



ORIGINAL PAPER

The Determinants of Credit Activity and the Impact of their Evolution on Economic Growth. Case Study: Albania

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Abstract:

The dominant component of the Albanian financial system is the banking sector, whose activity is transparent and leads to an efficient market economy. Credits make up the majority of the banking system's assets, which is why it is so important to determine if there is a link between the evolution of credit activity and economic growth in the current economic context. This paper aims to estimate through an empirical analysis the long-term and short-term effects of the impact of the credit activity and some bank-specific factors on economic growth in Albania, by employing a Vector Error Correction Model (VECM), using quarterly data from 1998q4 to 2021q4. For estimation purposes, economic growth is measured as the quarterly rate of GDP growth. In the econometric model the focus will be on the independent variable bank credit to the private sector as percent of GDP. This indicator is a very important one and widely used in the literature as a determinant of credit activity. The other independent variables considered are: treasury bills as percent of GDP; deposits as percent of GDP; ROE and the Herfindahl index. In general, there was a negative cointegration between GDP and bank credit to the private sector. In the long run, the results of the econometric model showed that there is a statistically significant direct relationship between the dependent variable of economic growth and the factors of treasury bills, deposits and the Herfindahl index. On the other hand, the results of the econometric model showed that there is an indirect correlation between economic growth and ROE.

Keywords: *Albania; credit activity; economic growth; Vector Error Correction Model.*

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Introduction

The dominant component of the Albanian financial system is the banking sector, whose activity is transparent and leads to an efficient market economy. Credits make up the majority of the banking system's assets, which is why it is so important to determine if there is a link between the evolution of credit activity and economic growth in the current economic context.

Like all countries that have switched from totalitarian regimes to a market economy, Albania in the first years after economic and political changes has faced a very low level of credit relative to GDP. After 2004, when bank loans started to grow rapidly, its ratio to GDP increased significantly. Developments in the global economy, and in particular the global economic crisis, have had a negative impact on the Albanian market and have led to a shrinking credit market and tightening bank lending conditions.

This paper aims to estimate through an empirical analysis the long-term and short-term effects of the impact of the credit activity and some bank-specific factors on economic growth in Albania, by employing a Vector Error Correction Model (VECM), using quarterly data from 1998q4 to 2021q4. For estimation purposes, economic growth is measured as the quarterly rate of GDP growth. In the econometric model the focus will be on the independent variable bank credit to the private sector as percent of GDP. This indicator is a very important one and widely used in the literature as a determinant of credit activity. The other independent variables considered are: treasury bills as percent of GDP; deposits as percent of GDP; ROE and the Herfindahl index.

I considered it necessary to study the link between credit activity and economic growth because, although the literature is very rich, it is limited in Albania. Due to the lack of comprehensive empirical analyzes for Albania, the main purpose of this article is to investigate empirically whether the evolution of credit determinants promotes economic growth. The contribution of this paper is to fill the empirical gap in the literature on finance and growth, with a particular focus on the banking sector in Albania.

Literature Review

For emerging markets, credit is very important for economic growth, given that the role played by other intermediaries in the financial market is still limited.

Credit expansion has been associated with faster economic growth and the onset of financial crises, a pair of results that seem to contradict each other. Angeles (2015) gave an explanation for these results, by separating credit to the private sector into corporate credit and household credit. Empirical analysis has shown that credit to firms is responsible for the positive effect of growth, while the greater occurrence of crises is mainly due to household credit. The events of the last decade, in which the rapid expansion of credit has led to crises and very little growth, can be understood as a change in the composition of credit to the component of his household. As credit was one of the factors that triggered the global crisis, in her paper, Banu (2013) tried to show whether there is a link between credit and economic growth, the economy not being able to develop in the absence of credit. With the help of a statistical software, she tried to determine the existence of a connection between GDP, credit to public administration and credit to households. The results of the analysis showed that credit to households contribute more to the formation of GDP than credit to general government.

The main conclusions of the work of Dudian and Popa (2013), which evaluated a model for the countries of Central and Eastern Europe, are: (1) the increase of non-

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performing loans and the differences of interest rates negatively affect the economic growth; (2) the increase in domestic credit to the private sector negatively affects GDP growth, but the increase in the growth rate has a positive effect on GDP. Cojocaru, Hoffman and Miller (2011) demonstrated in 25 CEE and CIS countries (including Romania) for the period 1990-2008 that there is a significant positive relationship between credit to the private sector (as a percentage of GDP) and GDP growth and a negative correlation between interest rate and GDP. Petkovski and Kjosevski (2014) also studied 16 transition economies in Central and South-Eastern Europe to assess whether the banking sector influences economic growth. Research shows that private sector credit and interest margins are negatively correlated with economic growth.

Although the literature is very rich, in Albania studies on the link between financial intermediation and economic growth are limited. Dushku (2010) investigates the relationship between financial intermediation and economic growth using the Granger causality test and the VECM mechanism. The study shows a bidirectional relationship between financial indicators and long-term economic growth. In the short term, this relationship is not clear because different indicators of financial intermediation offer different results. However, Musta (2016) states that credit to the private sector has a negative effect on growth due to the high level of non-performing loans and the low quality of the financial environment in the financial sector.

The purpose of Morina and Turan's (2019) paper is to examine whether the banking sector plays a role in supporting growth in transition economies such as Albania. The empirical investigation was performed using a VAR approach and the Granger causality test for the time period 2002T4-2016T4. The results of the research show that the interest rate margin is significant and positively related to economic growth and the credit granted to the private sector is negatively linked to economic growth.

Research Methodology

I considered it necessary to study the link between credit activity and economic growth because, although the literature is very rich, it is limited in Albania. Due to the lack of comprehensive empirical analyzes for Albania, the main purpose of this article is to investigate empirically whether the evolution of credit determinants promotes economic growth.

This paper aims to estimate through an empirical analysis the long-term and short-term effects of the impact of the credit activity and some bank-specific factors on economic growth in Albania, by employing a Vector Error Correction Model (VECM) through the R program, as one of the most appropriate methods, which in addition to identifying short-term connections, also allows identifying long-term relationships between variables. This study uses quarterly time series covering a 24-year period from 1998q4–2021q4, making a total of 93 observations for each variable.

For estimation purposes, economic growth is measured as the quarterly rate of GDP growth. These data come from the website of the Institute of Statistics in Albania (INSTAT).

In the econometric model the focus will be on the independent variable bank credit to the private sector as percent of GDP. This indicator is a very important one and widely used in the literature as a determinant of credit activity. Quarterly data, as total bank loans to the private sector (individuals and businesses) in ALL millions are collected from the Bank of Albania and reported to GDP.

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The other independent variables considered are: treasury bills as percent of GDP; deposits as percent of GDP; ROE and the Herfindahl index. Return on equity (ROE) is an internal measure of shareholder value performance and is by far the most popular measure of performance, as it: (i) proposes a direct assessment of the return on investment of a shareholder; (ii) is readily available to analysts based only on public information; and (iii) allows comparison between different companies or different sectors of the economy. The Herfindahl Index is a measure of the size of firms relative to the industry in which they are located and an indicator of competition between them.

The last two variables are total deposits in ALL millions relative to GDP and total treasury bills that are outstanding at the end of each quarter as a percentage of GDP. Data for these variables are collected from the Bank of Albania's website.

The main hypothesis that comes to the aid of the research methodology, where I will study more specifically the relationship of each indicator that explains the credit activity with the economic growth is:

H_0 = All the factors related to the credit activity do not determine the economic growth.

H_a = All the factors related to the credit activity determine the economic growth.

Results and Discussion

The aim of this model is to identify the short-term and long-term causal relationship between lending activity and economic growth in Albania. For this model, the focus will be on the independent variable bank credit to the private sector (% of GDP).

The study of Wesiah and Onyekwere (2021), "which aimed to investigate the causal relationship between financial intermediation and economic growth in the United Kingdom, using quarterly data from 1963q1 to 2015q1", also helped me to develop and interpret the estimated model. The authors "used the Johansen cointegration test and the Granger causality test in a vector error correction (VEC) framework to test the existence (or not) of a long-term relationship, as well as the causal direction between financial intermediation and economic growth." (Wesiah and Onyekwere, 2021, p.47)

The first step before estimating the econometric model is to select the time lag of the impact of the variables on the model. Table 1. presents the optimal lag for this study, as indicated by the Akaike information criterion (AIC), the Schwartz information criterion (SC), the Hannan-Quinn information criterion (HQ) and the final error prediction criterion (FPE). The lag selection criteria HQ and SC chose lag 1 as the optimal delay order, so all variables will be included in the model with lag = 1.

Table 1. Delayed order selection criteria (lag)

Lag	AIC(n)	HQ(n)	SC(n)	FPE(n)
1	7.716521	8.181176*	8.867773*	2249.108795
2	7.814109	8.677040	9.952148	2503.718262
3	7.291422*	8.552628	10.416247	1521.703112*
4	7.626995	9.286476	11.738607	2232.803090

* indicates the lag order selected by criteria

Source: own processing of the data in R software

The results of the Trace statistic of the Johansens cointegration test are presented in Table 2. According to the Trace test, the existence of two cointegration equations is

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confirmed, ie the cointegration rank is 2. For the higher ranks, the value of the test is lower, so the cointegration hypothesis for the higher ranks is not accepted. Economic growth and bank credit to the private sector have simultaneous effective equations and are integrated with rank 1 with high certainty and rank 2 with 95% confidence level. This result indicates that there is a long-term balance between economic growth and credit activity in Albania for this period.

Table 2. Johansen Trace test

No. hypothesized of cointegrations	Trace statistic	10% critical value	5% critical value	1% critical value
r = 0	131.47	97.18	102.14	111.01
r ≤ 1	78.4*	71.86	76.07	84.45
r ≤ 2	44.12	49.65	53.12	60.16
r ≤ 3	25.52	32	34.91	41.07
r ≤ 4	13.32	17.85	19.96	24.6
r ≤ 5	4.26	7.52	9.24	12.97

Source: own processing of the data in R software

As the variables considered are cointegrated, a Vector Error Correction Model (VECM) will be specified in R software, to investigate their short and long-term dynamics under unbalanced conditions. The mathematical representations of the equations are:

$$EQ_{gdp} = 9.441treasury + 0.751saving - 1.296roe + 1.723hh$$

$$EQ_{credit_private} = -247.429treasury - 10.184saving + 31.228roe - 36.721hh$$

Table 3. shows the long-term effect of credit proxies on growth. Thus, the result shows the receptivity of economic growth to changes in the growth of credit indicators. The coefficient for total credit and economic growth in both equations was 0, being that they are explained simultaneously and the factors that have an effect on one of them will indirectly affect the other variable, both variables being cointegrated.

Table 3. Long-term output of VEC regression equations in R

Variable	gdp	credit_private
treasury	9.44103	-247.42962
saving	0.7507722	-10.1848044
roe	-1.296357	31.228892
hh	1.723527	-36.711116

Source: own processing of the data in R software

In the long run, the results of the econometric model showed that there is a statistically significant direct relationship between the dependent variable of economic growth and the factors of treasury bills, deposits and the Herfindahl index. On the other hand, the results of the econometric model showed that there is an indirect correlation between economic growth and ROE. An increase of 1p.p. of the level of treasury bills will increase the GDP by 9.44p.p. An increase of 1p.p. of the level of deposits will increase the GDP by 0.75p.p. An increase of 1p.p. of the ROE level will reduce the GDP by 1.29p.p. An increase of 1p.p. of the Herfindahl index will increase GDP by 1.72p.p.

While the factor that has a positive long-term impact on bank credit to the private sector is ROE, respectively an increase of 1p.p. of ROE, will increase lending by

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31.23p.p. Other factors have a negative impact on total lending. An increase of 1p.p. of the level of treasury bills will reduce the credit to the private sector by 247.43p.p. An increase of 1p.p. of the level of deposits will reduce credit to the private sector by 10.18p.p. An increase of 1p.p. of the Herfindahl index level will reduce credit to the private sector by 36.71p.p.

In general, there was a negative cointegration between GDP and bank credit to the private sector. The results of the model show that the variables that have a negative impact on credit, positively influence economic growth, so the negative impact is absorbed by bank credit to the private sector. On the other hand, ROE has a positive impact on credit, but a negative impact on growth for this model.

In Table 4. is observed the short-term output of the VECM model results. The two equations describe a system in which each variable is a function of its own offset and the other variables in the system. In this case, the system contains six variables. In the first equation, *gdpg* is expressed as a function of its own delays and the other five variables. The same goes for the other equation.

ECT1 is the term for correcting errors or the long-term impact of variables on GDP. The table shows that the estimated ECT1 coefficient for *gdpg* is significant and has a negative sign. The size of the estimated error correction coefficient for *gdpg* indicates that approximately 0.58 percentage points from the previous quarter's imbalance in the system is corrected in each quarter of the year. ECT2 is the term for correcting errors or the long-term impact of variables on bank credit to the private sector. This estimated ECT2 coefficient for the *gdpg* equation is significant and has a negative sign. The magnitude of the estimated ECT2 coefficient of the error correction term for the *gdpg* equation indicates that approximately 0.23p.p. from the previous quarter's imbalance in the system is corrected in each quarter of the year.

Table 4. Short-term output of VEC regression equations in R

Regression coefficients	Equation 1 Equation <i>gdpg</i>	Equation 2 Equation <i>credit_private</i>
ECT1	-0.5866*** (0.1098)	-0.0841 (0.1053)
ECT2	-0.228*** (0.0047)	0.0028 (0.0045)
Intercept	27.3244*** (7.3871)	21.0612** (7.087)
<i>gdpg</i> -1	0.0929 (0.1008)	0.1839. (0.0967)
<i>credit_private</i> -1	-0.638 (0.5298)	-1.181* (0.5083)
<i>treasury</i> -1	-0.7815 (0.9935)	1.9776* (0.9531)
<i>saving</i> -1	-0.1072 (0.2501)	0.3406 (0.2400)
<i>roe</i> -1	0.1547 (0.1170)	-0.1374 (0.1122)
<i>hh</i> -1	-0.7915* (0.3482)	-0.6597. (0.3341)

Source: own processing of the data in R software

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In a long-term perspective, bank credit to the private sector has had a delayed negative impact with a lag on GDP (-0.638p.p.). A first explanation may come from the potential endogenous nature of private credit, especially since the data were correlated with only a delayed lag. Haiss and Kichler (2009) found that there is a positive influence of private credit on GDP if it is regressed two years apart.

Bank credit to the private sector in lag 1 has a negative and significant impact on this credit itself (-1.18p.p.). The constant has a positive impact on GDP and credit. In the absence of the effect of all variables, GDP growth will be 27.32 p.p. and the increase in credit to the private sector will be by 21.06p.p. GDP is adjusting negatively after an economic shock on the credit side. There is also a significant lag ratio (-1) between GDP growth and credit to the private sector. This relationship is significant and positive. When GDP grows, the effect on credit to the private sector will be positive, and the effect will appear 3 months after the gap (-1).

There is also a significant and positive lag ratio (-1) between treasury bills and private sector credit. When treasury bills increase, the effect on credit to the private sector will be positive, and the effect will appear 3 months after a gap (-1). There is a significant and negative lag ratio (-1) between the Herfindahl index and credit to the private sector. When the index increases, the effect on credit to the private sector will be negative, and the effect will appear 3 months after there is a gap (-1). There is a significant and negative lag ratio (-1) between the Herfindahl index and GDP growth. When the index increases, the effect on economic growth will be negative, and the effect will appear 3 months after there is a gap (-1).

The impulse-response functions in Figure 1. were derived for the GDP growth equation and the credit equation to the private sector. An increase in GDP growth increases credit first, followed by a contraction, followed by a positive long-term lending trend. An increase in lending results in a volatility of GDP growth similar to the business cycle, with a decrease in growth, a delayed positive growth and a long-term adjustment of GDP growth lower than the pre-credit shock.

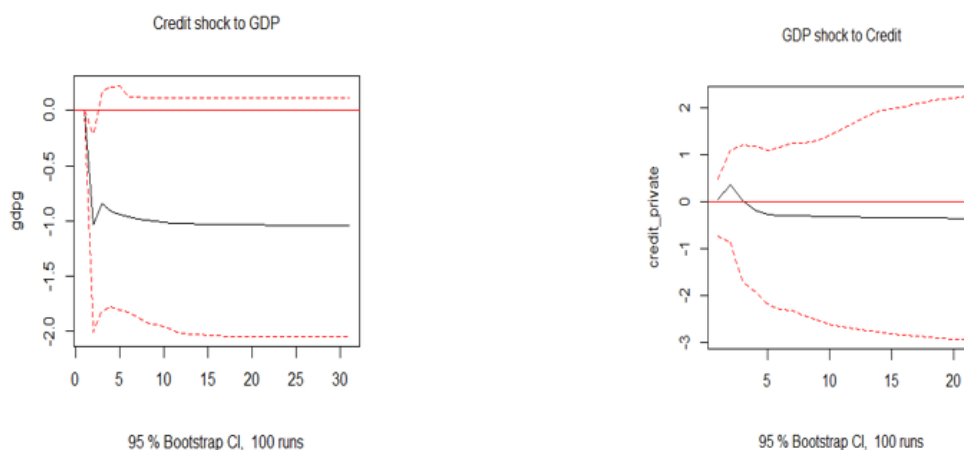


Figure 1. Impulse-response functions for economic growth and private credit

Source: own processing of the data in R software

According to Table 5. the model diagnosis is good, there is no serial correlation, heteroskedasticity and errors satisfy the normal distribution.

Table 5. Portmanteau, ARCH and Jarque-Bera Tests

	Portmanteau Test	ARCH	JB-Test	Skewness	Kurtosis
Chi-squared	92.108	491.83	14450	793.78	13657
p-value	1.301e-05	0.04724	< 2.2e-16	< 2.2e-16	< 2.2e-16

Source: own processing of the data in R software

Conclusions

In the long run, the results of the econometric model showed that there is a statistically significant direct relationship between the dependent variable of economic growth and the factors of treasury bills, deposits and the Herfindahl index. On the other hand, the results of the econometric model showed that there is an indirect correlation between economic growth and ROE.

In general, there was a negative cointegration between GDP and bank credit to the private sector. The reason for these results is that light budget constraints, which are prevalent in many countries in transition, and loans from companies applying light budget constraints could have led to counterproductive investments and financial losses. Banks can even make the situation worse by keeping such loans in their balance sheets. As a result, the increase in lending was not profitable.

Another phenomenon related to the negative coefficient may be that the transition years, the rapid lending that followed the first years of transition and the immediate aftermath of the financial crisis, the problems of foreign parent banks, the earthquake and then the 2020 pandemic influenced banks' policies and explain these results.

The results of this study show that the banking system in Albania does not allocate funds in an efficient way, in which the banking system does not cause economic growth, but only specific indicators can cause growth. According to Cinaj et.al (2020) the weaknesses in control and governance of banks will lead to an increased consideration of the respective roles and interactions of banking supervisors with external and internal auditors, who are key contributors to market discipline.

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