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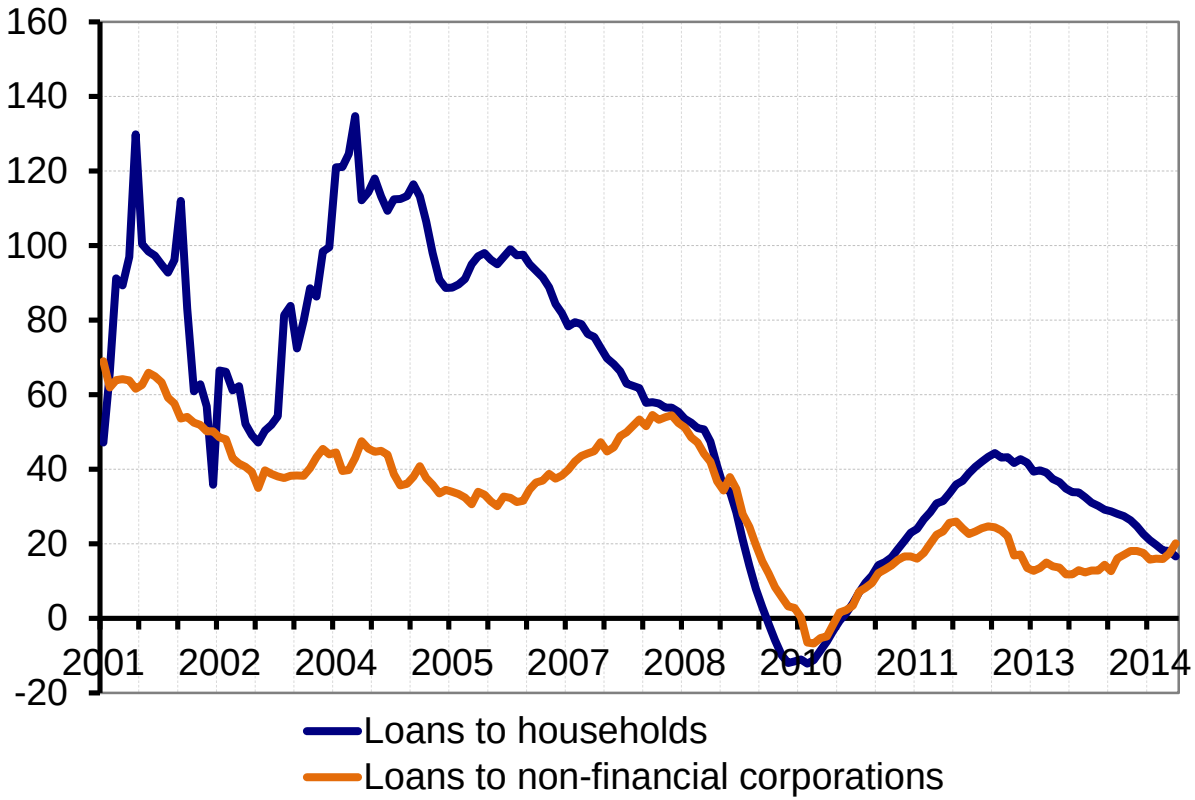
Disentangling demand and supply in loan developments in Russia

Changes in a credit portfolio of Russian banks (as % to the previous year)



Background information:

Russia witnessed drastic loan supply fluctuations over the past decade. Rapid growth of credit aggregates in 2006−2008 drove a credit boom that fuelled high economic growth

The global financial crisis of 2008−2010, while inducing a long period of financial stress in deleveraging developed countries, was weathered by Russia and many emerging economies with fairly modest impacts on real sector growth

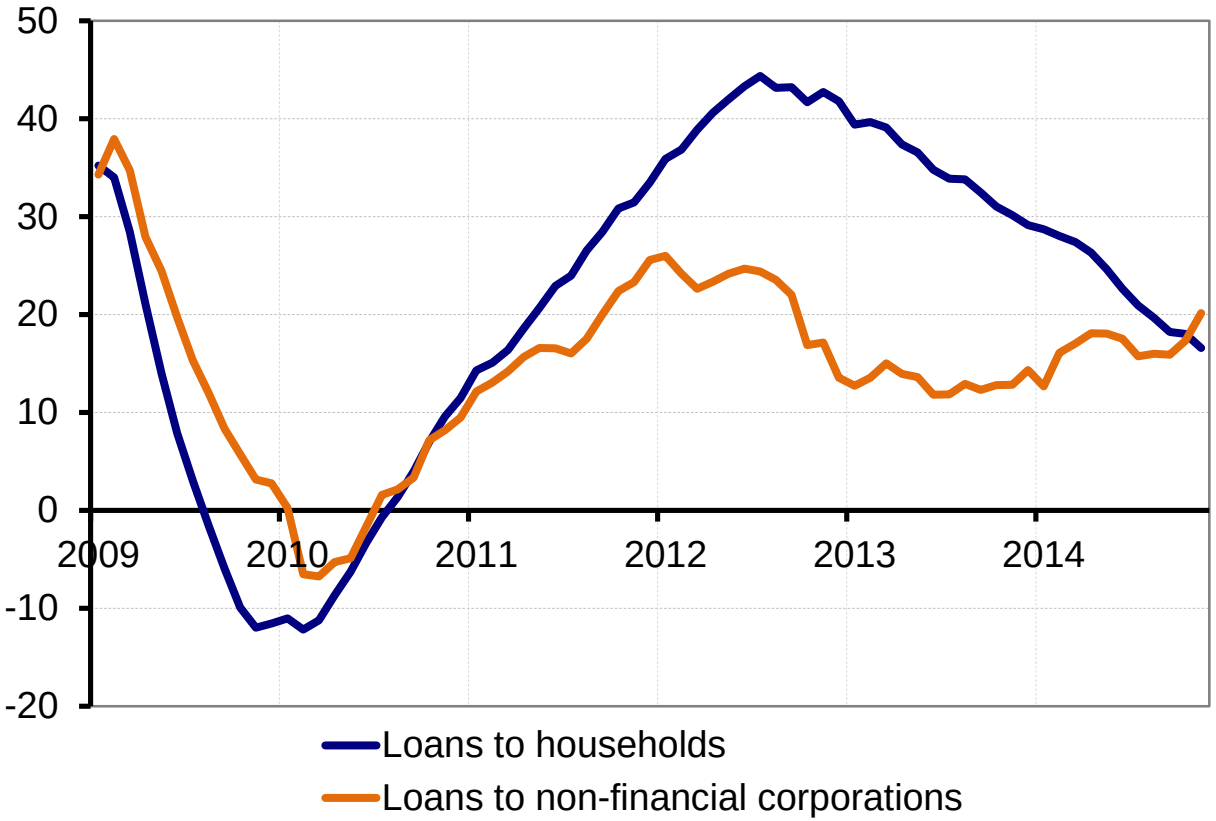
The interpretation of loans developments after the crisis in 2010-2014 remains debatable…

Outline

- Specific features of the Russian credit market development
- Cointegration analysis
- Structural VAR model with sign restrictions
- Panel regression based on BLS indicators

Specific features of the Russian credit market development

Changes in a credit portfolio of Russian banks (as % to the previous year)



Background information:

After the global financial crisis the growth of bank lending has renewed, and starting from the end of 2010, growth rates of a retail portfolio steadily exceed a similar parameter for corporate loans

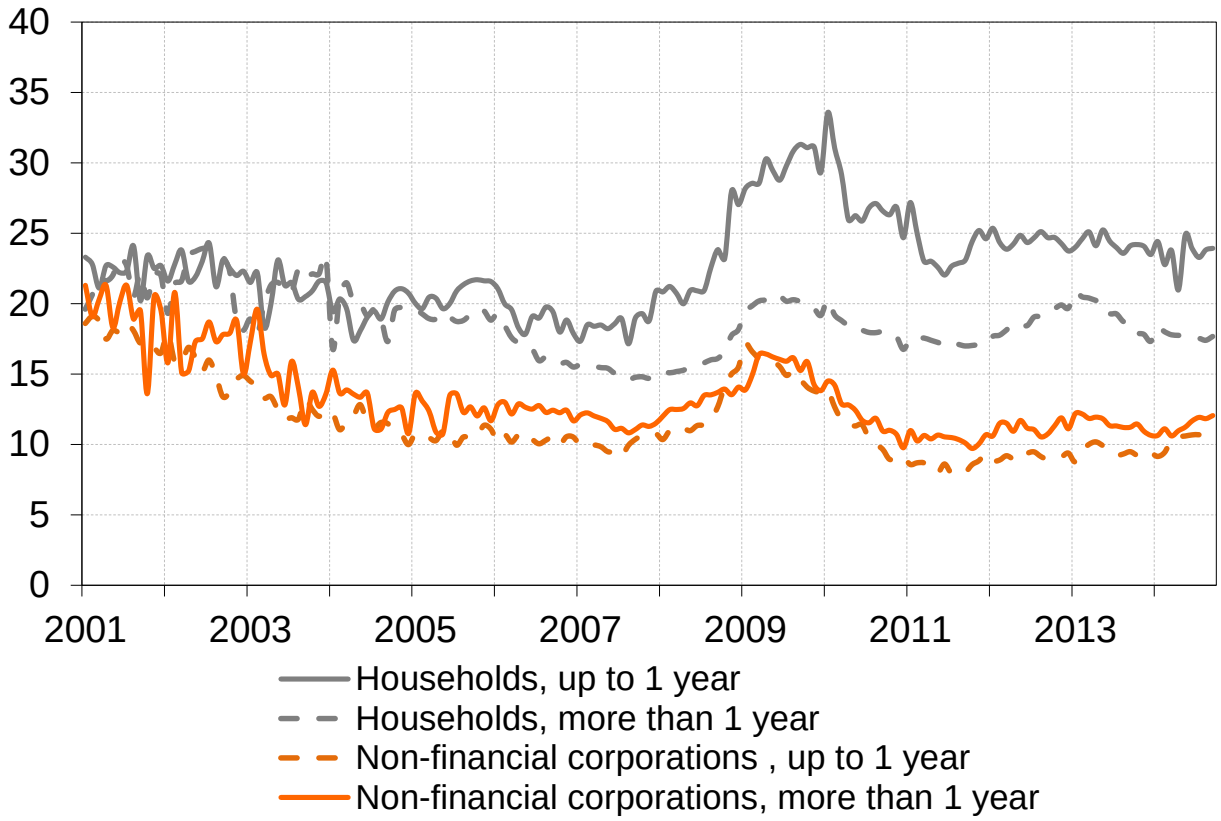
At the beginning of October, 2014 the portfolio of loans extended to households, which has been given out by the Russian banks, made 11,1 trillion rubles (over 17% from the total assets of the Russian banks), against 4,1 trillion rubles (and accordingly 12% of total assets) on the beginning of 2011

For the same period the portfolio of loans extended to enterprises increased from 14,1 to 25,8 trillion rubles, and its share in total assets of the Russian banking system changed from 41 to 40%

In 2012-2013 growth rate of loans to households was nearby 40%. To prevent occurrence of a credit bubble, the Bank of Russia had to undertake special measures

Specific features of the Russian credit market development

Nominal interest rates on loans (% p.a.)



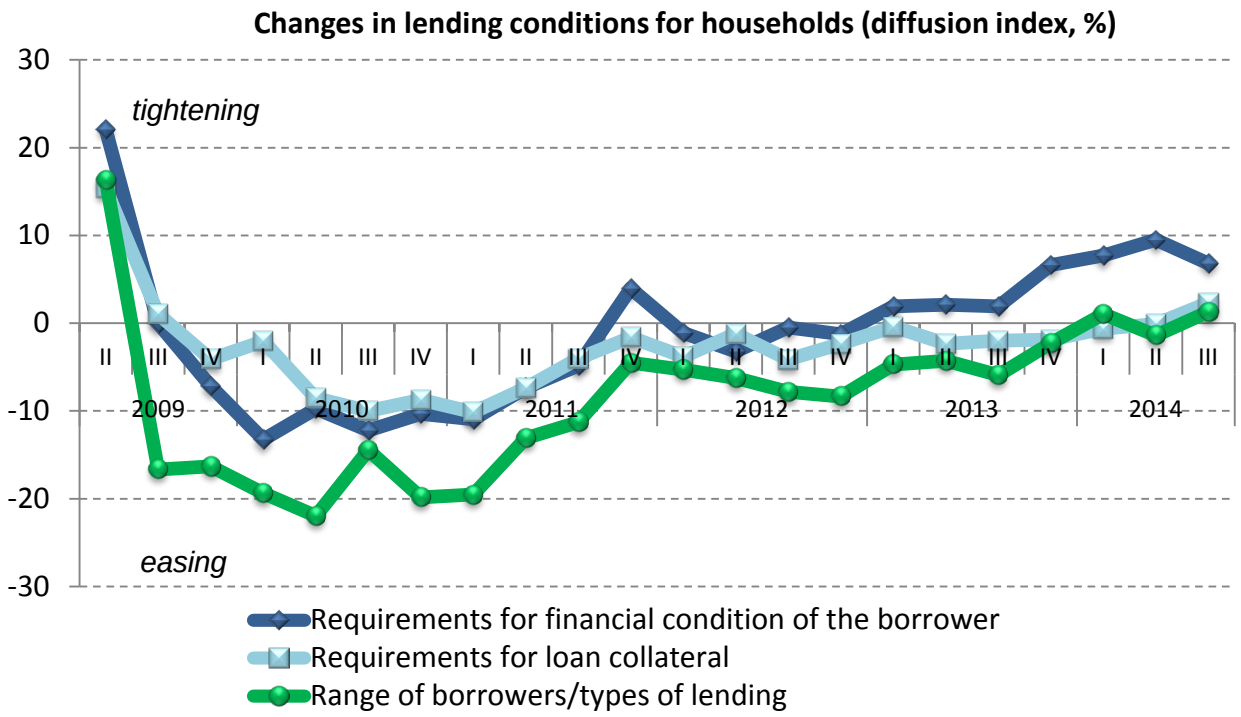
Background information:

Interest rates on loans to households, which essentially increased during the world financial crisis in 2008-2010, later remained high

Unlike rates on corporate loans which to the middle of 2012 had come back to a pre-crisis level, rates on household loans continued to noticeably exceed their level before the crisis

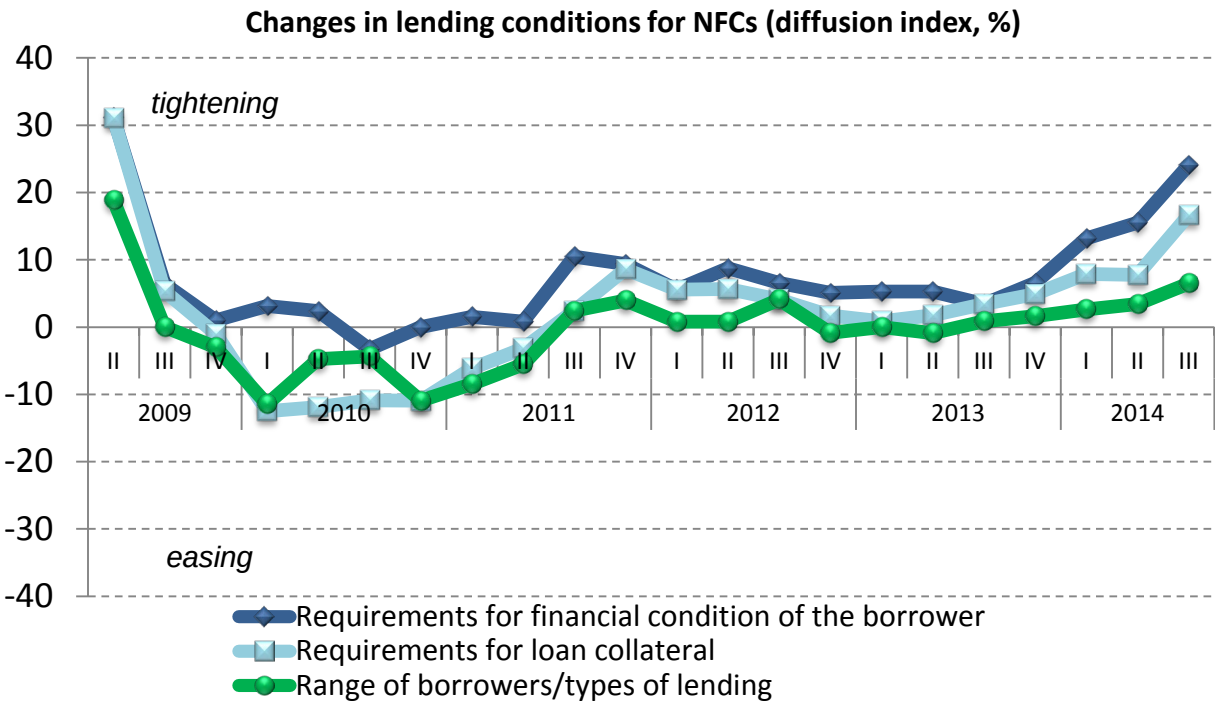
Therefore such a high growth in household loans was driven not by the interest rates policy of banks, but mostly by changes in the other bank lending conditions

Specific features of the Russian credit market development: lending to households



- The Russian market of loans to households, despite of significant growth in the last years, on the scales still essentially concedes to the similar markets of other countries in the East Europe
- The main instruments that accounted for banks' competitive struggle for borrowers were measures to introduce new credit products for households, simplify retail loan formalization procedures and increase the maximum amount of consumer loans.
- The growth of lending to households was promoted not only by improvement in financial position and performance of borrowers, but also by expansion of collection agencies on this market.

Specific features of the Russian credit market development: lending to NFCs



- During the global financial crisis the market of loans to NFCs has appeared essentially more sensitive to macroeconomic shocks, rather than the market of retail loans
- For 2008-2009 the overdue debts on loans to NFCs increased almost in 9 times, whereas in a segment of loans to households – only in 2,5 times.
- After the crisis the share of overdue debts in a portfolio of household loans decreased faster, and to the beginning of October, 2014 it made 4,2%, that is below a similar parameter for credits to the NFCs (5,8%)
- In 2014 the development of the market was affected by deterioration in the external economic situation which had a constraining impact on economic growth in Russia

COINTEGRATION ANALYSIS

ECM BASED ON TWO COINTERGATING RELATIONSHIPS

Cointegration analysis

Loan demand relationship (standard errors in parentheses)

$$L_t/GDP_t + OC_t/GDP_t + FD_t/GDP_t = 2.96*Y_t - 3.79*infl_t + \varepsilon_t$$
$$(0.24) \quad (0.76)$$

- L_t is domestic ruble loans to private sector
- OC_t is other domestic credit to 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
- $infl_t$ is inflation

Quarterly data of 2001 - 2014

Cointegration analysis

Loan supply relationship (standard errors in parentheses)

$$L_t/GDP_t = 1.21^{*}\ CoreLiab_t/GDP_t - 4.06^{*}NPL_t + \varepsilon_t$$
$$\qquad\qquad (0.02) \qquad\qquad\qquad (0.32)$$

- L_t is domestic ruble loans to private sector
- GDP_t is nominal GDP
- $CoreLiab_t$ is measure of banks' liabilities that excludes non-core funding sources (domestic and international interbank borrowing, borrowing from the Bank of Russia, debt securities and foreign currency deposits), includes ruble deposits with 0.7 weight and total of other liabilities
- NPL_t is non-performing loans ratio

Quarterly data of 2001 - 2014

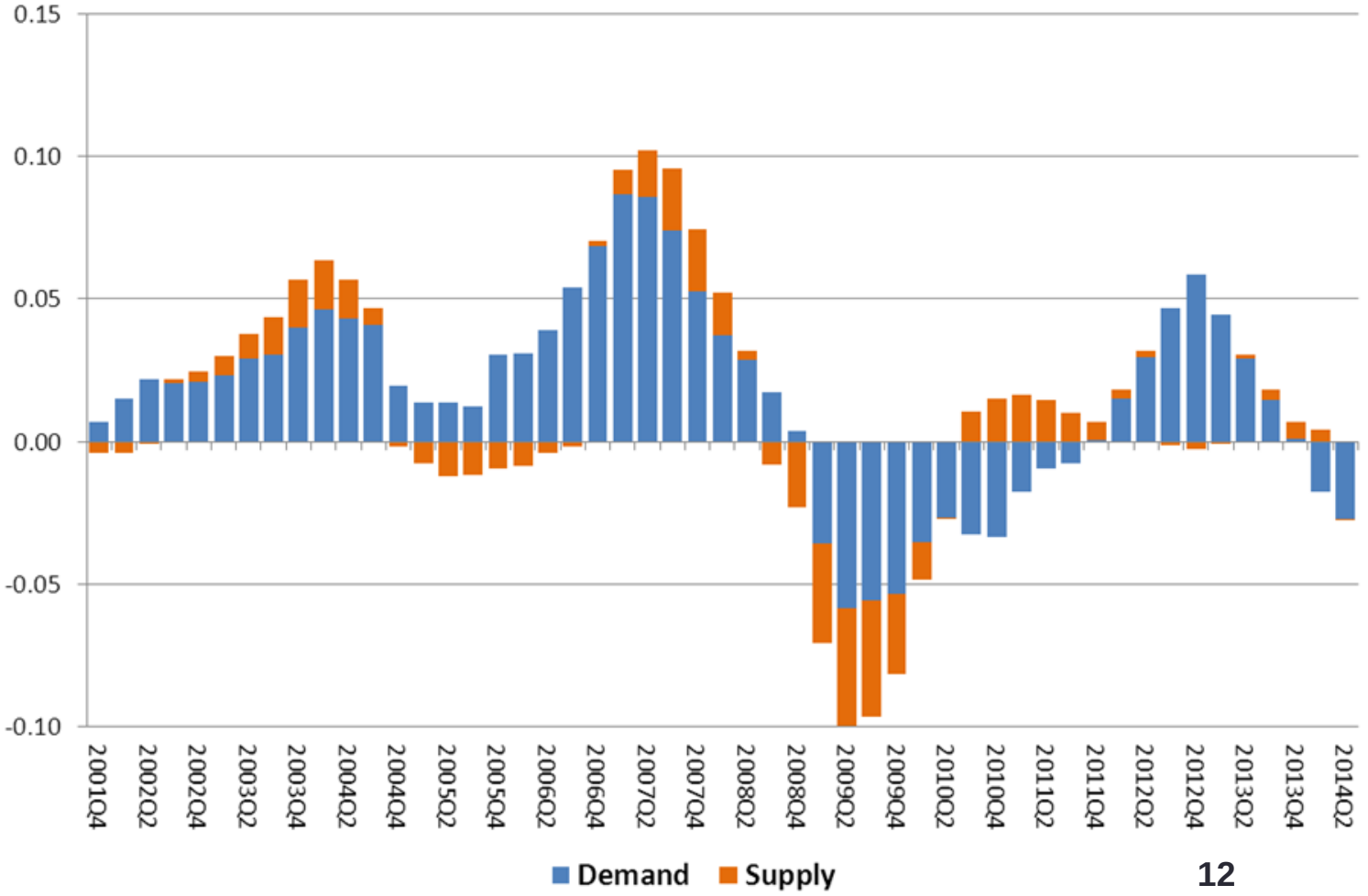
Cointegration analysis

We proceed by calculating the residuals of both equations (ECT^D and ECT^S) and model 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

	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)*

Cointegration analysis

Contribution of error correction terms to real loans growth (sum over 4 quarters)



Cointegration analysis

Main results:

- impact stemming from demand equation was generally more important on the observed period
- sharp transition of supply fundamentals from contractive stance in 2009 to expansionary stance in 2010 was significant for recommencement of loans growth.
- In 2013-2014 the deterioration of demand fundamentals seemed to go faster than slowdown in loans implying further equilibrium loans contraction.

STRUCTURAL VAR MODEL

WITH SIGH RESTRICTIONS

Structural VAR model

Variables:

- log of GDP, log of GDP deflator
- logs of loans to non-financial corporations (NFCs) and households (HHs)
- corresponding interest rates (with more than 3-year maturity)
- total ruble loans to total ruble deposits ratio (LTD)

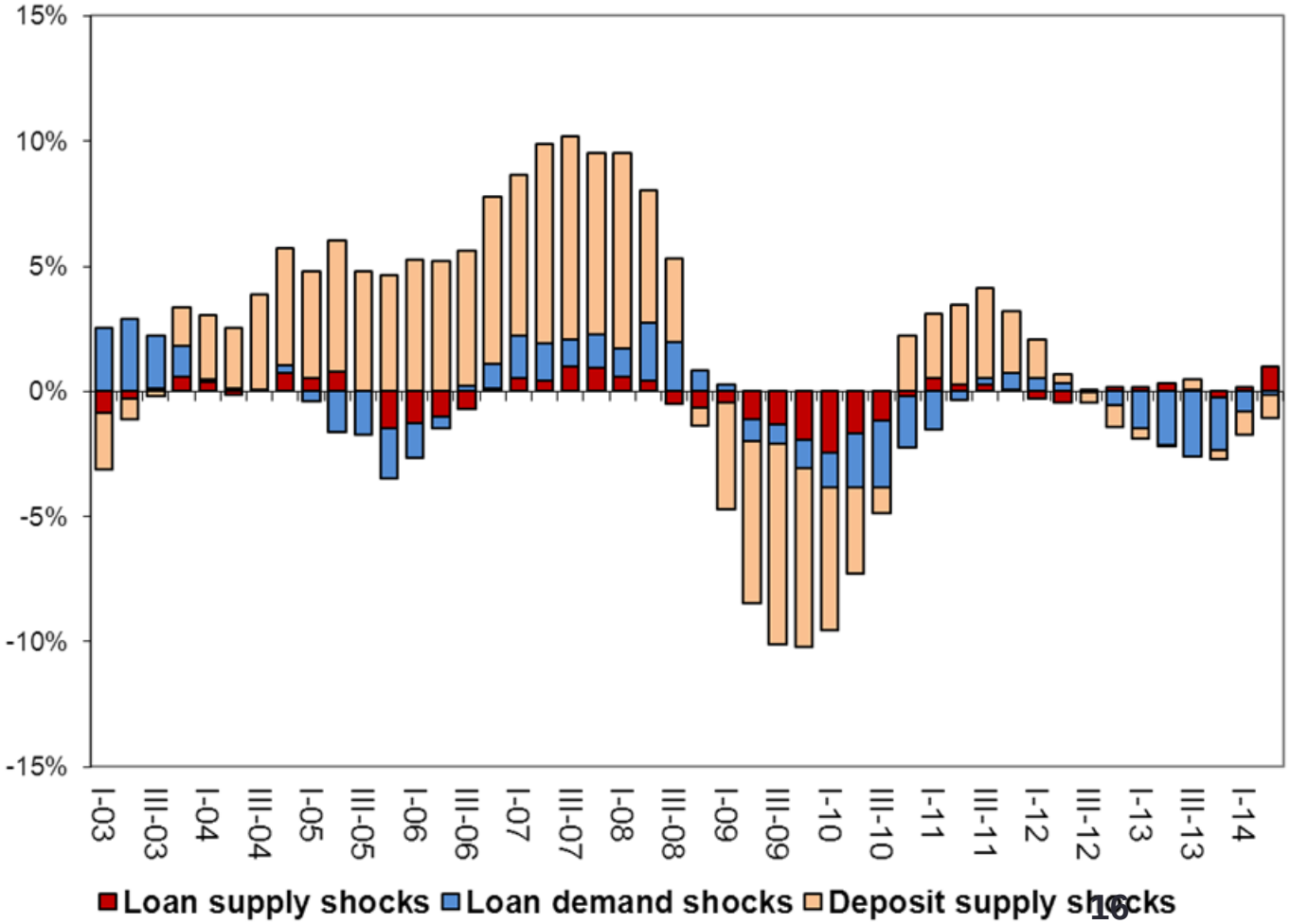
Sign restrictions on impulse response functions
(set for 2 first quarters after shock)

Variable / Type of shock	**Loan supply (NFC)**	**Loan supply (HH)**	**Loan demand (NFC)**	**Loan demand (HH)**	**Deposit supply**
Interest rate (NFC)	-	?	+	?	-
Loans (NFC)	+	?	+	?	+
Interest rate (HH)	?	-	?	+	-
Loans (HH)	?	+	?	+	+
Loans/deposits	+	+	+	+	-

Quarterly data of 2001 - 2014

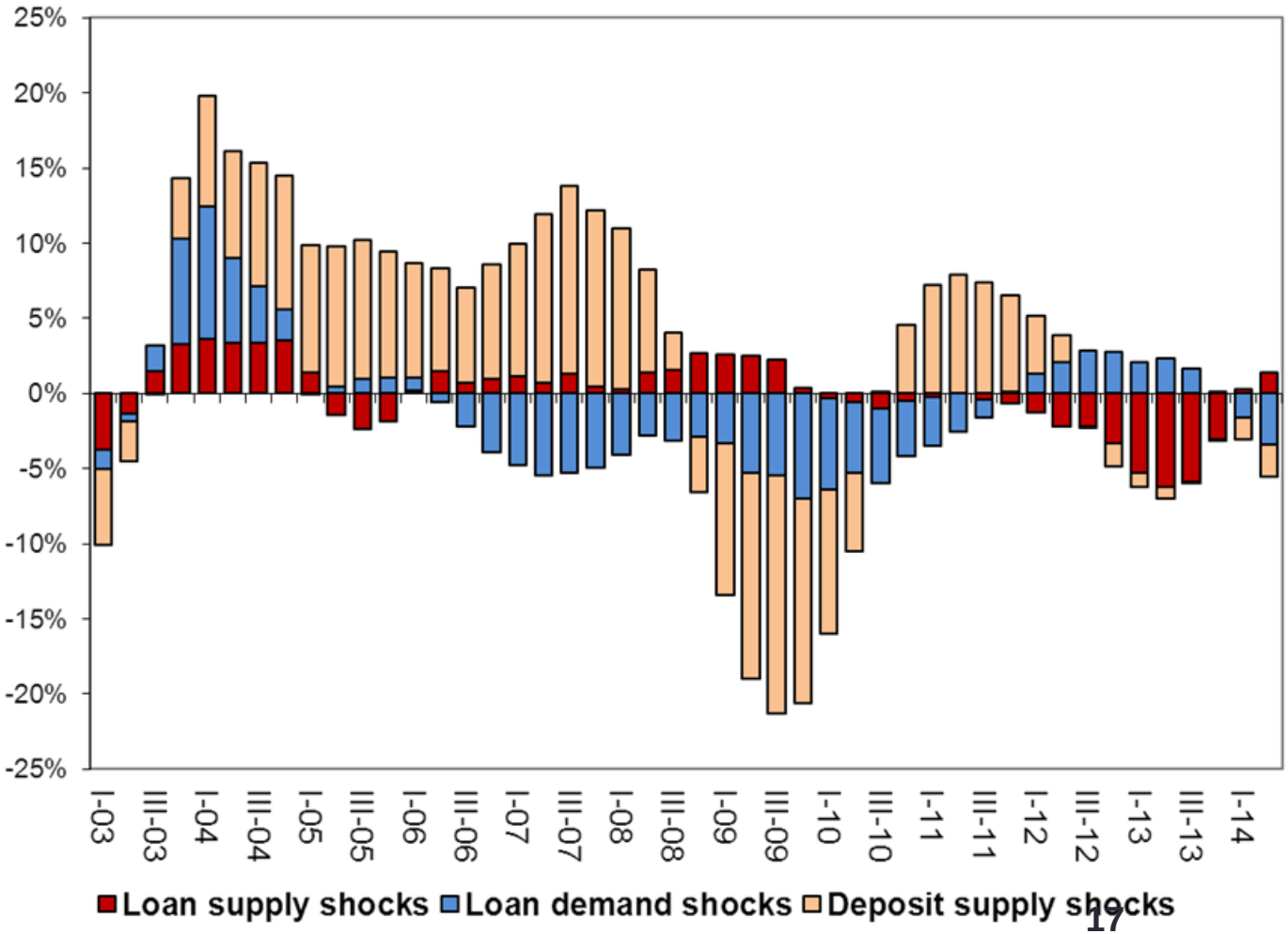
Structural VAR model

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



Structural VAR model

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



Structural VAR model

Main results:

- Contributions from deposits supply shocks are very important for loan developments in both sectors. The fluctuations of their contribution during and after the crisis seems particularly dramatic.

- Contributions from demand and supply shocks were less relevant in general, although became more important after the crisis.

- We may note that the slowdown in loans to NFC in 2013 was mostly associated with loan demand shocks. Conversely, there were series of expansionary demand shocks for loans to households in 2011-2012 that was partly offset by contractive supply shocks in 2012-2013.

PANEL REGRESSION MODEL

MICRO DATA AND BLS RESPONSES

BLS Surveys in Russia

Responsible: Monetary Policy Department

II quarter 2009 – first country-level survey (sample of banks: 60, market share: more than 70%)

I quarter 2010 – first regional-level surveys (regional branches of the Bank of Russia: 5)

Nowadays – country-level surveys (62 banks, market share 75%) и regional-level surveys(31 regional branches of the Bank of Russia)

BLS Surveys in Russia

Surveys of bank lending conditions in Russia are conducted on a quarterly basis.

Banks are supposed to answer four blocks of questions in the Survey questionnaire:

(1) regarding changes of lending conditions in general and separate lending conditions

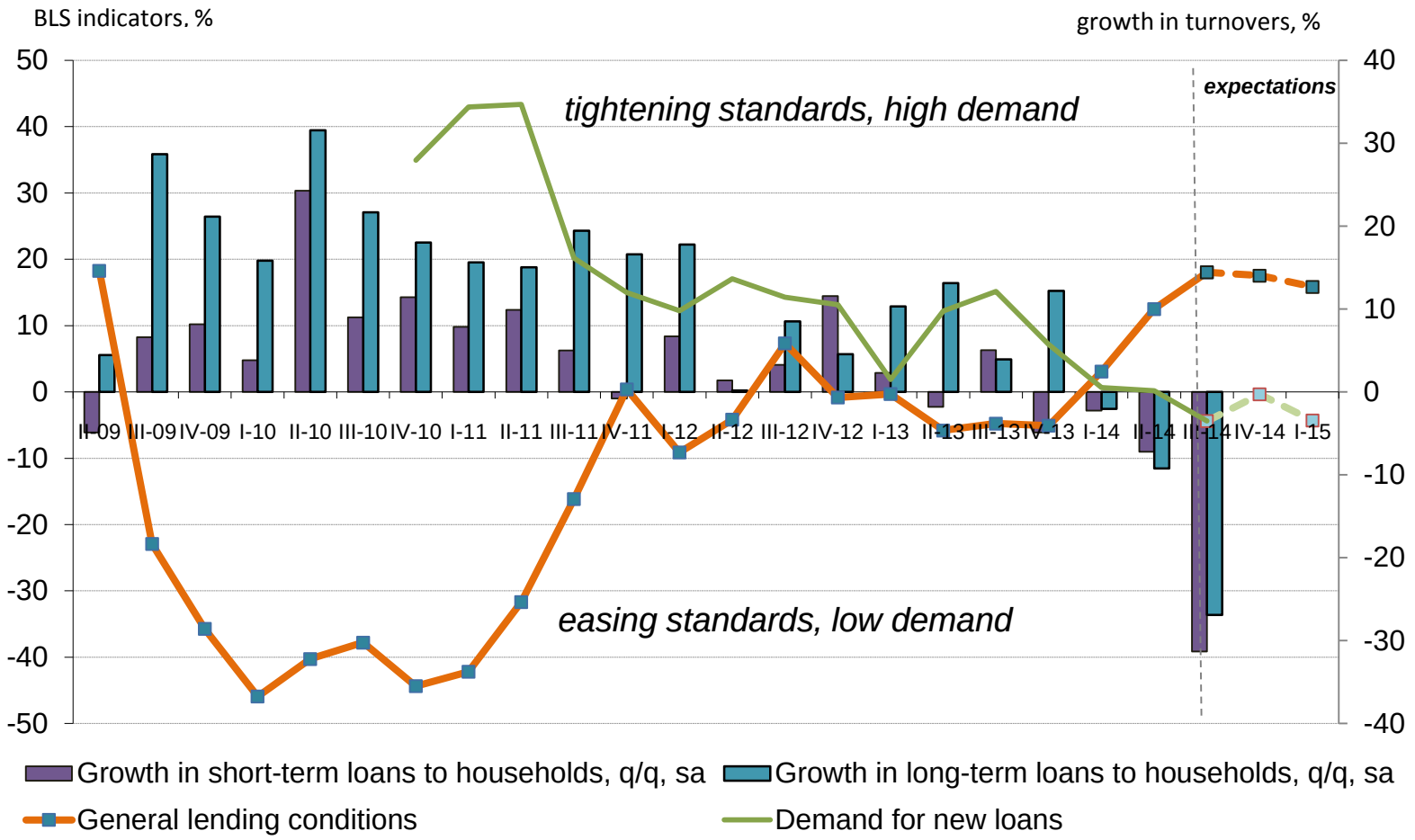
(2) the reasons of changes in lending conditions

(3) changes in demand for credits

(4) expectations of future changes in credit conditions and demand for credits.

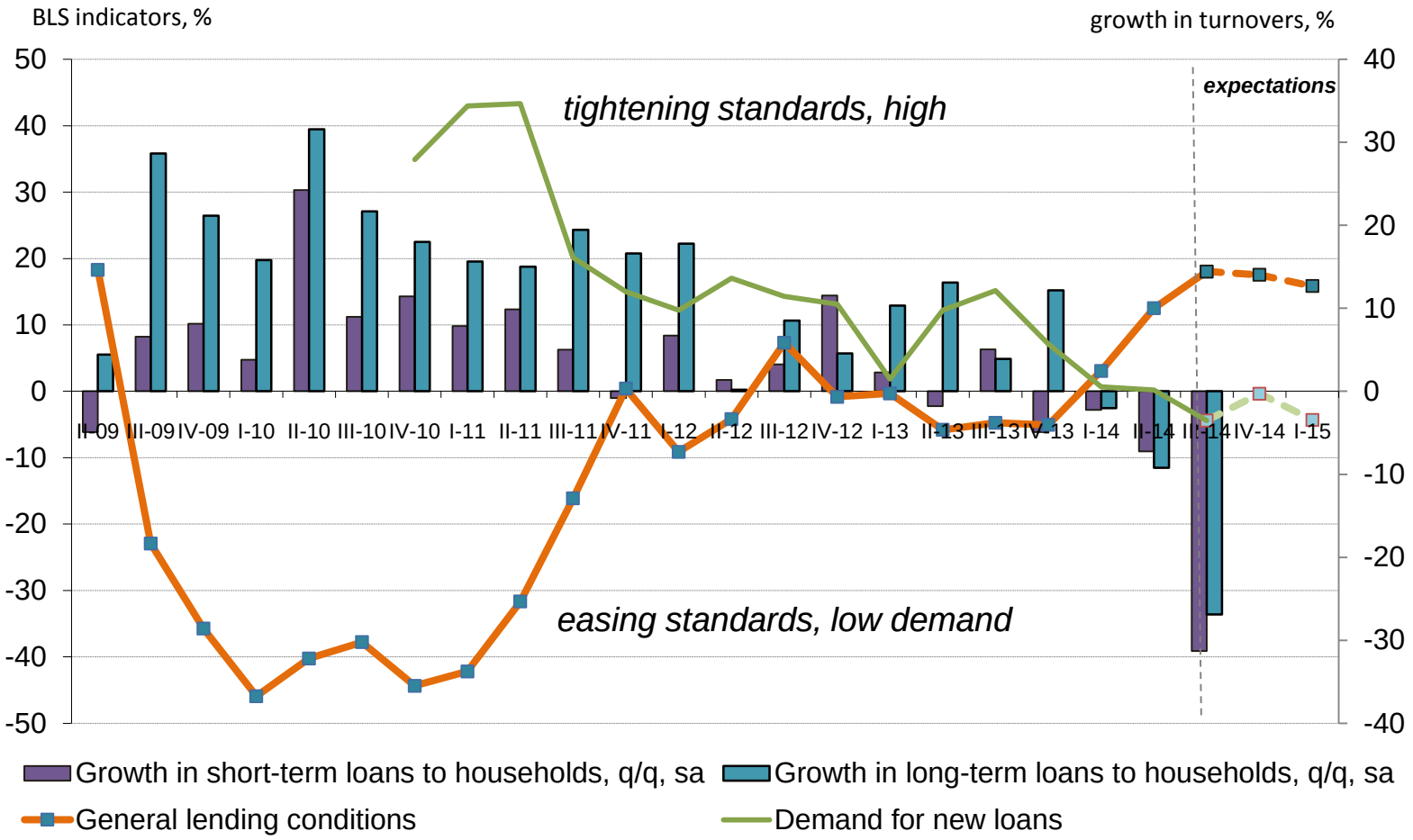
These replies are used as instruments which help to identify credit demand and supply and to estimate their respective contributions to loan developments in Russia.

Turnovers of lending to households and BLS



Steady growth of turnovers of loans to households, observable in 2009-2011, was accompanied by essential easing of bank lending conditions. in 2012-2013 lending conditions didn't change significantly, and growth of turnovers slowed down. Demand was high until the end of 2013.

Turnovers of lending to NFCs and BLS



Similar dynamics was observed in a segment of lending to enterprises. But in this part of the credit market starting from the middle of 2011 tightening of bank lending conditions has prevailed. In 2014 bank lending conditions were tightened by a majority of banks for both categories of borrowers.

Panel regression

base model

$$\Delta L_{it} = \alpha_i + \beta(K)Sup_{it} + \lambda(K)BLS\_Dem_{it} + \gamma(K)Z_{it} + \varepsilon_{it},$$

где

- ΔL_{it} - rate of growth in bank lending for bank *i* in the quarter *t (q-o-q)*,
- Sup_{it} - supply contributions obtained from the bank lending survey for bank i,
- Dem_{it} - demand contributions obtained from the bank lending survey for bank i,
- Z_{it} - vector of other variables that can influence loan growth:
  - individual bank loan rate,
  - nominal GDP growth.

Panel regression

We define indicators Sup_i and Dem_i as vectors of dummy variables, which correspond to three possible alternative answers in the survey (tightened, didn't change and eased)

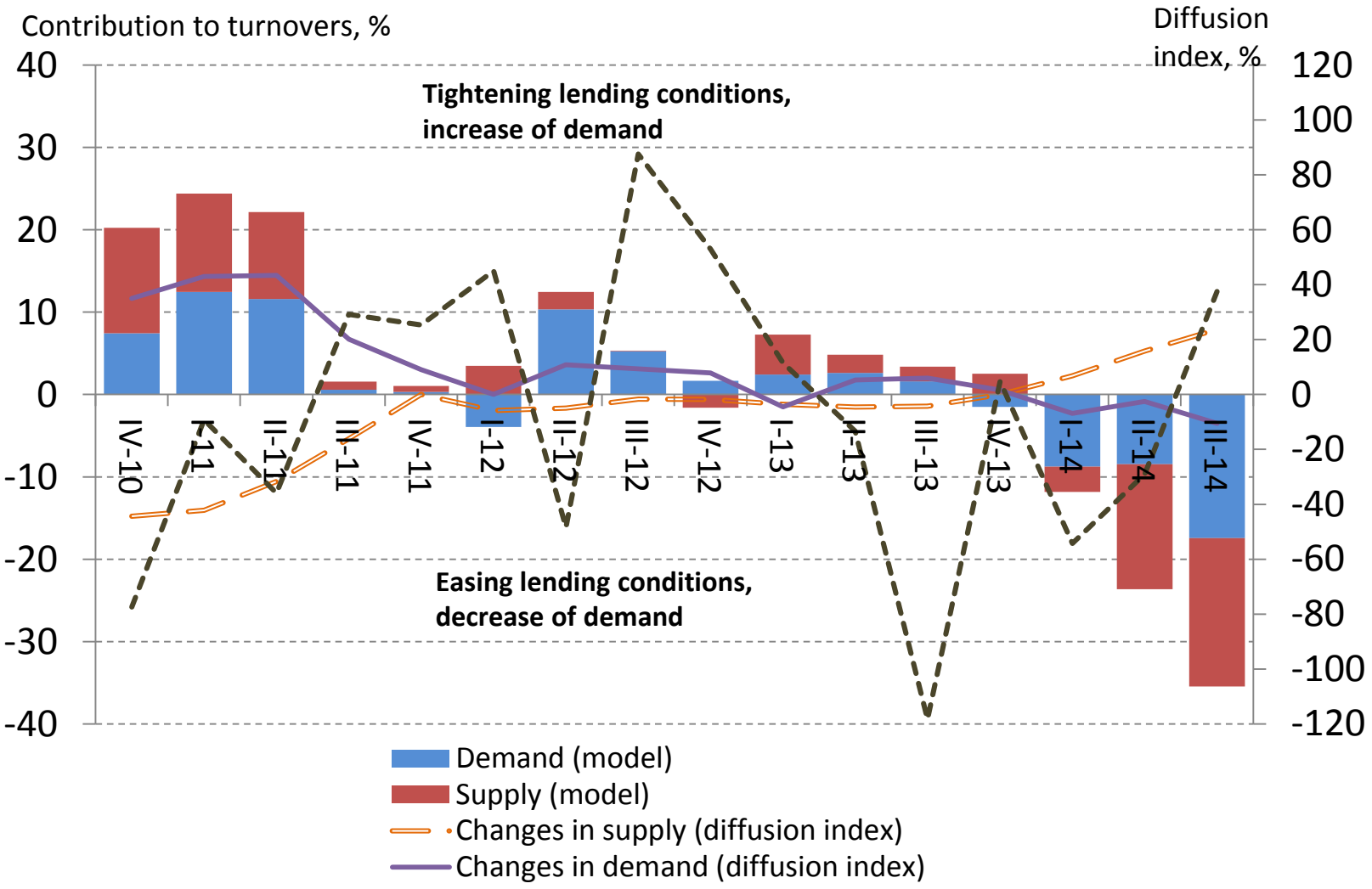
model extention

$$\Delta L_{it} = \alpha_i + \beta_1(K)Sup\_tightened_{it} + \beta_2(K)Sup\_eased_{it} + \lambda_1(K)Dem\_decreased_{it} + \lambda_2(K)Dem\_increased_{it} + \gamma(K)Z_{it} + \varepsilon_{it}$$

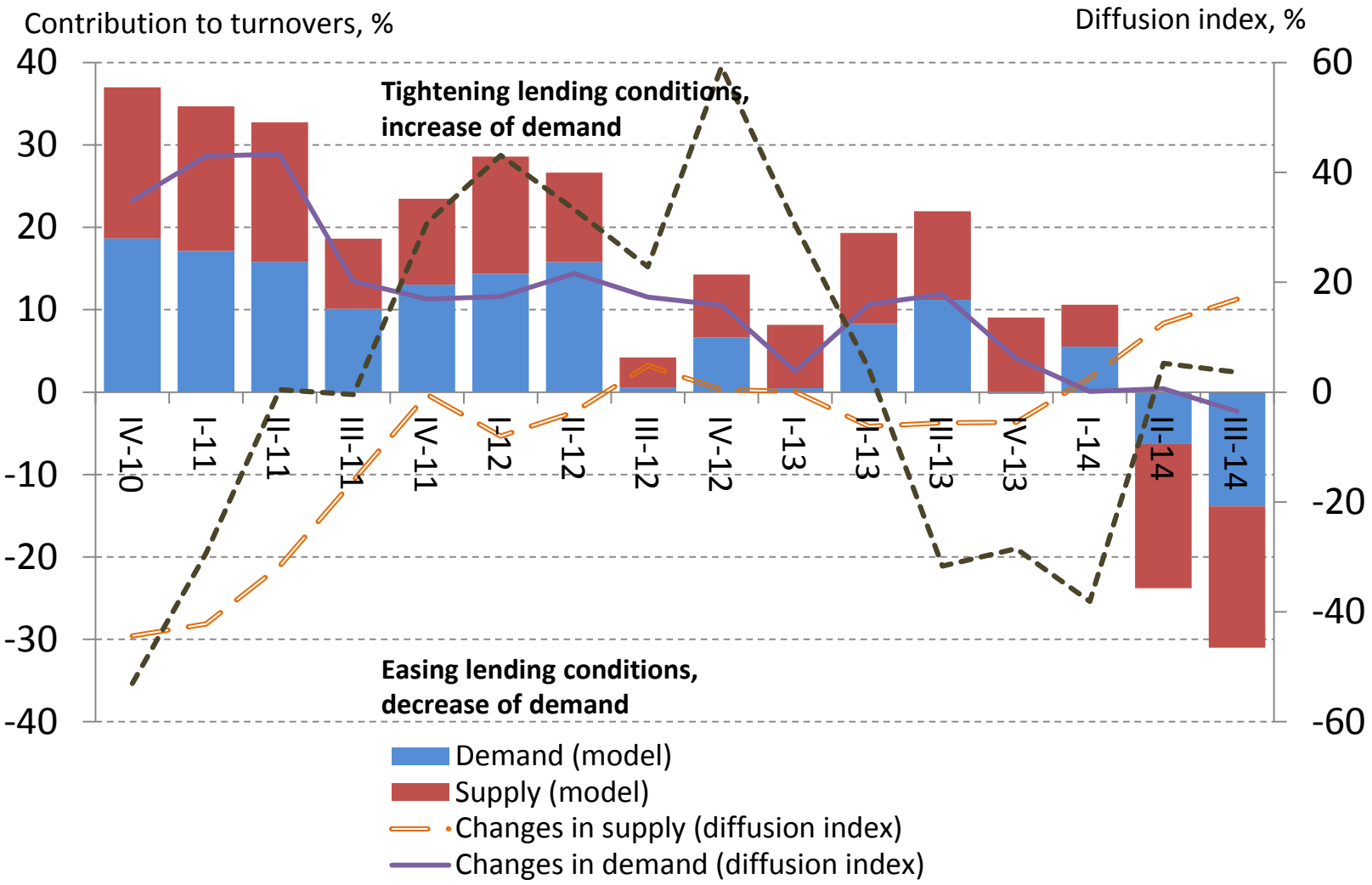
Each dummy variable takes the value of 1 if at time *t* bank *i* reported that its credit standards or demand changed in the previous three months and zero otherwise. We expect parameters β_1 and λ_1 to be negative and, accordingly, β_2 and λ_2 to be positive.

Quarterly data of 2010 - 2014

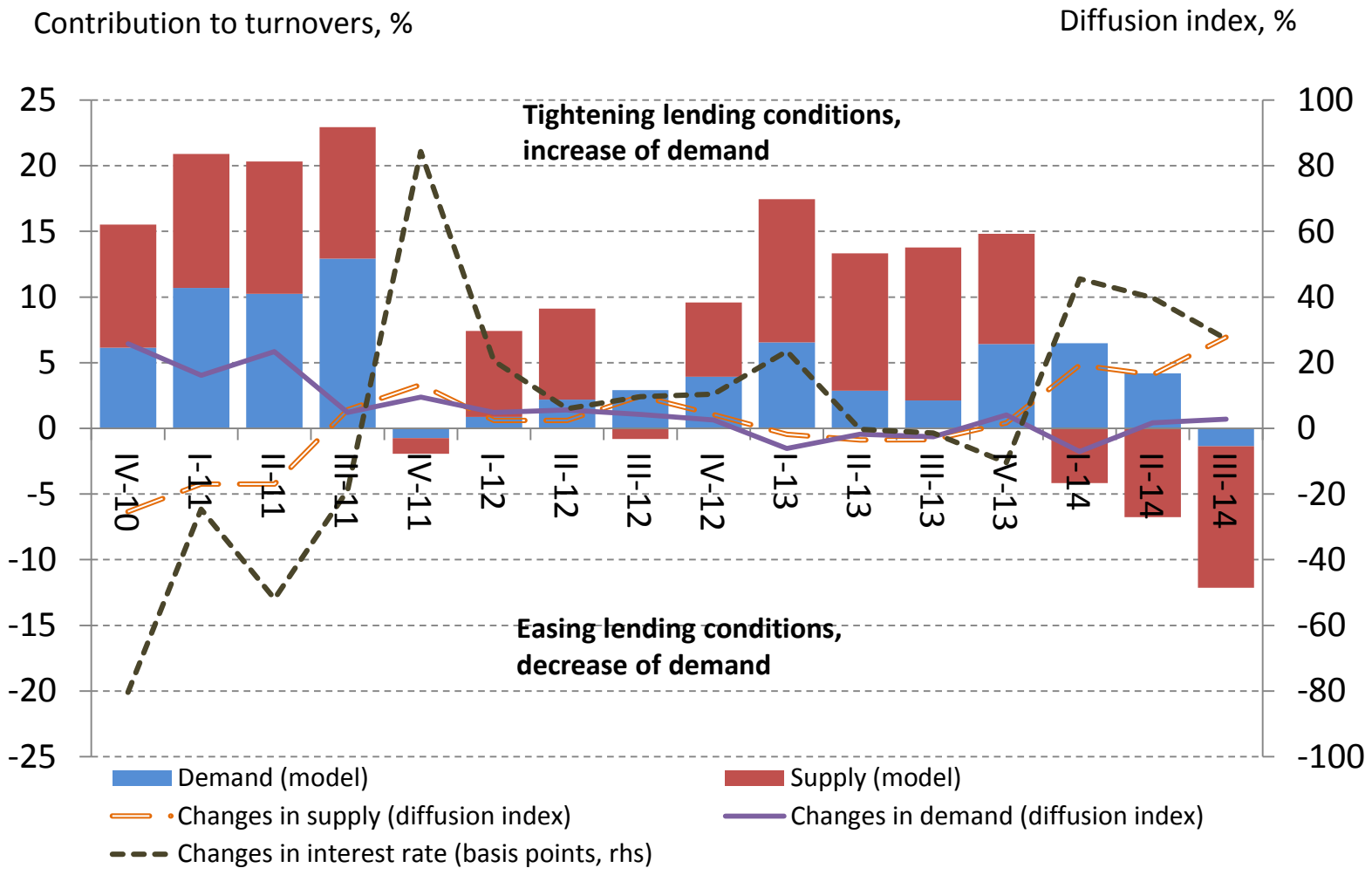
Contribution of supply and demand factors to the q-o-q rate of growth of short-term loans to HHs (%)



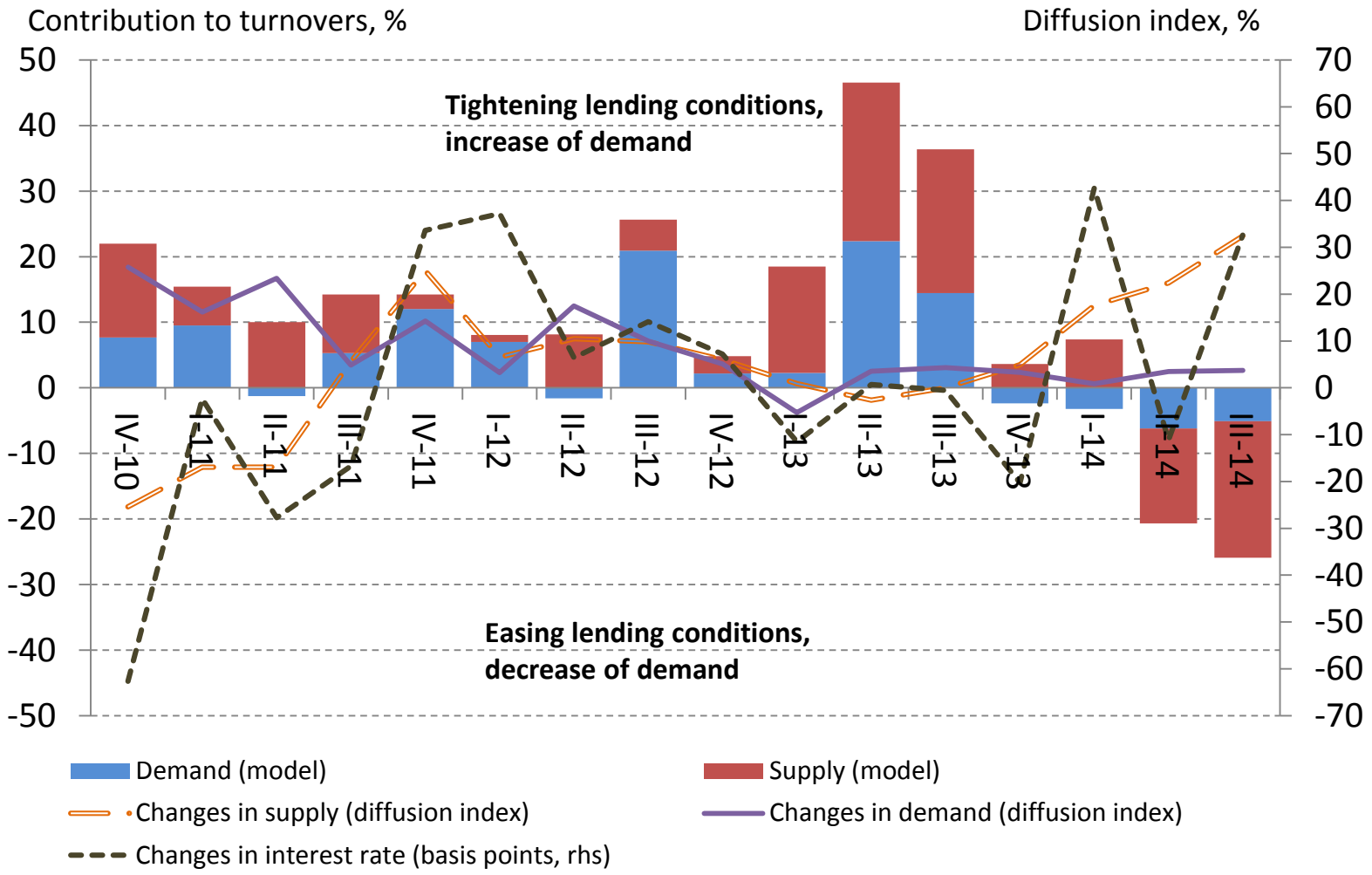
Contribution of supply and demand factors to the q-o-q rate of growth of long-term loans to HHs (%)



Contribution of supply and demand factors to the q-o-q rate of growth of short-term loans to NFCs (%)



Contribution of supply and demand factors to the q-o-q rate of growth of long-term loans to NFCs (%)



Conclusions

- We developed three alternative models and used them to explain loan developments in Russia. We found the role for both demand and supply shocks, although the results are inconclusive as regards the relative magnitude of these shocks (cointegration analysis provides the evidence of high relevance of loan demand relationship while structural VAR model attaches larger role to shocks to the banks' balance sheets).

- We present the evidence that monetary expansion fuelled the pre-crisis credit boom and also helped considerably to reignite the credit markets after the crunch in 2009.

- As regards the-post crisis developments we found that slow-down of loans to NFCs growth was generally in line with fundamentals. It may be explained by loan demand shocks in corporate sector (although BLS indicators fail to explain these developments).

- The post crisis rapid growth of loans to households was also mostly demand driven.

Thank you!