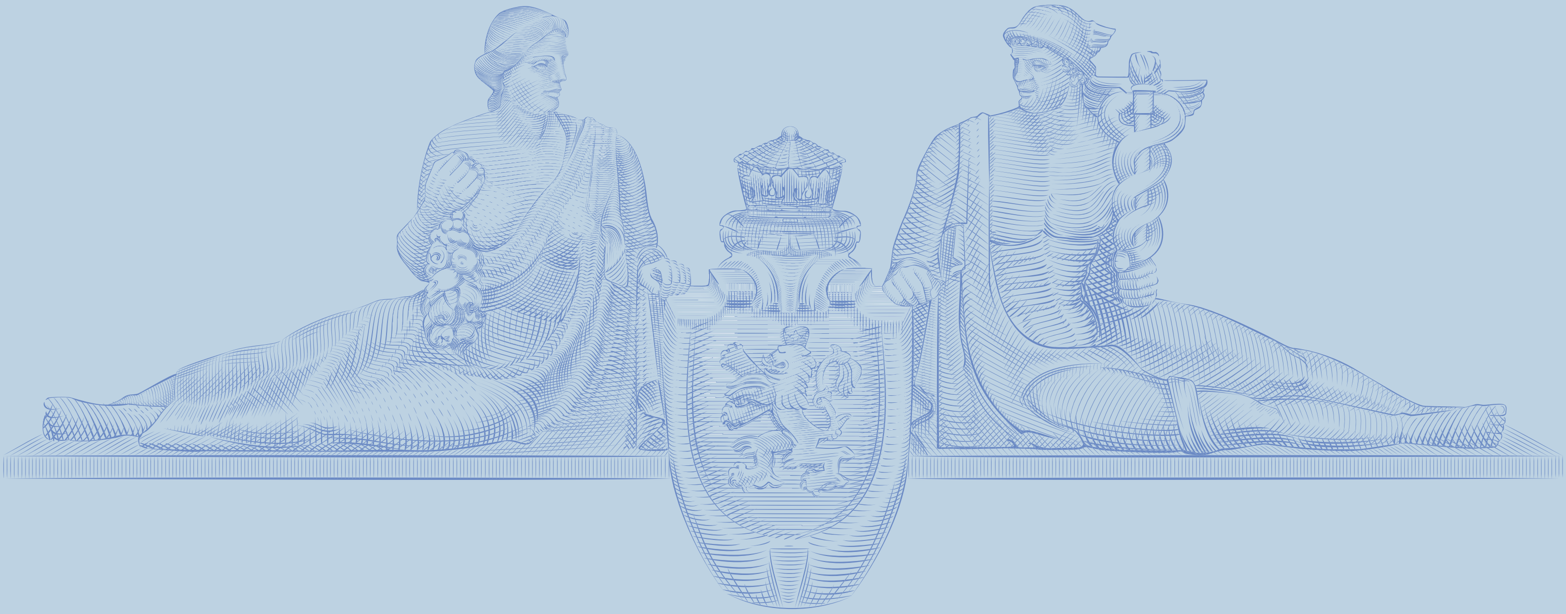

Topical Research and Highlights

Analysis of the Bank Lending Survey Results for the 2003–2014 Period

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BULGARIAN NATIONAL BANK

Analysis of the Bank Lending Survey Results for the 2003–2014 Period

This research topic provides a summary of the results and an empirical analysis of the data contained in the Bank Lending Survey (BLS) performed by the BNB since the fourth quarter of 2003. This research is based on an analytical material, part of the BNB research activity.

Bank lending survey provides information for the purposes of the ongoing monitoring and analyses of credit conditions in Bulgaria. BLS includes questions on quarterly developments in loan demand by corporations and households, as well as changes in the credit policy of banks, factors driving loan demand and standards and conditions offered by banks in extending financial resources to households and corporations. The survey presents also changes expected by banks in the following quarter with reference to loan demand and standards of banks. The bank lending survey made by the BNB is broadly similar to the BLS used in euro area countries.

This survey is performed in the first month of each quarter. It is addressed to contact persons designated by the management of individual banks who respond electronically to the questionnaire. After the receipt of completed questionnaires, the BNB aggregates results and presents both not weighted and weighted data by the market share of banks in the relevant credit segment. Weights are calculated as a ratio of extended corporate, mortgage or consumer loans by each bank to the total amount of disbursed loans of the respective type for the whole banking system. The survey results are sent to participating banks. In addition, they are published in the BNB Economic Review quarterly bulletin.

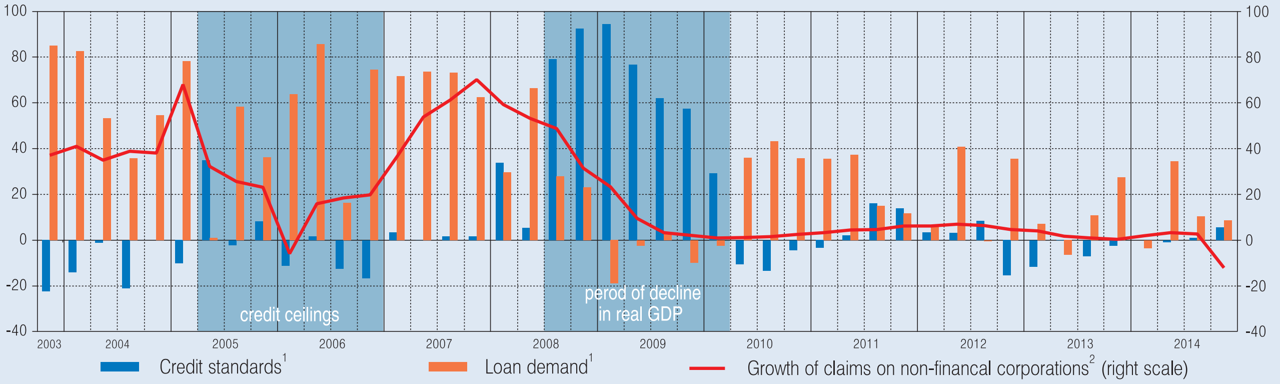
For the period from the fourth quarter of 2003 to the present day, the BLS included questions on demand and credit standards separately for short-term and long-term corporate loans. The BNB has included questions on demand and credit standards for total corporate loans and consumer and housing loans to households since the first quarter of 2010. Therefore, the analysis presented below includes a summary and an empirical assessment of the survey results focused on lending to non-financial corporations. Latest available data in the survey refer to the fourth quarter of 2014.

In interpreting survey results, it should be taken into account the qualitative nature of the data since they reflect assessments and opinions of individual banks on the developments in loan demand and standards compared to the previous quarter, as well as bank expectations of both demand and credit standards in the following quarter. Hence, the interpretation and analysis of survey results at an aggregate level call for a calculation of the net balance of opinions expressed as a percentage. As regards questions on credit standards, the net balance represents the difference between the percentage share of banks reporting a tightening of credit standards and that of banks reporting an easing of credit standards. Thus, a positive value of the net balance of opinions indicates a tightening of credit standards and a negative value points to an easing. Regarding the loan demand, the net balance represents the difference between the percentage of bank responses indicating an increase and a decrease in loan demand.

Chart 1: Bank Lending between the Fourth Quarter of 2003 and the Fourth Quarter of 2014

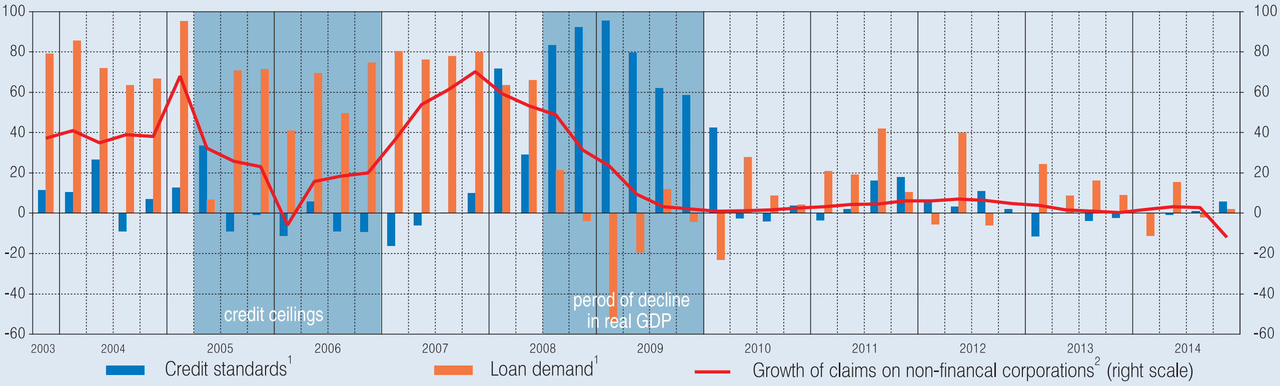
Short-term loans to enterprises

(net balance of opinions, percentage points) (per cent)



Long-term loans to enterprises

(net balance of opinions, percentage points) (per cent)



[1] Based on the BNB Bank Lending Survey.
[2] Based on monetary statistics data.

Notes: In the context of loan demand, the balance of opinions is defined as a difference in percentage points between the percentage of banks responding 'increased' ('considerably' and 'somewhat'), and the percentage of banks responding 'decreased' ('considerably' and 'somewhat'). As regards credit standards, the balance of opinions is defined as a difference in percentage points between the percentage of banks responding 'tightened' ('considerably' and 'somewhat') and the percentage of banks responding 'eased' ('considerably' and 'somewhat'). All bank responses are weighted by the bank's market share in lending to non-financial corporations for the relevant quarter.
The period of credit ceilings lasts from the second quarter of 2005 to the fourth quarter of 2006. To limit the fast growth of loans, in April 2005 the BNB introduced administrative credit limits (credit ceilings) in force until January 2007. Banks reporting quarterly credit growth exceeding the reference values set by the BNB had to maintain additional minimum required reserves.
For the purposes of the present analysis, the economic crisis period covers the third quarter of 2008 to the fourth quarter of 2009 when based on seasonally adjusted data on quarterly growth Bulgaria's GDP decreased.
In the fourth quarter of 2014 the year-on-year decline in claims on non-financial corporations is driven by the exclusion of Corporate Commercial Bank as a reporting unit from monetary statistics since November 2014 after the banking license revocation.

Source: BNB.

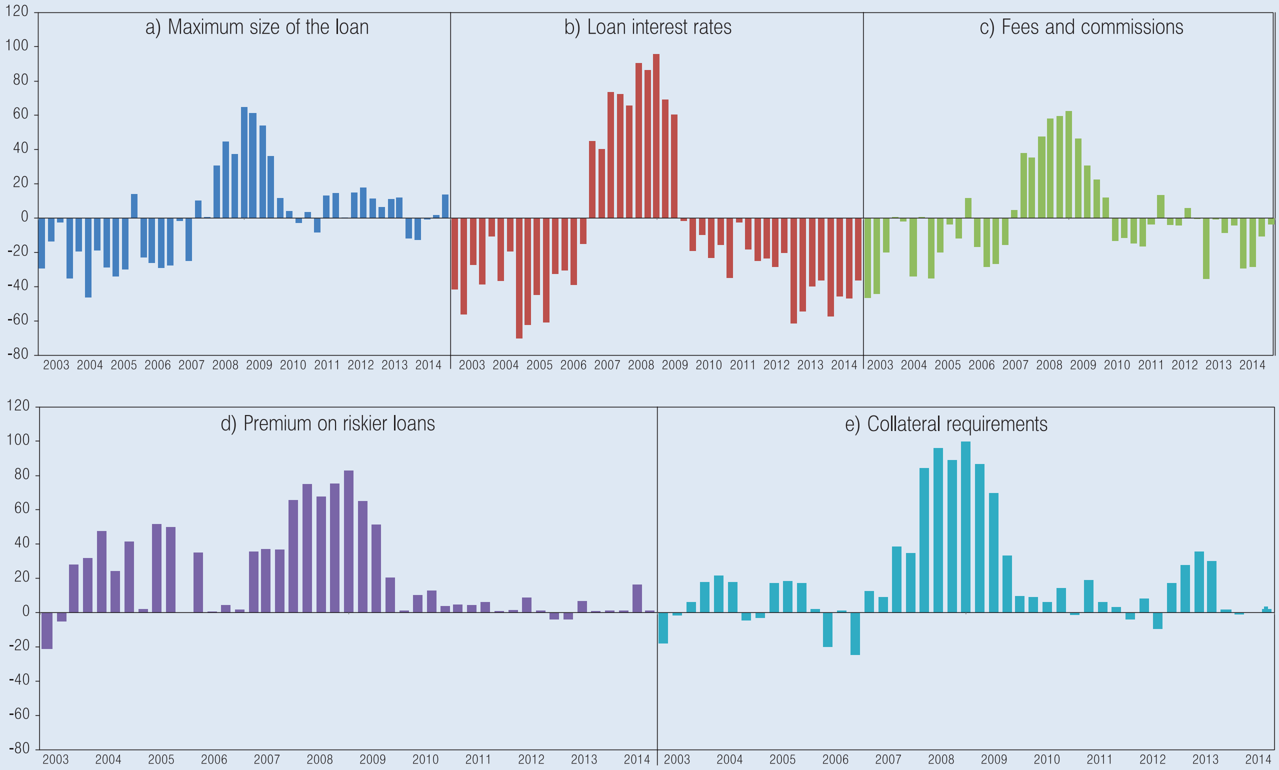
Survey data show that the period from the fourth quarter of 2003 to the second quarter of 2008 was marked by a significant increase in demand for both short-term and long-term loans by corporations, with these results corresponding to the high economic growth in Bulgaria over this period and expectations of high return on investment (Chart 1). On the part of banks, a comparatively slight easing of credit standards for short-term loans was observed prior to the global financial and economic crisis,[1] while long-term loans of banks were characterised by a net tightening in credit standards from the fourth quarter of 2003 to the second quarter of 2005 and a slight net easing thereafter. Survey credit standard results should be considered in the context of the consistent

[1] The first signs of the global financial crisis emerged at the very end of 2007 and in early 2008, though experienced several quarters later in Bulgaria. Domestic banks had no exposures to securities linked to the US real estate prices which declined significantly in 2007. Consequently, a global financial and economic crisis has developed. Global crisis effects spilled over into Bulgaria through the real economy, reflecting the increased uncertainty in international financial markets which led to a significantly lower inflow of foreign capital and an essential fall in external demand.

counter-cyclical policy of the BNB which in the years of high economic growth was reflected in stringent and conservative rules for capital adequacy, liquidity, risk classifications and bank provisions intended to limit the fast growth of loans[2] in the economy amid a strong inflow of foreign capital. This capital was associated with both the considerable growth of foreign direct investment into Bulgaria and the increase in financial resources provided by parent banks to the subsidiary banks and their branches in Bulgaria, intended to boost their market share in the region where banking profits were significant.

Chart 2: Changes to the Terms of Corporate Loans (2003–2014)

(net balance of opinions, percentage points)



Note: The balance of opinions in responses about factors of credit standards is defined as a difference between the percentage of banks responding 'has contributed to tightening' ('considerably' and 'somewhat') and the percentage of banks responding 'has contributed to easing' ('considerably' and 'somewhat').

Source: BNB – Bank Lending Survey.

Between the second half of 2008 and the first quarter of 2010 banks started to gradually report a strong tightening of credit standards on extending both short-term and long-term loans to corporations. Subsequently, until the end of the review period the levels of credit standards attained relatively stabilised or slightly eased. Easing of standards in recent years has been observed mainly in respect of interest rates and to a lower degree in respect of fees and commissions. As to the maximum size of the loan, the premium on riskier loans and collateral requirements remained comparatively high and/or tightened (Chart 2). Concurrently, after the banks had assessed lower demand, particularly in 2009, corresponding to the contraction in real economic activity, in 2010 and the first half of 2011 banks reported some growth in demand for short-term loans, while demand for long-term loans remained relatively lower. Overall, these results corresponded to the low positive growth rate of loans to corporations based on the monetary statistics data for the 2010–2012 period. In addition to banks' cautious lending policy, other factors that probably affected loan demand and

[2] The period before the global financial and economic crisis was marked by high growth rates of loans to non-financial corporations in Bulgaria. The strong moderation in credit growth in 2005 and 2006 was entirely affected by the BNB counter-cyclical policy measures to introduce credit ceilings. It was not caused by the decreasing demand for credit by corporations. See also the notes to Chart 1.

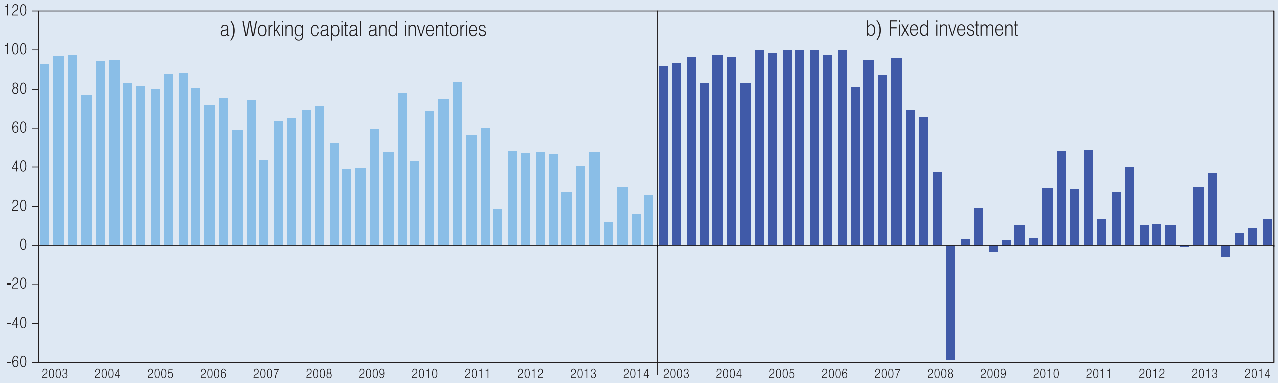
were responsible for the subdued dynamics of credit growth involved uncertain external and internal macroeconomic environment and the related postponement of investment expenditure by corporations, particularly long-term investment spending. The results of the survey confirmed relatively low loan demand.

As to the factors influencing the change of demand for loans by corporations (Chart 3), based on banks' responses, loan demand for financing corporate requirements for working capital and inventories was increasing in the course of conducting the survey albeit at lower rates. Until the third quarter of 2008 demand for corporate loans for investment purposes was assessed as strongly increasing which was in line with the enhanced economic activity over this period. In the period of a decline in real GDP growth until early 2010, consistent with subdued investment activity of corporations, banks reported a decrease in loan demand. Irrespective of these developments, in the period of a decline in economic activity the limited access of corporations to alternative sources of financing, such as funding by internal funds or loans from non-bank institutions, supported to a certain degree total corporate loan demand. As from 2011 demand for investment loans exhibited a certain recovery although it remained far lower as compared with the period prior to 2008. At the end of 2014 loan demand by corporations was mostly driven by banks' needs to ensure working capital and inventories and, to a lesser extent, by the increasing investment activity.

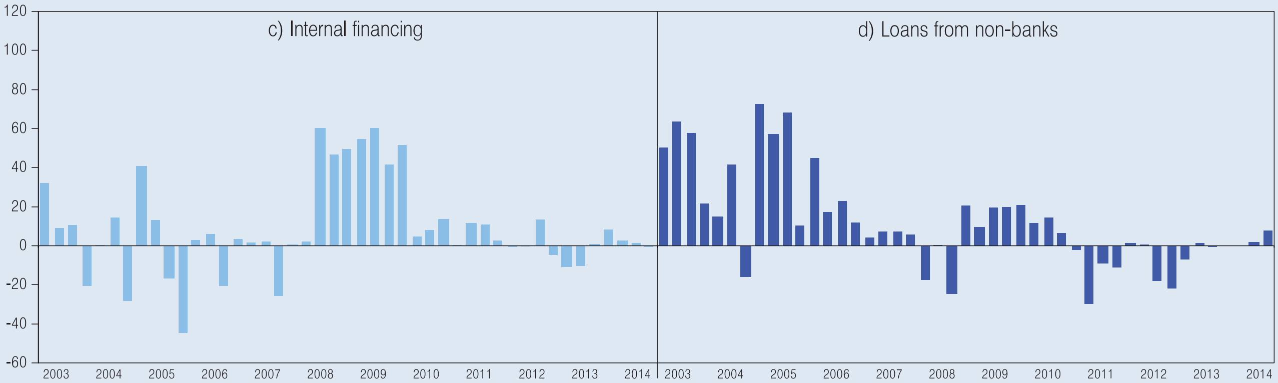
Chart 3: Factors Contributing to Changes in Demand for Loans by Corporations (2003–2014)

(net balance of opinions, percentage points)

Financial needs



Use of alterative sources of financing



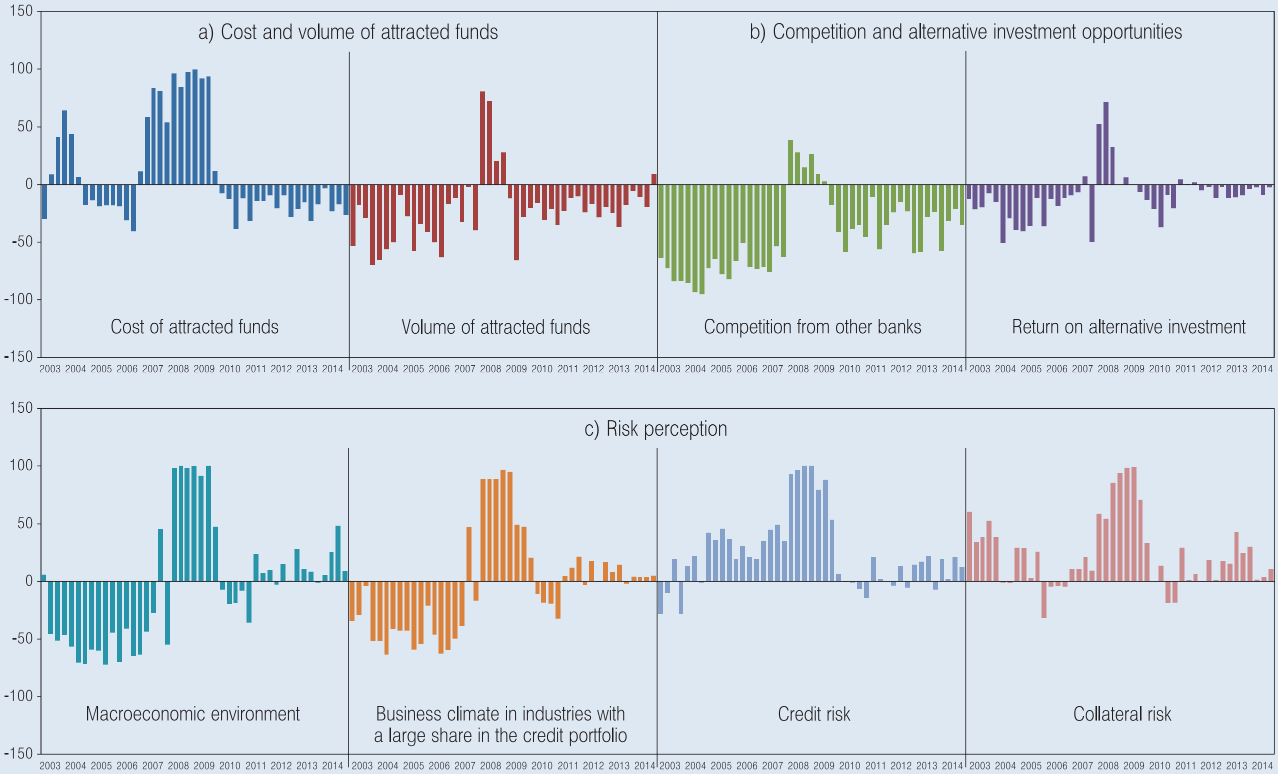
Note: The balance of opinions in responses about factors of loan demand is defined as a difference between the percentage of banks responding 'has contributed to growth' ('considerably' and 'somewhat') and the percentage of banks responding 'has contributed to a decrease' ('considerably' and 'somewhat').

Source: BNB – Bank Lending Survey.

Summarised results of the factors behind an easing or tightening of credit standards of banks are presented in Chart 4. In the years prior to the global financial and economic crisis, banks' responses suggested that almost all factors included in the survey had contributed to easing their credit standards: competition from other banks, favourable macroeconomic environment and business climate in industries with a large share in the credit portfolio and in the volume of attracted funds. According to banks' responses credit risk and collateral risk contributed to tightening of credit standards, which can be explained with the BNB conservative macro-prudential policy in respect of banks' capital adequacy and classification of risk and provisions.

Chart 4: Factors Contributing to Changes in Banks' Lending Policies (2003–2014)

(net balance of opinions, percentage points)



Note: The balance of opinions in responses about factors of credit standards is defined as a difference between the percentage of banks responding 'has contributed to tightening' ('considerably' and 'somewhat') and the percentage of banks responding 'has contributed to easing' ('considerably' and 'somewhat').

Source: BNB – Bank Lending Survey.

In the period of a decline in attracted funds from parent banks after the outset of the global crisis and a contraction of economic activity in Bulgaria, according to banks' responses, the major reasons behind a tightening of credit standards related to the increased cost of attracted funds and the perception of risk associated with macroeconomic environment and business climate in the industries with a large share in their credit portfolio, and the credit risk and collateral risk on extended loans. With the outset of the global financial crisis, banks increased interest rates on new deposits yet at the close of 2008 and kept these levels until end-2009 to counteract the potential negative effects on financing. This can be seen from the survey results on the significant importance of the cost of attracted funds as a factor for tightening the lending policy in the period of the crisis. The subsequent high growth rate of household deposits in the context of increased interest rates, higher household savings rates and confidence in the banking system, as well as the ongoing counter-cyclical policy of the BNB helped preserve the banking system stability and high liquidity. To curb possible negative effects of the global financial and economic crisis on the banking system, in the last quarter of 2008 the BNB took measures to facilitate banks' liquidity management using liquidity buffers created in previous years. Bank minimum reserve requirements to be maintained by banks with the BNB were changed, their rate and coverage being reduced. The measures taken helped release a considerable amount of liquid resources to the banking system.

After 2010 the factors contributing most to easing of credit standards were the competition from other banks, the increased amount of attracted funds and their lower price due to the accumulated ample liquidity in the banking system and the high savings rate in the economy, and the follow-up downward trend in deposit rates. Although the risk assessment was lower compared with the end-2008 to end-2009 period, risk perception remained a factor for tightening banks' credit policies against the background of continuing uncertainty in both external and internal environment.

The general conclusion of the descriptive analysis over the survey suggests broadly similar trends in the change of demand and credit standards based on the survey results, on the one hand, and the growth dynamics of loans to non-financial corporations based on monetary statistics data, on the other hand. A similar conclusion can be made comparing the survey results with other macroeconomic indicators as real GDP growth, investment in fixed capital and the confidence in the industry sector based on the business situation survey.

To formally assess the extent to which the survey results are statistically relevant to the overall dynamics of claims on non-financial corporations, an empirical analysis at a macro level was carried out followed by an empirical analysis at the level of individual banks. For the purpose of the macro analysis, a regression analysis based on the method of least squares was used, assessing the relationship between the dynamics of claims on non-financial corporations based on monetary statistics data, and the survey results on demand for loans by corporations and credit standards as explanatory variables. Initially, only survey results are included in the regression, and subsequently additional explanatory variables were included, such as quarter-on-quarter seasonally adjusted real GDP growth (Δ ln GDP), interest spread defined as the difference between weighted average lending rates and weighted average deposit rates for non-financial corporations, the share of bad and restructured loans in the total amount of loans to non-financial corporations (Δ BRL)[3], business climate and banking system capital to assets ratio. The main results of the empirical macro analysis are presented in Table 1.

The empirical analysis outcomes show that the variable recording the change in demand for loans by corporations is statistically significant for the growth of claims, for both short-term and long-term loans to corporations. These results remain unchanged, if demand significance in the current or previous period is tested (*i.e.* if the first lag of explanatory variable is taken into account). The inclusion of additional explanatory variables into the specifications has also no impact on the robustness of estimates. The coefficient in front of the variable recording the changes in demand for loans remains stable in the various specifications, moving within a range of 0.05 to 0.08, *i.e.* the 1 percentage point increase in demand for loans positively affects the growth of claims on non-financial corporations by 0.05–0.08 percentage points. Changes in credit standards have a statistically insignificant effect on corporate loans dynamics. Among the additional explanatory variables, statistical significance for the growth of claims is found regarding real GDP growth and banking system capital to assets ratio. The coefficients in front of these variables have the expected positive signs and are relatively higher than those in front of the variables from the survey.

For the purposes of the analysis at a micro level, panel estimation with cross-section fixed effects based on quarterly data is applied. Individual bank responses to the survey are linked to the amount of corporate loans extended by the respective banks published by the Banking Supervision Department. As regards loan demand and credit standards, two pairs of variables are designed

[3] The regression analysis is based on monetary statistics data on loans, which are restructured and with impaired performance past-due over 90 days, due to available time series data for the whole period under review (fourth quarter of 2003 to fourth quarter of 2014). It should be stated that in monetary statistics banks provide aggregated data on these loans, because detailed data on the exposures according to their past-due periods are not collected for the purpose of these statistics. In accordance with the international practice, reporting of monetary statistics differs from supervisory reporting, including the reporting of loans, which are restructured or with impaired performance. Therefore, the aggregated data on loans which are restructured and with impaired performance past-due over 90 days, represent neither the total loans with impaired performance, nor the share of loans with impaired performance past-due over 90 days.

Table 1. Dependent Variable: Δ ln Claims on Non-financial Corporations (Δ ln Kt)

Explanatory variables	Short-term loans to corporations		Long-term loans to corporations	
Constant	0.01 (0.01)	0.01 (0.01)	0.01* (0.01)	0.00 (0.01)
Δ credit demand (-1)	0.05** (0.02)	0.03 (0.03)	0.07** (0.02)	0.07*** (0.03)
Δ credit standards (-1) (credit supply)	0.02 (0.03)	-0.01 (0.02)	0.01 (0.02)	-0.01 (0.02)
d_2005q1	0.20*** (0.03)	0.26*** (0.03)	0.20*** (0.03)	0.25*** (0.03)
d_2005q2	-0.32*** (0.04)	-0.27*** (0.04)	-0.31*** (0.04)	-0.26*** (0.04)
d_2014q4	-0.17*** (0.03)	-0.17*** (0.03)	-0.16*** (0.03)	-0.16*** (0.03)
Δ BRL (-1)		-0.55 (0.56)		-0.47 (0.52)
Δ ln GDP (-1)		1.20* (0.71)		0.34 (0.73)
Δ Business climate (-1)		0.00 (0.00)		0.00 (0.00)
Δ Capital/Asssets (-1)		5.41*** (1.78)		5.46*** (1.64)
Δ Interest spread (-1)		0.58 (1.11)		0.98 (1.00)
Δ ln K_t (-1)	0.38*** (0.12)	0.43*** (0.11)	0.24** (0.12)	0.29** (0.12)
R^2	0.81	0.88	0.84	0.90
Standard error of regression	0.03	0.03	0.03	0.03
Jarque-Bera test	0.06	0.58	0.11	0.67
Breusch-Godfrey LM test	0.40	0.90	0.97	0.68
Durbin-Watson test	1.61	2.03	1.72	2.05
Breusch-Pagan-Godfrey test	0.04	0.01	0.56	0.25
Number of observations	45	42	45	42

*** reflects statistical relevance at the level of 1 per cent;
** reflects statistical relevance at the level of 5 per cent;
* reflects statistical relevance at the level of 10 per cent.

Notes: Three dummies are included in the specifications: d_2005q1, d_2005q2 and d_2014q4 for the first and second quarters of 2005, and the fourth quarter of 2014.
The results of the following test are presented in the table: Jarque-Bera normality test for distribution of residuals with null hypothesis: normal distribution, *p*-value is presented; Breusch-Godfrey LM test for serial correlation with null hypothesis: a lack of serial correlation in the residuals, *p*-value is presented; Durbin-Watson test for serial correlation in the residuals with DW statistics presented; Breusch-Pagan-Godfrey test for heteroscedasticity with null hypothesis: a lack of heteroscedasticity, *p*-value is presented.
According to Jarque-Bera criterium for normality of residuals, they are normally distributed. While the tests indicate that no serial correlation in the residuals is observed, Breusch-Pagan-Godfrey test reveals problems with heteroscedasticity of residuals regarding short-term loans to corporations. When applying the White's procedure to clear heteroscedasticity, the significance of coefficients in front of explanatory variables remained unchanged. Therefore, it may be concluded that it has no effect on empirical assessment conclusions.

Source: BNB.

for a decrease and an increase in loan demand by corporations and a tightening and an easing of credit standards, respectively. For example, the variable 'demand decreased' has value 1, if the bank *i* has reported a decrease in demand in the period *t* (responses: 'decreased significantly' or 'decreased somewhat'), otherwise 0. The variable 'standards tightened' has value 1, if the bank *i* has reported a tightening of credit standards in the period *t* (responses: 'tightened significantly' or 'tightened somewhat'), otherwise 0. Similarly, the variables 'demand increased' and 'standards eased' are designed. In addition to the survey results, additional explanatory variables are added to the panel. They comprise specific factors for each individual bank, such as interest spread between corporate loans and deposits by individual bank,[4] individual bank capital to assets ratio,[5] and variables that are common to all banks, as real GDP growth (quarter-on-quarter seasonally adjusted), business climate in Bulgaria and the share of bad and restructured loans in the total amount of loans to non-financial corporations.[6] The panel econometric analysis is carried out for unbalanced data panel comprising the period between the fourth quarter of 2003 and the last quarter of 2014. The main results are presented in Table 2.

The results of the empirical micro analysis generally confirm macro analysis results. The variable recording the changes in demand for loans by corporations, particularly 'demand decreased', has the expected negative sign and is statistically significant for the growth of corporate loans in almost all tested specifications. The coefficient in front of it is

[4] Interest spread between corporate loans and deposits by individual bank is implicitly calculated, using the ratio of interest income on extended loans to average loans and the ratio of interest expenditure on attracted funds to the average amount of attracted funds.

[5] Data of the Banking Supervision Department on capital and assets of individual banks.

[6] Monetary statistics data. See also footnote 3 above.

Table 2. Dependent Variable: Δ ln Loans to Corporations (Δ ln K)

Explanatory variables	Short-term loans to corporations		Long-term loans to corporations	
Constant	0.05***	-0.01	0.04***	-0.01
	(0.01)	(0.02)	(0.01)	(0.02)
Δ credit demand (-1) (decrease)	-0.09***	-0.08***	-0.07***	-0.05*
	(0.03)	(0.03)	(0.03)	(0.03)
Δ credit demand (-1) (increase)	0.02	0.01	0.03	0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Δ credit standards (-1) (tightening)	-0.04*	0.01	-0.02	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Δ credit standards (-1) (easing)	0.03	0.03	0.04	0.03
	(0.03)	(0.03)	(0.03)	(0.03)
Interest spread by bank		1.04***		1.00***
		(0.39)		(0.39)
Δ ln GDP		2.49***		2.38***
		(0.80)		(0.80)
Δ Capital/Assets		0.72***		0.72***
		(0.21)		(0.21)
Δ BRL (-1)		-2.32***		-2.35***
		(0.69)		(0.69)
Δ business climate		0.01***		0.01***
		(0.00)		(0.00)
Δ ln K (-1)	-0.22***	-0.24***	-0.22***	-0.25***
	(0.03)	(0.03)	(0.03)	(0.03)
Periods	43	43	43	43
Cross-sections	41	41	41	41
Number of observations	1303	1301	1303	1301
R^2	0.08	0.14	0.08	0.14
Durbin-Watson test	2.12	2.08	2.13	2.07

* Reflects statistical relevance at the level of 10 per cent.
** Reflects statistical relevance at the level of 5 per cent;
*** Reflects statistical relevance at the level of 1 per cent;

Notes: The results of the following test are presented in the table: Durbin Watson (DW) test for serial correlation is presented with DW statistics. The results of this test suggest that no serial correlation is observed in the residuals.
The number of cross-sections is determined by the existence of restructuring in the banking sector over the review period related to mergers at banks or emergence of new banks. In the case of mergers, individual banks before the merger and the emerged new bank thereafter are treated as separate units in the panel.

Source: BNB.

stable, ranging between -0.05 and -0.09. Overall, changes in credit standards have a statistically insignificant effect on credit growth. These results are not affected by the inclusion of additional explanatory micro and macro variables. Besides the demand for loans by corporations, a statistical significance is found regarding real GDP growth, the share of bad and restructured loans in the total amount of loans to non-financial corporations, as well as for bank-specific factors, such as interest spread between loans and deposits and individual banks' capital to assets ratio. The coefficients in front of these variables have the expected signs: positive for real GDP growth, business climate indicator and individual banks' specific interest spread and capital to assets ratio, and negative in front of the share of bad and restructured loans in the total amount of corporate loans. The coefficients in front of these variables are relatively higher than those in front of the variables derived from the survey.

In conclusion, the descriptive analysis of survey data on loans to non-financial corporations support the assumption that relatively subdued dynamics of corporate loans in last few years is influenced by the low credit demand mainly due to the need to provide funds for working capital and inventories, as well as by the relatively high credit standards that are maintained. The empirical analysis carried out on the basis of macro data and individual bank data for the 2003 to 2014 period show that changes in demand estimated by survey data have a statistically significant effect on corporate loans dynamics. The empirical research also reveals that important factors positively affecting corporate loans dynamics at both analysing levels are real GDP growth and banks' capital to assets ratio. The analysis at an individual bank level finds that statistically significant factors for the growth in corporate loans are also the improvement in business climate in Bulgaria, the decrease in the share of bad and restructured loans in the total amount of loans, and bank-specific factors, such as the interest spread between corporate loans and deposits.

The sculptural composition by Kiril Shivarov depicting Hermes and Demeter on the southern façade of the Bulgarian National Bank building is used in cover design.