liabilities, taking advantage of the bank interest rate is a primary interest rate channel. Some academics argue that the effect of the interest rate channel varies based on some factors. Such concerns include the pace of change and the speed at which bank interest rates on loans and deposits change, as well as the degree of competition between banks, the extent of growth of the capital system, and the balance position of banks. Macroeconomic elements in Russia have been considered as a high fluctuation from the failure of the Soviet Union and the creation of the independent states of the Russian Federation. There were many efforts have been done to reduce his fluctuation by applying many macroeconomic policies.

There are several observational reviews into Russia's monetary policy, which has utilized distinctive factors and created inconsistent outcomes. For example, the bank lending channel study via the effect of movement in monetary policy on bank balance liabilities, which can reason the modification of bank assets, involve loans (Angeloni et al., 2003). Drobyshevskiy (2008) showed that correspondent accounts on commercial banks seem into monetary policy instruments in the central banks in Russia. The work of Volkov (2015)the finding indicated that there is an efficient monetary policy transmission on the economy based on utilizing banking products by financial services organized by credit association.

Russia observed extreme loan supply variations completed the past decade. The rapid growth of credit aggregates in 2006−2008 drove a credit boom that powered high monetary growth. The financial crisis 2008, even though encouraging a long period of financial stress in

deleveraging advanced economics, was weathered via Russia and other emerging countries by equally unsure influences on real sector growth. However, later the fall of Lehman Brothers in 2008 financial stress increased in Russia's financial markets and bank lending fell. This condition developed a relevance for the Central Bank of Russia (CBR), which complete numerous efforts at reviving Russian credit markets. It similarly showed instructional to policymakers on the test of recognizing drivers of loan supply dynamics (Deryugina and Ponomarenko, 2011).

According to the study of Salmanov et al. (2015) carried out several investigations on the monetary policy transmitting mechanism-specific banking channel in Russia. These studies were conducted through the generalized method of moments using data from 2002 to 2013 for the money supply, monetary base, interbank lending rate, and refinancing rate. Subsequent empirical conclusions verified the reality of the bank lending channel in Russia. The observational results are statistically significant banking channel instruments. Banks will reduce lending if the money supply falls. If the interbank loan interest rate falls, banks will increase lending. Nonetheless, the use of this method is minimal. The refinancing rate seems to have more of a regulating effect than a monetary one. Its effect, however, is statistically significant. The truth of the banking credit channel is critical to demonstrating monetary policy. To boost, the productivity of the bank lending channel must, first and foremost, increase the sizes of refinancing by credit establishments and affirm the coming growth of the sector of financial telecommunications.

The study of Ono (2015) points out that the money supply drives economic development through economic loans. Oil price increases and a strengthening ruble supply created circumstances, which encouraged financial development. Other studies have concluded that by Ono (2015) investigation whether a bank lending channel is in monetary policy transmission in Russia, using Russian bank-level data from 2005 through 2012. The consequences of conditions recommend that banks with less capital tend to respond mush delicate to fluctuations in monetary policy. Besides, the research finds that lesser, more liquid, and/or better-capitalized banks were likely to have more speedily rising loan portfolios, and bigger banks tended to decrease the crisis shock.

According to Pestova and Mamonov (2013) recognize the impact of bank specific elements and macroeconomic that main to the rise in the nonperforming loans of Russian banks. The writer's evaluation panel data econometric models by an extensive variety of independent macroeconomic variables and banks' specific variables. The conclusions recommend that the maximum of the negative effect on the loan quality of Russian banks come from the decline of macroeconomic circumstances.

The study Juurikkala et al. (2011) concentrate on the part of banks in the monetary policy transmission mechanism in Russia with the generalized method of moments model. As the specified long-term aim of the Russian Central Bank is to change to inflation targeting, considering how the banking sector responds to alteration in monetary policy stance is significant. The result shows that fluctuations in monetary policy principal banks to modification their credit supply. The stability of the lending channel depends on a bank's capitalization. And the well-capitalized banks seem slighter informational frictions and have easier access to other financing resources at periods of monetary contraction.

The effects of monetary policy transmission to be devised, it is needed to realize how monetary policy transmission activities are shifted to the real economy and the role that the financial

sector is very vital. A study on monetary policy transmission in Russia is very scarce. This research attempts to jump to fill this gap by evaluating the efficacy of the credit channel in Russia.

In this research, consider the following questions: (i) Do the effect of bank characteristics and macroeconomic variables on credit supply in Russia? (ii) Do the effect of interacting bank characteristics and macroeconomic variables on credit supply in Russia? The contribution of this study is contributing to the credit channel concerning the monetary policy transmission mechanism that drives the lending behavior of Russian commercial banks. The finding showed that the questions have been addressed by establishing some significant positive and some insignificant negative effects on the amount of loans (credit supply) in Russia. In Russia, the investigator of this analysis has shown that total assets and amount loans are highly significant and positive. There is also a significant and negative relationship between bank characteristics liquidity and loan amount in Russia. In Russia's country, there is a significant and positive relation between interaction macroeconomic variables interest rate with bank characteristic capital ratio on amount loan. Also, there is a significant but negative relationship between the interaction inflation rate with total assets and the interaction of GDP with return on assets with the amount of loan.

This study's empirical analysis includes a sample of 1128 commercial banks from Russia country over the period 2009–2018. The selection of this country allows analysis of the effect of loan supply reaction of banks to monetary policy through the credit channel and avoids the bias caused by different monetary policies. Also, in this study, the dataset comprises the entire period during which the emerging countries central Bank carried out the single monetary policy in the Russian economy. The statistical software STATA is utilized for data analysis. The investigation is achieved using the fixed-effect model and random effect model methodology for panel data. This methodology allows controlling both unobservable heterogeneity and the problems of endogeneity between monetary policy and characteristics of banks using tools. This methodology yields consistent and unbiased estimates of the relationships between the macroeconomic variables, bank-specific characteristics.

The remainder of the study is organized as follows. Section 2 materials and methods. Section 3 results and discussion. The random effect model in Russia is presented in Section 4 and section 5 concluding the study.

Materials and Methods

This analysis makes use of data from Fitch's International Bank Database, Bank scope. Only commercial banks were chosen for the sample, which spans the years from 2009 to 2018. The final panel sample has 1128 banks. Macroeconomic statistics (such as real GDP growth rates, interest rates, and inflation rates) are gathered from the International Monetary Fund (IMF) and the World Bank Development Indicators (WDI).).

To analyze the bank credit channel, this study extracts the cross-sectional relevance of credit availability following the financial crisis based on balance sheet data. (Kashyap and Stein, 2000) for the bank lending channel (Bernanke et al., 1996). Following presents the theoretical works (Bernanke et al., 1999, Holmstrom and Tirole, 1997), this study concentrates on bank capital ratio. Meanwhile (Kashyap and Stein, 2000),(Bernanke et al., 1996), this research also characteristics the bank liquidity ratios (Ehrmann et al., 2003, Gambacorta, 2005, Gunji and Yuan, 2010, Jimenéz et al., 2012, Jiménez et al., 2014, Juurikkala et al., 2011, Mar´ ıa Cantero

Saiz and errez, 2017).

In this research, we control for macroeconomic variables by real GDP growth, interest rate, and inflation rate. Table 1 shows the variables included in the regression models for loans and their determinants, together with a rating of the variables in the previous section.

Table 1 Definition of Variables

Variables	**Units**	**Definition**
		Dependent variable
Δ log amount loan it	00.00 0.00	The growth rate of loans lagged one year (log difference in the total loans)
		Independent variables
		Macroeconomics condition (t)
Δ IR t interest rate	%	Annual change of the country 3 -month interbank interest rate. Calculated as the nominal interest rate minus inflation in country j at time t.
Δ GDP	%	Annual change of the country Real GDP growth (YOY) in country j at time t.
Δ Inflation rate	%	Annual change of the country Consumer Price Index, the (end of the year) change in CPI in country j at time t
		Bank characteristic(b)
Δ Bank capital it	%	The ratio of bank equity over total assets of the bank
Δ Bank liquidity it	%	The ratio of liquid assets (cash and balance with central bank, and loans and advances to governments and credit institutions) held by the bank over the total assets of the bank
Ln total assets it	-	The log of the total assets of the bank
ROA it	%	The total net income over assets of the bank

The evaluation of this study approach follows the contributions by (Kishan and Opiela, 2000, Gambacorta, 2005, Kashyap and Stein, 1995, Jimenéz et al., 2012, Jiménez et al., 2014, Ehrmann et al., 2003, Gunji and Yuan, 2010, Mar´ ıa Cantero Saiz and errez, 2017). These researchers emphasize the relevance of a few heterogeneity problems for the transmission of monetary policies, and this is discovered to be an interaction term between the political instrument and the heterogeneity foundation for the application. A comparable activity takes place in this investigation. The empirical research by the banks in the monetary transmission system focuses on the answer to monetary shocks of credit supply. The biggest challenge is if bank types show reasonably strong lower lending following monetary tightening. According to the research on the bank-lending channel, some bank features are connected to the study of how sensitive banks are to the lending channel. The focus is on the supply of lending responses across different bank types to improve understanding of the influence of monetary policy on the supply of loans. That is why the model includes the previously indicated category variables, namely size, liquidity, and capitalization. To capture the influence that these qualities have on monetary policy variations, this analysis includes interaction terms between monetary policy parameters and bank-specific characteristics (Size, LIQ, and CAP).

This research solely looks at accepted applications and assigns an indication to applications filed by businesses I at time t that is approved (amount loan). The empirical model used in this study analyzes the major drivers of credit growth in banks by different types of ownership. In this study, the model is like the models applied with (Kishan and Opiela, 2000, Gambacorta, 2005, Kashyap and Stein, 1995, Jimenéz et al., 2012, Jiménez et al., 2014, Ehrmann et al., 2003, Gunji and Yuan, 2010, Mar´ ıa Cantero Saiz and errez, 2017). To analyse the relationship between monetary strategy and the probability of the extensive margin amount of loan, we estimate a linear model, which mainly follows (Mar´ ıa Cantero Saiz and errez, 2017, Jimenéz et al., 2012, Nguyen and Boateng, 2013, Gunji and Yuan, 2010) This is designed to examine if banks react differently to monetary policy shocks. The model employs the following equation, using interaction factors generated from the monetary policy indicator and a particular feature of the bank. The model for the static linear panel data is defined through the following equation:

$$\text{Ln}\ \Delta\,\text{amount loan}_{it} = \beta_1 \Delta IR_t + \beta_2 \Delta\,GDP_t + \beta_3\,\Delta INF\ \beta_4\ \text{capital ratio}_{it-1} + \beta_5 \text{liquidity}_{it-1} + \beta_6\ \text{Ln total assets}_{it-1} + \beta_7\ ROA_{it-1} + \beta_8(\Delta IR_t \times CAP_{it-1}) + \beta_9(\Delta IR_t \times LIQ_{it-1}) + \beta_{10}(\Delta GDP_t \times CAP_{it-1}) + \beta_{11}(\Delta GDP_t \times LIQ_{it-1}) + \beta_{12}(\Delta INF_t \times CAP_{it-1}) + \beta_{13}(\Delta INF_t \times LIQ_{it-1}) + \beta_{14}(\Delta GDP_t \times \text{Ln Total assets}_{it-1}) + \beta_{15}(\Delta GDP_t \times ROA_{it-1}) + \beta_{16}(\Delta INF_t \times \text{Ln Total assets}_{it-1}) + \beta_{17}(\Delta INF_t \times ROA_{it-1}) + \beta_{18}(\Delta IR_t \times \text{Total assets}_{it-1}) + \beta_{19}(\Delta IR_t \times ROA_{it-1}) + \varepsilon_{it}$$

Research Conceptual Framework

In general, this study aims to create a deeper comprehension of the credit channel of monetary policy transmission mechanism channel in Russia. This study's framework analyses the relations between elements of the monetary policy transmission mechanism and bank-related variables, between the monetary policy transmission mechanism and the macroeconomic variables. This study expands a study framework presented in Figure 2.1, where the amount loan variable is taken as dependent and macroeconomic conditions (interest rate, GDP, and Inflation) and with bank characteristic (bank capital, bank liquidity, and bank size) variables are taken as independent variables.

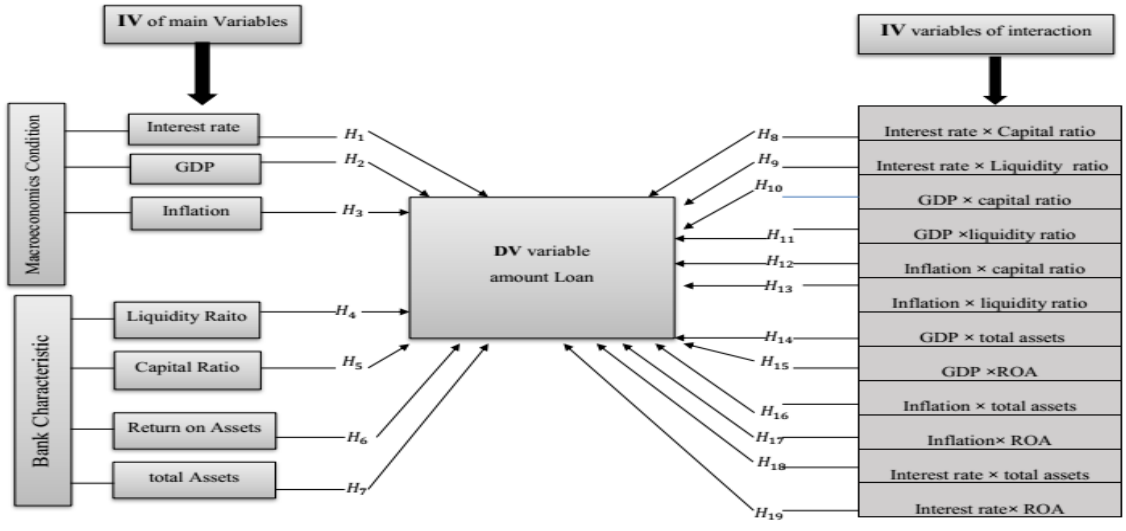

Figure 2.1 Research conceptual framework

Results and Discussion

Correlation Variables Matrix

Table 2 indicates that correlation variables with logarithm Δ amount loan as a dependent variable based on credit channel and independent variables in Russia country. There are some significant and some of them insignificant correlated with some of the bank elements and macroeconomics variables.

However, interest rates and their interactions with size are highly linked (r = 0.92), suggesting that a multicollinearity problem exists. However, because the interest rate and its interaction with size are not included in the same regression model, multicollinearity between independent variables does not affect the regression outcome. Similarity, the inflation rate, and its interaction with the return on assets, as well as the inflation rate and its interaction with the liquidity ratio, are strongly linked (r = 0.91 and r=0.80, respectively), suggesting the presence of a multicollinearity problem. However, multicollinearity between independent variables such as inflation and the interaction between GDP and return on assets, as well as inflation rate and the interaction between inflation rate and a liquidity ratio, would not influence the regression result.

As shown the **Error! Reference source not found.**, all macroeconomic variables (GDP, inflation rate, interest rate) have a correlation coefficient with interaction variables the bank characteristics (p>0.01). Also, there is a correlation coefficient with interaction variables, implying the existence multicollinearity problem. However, the multicollinearity between variables would not affect the result of regression.

This table shows the correlation matrix between amount loan and bank-level determinants and economics determinants based on the unbalanced country sample (Russia). The sample consists of 1128 commercial bank-year observations from 2009 to 2018. The independent variables are liquidity ratio, capital ratio, Ln total assets. ROA, ΔGDP, Δ INF, Δ IR. Ln AL: Ln amount Loan; LIQ: Liquidity Ratio; CAP: Capital Ratio; Ln TA: Ln total assets; LIQ: Δ GDP × Liquidity Ratio; GDP*CAP: Δ GDP × Capital Ratio: INF*LIQ: Δ INF × Liquidity Ratio; INF*CAP: Δ INF × Capital Ratio; IR*LIQ: Δ IR × Liquidity Ratio; IR*CAP: Δ IR ×Capital Ratio: GDP*LN TA: Δ GDP × Ln total assets; INF*LN TA; Δ INF × Ln total assets; INF*ROA: Δ INF × ROA; IR* Ln TA:Δ IR × Ln total assets;

The table presents the Pearson correlation coefficients among variables with their significance. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table 3 shows the variance inflation factor (VIF) of Russia's country-level variables. The value of VIF for the main variables ranges between 1.04 and 3.5. Also, the tolerance values for main variables with interaction variables range between (0.100708) and (0.853904). Additionally, the value of VIF for all the variables ranges between 1.17 and 9.93 in Russia. The results show that the tolerance for all the variables is more than 0.1, and, so, the VIF is below the threshold value of 10, as proposed by (Hair et al., 2011). In other words, the tolerance and VIF values of the variables included in this research are within the suggested ranges.

Table 2: Correlation Matrix Variables for Russia.

	AL	**TA**	**ROA**	**LIQ**	**CAP**	**GDP**	**INF**	**IR**	**GDP × LIQ**	**GDP × CAP**	**INF × LIQ**
AL	1										
TA	0.1986***	1									
ROA	0.0059	-0.0772 ***	1								
LIQ	-0.1629***	-0.1997***	0.0671***	1							
CAP	-0.0954***	-0.5113***	0.3135***	0.1338***	1						
GDP	0.1522***	0.0453***	-0.0302**	0.0386**	0.0236**	1					
INF	0.0345**	0.0370***	0.0441***	-0.0787***	-0.0151	-0.1623***	1				
IR	-0.1007***	0.015	0.0603***	-0.0664***	-0.0344**	-0.6833***	0.6030***	1			
GDP × LIQ	0.1723***	-0.0843***	0.0128	0.3154***	0.0690***	0.6137***	-0.2733***	-0.5112***	1		
GDP × CAP	0.1373***	-0.1873 ***	0.0167	0.0816***	0.3239***	0.5595***	-0.2507***	-0.4652***	0.6287***	1	
INF × LIQ	-0.0619***	0.0255**	0.0365**	-0.1409***	-0.0211	-0.2605***	**0.8092*** **	0.5503***	-0.4206***	-0.2600***	1
INF × CAP	-0.0503***	0.0694***	0.0489***	-0.0545***	-0.0988***	-0.2294***	0.7533***	0.5072***	-0.2496***	-0.3832***	0.6902***
IR × LIQ	-0.1036***	0.0492***	0.0398***	-0.1324***	0.0309***	-0.3689***	0.5518***	0.7744***	-0.6278***	-0.4045***	0.6888***
IR ×CAP	-0.0845***	0.0853***	0.0513***	-0.0424***	-0.1125***	-0.3419***	0.5332***	0.7267***	-0.6278***	-0.6039***	0.4802***
GDP × TA	0.0438***	-0.0595***	0.1093***	0.0851***	0.1033***	0.2068***	-0.1195***	-0.1851***	-0.4122***	-0.1850***	-0.1212***
GDP × ROA	-0.0686***	-0.0679***	0.0309**	-0.0505***	0.0255**	-0.1580***	**0.9177*** **	0.5509***	0.2477***	-0.1753***	0.7047***
INF × TA	-0.0193	0.0635**	-0.0487***	-0.0348**	-0.0907***	-0.0718***	0.2475***	0.1731***	-0.2361***	-0.1115***	0.2301***
INF × ROA	-0.0333**	-0.0168*	0.0.354**	0.0520***	-0.0143	-0.6149***	0.5616***	-0.0775***	-0.0775***	-0.3648***	0.4835***
IR × TA	-0.0254**	0.0640***	-0.0475***	-0.0497***	-0.0851***	-0.1104***	0.2064***	**0.9210*** **	-0.4441***	-0.1753***	0.1840***
IR ×ROA	0.0295	-0.1271***	-0.0147	0.0106	-0.0379**	0.9152***	-0.1551***	0.2512***	-0.1332***	0.4297***	-0.2281***
AL											
TA											
ROA											
LIQ											
CAP											
GDP											
INF											
IR											
GDP × LIQ											
GDP × CAP											
INF × LIQ											
INF × CAP	1										
IR × LIQ	0.4592***	1									
IR ×CAP	0.6961***	0.6964***	1								
GDP × TA	-0.1623***	-0.1622***	-0.2169**	1							
GDP × ROA	0.5665***	0.4752***	0.3980***	-0.0906***	1						
INF × TA	0.3912***	-0.1557***	0.2739***	-0.4818***	0.1768***	1					
INF × ROA	0.3897***	0.6823***	0.5729***	-0.1459***	0.6069***	0.1276***	1				
IR × TA	0.3076***	0.2408***	0.3475***	-0.7245***	0.1479***	0.8177***	0.1974***	1			
IR ×ROA	-0.1786***	-0.3171***	-0.2640***	0.1670***	-0.1831***	-0.0562***	-0.6643***	-0.858***	1		

Multicollinearity Test

Table 3 Variance Inflation Factor (VIF)

Variance Inflation Factor (VIF) -Russia		
Variable	VIEW	1/VIF (Tolerance)
Δ IR	3.5	0.286045
ΔGDP	2.29	0.435948
Δ INF	1.93	0.518768
Capital Ratio	1.52	0.659676
Total assets	1.4	0.715375
ROA	114	0.880677
Liquidity Ratio	1.04	0.961622
Mean VIF	1.83	
Δ IR ×Capital Ratio -1	9.93	0.100708
Δ INF × Capital Ratio -1	7.07	0.141493
Δ INF × Liquidity Ratio-1	6.89	0.145189
Δ INF × ROA-1	6.72	0.148819
Δ GDP × Liquidity Ratio-1	4.97	0.201241
Δ GDP × Capital Ratio -1	4.58	0.218382
Δ GDP × ROA -1	3.3	0.302606
Capital Ratio	1.85	0.541644
total assets	1.7	0.588308
Liquidity Ratio	1.33	0.751934
ROA	1.17	0.853904
Mean VIF	4.5	

Source: Author

Unit Root Test

Table 4 Unit Root test in Russia

	Variables	**ADF***	**Lags**	**PP****	**Lags**
with main variables	Ln Δ amount Loan	-100.65	0	317.846	0
	Liquidity Ratio	-14.864	0	34.7535	0
	Capital Ratio	-10.229	0	40.3597	0
	Ln total assets	-3.8517	0	24.1297	0
	ROA	-20.942	0	-32.952	0
	ΔGDP	-79.68	0	183.371	0
	Δ INF	-46.298	0	65.2034	0
	Δ IR	-39.462	0	46.1239	0
With interaction variables	Δ GDP × Liquidity Ratio-1	-2.6365	0	5.7925	0
	Δ GDP × Capital Ratio -1	-1.0911	0	5.4622	0
	Δ INF × Liquidity Ratio-1	-59.622	0	-71.03	0
	Δ INF × Capital Ratio -1	-60.074	0	-72.662	0
	Δ IR × Liquidity Ratio-1	-13.956	0	-13.944	0
	Δ IR ×Capital Ratio -1	-14.459	0	-13.653	0
	Δ GDP × Ln total assets-1	-71.348	0	157.932	0
	Δ GDP × ROA -1	-12.783	0	-15.815	0
	Δ INF × Ln total assets-1	-47.747	0	-52.087	0
	Δ INF × ROA-1	-48.633	0	-58.235	0
	Δ IR × Ln total assets-1	-36.455	0	-37.087	0
	Δ IR ×ROA -1	-22.22	0	-24.085	0

Source: Author

Note: *ADF (Augmented Dickey-Fuller)

**PP (Philip- Perron)

According to the results of table 4 reports of the Augmented Dickey-Fuller (ADF) unit root test and Philip-Perron (PP) test statistic for the dependent variable (amount loan), and the independent variables (liquidity ratio, capital ratio, total assets, return on assets, GDP, Δ interest rate, and Δ inflation) with interaction terms and the correlated control variables in Russia. As evident from the table, interestingly all variables under consideration do have not a unit root problem, and the data is stationary. Additionally, the p-value of all variables is significant, So, this study rejects H_0 and do not reject H_1. This means all variables in this study do have not a unit root problem and the data are stationary.

Random effect model in Russia

This section focuses entirely on unbalanced panel data that includes 1128 commercial banks listed in bank scope in Russia country. The following equation assesses the association between the bank-level determinants and amount loan using the pooled OLS and random effect analysis:

$$Ln\ \Delta amount\ \text{loan}_{it} = -0.15 - 0.026\Delta IR_t + 0.27\Delta\ GDP_t + 0.06\Delta INF + 0.28\ CAP - 1.69\ LIQ + 0.42Size + 0.10\ ROA + 0.064(\Delta IR_t \times CAP_{it-1}) + 0.0007(\Delta IR_t \times\ LIQ_{it-1}) - 0.06(\Delta GDP_t \times\ CAP_{it-1}) + 0.32(\Delta GDP_t \times LIQ_{it-1}) - 0.07(\Delta INF_t \times\ CAP_{it-1}) + 0.036(\Delta INF_t \times LIQ_{it-1}) - 0.064\ (\Delta\ GDP \times\ Size) - 0.0003(\Delta GDP \times\ ROA) - 0.015\ (\Delta\ INF \times\ Size) + 0.00004(\Delta\ INF \times ROA) + 0.001(\Delta\ IR \times\ Size) - 0.003(\Delta IR \times ROA) + \varepsilon_{it}$$

According to **Error! Reference source not found.** from results of fixed-effect regression with robust standard error adjusted in Russia country, the p-value which is significant at 1,5 and, 10 percent were accepted. Based on the independent variables such as size and GDP are statistically significant and computed positively (coefficient =0.420 and coefficient =0.277), but the liquidity ratio and interest rate are computed negatively (coefficient =-1.69 and coefficient =-0.026). According to the findings of this investigation, hypothesis H_0 is rejected, however, hypothesis H_1 is not rejected. This demonstrates how to size, GDP, liquidity ratio, and interest rate affect the amount of loans in the Russian economy from 2009 to 2018.

As shown in **Error! Reference source not found.**, the interaction between interest rate and capital ratio is statistically significant and estimated positively (coefficient=0.064). Nonetheless, the interaction between inflation rate and size, as well as the interaction between GDP and return on assets, are statistically significant but calculated negatively (coefficient=-0.015 and coefficient=0.003). According to the findings of this research, H_0 is rejected while H_1 is not rejected. This demonstrates that the amount of loans in the Russian economy from 2009 to 2018 is affected by these two interaction variables.

The findings showed that the topic was addressed by establishing some significant positive and some insignificant negative effects on the amount of loan (credit supply) in the Russian economy. Interest rates and GDP have been shown to have a significant impact on the amount of loans in Russia (credit supply). According to the research, (liquidity ratio, total assets) and are most important in banking and economic growth in Russia. This suggests that in some counties, this variable is an important determinant in loan approval.

Table 5 Random effect in Russia country

Fixed Effect Model Russia			
Variables	**Fixed effects (within) regression**	**P-value**	**Robust Standard Error**
TA	0.4204014	0.000***	0.041768
Standard Error	0.0304139		
ROA	0.0102652	0.078	0.0058139
Standard Error	0.0031347		
LIQ	-1.695159	0.000***	0.1388191
Standard Error	0.0984321		
CAP	0.2854203	0.178	0.211557
Standard Error	0.1343607		
ΔGDP	0.2774605	0.000***	0.0299246
Standard Error	0.0233466		
Δ INF	0.0685021	0.491	0.0218302
Standard Error	0.0186406		
Δ IR	-0.0264936	0.000***	0.0384125
Standard Error	0.0407527		
Δ GDP × LIQ	0.3275907	0.220	0.037662
Standard Error	0.0326487		
Δ GDP × CAP	-0.0658303	0.135	0.0535844
Standard Error	0.0429629		
Δ INF × LIQ	0.0362947	0.052	0.0242492
Standard Error	0.0214417		
Δ INF × CAP	-0.0756546	0.987	0.0388766
Standard Error	0.028555		
Δ IR LIQ	0.0007137	0.308	0.0432737
Standard Error	0.0439033		
Δ IR ×CAP	0.0644729	0.000***	0.0632742
Standard Error	0.0578865		
Δ GDP × TA	-0.0640029	0.077	0.0049221
Standard Error	0.0033459		
Δ GDP × ROA	-0.0038313	0.000***	0.0021662
Standard Error	0.0024656		
Δ INF × TA	-0.0156209	0.000***	0.0023976
Standard Error	0.0026324		
Δ INF × ROA	0.0000448	0.972	0.0012625
Standard Error	0.0014106		
Δ IR × TA	0.0014633	0.700	0.0037992
Standard Error	0.0054787		
Δ IR ×ROA	-0.0036788	0.170	0.0026782
Standard Error	0.0034269		
Constant	-1.581388	0.000	0.2287498
Standard Error	0.1649769		
R-sq:	within = 0.2677		
	between = 0.2193		
	overall = 0.1575		
chi2(19) = (b-B)'[(V_b-V_B)^(-1)](b-B)Prob>chi2	171.06 0.000	Hausman test	

Source: Author

According to the findings of this study, there is a strong relationship between the loan amount and

TA liquidity ratio, GDP, and interest rate based on Russia's country. It is consistent with the outcome of an effort by (Kashyap and Stein, 1995), which has shown that banks with less total assets tend to reduce loans comparatively more under the restrictive monetary policy. According to (Gunji and Yuan, 2010), Banks with larger total assets are less likely to decrease loans as a result of monetary policy shocks. This study's findings do not support the claim presented by (Jiménez et al., 2012) that Short-term interest rate increases have a higher positive impact on loan availability for companies. The finding of Walker (2012) has shown the size of the bank can be an effect on monetary policy which is consistent with this study. It is consistent with work the finding of research of (Singh and Kalirajan, 2007), displayed that the interest rate is important in monetary policy transmission in the post-reform period. Similarly, research to (Chen et al., 2016), Monetary policy transmission is more essential in a deficit scenario than in a normal environment. Following an in-depth examination of the prior literature, this study indicates that total assets impact loan amount and has examined the BRICS countries as a group as well as Russia individually. It is congruent with attempts to discover (Kapan and Minoiu, 2013), indicated that during the current financial crisis, the bank balance sheet was strong for maintaining lending and reducing liquidity and that the bank was more dependent on investment and less credit supply than other banks. Banks want to be prepared in the case of a poor economic situation. Total assets are required for bank display, and the bank can protect itself by controlling bank credit. The hypothesis linked to total assets and the loan was presented based on an examination of the literature on total assets.

The result of this study showed that there are an insignificant amount loan and capital ratio based on the country of Russia. It is inconsistent with work the finding of (Jimenéz et al., 2012) studied the extended lending margin with loan applications and found that a decrease in a firm's capital decreases loan approvals, but a decrease in the bank's liquidity or capital improves loan approvals. According to (Sichei, 2005), The findings revealed that monetary policy transmission is increasing, the bank loan is declining with large banks, and well-capitalized banks may be impacted by monetary policy. According to the findings of this study, there is no significant relationship between the loan amount and ROA depending on the country of Russia. It is incompatible with the discovery of work (Leung et al., 2014) there is a strong and positive effect on firm performance using ROA as a proxy for firm performance. (Shabbir, 2012) Using a model of 45 non-financial businesses listed on Pakistan's Karachi Stock Exchange from 2010 to 2012, researchers discovered that foreign investment has a positive and statistically significant relationship with ROA. According to the findings of this study, the relationship between the loan amount and inflation in Russia is insignificant. It is an inconsistency with the discovery of (Liu and Zhang, 2010) presented a new Keynesian model for China, which is a mixed monetary policy that specifies both the money supply and the interest rate. And the outcome indicates that monetary policy that consolidates both interest rates and the amount of money for monetary policy mechanisms achieves the greatest, welfare gains as assessed by inflation strength.

Conclusions

The study's findings demonstrated that, based on empirical results, the author of this research established that Russia has defined continued economic convergence and macroeconomic variables and bank characteristics in each of the BRICS group countries. In Russia's country, there is a significant and positive relation between interaction macroeconomic variables interest rate with bank characteristic capital ratio on amount loan. Also, there is a significant but negative relationship between the interaction inflation rate with total assets and the interaction of GDP with return on assets with the amount of loan. Given the aforementioned data, it is possible to infer that there is a diverse reaction of loan supply to monetary policy among Russia's banks. The findings may change if quarterly data is

utilized instead of yearly data. Quarterly statistics can reflect the short-run influence of policy on loans that annual data cannot capture. Perhaps analysis is necessary to examine the impact of financial market changes, like securitization, on monetary policy transmission. The study is beneficial to banks, central banks, and economic policymakers. Policymakers should rely on the findings on the amount of money lent to comprehend the significance of the credit channel's utility as a key feature of the monetary policy transmission system. Yet, this study is limited to commercial banks which exclude industrial banks and financial institutions. This is due to industrial banks and financial institutions being different in terms of capital structure, regulations, assets, and materially different types of operations.

References

ALTUNBAS, Y., GAMBACORTA, L. & MARQUÉS-IBANEZ, D. 2009. An empirical assessment of the risk-taking channel. *Available at SSRN 1459627*.

ANGELONI, I., KASHYAP, A. K. & MOJON, B. 2003. *Monetary policy transmission in the euro area: a study by the eurosystem monetary transmission network*, Cambridge University Press.

BERNANKE, B. S. & GERTLER, M. 1995. Inside the black box: the credit channel of monetary policy transmission. *Journal of Economic perspectives,* 9**,** 27-48.

BERNANKE, B. S., GERTLER, M. & GILCHRIST, S. 1996. The Flight to Quality and the Financial Accelerator. *Review of Economics and Statistics,* 78**,** 1-15.

BERNANKE, B. S., GERTLER, M. & GILCHRIST, S. 1999. The financial accelerator in a quantitative business cycle framework. *Handbook of macroeconomics,* 1**,** 1341-1393.

CHEN, K., HIGGINS, P., WAGGONER, D. F. & ZHA, T. 2016. China pro-growth monetary policy and its asymmetric transmission. Working Paper.

CLARIDA, R., GALI, J. & GERTLER, M. 1999. The science of monetary policy: a new Keynesian perspective. National bureau of economic research.

DERYUGINA, E. B. & PONOMARENKO, A. A. 2011. Identifying structural shocks behind loan supply fluctuations in Russia.

DROBYSHEVSKIY, S. 2008. Institut economiki perechodnogo perioda. *Analys vozmozhnosty vozniknoveniy «puziry» na rosiiskom rinke nedvizimosti: Moscow*.

DROBYSHEVSKY, S. & KOZLOVSKAY, A. 2002. Inside aspects of Russian monetary policy. *IET WP № 45*R.

EHRMANN, M., GAMBACORTA, L., MARTINEZ-PAGÉS, J., SEVESTRE, P. & WORMS, A. 2003. The effects of monetary policy in the euro area. *Oxford Review of Economic Policy,* 19**,** 58-72.

FARAJNEZHAD, M., SURESH, A., RAMAKRISHNAN, L. & ZADEH, M. S. K. 2020. Analyses the Effect of Monetary Policy Transmission on the Inequality in OECD Countries. *Journal of Environmental Treatment Techniques,* 8**,** 589-596.

FARAJNEZHAD, M. & SURESH, A. L. R. 2019. Effectiveness of Credit Channel of Monetary Policy Transmission Mechanism on Commercial Banks in Malaysia. *International Journal of Recent Technology and Engineering (IJRTE),* 8.

FARAJNEZHAD, M., (2023). An examiner of China commercial banks' loans through credit channel prior COVID-19. Journal of Business,Economics and Finance (JBEF), 12(3), 118-130

GAMBACORTA, L. 2005. Inside the bank lending channel. *European Economic Review,* 49**,** 1737-1759.

GUNJI, H. & YUAN, Y. 2010. Bank profitability and the bank lending channel: Evidence from China. *Journal of Asian Economics,* 21**,** 129-141.

HAIR, J. F., RINGLE, C. M. & SARSTEDT, M. 2011. PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice,* 19**,** 139-152.

HOLMSTROM, B. & TIROLE, J. 1997. Financial intermediation, loanable funds, and the real

sector. *the Quarterly Journal of economics*, 663-691.
JIMENÉZ, G., ONGENA, S., PEYDRÓ, J.-L. & SAURINA, J. 2012. Credit supply versus demand: Bank and firm balance-sheet channels in good and crisis times. *European Banking Center Discussion Paper,* 3.
JIMÉNEZ, G., ONGENA, S., PEYDRÓ, J.-L. & SAURINA, J. 2012. Credit supply and monetary policy: Identifying the bank balance-sheet channel with loan applications. *The American Economic Review*, 2301-2326.
JIMÉNEZ, G., ONGENA, S., PEYDRÓ, J. L. & SAURINA, J. 2014. Hazardous Times for Monetary Policy: What Do Twenty-Three Million Bank Loans Say About the Effects of Monetary Policy on Credit Risk-Taking? *Econometrica,* 82, 463-505.
JUURIKKALA, T., KARAS, A. & SOLANKO, L. 2011. The role of banks in monetary policy transmission: Empirical evidence from Russia. *Review of international economics,* 19, 109-121.
KAPAN, M. T. & MINOIU, C. 2013. *Balance sheet strength and bank lending during the global financial crisis*, International Monetary Fund.
KASHYAP, A. K. & STEIN, J. C. The impact of monetary policy on bank balance sheets. Carnegie-Rochester Conference Series on Public Policy, 1995. Elsevier, 151-195.
KASHYAP, A. K. & STEIN, J. C. 2000. What do a million observations on banks say about the transmission of monetary policy? *American Economic Review*, 407-428.
KISHAN, R. P. & OPIELA, T. P. 2000. Bank size, bank capital, and the bank lending channel. *Journal of Money, Credit and Banking*, 121-141.
LEUNG, S., RICHARDSON, G. & JAGGI, B. 2014. Corporate board and board committee independence, firm performance, and family ownership concentration: An analysis based on Hong Kong firms. *Journal of Contemporary Accounting & Economics,* 10, 16-31.
LIU, L.-G. & ZHANG, W. 2010. A New Keynesian model for analysing monetary policy in Mainland China. *Journal of Asian Economics,* 21, 540-551.
Mar´ Ia Cantero Saiz , S. S. A., Bego ´ Na Torre Olmo , ˜ & Errez, C. L. G. 2017. A New Approach To The Analysis Of Monetary Policy Transmission Through Bank Capital. *Finance Research Letters*.
MISHKIN, F. 1996. The Credit Channel. *Journal of Economic Perspectives*.
MISHKIN, F. S. 2006. Monetary policy strategy: How did we get here? : National Bureau of Economic Research.
NGUYEN, V. H. T. & BOATENG, A. 2013. The impact of excess reserves beyond precautionary levels on Bank Lending Channels in China. *Journal of International Financial Markets, Institutions and Money,* 26, 358-377.
ONO, S. 2015. Bank Lending Channel in Monetary Policy Transmission: Evidence from Russia. *International Journal of Economics and Finance,* 7, p1.
PESTOVA, A. & MAMONOV, M. 2013. Macroeconomic and bank-specific determinants of credit risk: Evidence from Russia.
SALMANOV, O., ZAYERNYUK, V. M. & LOPATINA, O. A. 2015. An Analysis of the impact of monetary policy on bank lending in Russia.
SHABBIR, S. 2012. Balance sheet channel of monetary transmission in Pakistan: An empirical investigation. *SBP Research Bulletin, 8 (1): 1,* 12.
SICHEI, M. M. 2005. Panel Date Analysis.
SINGH, K. & KALIRAJAN, K. 2007. Monetary transmission in post-reform India: An evaluation. *Journal of the Asia Pacific Economy,* 12, 158-187.
SINGH, S., RAZI, A., ENDUT, N. & RAMLEE, H. 2008. Impact of financial market developments on the monetary transmission mechanism. *Bank of International Settlement,* 39, 49-99.
Volkov, I. I. 2015. Interaction Of Monetary, Credit And Budget Policy As A Way To Overcome Crisis In Russia. *Российского Экономического УниверситетА имени ГВ ПлехановА.*