INTEREST RATE PASS-THROUGH IN BULGARIA*

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Abstract

This paper examines the interest rates pass through process under currency board and how efficiently changes in market interest rates are transmitted to retail interest rates (including bank lending rates on loans for non-financial enterprises). For that purpose, the equilibrium relationship between interest rates at money and retail markets is defined and the adjustment for short run relationship is formulated using an error correction model. Terms and conditions of bank loans are very important for symmetric interest rate transmission and efficient monetary policy. The effects of monetary policy increase when transmission mechanism function effectively and private sector experience improved credit access and low interest rates on loans. In case of currency board, monetary policy faces various constrains related to central banks direct intervention in money market. The Bulgarian Central Bank applies only policy instruments that are compliant with the monetary system under currency board.

Key words: Interest Rates Pass-Through, Transmission Mechanism, Monetary Policy, Financial Crisis

BULGARİSTAN'DA FAİZ ORANI GEÇİŞKENLİĞİ

Özet

Çalışma, para kurulu kapsamında faiz oranı geçişkenliğini ve piyasa faiz oranlarındaki değişikliklerin perakende faiz oranları üzerindeki etkinliğini incelemektedir. (Buna finansal olmayan işletmeler için bankaların kredi faizleri dahildir.) Bu doğrultuda, para faiz oranları ve perakende piyasası arasındaki denge ilişkisi tanımlanmış, kısa vade için hata düzeltme modeli kullanılarak formüle edilmiştir. Simetrik faiz oranı aktarımı ve etkin bir para politikası için banka kredilerinin koşulları büyük önem taşımaktadır. Aktarım mekanizması fonksiyonunun etkin olması, özel sektör tecrübesinin krediye ulaşımı geliştirmesi ve krediler üzerindeki düşük faiz oranları para politikaısnın etkilerini arttırmaktadır. Para kurulu durumunda merkez bankasının doğrudan para piyasasına müdahale etmesiyle bağlantılı olarak, para politikası çeşitli kısıtlamalarla karşı karşıya kalmaktadır. Bulgaristan Merkez Bankası yalnız, para kurulu kapsamında para sistemiyle uyumlu politika araçlarını uygulamaktadır.

Anahtar Kelimeler: Faiz Oranları Geçişkenliği, Aktarım Mekanizması, Para Politikası, Finansal Kriz.

1. Introduction

Significant brunch of the economic literature studied interest rate interactions in terms of transmission effects between money and credit markets. Interest rates are one of the transmission mechanism channels, and the speed and rate of adjustment are discussed mostly in reference to central banks' monetary policy. The results from empirical studies show that transmission effects delay over time and retail interest rates change with some time lag. On the other side, the terms and conditions of bank loans to non-financial enterprises and households determine to a great extend the decisions related to consumption, savings and investments.

Effectiveness of monetary transmission mechanism through interest rate channel is measured by the rate of adjustment of changes in wholesale interest rates to retail interest rates. Central bank policy is considered to be effective only if commercial banks lower the level of loan interest rates in short time. Central bank reference rate is the exogenous impulse that causes inequilibrium in money market (Tieman, A., 2004; Angeloni, I., A. K. Kashyap, and B. Mojon, eds., 2003), and a subject to study is the reaction of loan interest rates (Sorensen, C., T. Werner, 2006; Kobayashi, T., 2008).

2. A Brief Review of Literature

The interest rate studies show a strong relation between central banks' reference rates and/or market rates and banks' interest rate policy. Symmetric or non-symmetric interaction between interest rates is revealed, depending on the rate and speed of interest rate adjustment (Scholnick, B., 1996; De Bondt, G., 2002. Two major

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hypotheses can be summarized from the pass through literature. First one is the consumer behavior hypothesis that is related to the opportunity and experience of the economic agents to invest in capital markets. It is assumed that bank lending rates tend to be rigid upwards where capital markets are well-developed with greater participation of the investors. The second hypothesis is closely related to the rate of bank concentration, as banks are likely to increase lending rates where they can exercise more market power.

Interest rates pass through is well studied in economies in Eurozone with conventional monetary policy and well developed capital markets, but much lower attention is paid solely to transmission mechanism in terms of market interest rates and bank lending interest rates. Currency board in Bulgaria put serious restrictions in terms of studying the effect of Bulgarian central bank monetary policy on short term interest rates. Because of its explicit rule of non performing open-market operation, the current study is directed to analyze interest rate interactions between interbank money market and (bank) loan market. The aim is to determine whether transmission mechanism function effectively and what is the rate of adjustment of interest rates, i.e. how commercial banks respond to the money market dynamics and to what extend the changes of wholesale interest rates are transferred to retail lending interest rates. The result will help us to reveal the relations in interest rates short run dynamics and to investigate whether they move to long term equilibrium.

Mihailov (2010) studied interest rate pass through in reference to bank lending interest rates in leva and euro, and dynamics of Eurozone interbank market represented by Euribor. Credit risk is proved as a significant factor for determining the bank lending rates to private sector. Karagianis, Panagopoulos & Vlamis (2010) include in their study the reference rate of Bulgarian National Bank, except market interest rates. Results showed that transmission mechanism work effectively only in decreasing interest rates.

This paper adds to previous interest rate pass through studies in two areas. First, the analysis of market interest rates is widen and along with Euribor a reference rate of Bulgarian interbank money market, namely Sofibor, is included. The aim is to study the role of interbank market in transmission process, as Bulgarian National Bank cannot intervene on money market. Second, the effect of financial and economic crisis is studied, by consecutive analysis of interest rates interactions in two periods – before and during economic crisis.

3. Methodology and Data

This study considers the period of 2003-2011, in which the economy passes consequently through a phase of economic growth and decline in economic activity. The analysis is made for 2 sub-periods, 2003-2007 and 2008-2011, in order to determine and study the effect of financial and economic crisis on transmission channels of monetary policy.

We use 1-month data from interest rate statistics of the Bulgarian National Bank to insight the level of interest rates in the economy. In order to have consistent analysis and conclusions, a preliminary processing of row data is made.

Two groups of variables are formed in order to implement a comprehensive study of interest rate pass through mechanism. *First group* is referred to market interest rates and is aimed at studying the impact of interbank money market through the reference rates Sofibor and Euribor. Those reference rates are applied with the following terms: 1,2,3-month Sofibor и 1,3,6,12-month Euribor, or totally forming 7 variables. *The second group* of variables reflects the interest rate policy in retail bank lending market. More precisely, we use interest rates on loans for new business for non-financial enterprises. Lending interest rates are distinguished by currency (leva and euro) and term structure (divided on short-term and long-term loans), and totally form 4 variables, and namely interest rates on: short-term loans in leva, short-term loans in euro, long-term loans in leva and long-term loans in euro.

The aim of the empirical study is to analyze and assess interactions between wholesale interest rates and retail interest rates on loans for non-financial enterprises.

Special attention is paid at direction and speed of pass-through process. We follow in previous change of wholesale interest rates, what would be the reaction of retail interest rates, and would long-term equilibrium be restored.

Pass-through process is studied in three steps.

First step is aimed at determine whether we observe trend (development) in dynamics of interest rates (interest rates tend to move together through time), so we made tests for stationarity for all variables.

Interest rates dynamics in the period of 2003-2011 implies that, similar to most macroeconomic variables, interest rates series will show development in long run, or they will be nonstationary of 1 order. Such hypothesis is testes by applying augmented Dicky-Fuller ADF test to determine nonstationarity of the variables (Dickey & Fuller, 1981).

The preliminary test of stationarity for each variable is needed to further study interest rates long-term dynamics. Stationarity tests shows haw many times a single variable should be differentiated to became a stationary one (Petkov, P., 2009).

Having a trend in interest rate series implies that standard regression models are no longer applicable as we need to consider the time as a factor. Often the instrument of monetary policy has no immediate effect on retail interest rate change, but is lagged over time. On the other side, the pass through by monetary transmission mechanism could be delayed in short run, but in long run dynamics to observe long run equilibrium. In such cases applying standard regression models leads to spurious regression and "false" results.

Second step of the studying interest rates interaction involves analysis of long-term dynamics of wholesale and retail interest rates and further investigation of long term interest rates interactions. Considering long-term dynamics of interest rates we follow whether they move to long run equilibrium (despite the interest rates short-term dynamics).

Following previous studies, long-term equilibrium is tested using co-integration analysis of time series. For that purpose we use widely applied in the literature Engle and Granger approach (Engle & Granger, 1987). Cointegration tests for all pairs of variables will reveal whether a long term relationship between wholesale and retail interest rates exists. In such case, it shows that despite of short run dynamics, the exogenous impulse that causes wholesale interest rates changes, in long run, is transferred and cause change in retail interest rates on loans for non-financial enterprises. That means, the effects of monetary policy through the interest rate channel is fully passed through to bank lending market.

Engle and Granger approach put some restrictive conditions referred to the level of differentiating of time series. Most important of them, related to cointegration analysis, are (1) each series to be integrated of order 1 or I(1) and (2) stationary residuals.

Studying transmission mechanism of monetary policy through interest rate channel in term of long term equilibrium, wide the following groups of models are applyed: error correction models, ECM (Engle & Granger, 1987), vector autoregressive models (VAR) (Sims, 1972, 1980; Cochrane, 1994), autoregressive models (AR) (Enders & Granger, 1998; Enders & Siklos, 2001).

ECM models are appropriate to study the reaction of retail interest rates to changes in wholesale interest rates. Main advantage of ECM models is the opportunity, from one side, to follow the short run dynamics, and on the other side, to determine the existence of long term equilibrium (Scholnik, 1991; Winker, 1999).

VAR models are widely used when we have nonstationary time series, which are not cointegrated, and furthermore allow to deepen analysis by two additional functions:

(1)   Variance decomposition (Statev, S., 2008) – allows us to find the degree to which changes in one variable (for instance market interest rates) can explained changes in second variable (for instance retail interest rates);

(2)   Impulse response function furthermore allows us to examine the reaction (direction, speed of change) of the second variable (retail interest rates) to exogenous shock, coming from the first variable (market interest rates).

After proving cointegration between market and retail interest rates on loans for non-financial enterprises, a standard error correction model (ECM) is applied.:

$$\Delta y = -EC_t + \sum_{j=0}^{p-1} \gamma_j \Delta x_{t-j} + v_t ,$$

where:

Δy – a change in bank lending interest rates;
Δx – a changes in market interest rates;
γ – short term impact of market interest rates;
EC – residuals in cointegration regression.
Parameter estimation of the model characterizes interest rate pass through speed and rate of adjustment.

Third step is aimed at investigating interest rate pass through in short run. It is studied what is short-term banks' response to changes in European wholesale interest rates. It is reasonable to assume that banks

would transfer the changes in Euribor immediately to lending interest rates to private sector. Concerning the transmission of changes in Sofibor, it can be expected it will be affected by endogenous factors, as well.

Analysis of short term dynamics is furthermore directed to mutual related movement of interest rates, without reference to long term equilibrium. A Granger causality test (Granger, C. W. J., Huang, B.-N., and Yang, C.-W., 2000) is applied to specify whether one economic variable (e.g. market interest rates) can be applied to predict a change in second variable (e.g. bank lending rates) (Granger, C.W.J., 1969).

Conception of causality allows us to predict the behavior of bank lending interest rates to a previous change in Euribor and Sofibor, but does not assess the relationship between interest rates (as regression analysis normally does). Generally, Granger test results in this case will reveal can we predict changes in bank lending rates to loans for non-financial enterprises in terms of fluctuations in interbank money market (caused by exogenous impulse). Appropriate model to study Granger causality for nonstationary time series, integrated of order 1 with no cointegration proved between variables, is vector autoregression model (Swanson, N. R. and Granger, C. W. J., 1997).

The econometric analysis in this article is made with statistical software package Gretl 1.9.4.

4. Empirical Results

Following the above methodology in order to study interest rate interactions, first, we examine the stationarity of all variables and second, a cointegration test is performed where it is applicable, consecutively for two periods: 2003-2007 and 2008-2011. The impact of financial crisis is investigated in speed and movement of interest rate trends at interbank and loan markets for the two periods.

4.1. Results for the period 2003-2007

ADF unit root test shows that all tested variables (interest rates on short-term and long-term loans in leva and euro) are nonstationary and integrated of order 1, I(1) (Table 1 and Table 2).

Table 1/*Tablo 1*: ADF Unit root test, retail interest rates/ *ADF Birim Kök Testi, Perakende Faiz Oranı*

Variables		t-statistic		p-value		Integrated of order	
		2003-2007	2008-2011	2003-2007	2008-2011	2003-2007	2008-2011
Short-term loans, leva	L	-0.8562	0.2046	0.3452	0.9730	I(1)	I(1)
	FD	-6.6033	-3.1990	0.0000	0.0201		
Long-term loans, leva	L	-1.6495	-1.4610	0.4571	0.5536	I(1)	I(1)
	FD	-6.6079	-2.8029	0.0000	0.0049		
Short-term loans, euro	L	0.1788	2.9559	0.7382	0.1015	I(1)	I(1)
	FD	-4.1293	-2.9503	0.0000	0.0398		
Long-term loans, euro	L	-2.2905	-1.6151	0.1751	0.4748	I(1)	I(1)
	FD	-9.3553	-2.3450	0.0000	0.0184		

Nonstationarity of variables allows us to make further investigation for long term relationship between market interest rates and interest rates of loans to nonfinancial enterprises.

Performed Engle and Granger Cointegration Test involves consecutively testing of each pairs of variables, formed as follow:

(1)   1,2,3-month Sofibor and interest rates on short- and long-term loans in leva, and

(2)   1,3,6,12-month Euribor and interest rates on short- and long-term loans in euros

Results shows co-integration only for 1-month Euribor, 3-month Euribor and short-term loans in euros (Table 3).

Table 2/*Tablo 2:* ADF unit root test, market interest rates/ *ADF Birim Kök Testi, Piyasa Faiz Oranı*

Variables		t-statistic		p-value		Integrated of order	
		2003-2007	2008-2011	2003-2007	2008-2011	2003-2007	2008-2011
Euribor 1M	L	1.1025	-2.6034	0.9976	0.0922	I(1)	I(1)
	FD	-7.4258	-3.5291	0.0000	0.0363		
Euribor 3M	L	1.1965	-1.2634	0.9982	0.8962	I(1)	I(1)
	FD	-3.9115	-4.0774	0.0116	0.00673		
Euribor 6M	L	0.8678	-1.0611	0.9951	0.9338	I(1)	I(1)
	FD	-3.4266	-4.5842	0.0479	0.001		
Euribor 12M	L	0.7793	-0.7342	0.9937	0.9698	I(1)	I(1)
	FD	-3.4402	-4.8331	0.0097	0.0004		
Sofibor 1M	L	2.3119	-1.4568	1.0000	0.5557	I(1)	I(2)
	FD	-6.6902	-1.648	0.0000	0.4579		
	BP	x	-2.4479	x	0.0139		
Sofibor 2M	L	2.6315	-1.4714	1.0000	0.5484	I(1)	I(2)
	FD	-6.2342	-1.7062	0.0000	0.4281		
	BP	x	-2.3528	x	0.018		
Sofibor 3M	L	2.8444	-1.5279	1.0000	0.5196	I(1)	I(2)
	FD	-5.5642	-1.8341	0.0000	0.3643		
	BP	x	-2.2822	x	0.0217		

Table 3/ *Table 3:* Engle and Granger Cointegration Test (1), 2003-2007 /*Engle ve Granger Eşbütünleşme Testi(1) 2003-2007*

Variables	Short-term loans				Long-term loans			
	t-statistic		p-value		t-statistic		p-value	
	leva	euro	leva	euro	leva	euro	leva	euro
Sofibor 1M	-1.5905	x	0.7267	x	x	x	x	x
Sofibor 2M	-0.2287	x	0.9068	x	x	x	x	x
Sofibor 3M	-1.5803	x	0.7311	x	-1.9131	x	0.5732	x
Euribor 1M	x	-5.4126	x	0.0001	x	x	x	x
Euribor 3M	x	-5.3943	x	0.0001	x	x	x	x
Euribor 6M	x	x	x	x	x	-2.2977	x	0.3741
Euribor 12M	x	x	x	x	x	-2.2477	x	0.3992

Study results indicate that bank lending interest rates respond to changes in market interest rates only when consider interest rates on short term loans in euro. In this case a cointegration relationship is proved between interest rates on interbank deposits and interest rates on short term loans in euro. At the same time, interest rates on short term loans in leva and long term loans in euro and leva change independently of interbank money market dynamics. That means, banks attach greater importance to other factors when setting their interest rate policy in 2003-2007.

The pass through process, concerning Euribor and interest rates on short term loans in euro is further analysed in reference to the short run interdependence by applying error correction model, ECM. Again, results indicate that short term dynamics of bank lending interest rates is determined by changes in the rate of interbank deposits (Table 4).

Table 4/*Tablo 4*: Interest rates pass-through: Euribor 1M/Euribor 3M and short-term loans, euro/*Faiz Oranı Geçişkenliği: Euribor 1M/Euribor 3M ve kısa vadeli krediler,euro*

Parameter estimation	Coefficient		Std. Error		t-ratio		p-value	
	Euribor 1M	Euribor 3M	Euribor 1M	Euribor 3M	Euribor 1M	Euribor 3M	Euribor 1M	Euribor 3M
const	-0,01246	0,02013	0,10774	0,11201	-0,1156	0,1797	0,90836	0,85803
d_EUR_1/3month	0,18859	-0,73450	0,90975	1,19337	0,2073	-0,6156	0,83654	0,54067
res_stEur_E_1/3	-0,81556	-0,83297	0,13004	0,13031	-6,2716	-6,3923	<0,00001	<0,00001

Estimation of residuals (res_st_eur__1) shows the speed of adjustment of lending interest rates due to change in interbank interest rates. Estimations significantly hogher than 0 reveal strong impact of studied parameters. In this case, estimated residuals in 1-month and 3-month Euribor equations, respectively 0,816 and 0,833, signal that the pass through is performed in short term. The negative sign of the parameter estimation is explicable due to the time lag needed to restore long term equilibrium, as normally transmission effects delay in time.

Indicator for the pass trough rate of adjustment is parameter of independent variable (d_EUR_1_month, d_EUR_3_month). Both parameter estimations are statistically insignificant and therefore not indicative to explain the interest rate short run dynamics. By this reason, the analysis cannot be further deepened to determine the immediate response of bank lending interest rate.

The last step of analyzing interest rate interaction is to test the possibility to predict the change in bank lending rates due to change in market interest rates that means to test for Granger causality. Test is performed for (1) Euribor and interest rates on loans in euro, and (2) Sofibor and interest rates on loans in leva. Test results indicate that Sofibor time series Granger-cause interest rates on loans in leva (Table 5).

More precisely, causality is shown in: 1-month Sofibor, 2-month Sofibor and short term lending interest rates in leva; and 3-month Sofibor and long term lending interest rates in leva. Hence, concerning 2003-2007 period, the changes in Sofibor could be used to predict changes in interest rates in bank loans in leva.

Table 5/*Tablo 5*: Granger Causality Test (1) 2003-2007/Granger Nedensellik Testi (1) 2003-2007

Variables	Short-term loans, euro				Long-term loans, euro			
	F-statistic		p-value		F-statistic		p-value	
	leva	euro	leva	euro	leva	euro	leva	euro
Euribor 1M	x	0.1638	x	0.6873	x	x	x	x
Euribor 3M	x	1.0013	x	0.3215	x	x	x	x
Euribor 6M	x	x	x	x	x	0.0265	x	0.8714
Euribor 12M	x	x	x	x	x	2.6055	x	0.1123
Sofibor 1M	3.4279	x	0.0056	x	x	x	x	x
Sofibor 2M	2.6691	x	0.0125	x	x	x	x	x
Sofibor 3M	1.4445	x	0.2347	x	6.8623	x	0.0114	x

As it is obvious, Euribor does not Granger-cause interest rates on loans in euro (as it was determined for long run dynamics). In short run, changes in Euribor are not transferred to interest rates on loans to non-financial enterprises. In contrast to Sofibor, the short run interest rates dynamics in Eurozone do not influence bank lending rates.

4.2. Results for the period 2008-2011

ADF Unit root test showed different order of integration for different groups of variables. Euribor time series and interest rates of bank loans in euro are integrated of order 1. At the same time, Sofibor time series and interest rates of bank loans in leva are integrated of order 2 and higher order (Table 1 и Table 2).

After we can not prove that interest series tend to move together in long run, we perform a test for Granger causality in terms to further investigate short run dynamics. The aim is to find out whether changes in interest rates in short run can be predicted by previous changes in Euribor. Results are not positive for long run relation between interest rates or Granger causality. (Table 6 and Table 7).

Table 6/*Tablo 6*: Engle and Granger Cointegration test (2), 2008-2011/ *Engle ve Granger Eşbütünleşme Testi(2) 2008-2011*

Variables	Short-term loans, euro		Long-term loans, euro	
	t-statistic	p-value	t-statistic	p-value
Euribor 1M	-1.8483	0.6063	-2.2425	0.4018
Euribor 3M	-1.8557	0.6025	-2.2372	0.4045
Euribor 6M	-1.5836	0.0729	-2.2433	0.4014
Euribor 12M	-1.8344	0.6132	-2.2499	0.3981

Table 7/*Tablo 6*: Granger causality test (2), 2008-2011/ *Granger Nedensellik Testi (2) 2008-2011*

Variables	Short-term loans, euro		Long-term loans, euro	
	F-statistic	p-value	F-statistic	p-value
Euribor 1M	1.8909	0.1781	x	x
Euribor 3M	1.9503	0.1716	x	x
Euribor 6M	x	x	1.4511	0.5063
Euribor 12M	x	x	0.4254	0.5187

During the period of financial crisis, 2008-2011, the short term dynamics of interest rates in leva or euro cannot be analyzed on the basis of interest rate changes in interbank money market.

5. Conclusion

Interest rates pass through is observed in the period before financial and economic crisis. Long run equilibrium is proved for 1-month, 3-month Euribor and *short term lending interest rates in euro*. Also, a mutual movement of interest rates is observed analyzing short run dynamics. Hence, during that period Bulgarian banks transfer changes in interbank interest rates from Eurozone to domestic credit market. Results showed that the rate of adjustment is relatively high, but due to insignificant parameter estimation we could not deepen the analysis to define the exact rate of speed. To the end of 2008, in long run, monetary transmission mechanism works efficiently related to changes in interest rates on loans to non-financial enterprises. Bulgarian banks, through parent-banks, borrow (indirectly) money resources from Eurozone interbank money market, and transfer positive effects of the ECB monetary policy.

Monetary transmission mechanism breaks up related to changes in bank *long term interest rates on euro* loans. Analyzing both changes in short run dynamics and moving to long run equilibrium, bank lending interest rates showed independent movement. That is, commercial banks do not transfer changes of Euribor to euro long term interest rates.

Levels of *long- and short term interest rates in leva*, in long run, moves independently than dynamics of Bulgarian interbank money market as well. But in short run, market interest rates can be used as an additional factor to predict changes in bank lending rates. As a whole, the interbank money market plays a very small role in changing banks' interest rate policy.

Interest rate pass trough during the second studied time period, 2008-2011 reflected the effect of financial crisis, revealed totally different results. No interaction of interest rates, including policy effect transmission was proved for both bank lending interest rates in leva and euro. Equilibrium in long run was not observed during financial crisis as it was proved for Euribor and euro short term interest rates during the economic growth in previous period. Nor changes of interest rates (long- or short term) are correlated to the

dynamics of market interest rates. Over that period commercial banks form their interest rate policy considering other (macro)economic factors.

Most of the results underline the insignificant role of interbank money market for monetary transmission mechanism related to the Bulgarian National Bank policy. As interest rate determinants could be pointed out the lack of confidence between commercial banks, extremely high interest rates on deposits (that is the main source of financing for commercial banks in 2008-2011), worsen economic conditions, an increased risk profile of the economic agents, etc. But of greatest importance of all factors is the lack of confidence between commercial banks. Because of the big importance of interbank money markets for transmission mechanism, they are often intervened by central banks. Weak interaction between interbank market and credit market in 2003-2011 indicates how deep the problem is concerning the deficit of confidence. In the first period, 2003-2007, the increasing of nonresident capital flow, mostly from parent-banks, shifts attention out of unsatisfactory functioning of interbank money market. Several years later it becames obvious that confidence between banks is not fully restored. As a result, banks tend to lower external financing from other credit institution that additional put pressure to anyway decreased bank loan supply.

Ineffectively working transmission mechanism through the channel of interest rates makes of great importance the question how bank lending interest rates can be decreased during financial crisis? Beyond any doubts remain the sporadically suggested administrative regulations of bank interest rates, so as to be tied up to Euribor or Sofibor, for example. Tiding up bank lending interest rates to any regulatory imposed reference rates would not have the effect of lowering bank lending rates. The situation of credit market after 2008, when interbank money market became insignificant for banks' interest rate policy, provided irrefutable evidence of inefficiency of such policy. Banks turned to extremely expensive money resource from non-financial enterprises and households to compensate significant nonresident capital outflow, and market interest rates (Sofibor, Eribor) became insignificant. Instead, banks' behavior could be influenced in terms of applying transparent and easy comprehensible interest rate policy. It is inherent and very important role of microeconomic policy, including the Bulgarian National Bank, without violating the principle of market interest rates and non-interference with regulatory requirement, to provide effectively and transparent functioning of credit markets.

Genişletilmiş Özet

Çalışma, para kurulu kapsamında faiz oranı geçişkenliğini ve piyasa faiz oranlarındaki değişikliklerin perakende faiz oranları üzerindeki etkinliğini incelemektedir. (Buna finansal olmayan işletmeler için bankaların kredi faizleri dahildir.) Bu doğrultuda, para faiz oranları ve perakende piyasası arasındaki denge ilişkisi tanımlanmış, kısa vade için hata düzeltme modeli kullanılarak formüle edilmiştir. Simetrik faiz oranı aktarımı ve etkin bir para politikası için banka kredilerinin koşulları büyük önem taşımaktadır. Aktarım mekanizması fonksiyonunun etkin olması, özel sektör tecrübesinin krediye ulaşımı geliştirmesi ve krediler üzerindeki düşük faiz oranları para politikaısının etkilerini arttırmaktadır. Para kurulu durumunda merkez bankasının doğrudan para piyasasına müdahale etmesiyle bağlantılı olarak, para politikası çeşitli kısıtlamalarla karşı karşıya kalmaktadır. Bulgaristan Merkez Bankası yalnız, para kurulu kapsamında para sistemiyle uyumlu politika araçlarını uygulamaktadır.

Aktarım mekanizması bağlamında para ve kredi piyasası arasındaki faiz oranı etkileşimleri ekonomik literatürde önemli bir konudur. Faiz oranları, aktarım mekanizmasının kanallarından biridir ve merkez bankasının uyguladığı para politikasının ele alınmasında faizlerin oranı göz önüne alınmaktadır. Ampirik çalışmalar, aktarım mekanizmasının ve perakende faiz oranlarının etkisini gecikme ile gösterdiğini ortaya koymaktadır. Diğer taraftan finansal olmayan işletmeler ve hanehalkları için banka kredilerinin koşulları tüketim,tasarruf,yatırım ile ilgili kararlar da belirleyici olmaktadır. Faiz oranı kanalıyla parasal aktarım mekanizmasının etkinliği toptan faiz oranlarının piyasa faiz oranlarına değişikliklerin uyum oranıyla ölçülmektedir. Yalnızca ticari bankaların kısa vadeli kredi faiz oranları düzeyindeki düşüş durumunda merkez bankalarının politikalarının etkili olduğu kabul edilmektedir. Merkez Bankası referans faiz oranları para piyasasında dengesizliğe sebep olur ve   bu çalışmanın konusu da söz konusu dış etki karşısında kredi faiz oranlarının vereceği tepkidir.

Çalışma 2003-2011 dönemini baz almaktadır. Analiz ise 2 alt dönem için yapılmıştır. Söz konusu dönemler 2003-2007 ve 2008-2011'dir. Çalışmanın amacı, para politikasının aktarım kanalları üzerinde finansal ve ekonomik krizin etkisini belirlemek ve incelemektir. Çalışmada ekonomideki faiz oranları seviyesini kavramak için Bulgaristan Ulusal Bankası faiz oranı istatistiklerinden 1 aylık veri kullanılmıştır. Mali ve ekonomik kriz öncesi dönemde faiz oranı geçişkenliği gözlemlenmiştir. Uzun dönem denge; 1 ay, 3 ay Euribor ve kısa vadeli borç verme faiz oranları için kanıtlanmıştır. Ayrıca kısa vadeli dinamiklerin analizinde faiz oranlarının karşılıklı hareket ettiği gözlemlenmiştir. Bu sebeple söz konusu dönemde Bulgaristan Bankalarının Interbank faiz oranlarındaki transfer değişimleri Euro bölgesi yerli kredi piyasasına aktarılmaktadır. Sonuçlar,

uyum oranının görece yüksek olduğunu göstermiştir. Ancak anlamsız parametre tahmininden ötürü hız oranını tanımlama adına analiz derinleştirilememektedir. Uzun vadede 2008 sonuna kadar, parasal aktarım mekanizması finansal olmayan işletmelerde kredi faiz oranlarındaki değişimlerle ilgili olarak verimli çalışmaktadır. Bulgar Bankaları, ana bankalar aracılığıyla, Euro bankalararası para piyasasından (dolaylı olarak) para kaynaklarını borç alabilmekte ve pozitif etkilerini Avrupa Merkez Bankası para politikasına aktarabilmektedir. Parasal aktarım mekanizması, Euro kredisi üzerindeki uzun vadeli banka kredilerindeki, değişimlerle ilgili olarak dağıtılmaktadır. Kısa vadeli dinamiklerdeki değişim ve uzun dönem denge hareketinin analizi banka kredi faiz oranlarının bağımsız hareket ettiğini göstermiştir. Yani ticari bankalar Euribor değişikliklerini Euro uzun vadeli faiz oranlarına aktaramamaktadır.

Leva'da uzun vadeli faiz oranları düzeyleri Bulgar bankalar arası para piyasası dinamiklerinden daha bağımsız hareket etmektedir. Fakat kısa vadede, piyasa faiz oranları, banka kredi oranları değişikliklerini tahmin etmede ek bir faktör olarak kullanılabilir. Genel olarak, bankaların faiz oranı politikasının değişiminde bankalar arası para piyasası çok küçük bir rol oynamaktadır.

Faiz oranı geçişkenliğinin 2.periyodu olan 2008-2011 dönemindeki analizi ise finansal krizin etkilerini yansıtmaktadır ve sonuçlar tamamen farklıdır. Leva ve Euro'da banka kredi faiz oranları için ,politik aktarım etkisi de dahil olmak üzere, faiz oranlarının bir etkileşimi olmadığı kanıtlanmıştır. Finansal kriz esnasında uzun vadede denge gözlenmemiş ve bu önceki dönemdeki ekonomik büyüme ve esnasında Euribor ve Euro kısa vadeli faiz oranları için kanıtlanmıştır. Faiz oranlarındaki değişiklikler (kısa ya da uzun vadeli) piyasa faiz oranı dinamikleriyle arasında korelasyon yoktur. Bu dönemde ticari bankalar faiz politikalarını oluştururlarken diğer makro ekonomik faktörleri göz önünde bulundururlar.

Sonuçların birçoğu Bulgaristan Ulusal bankası politikasıyla ilgili olarak, parasal aktarım mekanizması için bankalar arası para piyasasının rolünün anlamsız olduğuna vurgu yapmaktadır. Faizi belirleyen faktörler; ticari bankalar arasındaki güven eksikliğine, çok yüksek mevduat faiz oranlarına, kötüleşen ekonomik koşullara, ekonomik aktörlerin risk profillerinin artışına işaret eder. Ancak bunların arasında en önemlisi ticari bankalar arasındaki güven aksaklığıdır. Aktarım mekanizması için bankalar arası para piyasaları büyük önem taşıdığından merkez bankaları tarafından müdahaleye uğrarlar. 2003-2011 periyodunda bankalar arası piyasa ve kredi piyasası arasındaki zayıf etkileşim güven eksikliği probleminin ne denli derin olduğunu gösterir niteliktedir. Bu bağlamda bankalar arasındaki güvenin tam anlamıyla sağlammış olmadığı aşikardır. Sonuç olarak, bankalar diğer kredi kurumundan dış finansmanını düşürme eğilimindedir. Bu durum zaten azalmış olan banka kredisi arzı üzerinde bir baskı yaratmaktadır.

References

Angeloni, I., A. K. Kashyap, and B. Mojon, eds. (2003). Monetary policy transmission in the Euro Area. Cambridge: Cambridge University Press.

BNB, Interest rate statistics, Interbank money market indices.

BNB,www.bnb.bg

http://www.bnb.bg/Statistics/StMonetaryInterestRate/StInterestRate/StIR/InterestRate/index.htm

De Bondt, G. (2002). Retail bank interest rate pass-trough: New evidence at the Euro area level, ECB WP No. 136.

Granger, C. W. J., Huang, B.-N., and Yang, C.-W. (2000). A bivariate causality between stock prices and exchange rates: evidence from recent Asian Asianflu. The Quarterly Review of Economics and Finance, 40(3):337{354}.

Granger, C.W.J. (1969). Investigating Casual Relations by econometric models and cross-spectral methods. Econometrica, Vol. 37, No. 3, pp. 424-438.

Kobayashi, T. (2008). Incomplete Interest Rate Pass-Through and Optimal Monetary Policy. International Jourenal of Central Banking, September 2008

Petkov, P. (2009). Interaction between GDP and export in Bulgarian economics. Economic alternatives/6, p.41.

Scholnick, B. (1996). Assymetric adjustments of commercial bank interest rates:evidence from Malaysia and Singapore, *Journal of International money and Finance*, Vol.15, No.3, p. 485-496.

Sorensen, C., T. Werner. (2006). Bank interest rate pass through in the euro area. A cross country comparison, ECB, WP, No. 580.

Statev, S. (2008). Financial deepening and economic growth. News. University of Economics, Varna, issue 2, p. 22

Swanson, N. R. and Granger, C. W. J. (1997). Impulse response functions based on a causal approach to residual orthogonalization in vector autoregressions. *Journal of the American Statistical Association*, Vol. 92, pp. 357–367.

Tieman, A. (2004). Interest rate pass through in romania and other central european economies, IMF, WP/04/211