When Credit Matters – Possible Room for ECB's Success in Quantitative Easing from Selected EA Members' Point of View

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Abstract
This paper construct SVAR model for individual EA member states that is able to capture effects of ECB's unconventional measures on domestic economy. We separately model innovation to ECB key interest rate representing standard interest rate policy as exogenous variable and effects of pure quantitative easing through change in monetary base of national central banks as endogenous variable. This allows us to differentiate between two separate effects of ECB's monetary policy. By incorporating banking sector we specifically examine effects of monetary policy on credit provisioning in individual countries. This model is applied on three countries that are predominantly bank-oriented: Austria, Germany and France. Our results suggest that while standard interest rate policy might have an effect on credit provisioning through credit multiplier, balance sheet policy predominantly affects long-term interest rates and bank spreads but the effect evaporates rather quickly. Effectiveness of monetary policy in influencing the real output through credit provisioning should be called into question as we do not find significant link between credit and economic output.

Keywords: quantitative easing, monetary transmission mechanism, bank lending channel, SVAR
JEL codes: E37, E51, E52, E58

1. Introduction

Fears of threatening deflation and sluggish economic growth have recently pushed the ECB to adopt a more aggressive approach to monetary easing. Decrease in key policy interest rate to technical zero levels (0.05% for main refinancing operations), adoption of enhanced targeted long term refinancing operations (TLTRO) for up to 4 years period, introduction of the extensive quantitative easing policy (Extended Asset Purchase Programme, EAPP hereinafter) represent three measures that should finally ignite fires of inflation. Officially, these measures are intended to improve functioning of impaired monetary transmission mechanism (henceforth MTM), support the credit provision by banking system to real economy and contribute to accommodating stance of monetary policy (ECB, 2014).

At first sight, the liquidity crisis in euro area is not any more an issue judging by the evolution of excess liquidity over the course of time. However, nominal interest rates set technically at zero level bound should be necessary (but not sufficient) condition for increase in inflation expectations at least in medium to long term. The only possible reaction of the monetary authority is to affect inflation expectations which can be (hopefully) done by various tools, quantitative easing being one of them.

Loan provision growth rate has stayed in red numbers since 2013 with the non-financial corporations sector as a main contributor to this negative evolution. Thus, even though the price of loans (interest rate) has been successfully suppressed to minimum levels the volume of loans provided by the banking sector has been diminishing on ongoing basis. Without sufficient flow of money to private sector, especially in form of long-term investment loans, economic recovery in Europe will remain just a desired wish.

If the interest rate transmission channel has been working beyond expectations how come then that the effects or credit crunch has yet not been eliminated across various countries? And can we really put all our hopes into bank credit to become the decisive factor that will lead EA towards so deeply desired economic growth?

In light of all these considerations, we feel it necessary to analyze the "black box" of monetary policy in a more thorough way. On top of that the bank sector should start playing once again a significant role in any model trying to analyze possible effects of any unconventional monetary policies. Last but not least, as the EA member states are a very heterogeneous group of players we would like to look at the transmission of monetary shocks to particular economies rather than to analyze EA as a one closed uniform system.

Therefore the main goal of this paper is twofold. Firstly, in order to be able to conduct a disaggregated analysis of monetary transmission mechanism on individual member states we aim to construct a SVAR model that incorporates both exogenous monetary policy shocks through change in ECB's key interest rate and unconventional monetary measures affecting balance sheets of national banks through monetary base innovation. As to our knowledge, this is the first paper to do so after the creation of EMU in 1999. Secondly, we specifically focus on investigating the role and effects of credit provisioning in current monetary transmission mechanism by introducing banking sector as an intermediary between ECB and domestic real economy.

According to Siranova and Kotlebova (2015a), the empirical evidence from the crisis period shows that in case of three countries (Austria, Germany and France) there exist an evidence that credit provisioning might lead to increase in domestic output. Additionally, as Austria, Germany and France belong to countries with a strong banking sector ties to real economy we decide to apply our SVAR model on these three countries in order to investigate the functioning of their individual monetary transmission mechanism.

Regarding the structure of this paper, in the second chapter we shortly discuss theoretical role of banks in the current MTM and SVAR model and data sample used for estimation. SVAR output is discussed in the chapter three. Chapter four concludes.

2. Monetary Transmission Mechanism and Banking System

In standard literature on MTM (Mishkin, 1996) the interest rate channel predicts reaction in investment decisions by companies or households due to the changing costs of capital (captured by real long-term interest rate). In reality, economic agents might react in two possible ways to changing costs of capital: a) restrict or extend their investment plans and finance their decision from internal sources due to the realization that overall costs of capital in economy have changed; b) restrict or extend their investment plans and finance their decisions from external sources – via intermediate bank sector or via financial markets.

The bank lending channel usually focuses on the means by which monetary policy affects aggregate demand via credit supply of intermediary institutions (Bernanke and Gertler, 1995 and others). By changing the costs of borrowing for banking institutions (liability side) central bank directly influences interest spread (lending-deposit interest rates) that represent key source of profit for most of the traditional deposit-oriented banking institutions. Demand side of the economy is therefore stimulated by higher consumption spending by domestic private agents (households or government).

The bank channel of monetary policy may affect the aggregate supply side through credit-cost channel (CCC), meaning that the lending bank interest rate enters cost function of firms in the economy. The effect on supply side of the economy is the greater the higher the importance of bank credit in the domestic economy.

The costs of capital channel transmitted through financial markets is a straightforward one and can be directly derived from link between short term policy rate and long-term real interest rate assuming price stickiness (i.e. slow adjustment in price level, expected inflation rate does not change in short- to medium-term). Costs of firms' external borrowing through debt markets declines due to the positive shock to the long-term interest rate (decrease) and firms respond to it by increasing their overall investments and vice versa.

The balance sheet channel, also known as the "financial accelerator" or "broad (credit) channel", focuses on "the potential impact of changes in monetary policy on borrowers' balance sheets and income statements, including variables such as borrowers' net worth, cash flow and liquid assets" (Bernanke and Gertler, 1995).

Firstly, a negative shock to interest rate adversely affects borrowers' asset value through changing market prices of equity, bonds and real-estates which indirectly influences net wealth.

Secondly, an increase in interest rates works to increase the payments that the firm must make to service its floating rate debt, thus effectively increasing firm's costs of capital and decreasing incentive to invest. An indirect effect arises, too, when the same increase in interest rates works to reduce the capitalized value of the firm's long-lived assets. Second-round effects might comprise fall in households' consumption and spending that transmits into firm's revenue fall leading to a decrease in net wealth as a function of rigidities on the costs side. As the investor's balance sheet value and creditworthiness deteriorates due to increase in policy rate, a change in net worth affects the borrower's ability to obtain loans (or other sources of external financing) for further investment and consumption. A reduction of net worth increases adverse selection and moral hazard, since borrowers with low net worth have an incentive to take greater risks.

Most of the empirical literature focuses on analysis of effects of pure QE using purchase of public securities on economy of the United States (e.g. Baumeister and Benati, 2010; Hamilton and Wu, 2012 and others) or the United Kingdom (Joyce et al., 2011; D'Amico et al., 2012 and others) through decrease in long-term interest rate.

Second group of studies estimates direct impact of QE on economic growth (positive) and inflation (positive) again in the United States (Baumeister and Benati, 2010; Krishnamurthy and Vissing-Jorgensen, 2011 among others). Only a handful of studies have been so far focusing on euro area by either estimating an impact of the Enhanced Credit Support (e.g. Lenza et al., 2010) or SMP (e.g. Eser and Schwaab, 2013) on long-term public sector interest rates or real economic growth and inflation. Bridges and Thomas (2012) take a monetarist approach to the Bank of England's outright purchases and find that direct purchases of securities from the hands on non-bank private sector led to increase in money supply, and consequently output and inflation. Beirne et al. (2011) investigates impact of CBPP1 on CB market arriving to the conclusion that this program led to increase in supply of CBs, revival of secondary CB market and decrease in market spread.

2.1 Monetary Transmission Mechanism in VAR Models

Testing the functionality of various channels included into the theoretical transmission mechanism has been widely conducted by various types of VAR models. Since seminal work by Sims (1980) the VAR models have become a workhorse for many central bankers around the globe. Leeper et al. (1996) and Christiano et al. (1999) provide a summary of VAR literature related to the MTM in the US and Angeloni et al. (2003) for the group of "old" EMU members. Differences in MTM before accessing the EMU are also studied in Mojon and Peersman (2001), the EMU as a whole is investigated in Peersman and Smets (2001).

Lenza et al. (2010) models the euro area using Bayesian VAR (BVAR henceforth) model with an extensive set of variables. Outcomes from counterfactual analysis suggest that household credit is positively affected by an unexpected cut in key interest rate on impact, credit to non-financial corporations responds positively with a lag. Real activity is affected positively with lag of several months, the same holds also for the inflation but the overall impact of interest-rate policy real economy is rather limited. Reduced BVAR model with limited set of variables by Baumeister and Benati (2010) specifically focuses on impact on interest rate spread concluding that compression in the long-term yield spread has a powerful effect on both output and inflation. Fahr et al. (2011) BVAR model includes variables of financial distress into list of endogenous variables and comes to a conclusion that ECB's Enhanced Credit Support was instrumental in supporting credit creation and averting downside risks to price stability. Peersman (2011) introduces more detailed block of credit market into BVAR model and argues that change in central bank balance sheet (orthogonal shock to standard interest rate policy) has a more sluggish but positive impact on inflation and output and is passed on to bank lending via a decline in interest rate spreads. Giannone et al. (2012) compares US and EA credit-business cycle link with BVAR model. While the money market behavior remains in line with its historical regularities partially due to the ECB's success in stabilizing market conditions, bank deposits and longer interest rates did not respond accordingly exhibiting steeper than usual yield curve.

2.2. SVAR Model for Individual EA Member States

As we are interested in estimating the response of domestic credit provisioning and transmission of monetary shock on real economy we derive our specification from a recent study by Peersman (2011).

Long-term effects of quantitative or credit easing are expected to be captured by fluctuations in monetary base that transmits to long-term interest rates, bank spread, credit aggregates and real economic growth, at the end. This is in strong contrast to traditional view of MTM analyzed through SVAR models (see Mojon and Peersman, 2001), as the money starts playing the primary role in monetary policy strategies of particular countries, once again. Introducing monetary base as a policy variable allows us to identify effects of ECB's unconventional policy, especially fixed rate full allotment liquidity operations, extension of maturity for LTRO operations and outright purchases of government securities on individual country levels. As the ECB's monetary policy is effectively conducted by national central banks in a disaggregated way change in monetary base recorded in balance sheets of national banks should be able to capture effects of ECB's unconventional measures.

Banking sector response to monetary policy stance is modeled via changes in bank claims on private sector that precedes change in monetary base in contemporaneous setting. This is to acknowledge that monetary base, with reserves as the key component, responds to level of credit provisioning through increase in deposit side of bank balance sheets. In other words, increase in credit provisioning is financed through increase in deposits that are ultimately subject to minimum reserve requirements.

Due to the fact that pure quantitative easing, as defined in Beirne et al. (2011), is conducted through outright purchases of government bonds, we specifically approximate long-term interest rates by 10 year government bond yields. The bank sector behavior is captured by bank claims on private sector and bank spread calculated as the difference between average interest rate on loans and deposits. The standard representation of individual economies contains relatively small sample of variables, contrary to some other studies (e.g. Lenza et al., 2010; Giannone et al., 2012) but in line with Peersman (2011).

The estimated system for each particular EMU member state has the following representation:

$$Y_t = \alpha + A(L)Y_{t-1} + B(L)X_t + v_t \qquad (1)$$

where Y_t is a vector of endogenous variables containing the seasonally adjusted natural logarithms of respectively real output y_t, prices p_t, the volume of bank claims on private sector cr_t, the monetary base m_t, the level of the interest rate on 10 year government bonds i_t and bank spread bs_t. The vector X_t includes list of exogenous variables containing the seasonally adjusted natural logarithms of respectively EA real output y_t^E and EURIBOR interest rate i_t^E. α represents vector of constants, A(L) and B(L) are matrices polynomial in the lag operator L.

Following Lenza et al. (2010), Peersman (2011) and Giannone et al. (2012), the VARs in this study are estimated in (log) levels, which allows for implicit cointegrating relationship in the data (Sims et al. 1990). Contrary to Peersman (2011) and other studies focusing on modelling aggregate EA economy inclusion of list of exogenous variables for individual countries is motivated by two considerations.

Firstly, it is standard to control for exogenous variables in order to eliminate the so-called prize puzzle in the empirical VAR literature (i.e. empirical finding that prices rise following an interest rate tightening due to the reaction of monetary policy to external shocks). From this reason our list incorporates standard items, such as foreign demand variable (see Mojon and Peersman, 2001).[1] As we predominantly focus on investigating the effects of quantitative easing policy on credit channel and then real economic growth, following Peersman (2011) procedure, we neglect impact of real exchange rate that is not in the endogenous nor in the list of exogenous variables.

[1] World commodity price index (IMF) used by Mojon and Peersman (2001) is considered as an exogenous variable but in most of the cases is not included to the list of exogenous variables as money market interest rate and EMU real output is sufficient to achieve negative response in price index to positive shock into long term interest rate.

Due to the loss of independent monetary policy in EA member states it is not possible to model monetary policy rule in the MTM via changes in the key short-term policy rate any more. As a result, this variable must be excluded from the list of endogenous variables. However, it still holds true that changes in the ECB's key policy rate will be transmitted into the individual economies, thus affecting all of our endogenous variables. The 3-month EURIBOR interest rate is therefore used as a proxy variable reflecting changes in the ECB's monetary policy stance (in line with Mojon and Peersman, 2001) and is listed in the vector of exogenous variables.[2] The counterfactual analysis presented in Giannone et al. (2012) suggests that interbank market rates captured by the 3-month EURIBOR behaved accordingly to the business cycle and the ECB's monetary policy succeeded to keep them close to their normal-like business cycles levels.

Turning to identification of matrix of contemporaneous shocks we restrict short-term impact of credit aggregate on long-term government bond yields assuming that increase in credit provisioning to domestic non-financial corporations and households is not used for financing government debt of individual countries in the short-run. In line with standard literature we assume that there is only a lagged impact of credit supply on prices and economic growth, if ever (see following discussion). However, the credit supply is affected by credit growth and prices even in a short-run.

Monetary base is allowed to respond to innovations in output and prices also contemporaneously, but direction of impulse remains ambiguous. Firstly, during normal (=pre-crisis) years it is assumed that changes in monetary base of individual countries simply reflect demand of banking sector for net liquidity that might be driven by real economic conditions in that particular economy. During the crisis period, monetary base becomes once again an important monetary policy tool through which are decisions of ECB transmitted into economies of individual countries. Aside from the demand of banking sector, central banks of individual countries reacts to economic conditions and conduct purchases of government securities in an amount deemed to be necessary to steer domestic economy in positive direction.

The benchmark VAR is estimated as described in (1) for sample period 2003q1-2014q4 and then sub-periods of 2003q1-2008q2 and 2008q3-2014q4. This is to address issue of time-varying coefficients as discussed in Baumeister and Benati (2010) resulting from a possible shift in structural relationship between key macroeconomic variables due to the dramatic economic contraction known as the Great Recession. Our choice of 2008q3 as a breaking point is motivated by the date of introduction of first wave of ECB's unconventional monetary policy measures including new 6-month LTRO (long-term refinancing operations) and fixed-rate full allotment policy that coincides with an upsurge of uncertainty in banking sector due to the Lehman Brothers fall.

We use the usual lag-length selection criteria (Schwarz and Akaike information criteria) but adjust it in order to ensure that the inverse roots of AR characteristic polynomial are inside unit circle.

Data are taken from various sources: domestic banking sector's claims on the private sector from the IMF database, EONIA, 3-month EURIBOR interest rate and average interest rate on loans and deposits from the ECB database, real GDP for individual countries and EA (floating composition), CPI index (all prices) and benchmark rates for 10-years government bonds are taken from the Eurostat database, monetary base from International Financial Statistics by IMF.

3. Estimation Results

Appendix I displays impulse response functions to shock to monetary base (unconventional monetary policy shock) and bank claims on private sector innovations. The red upper and lower bound represent 95 percent confidence interval around shock of 1 standard deviation.

The impulse response functions for unconventional shock to monetary base exogenous to standard change in key policy in Eurozone depict a similar pattern among all three countries. In pre-

[2] As part of the robustness check we use EONIA instead of 3-month EURIBOR interest rate serving as a proxy for ECB's monetary policy decisions. The correlation between EONIA and 3-month EURIBOR during the analyzed period approaches 98 percent. However, spread between both variables was dramatically affected by the liquidity shortage in the money market, especially around year 2008. While not specifically controlling for this spread as a potential exogenous variable further research on impact of EA money market conditions on individual countries is to be recommended.

crisis period positive exogenous shock to monetary base leads to an increase in long-term interest rate, except for Germany, but its effect quickly evaporates after second and third quarter. Unconventional policy adopting balance sheet policy seems to be effective in affecting the long-term interest rate with a lag of two quarters. After that the negative response slowly returns interest rate to zero level. The only country where expansion of central bank balance sheet is likely to have a long-term effects on 10 year government bond yields is Germany. Statistically, only in the case of Germany the response of long-term benchmark interest rate is significant from zero at 5 percent confidence interval.

Second step of transmission mechanism adopted in times of economic downturn focuses on changing the conditions of credit provisioning captured by bank spread. Traditionally, positive shock to monetary base leads to decrease in bank spread between price of loans and deposits but the effect disappears after three quarters. Similar reaction to innovations in central bank balance sheet during crisis period is to be found in the crisis period in all three countries, yet the response might be considered to be stronger (France), longer-lasting (Germany), but also less significant (Austria). Nevertheless, the monetary policy aiming at expanding the central bank monetary base has, in general, two effects in all selected countries. After change in long-term benchmark rate (strongest effect in absolute terms), monetary policy shock is expected to be passed on to bank lending via decline in bank interest spread. This phenomenon has been recently confirmed for Eurozone in Peersman (2011). Interestingly, while in case of long-term benchmark interest rate the biggest impact of monetary policy shock is expected to be achieved after roughly half a year, the response of bank spread is immediate but the effect dies out very quickly (second quarter).

Unexpected direct effect of balance sheet expansion on credit provisioning remains, however, nonexistent practically in all cases. Thus, it seems that even in the presence of zero lower bound environment the only functioning mechanism of monetary transmission still relies on change in banking spread transmitted into change in interest rates on loans. Assuming, however, that existence of fixed costs effectively prohibits commercial banks to grant loans with zero or even negative interest rate the monetary policy is likely to reach its limit sooner or later. On top of that, one should also question the ability of banking system to positively contribute to economic growth through increase in credit provisioning as neither pre-crisis nor crisis experience can be characterized by positive, statistically significant and long-lasting response of real GDP to unexpected innovation to bank claims. And if there are even any signs of positive transmission from bank claims to economic growth present (France for crisis period, Germany for pre-crisis period), the weakness of this channel leaves almost no room for maneuver. Rather than this, results presented in the Appendix II tells a different story.

In all countries and during all periods analyzed the Eurozone real GDP entering equations as a purely exogenous variable drives the domestic economic growth. Additionally, in case of Austria and France, growth in credit aggregate is positively related to the change in foreign demand. German banking sector responds differently with negative coefficient associated with growth in foreign (EA) demand. Response of domestic economy to change key policy rate in EA varies across countries. In Austria, common monetary policy is able to affect long-term interest rates and bank spread in positive directions, however link to domestic monetary base remains strongly dependent on economic conditions. French economy seems to be responsive towards common monetary policy too as the innovations to EURIBOR are not only transmitted to domestic banking sector (decrease in credit provisioning) but also to real economy (inflation and real GDP). Yet, long-term interest rates and bank spreads are predominantly driven by other, likely domestic sources. As in the previous case, German banking system seems to react to interest-rate policy represented by EURIBOR variable through credit multiplier rather than via decrease in bank spread. Yields on German government bonds show a strong link to ECB interest rate policy, but only in the crisis period which stands in contrast to Austrian pre-crisis experience. Evolution in real sector is likely to be pushed by other macroeconomic factors than ECB interest rate policy even though the pre-crisis CPI shows some evidence or responsiveness towards changes in EURIBOR.

Our findings let us believe that transmission mechanism of unconventional monetary policy measures adopted by the ECB works in two key dimensions (and does not work in many others). Firstly, traditional interest rate innovations exogenously imposed on EA domestic economies have only limited impact on long-term benchmark yields or bank spreads. Instead, key interest rate changes might be transmitted into domestic economies via credit multiplier channel, as suggested by Peersman

(2011). Secondly, the balance sheet expansion due to the quantitative easing policies might have a stronger impact on long-term government yields and works its way through declining bank spread. However, this effect seems to be of a very short-term nature and does not fully transmit into positive upsurge in credit provisioning. Pure expansion in quantity of money, as assumed by baseline money multiplier theory, does not itself guarantee reboot of banking credit. On top of that, as the credit growth seems to be demand (foreign and domestic economic activity) rather than supply determined overflowing the system with cheap money represents necessary but not sufficient condition for kick-starting economic growth. From this perspective, ECB's decision to expand standard quantitative easing to include covered bonds and asset-backed securities (Covered Bond Purchase Programme 3 and Asset-backed Securities Purchase Programme) that are inherently linked to underlying loans is clearly a logical step, yet may face many obstacles. Unfortunately, as the total value of securities planned to be purchased within the scope of these two programs seem to be very limited (see Siranova and Kotlebova, 2015b) and small in comparison to PSPP program (Public Securities Purchase Programme) the most likely scenario of future evolution cannot count on credit as a possible source of economic growth.

4. Conclusion

As a response to sluggish economic growth and negative inflation expectations the ECB has recently introduced new wave of unconventional monetary measures. While aggregate impact of quantitative easing has been studied relatively thoroughly the disaggregated analysis on individual constructing country level is missing. This paper aims to close this gap by SVAR model that enables analyze possible impact of ECB's unconventional measures on domestic economy. We separately model innovation to ECB key interest rate representing standard interest rate policy as exogenous variable and effects of pure quantitative easing through change in monetary base of national central banks as endogenous variable. This allows us to differentiate between two separate effects of ECB's monetary policy. By incorporating banking sector we specifically examine effects of monetary policy on credit provisioning in individual countries. This model is applied on three countries that are predominantly bank-oriented: Austria, Germany and France.

Our results suggest that while standard interest rate policy might have an effect on credit provisioning through credit multiplier, balance sheet policy predominantly affects long-term interest rates and bank spreads but the effect evaporates rather quickly. Effectiveness of monetary policy in influencing the real output through credit provisioning should be called into question as we do not find evidence of causal relationship running in credit-to-GDP direction.

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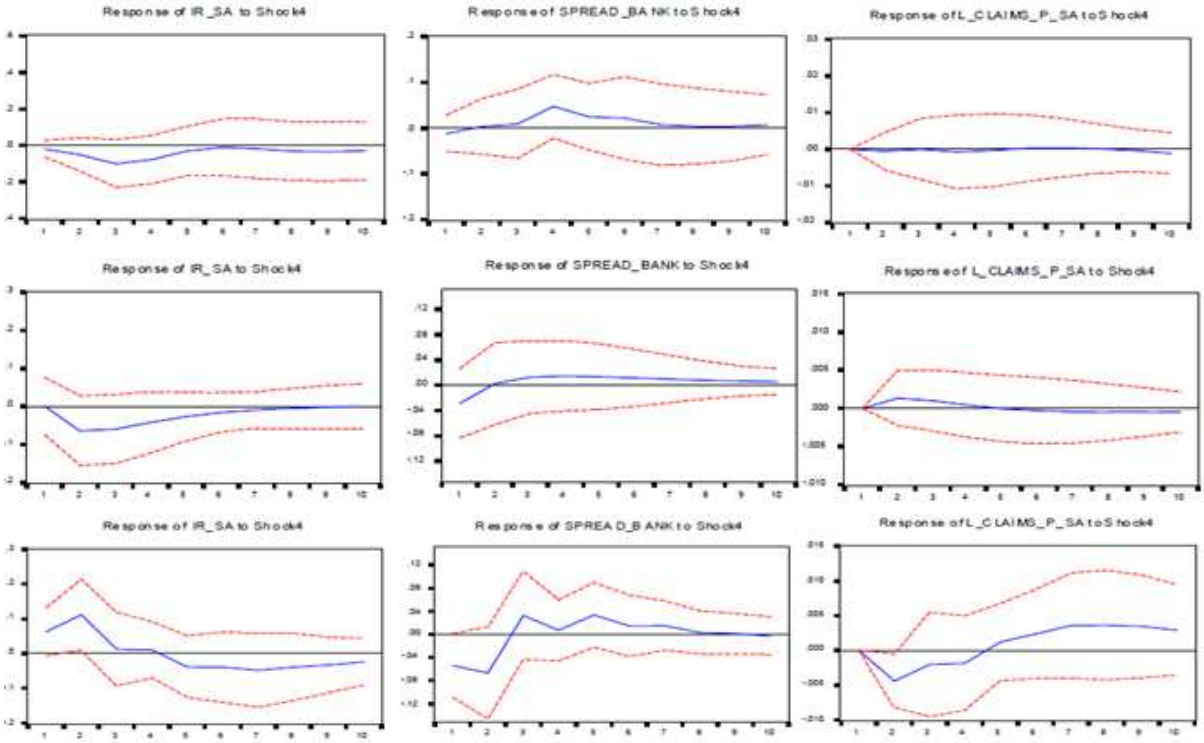
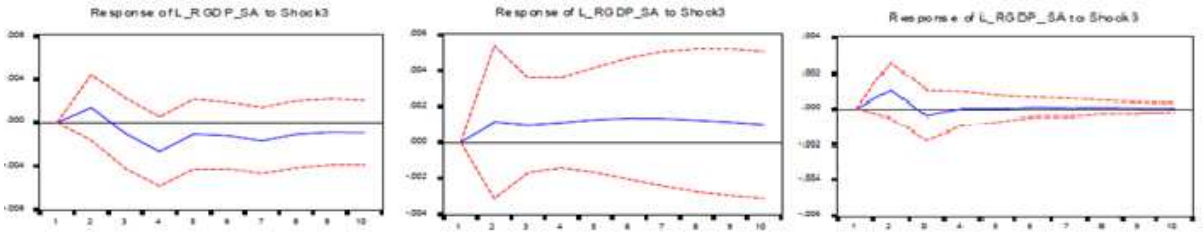
Appendix

Appendix I: Impulse responses

Panel A1: Austria (shock to monetary base) - full period (upper row), crisis period (middle row), pre-crisis period (bottom row)



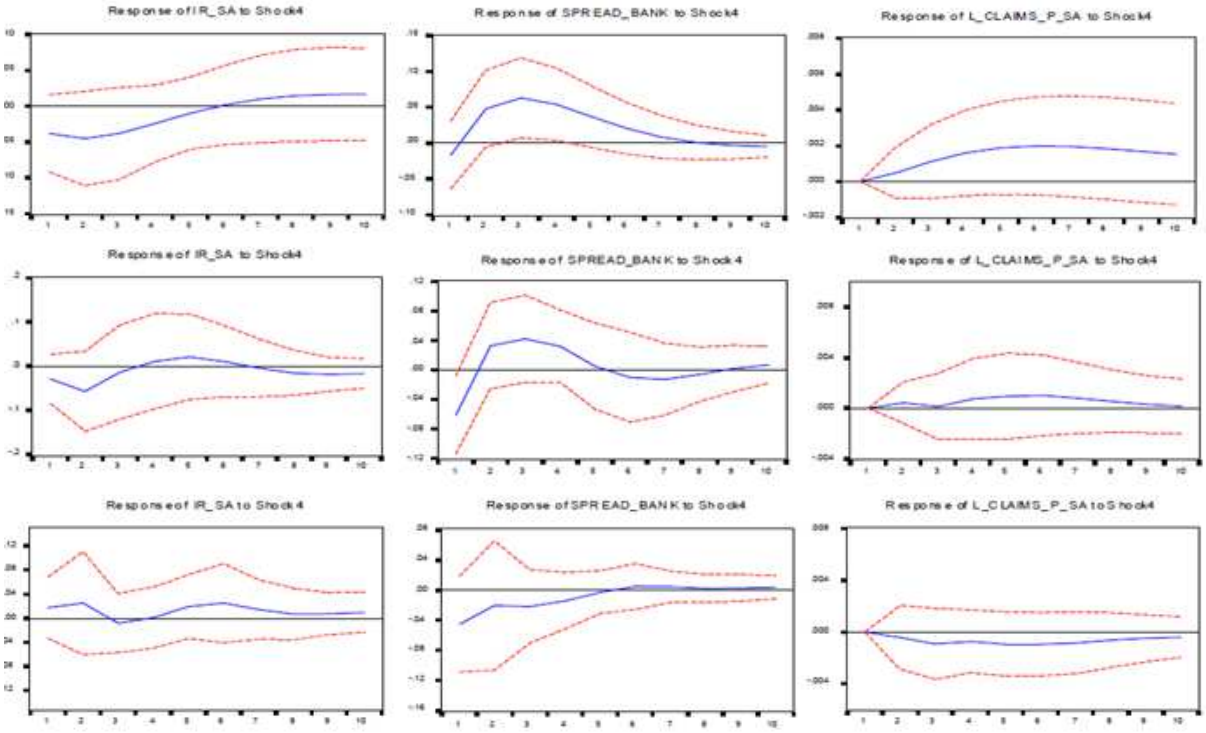
Panel A2: Austria (shock to credit aggregate) - full period (left), crisis period (middle), pre-crisis period (right)



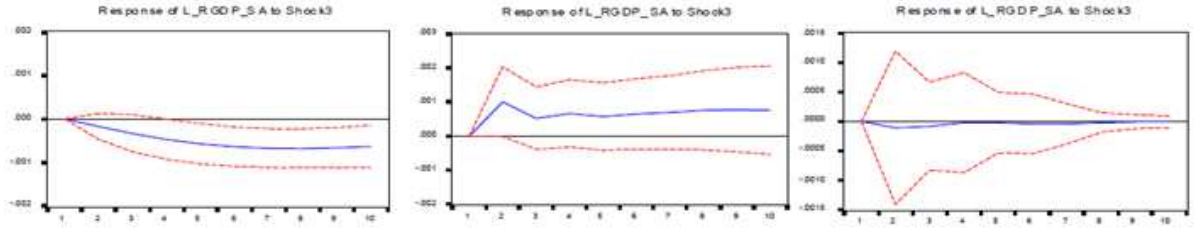
Note: IR stands for benchmark 10-year government bonds yield, SPREAD_BANK for bank spread calculated as a difference between average interest rate on loans and deposits, CLAIMS_P for claims of banking sector on private sector, RGDP for real GDP deflated with HICP index.

Source: authors´ own processing

Panel B1: France (shock to monetary base) - full period (upper row), crisis period (middle row), pre-crisis period (bottom row)



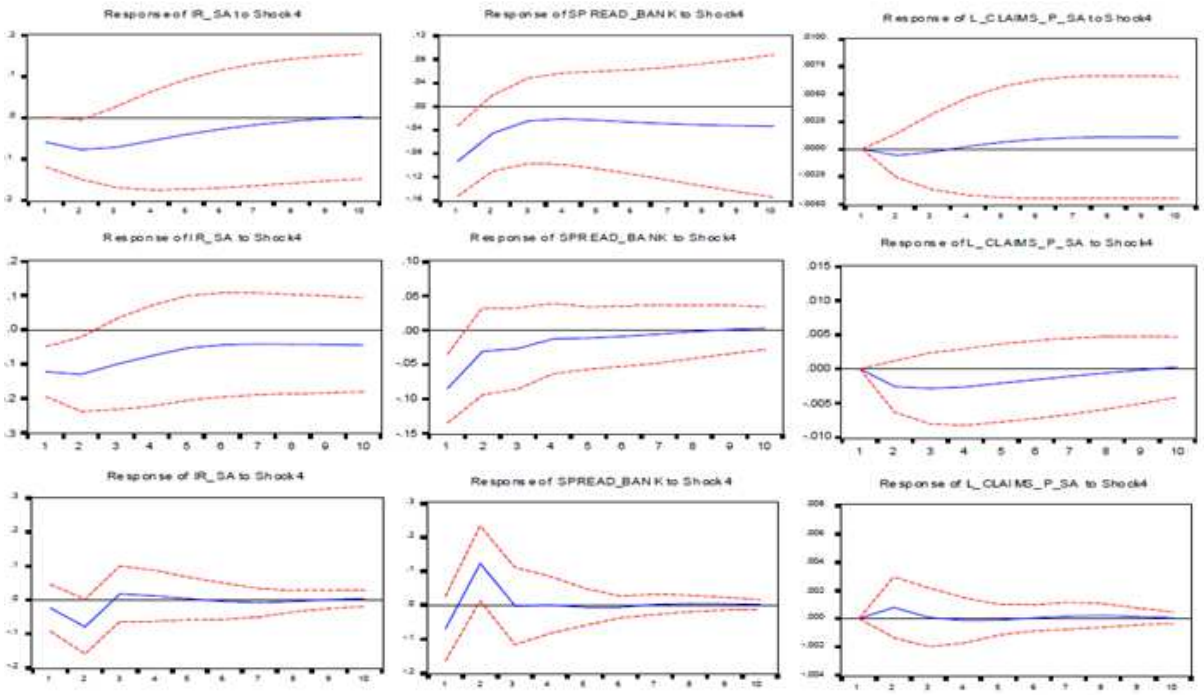
Panel B2: France (shock to credit aggregate) - full period (left), crisis period (middle), pre-crisis period (right)



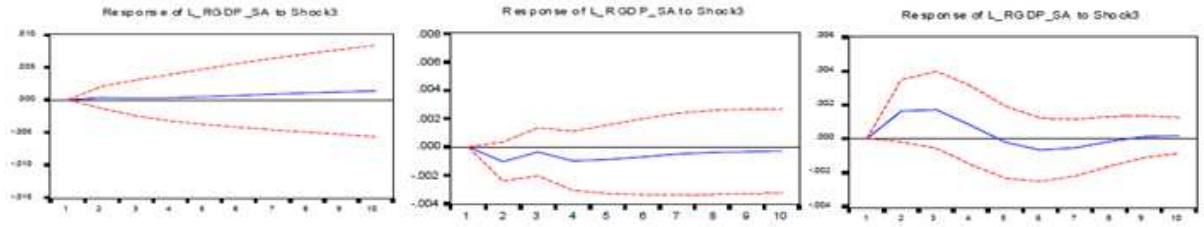
Note: IR stands for benchmark 10-year government bonds yield, SPREAD_BANK for bank spread calculated as a difference between average interest rate on loans and deposits, CLAIMS_P for claims of banking sector on private sector, RGDP for real GDP deflated with HICP index

Source: authors´ own processing

Panel C1: Germany (shock to monetary base) - full period (upper row), crisis period (middle row), pre-crisis period (bottom row)



Panel C2: Germany (shock to credit aggregate) - full period (left), crisis period (middle), pre-crisis period (right)



Note: IR stands for benchmark 10-year government bonds yield, SPREAD_BANK for bank spread calculated as a difference between average interest rate on loans and deposits, CLAIMS_P for claims of banking sector on private sector, RGDP for real GDP deflated with HICP index

Source: authors´ own processing

Appendix II Effects of EURIBOR and EMU real GDP on list of SVAR endogenous variables

Austria		Real GDP	HICP	Claims	MB	LIR	Bank Spread
Full	Euribor	0.0012	*-0.0049***	-0.0015	0.0321	0.0513	*0.2513***
		(0.2797)	*(-2.8819)*	(-0.1777)	(0.5268)	(0.3782)	*(2.5919)*
	Real GDP EMU	*0.9254****	*0.2974****	0.1804	-1.8476	-9.4214	-4.1143
		(4.4042)	*(3.4670)*	(0.4158)	(-0.6069)	(-1.3875)	(-0.8481)
Before crisis	Euribor	-0.0055	-0.0007	-0.0026	*-0.0932***	*0.3804**	-0.0378
		(-1.0842)	(-0.2549)	(-0.3995)	*(-2.1657)*	*(2.0080)*	(-0.2566)
	Real GDP EMU	*1.1600***	-0.1230	*2.7509****	0.7366	-9.0637	-3.1306
		(2.7191)	(-0.5281)	*(5.0141)*	(0.2019)	(-0.5639)	(-0.2503)
Crisis	Euribor	0.0023	-0.0033	-0.0029	*0.2061****	0.0284	0.0804
		(0.3737)	(-1.5794)	(-0.3357)	*(2.9422)*	(0.1427)	(0.6030)
	Real GDP EMU	*0.8609****	*0.2042***	0.2670	-1.5424	-3.8985	-2.3482
		(3.4338)	*(2.4189)*	(0.7707)	(-0.5486)	(-0.4878)	(-0.4385)

France		Real GDP	HICP	Claims	MB	LIR	Bank Spread
Full	Euribor	*-0.0037****	*-0.0022***	*-0.0064****	0.0262	0.0200	0.0517
		(-2.8120)	*(-2.1160)*	*(-2.9770)*	(0.6638)	(0.2285)	(0.7812)
	Real GDP EMU	*0.5189****	*0.2185****	*0.5181****	-1.7891	-0.1143	3.0670
		(6.2242)	*(3.2577)*	*(3.8183)*	(-0.7134)	(-0.0205)	(0.7289)
Before crisis	Euribor	-0.0010	*-0.0029**	*-0.0095****	*0.1806***	-0.1162	0.1146
		(-0.4919)	*(-1.7345)*	*(-2.9084)*	*(2.3048)*	(-0.8070)	(0.9804)
	Real GDP EMU	*0.7758****	*0.2740****	*0.3800**	-0.8752	11.4370	-6.0670
		(6.6360)	*(2.8865)*	*(1.9579)*	(-0.1886)	(1.3414)	(-0.8762)
Crisis	Euribor	-0.0037	*-0.0206****	0.0280	*-0.2974***	0.2288	-0.1614
		(-0.4198)	*(-3.2401)*	(1.6242)	*(-2.4777)*	(0.3001)	(-0.2327)
	Real GDP EMU	*0.5206****	*0.2174***	*0.6406***	2.2995	11.4065	11.0422
		(3.7267)	*(2.1284)*	*(2.3130)*	(1.1946)	(0.9330)	(0.9925)

Germany		Real GDP	HICP	Claims	MB	LIR	Bank Spread
Full	Euribor	-0.0046	-0.0012	*0.0133****	0.0659	0.0244	0.0186
		(-1.2219)	(-0.9923)	*(3.2562)*	(0.8773)	(0.2046)	(0.1536)
	Real GDP EMU	*0.6323****	*0.1472****	*-0.3254***	-0.4357	*10.0263***	*-8.4897***
		(5.3902)	*(4.0682)*	*(-2.5601)*	(-0.1863)	*(2.6965)*	*(-2.2503)*
Before crisis	Euribor	0.0090	*-0.0090**	0.0137	-0.1139	-0.0787	-0.0637
		(1.2498)	*(-1.9841)*	(1.3309)	(-1.4732)	(-0.2367)	(-0.1326)
	Real GDP EMU	*0.6870****	0.0175	-0.0040	0.5312	2.3194	-10.5691
		(3.7379)	(0.1521)	(-0.0154)	(0.2703)	(0.2744)	(-0.8663)
Crisis	Euribor	0.0020	0.0010	*0.0157***	0.0936	*0.3870***	0.0840
		(0.9648)	(0.7729)	*(2.6934)*	(0.7963)	*(2.6372)*	(0.8623)
	Real GDP EMU	*1.4053****	0.1210	*-0.9389***	4.7180	-8.0715	-6.0721
		(11.095)	(1.4989)	*(-2.6667)*	(0.6639)	(-0.9094)	(-1.0303)

Note: * denotes significance at 10 percent level, ** denotes significance at 5 % level, *** denotes significance at 1 % level. T-statistics in parenthesis. Full stands for 2003q1-2014q4 period, before crisis for 2003q1-2008q2 period and crisis for 2008q3-2014q4 period. Real GDP is deflated with HICP deflator. Claims represents claims of banking sector on private sector, MB stands for monetary base, LIR for 10-year benchmark government yields. Bank spread is calculated as difference between average interest rate on loans and deposits.

Source: authors´ own processing