THE EFFECT OF SOME BANK INDICATORS UPON THE GDP, THE UNEMPLOYMENT RATE AND FOREIGN DIRECT INVESTMENT IN BULGARIA

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Abstract: The article presents the findings of a research into the effect that loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations have upon the GDP, the unemployment rate and foreign direct investment in Bulgaria. The research employs regression analysis and provides a review of related literature about the impact of bank loans, bank deposits, interest rates on bank loans and deposits, as well as other bank indicators upon economic growth, employment and investment.

Key words: banks, regression analysis, bank indicators, macroeconomic variables, Bulgaria.

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Introduction

One of the major roles of banks is to transfer funds from entities with free financial resources to entities that need to invest in production, yet do not have any available funds and therefore demand loans. This is an essential function of banks since it leads to economic growth. Household deposits are the most valuable funds, which banks borrow, as they are resources that can be extended as loans. The significant volume of financial

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resources brings forward the question about the importance of those funds to the economy of the country. Investments made by companies promote economic growth and result in new job openings. The loans, which banks extend to non-financial corporations, provide the resources required by companies for expanding their activity and increasing their production. Interest rates are a major factor for the development of the economy. It is therefore interesting to study the effect of these indicators upon the macro-economic indicators of the country.

This research employs regression analysis. The data about the indicators included in the analysis refer to the period from 2007 to 2018. We study the correlation between loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations and the dynamics of three major macro-economic indicators - the GDP, the unemployment rate and FDI in Bulgaria - to assess the macro-economic effect of some of the basic activities of banks in our country. Hence, if loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations affect Bulgarian economy, they will also affect the values of these macro-economic indicators.

The object of this research is banks as primary financial intermediaries in the economy. The subject of the research is the impact of major bank indicators upon GDP, unemployment and foreign direct investment.

The main objective of the article is to study the effect of loans to non-financial corporations, household deposits and the interest rates on new business loans in Bulgarian currency, which banks extend to non-financial corporations upon the GDP, unemployment and foreign direct investment in Bulgaria in the period from 2007 to 2018.

To accomplish this, we set several specific tasks:

1. To review existing literature about the impact of extended bank loans, household deposits and the interest rates on the credit and deposit operations of banks and other bank indicators upon economic growth, employment and investment in the economy in different countries as well as in countries using a common currency or in countries with fixed exchange rates.

2. To analyse Pearson's correlation coefficients between the variables in the model.

3. To conduct a multiple regression analysis in order to identify the contribution of each factor variable (loans to non-financial corporations, household deposits and interest rates on new business bank loans in Bulgarian currency to non-financial corporations) to changes in the values of the dependent variables (GDP, unemployment and foreign direct investment).

The underlying thesis of the research is that the variables of loans to non-financial corporations, household deposits and interest rates on new business bank loans in Bulgarian currency to non-financial corporations have a substantial impact upon the GDP, the unemployment rate and the volume of foreign direct investment in the country.

1. Literature Review

Banks perform an essential function in the economy by allocating funds from individuals that have free financial resources to the entities that need such resources for their investment activity. According to Mishkin (2016), due to the important role of banks in allocating funds to borrowers who are then able to invest in production, this financial activity is crucial for ensuring the smooth and efficient performance of financial systems and economies. Banks extend loans to companies, assist households in purchasing new cars and housing and provide services like savings accounts, debit cards and ATMs. As Choudhry and Masek (2011) point out, "It is therefore essential that bank affairs be managed soundly".

Historically, the most important type of financial institution around the globe has been commercial banks. Simpson (2014) comments that "in less developed economies today, commercial banks still dominate the financial system by providing the bulk of financing to businesses – and often to governments – and serve as the principal holders of the funds owned by households and businesses. As in more advanced economies, commercial banks in developing economies provide the backbone for payments other

than made with cash". The banking sector has a major share in the assets of the financial system in Bulgaria.

According to Berger, Molyneux and Wilson (2010), banks are vital to any economy. They make payment transactions, serve as a major source of lending for the majority of economic agents and (usually) are a safe place for depositing funds. The banking system acts as an intermediary in the allocation of funds from depositors to borrowers by transforming relatively small liquid deposits into high-value non-liquid loans. This process of intermediation helps match the supply of deposits to the supply of loans and ensures liquidity of the economy. Provided that banking intermediation is efficient, the demand for deposits and for loans can be met at a low cost and thus benefit both stakeholders and the economy at large.

Prof. P. Stefanova (1994) claims that banks perform various lending, investment, insurance, fiduciary, etc. operations. According to Prof. Stefanova (2000), the banking system regulates money supply by establishing lending and payment relations, thus ensuring the necessary rate of economic growth, employment, price stability and the purchasing power of the monetary unit.

According to Prof. N. Nikolova (2009), "a sound banking sector is of primary economic and social significance. On the one hand, it is a major requirement for the sustainable development of the economy. On the other hand, banks operate primarily with money they do not really own, which requires protecting the interests of their depositors". The Central bank regulates and supervises the activity of commercial banks in the country so as to ensure the stability of the banking system and to protect the interests of depositors.

Howells and Bain (2005) observe that "nowadays banks are among the largest financial institutions in Europe with branches and subsidiaries across the globe. They offer a range of services that go beyond the traditional banking functions related to extending loans and keeping deposits". Contemporary banks operate in an extremely dynamic and highly competitive environment and are often forced to shift the focus of their activity from classical bank products and services onto spheres that are riskier and more profitable for potential investors.

Mishkin (2016) notes that bank managers have four major responsibilities. The first one is to make sure that their banks have sufficient cash available to provide to depositors who want to withdraw a certain sum from their deposits, i.e. when the deposits held in the bank are decreasing because depositors are withdrawing funds and require payment. In order to maintain sufficient funds available, banks need to manage their liquidity, i.e. to acquire assets that are liquid enough to allow them to cover the debts of the bank to its depositors. Secondly, bank managers must seek an acceptably low risk level by acquiring low-default assets and diversifying their portfolios (assets management). The third responsibility of bank managers is to ensure resources at a low cost (debt management). Finally, bank managers need to determine the amount of capital, which their banks should maintain, and to make sure that the necessary capital is provided (capital adequacy management).

Bikker and Bos (2008) point out that "economic literature pays a lot of attention to bank performance which is measured in competition, concentration, efficiency, productivity and profitability. The main reason for that is that banks have a key role in providing loans to corporations".

The analysis of the financial indicators of banks is extremely important since they accumulate enormous financial resources from citizens and companies. It is therefore necessary to exercise strict control on their financial situation, as the insolvency of a bank will have a significant negative impact on the economy at large.

Various economic entities are interested in the assessment of bank performance, especially in two of its aspects – the efficiency of bank performance and the risk borne by a bank. The ex post analysis of efficiency and credit risk makes it possible to assess the current situation of a bank and make conclusions about the future. The efficiency of a bank performance is assessed by employing various coefficients and more complex controlling methods. Information about the assessment is provided in the financial statements of a bank.

According to Johnson and Johnson (1996), an analysis of the financial results of a bank is conducted in order to assess the accomplishment of the objectives and goals set by its managers and to compare achieved results with the results achieved by other banks. The

assessment of bank performance includes analysing key financial statements and designing major coefficients and indicators for measuring financial results. The aim of the analysis is to identify existing strengths and weaknesses and thus enable managers to focus on retaining the former and eliminating the latter.

The crucial role of the banking sector to the economy of any country explains the interest of researchers in assessing the effect which bank performance has on the economy in general. Specialised literature abounds in research works that deal with the impact of bank loans and deposits and the interest rates on lending and deposit operations, as well as other bank indicators, upon economic growth, employment and investment in the economy. Research works deal with individual countries, as well as with unions using a single currency or fixed exchange rates.

Driscoll (2004), studies the effects which bank lending has on the acceleration of economic growth by employing regression analysis and arrives at the conclusion that bank loans have a small, often negative and statistically insignificant impact on the GDP in the USA. The USA are approached as a group of small open economies with fixed exchange rates.

Ashcraft (2006) shares a similar view about the influence of bank lending on USA's output and observes that "the aggregate elasticity of output to bank lending is very small, if not zero. While small firms might view bank loans as very special, they are not special enough for the lending channel to be an important part of how a monetary policy works".

Cappiello, Kadareja, Sørensen and Protopapa (2010) employ a method based on the method used by Driscoll (2004), approaching the counties in the Euro area as a group of small open economies that have a fixed exchange rate and segmented national retail banking markets. The authors arrive at the conclusion that there is a bank-lending channel of monetary policy transmission in the euro area. In contrast to the findings for the US, in the euro area, changes in the supply of credit, both in terms of volumes and in terms of credit standards applied on loans to corporations, have significant effects on real economic activity. These findings highlight the importance of monitoring of credit developments.

In an earlier research on the importance of banks to the transmission mechanism in monetary policy, Bernanke (1983) examines the effects of the

financial crisis of the 1930s on the path of aggregate output during that period. The author focuses on non-monetary, primarily credit-related, of the financial sector-GDP link and considers the problems of debtors as well as those of the banking system. Bernanke (1983) argues that the financial disruptions of 1930-1933 reduced the efficiency of the credit allocation process, and that the resulting higher cost and reduced availability of credit acted to depress aggregate demand. 'Evidence suggests', claims Bernanke, 'that effects of this type can help explain the unusual length and depth of the Great Depression'.

Bernanke and Blinder (1988) point out that standard models of aggregate demand treat bank assets and bank liabilities asymmetrically. Bank liabilities have a special role in the transmission mechanism of the monetary policy, while bank assets are not included at all. Bernanke and Blinder (1988) redesign the IS-LM model so that it would allow a more balanced treatment of money and loans. In the modified model, the shocks in credit supply and demand have independent effects on aggregate demand. Their major impact on policy is that the relative value of money and credit as policy indicators depends on the variations in money and credit demand shocks. Bernanke and Blinder (1988) prove that money-demand shocks became much more important relative to credit-demand shocks in the 1980s.

In his research, Levine (1997) uses regression analysis and concludes that there is a strong positive correlation between the performance of a financial system and economic growth in the long term. Levine (1997) claims that such a conclusion about financial development and long-term growth has an important corollary: although financial panics and recessions are critical issues, the finance-growth link goes beyond the relationship between finance and short-term fluctuations.

The research conducted by Levine, Loayza and Beck (2000) aims to establish whether the level of development of financial intermediaries exerts a casual influence on economic growth and whether cross-country differences in legal and accounting systems (such as creditor rights, contract enforcement and accounting standards) could explain differences in the level of financial development. The research includes a large number of countries. Using both traditional cross-section, instrumental-variable procedures and

recent dynamic panel techniques, Levine, Loayza and Beck (2000) establish that development of financial intermediaries are positively correlated to economic growth. The data also show that cross-country differences in legal and accounting systems help determine differences in financial development. Together, these findings suggest that legal and accounting reforms that strengthened creditor rights, contract enforcement, and accounting practices, boost financial development and accelerate economic growth.

The emphasis in the research conducted by the ECB in 2008 is on the key role of banks in the financial system of the euro area to the allocation of savings and the funding of corporations and households. Hence, changes in bank lending and the price of credits in response to the monetary policy conducted by the ECB are a powerful channel through which monetary policy affects economy. The research also examines the role of banks in the monetary policy transmission mechanism in the euro area and arrives at the conclusion that the transmission mechanism is in a process of development.

In his research on a number of countries, including France and former French colonies in Africa, in the period from 1985 to 2012, Lionel (2014) uses a dynamic panel model. The findings of his research demonstrate a significant and negative effect of domestic credit provided by the banking sector on economic growth. The analysis reveals that money supply has significant positive effect on GDP growth, while the impact of international currency reserves and inflation is negative. Lionel (2014) recommends that the negative impact of domestic credits provided by the banking sector be reversed by allocating funds to projects with high social returns and to productive local industries.

Carroll and Weil (1994) study the correlation between savings and the growth rate of the GDP in different countries. In that model, an external acceleration of the economic growth results in a decline in savings. The authors therefore conclude that savings do not lead to economic growth.

The findings of reviewed research works indicate that the effect of bank loans upon changes in GDP varies in different countries. According to the findings of some studies, bank loans are a factor of economic growth, while the conclusion reached in other research works is that there is a negative correlation between the two variables. If these findings are reliable,

then loans will be expected to have a positive overall impact on economic growth in the euro area, while according to most of the research about the USA, an increase in bank loans does not affect GDP or results in its decline.

2. Conducting a Regression Analysis to Examine the Impact of Loans to Non-financial Corporations, Household Deposits and Interest Rates on New Business Loans in Bulgarian Currency to Non-financial Corporations on Major Macro-economic Indicators about Bulgaria

The data employed in the analysis includes the values of three explanatory variables and three response variables (i.e. six attributes). The explanatory variables are loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations. We use SPSS statistics software package to conduct the regression analysis and identify common regression coefficients for the entire researched period.

The constraints of the model are as follows:

- All borrowers have access to bank loans, provided that they meet the requirements for obtaining a bank loan;
- The specifics of the financial system in Bulgaria in terms of the major role of banks in ensuring debt financing to companies due to the underdeveloped financial markets and the limited opportunities for banks to obtain debt financing on financial markets;
- The fact that bank deposits are a major instrument of household savings in Bulgaria due to the limited volume of investment in securities on financial markets;
- The analysis employs those macro-economic indicators, which are most likely to be strongly affected by loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations, i.e. the GDP, the unemployment rate and FDI. Those are also the indicators which best reflect the level of economic development and current economic processes in the country;
- It should be clarified that the values of macro-economic indicators change due to the impact of numerous variables. Absorbed funds from EU

loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations are only a few of the factors that are expected to determine trends in the GDP, the unemployment rate and FDI in Bulgaria.

Loans to non-financial corporations and household deposits are presented in billions of Euros first and then a natural logarithm (LN) is used. This approach is employed due to the fact that the distribution of the logarithmic values of the variables is closer to the normal distribution of variables than that of the variables whose values are in billions of Euros. In addition, the regression model is more effective when using variables with normal distribution.

Table 1
GDP, loans to non-financial corporations, household deposits, interest rates on new business loans in Bulgarian currency to non-financial corporations by year

Year	Loans to non-financial corporations (in billions of BGN)	Household deposits (in billions of BGN)	Interest rates on new business loans in Bulgarian currency to non-financial corporations (%)	GDP (in billions of BGN)
2007	24.305	18.986	9.16	56.52
2008	31.883	22.168	11.18	66.728
2009	32.712	24.837	9.89	68.321
2010	33.993	28.037	8.94	74.771
2011	36.104	31.902	9.33	80.759
2012	38.166	35.869	7.22	82.040
2013	38.306	39.248	7.93	81.866
2014	34.319	41.003	6.69	83.756
2015	33.285	44.407	5.15	88.575
2016	33.180	47.196	3.90	94.130
2017	33.160	49.456	3.84	101.043
2018	34.871	53.383	3.48	107.925

Source: The BNB and the NSI

Table 2

Unemployment rate, loans to non-financial corporations, household deposits, interest rates on new business loans in Bulgarian currency to non-financial corporations by year

Year	Loans to non-financial corporations (in billions of BGN)	Household deposits (in billions of BGN)	Interest rates on new business loans in Bulgarian currency to non-financial corporations (%)	Unem-ployment rate (%)
2007	24.305	18.986	9.16	6.1
2008	31.883	22.168	11.18	5.6
2009	32.712	24.837	9.89	6.8
2010	33.993	28.037	8.94	10.2
2011	36.104	31.902	9.33	11.2
2012	38.166	35.869	7.22	12.3
2013	38.306	39.248	7.93	12.9
2014	34.319	41.003	6.69	10.7
2015	33.285	44.407	5.15	10
2016	33.180	47.196	3.90	8
2017	33.160	49.456	3.84	7.1
2018	34.871	53.383	3.48	6.1

Source: The BNB and the NSI

Table 3

FDI, loans to non-financial corporations, household deposits, interest rates on new business loans in Bulgarian currency to non-financial corporations by year

Year	Loans to non-financial corporations (in billions of BGN)	Household deposits (in billions of BGN)	Interest rates on new business loans in Bulgarian currency to non-financial corporations (%)	FDI (in billions of BGN)
2007	24.305	18.986	9.16	11.123
2008	31.883	22.168	11.18	12.054
2009	32.712	24.837	9.89	4.766
2010	33.993	28.037	8.94	2.252
2011	36.104	31.902	9.33	3.415
2012	38.166	35.869	7.22	2.583
2013	38.306	39.248	7.93	2.706
2014	34.319	41.003	6.69	0.679
2015	33.285	44.407	5.15	4.692
2016	33.180	47.196	3.90	1.962
2017	33.160	49.456	3.84	4.526
2018	34.871	53.383	3.48	3.411

Source: The BNB

Table 4
GDP, loans to non-financial corporations, household deposits, interest rates on new business loans in Bulgarian currency to non-financial corporations by year

Year	Interest rates on new business loans in Bulgarian currency to non-financial corporations (%)	LN_LOAN	LN_DEPOSIT	LN_GDP
2007	9.16	3.19	2.94	4.03
2008	11.18	3.46	3.1	4.2
2009	9.89	3.49	3.21	4.22
2010	8.94	3.53	3.33	4.31
2011	9.33	3.59	3.46	4.39
2012	7.22	3.64	3.58	4.41
2013	7.93	3.65	3.67	4.41
2014	6.69	3.54	3.71	4.43
2015	5.15	3.51	3.79	4.48
2016	3.90	3.50	3.85	4.54
2017	3.84	3.50	3.90	4.62
2018	3.48	3.55	3.98	4.68

Source: Computations made by the author based on data provided by the BNB and the NSI

Table 5
Unemployment rate, loans to non-financial corporations, household deposits, interest rates on new business loans in Bulgarian currency to non-financial corporations by year

Year	Interest rates on new business loans in Bulgarian currency to non-financial corporations (%)	LN_LOAN	LN_DEPOSIT	Unemployment rate (%)
2007	9.16	3.19	2.94	6.1
2008	11.18	3.46	3.10	5.6
2009	9.89	3.49	3.21	6.8
2010	8.94	3.53	3.33	10.2
2011	9.33	3.59	3.46	11.2
2012	7.22	3.64	3.58	12.3
2013	7.93	3.65	3.67	12.9
2014	6.69	3.54	3.71	10.7
2015	5.15	3.51	3.79	10
2016	3.90	3.50	3.85	8
2017	3.84	3.50	3.90	7.1
2018	3.48	3.55	3.98	6.1

Source: Computations made by the author based on data provided by the BNB and the NSI

Table 6
FDI, loans to non-financial corporations, household deposits, interest rates on new business loans in Bulgarian currency to non-financial corporations by year

Year	Interest rates on new business loans in Bulgarian currency to non-financial corporations (%)	LN_LOAN	LN_DEPOSIT	LN_FDI
2007	9.16	3.19	2.94	2.41
2008	11.18	3.46	3.10	2.49
2009	9.89	3.49	3.21	1.56
2010	8.94	3.53	3.33	.81
2011	9.33	3.59	3.46	1.23
2012	7.22	3.64	3.58	.95
2013	7.93	3.65	3.67	1.00
2014	6.69	3.54	3.71	-.39
2015	5.15	3.51	3.79	1.55
2016	3.90	3.50	3.85	.67
2017	3.84	3.50	3.90	1.51
2018	3.48	3.55	3.98	1.23

Source: Computations made by the author based on data provided by the BNB

The linear correlation between the variables in the model is studied by compiling Pearson's correlation coefficients. There might be a strong correlation between some of the explanatory variables in the model; therefore including them simultaneously in the regression model might result in strong disturbances in the regression analysis. It is therefore necessary to conduct a correlation analysis (Mishev and Goev, 2010, pp. 55-56).

Table 7
Pearson's correlation coefficients between GDP, loans to non-financial corporations, household deposits and interest rates on new businesses loans in Bulgarian currency to non-financial corporations

		INTRATE	LN_LOAN	LN_DEPOSIT	LN_GDP
INTRATE	Pearson's correlation coefficient	1	-.205	-.720**	-.872**
	Significance		.003	.000	.000
	N	12	12	12	12
LN_LOAN	Pearson's correlation coefficient	-.205	1	.577*	.594*
	Significance	.003		.049	.041
	N	12	12	12	12

LN_DEPOSIT	Pearson's correlation coefficient	-.720**	.577*	1	.974**
	Significance	.000	.049		.000
	N	12	12	12	12
LN_GDP	Pearson's correlation coefficient	-.872**	.594*	.974**	1
	Significance	.000	.041	.000	
	N	12	12	12	12

**. The correlation is significant at a significance level of 0.01 (bilateral).
*. The correlation is significant at a significance level of 0.05 (bilateral).

Table 8

Pearson's correlation coefficients between the unemployment rate, loans to non-financial corporations, household deposits and interest rates on new businesses loans in Bulgarian currency to non-financial corporations

		LN_LOAN	**LN_DEPOSIT**	**INTRATE**	**UNEPLOY**
LN_LOAN	Pearson's correlation coefficient	1	.577*	-.205	-.672*
	Significance		.049	.003	.017
	N	12	12	12	12
LN_DEPOSIT	Pearson's correlation coefficient	.577*	1	-.720**	.256*
	Significance	.049		.000	.001
	N	12	12	12	12
INTRATE	Pearson's correlation coefficient	-.205	-.720**	1	.029
	Significance	.003	.000		.001
	N	12	12	12	12
UNEPLOY	Pearson's correlation coefficient	.672*	.256	.029	1
	Significance	.017	.001	.001	
	N	12	12	12	12

*. The correlation is significant at a significance level of 0.05 (bilateral).
**. The correlation is significant at a significance level of 0.01 (bilateral).

Table 9
Pearson's correlation coefficients between FDI, loans to non-financial corporations, household deposits and interest rates on new businesses loans in Bulgarian currency to non-financial corporations

		LN_LOAN	LN_DEPOSIT	LN_FDI	INTRATE
LN_LOAN	Pearson's correlation coefficient	1	.577*	-.571	-.205
	Significance		.049	.003	.003
	N	12	12	12	12
LN_DEPOSIT	Pearson's correlation coefficient	.577*	1	-.564	-.720**
	Significance	.049		.006	.000
	N	12	12	12	12
LN_FDI	Pearson's correlation coefficient	-.571	-.564	1	.379
	Significance	.003	.006		.005
	N	12	12	12	12
INTRATE	Pearson's correlation coefficient	-.205	-.720**	.379	1
	Significance	.003	.000	.005	
	N	12	12	12	12

*. The correlation is significant at a significance level of 0.05 (bilateral).
**. The correlation is significant at a significance level of 0.01 (bilateral).

As these results indicate, none of the single correlation coefficients has a value exceeding -0.720. The relatively high values of the correlation coefficients of these macro-economic variables are indicative of the coherent and coordinated macro-economic policy conducted by the government. There are some grounds for concern due to the correlation between household deposits and interest rates on new businesses loans in Bulgarian currency to non-financial corporations, as well as the correlation between loans to non-financial corporations and household deposits which are closely correlated, the correlation coefficients being -0.720 and 0.577 respectively.

The explanatory variables, which we included in our analysis, were selected through stepwise regression. The method was individually employed for each of the researched dependent variables.

Applying stepwise regression to the factors GDP, unemployment rate and FDI results in some differences in terms of their correlation to the dependent variables. The GDP proves to be determined by all three factors, i.e. loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations. The unemployment rate is determined by interest rates on new business loans in Bulgarian currency to non-financial corporations and loans to non-financial corporations, while FDI are only influenced by changes in the interest rates on new business loans in Bulgarian currency to non-financial corporations.

A multiple regression analysis is conducted, in which the explanatory variables are included in a common model, in order to establish the contribution of each factor variable to changes in the values of the dependent variables (Mishev & Tsvetkov, 1998, pp. 175-177).

$$Y_t = \beta_0 + \sum \beta_j X_{jt} + e_t, \quad (1)$$

where:

Y_t is the dependent variables (LN_GDP is the natural logarithm oft he GDP in the country over the analysed period in billions of BGN; UNEPLOY is the unemployment rate as a %; LN_FDI is the natural logarithm of FDI to Bulgaria over the period from 2007 to 2018 in billions of BGN);

β_0 is the independent coefficient;

β_j is the regression coefficients;

X_{jt} is the explanatory variables (LN_LOAN is the natural logarithm of the value of loans to non-financial corporations over the researched period in billions of levs; LN_DEPOSIT is the natural logarithm of the value of household deposits in banks in Bulgaria in the period from 2007 to 2018 in billions of levs; INTRATE is the interest rates on new business loans extended by banks in Bulgaria to non-financial corporations in Bulgarian currency over the researched period as a percentage);

$j = 1, 2, 3$ is the number of factors;

$t = 1, 2, \ldots 12$ is the number of periods, the year 2007 being the base year;

e_t is the random components in the model.

3. Economic Interpretation of the Findings of the Regression Analysis

Tables 10, 11 and 12 present the findings of the regression analysis in terms of the GDP, the unemployment rate and FDI and the factors selected through stepwise regression. These findings indicate several trends:

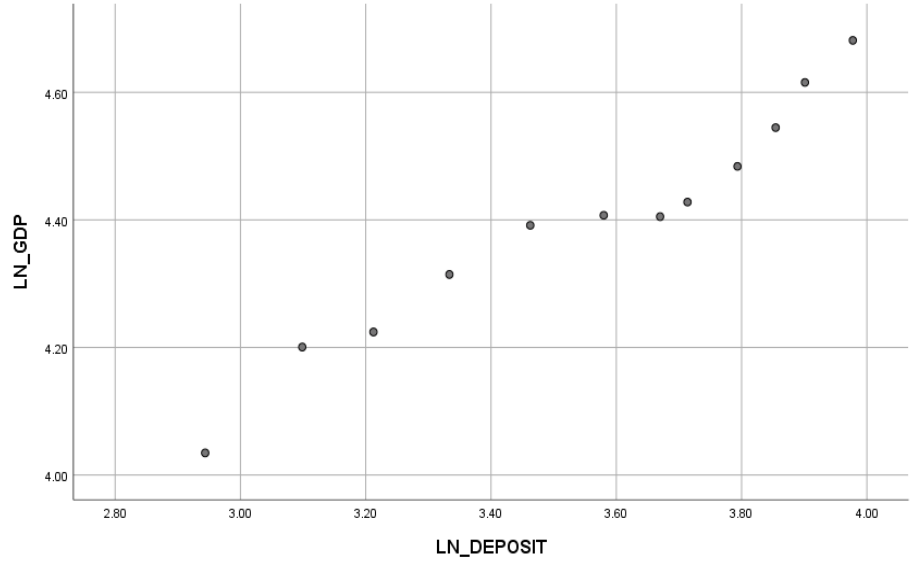
- The impact which the common factors have on the models is in the same direction;
- The parameters in the model where the dependent variable is the unemployment rate have lower absolute values. This is probably due to the fact that in contrast to the other regression equations in the model where the variables are expressed as logarithms, the unemployment rate is measured as a percentage.

Table 10
GDP results after conducting a stepwise regression analysis

Variable	B	Significance
Independent coefficient	2.344	0.001
LN_DEPOSIT	0.366	0.000
INTRATE	-0.016	0.014
LN_LOAN	0.247	0.002

Source: Computations made by the author based on data provided by the BNB and the Ministry of Finance
Dependent variable: LN_GDP; Number of observations: 36; R^2=0.952; Adjusted R^2=0.934; Standard error of the estimate =0.4341; F =184.056.

The GDP is most dependent on the household deposits factor (table 1). The correlation between them is positive. The substantial accumulated financial resource from household deposits enables banks to extend loans for projects that contribute to economic growth. The positive effect on the environment in which companies operate allows them to invest and to expand their business.



Source: Computations made by the author based on data provided by the BNB and the NSI

Figure 1 Correlation between household bank deposits and Bulgaria's GDP in the period from 2007 to 2018

Loans to non-financial corporations also have a positive effect on GDP, yet the correlation of the dependent variable to household deposits is stronger than that to loans extended to non-financial corporations. Bank loans give companies access to funds for implementing various projects, for expanding their activity and for increasing their production. Economic activity is largely affected by changes in the values of extended loans. Hence, the importance of exercising strict control on the regular servicing of loans for the good performance of the economy.

There is a very weak negative correlation between interest rates on new business loans in Bulgarian currency to non-financial corporations and GDP. This is logical, since when interest rates on loans go up, the value of economic investment declines and so does economic activity. Companies limit their investment in projects and deposit funds in banks instead, since bank deposits become more profitable.

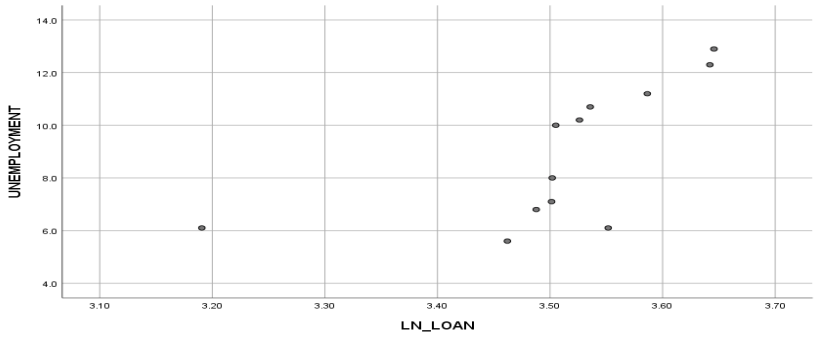
Table 11
Unemployment rate results after conducting a stepwise regression analysis

Variable	B	Significance
Independent coefficient	-47.866	0.038
LN_LOAN	14.252	0.017
INTRATE	0.306	0.023

Source: Computations made by the author based on data provided by the BNB and the NSI
Dependent variable: UNEPLOY; Number of observations: 36; R^2=0.999; Adjusted R^2=0.998; Standard error of the estimate =0.04266; F =4.474.

Loans to non-financial corporations are the factor which affects most powerfully the dependent variable of the unemployment rate, the correlation between them being positive (table 2). This finding is unexpected and surprising having in mind the importance of banks' lending activity to the economy of the country. An increase in the loans extended to companies would be expected to have a positive impact upon the economic environment and to provide greater opportunities for corporate development and hence result in growing labour demand and employment.

The explanations for that finding should therefore be sought in the problems related to bank loans in Bulgaria. The share of non-performing loans in the total volume of extended bank loans is still high. It is also higher than the EU average. Banks continue to clean their portfolios from bad debts. It would therefore be unacceptable to relax loan terms. Another explanation could be stricter lending requirements during a financial crisis when banks reduce the number of the projects that they are willing to finance.



Source: Computations made by the author based on data provided by the BNB and the NSI

Figure 2 The correlation between bank loans to non-financial corporations and the unemployment rate in Bulgaria in the period from 2007 to 2018

Interest rates on new business loans in Bulgarian currency to non-financial corporations have a positive, yet, much weaker effect. This is in line with economic laws, since lower interest rates on loans promote banks' lending activity, thus encouraging companies to make higher investment, to expand their business and to take on new employees.

Table 12
FDI results after conducting a stepwise regression analysis

Variable	B	Significance
Independent coefficient	12.872	0.000
INTRATE	-0.109	0.009

Source: Computations made by the author based on data provided by the BNB
Dependent variable: LN_FDI; Number of observations: 36; R^2=0.942; Adjusted R^2=0.788; Standard error of the estimate=0.69003; F=5.742.

The findings of the research indicate that FDI are affected by changes in the interest rates on new business loans in Bulgarian currency to non-financial corporations (table 3). The correlation between the two variables is negative, i.e. when the interest rates in the country increase, the value of FDI decreases. Lower interest rates enable companies to obtain loans for expanding their activity; they also lead to a better investment environment and a lower risk to business, thus encouraging foreign investors to invest their capital in the country.

When applying multiple regression in which the dependent variable is the unemployment rate and ignoring the results obtained through stepwise regression, the direction of the correlation between interest rates on new business loans in Bulgarian currency to non-financial corporations and loans to non-financial corporations does not change. The impact of the other factor, household deposits, can be observed, though. The same applies to the dependent variable of FDI and the factors loans to non-financial corporations and household deposits that are excluded from the analysis conducted through stepwise regression since they are statistically insignificant.

In general, however, including all the factors does not increase the explanatory power of the model. Hence, the conclusion that stepwise regression is a useful stage in designing an adequate model for studying changes in macro-economic indicators that are affected by loans to companies, household deposits and interest rates on corporate loans.

Conclusion

The findings of the analysis we conducted lead to the several conclusions about the impact of loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations upon Bulgarian economy:

- The researched variables are not of primary significance to the macro-economic situation in the country.
- Those factors need to be managed carefully having in mind the strong influence they have upon the macro-economic indicators of the country.
- GDP is determined by all three factors, i.e. loans to non-financial corporations, household deposits and interest rates on new business loans in Bulgarian currency to non-financial corporations. The unemployment rate depends on interest rates on new business loans in Bulgarian currency to non-financial corporations and loans to non-financial corporations. Unlike them, FDI are affected by changes in the interest rates on new business loans in Bulgarian currency to non-financial corporations.
- The effect of the common factors in the models is in the same direction.
- Household deposits are the factor with the highest real effect upon the growth of Bulgarian economy.
- Interest rates on loans to non-financial corporations stand out as the factor that affects the values of the GDP, the employment rate, and FDI in the country.
- It is advisable that a comprehensive analysis be conducted in order to establish which macro-economic indicators are most affected by each of the researched variables so that the effect of those factors could be real.

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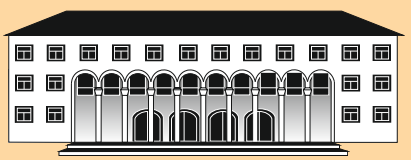

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