FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN CEE COUNTRIES

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Abstract*: Given the important financial sector's role in economies, the study examines whether there is a relationship between the GDP growth and financial development of CEE countries. For this purpose, first the causality is tested by means of Granger-causality test and then an attempt is made to assess the influence of one variable on the other. The GDP growth and financial development's relationship is examined for the ten countries in CEE, with the period covered being 2010-2022. It is expected that financial development has a great importance for the improved growth in the studied countries. Data on loans, deposits in the banking system, and market capitalization as a share of GDP are used. The results confirmed that financial sector contributes positively to the realization of higher and stable GDP growth in CEE countries.*

Keywords*: financial development, CEE countries, economic growth*
JEL*: G10, G21, C50*

1. Introduction

The financial sector plays a leading role in an economy because of its active participation in the redistribution of spare resources in the economy. In most countries, the banks play the leading role in financial intermediation and the transfer of free financial resources from savers to investors, especially in Central and Eastern European (CEE) countries where the non-banking sector is not as well developed as the banking sector.

In most CEE countries, financial intermediation by banks as a share of assets in GDP does not exceed 100%, apart from the banking sector in the Czech Republic and Hungary. Capital markets in CEE countries are quite underdeveloped, having a market capitalisation of no more than 30% of GDP, except for the Czech Republic and Poland.

Given the significant role of the financial sector in the economies, this study aims to examine the link between economic growth in CEE countries and their financial development. The choice of these countries is conditioned by the fact that they are less developed than the old EU member states. Some of them are already members of the euro area but have incomes below the EU average, such as Estonia and Lithuania. Others have not yet adopted the euro and are lagging further behind the incomes of the old EU member states such as Bulgaria and Romania.

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However, in all these countries reforms need to be undertaken to bring about faster convergence towards the core EU countries.

The study tests the link between GDP growth and financial development by first examining the causality i.e. whether financial sector contributes to economic growth or conversely economic growth contributes to faster financial sector development. Some studies in the economics literature prove the bilateral relationship between these variables (Adusei, 2013; Yildirim et al., 2013).

For the purpose of this study, the data published by the European Central Bank (ECB) on the balance sheets of credit institutions are used, and for the market capitalization of these countries, the data published in the CEIC database with the stock markets of individual countries as the primary source are used. The study period is 2010 to 2022, the latest available annual data.

The study is structured in four parts. The introduction presents the relevance of the study and the aim. The second part provides literature brief overview. The third part presents the methodology, data and results of the dependencies assessed. In the last part, the main conclusions of the study and future research related to the topic are drawn.

2. Review of the literature

In reviewing the literature on the relationship of economic growth to financial development, the following grouping can be made:

- Studies that support the thesis that financial development contributes to economic growth (Levine, Zervos, 1998; Khan, Senhadji, 2000; Paudel, Acharya, 2019);

- Studies that support the thesis that economic growth contributes to financial development (Ndlovu, 2013; Zang, Kim, 2007);

- Studies that argue that there is a bidirectional link between these two variables (Adusei, 2013; Yildirim et al., 2013).

These results between financial performance and GDP growth depend on the choice of countries (individual country or group of countries) and the choice of variables characterizing the sophistication of the financial system.

The greatest variety is found in the choice of variables. The majority of studies apply indicators that cover the banking sector performance, which is justified by the greater development of this segment in financial sector's structure. Among the indicators used are monetary aggregates (King, Levine, 1993; Lynch, 1996), claims on the non-financial sector or loans to the private sector provided by banks (Mihaylova-Borisova, 2023; King, Levine, 1993; Khan, Senhadji, 2000; Cojocaru, Hoffman, Miller, 2011; Guru, Yadov, 2019), bank deposits (Puatwoe, Piabuo, 2017), banking sector efficiency (Mihaylova-Borisova, 2014). Others focus on indicators characterizing the capital market and more specifically market capitalization as a % of GDP (Neimke, 2003; Khan, Senhadji, 2000).

Among the studies that deal with assessing the relation between GDP and financial development for the CEE countries, several can be mentioned.

Cojocaru, Falaris, Hoffman, and Miller (2015) examine the role of financial sector for the CEE countries' economic growth and the former Soviet Republics for the period 1990-2008.

Zahariev (2018) proves the existence of a positive relationship between a country's GDP dynamics and financial system indicators such as the banking system's assets.

Lupu (2019) examines the impact of financial performance on GDP growth of two countries, Bulgaria and Romania, over the period 1993 to 2019. It proves the existence of such a relationship consistently for the whole period.

The importance of financial sector for GDP growth in the eight Central and Eastern European countries is studied by Dudian, Popa (2013). The authors use indicators for the banking systems of the countries, covering the period 1996 to 2011. Based on the estimated equations, they reach several conclusions, highlighting that the presence of banking crises in most of these countries leads to an impact on the estimated relationships between the dependent and independent variables. They confirmed that the rate of change of domestic credit had positive influence on economic growth, while domestic credit is negatively related to growth. They also confirm the negative relationship between interest rate spread and non-performing loans with economic growth for the countries under study.

A dynamic panel model to examine the relationship between financial development and economic growth is applied by Caporale et al. (2014). The authors divide the ten new member states into more homogeneous groups by examining the period 1994-2007. The result of the study is that the financial market has a limited impact on economic growth due to high levels of non-performing loans and the manifestation of crises in some of the countries studied. It is shown that the capital market development of the five CEE countries - Slovakia, Slovenia, Poland, the Czech Republic and Hungary - is positively related to their economic growth.

Mihaylova-Boriosva (2023) examines the link between GDP growth and bank intermediation by including the credit to private sector as a share of GDP for CEE countries. The positive relationship between economic growth and bank credit is demonstrated in the study.

3. Data, methodology and results

3.1. Data used and tested hypothesis.

Before proceeding to the estimation of the specific equation, the data used are presented. The variables applied to characterize financial development by the banking sector and the capital market are shown in Table 1, namely credit extended to the private sector and market capitalization of the stock markets of the CEE countries. The study covers the ten CEE countries Bulgaria, Romania, Czech Republic, Slovakia, Hungary, Poland, Slovenia, Estonia, Lithuania and Latvia.

Table 1. Lisy of variables

	Definition	Sources of data
GDP_GR	GDP growth rate, %	World Bank Database
CPI	Inflation, measured by CPI index, %	World Bank Database
CREDITS	Credits, provided by banks	European central bank
DEPOSITS	Deposits, attracted by banks	European central bank
MCAP	Market capitalization, % of GDP	CEIC

Source: Own presentation

Descriptive statistics of the variables are given in Table 2.

Table 2. Descriptive statistics

	GDP_GR	CPI	CREDITS	DEPOSITS	MCAP
Total					
Average	2.7	3.03	78247	76822	27.85
Minimum	-5.5	-1.54	14364	8792	1.56
Maximum	8.21	19.71	339010	413039	393.04
Median	2.95	2.34	39702	43924	14.15
Standard Deviation	2.77	3.99	83951	86098	58.54
Bulgaria					
Average	2.14	2.8	37951	38823	16.99
Minimum	-3.96	-1.42	30995	24232	9.58
Maximum	7.63	15.33	55156	61912	24.34
Median	2.68	2.44	34293	36207	15.33
Standard Deviation	2.69	4.12	7700	11349	5.74
Czech Republic					
Average	1.96	3	166245	156597	132.39
Minimum	-5.5	0.31	104630	118612	21.77
Maximum	5.39	15.1	245926	236959	393.04
Median	2.46	2.15	148573	135685	27.93
Standard Deviation	2.82	3.81	56194	38070	146.91
Estonia					

Average	3.22	3.61	21671	15748	10.51
Minimum	-1.29	-0.49	14364	8792	7.44
Maximum	8.01	19.4	32277	26085	16.49
Median	3.16	2.97	20817	14622	10.01
Standard Deviation	2.69	5.12	6163	5878	2.20
Hungary					
Average	2.72	3.68	75915	80340	16.70
Minimum	-4.54	-0.23	62313	56702	11.30
Maximum	7.2	14.61	105335	123641	20.91
Median	3.71	3.33	72252	74541	16.46
Standard Deviation	3.08	3.8	13457	23422	2.93
Lithuania					
Average	3.38	3.39	24982	21797	8.87
Minimum	-0.02	-0.88	18347	12379	5.30
Maximum	6.04	19.71	39123	40226	15.05
Median	3.55	2.33	21087	19159	8.95
Standard Deviation	1.74	5.16	7402	9316	2.24
Latvia					
Average	2.23	2.73	17764	12856	3.54
Minimum	-4.46	-1.08	15355	8818	1.56
Maximum	7.04	17.31	20540	19568	5.21
Median	2.57	2.26	17402	12547	3.64
Standard Deviation	2.86	4.67	1312	3333	1.12
Poland					
Average	3.6	2.99	284371	287346	53.19
Minimum	-2.02	-0.87	217025	190174	36.32
Maximum	6.85	14.43	339010	413039	73.68
Median	4.38	2.23	275128	270013	51.06
Standard Deviation	2.38	3.88	44216	74791	10.99
Romania					
Average	2.92	3.8	69240	69875	17.44
Minimum	-3.9	-1.54	61182	46388	12.05
Maximum	8.2	13.8	96520	113095	21.19
Median	3.85	3.83	65311	64291	19.29

Standard Deviation	3.56	3.81	10100	22130	2.91
Slovenia					
Average	2.21	1.78	30737	30671	14.61
Minimum	-4.32	-0.53	24595	26353	12.26
Maximum	8.21	8.83	37814	39955	19.33
Median	2.77	1.74	30701	28998	14.19
Standard Deviation	3.41	2.33	5017	4606	2.17
Slovakia					
Average	2.6	2.56	53596	54163	4.27
Minimum	-3.34	-0.52	34333	39466	1.86
Maximum	6.72	12.77	88186	77099	5.43
Median	2.67	1.94	49920	51033	4.77
Standard Deviation	2.46	3.39	17636	13039	1.33

Source: Own presentation

Three hypotheses will be tested in relation to the study of the link between GDP and financial development in the countries covered:

Hypothesis 1: Financial development of CEE countries contributes to economic growth. Such a relationship has been estimated in the studies of a number of authors (Levine, Zervos, 1998; Khan, Senhadji, 2000; Paudel, Acharya, 2019).

Hypothesis 2: Economic growth is positively affected by the credit provided to the private sector by the banking system. When credit provided increases, economic growth is also stimulated by more accurately transferring spare resources to productive investment and avoiding information asymmetry through the intermediation of banks.

Hypothesis 3: The market capitalization of stock markets in CEE countries also matters for economic development in terms of increasing the real growth of the economy as it grows, again through investment.

Before assessing the corresponding relationship between the dependent and independent variables, it is necessary to test their stationarity. For this purpose, the statistical software Eviews.10 and the corresponding stationarity tests are used. The results are shown in next three tables.

Table 3. Results of stationarity tests at the levels of the variables

Test		GDP_GR	CREDITS	DEPOSITS	MCAP	CPI
		Null: Unit root				
Levin, Lin, and Chu t	*Statistic*	-5.285	3.832	8.094	0.454	1.578
	Probability	0.000	1.000	1.000	0.675	0.943
		Null: Unit root				
ADF-Fisher chi-squaretest	*Statistic*	50.033	11.073	0.789	18.779	4.938
	Probability	0.000	0.944	1.000	0.536	1.000
PP-Fisher chi-square test	*Statistic*	123.700	9.293	0.055	54.680	3.413
	Probability	0.000	0.979	1.000	0.000	1.000

Source: E-views, author's presentation

Table 4. Results of stationarity tests for the first difference of variables

Test		CREDITS	DEPOSITS	MCAP	CPI
		Null: Unit root process			
Levin, Lin, and Chu t	*Statistic*	1.341	-0.343	-1.119	-2.616
	Probability	0.910	0.366	0.132	0.004
		Null:Unit root process			
ADF-Fisher chi-square test	*Statistic*	16.950	21.080	41.716	22.454
	Probability	0.656	0.393	0.003	0.316
PP-Fisher chi-square test	*Statistic*	47.680	26.492	130.156	17.190
	Probability	0.001	0.150	0.000	0.641

Source: E-views, author's presentation

Table 5: Stationarity test results for the second difference of variables

Test		CREDITS	DEPOSITS	MCAP	CPI
		Null: Unit root (assumes common unit root process)			
Levin, Lin, and Chu t	*Statistic*	-3.104	-9.761	-4.839	-3.477
	Probability	0.001	0.000	0.000	0.000

		Null: Unit root (assumes individual unit root process)			
ADF-Fisher chi-square test	*Statistic*	52.192	95.451	65.141	27.566
	Probability	0.000	0.000	0.000	0.120
PP-Fisher chi-square test	*Statistic*	136.901	117.437	181.495	44.772
	Probability	0.000	0.000	0.000	0.001

Source: E-views, author's presentation

On analysing the obtained results, it can be concluded that the GDP growth (GDP_GR) is stationary at the level of the variable i.e. it is integrated by I (0) and the variables CREDITS, DEPOSITS, MCAP and CPI are stationary at their second difference i.e. they are integrated by second order I (2).

3.2. Results

Before estimating the equation for the variables under study, it is necessary to test causality i.e. to test the first hypothesis. Granger causality test is used for this purpose.

Using the test to determine the causality between credit (CREDITS) and GDP growth (GDP_GR), it is found that the null hypothesis *CREDITS does not Granger Cause GDP_GR* is rejected with a probability of 0.028 and is below the critical value of 5%, while the hypothesis *GDP_GR does not Granger Cause CREDITS* cannot be rejected with a probability of 0.3866>0.05. Thus, it is proved that credits for determinants of economic development of CEE countries like the studies of Levine, Zervos, 1998; Khan, Senhadji, 2000; Paudel, Acharya, 2019.

Using the test to determine the causal link between market capitalization (MCAP) and GDP growth (GDP_GR), it is found that the null hypothesis *MCAP does not Granger Cause GDP_GR* is rejected with probability 0.0256 and is below the critical value of 5%, while the hypothesis *GDP_GR does not Granger Cause MCAP* cannot be rejected with probability 0.569>0.05. Thus, it is proved that market capitalization is important for the economic development of CEE countries.

Therefore, the following equation will be estimated:
$$GDP_{GR} = f(CREDITS, DEPOSITS, MCAP, CPI) \tag{1}$$

where:

GDP_GR - real GDP growth, annual percentage change.

CREDITS - credit extended by banks to the private sector, expressed in millions of euros for all CEE countries. Credits are expected to have a positive impact on economic growth due to the fact that economic agents will increase demand for goods and services with greater borrowing of financial resources, which will increase output and hence the GDP growth rate.

MCAP - market capitalisation expressed as a share of GDP. It can be expected that an increase in the market capitalisation of a stock exchange will have a positive impact on economic activity because an increase in market capitalization is evidence of more active demand for financial instruments, which raises their prices. Economic agents, through the intermediation of the capital market, will access more financial resources to invest in new projects. The increase in investment will also contribute to an increase in output and economic growth.

CPI - inflation measured by the harmonised index of consumer prices in percentages. Inflation is expected to be positively associated with GDP growth due to the fact that stable and predictable inflation contributes to higher GDP growth (Fisher, 1993; Iqbal, Nawaz, 2009). For example, Fisher (1993) proves that at low levels of inflation, positive GDP growth is observed, but when inflation increases, the relationship changes from positive to negative. Similarly, Iqbal, Nawaz (2009) prove for Pakistan that the link between inflation and GDP growth turns from positive to negative above 6% inflation. Inflation is included in the second difference estimating equation due to the fact that at second difference the series is stationary. This is the reason for not including inflation with non-linear form (Table 3, 4 and 5).

The inflation rate for the period 2010-2022 averages around 3% for the CEE countries, which is within the understanding of price stability, although in the last year of the study, 2022, there is a more significant increase in inflation due to the continued expansionary policies of central banks, limited energy commodities, rising prices (Borisov, 2022, p.8), the war between Ukraine and Russia.

DEPOSITS - deposits in the banking system, expressed in millions of euros for all CEE countries.

A balanced panel model is estimated for ten CEE countries. Cross-section fixed effects are included. The results of the estimated equation are presented in Table 6.

Table 6: Results of the estimated regression equation

	Model
Constant	5.0202***
	(8.3277)
D(D(CREDITS))	0.285345***
	(3.5258)
D(D(DEPOSITS))	-0.000226***
	(-3.626892)
D(D(MCAP(-1)))	0.008277**
	(1.993236)
D(D(CPI(-2)))	0.258475**
	(2.511652)
GDP_GR(-1)	-0.343001***
	(-3.42903)
GDP_GR(-3)	-0.250648*
	(-1.773001)
R-squared	0.456408
Adjusted R-squared	0.346221
Prob(F-statistic)	0.000019
Durbin-Watson stat	2.349869
Cross-sections included	10
Total panel (balanced) observations	90
Sample adjusted period	/2010-2022/

 * Significant at the 10 percent level

 ** Significant at the 5 percent level

 *** Significant at the 1 percent level

Source: E-views, own calculations

All coefficients on the independent variables are statistically significant, (at the 1% level) except for market capitalization, which shows significance at the 5% level, and economic growth with lag 3, which is significant at the 10% level. The estimated regression results prove that there is a positive link between credit and GDP growth and between market capitalization and GDP growth as expected. Market capitalization is included with lag 1 in the estimated equation, which is explained by the fact that it takes time to transfer the impact of financing investment with financial resources from capital markets on economic developed. More

significant is the impact of credit on GDP growth, as the coefficient is several times higher in front of this variable compared to the coefficient in front of market capitalization, 0.29 versus 0.01, respectively.

The dependent variable with lags 1 and 3 is also included, which is explained by the presence of a certain cyclicality in the economy. Inflation has the expected positive sign due to the low level of inflation during the covered period of study, which is consistent with previous studies.

4. Conclusion

The study examines whether there is a relationship between GDP growth and financial intermediation in CEE countries by first testing causality. For this purpose, a balanced panel model was used for the ten CEE countries - Bulgaria, Romania, Czech Republic, Slovakia, Hungary, Poland, Slovenia, Estonia, Lithuania and Latvia.

The hypothesis of the existence of a link from financial intermediation to GDP growth is tested. Two variables are used to characterise financial performance to capture financial intermediation through banks and intermediation through the capital market, namely bank credit and market capitalisation.

The results of the study show that there is a positive relation between GDP growth and financial intermediation, and it is unidirectional for the study period 2010-2022: from financially developed country to economic growth. This indicates that countries' policies should focus on the continued improvement of financial systems development for the purpose of achieving higher and sustainable levels of GDP growth.

Given the importance of the financial sector for economic development, it is envisaged to conduct a study on the banking efficiency of CEE countries in the future and to link efficiency to economic development. In addition, it would also be of interest to extend the scope of countries to the European Union level because all CEE countries are also members of the European Union.

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