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DOES SOVEREIGN RISK IMPACT INTEREST RATES LEVEL IN BULGARIA?

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Abstract: *The sovereign risk premium has risen not only in Euro area, but in non-Euro area member states of EU after world financial crisis. This paper uses new Keynesian model to research sovereign risk channel. The model is changed for non-Euro area country, because there is no common monetary policy as for Euro area. Due to it, the model applies separately for single country. By to the low level of GDP per capita in non-Euro area states, the main purpose of economic policy is high economic growth. Due to it, an important aim for these countries is the sovereign risk to be kept on optimal level.*

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In the new Keynesian model, the government spending influences on economic activities through different channels. First, the public expenditure adds directly to the aggregate demand and it is positive impact. Second, by high economic activity, the marginal costs and inflation increase. By the constant nominal interest rate, real such declines and private expenditure rises. Third, the fiscal policy also has an effect through the sovereign risk channel. The high government spending could raise the deficit, the debt and thereby increases interest rate spreads. This paper researches only sovereign risk channel and try to give a proof of the impact of high sovereign risk on the spread between credit and deposit interest rates in non-Euro area member states of EU. Until now the sovereign risk is researched for the countries in Euro area (P.R. Lane (2012)[12] as well as ECB (2012)[13] and IMF (2013)[14]).

The economies with weaker fundamentals depend on the fiscal policy made. There are two possibilities:

- To make precautionary fiscal policy to keep government debt on optimal level by this amount of Gross Domestic Product (GDP) ensuring stable conditions on the market and constant risk premium for the business;
- To raise government debt, to elevate the sovereign risk and after it, risk premium, to increase the cost of lending and reduce the aggregate demand in the economy.

The theoretical framework of this paper is New Keynesian model considered in Corsetti, Kuester, Meier and Muller (2013)[15]. In the model government debt is not risk – free. When debt increases, the sovereign risk premium changes in the same direction and fiscal outlook of country deteriorates. In

[12]Lane, P.R., (2012)," The European Sovereign Debt Crisis", Journal of Economic Perspectives, 26(3), p.49-67

[13]ECB, Financial Stability Review, December 2012,, Frankfurt am Main, Germany

[14]IMF, Global Financial Stability Report, April 2013, Washington D.C.

[15]Corsetti, Giancarlo, Kuester, Keith, Maier, Andre, Muller, Gernot, (2013) ," Sovereign Risk, Fiscal Policy and Macroeconomic Stability", IMF, Working paper 13/227,

the same time, the private sector credit spread rises with higher sovereign risk, because strained public finance increases the costs of financial intermediation.

The link between sovereign risk and private spread creates a "sovereign risk channel" for the transmission of macroeconomic shocks. For the Euro area is confirmed by an increase of sovereign risk premium related raises the private sector risk premium.

The literature so good explains a sovereign risk channel. Neri (2013)[16],[17] estimates between April 2010 and the end of 2011, the sovereign spread in the crisis countries led to an increase of borrowing cost for nonfinancial firms and households by 130 and 60 basic points, respectively. For Italy (the largest of stressed economies) Zoli (2013)[18] finds that some 50-60% of increase of sovereign spread is transmitted to firms borrowing rates.

For the economics with weaker fundamentals like in the countries in non-Euro area, we accept different criteria for the level of government debt comparing with such in Euro area (for the stressed economies in Euro area – exceed 125% of GDP and more than 90% for other countries in Euro area). The level of government debt in non – Euro area countries that influences on the cost of private lending is lower. The macroeconomic stability depends on fiscal policy, public spending and government debt. Some more by the different monetary regime as a Currency Board (like in some EU countries), it is not active monetary policy and this policy could not add the effect to fiscal one ensuring stable economic development.

The different stages of impact by increasing government debt are:
Government debt ↑ → Risk in the economy↑ → Risk premium ↑ →
→ Cost of lending in private sector↑ → aggregate demand ↓ →
→ aggregate supply (GDP)↓

Acharya, Drechsler and Schnabl (2013) [19] also research the connection between fiscal policy disturbances, sovereign risk and bank credit risk. The high risk comes from government debt, overhand problems in private sector, hampering investments.

Limitations of the research

- Because the different way to be made the data by National statistics – with or not accumulation, monthly, quarterly or annually, chronologically presented – the different variables are recalculated to be mathematically compatible;

- By the research is used the data for deposits and credits of nonfinancial firms and of households in Bulgaria, their average interest rates for all maturities, new issued government securities, all variables are quarterly, without accumulation for the period 2005 – 2013;

- The value of government securities quarterly is calculated as total amount of bid approved at sell price of such securities;

[16]Neri,S., (2013), " The Impact of the Sovereign Debt Crisis on Bank Lending Rates in the Euro area", mimeo, Banca d'Italia,

[17]Neri, S. and Ropele,,T, (2013)," The Macroeconomic Effects of Sovereign Debt Crisis in Euro Area", mimeo, Banca d' Italia

[18]Zoli, E., (2013),"Italian Sovereign Spreads: Their Determination and Pass – through to Bank Funding Costs and Lending Conditions", IMF, Working Paper 13/84, 2013

[19]Acharya, V.V., Drechsler,I and Schnabl, P., (2013), " A Pyrrhic Victory? Bank Bailouts and Sovereign Credit Risk ", mimeo, NYU – Stern

- An average yields are calculated by the using such realizing by every auction and multiplied with an amount of government securities by this yield and after it is collected quarterly;

- To calculate the depend variable in one of equation – wealth - it uses GDP, because it shows the change of disposal wealth in the economy during the year;

- The impact of increasing sovereign risk is measured through the change of spread between lending and deposits interest;

- It is very difficult to distinguish the change of spread between credit and deposit rates due to the impact of increasing of government debt and sovereign risk or result from automatic adjustment and due to it, the research suggests as a reason for changes only the impact of government debt.

Model

It is tested the model considered in Corsetti, Kuester, Meier and Muller (2013 – already cited) adjusted for the conditions in the non-Euro area economies. It is noted, due to the lack of data of national statistics, we are not able to test all functions concerning the model above.

$$1+w_t = \frac{1+ibt}{1+idt} \quad (1)$$

,where

w_t - spread between lending and deposit rates
i^b_t - average bank credit rate in the current quarter
i^d_t – average bank deposit rate in the current quarter

$$A_t = S^f_{t-1}(1+ i^{dep}_{t-1}) + S^h_{t-1}(1+ i^{dep}_{t-1}) + B^g_{t-1}(1+ i^g_{t-1}) \quad (2)$$

,where

A_t - wealth, measure with GDP
S^f_{t-1} - nonfinancial firms deposits at home banks at the end of previous quarter
S^h_{t-1} - households deposits at home banks at the end of previous quarter
i^{dep}_{t-1} – average deposit's interest rates of nonfinancial firms or households for previous quarter
B^g_{t-1} - new issued government debt for previous quarter
I^g_{t-1} - average yield of new issued government debt for previous quarter

Because there is not data separately for sold government securities to the nonfinancial firms and the households, it is tested second part of model nevertheless type of purchasers.

Third part of model researches how the government debt in the current quarter depends on such in previous quarters, because the payments of collateral and of interest. It requires because the weaker fundamentals of budget constrain in the countries in non-Euro area and short maturity of government securities sold. Due to it the sovereign risk in the future depends on the fiscal policy in the current quarter.

$$B^g_t = a_1 + a_2 B^g_{t-1}(1+ i^g_{t-1}) + a_3 B^g_{t-2}(1+ i^g_{t-2}) + a_4 B^g_{t-3}(1+ i^g_{t-3}) \quad (3)$$

where

B^g_t – new issued government debt in the current quarter
B^g_{t-1} –new issued government debt in the previous quarter
B^g_{t-2} – new issued government debt in two quarters before
B^g_{t-3} – new issued government debt in three quarters before
i^g_{t-1}, i^g_{t-2}, i^g_{t-3} – average yield of new issued government debt for the quarter

Financial intermediation

Savers and borrowers have access to area – wide perfect competitive intermediaries. The banks accept risk – free deposits, paying the interest rate i^d_t . The borrowing depends on the price of resources and the amount of saving. The lender pays the interest rate i^b_t.

It is tested the first part of the model considered in Corsetti, Kuester, Meier and Muller (already cited) to measure the sovereign risk. By the calculation of the spread we use the average rates for credits and deposits with all maturate. During the period 2005 -2013 we distinguish three stages in

economic activities in the country – first – before the world financial crisis, second – the recession period in Euro area and third – when we observe the smooth and slowly recovery in the world economy. We accept that banks take only free – risk deposits (as in the model above) and the spread between lending and deposit interest rates shows the change of risk. First, to calibrate the sovereign risk, the research estimates the spread for nonfinancial firms in non-Euro area country – the case in Bulgaria. Because the different data, we calculate separately the spread for the households.

By the calibration for nonfinancial firms in non – Euro area country, for the first stage (see above) – the spread moves from 2.5163 to 2.53807 in the third quarter 2006. The increase is small; the risk keeps on constant level. This period characterizes with:

- For the real sector – the lack of the projects with appropriate rate of return to be financed and constant level of demand of credit;
- For the banks - with huge amount of disposal resources and restrictive credit policy. It due to worse experience during deep banking crisis during 1996 – 1997 and the risk in real sector.

For the period fourth quarter 2006 until third 2009 the spread changes observed with 56 basic points. After it we note the decrease to 1.6572 in the second quarter 2009. It confirms:

- For the real sector – the reduction of the risk and change of demand of credit;
- For the banks - the accumulation of foreign resources (noted – more of Bulgarian banks have foreign owners) and credit expansion in the country (especially in 2008).

During the second stage – world and Euro area recession – the spread between credit and deposit interest rates changes in small dimension – from 1.901579 to 2.231470 in fourth quarter 2012.

- For the real sector – after crisis is noted slowly recovery. As it is usual for the recession period, continues the period with small number of projects with enough rate of return and firms realize precautionary investment policy. It keeps the demand for bank lending (noted again – most of non-Euro area countries characterized with undeveloped financial markets and bank lending is main source of funds);
- For the banks - due to the policy made, they restricted the credit for nonfinancial firms, nevertheless enough level of disposal recourses.

By the third stage – after Euro area slowly recovery – it is noted an increase of spread between credit and deposit interest rates with 58 basic points for the period from fourth quarter 2012 until third 2013. It shows the tendency of raising the risk in the economy. We look for the reason for such risk.

- For the real sector - observed smooth recovery and increase of demand of credit.
- For the banks – the deposits are raised for the last years and intermediaries have the recourses to finance real sector and supply also raises; Demand and supply change in one direction with same power. The increase of spread between credit and deposit interest rates probably depends on the sovereign risk due to often using and selling new issues of government securities and direct bank government credit.

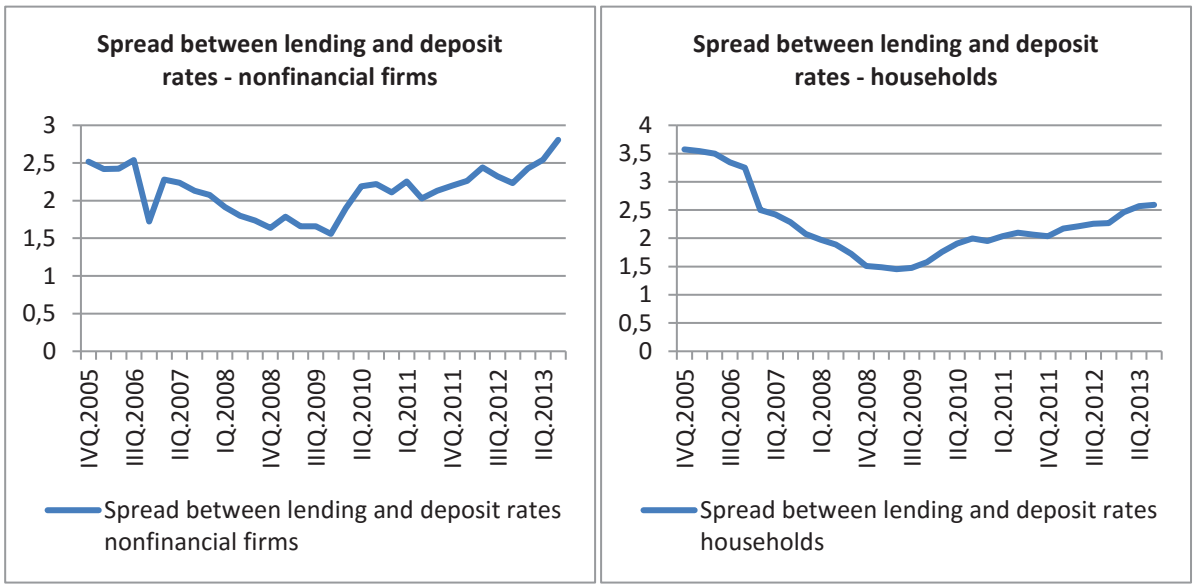
By the testing the model for households, we calculate the spread between credit and deposit interest rates for all maturates. For the first sub-period the spread is higher compared with such for nonfinancial firms. The reasons for this situation are probably:

- For households – consumer credit demand increased, but the risk in the side of households keep on the same level and they make precautionary credit policy ;
- For the banks –as we noted above, the disposal recourses are on high level, preferably from foreign sources.

After it the spread for households has risen. For the period from third quarter 2010 until fourth such 2012 – the spread changed with 27 basic points and only for the period IVQ 2012 – IIIQ 2013 raises with 32 basic points. Due to slowly recovery in the economy, the households do not increase the demand for lending by the banks. The intermediated institutions have liquidity resources. The equilibrium level of interest rate on this market is not changed. Due to it, probably an increase of spread between lending and deposit rates depends on the sovereign risk.

Below is presented the spread between lending and deposit rates for nonfinancial firms and households in the case of Bulgaria:

Graph 1



Source: www.bnb.bg – Statistics – Monetary statistics – Interest rates

Financial conditions and policy measures in non-Euro area

EU characterizes with single monetary union for Euro area, but not for all countries as whole. Some more, fiscal policy is largely decentralized, remaining an area of competence of individual EU member. The supranational market requires the smooth economic fluctuations in all state members, with or without Euro area. It depends on the sustainability of national fiscal policy and to keep the level of government debt on optimal level. In the past, the failure of the EU economic governance to prevent and correct unsustainable national policy contributes to the build – up major imbalances not only in Euro area, but in non-Euro area, too. Some more by the framework "sovereign risk channel", the increase of government debt influences stronger in non-Euro area countries on the activities and the economic growth. The countries outside the Euro area need more than other member states to achieve high economic growth reaching average GDP per capita in the union. Due to it, for non-Euro area is more important to keep the government debt and the sovereign risk at low level.

Our example for non-Euro area is Bulgaria. The situation in a country is more specific, because like in some other countries in EU, there is not typical Central Bank. The monetary institution works by the rules of Currency Board and is not able to make active monetary policy to smooth imbalances in the fiscal policy.

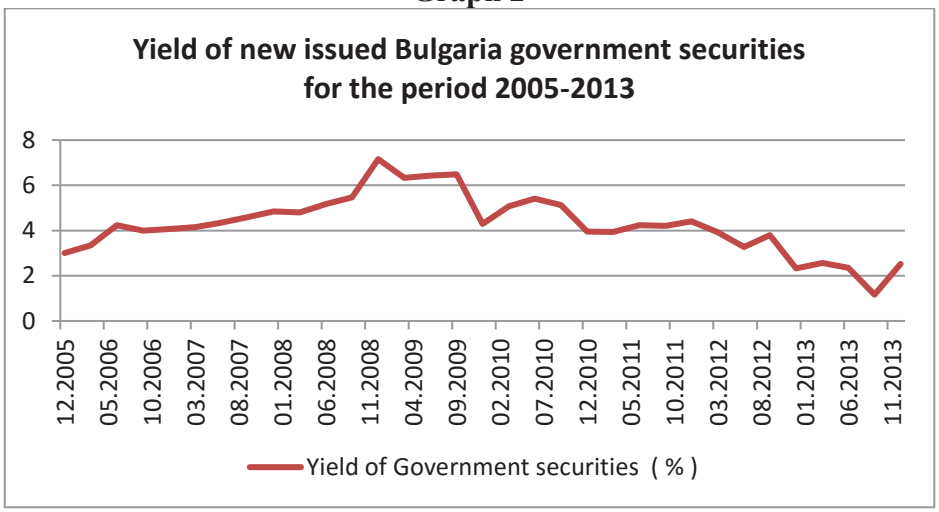
To estimate of sovereign risk , on the first stage we need to investigate the maturity structure and average yield of issued and sold Bulgarian government securities for the period 2005-2013, after it to evaluate the sovereign risk. The change of such risk influences on economic conditions. An increase raises the price of money, deteriorates investments, consumer expenditure for durable goods and net export and reduces the aggregate demand and finally - the aggregate supply (GDP).

During observed period (2005 – 2013) are noted several stages in the world economy (see above). First stage is until world financial crisis. Because the Bulgarian economy is small economy, outside the Euro area, with undeveloped financial market, the crisis affects on own economy later -

after second half of 2009. Second stage is during the recession in Euro area. Because the Bulgarian economy is open economy the impact is strongly. Third stage is the period of smoothly and slowly recovery in Euro area.

To estimate average yield, we could be interested about the maturities of new issued government securities, because it defines average yield for every issue. According the maturities we distinguish several periods: first – from fourth quarter 2005 until third 2009 with very actively using of government securities with maturity 3 - months, 3-,5-,10- years. Second, by the using the government securities with more long maturity – 1- and 1,5 year, 10- and 15- years. It has some positive effects. Because long maturity, there are not payment of collateral in near future and it make possible to be realized an increase of public spending. During the recession, when private expenditure decreases, to keep the aggregate demand on high level, respectively the value of GDP, it could replace with increase of public spending. The negative point is higher price of accumulated funds on every stage and shows lack of alternatives. Last year, 2013, the new issues government securities characterizes with short maturity – mainly to 1-, 3-, 3,5- years with relatively higher yield. By this distribution of maturities, average yield of new issued government securities is presented graphically below.

Graph 2



Source: www.minfin.bg – Government debt – Annual Report of Government debt (exclude 2013 – Monthly Reports)

$$A_t = S^{f}_{t-1}(1+ i^{dep}_{t-1}) + S^{h}_{t-1}(1+ i^{dep}_{t-1}) + B^{g}_{t-1}(1+ i^{g}_{t-1}) \quad (2)$$

By the testing the model we calculated following results:

	A_t
A_t	1.00
$S^{f}_{t-1}(1+ i^{dep}_{t-1})$	0.636
$S^{h}_{t-1}(1+ i^{dep}_{t-1})$	-0.262
$B^{g}_{t}(1+ i^{g})$	-0.117

The statistical analysis shows the correlation coefficients are enough significant. The coefficient of determination is close to 0.5. The economic analysis notes strongest influence of saving of nonfinancial firms on the change of wealth in the current quarter. The calculated correlation coefficient between A_t (GDP) and saving of households in developed countries is positive. The coefficient calculated for Bulgaria is negative and probably shows the short time horizon of economic agents and low level of income. The impact of new issued government securities on the change of wealth (GDP quarterly) is negative. An increase of new issued government securities get up the sovereign risk, raises the risk premium and reduces aggregate demand and respectively aggregate supply.

By the testing of third equation are calculated following results:

$$B^{g}_{t} = a_1 + a_2 B^{g}_{t-1}(1+ i^{g}_{t-1}) + a_3 B^{g}_{t-2}(1+ i^{g}_{t-2}) + a_4 B^{g}_{t-3}(1+ i^{g}_{t-3}) \quad (3)$$

	B^g_t	$B^g_{t-1}(1+ i^g_{t-1})$	$B^g_{t-2}(1+ i^g_{t-2})$	$B^g_{t-3}(1+ i^g_{t-3})$
B^g_t	1.00	0.245	0.361	0.136
$B^g_{t-1}(1+ i^g_{t-1})$	0.245	1.00	0.263	0.316
$B^g_{t-2}(1+ i^g_{t-2})$	0.361	0.263	1.00	0.277
$B^g_{t-3}(1+ i^g_{t-3})$	0.136	0.316	0.277	1.00

The impact on new issued government securities is stronger for two previous periods due to probably the short maturates. According the results, strongest impact on B^g_t has the variable two periods before, because usually the maturity is longer than 3 months.

	B^g_t
B^g_t	1.00
$B^g_{t-1}(1+ i^g_{t-1})$	0.175
$B^g_{t-2}(1+ i^g_{t-2})$	0.312
$B^g_{t-3}(1+ i^g_{t-3})$	-0.006

Conclusion

During the period 2005 -2013 it distinguished three stages of economic activities in the observed country – first – before the world financial crisis, second – the recession period in world economy and Euro area and third – when we observe the smooth and slowly recovery in the world and Euro area economies. By the calibration for nonfinancial firms, for the first stage - the spread between credit and deposits interest rates increases very small. During the second stage – world and Euro area recession – the spread between credit and deposit interest rates changes in small dimension. By the third stage – after Euro area slowly recovery – it is noted an increase of spread between credit and deposit interest rates with 58 basic points for the period from fourth quarter 2012 until third 2013. It shows the tendency of raising the risk in the economy. The higher spread between credit and deposit interest rates probably depends on the sovereign risk due to often using and selling new issues of government securities and direct bank government credit. For households in the first sub-period the spread is higher compared with such for nonfinancial firms. After it the spread for households has risen. For the period from third quarter 2010 until fourth such 2012 – the spread changed with 27 basic points and only for the period IVQ 2012 – IIIQ 2013 raises with 32 basic points. Because slowly recovery, the households do not increase the demand for lending by the banks. The intermediated institutions have liquidity resources. The equilibrium level of interest rate on this market is not changed. Due to it, an increase of spread depends on the sovereign risk. Because the low level of GDP per capita in non-Euro area states, the main purpose of economic policy for all of them is to achieve high economic growth reaching average level in near future for the Euro area. Due to it, important aim for these countries is the sovereign risk to be kept on optimal level.

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