

The Relationship between Economic Growth and Banking Sector Development in Ukraine

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Abstract: The paper examines the relationship between economic growth and banking sector indicators in Ukraine. The constructed empirical model revealed a positive impact of bank deposits on real GDP growth. The causal relationships between economic growth in Ukraine and the performance of the banking sector are analyzed using the Granger Causality Test. It is established that banking deposits Granger-cause GDP, while banking credits do not, but GDP has an effect on banking credits. It is noted that the banking sector of Ukraine does not play a significant role in the redistribution of capital in the intersectoral and spatial dimensions. It is defined limiting factors of lending to the private sector and ways to increase the deposit base of banks.

Key-Words: economic growth, GDP, banking sector, banking credits, banking deposits, banking investments.

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1 Introduction

Economic growth is a necessary condition for solving socio-economic problems, such as raising the population's living standards, ensuring the welfare of the nation. As it is noted by Bil and

Mulska (2020) [1]: "Limited access to material, socio-economic, and financial benefits leads to the processes of marginalization of households, communities, and regions of the country".

Welfare as a social measuring factor is a strategic dominant of economic growth. Thus, economic

growth is the crucial aspect of any country's macroeconomic strategy.

The impact of the financial sector on economic growth has remained the subject of scientific debate for decades. The financial sector is an integral part of the economic system of the state. It plays a significant role in the redistribution of financial resources between economic agents.

The financial sector of Ukraine has remained bank-centric for many years, as of the end of 2020 the share of banking assets in total assets of the

financial sector was 89.6% (Table 1). As for the level of the financial sector development in Ukraine, it still remains rather weak. Fig. 1 shows the ratio of total assets of relevant financial institutions to GDP in Ukraine.

To compare, at the end of 2019 the Polish financial landscape was made up of 30 commercial banks, 538 cooperative banks, and 32 branches of credit institutions. The size of the banking sector in terms of GDP (gross domestic product) was 88.3% [2].

Table 1. Assets structure of the Ukrainian financial sector, %

Financial institution	2015	2016	2017	2018	2021	2020
Banks	88.5	88.8	91.5	90.7	89.4	89.6
Insurance companies	4.3	3.9	2.8	3.0	2.9	2.6
Private pension funds	0.1	0.1	0.1	0.1	0.1	0.1
Financial companies	6.8	6.8	5.3	5.9	7.3	7.4
Pawnshops	0.2	0.2	0.2	0.2	0.2	0.2
Credit unions	0.1	0.1	0.1	0.1	0.1	0.1

Source: National Bank of Ukraine [3]

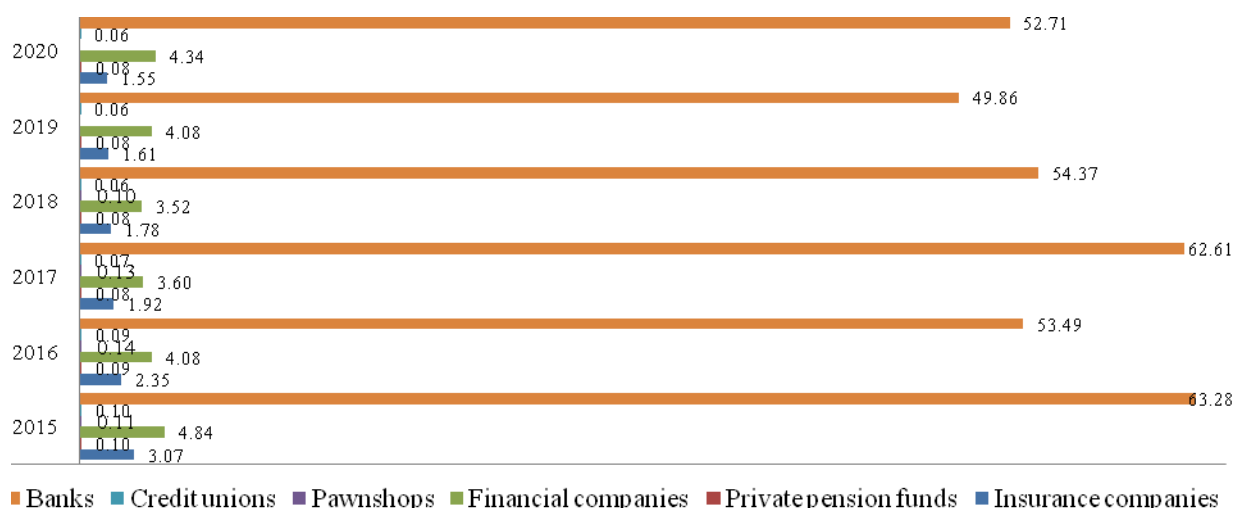


Fig. 1: Assets of financial institutions in Ukraine, % of GDP

Source: National Bank of Ukraine [3]

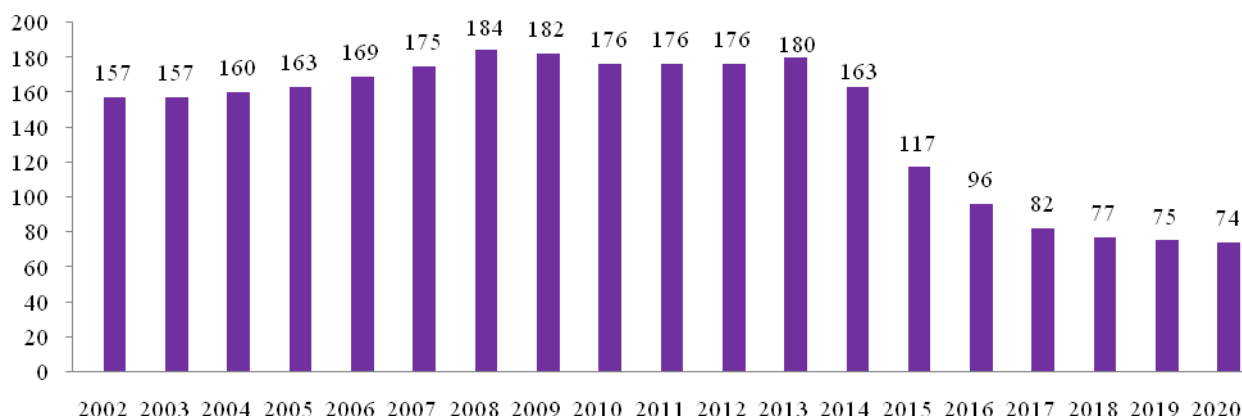


Fig. 2: Number of banking institutions in Ukraine, units

Source: National Bank of Ukraine [3]

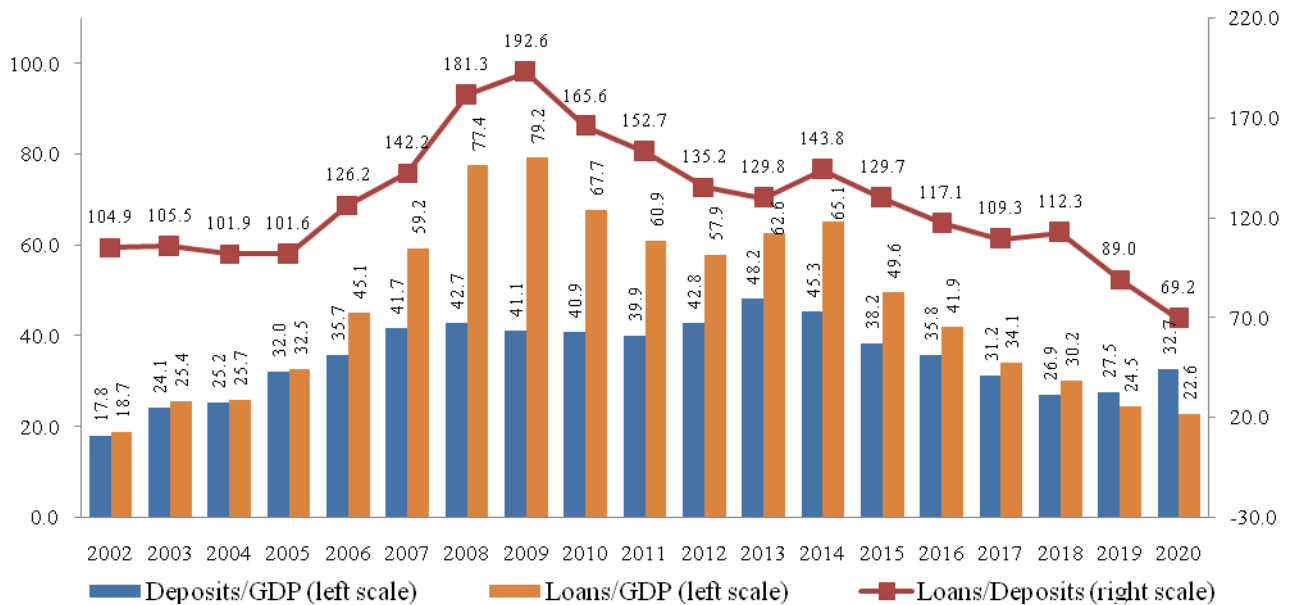


Fig. 3: Financial intermediation of the Ukrainian banking sector, %

Source: National Bank of Ukraine [3]

It should be noted that the banking sector of Ukraine has undergone a difficult period of formation and development. Fig. 2 shows the number of functioning banking institutions in Ukraine in 2002-2020. As of January 1, 2021, 74 institutions were operating in the country. Since 2013, more than 100 banks have been declared insolvent and withdrawn from the market. The reasons for this were not only military and political instability and changes in the economic priorities of the state but also the problems that existed in the banking system since 2008-2009. Significant quantitative changes were accompanied by the restructuring of the banking sector, increasing requirements for compliance with activity standards, addressing institutional and functional problems accumulated in all previous years.

The sharp decline in lending since 2015 is the result of negative expectations of economic entities due to economic and military-political events that led to the outflow of deposits in the banking sector, reduced solvency of borrowers and a significant increase in the risk of non-repayment of borrowed funds.

However, the policy of 'cleansing' the banking sector resulted in a significant reduction in banking assets, which became quite noticeable in 2017-2020. Accordingly, it limited opportunities for lending to the economy. Fig. 3 shows the ratio of bank deposits to GDP, bank loans to GDP and bank credits to bank deposits in Ukraine. The withdrawal of troubled banks from the market increased the burden on the Deposit Guarantee Fund, which was forced to borrow funds in the financial market to make payments.

Another feature of the development of the banking sector of Ukraine in 2019-2020 was a significant reduction in the ratio of loans/deposits. The reason for this was a considerable increase in banking investments in government bonds of Ukraine due to fairly high interest rates.

This paper empirically examines the relationship between the development of the banking sector and economic growth. The algorithm of our study is structured as follows: Section II is focused on a review of the literature on the relationship between the development of the banking sector and economic growth. Section III describes the data sources and methodology for studying the relationship between the development of the banking sector and economic growth in Ukraine. Section IV presents the results of the empirical model. Section V represents the findings of the study.

2 Literature Review

The relationship between the banking sector indicators and economic growth has been studied by many Ukrainian and foreign scholars. In the early 20th century, Schumpeter (1911) [4] proved the positive influence of banks on the growth of national income through directing funds to the implementation of the most effective projects.

In the late 1960s, Goldsmith (1969) [5] studied the relationship between financial and economic development of 35 countries within the period from 1860 to 1963. He derived the Financial Interrelation Ratio defined as the value of all financial assets over GNP. Goldsmith was the first to empirically

establish a unidirectionality of the economic growth pace and financial development.

McKinnon (1973) [6], studying the relationship between the level of economic development and the financial sector in the post-World War II period for countries such as Argentina, Brazil, Chile, Germany, Indonesia, Korea, and Taiwan, concluded that the countries where financial the sector is functioning better provide higher economic growth rates as well. As the main reason for this phenomenon, the scientist considered financial liberalization, which allows intensifying the activities of financial intermediaries and, thus, more effectively redistribute investment to productive areas.

Levine, Zervos (1998) [7] analyzed the indicators of the banking sector, stock market, and economic development in 47 countries from 1976 to 1993. They found that the growth of stock market liquidity and the development of the banking sector are positively correlated with economic growth, capital accumulation, and productivity growth. Scientists have determined that one standard-deviation increase in initial stock market liquidity and the estimated coefficient on Bank Credit would have increased real GDP per capita by 31 percent in 18 years, the capital stock per person would have been 29 percent higher, and productivity would have been 24 percent greater.

Liang, Reichert (2006) [8], assessing the relationship between financial development and economic growth in 70 Emerging and Developing Countries and 20 Advanced Countries in the period between 1960 and 2000, found that Granger causality results showed a stronger relationship in Emerging and Developing Countries. This confirms the hypothesis of the "demand-following" relationship. Herewith, the globalization of financial markets and the development of international trade help to balance the tightness of the relationships between the studied variables in Emerging / Developing Countries and Advanced Countries. The authors also state that the direction of the relationships may change depending on the stage of the economic cycle.

However, scientific thought provides other views on the role of the financial sector in ensuring economic growth. Thus, Robinson (1952) [9] believed that the development of financial markets is only a consequence of general economic growth. It is economic growth that creates the demand for financial services; thus, the financial sector responds more to the needs of the real sector of the economy rather than causing it to grow.

Lucas (1988) [10] noted that the impact of the financial sector on economic growth is somewhat exaggerated. The researcher considered increasing

investment in scientific development and human capital to be the main determinants of economic growth.

Stiglitz (2000) [11], examining the impact of the financial sector on economic growth, concludes that the liberalization of capital markets does not promote economic growth, but produces instability, which negatively affects it. The scientist sees the cause of financial instability in short-term capital movements, resulting in a discrepancy between private and social returns and risks. Stiglitz notes that capital flows are markedly procyclical, exacerbating economic fluctuations when they do not actually cause them.

Cameron (1967) [12] believed that financial systems may be both growth-inducing and growth-induced, with the key being the quality of financial services and the efficiency of their provision. Effective financial intermediaries are able to better redistribute resources in the economy and accelerate innovation development.

Empirical studies of the relationship between financial development and economic growth in Ukraine include the research by Paranytsya (2013) [13], who studied the impact of the financial sector on the industrial sector during 2000-2011. In general, the scientist concluded that the indicator of financial depth has a negative impact on the growth of industrial production in Ukraine.

Ukrainian scientist Korneyev (2014) [14] assessed the relationship between financial development and economic growth during 1991-2021 based on the data from 15 countries close to Ukraine in terms of economic development, in particular: Moldova, Romania, Latvia, Lithuania, Estonia, Hungary, Slovakia, Czech Republic, Bulgaria, Armenia, Azerbaijan, Poland, Kazakhstan, and Georgia. According to his findings, in the long run, there is a weak negative connection between the financial development index and economic growth, i.e. the growth of the financial development index slows down GDP growth per capita.

Ukrainian scientists Zveryakov and Zherdets'ka (2017) [15] studying causal links between Ukraine's economic growth and the development of the banking system found that the results of empirical research are sensitive to the stage of the economic cycle: if the period 2008-2009 was studied, the results showed the impact of economic development on the banking sector, and in the period 2006-2008, the direction of causation was opposite.

Thus, empirical studies of the relationship between indicators of the banking sector and economic growth are divided into the following main areas:

- the development of the banking sector determines economic growth;
- economic growth determines the level of the banking sector development;
- lack of relationship between the banking sector and economic growth.

3 Methodology

3.1 The Research Model

According to the endogenous model of economic growth of Barro, and Sala-i-Martin (2004) [16] GDP growth rate depends on the influence of certain institutional factors.

The main indicator that measures economic growth is the change in real GDP.

In our research of the relationship between economic growth (EG) and banking sector development, we estimate the standard growth equation:

$$EG = f(BC, BD, BI)$$

$$EG_t = \alpha + \beta_1 \times BC_{t-1} + \beta_2 \times BD_{t-1} + \beta_3 \times BI_{t-1} + \beta_4 \times BC_BD_{t-1} + \varepsilon_t \quad (1)$$

where EG_t is economic growth measured as the annual growth rate of the real GDP;

BC_{t-1} - banking credits provided to economic sectors;

BD_{t-1} - banking deposits;

BI_{t-1} - banking investments;

BC_BD_{t-1} – the ratio of bank credits to deposits;

α – intercept or constant;

β₁, β₂, β₃ – coefficients;

ε_t - residual errors.

The least squares method was used to construct the regression equation.

3.2 Source of Data

The study used the data from the State Statistics Service of Ukraine and the National Bank of Ukraine. Real GDP growth was used as an indicator of GDP. BC is the amount of bank credits to residents,% of GDP. BD is the amount of bank deposits of residents and non-residents,% of GDP. BI is the amount of bank investments (except for the National Bank of Ukraine) in securities of residents, including shares,% of GDP. BC_BD is the ratio of bank credits to deposits,%.

In our research, we estimate the standard growth equation using a panel data set over the period of 2002-2020. Calculations of model parameters were

performed using Eviews 9.0.

4 Research Findings and Discussion

Table 2 shows the input data for the construction of the regression model.

Table 2. Input data

	GDP	BC	BD	BI	BC_BD
01.01.2003	5,3	18,7	17,8	1,8	104,9
01.01.2004	9,5	25,4	24,1	2,4	105,5
01.01.2005	11,8	25,7	25,2	2,3	101,9
01.01.2006	3,1	32,5	32,0	2,6	101,6
01.01.2007	7,6	45,1	35,7	2,5	126,2
01.01.2008	8,2	59,2	41,7	3,0	142,2
01.01.2009	2,2	77,4	42,7	3,7	181,3
01.01.2010	-15,1	79,2	41,1	3,8	192,6
01.01.2011	4,1	67,7	40,9	6,9	165,6
01.01.2012	5,5	60,9	39,9	6,2	152,7
01.01.2013	0,2	57,9	42,8	6,8	135,2
01.01.2014	0,0	62,6	48,2	9,3	129,8
01.01.2015	-6,6	65,1	45,3	9,6	143,8
01.01.2016	-9,8	49,6	38,2	5,7	129,7
01.01.2017	2,4	41,9	35,8	11,2	117,1
01.01.2018	2,5	34,1	31,2	12,1	109,3
01.01.2019	3,4	30,2	26,9	11,8	112,3
01.01.2020	3,2	24,5	27,5	9,5	89,0
01.01.2021	-4,2	22,6	32,7	14,6	69,2

Table 3 shows the result of unit root test for selected variables.

Table 3. Augmented Dickey Fuller Test

Variables	ADF values		Test critical values 5% level
	Sig. level	2st difference	
GDP	0.0018	-4.979623	-3.098896
BC	0.0045	-4.624554	-3.144920
BD	0.0288	-3.413150	-3.098896
BI	0.0001	-6.843625	-3.081002
BC_BD	0.0058	-4.256288	-3.081002

The result indicates that all variables are stationary at the second difference.

Table 4 presents the descriptive statistics of the research model. Thus, the average value of GDP growth is 1.56%. The average ratio of bank credits to deposits is 130.04%, and the maximum is 192.59%. The Jarque-Bera statistics are all statistically significant at the 1% level, indicating that the variables follow a normal distribution.

Table 5 shows the correlation matrix of the selected variables used in the study.

Table 4. Descriptive statistics

	GDP	BC	BD	BI	BC_BD
Mean	1.555556	47.64183	35.38176	6.173938	130.0382
Median	2.800000	47.32853	37.01389	5.975665	127.9789
Maximum	11.80000	79.19187	48.22394	12.10203	192.5875
Minimum	-15.10000	18.70068	17.82251	1.837828	89.03309
Std. Dev.	6.823594	19.31811	8.426874	3.605987	28.82843
Skewness	-0.883852	0.081506	-0.458370	0.343005	0.704603
Kurtosis	3.381554	1.696085	2.205337	1.654234	2.643620
Jarque-Bera	2.452769	1.295076	1.103925	1.711271	1.584653
Probability	0.293351	0.523333	0.575819	0.425013	0.452790
Sum	28.00000	857.5529	636.8717	111.1309	2340.688
Sum Sq. Dev.	791.5444	6344.221	1207.207	221.0534	14128.34
Observations	18	18	18	18	18

Table 5. Correlation Matrix

	GDP	BC	BD	BI	BC_BD
GDP	1.000000	-0.539221	-0.592834	-0.355003	-0.381463
BC	-0.539221	1.000000	0.906904	0.012896	0.939420
BD	-0.592834	0.906904	1.000000	0.198303	0.711317
BI	-0.355003	0.012896	0.198303	1.000000	-0.133817
BC_BD	-0.381463	0.939420	0.711317	-0.133817	1.000000

Four independent variables exhibit a negative correlation with GDP, with the correlation between bank deposits and GDP reporting the largest value (0.593). The results indicate that there is a close relationship between bank credits and bank deposits as well as between bank credits and the ratio of bank credits to bank deposits. It shows the existence of multicollinearity between variables.

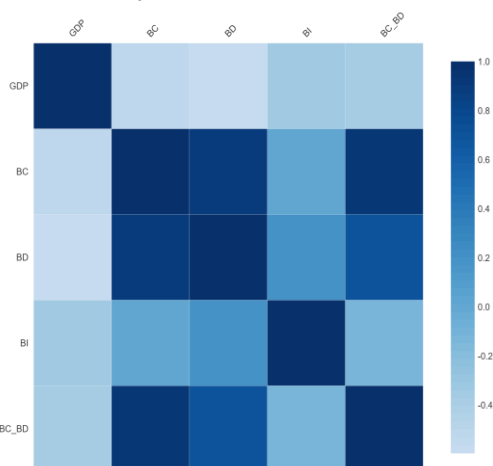


Fig. 4: Correlation Matrix

Table 6 presents The Regression Model Results.

Table 6. Multivariate Regression Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BC	-4.306045	1.086432	-3.963475	0.0016
BD	4.393384	1.222695	3.593196	0.0033

BI	-0.594807	0.302199	-1.968260	0.0707
BC_BD	1.696958	0.435317	3.898209	0.0018
C	-165.7393	47.34508	-3.500667	0.0039
R-squared	0.733738	Mean dependent var	1.555556	
Adjusted R-squared	0.651811	S.D. dependent var	6.823594	
S.E. of regression	4.026437	Akaike info criterion	5.853774	
Sum squared resid	210.7585	Schwarz criterion	6.101100	
Log likelihood	-47.68397	Hannan-Quinn criter.	5.887877	
F-statistic	8.956003	Durbin-Watson stat	2.519168	
Prob(F-statistic)	0.001061			

The structural parameter estimate obtained implies that 73,37% of GDP is explained by selected variables. F test is 8.956 and the probability of F test value 0.001 is less than the significant level of 5%.

Considering that the probability of all variables is less than 5%, we can reject the null hypothesis and accept the alternative hypothesis:

- H0: indicator equals zero (reject);
- H1: indicator does not equal zero (accept).

Table 5 reveals a significant positive relationship between banking deposits and GDP. Thus, an increase in banking deposits by 1 deviation will increase GDP by 4.39:

$$EG = \alpha - 4,306045 \times BC + 4,393384 \times BD - 0,594807 \times BI + 1,696958 \times BC_BD - 165,7393, \quad (2)$$

Lending to the private sector in Ukraine is carried out in two main areas - lending to the non-financial sector (business entities) and lending to households. The lack of a positive impact of bank lending on real GDP growth can be explained by the fact that banks in Ukraine, wanting to reduce credit risks, prefer short-term lending to economic entities. Such credits are normally used to cover current needs, rather than to finance investment projects and economic expansion. For many years, Ukrainian banks have experienced a shortage of long-term resources resulting in an imbalance between the terms of attracting liabilities and placing them in assets. The opportunities for economic development are threatened by low level of credit activity. Lack of own funds and limited lending lead to a reduction in business activity, loss of markets. As a result, there are problems with employment and job creation, which ultimately leads to social tensions. The low efficiency of economic entities directly affects the amount of budget resources of the state.

At the same time, the credit portfolio of Ukrainian banks contains a significant share of non-performing loans, which significantly affects the financial performance of the banking sector. Thus, the Ukrainian banking sector is unable to perform its key task of ensuring effective redistribution of capital in cross-sectoral and spatial dimensions.

Breusch-Godfrey Serial Correlation LM Test showed the absence of autocorrelation (Table 7).

Table 7. Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.199150	Prob. F(2,11)		0.3380
Obs*R-squared	3.222006	Prob. Chi-Square(2)		0.1997
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BC	-0.161749	1.077586	-0.150103	0.8834
BD	0.258983	1.217170	0.212775	0.8354
BI	-0.124073	0.312777	-0.396682	0.6992
BC_BD	0.037755	0.431005	0.087598	0.9318
C	-5.573573	46.91334	-0.118806	0.9076
RESID(-1)	-0.373060	0.289849	-1.287084	0.2245
RESID(-2)	-0.376022	0.311061	-1.208835	0.2521
R-squared	0.179000	Mean dependent var		2.98E-14
Adjusted R-squared	-0.268818	S.D. dependent var		3.521017
S.E. of regression	3.966137	Akaike info criterion		5.878764
Sum squared resid	173.0327	Schwarz criterion		6.225019

Log likelihood	-45.90887	Hannan-Quinn criter.	5.926508
F-statistic	0.399717	Durbin-Watson stat	1.931873
Prob(F-statistic)	0.864286		

The null hypothesis of the model is that there is no serial correlation. The alternative hypothesis is that there exists autocorrelation. In Table 7, it failed to reject the null hypothesis because the p-value is more than 0.05 up to the specified lag of 2 (0,2521). The Breusch-Godfrey Correlation LM test exhibits probability values of 0.3380 for F-statistics and 0.1997 for R-Squared that are significant to accept the null hypothesis implying that there is no autocorrelation in the residuals generated from the regression model. Therefore, the model is valid as it is not victimized by sequential correlation throughout the series.

At the next stage, we will perform a Granger Causality test for estimating the relationship between economic growth and banking sector development in Ukraine (Table 8).

H1: H0 hypothesis implies that banking sector development does not Granger-cause GDP. If Prob. is greater than 0.05 we accept H0. It means the lack of causality. If Prob. is less than 0.05 we reject H0. It means that there is Granger causality running from banking sector development to economic growth (Supply-leading relationship).

H2: H0 hypothesis implies that GDP does not Granger-cause banking sector development. If Prob. is greater than 0.05 we accept H0. It means the lack of causality. If Prob. is less than 0.05 we reject H0. It means that there is Granger causality running from economic growth to banking sector development (Demand-following relationship).

The results of Granger Causality models reveal that banking deposits Granger-cause GDP in the 1-lag model, herewith, in the 2-lag model banking deposits also have an impact on GDP, although the relationship is weak. Thus, the growth of GDP in Ukraine is facilitated by an increase in savings in the economy.

However, banking credits provided to economic sectors do not Granger-Cause GDP but GDP affects banking credits in the 1-lag model. This indicates that in Ukraine there are no effective mechanisms for transforming the savings of the population into an investment resource for economic development, which means that the functioning of the banking sector as a financial intermediary still remains inefficient.

5 Conclusion

The main purpose of this work is to study the impact of the banking sector on the economic growth in Ukraine. A standard growth equation using a panel data-set over the period of 2002-2020 was used for the empirical study. We used four variables to measure the banking sector level: BC is the amount of bank loans to residents, % of GDP, BD is the amount of bank deposits of residents and non-residents, % of GDP, BI is the amount of bank investments (except for the National Bank of Ukraine) in residents' securities, including shares, % of GDP, BC_BD is the ratio of bank credits to deposits, %. The obtained equation reveals a significant positive relationship between banking deposits and GDP. Thus, an increase in banking deposits by 1 deviation will increase GDP by 4.39. At the same time, there is a negative impact of banking credits on GDP.

The assessment of the causal links between GDP dynamics and indicators of the banking sector development using the Granger Causality Test established that banking deposits Granger-cause GDP. Accordingly, the increase in savings contributes to economic growth in Ukraine.

Important areas of increasing deposits by the banking sector of Ukraine are: launching new types of deposit services, exemption passive income from personal income tax and military collection, increasing the minimum amount of deposit guarantee for individuals, which will strengthen public confidence in banking institutions, increase reliability of banking sector by bringing the standards of banking in line with the requirements of Basel III.

Granger Causality Test shows that banking credits do not Granger Cause GDP but GDP has an effect on banking credits in the 1-lag model. This confirms the conclusion that in Ukraine the development of the economy affects the amount of bank lending and not vice versa. Therefore, limiting factors of lending to the private sector in Ukraine are significant devaluation risks, inflation expectations, low level of confidence in the banking system, unsatisfactory quality of bank management in the field of loan portfolio management, reduction of real incomes, high probability of default crisis.

Future work concerns analysis of the relationship between indicators of the real sector and economic growth in Ukraine.

Table 8. Granger Causality Test

Null Hypothesis:	Lag 1			Lag 2			Lag 3		
	Obs	F-Statistic	Prob.	Obs	F-Statistic	Prob.	Obs	F-Statistic	Prob.
BC does not Granger Cause GDP	18	4.36852	0.0541	17	1.45292	0.2722	16	0.96517	0.4504
GDP does not Granger Cause BC		8.65521	0.0101*		2.38232	0.1345		2.14663	0.1644
BD does not Granger Cause GDP	18	6.18349	0.0252*	17	4.57628	0.0333*	16	1.79824	0.2175
GDP does not Granger Cause BD		1.96007	0.1818		0.53438	0.5994		0.11786	0.9473
BI does not Granger Cause GDP	18	1.56844	0.2296	17	0.93767	0.4184	16	0.27365	0.8430
GDP does not Granger Cause BI		1.96849	0.1810		0.91129	0.4281		0.65148	0.6017
BC_BD does not Granger Cause GDP	18	1.33136	0.2666	17	0.56009	0.5854	16	0.67912	0.5866
GDP does not Granger Cause BC_BD		3.77504	0.0710		1.27693	0.3142		0.98205	0.4435

* If Prob. is greater than 0.05 we accept H0

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