ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Deryugina, Elena; Kovalenko, Olga; Pantina, Irina; Ponomarenko, Alexey

Working Paper

Disentangling loan demand and supply shocks in Russia

BOFIT Discussion Papers, No. 8/2015

Provided in Cooperation with:
Bank of Finland, Helsinki

Suggested Citation: Deryugina, Elena; Kovalenko, Olga; Pantina, Irina; Ponomarenko, Alexey (2015) : Disentangling loan demand and supply shocks in Russia, BOFIT Discussion Papers, No. 8/2015, ISBN 978-952-323-032-3, Bank of Finland, Institute for Economies in Transition (BOFIT), Helsinki, https://nbn-resolving.de/urn:nbn:fi:bof-201503111111

This Version is available at:
https://hdl.handle.net/10419/212818

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

BOFIT Discussion Papers
8 • 2015

Elena Deryugina, Olga Kovalenko,
Irina Pantina and Alexey Ponomarenko

Disentangling loan demand and supply shocks in Russia

EUROJÄRJESTELMÄ
EUROSYSTEMET

Bank of Finland, BOFIT
Institute for Economies in Transition

BOFIT Discussion Papers
Editor-in-Chief Laura Solanko

BOFIT Discussion Papers 8/2015
5.3.2015

Elena Deryugina, Olga Kovalenko, Irina Pantina and Alexey Ponomarenko:
Disentangling loan demand and supply shocks in Russia

ISBN 978-952-323-032-3
ISSN 1456-5889 (online)

This paper can be downloaded without charge from http://www.bof.fi/bofit.

Suomen Pankki
Helsinki 2015

Contents

Abstract 4

1 Introduction 5

2 Cointegration analysis 6

3 Structural VAR model with sign restrictions 10

4 Panel regression based on BLS surveys in Russia 16

4.1 BLS indicators in Russia: historical data and descriptive evidence 16

4.2 Panel regression based on the micro data 21

5 Conclusions 27

References 28

Appendix 30

Elena Deryugina, Olga Kovalenko, Irina Pantina and Alexey Ponomarenko

Disentangling loan demand and supply shocks in Russia

Abstract

This article presents three alternative models for decomposing loan developments into components associated with changes in loan demand and supply fundamentals. Two models are based on macro data (error correction model and structural vector autoregression with sign restrictions) and one is based on bank-specific Bank Lending Survey results. We conclude that although loan growth in Russia converges to a long-run equilibrium determined by macroeconomic (demand) factors the convergence is likely to be driven by bank-side (supply) shocks. We identify large and unexplained supply shocks in loan fluctuations during the crisis of 2008–2009, signifying an impairment of credit markets. We also find contractionary shocks unrelated to demand fundamentals or balance sheet structures in 2013, although in general loan developments in 2013 and the first half of 2014 were not at all extraordinary.

Keywords: loan demand, loan supply, cointegration, structural VAR, sign restrictions, Bank Lending Survey, Russia
JEL Classification: C32; E51; G21

Elena Deryugina, Bank of Russia. Email: DeryuginaEB@cbr.ru
Olga Kovalenko, Bank of Russia. Email: KovalenkoOV@cbr.ru
Irina Pantina, Bank of Russia. Email: PantinaIV@cbr.ru
Alexey Ponomarenko, Bank of Russia. Email: PonomarenkoAA@cbr.ru

Acknowledgements
An early version of this paper was presented at the XII ESCB Emerging Markets Workshop in Saariselka (December 2014) hosted by the Bank of Finland Institute for Economies in Transition (BOFIT). We wish to thank the participants of the workshop and especially Laura Solanko for comments and suggestions. We also express particular gratitude to Iikka Korhonen for encouragement and support to the following study. The views expressed in this paper are solely those of the authors and do not necessarily represent the official position of the Bank of Russia.

1 Introduction

Aggregate loan development typically hinges on a combination of factors that impact simultaneously on the demand and the supply side of bank lending. Disentangling these developments is a crucial issue for policymakers, as changes in credit dynamics – especially when exceptional, as in the period of a financial crisis – can have different effects on economic activity and may require different monetary policy responses depending on whether they originate from demand or supply shocks (see e.g. ECB (2009) for a discussion).

From a monetary policy perspective, it is important to know whether developments in aggregate loans to the private sector are driven by changes in loan demand or supply since monetary policy-makers' choices of tools and actions may differ greatly, depending on whether the aim is to affect loan supply, loan demand, or both. Moreover, it is important to identify the underlying source of a shock to loan supply. The appropriate monetary-policy response may differ substantially depending on whether banks reduce loans because borrowers' creditworthiness has deteriorated or because banks cannot obtain adequate financing from the market. In the first case, a reduction in policy rates would encourage aggregate demand, so that the net worth of corporations and the willingness of banks to lend would increase over time. In the second case, providing the necessary liquidity to banks would enable them to satisfy the demand for loans coming from profitable firms.

From a financial stability perspective, gauging the interaction between monetary stance and loan supply becomes particularly important during crisis periods when the banking sector is under pressure and loan supply is hit by adverse shocks. In such cases, it is crucial for the central bank to have a sound knowledge of the quantitative implications of financial stress for loan supply in order to alleviate the shocks to loan supply and put banks in a position to fulfill their role as financial intermediaries for the economy. Such policy actions can range from adjustments in key policy rates to a number of non-standard measures, should the credit markets become impaired.

In general, however, it is difficult to identify the supply and demand effects that underlie credit developments, especially as shifts in demand and supply often occur simultaneously. They both impact bank lending rates and credit volumes, and in certain situations may pull in the same direction. It is consequently challenging to empirically identify supply effects in aggregate time series data and in view the fact that no existing methodol-

ogy is without its caveats. The aim of this paper is to develop a suite of alternative models that may contribute to a better understanding of the demand and supply factors on the credit market.

Applying conventional modeling strategies (e.g. linking credit growth with macroeconomic fundamentals for evaluation of "equilibrium" values) may be challenging because arguably credit growth deviated from equilibrium during the significant part of our time sample as Russia witnessed drastic fluctuations in credit growth during the past decade. Rapid loan expansion in 2006−2008 drove a credit boom that fuelled rapid economic growth. The global financial crisis of 2008−2009, while ushering in a long period of financial stress in the developed countries, due to deleveraging, was initially weathered by Russia and many emerging economies with fairly modest impacts on real-sector growth. Nevertheless, after the collapse of Lehman Brothers in September 2008, financial stress intensified on Russia's financial markets, and bank lending plummeted. Loan growth began to pick up in late 2010 after the implementation of extraordinary measures by the Russian government and Bank of Russia in 2010. Notably, the fluctuations in real activity were also often correlated with exogenous deposits supply shocks (due to e.g. (de)dollarization) arguably calling for a more complicated method of disentangling the effects stemming from lenders' and borrowers' sides.

The rest of the paper is structured as follows. Section 2 presents an error-correction model based on loan demand and loan supply relationships. Section 3 sets out the structural VAR model that identifies loan supply, loan demand and core liabilities shocks. In Section 4 we develop an econometric model based on bank-level information and responses of banks to the Russian Bank Lending Survey (BLS). The model helps in identifying the influences of supply and demand factors on lending to enterprises and households. Section 5 concludes.

2 Cointegration analysis

Our first approach relies on cointegration analysis, in an attempt to identify long-run relationships that can be interpreted as demand and supply functions (see, for example, Hűlsewig et al. (2006); de Mello and Pisu (2010); Kok Sørensen et al. (2012); Brissimis et al. (2014))). This approach has been previously applied to the Russian economy (Yudaeva et al. (2009)). The advantages of this approach are its transparency and interpretability. The

arguable disadvantage is the assumption that the variables included in the model represent all the fundamental factors that influence loan developments. Moreover, though the error-correction approach is designed to determine the long-run equilibrium volume of loans it is not necessarily helpful in analysing actual short-run developments.

More specifically, we estimate two cointegrating relationships representing loan demand and supply. Instead of estimating the model using in a conventional but complex VECM framework we follow Brissimis et al. (2014), and conduct our estimation in a parsimonious two-step procedure. In the first step, we estimate separately the two cointegrating relationships in which the theoretical restrictions pertaining to the demand for or supply of credit are imposed[1]. The equations are estimated by Fully Modified OLS (Phillips and Hansen (1990)). In the second step, we estimate an error correction model, including as error correction terms the residuals of the cointegrating equations estimated in the first step.

The time sample of our empirical analysis is from 2001Q1 to 2014Q2. The main data source is the Bank of Russia (GDP and GDP deflator are reported by Rosstat). All series are seasonally adjusted.

The first conitegrating relationship is based on the concept of the equilibrium credit-to-GDP ratio[2] (see Cottarelli et al. (2005), Égert et al. (2006), Kiss and Vadas (2006), Coudert and Pouvelle (2010) for reviews). During the period studied, the Russian corporate sector relied interchangeably on domestic and foreign borrowing. Therefore we combine domestic private credit with foreign debt in the demand side analysis. We use real GDP as a proxy for economic development and inflation as a measure of uncertainty (we expect disinflation to be associated with an increase in bank credit to the private sector as in Égert et al. (2006)).

We also tested asset (housing and stock) price indices but did not get satisfactory results. Notably, we were unable to obtain significant results for domestic interest rates (nominal or real) in this relationship. One possible explanation for this result is that the

[1] The possibility of cointegration is established by the unit root tests and Johansen test of the unrestricted VAR in levels for the full set of variables as presented in Tables 4 and 5 in the Appendix.
[2] We label this relationship the "demand" equation because it is based on macro (real sector side) fundamentals as opposed to financial (bank side) fundamentals in the second relationship, even though it may reflect changes in both borrowers' and banks' behavior.

available indicators of interest rate do not fully capture the availability of credit on the heterogeneous[3] financial markets accessed by Russian borrowers.

Thus, we obtain the estimates of equation (1), which we label the loan demand relationship (standard errors in parentheses):

$$\frac{L_t}{GDP_t} + \frac{OC_t}{GDP_t} + \frac{FD_t}{GDP_t} = 2.96_{(0.24)} \cdot Y_t - 3.79_{(0.76)} \cdot infl_t + \varepsilon_t \quad (1)$$

where L_t is domestic ruble loans to the private sector, OC_t is other domestic credit to the private sector (including foreign currency loans and bonds), FD_t is foreign debt of the private sector, GDP_t is nominal GDP, Y_t is log of real GDP and $infl_t$ is annual change in log of GDP deflator.

The second cointegration relationship includes the banking sector variables and is assumed to describe the supply side. In the spirit of Carpenter et al. (2014) we want our loan supply equation to capture credit, liquidity and interest rate risks of banks' balance sheets[4]. For this purpose we use the aggregate Net Stable Funding Ratio concept[5] as a good summary indicator of balance sheet structure. Following Vazquez and Federico (2012) we estimate a measure of banks' core liabilities *($CoreLiab$)*, which excludes non-core funding sources (domestic and international interbank borrowing, borrowing from the Bank of Russia, debt securities and foreign currency deposits) and includes ruble deposits with 0.7 weight as well as total other liabilities. We expect this variable to be positively associated with loans to the private sector. If the estimated coefficient is close to unity, we can argue that the Net Stable Funding Ratio is a good indicator of a banking system's loan supply capabilities. Credit risk is proxied by the non-performing loans ratio (NPL). The estimation of this equation yields the following results (standard errors in parentheses):

$$\frac{L_t}{GDP_t} = 1.21_{(0.02)} \cdot \frac{CoreLiab_t}{GDP_t} - 4.06_{(0.32)} \cdot NPL_t \quad (2)$$

The estimated coefficients of both demand and supply equations are highly statistically significant and economically interpretable. We proceed by calculating the residuals of both

3 Also arguably underdeveloped and segmented in the case of domestic markets.
4 See Gatev and Strahan (2006) and Cornett et al. (2011) for other examples of using balance sheet structure indicators for loan supply analysis.
5 This concept is similar to the idea that "core" liabilities (Shin and Shin (2011)) are needed to finance equilibrium loans growth. Modelling the conventional loans-to-deposits ratio may also be regarded as a simplified version of this approach.

equations *(ECT^D and ECT^S)* and study the short-run dynamics of real loans (deflated by GDP deflator *P*) by means of the error-correction model containing the error correction terms and lags of the dependent variable[6] (Table 1). We start by including the error correction terms separately. The results indicate that the loading coefficients are statistically significant and have correct signs and expected magnitudes (see de Mello and Pisu (2010); Brissimis et al. (2014)). When included simultaneously, the statistical significance of loan supply error correction term is somewhat low, but the sign and the magnitude of the coefficient are in line with expectations.

Table 1 Estimates of error-correction models (standard errors in parentheses)

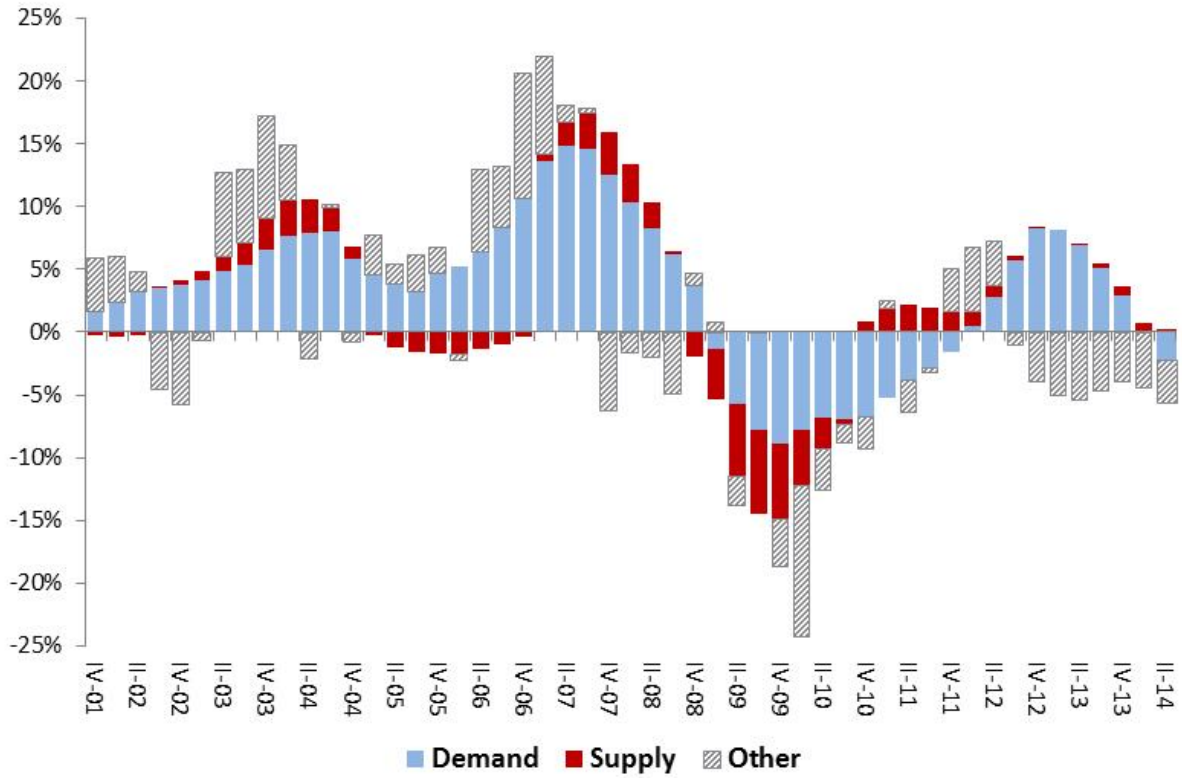
	Dependent variable: $\Delta \log(L_t/P_t)$		
	Model 1	Model 2	Model 3
ECT^D	–0.06 (0.02)	–	–0.06 (0.03)
ECT^S	–	–0.12 (0.06)	–0.06 (0.06)
$\Delta \log(L_{t-1}/P_{t-1})$	0.45 (0.11)	0.44 (0.14)	0.34 (0.14)
$\Delta \log(L_{t-2}/P_{t-2})$	0.13 (0.11)	0.18 (0.12)	0.16 (0.12)
constant	0.01 (0.01)	0.01 (0.01)	0.02 (0.01)
R^2	*0.52*	*0.47*	*0.51*
p-value of LM-test with 1(4) lags	*0.1 (0.46)*	*0.02 (0.2)*	*0.06 (0.36)*
p-value of ARCH LM-test with 1(4) lags	*0.34 (0.81)*	*0.25 (0.58)*	*0.49 (0.68)*

In order to illustrate the relative importance of demand and supply factors for loan developments we use Model 3 to calculate[7] the contributions of error-correction terms to short-run loans (from Model 3) (Figure 1). The results indicate that pre-crisis credit expansion was by and large determined by demand fundamentals[8] while fluctuations in supply fundamentals did not play an important role[9]. On the contrary, during the most severe crisis

[6] Lags of other explanatory variables were not statistically significant.
[7] We take the difference between simulated credit growth based on actual error correction terms and the simulation result obtained after setting the respective error correction term equal to zero.
[8] Note that interpreting pre-crisis loans growth as "equilibrium" in all senses (e.g. "sustainable") basing on the results obtained from the in-sample-estimated model may be misleading (see e.g. Égert et al. (2006) for discussion).
[9] This result is in line with the results obtained by De Mello and Pisu (2010) who show that the demand relationship is equilibrium-correcting for the volume of loans, whereas this is not true for the supply equation, but is strikingly different from Brissimis et al. (2014) who show that supply fundamentals are more important. Note that this result does not mean that balance sheet structure was irrelevant; it simply means that loan supply fundamentals and actual loan supply were not in disequilibrium. See Ponomarenko et al. (2014) for a discussion of the sources of pre-crisis monetary expansion that helped to stabilize the loans-to-deposits ratio until 2008.

phase a sharp transition of supply fundamentals to a contractionary stance in 2009 and back to an expansionary stance in 2010 had a notable effect on credit growth. Together with a large unexplained component this result can be regarded as evidence of significant supply-side shocks affecting loan developments in Russia during the crisis and presumably amplifying the real contraction. The results indicate that credit growth in 2012–2014 was less than justified by the fundamentals, although in 2013–2014 the deterioration of demand fundamentals seemed to outpace the slowdown in loans, implying further equilibrium credit contraction.

Figure 1 Contributions of demand and supply disequilibria to real loans growth sum over 4 quarters)



3 Structural VAR model with sign restrictions

An alternative approach to identification of structural shocks is based on a structural VAR (SVAR) model. We employ an agnostic identification scheme by imposing sign restrictions on the impulse response functions that match our a priori expected characteristics of each type of shock. Although somewhat subjective, this approach allows us to disentangle different types of shocks using the data in a very parsimonious way (see Hristov et al.

(2012) for a review of applications of this approach to euro area). The disadvantage of this method is that (at least with our model) the definition of categories is rather broad and so requires further analysis whenever more detailed explanation is needed.

Our empirical strategy is closely related to the method proposed by Uhlig (2005), which can be briefly summarized as follows. Consider the conventional reduced-form VAR

$$Y_t = B(L) \cdot Y_{t-1} + u_t \tag{3}$$

where Y_t is an $n \times 1$ vector of time series data; $B(L)$ is a matrix polynomial in the lag operator L; and u_t is an $n \times 1$ vector of residuals with variance-covariance matrix $E[u_t \cdot u_t'] = \Sigma$. This model is estimated using a Normal-Wishart distribution prior for (B, Σ).To decompose u_t and obtain economically meaningful structural innovations, we need to find a matrix A such that $Ae_t = u_t$, where e_t is an $n \times 1$ vector of structural innovations assumed to be independent, so that $E[e_t \cdot e_t'] = I_n$. The only restriction on A is

$$\Sigma = E[u_t \cdot u_t'] = AE[e_t \cdot e_t']A' = AA' \tag{4}$$

We need at least $n \times (n-1)/2$ restrictions on A to achieve identification. We therefore restrict A to be a lower triangular as implied by Cholesky decomposition. For any orthogonal matrix Q with $QQ' = I_n$, $\Sigma = AQQ'A'$ is an admissible decomposition for Σ. As we cannot discriminate among different Q-matrices from the data, we select only those data that fulfill the *a priori* imposed restrictions on impulse responses. For that purpose, we first draw 1000 times from the posterior distributions of (B, Σ) and obtain 1000 models. We then randomly select one of these and start combining it with randomly (as proposed in Rubio-Ramirez et al. (2005)) generated Q-matrices until the impulse responses implied by this combination fulfill the restrictions. We discard the model and draw again until sign restrictions are fulfilled. We then iterate until we have 1000 accepted sets consisting of VAR parameters, variance-covariance matrix of residuals and the appropriate identification scheme. We report the median output (i.e. impulse response functions, identified structural innovations and historical decomposition of loan developments) for the whole collection of accepted models.

We include in our model the parsimonious set of variables that generally capture loan supply and loan demand factors. These are log of real private spending (sum of

households' final consumption and fixed capital formation), log of private spending deflator, logs of loans to non-financial corporations (NFCs) and households (HHs), corresponding interest rates (with more than 3-year maturity) and the ratio of total ruble loans to core liabilities (calculated as explained in the previous section). All variables (except interest rates) are in differences and seasonally adjusted. The sample period is 2001Q1 to 2014Q2.

We assume a relatively simple identification scheme[10] (Table 2). Loan demand and supply shocks are conventionally identified via the response of interest rate: an increase in bank loans is related to an expansionary loan supply shock if the loan rate simultaneously falls, whereas it is triggered by an expansionary loan demand shock if the loan rate simultaneously rises. We further decompose supply shocks into two types. On the one hand, loan supply disturbances could be the result of shifts in the volume of core liabilities (e.g. deposits) on the banks' balance sheet. In this case we assume that loan supply will increase proportionally and the loans-to-core liabilities ratio will not increase. On the other hand innovations to the supply of loans could be the consequence of changes in banks' behavior that is not related to changes in funding sources (e.g. a change of perceived credit risk). In this case the banks may alter their balance structure by allowing loans to grow faster than core funding sources. We distinguish between these two types of shock by assuming that the ratio of loans to core liabilities (as defined in the previous section) will decrease in the former case and increase in the latter[11]. As loan and interest rate variables for different sectors are separately included in our model, we allow for different magnitudes of responses to shock across the sectors[12]. We examine the unrestricted responses of private spending and private spending deflator to assess the macroeconomic relevance of the identified shocks

[10] Notably, we do not identify monetary policy shock in our set-up. The reason is that the choice of a monetary stance variable for Russia is not obvious. For outsiders, the obvious candidate would appear to be short-term money market interest rate. However, considering the relative insignificance of interbank money markets (particularly domestic) in Russia and the high volatility of short-term interest rates, it is doubtful that the overnight money market interest rate or any Bank of Russia interest rate per se would be adequate for this task (at least on average in our sample).

[11] See Peersman (2011) for the examples of the use of the loans-to-base money ratio for identification of loan multiplier shocks.

[12] Admittedly we still assume that shocks are synchronized across sectors, meaning that shocks that are not common will not be identified as structural under this set-up. In order to distinguish between shocks to different sectors we would need a more complicated identification scheme. Also in the course of our research we found that restricting the impulse responses for loan and interest rate variables in one sector is usually enough to obtain the similar response of variables in another sector, which indicates that shocks are generally correlated across sectors.

Table 2 Sign restrictions on impulse response functions (set for two quarters after the shock)

Variable / Type of shock	Loan supply (core liabilities)	Loan supply (other)	Loan demand
Interest rate	–	–	+
Loans	+	+	+
Loans/core liabilities	–	+	+

The impulse response functions (Figures 2–4) testify that identified shocks have pronounced macroeconomic effects. More specifically, an expansionary loan demand shock is associated with immediate growth of private spending in the short run and prolonged acceleration of inflation. An expansionary shock to core liabilities leads to higher spending growth over the next 5 quarters and a gradual acceleration of inflation (peaking in 5–7 quarters). Responses of spending and inflation to other loan supply shocks are limited to the short-run horizon and are less statistically significant.

Figure 2 Impulse responses to the expansionary loan demand shock (shaded area = sign restrictions periods)

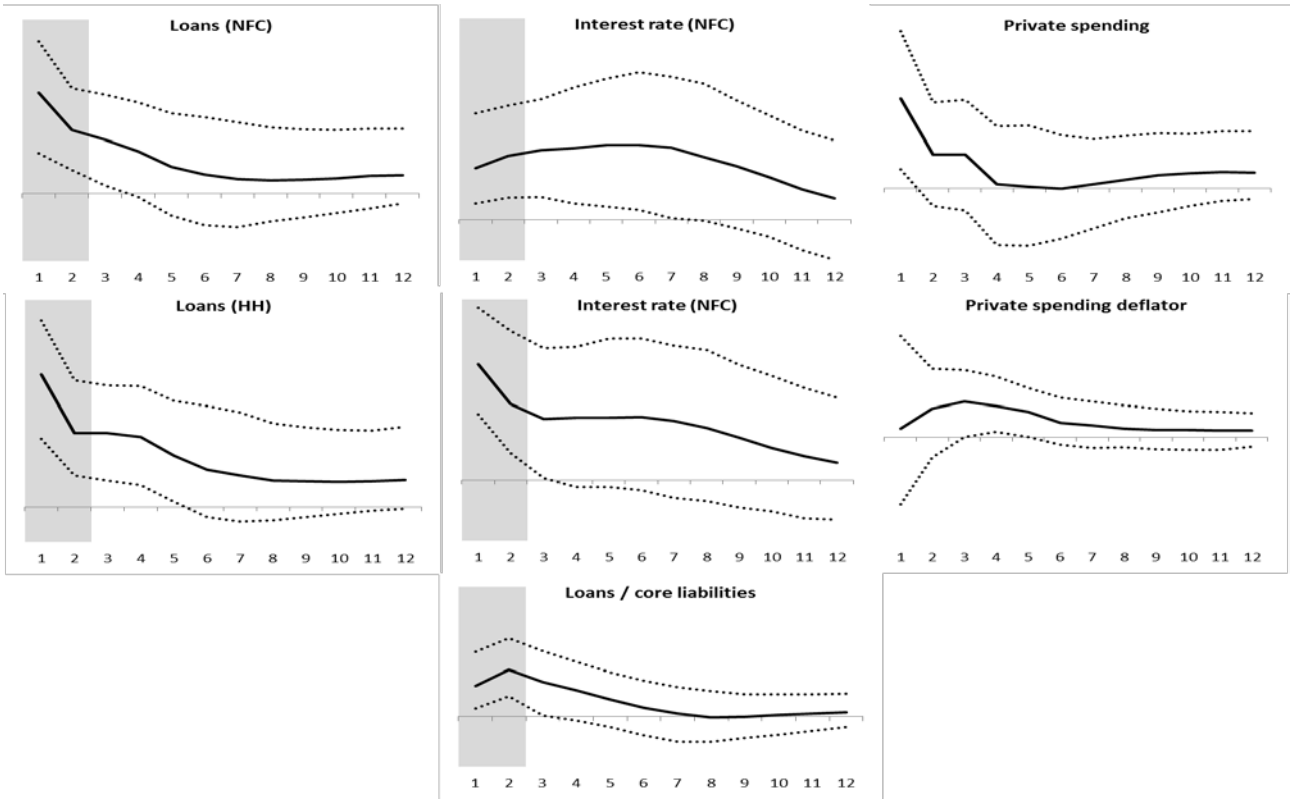


Figure 3 Impulse responses to the expansionary core liabilities shock (shaded area = sign restrictions periods)

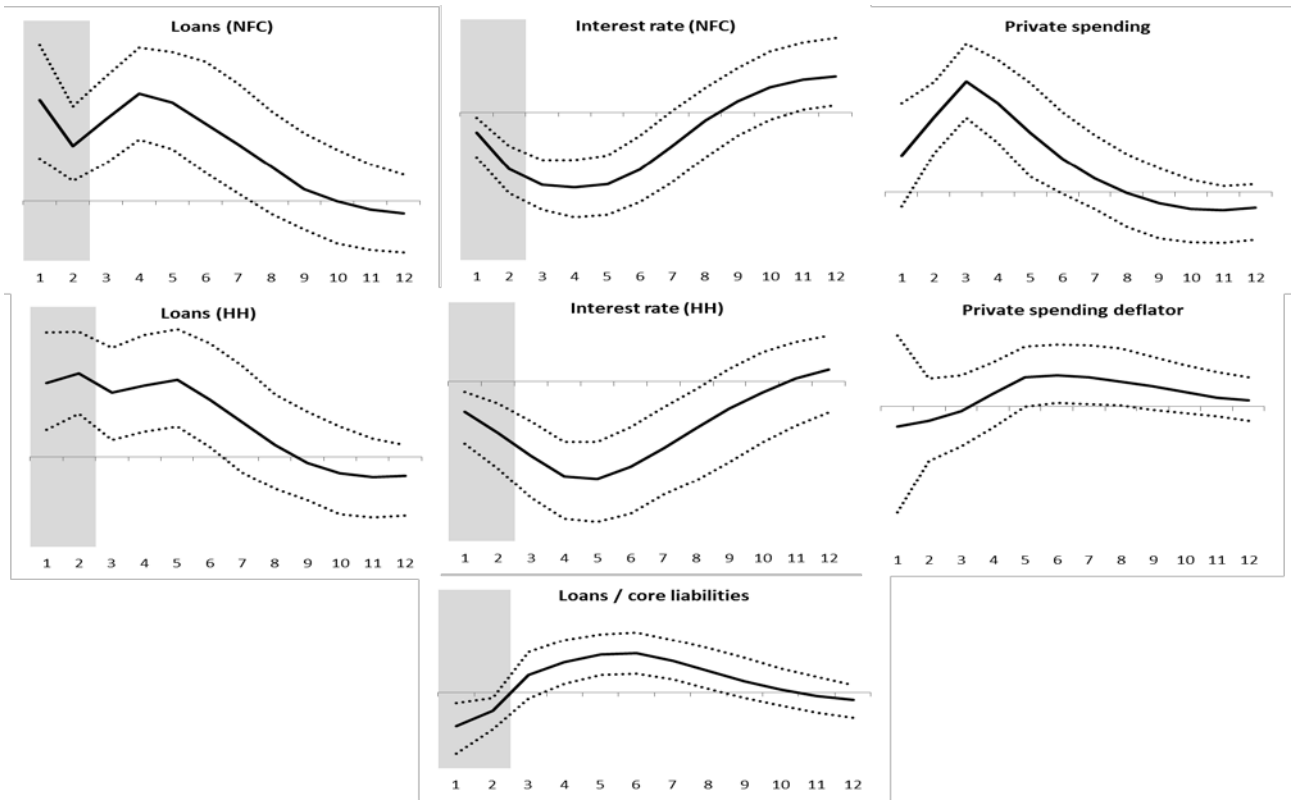
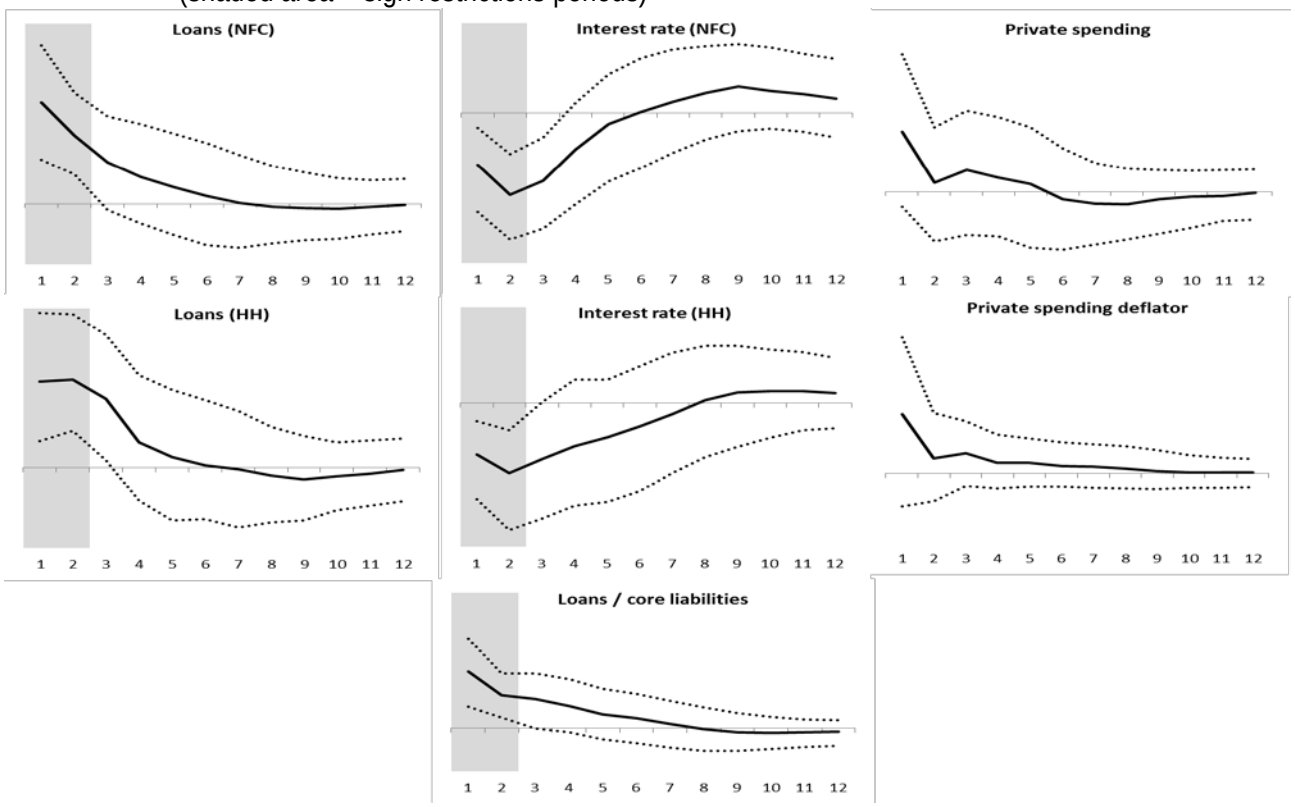


Figure 4 Impulse responses to the expansionary loan supply shock (shaded area = sign restrictions periods)



Next we calculate the historical decompositions of credit growth (Figures 5–6). Note that the contributions from core liabilities shocks during and after the crisis seem particularly dramatic: They were very important for loan developments in both sectors during the pre-crisis period as well. There is a notable contractive effect stemming from this type of shock in 2014. Supply shocks not associated with core liabilities changes are less important but are also present in 2009 and interestingly in 2012–2013. As regards the contributions from loan demand shocks, they had a prolonged contractionary effect on credit growth in 2009–2010 and somewhat less notably in 2013–2014. The large unexplained parts of the expansionary shocks in 2007–2008 (in NFCs sector) and contractionary shocks in 2009–2010 (in both sectors) may be regarded in combination as an abnormal boom/bust episode.

Comparison of these results with the findings of similar studies may be not entirely legitimate since in our case loan supply shocks are presumably not separated from monetary policy shocks, in contrast to the usual situation. Nevertheless our results are generally in line with similar studies for developed countries (Busch et al. (2010); Hristov et al. (2012); Finlay and Jaaskela (2014)) which find that loan supply shocks played an important (although not dominating) role.

Figure 5 Contributions of structural shocks to y–o–y growth of loans to households (deviation from baseline projection)

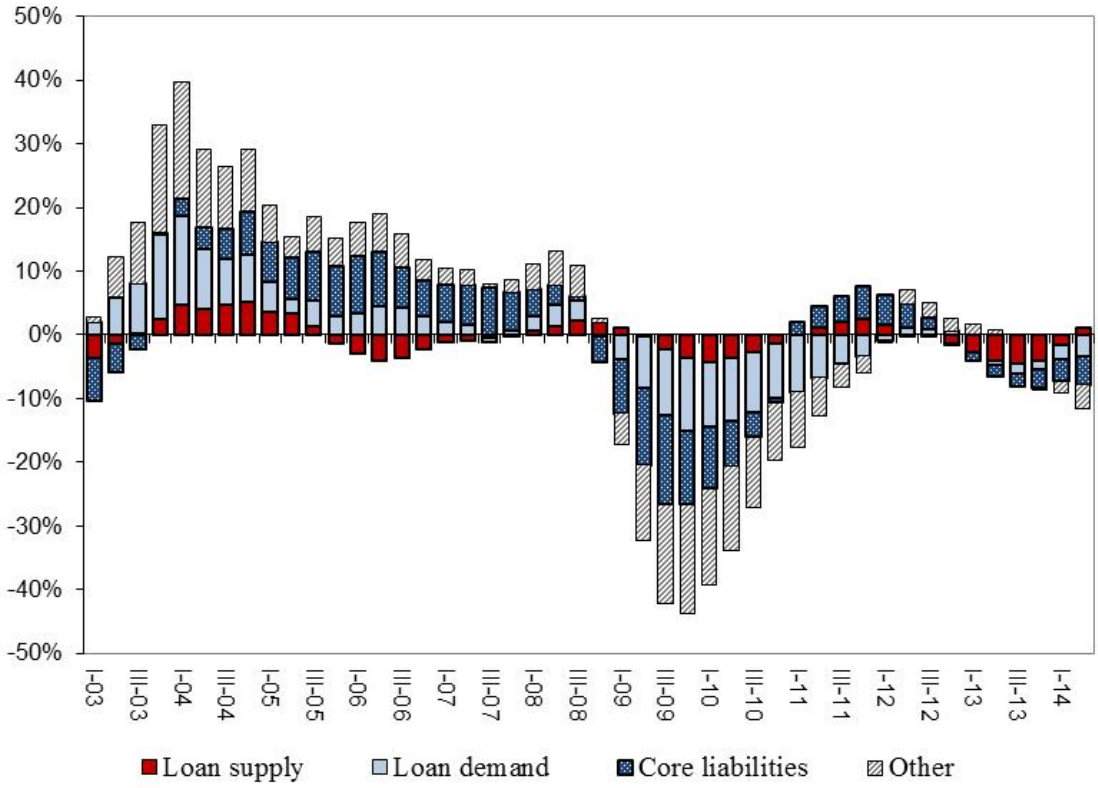
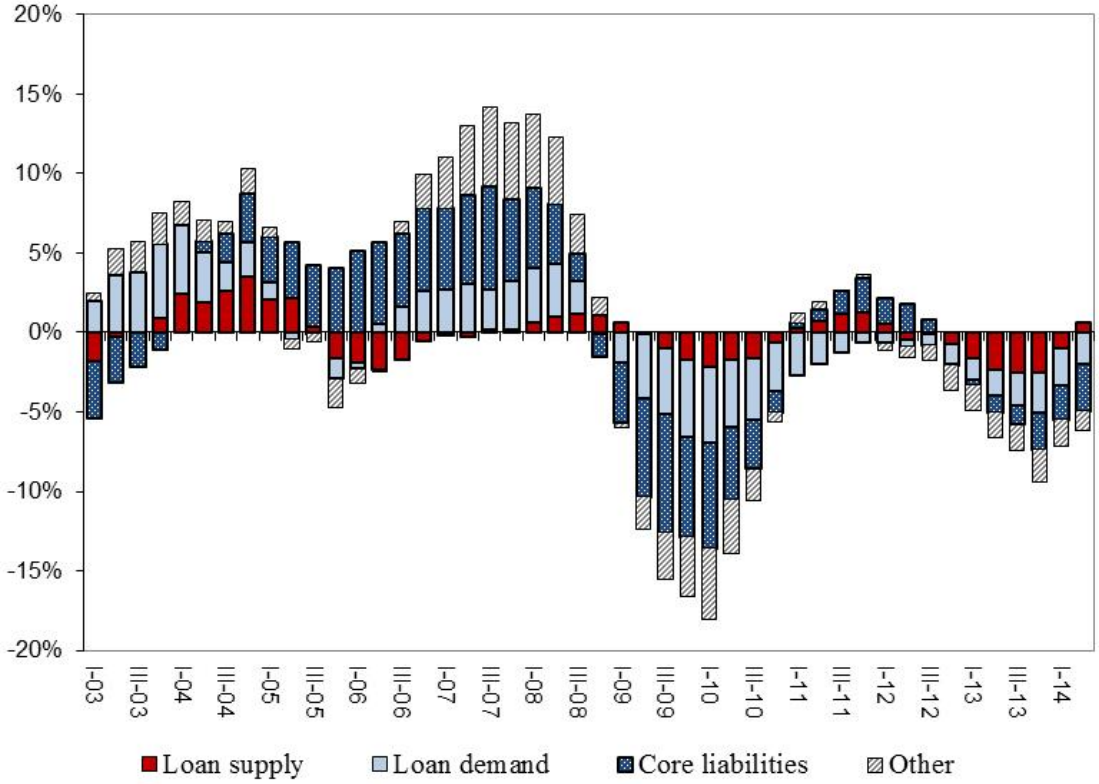


Figure 6 Contributions of structural shocks to y–o–y growth of loans to NFCs (deviation from baseline projection)



4 Panel regression based on BLS surveys in Russia

4.1 BLS indicators in Russia: historical data and descriptive evidence

This part of the paper contributes to several stands of the literature. There are papers dealing with bank lending conditions that combine aggregated indicators in the macroeconomic analysis and modeling (Cunningham T. J. (2005); Lown and Morgan (2006); de Bondt et al. (2010)), and others that are based on bank-level responses (Del Giovane et al. (2011,2013); Bassett et al. (2014)). In this section we generally follow the approach of Del Giovane et al. (2011) in an effort to use comparable data to analyze the relative contributions of demand and supply factors in credit market dynamics. The main advantage of this approach is that it enables one to use micro data that is suitable for disentangling demand and supply effects instead of “hard” macro data. This, however, comes with the disadvantage of having to rely on subjective survey results instead of reported statistics.

The Bank Lending Survey appeared to be another informative tool to assess developments in the credit market. Russian surveys of bank lending conditions are carried out

on two levels: the Russian Federation as a whole (country-level survey) and separate regions (regional-level surveys). The first Bank Lending Survey in Russia was conducted at the country level in the second quarter of 2009. More than 60 of the largest Russian banks that are highly active on the credit market participate in this survey, their total credit portfolio accounting for over 80% of the combined credit portfolio of the Russian banking sector. The survey enables an assessment of changes in credit standards for loans to three major categories of borrowers: large companies; small and medium-sized companies; and households. Regional-level surveys are conducted in 31 regions of the Russian Federation which account for more than 70% of the Russian regional credit market (without Moscow city and St. Petersburg city).

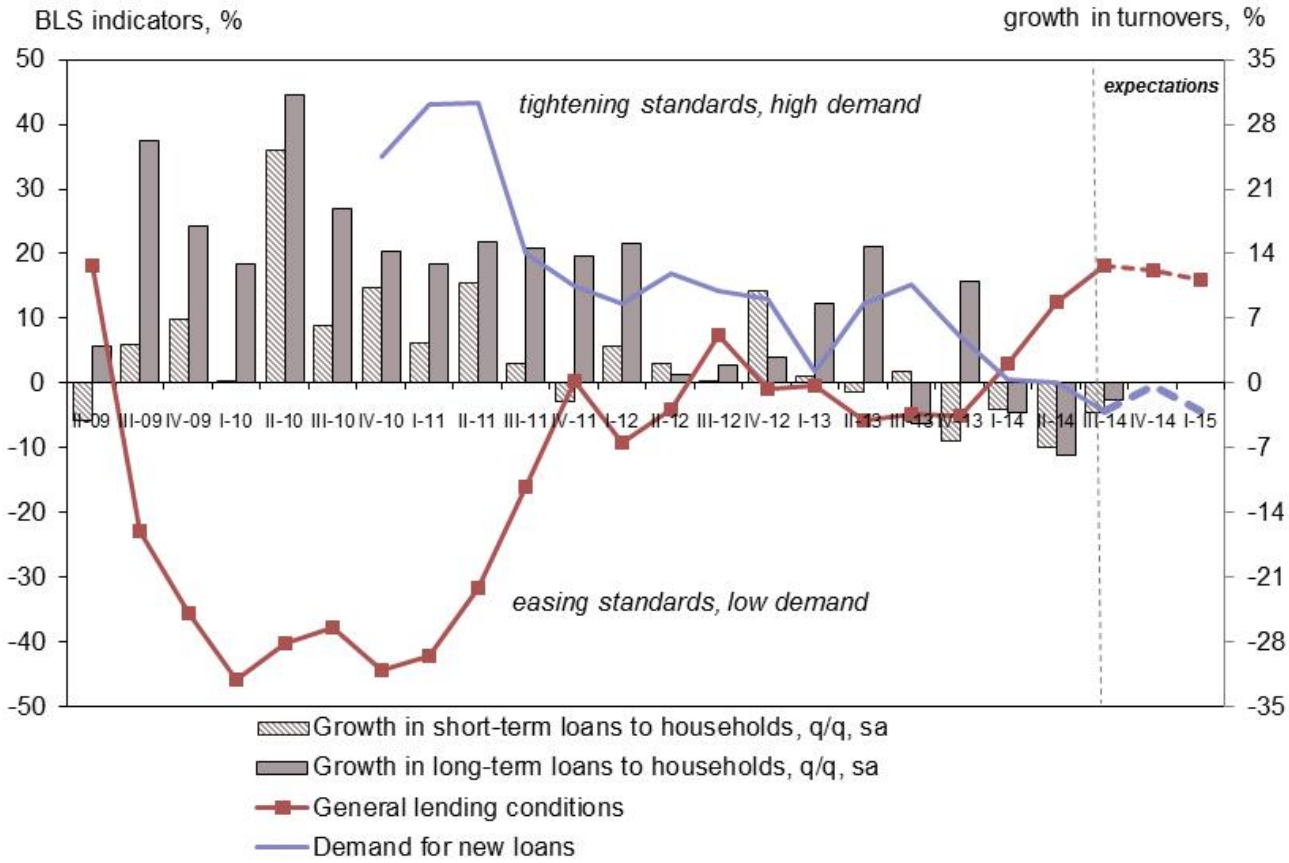
To identify the influence of demand and supply factors on the credit market in Russia we estimate an econometric model based on bank-level information and responses of banks to the Bank Lending Survey. On the basis of this model we evaluate the effects of supply and demand factors on the volume of lending to enterprises and households. Surveys of bank lending conditions in Russia are conducted on a quarterly basis. Banks are asked to answer four blocks of questions in the survey questionnaire: (1) regarding changes in lending conditions in general and separate lending conditions, (2) the reasons for changes in lending conditions, (3) changes in demand for credit and (4) expectations of future changes in credit conditions and demand for credits. The replies are used to help identify credit demand and supply and to estimate their respective contributions to loan developments in Russia.

We have two datasets on banks to work with – loans to households and NFC – because not all the banks are active on both fields. Our dataset for estimating a model for households consists of 50 banks, and the dataset for analysis of corporate loans includes 52 banks. The sample period consists of 16 quarters, starting from the 4th quarter of 2010, when a question on changes in demand for loans was included in the survey questionnaire, and ending at the 3rd quarter of 2014. For both loans to enterprises and loans to households we use bank-specific lending and lending rates for terms of up to 1 year and more than 1 year[13].

[13] Unlike in Sections 2 and 3, where the information on credit portfolio is used, in this section we take statistics on bank lending provided under reporting form 0409128.

Figures 7 and 8 provide descriptive evidence on the relationship between BLS indicators of supply and demand conditions in Russia and the growth of loans to households and enterprises in Russia (quarterly changes in loan volumes, seasonally adjusted).

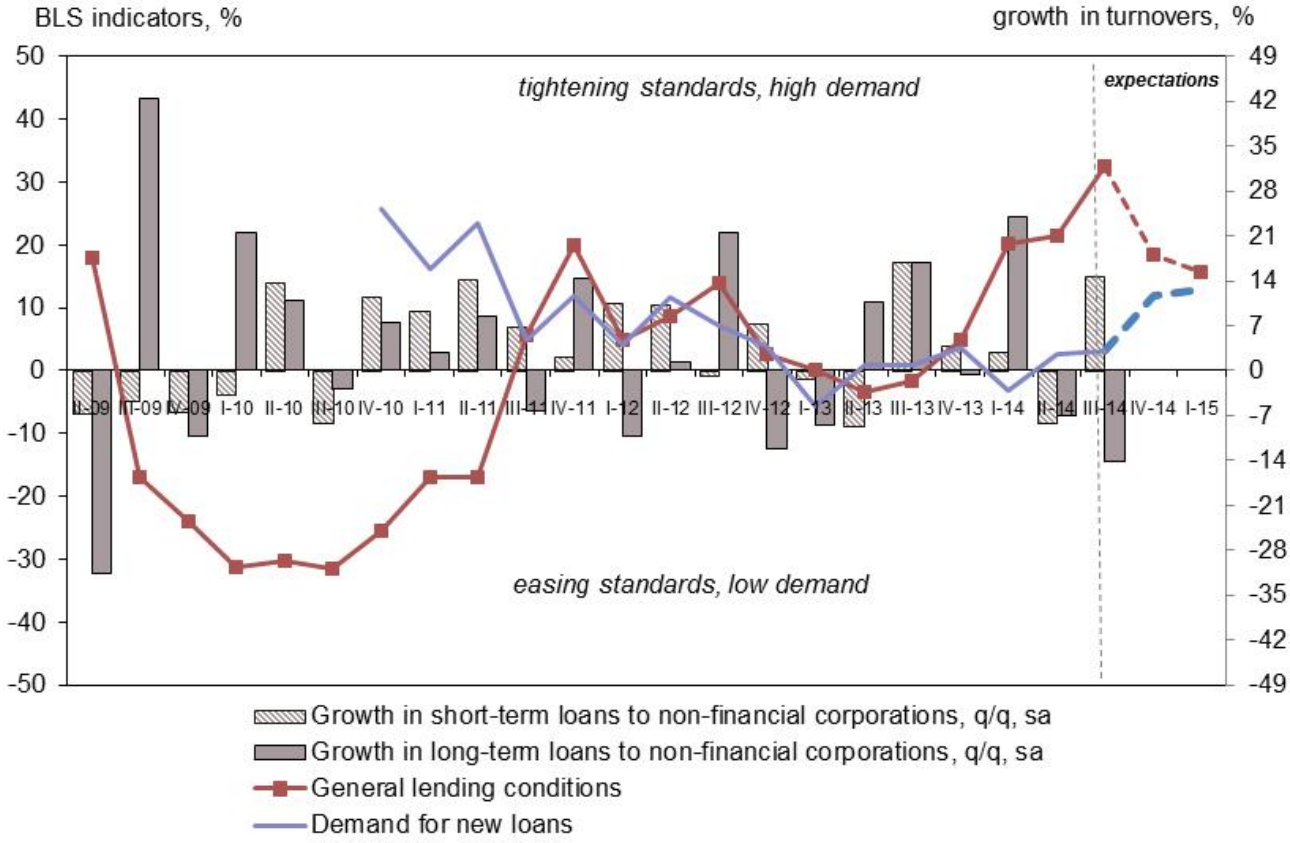
Figure 7 Changes in lending to households (%)



The parameter *general lending conditions* gives an assessment of the general changes in credit availability for each category of borrowers; its tightening indicates a decrease in availability of loans; an easing indicates an increase in availability. Indices of changes in bank lending conditions are in percentage points and take values from –100 (all banks have eased lending conditions) up to +100 (all banks have tightened).

Changes in *demand for new loans* characterize current changes in the demand for loans or expectations of future changes. Index numbers are in percentage points and take values from –100 (all banks indicated a significant decrease in loan demand) up to +100 (all banks indicated a significant increase in loan demand).

Figure 8 Changes in lending to non-financial corporations (%)



Steady growth in lending to households, observable in 2009–2011, was accompanied by essential easing of bank lending conditions. Then in 2012–2013 lending conditions underwent minor alterations, and loan growth slowed. Similar dynamics were observed in a segment of lending to enterprises. But this part of the credit market has seen a tightening of bank lending conditions since the middle of 2011. In 2014 bank lending conditions were tightened by a majority of banks for both categories of borrowers. Banks increased loan interest rates and raised requirements on the financial condition of the borrower and on loan collateral. Banks were forced to change lending conditions due to restrictions in internal and external sources of funding. Changes in the demand for new loans to households in 2014 were very small in the first half of 2014 and even negative in the 3rd quarter. Changes in demand for new loans to enterprises were negative in the early part of the year; later there was moderate growth. At the same time, the demand for loans has increased for both categories of borrowers.

Table 3 gives descriptive statistics on the indicators of supply and demand conditions, respectively for loans to households and enterprises. They are reported for the whole

period considered (2010Q4–2014Q3). The table reports the frequency of individual banks' responses concerning supply conditions and their assessments of demand developments; all answers refer to changes over the previous three months.

Table 3 Descriptive statistics for BLS responses

Direction of change[14]	Loan supply		Loan demand	
	Short-term loans	Long-term loans	Short-term loans	Long-term loans
Lending to households				
Tightened standards/ decreased demand	90 *(11%)*	122 *(15%)*	74 *(9%)*	91 *(11%)*
Didn't change	527 *(66%)*	462 *(58%)*	519 *(65%)*	360 *(45%)*
Eased standards/ increased demand	183 *(23%)*	216 *(27%)*	207 *(26%)*	349 *(44%)*
Total observations: 800				
Lending to NFCs				
Tightened standards/ decreased demand	136 *(16%)*	172 *(21%)*	186 *(22%)*	188 *(23%)*
Didn't change	596 *(72%)*	565 *(68%)*	553 *(66%)*	510 *(61%)*
Eased standards/ increased demand	100 *(12%)*	95 *(11%)*	93 *(11%)*	134 *(16%)*
Total observations: 832				

As regards loans to non-financial corporations, a large majority of individual banks' responses fall in the "didn't change" category. Responses indicating that supply conditions eased are generally fewer in number than those indicating that supply conditions tightened. As to the demand assessments, fewer were in the "increased" category (11% for short-term loans and 16% for long-term loans). The situation is the reverse for loans to households. Although most of the answers were in the category "didn't change", the rest of them generally indicate easing of standards and increase in demand. Thus, the results of the bank lending surveys point to credit expansion by banks in the market for loans to households. To increase the availability of credits to borrowers in 2009–2013 banks eased requirements

[14] There are 5 possible changes of the supply parameters in the original Bank Lending Survey (tightened considerably, tightened somewhat, eased considerably, eased somewhat and didn't change), the same for the demand parameters (decreased considerably, decreased somewhat, increased considerably, increased somewhat and didn't change). In this paper we label responses as "tightened" or "eased".

regarding financial performance. According to banks participating in the survey, there was less mitigation of these requirements for NFCs, and in 2012 there was some tightening.

4.2 Panel regression based on the micro data

The econometric analysis on the information content of the demand and supply indicators is carried out on the basis of a panel regression:

$$\Delta L_{it} = \alpha_i + \beta(K)Sup_{it} + \lambda(K)BLS_Dem_{it} + \gamma(K)Z_{it} + \varepsilon_{it} \tag{5}$$

where ΔL_{it} is the quarter-on-quarter (henceforth q–o–q) rate of growth in bank lending for bank *i* in quarter *t*, alternatively for loans to households and NFCs; Sup_{it} and Dem_{it} indicate, respectively, the indicators of supply and demand contributions obtained from the Bank Lending Survey for bank i; Z_{it} is a vector of other variables that can influence loan growth, including the interest rate on individual bank loans, and other macro variables usually included in estimated credit demand equations.

Following Del Giovane et al. (2011) we define indicators Sup_i and Dem_i as vectors of dummy variables that correspond to three possible responses in the survey (tightened, didn't change and eased). Thus, we can write expression (5) as follows:

$$\Delta L_{it} = \alpha_i + \beta_1(K)Sup_tightened_{it} + \beta_2(K)Sup_eased_{it} + \lambda_1(K)Dem_decreased_{it} + \lambda_2(K)Dem_increased_{it} + \gamma(K)Z_{it} + \varepsilon_{it} \tag{6}$$

Each dummy variable takes the value of 1 if at time *t*, if bank *i* reported that its credit standards or demand changed in the previous three months, and zero otherwise. We expect parameters β_1 and λ_1 to be negative and, accordingly, β_2 and λ_2 to be positive.

An alternative approach would be to include the cumulated levels of the supply and demand indicators, rather than the indicators themselves. As remarked in Giovane et al., this definition would indeed be more consistent with a literal reading of the BLS questions and answers, an important aspect that has not been addressed in previous works based on lending surveys, including recent studies on BLS information for the euro area. However, as the authors showed in their paper, the inclusion of the cumulated indicators pro-

duces unclear results or worsens the fit of the estimates (depending on the approach), which argues against this specification.

The results are reported in Table 6 for loans to households and in Table 7 for loans to enterprises (in the Appendix). Column (I) refers to the specification that includes only the BLS indicators as regressors (i.e. $\gamma = 0$), column (II) to the regression that also includes the individual bank loan rate[15]. Fixed effects and seasonal dummies were included in both specifications.

In the case of loans to households, as well as for loans to enterprises, all the model specifications produced the correct signs of parameters for BLS indicators. Tightening of lending conditions and decrease of demand had negative impacts on the growth in lending and accordingly easing of lending conditions and increase of demand contribute positively to growth in lending. But due to the small number of observable changes in BLS indicators, both supply and demand conditions appear to play a statistically insignificant role in most cases, and these results are robust to the introduction of additional regressors. The individual bank loan interest rate enters with a negative sign, suggesting that a demand effect prevails in its relationship with credit developments.

We also found that the reactions of short-term loans to households to positive and negative changes in bank lending conditions and demand for new loans were asymmetric (Table 6 in the Appendix, column (I)). A tightening of lending conditions or a decrease in demand more strongly influence loan growth than do their opposites. The results of the model based on the regression that only includes the BLS indicators indicate that "lending conditions tightened" responses are associated with reductions in the q–o–q rate of growth of loans amounting to 14.5 percentage points in short-term loans to households (corresponding to 5.4 percentage point increases for easing of lending conditions). A decrease in demand in the same model is associated with a reduction in the q–o–q rate of growth of short-term loans to households of 27.9 percentage points (corresponding to a 7.9 percentage point increase for a positive change in demand). Long-term loans to households change by approximately 6.4 and 6.1 percentage points in case of either tightening or easing of lending conditions. But positive changes in demand for new loans lead to increases in long-term loans of 14.9 percentage points, whereas a demand decrease changes the lending path by only 3.6 percentage points.

[15] We also tried to use nominal GDP growth as the other control variable, but it didn't show better results.

In the case of loans to non-financial corporations, based on regression including only the BLS indicators (Table 7 in the Appendix, column (I)), we found that both short-term and long-term loans to non-financial corporations grow rapidly in response to easing of bank lending conditions. Easing of lending conditions on short-term loans is associated with lending growth of 19.0 percentage points, whereas for loans with maturity over a year the corresponding figure is 18.2 percentage points. A decrease in demand for new loans leads to reductions of 2.6 and 10.3 percentage points respectively.

The contributions of supply and demand factors to the dynamics of short-term and long-term lending by Russian banks in 2010–2014 are presented in figures 9–10[16]. On the basis of received contributions, it is possible to separate a few historical periods in terms of specific features of the Russian credit market developments.

In 2010–2011 steady growth of lending to households and non-financial corporations was driven by simultaneous shifts in demand and supply conditions. Banks reduced interest rates on loans and eased non-price-related lending conditions (including maximum maturity and size of loans, requirements regarding borrower's financial standing, and the quality of loan collateral). Under these favorable economic conditions, we found a strong demand for loans to households and enterprises.

The speed of development in these two parts of the credit market differed substantially. The most dynamically developing segment was the market for loans to households. High growth rates in household loans were driven only not by banks' interest rate policies but also by changes in the other bank lending conditions. In order to attract new clients, some banks launched target-oriented programs for financing education, recreation, non-capital construction, and renovation. Credit products for retired employees, military men, students, medical workers, and farmers have entered the market. Demand for mortgage loans was rather high in this period due to a notable drop in the level of interest rates. A number of big banks launched a new credit product – refinancing consumer and mortgage loans. Subsequently new forms of loans appeared, focused on the borrowers who were not having difficulties in servicing their loans but wanted to change terms, payment schedules or other conditions. In lending to enterprises, banks were much more conservative, keeping in mind recent negative developments in the real economy connected with the preceding world financial crisis.

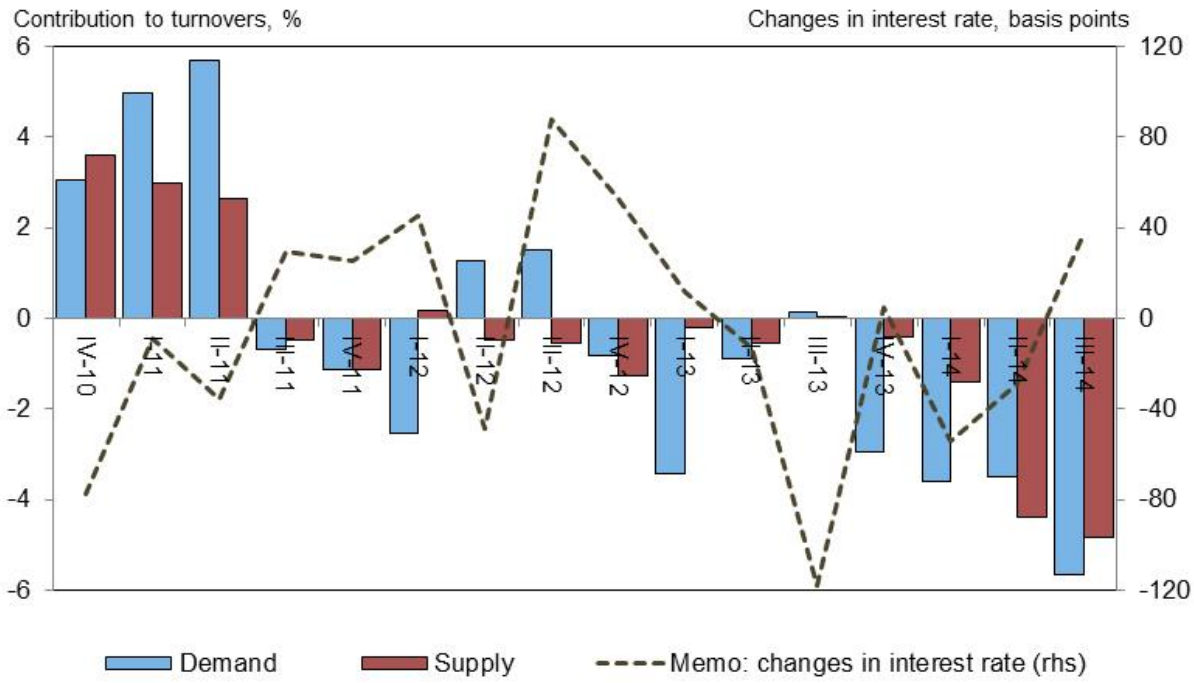
[16] Figures 9 and 10 depict results estimated for the panel of Russian banks.

Starting in August 2011, however, the situation in the main segments of the Russian financial market began to deteriorate. As a result, in the last quarter of 2011 banks began to moderately tighten both price-related and non-price-related lending conditions for corporate borrowers. In retail lending, banks compensated borrowers for the deterioration of price terms by improving some of their nonprice conditions, in light of the high level of competition in this promising part of the credit market. The growth of lending in 2012 slowed down in all segments of the market. In 2013 changes in lending conditions occurred heterogeneously. On the one hand, banks decreased interest rates and commissions on loans; on the other hand they raised requirements regarding borrower's financial position and loan collateral. Demand for new loans, except for mortgage loans, remained subdued.

In 2014 developments in the credit market were affected by a deterioration in the external economic situation, which had a constraining impact on economic growth in Russia. Restriction of access to capital markets in respect of the five largest Russian banks and several enterprises in the second half of 2014 led to essential limitations for external sources of long-term funding and forced companies and banks to search for financial resources in the domestic market. Besides downgrades of Russia's sovereign ratings by all the international rating agencies and, as a result, a decrease in corporate ratings led to a tightening of external lending criteria for the other Russian financial and non-financial organizations. Bank of Russia gradually increased the key rate from 5.5 to 17%. Commercial banks tightened their lending conditions and increased interest rates for both households and enterprises. Cautious credit policies of banks helped them to manage increased demand for new loans in conditions of growing uncertainty in the real economy.

Figure 9 Contribution of supply and demand factors to the q–o–q rate of growth of loans to households (%)

Short-term loans



Long-term loans

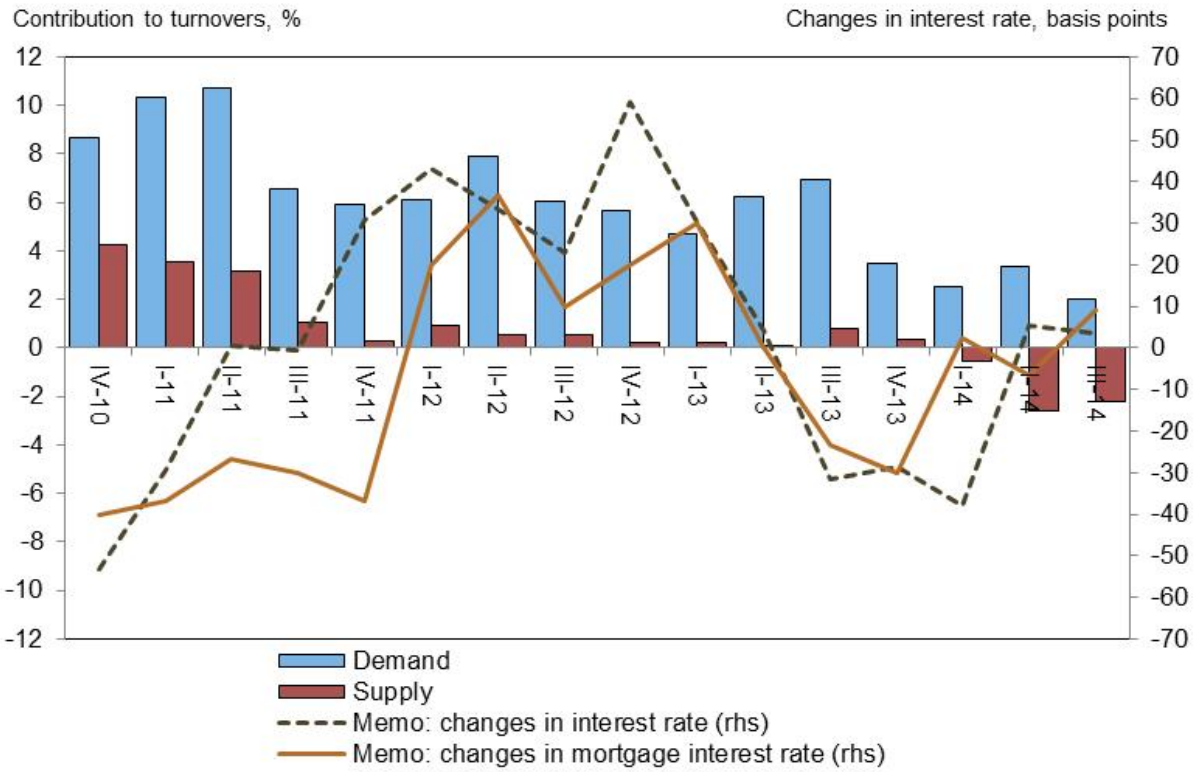
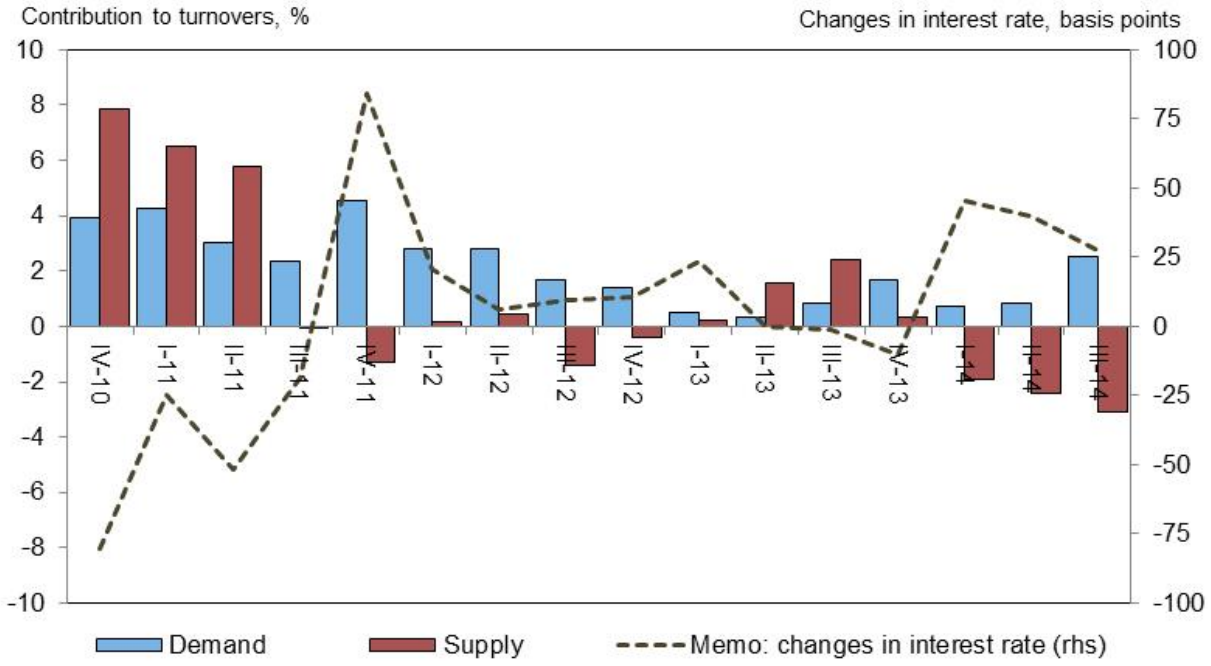
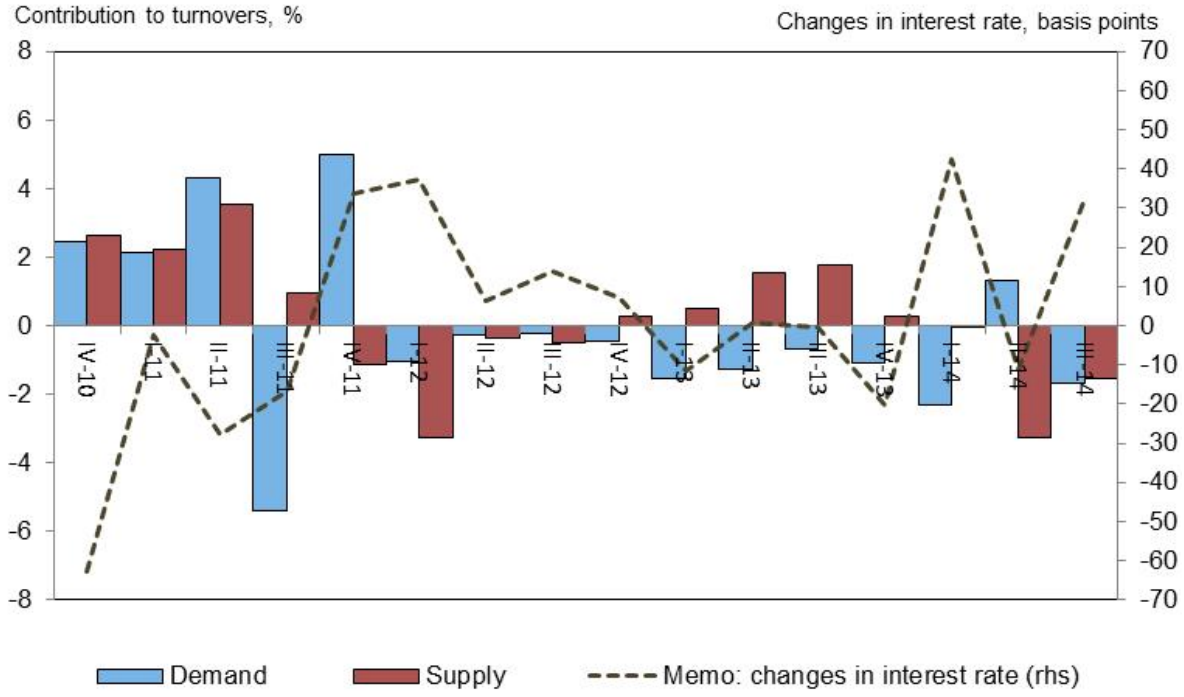


Figure 10 Contribution of supply and demand factors to the q–o–q rate of growth of loans to non-financial corporations (%)

Short-term loans



Long-term loans



5 Conclusions

We have developed a suite of models that may be used for explaining and interpreting loan developments in Russia. These are ECM and SVAR models based on macro data and a panel model that links bank-specific BLS results with actual lending growth. The outcome of these models may be crucial for formulation of monetary policy reactions to loan developments as regards both price and financial stability objectives. More precisely, these models are designed to decompose loans growth into components associated with changes in loan demand and supply fundamentals as well as an abnormal (unexplained) part. The models are heterogeneous in terms of econometric methodology, initial data and definition of shocks, so that their use in combination is far from straightforward. Yet, cross-checking results may be necessary to make robust judgments based on an all-encompassing set of information.

The results of our exercise may be summarized as follows. The ECM-based representation of loan developments as convergence towards long-run equilibrium shows that deviations from demand side fundamentals generally play a larger role in determination of loan growth in Russia. Nevertheless, the examination of actual shocks via a SVAR model produces evidence that these fluctuations can be largely classified as loan supply shocks. This result is not entirely controversial since we should not rule out the effect of the business cycle (usually regarded as a loan demand factor) on loan supply (via the creditworthiness of borrowers, availability of funding etc.). As regards the cisris period in 2008–2009, both macro models identify large supply and unexplained shocks in loan fluctuations signifying an impairment of credit markets. Both models also find contractionary shocks that were not related to demand fundamentals or balance sheet structure in 2013, although in general loan developments in 2013 and the first half of 2014 were hardly extraordinary. As regards the BLS-based model's results, its applicability is severely limited by the lack of variability in the data series (partly due to the short time period studied). More precisely, while the BLS data reflect the substantial changes in loan demand and supply (recovery in 2010–2011 and contraction in 2014) they fails to capture the more subtle fluctuations in 2012–2013.

References

Bassett, W.F., Chosak, M.B., Driscoll, J.C. and E. Zakrajsek (2014): Changes in Bank Lending Standards and the Macroeconomy. Journal of Monetary Economics 62 (March), 23–40

BIS (2011): The impact of sovereign credit risk on bank funding conditions. Bank for International Settlements, Committee on the Global Financial System, CGFS Papers No. 43.

de Bondt, G., Maddaloni, A., Peydro, J.-L. and S. Scopel (2010): The Euro area bank lending survey matters: empirical evidence for credit and output growth. ECB WP Series 1160.

Brissimis, S. N., Garganas, E.A. and S.G. Hall (2014): Consumer credit in an era of financial liberalization: an overreaction to repressed demand? Applied Economics 46(2), 139–152.

Busch, U., Scharnagl, M. and J. Scheithauer (2010): Loan Supply in Germany During the Financial Crisis. Discussion Paper Series 1: Economic Studies 2010,05. Deutsche Bundesbank, Research Centre.

Carpenter, S.B., Demiralp, S. and J. Eisenshmidt (2014): The Effectiveness of the Non-Standard Policy Measures during the Financial Crises: The Experiences of the Federal Reserve and the European Central Bank. Journal of Economic Dynamics and Control 43 (June), 107–129.

Cornett, M.M., McNutt, J.J., Strahan, P.E. and H. Tehranian (2011): Liquidity risk management and credit supply in the financial crisis. Journal of Financial Economics 101

Cottarelli C., Dell'Ariccia G. and I. Vladkova-Hollar (2005): Early birds, late risers and sleeping beauties: Bank credit growth to the private sector in Central and Eastern Europe and in the Balkans. Journal of Banking and Finance, 29(1), 83–104.

Coudert, V. and C. Pouvelle (2010): Assessing the sustainability of credit growth: the case of Central and Eastern European countries. European Journal of Comparative Economics 7(1), 87–120.

Cunningham, T.J. (2006): The predictive power of the senior loan officer survey: do lending officers know anything special? Federal Reserve Bank of Atlanta Working paper 24.

Del Giovane. P., Eramo, G. and A. Nobili (2011): Disentangling demand and supply in credit developments: A survey-based analysis for Italy. Journal of Banking & Finance 35(10), 2719–2732.

Del Giovane. P., Eramo, G. and A. Nobili (2013): Supply tightening or lack of demand? An analysis of credit developments during the Lehman Brothers and the sovereign debt crises. Banca d'Italia Working Paper No. 942.

ECB (2009): Monetary policy and loan supply in the euro area. ECB Monthly Bulletin (October), 63–80.

Egert B., Backé P. and T. Zumer (2006): Credit growth in central and eastern Europe: new (over)shooting stars? ECB WP Series 687.

Finlay R. and J. Jaaskela (2014): Credit supply shocks and the global financial crisis in three small open economies. Journal of Macroeconomics 40, 270–276.

Gatev, E. and P.E. Strahan (2006): Banks' Advantage in Hedging Liquidity Risk: Theory and evidence from the Commercial Paper Market. The Journal of Finance vol LXI, No 2

Hristov. N., Hulsewig. O. and T. Wollmershauser (2012): Loan supply shocks during the financial crisis: Evidence for the Euro area. Journal of International Money and Finance 31, 569–592.

Hulsewig, O., Mayer, E. and T. Wollmershauser (2006): Bank Loan Supply and Monetary Policy Transmission in Germany: An Assessment Based on Matching Impulse Responses. Journal of Banking & Finance 30 (10), pp. 2893–2910.

Kiss, G., Nagy, M. and B. Vonnak (2006): Credit growth in Central and Eastern Europe: Convergence or Boom? Magyar Nemzeti Bank Working paper, 2006/10

Kok Sorensen, C., Marques Ibanez, D. and C. Rossi (2012): Modelling Loans to Non-Financial Corporations in the Euro Area. Banca d'Italia Working Paper No. 857.

Lown C. and D.P. Morgan (2006): The credit cycle and the business cycle: new finding using the loan officer opinion survey, Journal of Money, Credit and Banking, 38, 6, 1575–1597.

de Mello, L. and M. Pisu (2010): The bank lending channel of monetary transmission in Brazil: A VECM approach. The Quarterly Review of Economics and Finance 50, 50–60.

Peersman, G. (2011): Macroeconomic effects of unconventional monetary policy in the Euro area. ECB WP Series 1397.

Phillips, P. C. B. and B.E. Hansen (1990): Statistical inference in instrumental variables regression with I(1) processes. Review of Economics Studies, 57, 99–125.

Ponomarenko, A., Vasilieva, E. and F. Schobert (2014): Feedback to the ECB's monetary analysis: The Bank of Russia's experience with some key tools. Journal of Banking and Financial Economics 2(2), 116–150.

Rubio-Ramirez, J., Waggoner, D., and T. Zha (2005): Markov switching structural vector autoregressions: Theory and application. Federal Reserve Bank of Atlanta Working Paper 27.

Shin, H.S. and K. Shin (2011): Procyclicality and monetary aggregates. NBER Working Paper 16836.

Uhlig, H. (2005): What are the effects of monetary policy on output? Results from an agnostic identification procedure. Journal of Monetary Economics 52, 381–419.

Vazquez, F. and P. Federico (2012): Bank Funding Structures and Risk: Evidence from the Global Financial Crisis. IMF WP/12/29.

Yudaeva, K.V., Ivanova N.S., Kozlov K.K. and M.V. Kamenskih (2009). "Dinamika kreditovaniya v padayushei ekonomike: kreditnoe szhatie ili padenie sprosa na kredity?" Obzor Centra makroekonomicheskih issledovanij Sberbanka Rossii, Dekabr'. (in Russian)

Appendix

Table 4 P-values of ADF unit root test for variables used in Section 2 (lags are based on Akaike criteria)

L_t/GDP_t	0.89
OC_t/GDP_t	0.65
FD_t/GDP_t	0.65
Y_t	0.39
$infl_t$	0.63
$CoreLiab_t/GDP_t$	0.89
NPL_t	0.56

Null: variable has unit root

Table 5 Johansen trace test for variables used in Section 2

Null	p-value
No cointegrating relationships	0.00
At most 1 cointegrating relationship	0.00
At most 2 cointegrating relationships	0.00
At most 3 cointegrating relationships	0.00
At most 4 cointegrating relationships	0.00
At most 5 cointegrating relationships	0.1

Table 6 Estimated panel regressions for loans to households used in section 4

Variables	(I)	(II)
Short-term loans (up to 1 year)		
Lending conditions tightened	–14.50 (0.46)	–12.48 (0.52)
Lending conditions eased	5.43 (0.71)	1.98 (0.89)
Demand decreased	–27.89 (0.18)	–26.67 (0.20)
Demand increased	7.89 (0.57)	9.04 (0.51)
Changes in interest rate	–	–10.31 (0.00)
Constant term	6.37 (0.58)	5.64 (0.62)
Fixed effects	yes	yes
Seasonal dummies	yes	yes
R2	0.14	0.16
Observations (periods, cross-sections)	(15, 50)	(15, 50)
Long-term loans (more than 1 year)		
Lending conditions tightened	–6.44 (0.23)	–6.43 (0.23)
Lending conditions eased	6.10 (0.15)	5.34 (0.21)
Demand decreased	–3.58 (0.55)	–2.91 (0.63)
Demand increased	14.86 (0.00)	14.58 (0.00)
Changes in interest rate	–	–2.73 (0.06)
Constant term	8.80 (0.04)	9.50 (0.03)
Fixed effects	yes	yes
Seasonal dummies	yes	yes
R2	0.19	0.20
Observations (periods, cross-sections)	(15, 50)	(15, 50)

Table 7 Estimated panel regressions for loans to NFCs used in section 4

Variables	(I)	(II)
Short-term loans (up to 1 year)		
Lending conditions tightened	–7.03 (0.18)	–4.35 (0.38)
Lending conditions eased	19.00 (0.00)	14.20 (0.01)
Demand decreased	–2.63 (0.55)	–1.98 (0.64)
Demand increased	12.48 (0.04)	12.00 (0.04)
Changes in interest rate	–	–11.86 (0.00)
Constant term	14.01 (0.00)	15.64 (0.00)
Fixed effects	yes	yes
Seasonal dummies	yes	yes
R2	0.16	0.22
Observations (periods, cross-sections)	(15, 52)	(15, 52)
Long-term loans (more than 1 year)		
Lending conditions tightened	–5.40 (0.50)	–1.62 (0.93)
Lending conditions eased	18.16 (0.05)	9.48 (0.30)
Demand decreased	–10.25 (0.17)	–14.73 (0.04)
Demand increased	1.92 (0.42)	1.12 (0.58)
Changes in interest rate	–	–21.91 (0.00)
Constant term	9.42 (0.05)	12.37 (0.00)
Fixed effects	yes	yes
Seasonal dummies	yes	yes
R2	0.15	0.21
Observations (periods, cross-sections)	(15, 52)	(15, 52)

BOFIT Discussion Papers

A series devoted to academic studies by BOFIT economists and guest researchers. The focus is on works relevant for economic policy and economic developments in transition / emerging economies.

2013
- No 21 Iftekhar Hasan, Krzysztof Jackowicz, Oskar Kowalewski and Łukasz Kozłowski: Market discipline during crisis: Evidence from bank depositors in transition countries
- No 22 Yin-Wong Cheung and Risto Herrala: China's capital controls – Through the prism of covered interest differentials
- No 23 Alexey Egorov and Olga Kovalenko: Structural features and interest-rate dynamics of Russia's interbank lending market
- No 24 Boris Blagov and Michael Funke: The regime-dependent evolution of credibility: A fresh look at Hong Kong's linked exchange rate system
- No 25 Jiandong Ju, Kang Shi and Shang-Jin Wei: Trade reforms and current account imbalances
- No 26 Marco Sanfilippo: Investing abroad from the bottom of the productivity ladder – BRICS multinationals in Europe
- No 27 Bruno Merlevede, Koen Schoors and Mariana Spatareanu: FDI spillovers and time since foreign entry
- No 28 Pierre Pessarossi and Laurent Weill: Do capital requirements affect bank efficiency? Evidence from China
- No 29 Irina Andrievskaya and Maria Semenova: Market discipline and the Russian interbank market
- No 30 Yasushi Nakamura: Soviet foreign trade and the money supply
- No 31 Anna Krupkina and Alexey Ponomarenko: Money demand models for Russia: A sectoral approach

2014
- No 1 Vikas Kakkar and Isabel Yan: Determinants of real exchange rates: An empirical investigation
- No 2 Iftekhar Hasan, Krzysztof Jackowicz, Oskar Kowalewski and Łukasz Kozłowski: Politically connected firms in Poland and their access to bank financing
- No 3 Carsten A. Holz and Aaron Mehrotra: Wage and price dynamics in a large emerging economy: The case of China
- No 4 Zuzana Fungáčová, Anna Kochanova and Laurent Weill: Does money buy credit? Firm-level evidence on bribery and bank debt
- No 5 Jitka Poměnková, Jarko Fidrmuc and Iikka Korhonen: China and the World economy: Wavelet spectrum analysis of business cycles
- No 6 Christopher A. Hartwell: The impact of institutional volatility on financial volatility in transition economies: a GARCH family approach
- No 7 Christian Dreger, Tongsan Wang and Yanqun Zhang: Understanding Chinese consumption: The impact of hukou
- No 8 John Bonin, Iftekhar Hasan and Paul Wachtel: Banking in transition countries
- No 9 Chun-Yu Ho: Switching cost and deposit demand in China
- No 10 Zuzana Fungáčová and Laurent Weill: Understanding financial inclusion in China
- No 11 Anna Krupkina, Elena Deryugina and Alexey Ponomarenko: Estimating sustainable output growth in emerging market economies
- No 12 Qing He, Chang Xue and Chenqi Zhu: Financial Development and patterns of industrial specialization: Regional evidence from China
- No 13 Carsten A. Holz: Wage determination in China during the reform period
- No 14 Thorsten Beck, Hans Degryse, Ralph De Haas and Neeltje van Horen: When arm's length is too far. Relationship banking over the business cycle
- No 15 Boris Blagov and Michael Funke: The credibility of Hong Kong's currency board system: Looking through the prism of MS-VAR models with time-varying transition probabilities
- No 16 Philip Molyneux, Hong Liu and Chunxia Jiang: Bank capital, adjustment and ownership: Evidence from China
- No 17 Yin-Wong Cheung and Dagfinn Rime: The offshore renminbi exchange rate: Microstructure and links to the onshore market
- No 18 Marko Melolinna: What is the role of Emerging Asia in global oil prices?
- No 19 Yiwei Fang, Iftekhar Hasan and Lingxiang Li: Banking reform, risk-taking, and earnings quality – Evidence from transition countries
- No 20 Yanrui Wu: Local government debt and economic growth in China
- No 21 Christophe J. Godlewski, Rima Turk-Ariss and Laurent Weill: Do the type of sukuk and choice of shari'a scholar matter?
- No 22 Elena Deryugina and Alexey Ponomarenko: A large Bayesian vector autoregression model for Russia
- No 23 Yin-Wong Cheung, Menzie D. Chinn and Xingwang Qian: The structural behavior of China-US trade flows
- No 24 Claudio Cozza, Roberta Rabellotti and Marco Sanfilippo: The impact of outward FDI on the performance of Chinese multinationals

2015
- No 1 Qing He, Liping Lu and Steven Ongena: Who gains from credit granted between firms? Evidence from inter-corporate loan announcements Made in China
- No 2 Ke Pang and Pierre L. Siklos: Macroeconomic consequences of the real-financial nexus: Imbalances and spillovers between China and the U.S.
- No 3 V.V. Mironov, A.V. Petronevich: Discovering the signs of Dutch disease in Russia
- No 4 Joshua Aizenman: The internationalization of the RMB, capital market openness, and financial reforms in China
- No 5 Yu-Fu Chen, Michael Funke and Kunyu Tao: Financial market reform – A new driver for China's economic growth?
- No 6 Jarko Fidrmuc and Iikka Korhonen: Meta-analysis of Chinese business cycle correlation
- No 7 Jarko Fidrmuc, Zuzana Fungáčová and Laurent Weill: Does bank liquidity creation contribute to economic growth? Evidence from Russia
- No 8 Elena Deryugina, Olga Kovalenko, Irina Pantina and Alexey Ponomarenko: Disentangling loan demand and supply shocks in Russia

www.bof.fi/bofit

ISSN 1456-4564 (print) // ISSN 1456-5889 (online)