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Article

Interest Rate Channel and Market Rates in Case of Uzbekistan – Svar Approach

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Abstract: In this scientific work, is studied the influence of the interest rate channel of the transmission mechanism on market rates. The analysis was carried out in case of Uzbekistan, using statistical data of 36 commercial banks for the period 2019M01-2024M06. According to the results of the analysis, it was found that the influence of the Central Bank key interest rate on the short-term interest rates on total time deposits and the short-term interest rates on total loans of legal entities is strong.

Keywords: interest rate channel, monetary policy, commercial banks, deposit, credit.

Introduction

The transmission mechanism of the monetary policy of the Central Bank has its own channels, through which the impulses of the monetary policy are transmitted on the economy. The channels of the transmission mechanism represent some mechanisms of interaction between the monetary policy and the real sector of the economy, starting from the announcements of monetary decisions. As a result, the reverse reaction of the monetary policy makers to the changing indicators reflecting the real situation after the measures implemented in the field of monetary policy is also taken into account.

In the economic literature, there are different views on the monetary policy transmission mechanism. In the previous period, the transmission mechanism was partially studied or some areas were studied, but after Ben Bernanke's scientific article at the Cornegie-Rochester Conference Series on Public Policy in 1986, scientists became very interested in studying this field on a large scale.

Although the impact of the central bank on the nominal interest rate by changing the money supply is undisputed by scholars, there are differing views on how the central bank affects the spending of households and firms. V. Ramey (1993), a scientist at the University of California, conditionally divided these views into two groups, i.e., "money view" and "credit view".

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In the "money view" (money view) the central bank changes the short-term interest rate to affect the exchange rate and the long-term interest rate. Their change leads to a change in the volume of investments and expenses related to attracting capital. In the J.M. Keynes model, that is, in the IS-LM model, an increase in the nominal interest rate leads to an increase in the real interest rate, which, in turn, reduces aggregate demand. If we take into account the dependence of gross production on gross demand, this situation will cause a decrease in GDP. According to the "Christiano and Eichenbaum (1995)" model, an increase in the nominal interest rate reduces the aggregate supply, resulting in a negative effect on GDP growth.

In the "money view", great attention is paid to the investment demand of the financial sector. As a result, deficiencies in the financial sector and other economic indicators are ignored. The "money view" is more characteristic of Keynesians.

The nature of the "credit view" is based on the state of the financial market, information asymmetry, and the substitution of financial assets with real assets. They lead to higher interest rates and increase the cost of raising capital. From the credit view, by adjusting the price of real assets, it controls not only the interest rate itself, but also the premium paid for additional risks. Here, real assets participate as loan collateral. As the collateral price increases, the risk decreases and the reward decreases.

This situation was seen in the scientific works of A. Tobin (1969), K. Brunner and A. Meltzer (1972), who analyzed the market of various assets and tried to integrate it into the monetary policy transmission mechanism. In their work, B. Bernanke and A. Blinder (1988) focus on the imperfection of market information and the costs of a loan agreement between a bank and a client. This situation hinders the efficient functioning of the financial market and creates premiums that oblige borrowers to pay in addition to interest payments on debt.

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In this research, we consider the impact of the main indicative interest rates in monetary policy on deposit and loan interest rates of commercial banks. Central banks primarily affect short-term market interest rates by changing the key interest rate. Based on this, we will analyze the impact on the short-term deposit and loan rates of in banks.

Literature review

In the last 50 years, many scientific studies have been conducted on the importance of the monetary policy transmission mechanism and on determining the effectiveness of the transmission in different countries. In this, scientists are using various empirical models. Over the years, these scientific studies reveal new channels of monetary policy transmission and methods of determining their effectiveness.

M.P. Deb et al. (2023) studies the impact of the monetary policy transmission mechanism on the economy, with the statistical data of 33 developed and developing market economy countries during 1991-2023. According to the results of the analysis, it was determined that there are significant differences in how the monetary policy affects the economy, depending on the economic conditions in the countries, the level of development of financial institutions and other factors. In their scientific research, using VAR models and Local Projections Method, monetary restrictive policy has a quick and negative effect on economic activity, but it takes time to fully affect inflation and inflation expectations. It is worth noting that there is considerable variation in the conduct of monetary policy across countries and over time, depending on structural features and cyclical conditions. The channels of the transmission mechanism work effectively in countries with a managed exchange rate regime, a developed financial system and a strong monetary policy framework. They also found that monetary policy is stronger when there is low uncertainty in the

economy, when financial conditions are tight, and when monetary policy is coordinated with fiscal policy, that is, when positions move in the same direction.

A. Cesa-Bianchi, G. Thwaites and A. Vicondoa (2020) researched the impact of changes in monetary policy in Great Britain on macroeconomic and financial variables using a new series of high-frequency monetary policy surprises. Using surprises as instruments in a monthly SVAR model over the UK's inflation targeting period, they find that monetary policy tightening leads to a decline in economic activity and the CPI, a stronger pound sterling, a contraction in bank lending and leading to a significant increase in mortgage and corporate bond spreads. UK monetary policy has also affected foreign credit spreads, confirming the large presence of large international players in the UK financial intermediation sector. Finally, they propose a new identification restriction test using the narrative series of monetary policy shocks developed by Cloyne and Hurtgen (2016) to show that high-frequency monetary policy surprises are not significantly affected by nonmonetary news.

D.Vayanos and J.L.Vila (2021) modeled the interest rate channel in their scientific work and determined that it occurs as a result of the interaction between investors' preferences for certain periods and prudent actions (arbitrageurs) in relation to risk. According to the results of the analysis, shocks in short-term interest rates are transmitted to long-term interest rates through arbitrageurs' trading on the stock exchange. Arbitrageurs benefit from passing these short-term interest rate shocks through bond risk premiums, which have been found to be directly proportional to movements in the interest rate structure. If short-term interest is the only risk factor, changes in investor demand will have the same effect on interest rates for all maturities, regardless of where they originate. The analysis showed that long-term interest rates are less affected by short-term interest rate forecasts. Buying large amounts of assets can be more effective in moving long-term interest rates, especially when focused on longer durations.

In our opinion, the econometric models used in this study show how long-term interest rate movements and their market reaction take place, taking into account the interaction of investor demand and short-term interest rates. This modeling helps to understand the relationship between investor demand and interest rates. The results show that large asset purchases and forecasts play an important role in moving long-term rates, providing important implications for economic policy and monetary policy planning.

M.Gubareva and M.R.Borges (2022) studied the sensitivity of the developing market corporate debt to interest rates. According to them, in previous studies, the sensitivity of corporate bonds to interest rates depends on the maturity, creditworthiness of issuers, embedded options and other individual factors. However, the dependence of sensitivity to interest rates on the stages of the economic cycle does not receive proper academic attention. Their research has provided empirical evidence and theoretical explanations for the bifurcation of sensitivity to interest rates across phases of the cycle, and shown how credit transmission reacts to interest rates. The research, analyzed using statistical data from 2004-2016, suggests that hedging against interest rates should be dynamic and take into account where the economy is in the current economic cycle.

B.S.Bernanke (2020) said that in order to overcome various monetary restrictions caused by the low setting of short-term interest rates in the money market, the Federal Reserve System and central banks of other developed economies have used new monetary policy instruments in recent years. In the scientific research conducted by this economist, it was noted that new monetary instruments, in particular, quantitative easing (QE) and forward guidance, are considered as the main new instruments used by the FedBank. He notes that the new instruments have been effective in easing financial conditions when central banks' key interest rates are low, and they may be even more effective in the future. He noted that new monetary instruments should be included in the set of standard central bank instruments. Simulations from the model used in FedBank show that if the nominal interest rate is in the range of 2-3 percent, which is consistent with many estimates for the US, then a combination of quantitative easing (QE) and forward-looking policy is around 3 percent. gap, and this compensates to a large extent the effects of the low threshold. The

econometric models used in his research are designed to simulate the effects of monetary policy. The results show that new monetary instruments, in particular quantitative easing (QE) and forward guidance, are effective in easing economic conditions further. It also suggests that if the real interest rate is low, there is a need to strengthen countermeasures to constraints on money market rates.

Research methodology

In our work, we analyzed the affect of the Central bank key interest rate (INR_t) and money market rates (MMR_t) to the short-term interest rates on total time deposits of individuals ($STDR\ of\ Individuals_t$), to the short-term interest rates on total time deposits of legal entities ($STDR\ of\ Legal\ Entities_t$), to the short-term interest rates on total loans of individuals ($STLR\ of\ Individuals_t$) and to the short-term interest rates on total loans of legal entities ($STLR\ of\ Legal\ Entities_t$). The selected indicators correspond to the periods 2019M01-2024M06. We conduct our empirical analysis through the SVAR model.

Analysis and discussion of results

the interest rate channel of the monetary policy transmission mechanism has a faster and stronger impact on the economy than other channels. Through the interest channel, central banks initially affect the money market rate, and the rest of the market interest rates change accordingly. Market interest rates include bank deposit rates, loan rates, securities rates, etc.

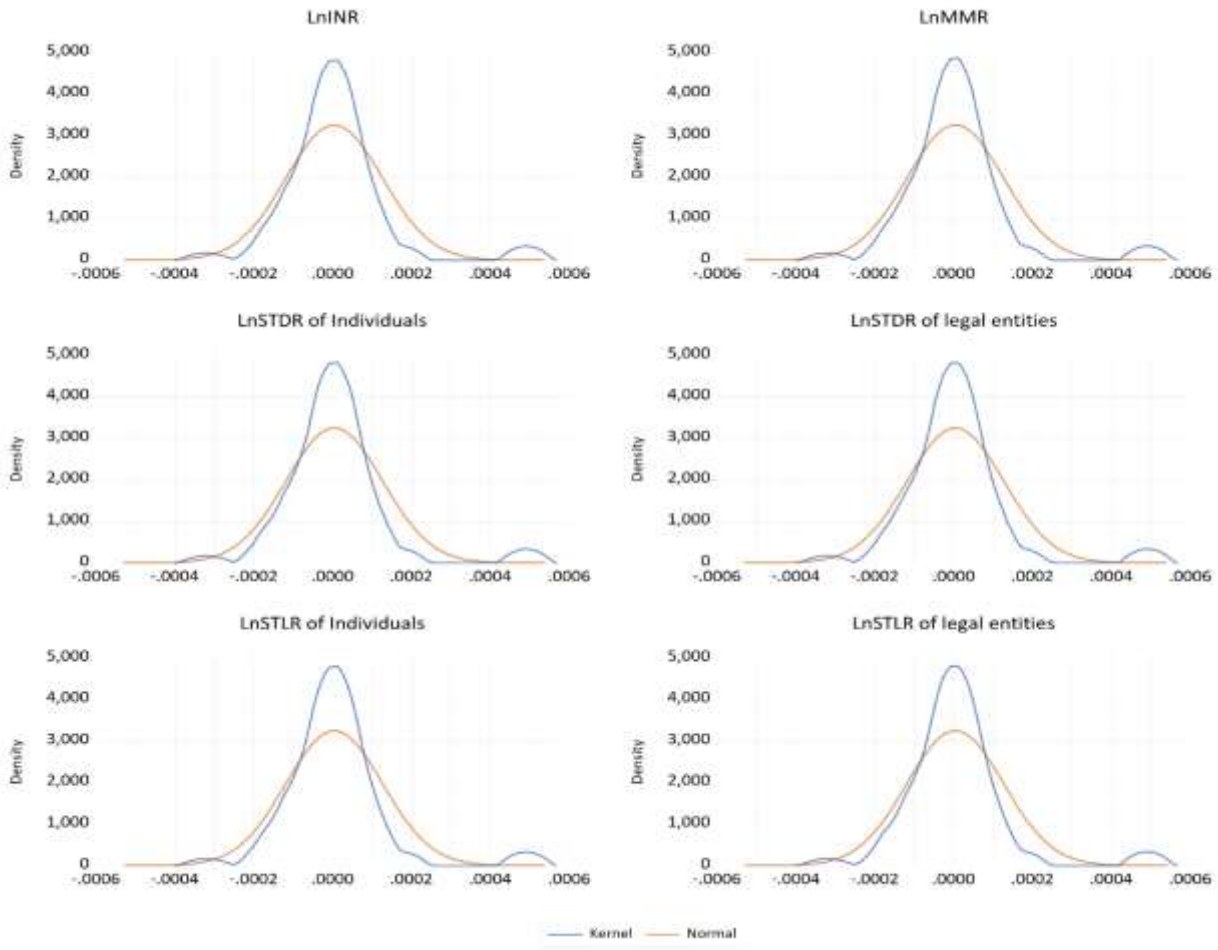

Diagram 1. Normal distribution of the selected indicator

The Jacques Bera coefficient was used to test the normal distribution of the data. The analysis showed that all the selected indicators have a normal distribution. Because it was found that the Jacques-Bera coefficient calculated for all the selected indicators is reliable and their probability is less than 0.05.

Table 1

Descriptive statistics of the selected indicators

	Observations	Mean	Maximum	Minimum	Std. Dev
INR_t	64	0.38	1.76	-1.64	0.69
MMR_t	64	0.37	1.75	-1.65	0.68
$STDR\ of\ Individuals_t$	64	0.40	1.76	-1.63	0.69
$STDR\ of\ Legal\ Entities_t$	64	0.38	1.75	-1.63	0.69
$STLR\ of\ Individuals_t$	64	0.43	1.80	-1.58	0.68
$STLR\ of\ Legal\ Entities_t$	64	0.42	1.79	-1.60	0.69

The average level of the central bank's real key interest rate is 0.38 percent, and it fluctuated from -1.64 percent to 1.76 percent during the period under review, and its standard deviation is equal to 0.69 percent. Also, the average level of the money market real rate is 0.37 percent, and the minimum -1.65 percent, maximum 1.75 percent, and its standard deviation is equal to 0.68 percent.

Table 2.

Correlation matrix of indicators.

	INR_t	MMR_t	$STDRInd_t$	$STDRLegEnt_t$	$STLRInd_t$	$STLRLegEnt_t$
INR_t	1					
MMR_t	0.6023	1				
$STDRInd_t$	-0.2256	0.1443	1			
$STDRLegEnt_t$	0.0536	0.3294	0.4586	1		
$STLRInd_t$	0.4793	0.4530	0.2116	0.3287	1	
$STLRLegEnt_t$	0.4290	0.4349	0.2591	0.3837	0.6816	1

According to the results of the analysis, it was found that there is a strong correlation between the Central Bank key interest rate and the money market rate. Also, there is a correlation between the money market rate and the bank loan rates.

We conduct our empirical analysis through the SVAR model. When using the SVAR model, we perform the Augmented Dickey-Fuller Test based on the initially selected indicators.

Using this Augmented Dickey-Fuller Test model, it is appropriate to check the indicators for unit root and to conclude whether these indicators are stationary or non-stationary.

Table 3.

Augmented Dickey-Fuller Test

		t-Statistic	Probability	Conclusion
1	INR_t	-7.707338	0.0000	I(0)
2	MMR_t	-7.713397	0.0000	I(0)
3	$STDR\ of\ Individuals_t$	-7.697551	0.0000	I(0)
4	$STDR\ of\ Legal\ Entities_t$	-7.694982	0.0000	I(0)
5	$STLR\ of\ Individuals_t$	-7.705718	0.0000	I(0)
6	$STLR\ of\ Legal\ Entities_t$	-7.709811	0.0000	I(0)

From the above data, it can be seen that all the selected indicators are stationary, and this is the basis that we can use the SVAR model. This can be seen from the image data below.

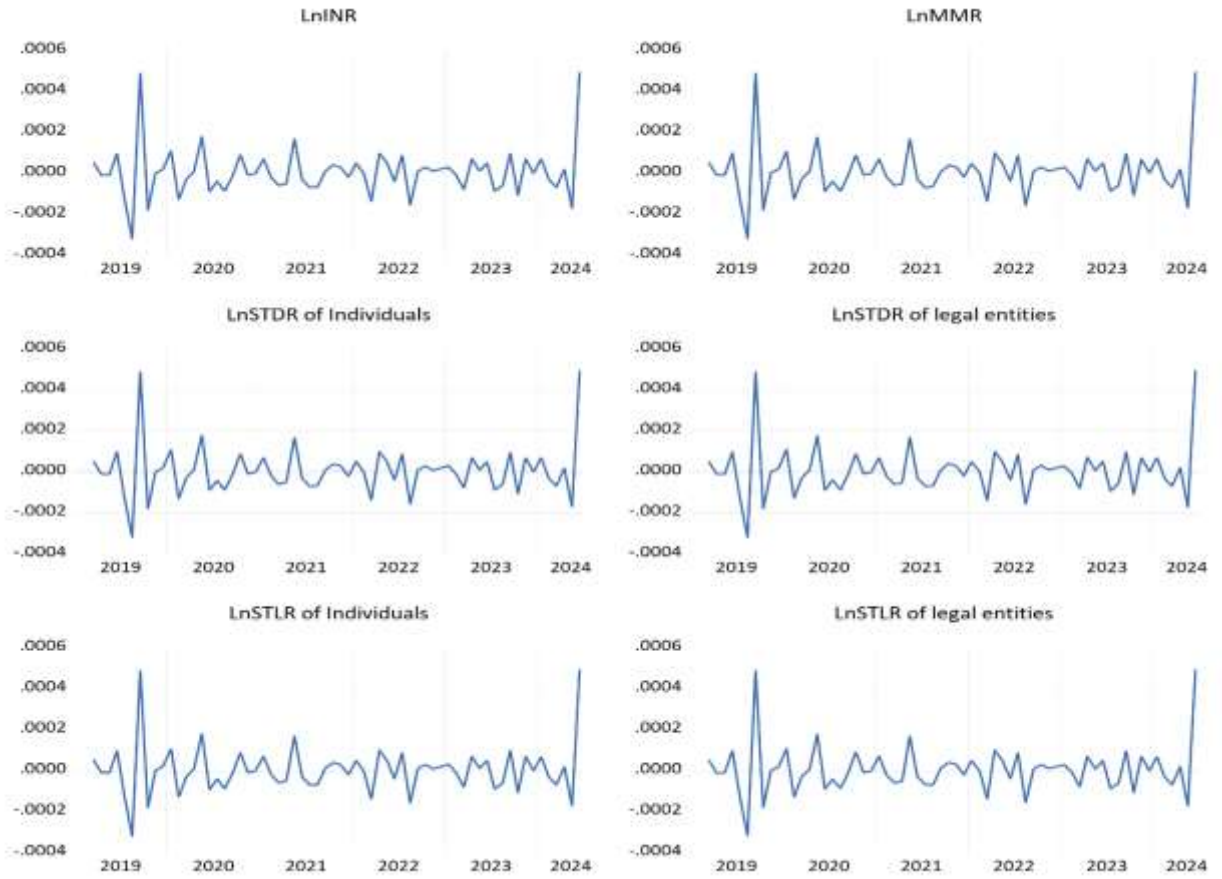

Diagram 2. Dynamics of changes of the analyzed indicators in the period 2019M01-2024M06.

At the next stage of our analysis, it will be appropriate to select the optimal "lag" for the SVAR model.

Table 4.

VAR Lag Order Selection Criteria

Lag	LogL**	LR	FPE	AIC	SC	HQ
0	4257.201	NA	1.18e-68	-139.3836	-139.1760	-139.3023
1	4355.961	174.8548	1.52e-69	-141.4414	-139.9880*	-140.8718*
2	4401.428	71.55372	1.15e-69	-141.7517	-139.0526	-140.6939
3	4445.844	61.16361*	9.53e-70*	-142.0277*	-138.0828	-140.4816

As can be seen from the above data, the optimal number of lags for our model is 3 based on the LR test, Final Prediction Error (FPE) and Akaike Information Criterion (AIC) tests. However, according to the Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ) tests, the number of lags is 1. Therefore, it is not a mistake for us to accept the optimal number of "lags" as 3 in our analysis.

When the indicators are analyzed using the SVAR model, the number of "lags" is assumed to be 3, and the results obtained are as follows.

Table 5

The result of the SVAR model

Vector Autoregression Estimates (with restrictions)

	STDR of Ind	***STDR of LegEnt***	***STLR of Ind***	***STLR of LegEnt***

***INR* (-1)**	0.328630	0.143789	0.568988	0.586190
	(0.13702)	(0.22355)	(0.18266)	(0.16923)
	[2.39833]	[0.64320]	[3.11499]	[3.46389]
***INR* (-2)**	-0.022812	0.061027	0.540507	0.085645
	(0.15040)	(0.24537)	(0.20049)	(0.18575)
	[-0.15167]	[0.24871]	[2.69592]	[0.46109]
***INR* (-3)**	-0.045447	0.234860	0.152993	0.110940
	(0.13034)	(0.21265)	(0.17375)	(0.16098)
	[-0.34867]	[1.10443]	[0.88051]	[0.68917]
***MMR* (-1)**	0.358144	0.154110	0.099358	0.246607
	(0.07242)	(0.11814)	(0.09653)	(0.08944)
	[4.94567]	[1.30441]	[1.02925]	[2.75738]
***MMR* (-2)**	0.204241	0.035419	0.210160	0.286753
	(0.08721)	(0.14229)	(0.11626)	(0.10771)
	[2.34182]	[0.24892]	[1.80765]	[2.66221]
***MMR* (-3)**	0.152498	0.051736	0.109757	0.015625
	(0.07191)	(0.11732)	(0.09586)	(0.08881)
	[2.12072]	[0.44099]	[1.14499]	[0.17594]
C	4.60E-06	4.58E-06	4.57E-06	4.59E-06
	(1.6E-05)	(1.6E-05)	(1.6E-05)	(1.6E-05)
	[0.28804]	[0.28720]	[0.28646]	[0.28780]

The mutual impulse response of the selected indicators is presented below.

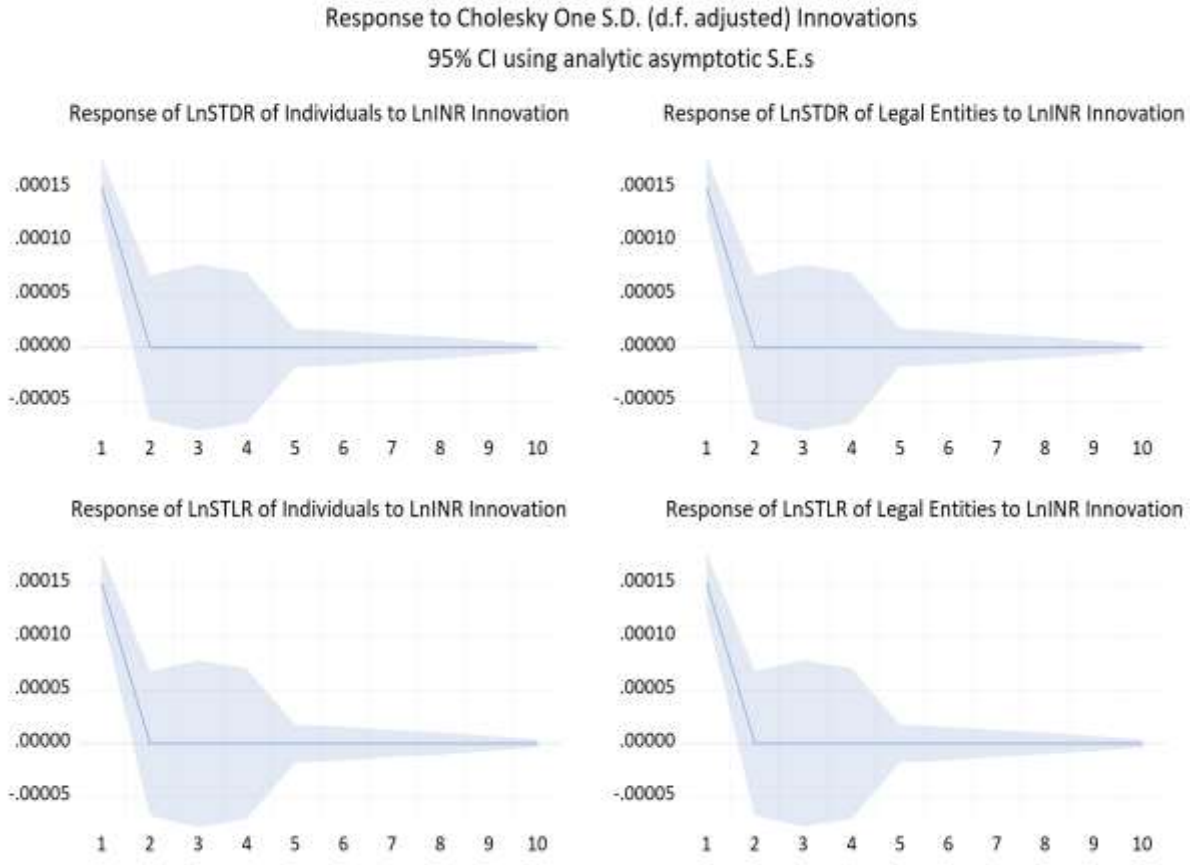

Diagram 3. Impulse responds of short-term interest rates of the commercial banks to selected indicators

From the impulse reaction in the structural vector autoregression model, we can see that the short-term interest rates on total time deposits of individuals and and legal entities in commercial banks to the Central Bank key interest rate is strong, and this effect is positive.

Conclusion

From the results of the model, we can see that the Central Bank key interest rate and the money market rates have a strong influence on short-term deposits and loans rates of commercial banks. In particular, it was determined that a one percent increase in the Central Bank key interest rate a month ago will increase the short-term interest rates on total time deposits of individuals by 0.33 percent. Also was determined that a one percent increase in the Central Bank key interest rate increases the short-term interest rates on total loans of individuals by 0.57 percent, and the short-term interest rates on total loans of legal entities by 0.59 percent.

The influence of the money market rate on the short-term interest rates of commercial banks is becoming stronger. In particular, it was determined that a one-percent increase in the money market rate increases the short-term interest rates on total time deposits of individuals by 0.36 percent with a one-month lag, by 0.20 percent with a two-month lag, and by 0.15 percent with a three-month lag. Also, it was determined that a one percent increase in the money market rate increases the short-term interest rates on total loans of legal entities by 0.25 percent with a one-month lag, and by 0.29 percent with a two-month lag.

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