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## **Determinants of bank credit to the private sector: The case of Albania**

Gerti Shijaku and Irini Kalluci

Bank of Albania

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DETERMINANTS OF  
BANK CREDIT TO THE  
PRIVATE SECTOR:  
THE CASE OF ALBANIA

Gerti Shijaku  
Irina Kalluci\*

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*\* Gerti Shijaku, Research Department, Bank of Albania,  
e-mail: gshijaku@bankofalbania.org*

*\*Irimi Kalluci, Supervision Department, Bank of Albania,  
e-mail: ikalluci@bankofalbania.org*

*The views expressed herein are solely those of the authors and do not necessarily  
reflect the views of the Bank of Albania.*

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## ABSTRACT

*This discussion paper focuses on identifying and evaluating the long run determinants of bank credit to the private sector in the case of Albania by employing a Vector Error Correction Mechanism (VECM) approach based on demand and supply indicators. Estimations show that an adjustment mechanism exists bringing bank credit back to equilibrium. The results imply that lending is positively linked to economic growth. Further, banking and financial intermediation, as well as financial liberalisation would stimulate higher lending demand. In addition, lower cost of lending, diminishing government domestic borrowing and a more qualitative bank credit would create further lending incentives. At the same time, the exchange rate is found to pick up some demand valuation and consumption smoothing effects.*

Keywords: Credit to the private sector, VECM approach

JEL Classification: C32, C51, C53, E44, G21, H63

## 1. INTRODUCTION

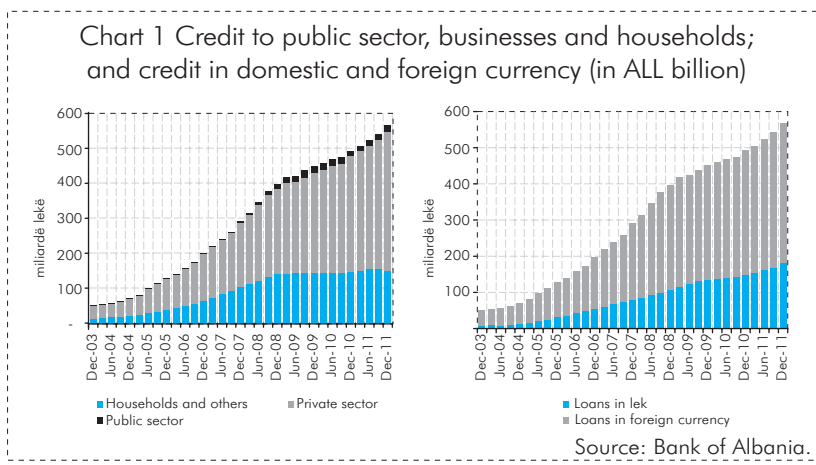
Credit is crucial to the economy of a country. Especially for the countries of Central, Eastern and Southeast Europe (CESEE) that have gone through several stages of development after the change of economic and political regimes, credit to the private sector would be a very good stimulus for economic development in those countries. "Levine (1997) ... concluded that the functioning of financial markets is very important for economic growth" (Dushku, 2010).

To understand more about the factors that determine credit, many studies have been conducted for these countries, as well as for others that are similar to them, judging from the level of development or the stages through which they have passed. In the early 2000s, lending in Albania was at very low levels. "The tight policy of credit, through the imposition of credit ceilings for banks and the increasing level of non-performing loans (NPL) restrained the ability of commercial banks to meet rising demand for credit" (Sheqeri, 2003). Until the end of 2000, the Bank of Albania used direct instruments of monetary control through the imposition of credit ceilings, preventing commercial banks from providing loans beyond a predetermined level. On the other hand, a good portion of loans granted during the previous regime, but also of newly granted loans, turned non-performing. In these conditions, the banks still did not feel safe for the repayment ability of their potential borrowers. Hence, they opted to invest most of their funds in government risk-free securities. But in 2001, the NPL ratio fell sharply. "This "strong" fall is the result of an administrative decision for transferring bad loans of the Savings Bank to the Loan Handling Agency. Consequently the situation changed, abruptly, in favour of reducing these loans for the banking system (Çeliku and Luçi, 2004).

The Albanian economy experienced a rapid credit growth, especially after 2004 (Chart 1), which coincided with the privatization of the largest bank in the country, and was followed by the entry of foreign renowned groups and a merger of two banks, stepping up the lending process and increasing competition in this aspect. Especially lending in foreign currency increased notably. Although the pace of growth for credit was very high, the loan-to-deposit ratio was still at low levels, which showed that banks had still space

(and funds available) to grant loans (Chart 2). Immediately after the outburst of the global financial crisis in 2008, credit growth began to slow down to extremely low levels, especially after 2009. It continues to grow very slowly, while the pace of deposit growth has been higher almost until the end of 2011. These developments reflect both demand and supply-side effects<sup>1</sup>. On the supply side, banks have tightened lending standards; on the other hand, the private sector has reduced its demand for bank lending. This is mostly linked to the perceived uncertainty, by both demand and supply sides, about the macroeconomic situation, public debt, and the specific problems of the business sector, the financial situation of individuals, unfavourable developments in the real estate market and reduction in the demand to finance new investments.

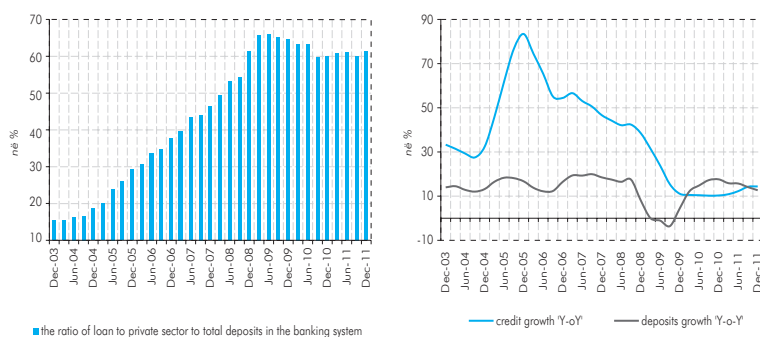
Rapid credit growth was a common feature of transition countries, especially after 2000s, but it reversed after the outburst of financial crisis. In Albania, bank credit to the private sector has grown by higher levels compared to other countries in the region and those of Central Eastern European countries (CEECs), mainly due to higher economic growth rates. Nonetheless, the ratio of bank credit to private sector to Gross Domestic Product (GDP) is still at low levels. A recent study by Kalluci (2012) shows that lending in Albania remains below the potential level, but the gap is narrowing, which confirms that there is space to lend more.



<sup>1</sup> See Annual Report of the Bank of Albania (2011)



Chart 2 Ratio of total credit to private sector over total deposits in the Albanian banking sector, and the annual percentage change in deposits and credit



Source: Bank of Albania.

Looking at these different dynamics of bank credit to the private sector, a central question arises naturally: what factors (demand or supply side) have caused the different behaviour of the Albanian economy towards lending? It is precisely this reason that prompted us to undertake this study, to identify these determinant factors, especially at a time when lending has slowed down and there is a need to stimulate it. This discussion material aims to identify the long run determinants of bank credit to the private sector in the case of Albania. We adopted the baseline model by Égert, et. al. (2006) and Albulescu (2009). But, we extended it to also include additional explanatory variables such as output gap and the real effective exchange rate (REER). Using the Vector Error Correction Mechanism (VECM) approach, the study identifies a cointegrating relationship between bank credit to the private sector and other explanatory variables, while the magnitude of the speed of adjustment is considered relatively high. This also reveals that bank credit is determined by both demand and supply indicators. Hence, in the long run, bank credit would be affected positively by a sound and better economic growth and a higher confidence among different economic agents, and by deeper banking and financial intermediation. At the same time, bank credit is found to increase as government domestic borrowing shrinks, lending costs diminish and non-performing loans improve. The exchange rate is found to have a positive impact on credit demand, picking up some demand valuation and consumption smoothing effects.

The rest of the paper is organized as follows: Section 2 reviews the literature regarding the determinants of bank credit to the private sector. Section 3 is dedicated to empirical analysis through presenting the estimation techniques, the model and data. Section 4 presents the empirical results for Albania. Finally, Section 5 draws some concluding remarks.

## 2. LITERATURE REVIEW

There are several studies in literature aiming to identify the determinants of lending, which may be demand-side or supply-side factors. Some studies put both factors in the same equation, while others try to distinguish them in two separate equations.

Hoffman (2001), through a cointegrating VAR for 16 industrialized countries, finds significant positive relations of real credit to real GDP and property prices, and a negative correlation with real interest rates. Calza, et. al. (2001), using VECM for the euro area data, model the factors that affect the demand for credit and find that in the long run, the latter are positively related to real GDP growth and negatively to short term and long term real interest rates. Cotarelli, et. al. (2005) identify long-term relations between bank credit to the private sector to GDP ratio and a set of economic and institutional variables, for a panel of non-transition developing and industrialized countries. Then they use these estimates for an equilibrium level of credit to GDP in CEE and the Balkans. They conclude that: there is an evidence of a crowding out effect (because of a negative coefficient on the public debt ratio); a positive and significant relation of lending to GDP per capita; inflation above a certain threshold negatively affects the dependent variable; greater financial liberalization and transparency in accounting standards lead to higher bank credit to GDP ratio.

Égert, et. al. (2006) investigate the determinants of the domestic bank credit to the private sector as a percentage of GDP in 11 CEE countries. They use three alternative techniques for estimation: fixed-effect ordinary least squares; panel dynamic OLS and the mean group estimator, for 43 countries, which are then grouped into other small panels. The authors first estimate a baseline model and find negative relations of private credit to GDP ratio (dependent variable) with bank credit to the public sector, lending rate, inflation and spread between lending and deposit rates (a proxy for financial liberalization). The GDP per capita was found to have a positive effect on the dependent variable. Then, checking the robustness of variables in the baseline model, they use alternative measures for some of the explanatory variables (i.e they replace in the baseline

equations: GDP per capita by real GDP growth and real industrial production; long term by short term lending rates; and PPI by CPI). In the last equations, they add house prices and a dummy for credit registry. Rosenberg and Tirpák (2009) examine the determinants of foreign currency lending in new EU member states of the CEE and find significant positive relations with the share of foreign deposits and the interest rate differential (difference between domestic and foreign currency interest rates). On the other hand, they conclude that foreign currency borrowing is negatively affected by net foreign assets of the banks, exchange rate volatility and regulatory measures that discourage borrowing in foreign currency.

Albulescu (2009) evaluates two equations through OLS. The growth rate of credit granted in domestic currency and of those denominated in foreign currency serves as dependent variable, respectively, for Romania. In the first equation, the author finds that credit growth rate is linked positively with economic growth, deposits in domestic currency growth and unemployment rate, but negatively with net wages growth and interest rates. In the second equation, foreign currency credit dynamics are explained by net wages and foreign currency deposits. The ratio of foreign currency credit to deposit is an important factor, negatively related to growth rates of foreign currency credit. Guo and Stepanyan (2011) identify both demand-side and supply-side factors of credit growth, with a focus on supply side for 38 emerging market economies. They cover both pre-crisis and post-crisis periods (2002-2010). The authors find that domestic deposits and non-residents liabilities positively contribute to credit growth and that they symmetrically serve as funds for the latter, whether domestic or foreign sources. GDP growth and inflation also increase credit; while higher deposit rates, signalling tighter monetary conditions and a tighter monetary policy in the U.S., will decrease credit growth. In another alternative equation, they add other factors such as: exchange rate (to pick up the effect of foreign currency credit); initial credit to GDP ratio (the higher the ratio, the lower the subsequent credit growth); NPLs (a higher level of NPLs would reduce credit).

In the case of Albania, several papers have considered various aspects of credit, but have a somewhat different focus from the one we have in this study. Vika (2009), through the GMM method,

identifies several factors that affect total credit to private sector and credit denominated in domestic currency 'Albanian lek' (during 2004-2006), finding positive correlation of the dependent variable with NEER, GDP, liquidity of the banking system and the interaction term between monetary policy indicator and liquidity (although the last two factors are statistically insignificant). On the other side, the relation is negative with the repurchase agreement rate (REPO), size of banks and interaction term between monetary policy and size (in contrast to expectations for a positive sign of the last two variables). Kalluci (2012) identifies an equilibrium level of lending to the Albanian economy, starting from a benchmark of 52 developed and developing countries. Comparisons to all these countries show that Albania is still below its potential level of lending, but the gap is narrowing. However, when a panel of developed countries serves as a benchmark, the gap between actual and potential level results far larger. Suljoti and Hashorva (2012) empirically evaluate the relationship between house prices and mortgage loans for the 1998-2010 period. These indicators affect positively each-other on both directions. Also, mortgage loans are positively correlated with income, but negatively with the interest rates. Note and Suljoti (2012) identify the determinants of credit growth, after 2008, for a panel of 10 SEE countries for the period 2008 Q4 - 2011 Q3. Lending to these economies in the years after the crisis is negatively influenced by NPLs and interest rates. Meanwhile, the economic growth, the pace of funding sources (deposits) and foreign borrowings of the banking system has had a positive impact on lending.

We believe that this paper will contribute to the existing literature, in several aspects. First, to our best knowledge, this is the first paper that identifies the determinants of bank credit specifically for Albania. Other studies may have dealt with that, but in a context of a panel of countries, including Albania. Thus, we may use the results of other studies for comparison (where possible) with the results that we derive from our estimations. Second, we include both demand and supply factors in the same equations, not tracing apart each type of determinants. Third, unlike other studies regarding bank credit in the case of Albania, we cover a longer time span (2001-2011).

### 3. METHODOLOGY AND DATA

Several theoretical and empirical studies have dealt with bank credit to the private sector and lending booms<sup>2</sup>, identifying the determinants of credit demand and supply. On the demand side, real GDP, prices and interest rates commonly serve as explanatory variables, although there is no widely-used standard model. On the supply side, a variety of credit channel models considers how changes in the financial position of banks (bank lending channel) and borrowers (balance sheet channel) affect the availability of credit in a given economy. However, according to Rajan (1994), modelling and estimation techniques in this area are complicated due to difficulties in separating demand-side from supply-side effects. Égert, et. al. (2006) and Albulescu (2009), in their empirical work, use variables influencing the capacity of the banks to grant credit, as well as variables influencing the capacity of businesses and of the households to obtain them. Considering their empirical work, we build two models, assuming that the bank credit to the private sector is a function of a set of deterministic explanatory variables, schemed as follows:

$$C^{pr} \int \left\{ \underbrace{\gamma + \omega^n}_{\emptyset} + \underbrace{D^{tot} + \varphi}_{\delta} + \underbrace{i^{spread}}_i + \underbrace{\pi^{REER} + \sigma^{NPL}}_{\theta} \right\} \quad (1)$$

and

$$C^{pr} \int \left\{ \underbrace{\gamma + \omega^n}_{\emptyset} + \underbrace{D^{tot} + \varphi}_{\delta} + \underbrace{i^{spread}}_i + \underbrace{\pi^{REER} + \tau}_{\theta} \right\} \quad (2)$$

Where, the bank credit to the private sector ( $C^{pr}$ ) is a function of a set of explanatory variables given by,

$$C^{pr} = [\emptyset, \delta, i, \theta]$$

Where,  $\emptyset$  represents a set of wealth and economic activity evolution

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<sup>2</sup> See: Calza (2001) and (2003), Hofmann (2001), Cottarelli (2005), Duenwald (2005), Égert (2006), Albulescu (2009), Brzoza-Brzezina and Krzysztof (2009), Guo and Stepanayan (2011), Tan (2012), etc.

indicators such as quarterly Gross Domestic Product (GDP) ( $\gamma$ )<sup>3</sup> and net wages to private sector ( $\omega^n$ );  $\delta$  represents a set of banking system confidence and development indicators such as total deposits in the Albanian banking system ( $D^{tot}$ ) and the credit to the private sector to total deposits ratio ( $\phi$ ) to capture the financial intermediation effects;  $i$  represents a lending opportunity cost such as the spread between weighted average of lending and deposits rate in domestic and foreign currency ( $i^{spread}$ )<sup>4</sup>;  $\theta$  represents other macroeconomic and explanatory indicators such as Albanian REER ( $\pi^{REER}$ ), the stock of government domestic debt ( $\tau$ ) and NPLs ( $\sigma^{NPL}$ ). The specified models (eq. 1 and 2) are estimated by VECM techniques, as follows:

$$\Delta X_{i,t} = \beta_0 + \alpha_i \left( X_{i,t-1} + \sum_{i=1}^{p-1} \beta_i X_{i,t-1} \right) + \sum_{i=1}^{p-1} \beta_i \Delta X_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

Where,  $X_{i,t}$  is a vector of  $\kappa$  observable endogenous variables,  $\Delta$  is the difference operator,  $\beta_0$  is a vector of constant terms,  $\beta_i$  are the matrices of the coefficients measuring lagged effect of variables on each other,  $\alpha_i$  is the parameter for the speed of adjustment towards equilibrium,  $\varepsilon_t = [\varepsilon_{st}, \varepsilon_{bt}]$  is the vector of error terms and  $\varepsilon_t \sim iid(0, \sigma^2)$ .

The VECM approach represents a very suitable formulation for determinants of bank credit to the private sector. As Onafowora and Owoye (1998) reveal, it can distinguish between stationary variables with transitory (temporary) effects and non-stationary variables with permanent (persistent) effects. This method has the advantages that it can combine the long run and short run information in the data by exploiting the cointegration property of the model. Both these elements (short run and long run) of the model are calculated simultaneously and the model is run through a system of equations, eliminating problems with endogeneity, omitted variables and serial correlation [Giorgioni and Holden, (2001); Calza, et. al. (2001) and Juselius, (2003)]. Hence,

<sup>3</sup> We have also estimated the specified models by including the output gap ( $\gamma^{gap}$ ) instead of ( $\gamma$ ).

<sup>4</sup> We also estimated a model by including instead of only the weighted average of lending rate in domestic and foreign currency ( $i^l$ ).

according to Tanku (2006), both the long run and short run estimated coefficients are unbiased and efficient under such specification. Additionally, while the cointegrating vector is generally interpreted as a long run equilibrium relationship, the estimates of the short run dynamics help to characterize the process of adjustment towards this equilibrium. Further, as in Hofmann (2001), we prefer the Johansen approach to alternative single equation estimators (e.g. ARDL approach<sup>5</sup>), because we cannot rule out the existence of multiple long run relationships, nor do we have any a priori reason to assume that any set of variables is weakly exogenous. Finally, the coefficient and the statistical significance of the error correction term is an alternative option to evaluate the long run cointegration relationship and to show that there is a long run cointegration relationship between dependent and independent variables.

The estimation of the determinants of bank credit to the private sector through the means of VECM techniques is based on the assumption that credit is determined by economic activity and the capacity to grant and obtain credit. Using  $\gamma$  as an explanatory variable is a reasonable choice, given that, as a scale indicator, it measures the country's overall performance of the economy and controls for the overall demand in the economy. Kiss, et. al. (2006) suggest that it is also an appropriate proxy of overall confidence of business and households and can, thereby, reflect the aggregate demand and supply for credit, since better and higher economic growth can positively stimulate the confidence of the economic agents and improve their expectations. Hence, we expect  $\gamma$  to have a positive coefficient given the effect of economic growth on expected income and profit, since higher economic growth improves the financial conditions of the private sector and allows for higher levels of indebtedness. Similarly, these authors reveal that firms want to maintain the ratio between internal and external capital as the economy grows. Therefore, under higher economic growth, the capital intensity of production increases, leading to higher credit demand. In respect of the supply, Albulescu (2009) suggests that economic growth is also expected to correlate positively with credit as the banks are more willing to lend in an economic upturn and vice versa.

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<sup>5</sup> This approach requires one way causality cointegration.



Another crucial explanatory variable for bank credit to the private sector is net wages,  $\omega^n$ . First, this variable normalises the estimated equations. According to Albulescu (2009), together with real GDP, it represents a good proxy for wealth effect, given that it accounts for population capacity to attract credit but also the saturation effect. Second, most of the Albanian work force is employed in the private sector (e.g. around 80%), but also  $\omega^n$  is a more appropriate indicator, since we are examining the determinants of bank credit to the private sector. Third, we would expect that the private sector compared to the public one responds quicker and is more flexible to adjust costs in response to the performance of economic activity, especially during economic downturn. Hence, this indicator is also a good proxy to capture the effects of business behaviour. We expect  $\omega^n$  to have a positive coefficient as raising net wage level facilitates the access to credit and gives households the possibility to obtain more mortgage loans, thereby, reflecting an income effect. Besides, Albulescu (2009) suggests that higher wages might embody a substitution effect hence, reducing the need to obtain consumer credits. Thus, it is difficult to say if this variable influences positively or negatively the credit demand.

Additionally, financial and banking system developments are another crucial component for determining banking credit. Thus,  $D^{tot}$  offers a significant approach to control for the overall importance of total deposits as a source of disposable funds to the banking system, while  $\varphi$  embodies a good proxy for financial intermediation patterns. On the one hand, according to Albulescu (2009), higher bank deposits influence credit, because financing is made mainly based on the disposable resources. Expanding deposits provide banks with more funds available for lending encouraging credit extension. Therefore, a positive dynamics in banking deposits involves a credit evolution in the same direction. Besides, developments of financial and banking system attract more deposits available for credit lending. Hence, as Tan (2012) reveals, we expect both these coefficients to have a positive effect on bank credit to the private sector, while  $\varphi$  also normalised the equation estimated.

The choice of the cost related indicators is quite straightforward. Calza, et. al. (2003) and Kakes (2000) believe that the interest rate is a potential determinant of credit demand. As an opportunity cost indicator it simultaneously determines both the demand and supply of bank credit. According to Čeh, et. al. (2011), the interest rate has opposite effects on demand, since an increase/decrease in the cost of borrowing worsens/improves the macroeconomic situation in a country. Besides, a change in the interest rate influences the price of borrowing, reflecting the possible substitution effect by other means of financing. Therefore, we expect that rising  $i^r$ , on one hand, causes the increase of the refinancing costs and, on the other hand, it makes the access of final users to credit more difficult. But, in line with Friedman and Kuttner (1993), some studies also include the cost of alternative sources of financing to account for the opportunity cost of lending, while Kiss, et. al. (2006) reveal that a further set of possible explanatory variables includes different indices capturing structural features, such as financial liberalisation. Égert, et. al. (2006) imply that the usage of  $i^{\text{spread}}^{\circ}$  instead of  $i^r$  rates is another important indicator, since the difference between lending and deposit rates reflects the profitability of the banking system (as do ROA and ROAC) and the risk of lending to the private sector. Thus, apart from the cost effects, the spread can also capture the financial liberalization effect, in particular that of the banking sector and might, therefore, be a good proxy for the efficiency of financial resources allocation. A narrowing spread may indicate elements of financial liberalization especially if it reflects more intensive competition both among the banks and between the banks and other financial intermediaries. It should be noted, however, that the spread variables could also capture other factors apart from financial liberalization. We assume that this indicator is negatively linked to bank credit, as a higher degree of financial liberalization makes both credit supply and demand easier. But, if the income effect prevails, higher profitability encourages banks to increase lending, which means that both variables might take a positive sign due to balance sheet and income effects on the supply side [Čeh, et. al. (2011)]. However, if profit making becomes “expensive”,

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<sup>6</sup> Casolaro et al. (2005) model the cost component as the spread between the cost of lending and money market rate that is used as a proxy for the alternative forms of financing.

such that  $i^r$  and  $i^{\text{spread}}$  arises from higher client risk premiums, credit supply may fall.

Finally, bank credit is also determined by other macroeconomic indicators. First, in the Albanian banking sector, lending is provided mostly in foreign currency. This makes the credit portfolio more sensitive to exchange rate volatility. According to Vika (2009), including  $\pi^{\text{REER}}$  allows capturing the extra cost effects of exchange rate volatility and together with  $\gamma$  intend to capture the effects of demand in the economy and the cyclical behaviour of bank loans, regardless of changes in the monetary policy. It can also capture a broader relationship and is more appropriate to interact with other real variables (Berkelmans, 2005). However,  $\pi^{\text{REER}}$  can take a positive or negative sign depending on whether it represents consumption smoothing or cost effects. Second, banks can lend to both the private and the public sector or discriminate between the two depending on macroeconomic conditions or banks strategies. Hence, including  $\tau$  can also play a role in determining private credit and allows us to capture any possible crowding-out effects. The Albanian government has relied mostly on domestic financing for different reasons, with banks being the largest buyers of these securities, thus reducing the funds disposable to lend to the private sector. Cottarelli, et. al. (2003) find public debt stock to be more appropriate than different flow variables of the government budget. We expect the coefficient of  $\tau$  to have a negative sign, given that any increase in bank credit to the government is thought to decrease lending to the private sector and vice versa. Furthermore, theoretically and empirically, several papers<sup>7</sup> suggest that the bank health may be an important determinant of credit growth. In the lending process, for different reasons, not always the whole credit is recapitalised successfully. The part of credit not repaid back is considered as bad credit for the banking sector and classified as nonperforming (NPL). In the case of Albania, the NPL level and the ratio to the total credit portfolio has been low since the beginning of 2000s, but it rose substantially after the crisis outburst, aggravating the risk aversion of the banks and affecting the portfolio growth. Hence, we have included  $\sigma^{\text{NPL}}$  as another explanatory variable to capture the effect of the quality of bank credit behaviour and the

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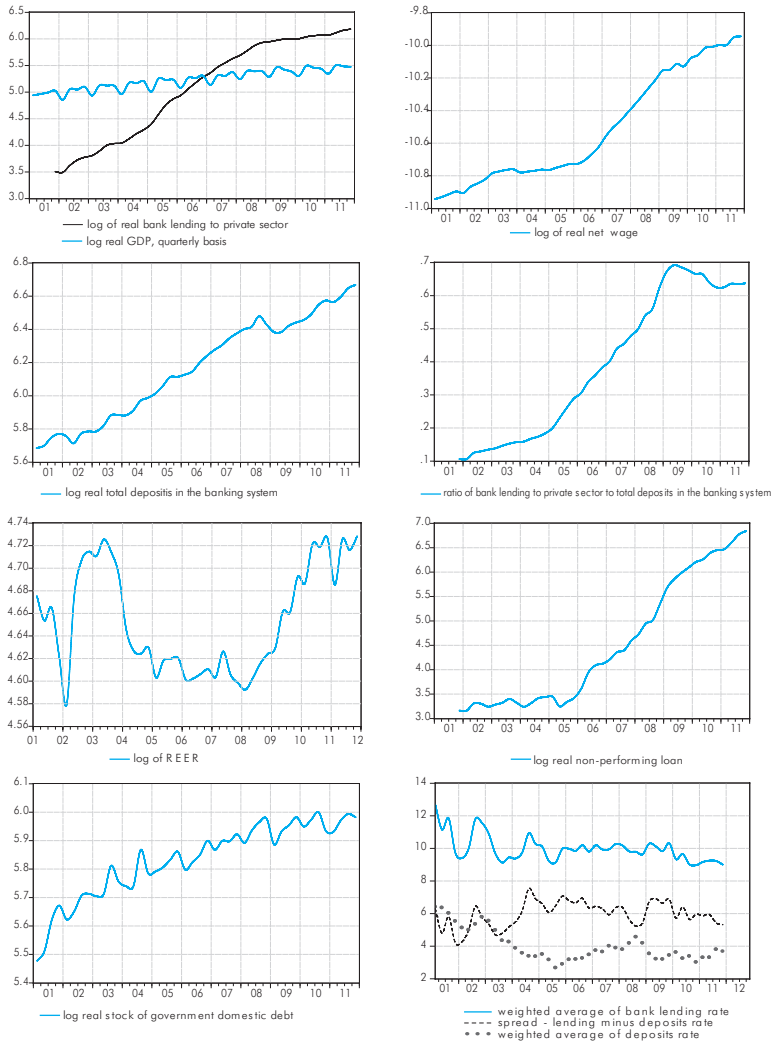
7 See also McGuire and Tarashev (2008) and Guo and Stepanyan (2011).

credit supply. Consistent with findings in McGuire and Tarashev (2008), we assume that as the quality of bank assets deteriorates, the credit granted diminishes. Hence, we would expect a negative relationship as rising  $\sigma^{\text{NPL}}$  would mean less funds for banks to lend.

## A. DATA

The empirical estimation of the determinants of bank credit to the private sector was based on economic activity, wealth, banking developments, cost-related and other macroeconomic indicators. The study considers quarterly data from 2001 Q1 to 2011 Q4 and is based on eq. 1 and 2. Data on bank credit to the private sector, NPLs, total deposits, lending and deposits rate, and (REER) are taken from the Bank of Albania. The data on Consumer Price Index (CPI), quarterly GDP, and net wages in the private sector are taken from the Albanian Institute of Statistics (INSTAT), and those on government domestic debt are taken from the Ministry of Finance. Data on credit to the private sector, quarterly GDP, net wages, total deposits, NPL, government domestic debt are in billion Albanian lek, deflated by CPI and, together with REER, are entered in the model as a logarithm. The data on interest rate and the spread are generated in real terms by subtracting the rate of annualised inflation rate in Albania.

Chart 3: Dependent and other explanatory variables



Source: Bank of Albania, INSTAT and Ministry of Finance.

## 4. EMPIRICAL RESULTS

The assessment of long run cointegration relationship, through the VECM approach, provides an analytical and statistical framework, which is based on the assumption that variables should be integrated according to the first order  $I(1)$ . Hence, implementing the unit root test is necessary first, to understand their characteristics and second, to make sure that the VECM approach is an appropriate method. The appropriate lag length in the autoregressive unit root test process is based on Schwarz Info Criterion (SIC). After conducting Augmented Dickey Fuller (ADF), Philips Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS)<sup>8</sup> unit root tests (Table 2), we find conclusive evidence that variables included in the specified model are integrated of order one  $I(1)$  over the sample period<sup>9</sup>. In the following, we analyse the relationship between real lending and other explanatory variables based on the multivariate approach of cointegration analysis proposed by Johansen (1988, 1991, 1995).

The appropriate 2 lags length on VAR model was based on SIC criteria, which also satisfy stability condition and LM-test for serial correlation. Therefore, based on Johansen (1988, 1991, 1995), we found it legitimate to specify the VECM model with one lag. This is also an appropriate approach, given the small sample on which we base our research. The diagnostics suggest that the models fulfil the condition on stability and there is no evidence of serial correlation or heteroskedasticity, but, in some cases, there is evidence of non-normality of the VAR residuals. Based on Lütkepohl (1993, 2005), Hofmann (2001) suggests that the VECM approach does not strictly depend on the normality assumption. The violation of the normality assumption might not be too severe to our analysis. The Johansen Cointegration Test (JCT), based on an unrestricted constant and a linear trend in the variables, but not in the cointegration relationship, reveals that there is more than one cointegrating vector present in the data. This, in return, justifies the usage of the VECM approach. As in Sorensen (2009), after the identification of the long run cointegrated vector within

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<sup>8</sup> Results on KPSS test can be provided on request.

<sup>9</sup> However, the variable on output gap is found to be integrated of order  $I(2)$ . Hence, when used, it entered the model in first difference such that it would be  $I(1)$  as other ones.

specified VECM models, we evaluated two restriction tests. First, through LR-test of restrictions with a Chi-square ( $\chi^2$ ) distribution, we tested if  $i^{\text{spread}}$  (but also  $i^r$ ) is actually stationary,  $I(0)$ , to ensure that the identified cointegrating relation reflects a true relationship between  $I(1)$  variables and is not just picking up a stationary one. Second, joint LR-test weak exogeneity tests on the non-significant  $\alpha$ -coefficients are performed on all the endogenous variables in order to determine whether, in the spirit of a general-to-specific approach it would be legitimate to specify the model more parsimoniously<sup>10</sup>. Following Johansen (1992, 1995), based on the likelihood ratio (LR) test procedure and p-value, we can easily reject the null hypothesis that  $i^{\text{spread}}$  (also  $i^r$ ) is  $I(0)$ . Further, joint LR-test of restrictions with a Chi-square ( $\chi^2$ ) distribution confirms that all explanatory variables are weakly exogenous, meaning that they adjust to the equilibrium when the system is exposed to a shock.

Results on the restricted VECM model, together with some diagnostic checks, are shown in Table 1, while the different specifications confirm that the estimated coefficients are robust and that they are statistically significant with the theoretically expected signs. The coefficient of  $\gamma$  enters the long run relationship with the expected positive sign and is statistically significant in both models. This result is particularly robust among the model specified, with the size of the coefficient lying around 0.165 to 0.220 for both specifications and is relatively similar to findings of Vika (2009). This demonstrates that higher GDP growth boosts the confidence among economic agents that they can afford to pay off loans and subsequently increase their credit demand.<sup>11</sup> Regarding other wealth indicators,  $\omega^n$  is found to be negatively correlated with bank credit demand and is statistically significant. This effect is robust and varies among

<sup>10</sup> The null hypothesis here is that all independent variables are weakly exogenous such that they respond to the lagged residuals of the long run cointegration equation.

<sup>11</sup> However, when  $(y^{\text{gap}})$  was used instead of  $(y)$ , we found a statistically significant negative relationship, ranges between -1.168 (in eq.1) to -1.066 (in eq. 2) per cent in respond of a 1 per cent increase in output gap. Such findings need further analysis, but according to Čeh et. al. (2011) it suggests that the economy “overheating” that results in faster-than-potential growth reduces credit demand due to an increase in own sources of finance, i.e. that in bad times, demand from enterprises for external sources of finance is stronger than demand for own sources of finance (See also Ghosh and Ghosh, 1999; and Barqas and Steiner, 2002)]. The data on the output gap (output\_gap) represents a deviation of nominal GDP from potential GDP estimated by the Production Function Cobb-Douglas approach (Kota, 2009).

both models around -1.096 to -1.354. This implies that any raise in the revenues of the populations diminishes the orientation of households towards demand for bank credit. As regards the estimated coefficients, the long run elasticity of real net wages is above unity, which is consistent with the findings of several empirical investigations, including a recent study by Albulescu (2009) in the case of Romania. According to Calza, et. al. (2001), one possible explanation that the coefficients size exceeds unity reflects the fact that  $\omega^n$  might capture the effect of other wealth-omitted variables, which are also relevant to explain credit demand. Albulescu (2009) implies this might also reflect a quick convergence wages process. Based on the parameter magnitude from both models, wealth effects are found to be lower in eq. 1 compared to those in eq. 2.

Further, growth in bank deposits ( $D^{tot}$ ) and financial intermediation  $\phi$ , on the other hand, are found to boost bank credit growth, in accordance with our expectations. The estimated coefficients are consistent across both models and at any given time the impact on bank credit behaviour is statistically significant. The estimated impact on  $C^{pr}$  ranges around 1.684% to 1.1795% in response of 1% increase in real total deposits in the banking sector. The coefficient of bank deposits growth above unity implies that, for every additional deposit unit, bank credit to the private sector would increase, but by more than one to one on average. One possible explanation for the value of  $D^{tot}$  exceeding unity may be related to the relatively low level of bank lending compared to deposits level during the selected sample; the upward bias due to quick adjustment toward credit equilibrium and the economic convergence process of the last decade.<sup>12</sup> According to Delannay (2004), another reason might be the growing access to bank credit, underlined by the growing level of financial intermediation in transition countries, such as Albania. At the same time, considering Note and Suljoti (2012), unlike the CESEE countries, deposits constitute the main source for lending in the Albanian banking system. However, such conclusions would need further analysis. On the other hand, based on the estimated coefficient, we found that improvement in the effectiveness of the

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<sup>12</sup> Vika (2009) implies that the growth rate of bank credit to the private sector has been consistently higher compared to that of bank assets, mainly due to its low level in the first decade of transition. Kalluci (2012) found that bank credit is below the potential level but the gap continues to narrow.



financial intermediation by 1pp would stimulate bank credit by around 0.03129pp to 0.03148pp across the models.

Furthermore, when taking a closer look at the effectiveness of the financial sector (and also at the real lending rate when used instead<sup>13</sup>), we found reasonably robust empirical support to conclude that  $i^{\text{spread}}$  (also  $i^r$ ) is negatively linked to private credit and further financial liberalization incentives, measured by a decline in spread, would lower the cost of lending and boost credit growth. An increase in financial liberalization, measured by a decline in spread by 1pp, would encourage an increase by around 0.01017 pp to 0.01292 pp in the private credit.<sup>14</sup> Considering these findings, according to Čeh, et. al. (2011) the sign of both coefficients seems to suggest that bank credit is driven by demand side rather than supply side effects and policies focusing on easing financial and monetary conditions and enabling further financial liberalization, among other things, would further boost credit to the private sector. As Note and Suljoti (2012) reveal, despite the fact that most central banks in the region have pursued an easing monetary policy, the latter is not fully reflected in the credit markets as a result of high risk premiums.

In addition, according to Guo and Stepanyan (2011), the positive and significant sign for  $\pi^{\text{REER}}$  confirms that private credit increase, picks up some demand valuation and consumption smoothing effects. Hence, we found that an increase in  $\pi^{\text{REER}}$  results in boosted bank credit to the private sector, and vice versa. Interestingly, the banks' credit would raise around 0.331% to 0.535% in response of a 1% boost in  $\pi^{\text{REER}}$ . One preliminary possible explanation may lay on the fact that Albania is a net import country and, therefore, firms may require more credit to finance their investment needs. With regard to  $\tau$ , the estimations provide us with some interesting insights, as an increase (decrease) in credit to the public sector is found to cause a decline (rise) in credit to the private sector. We found that bank credit to the private sector would increase around 0.413% in response of 1% decrease in stock of domestic public

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<sup>13</sup> Vika (2009) and Note and Suljoti (2012) found a negative relationship between bank credit and lending costs.

<sup>14</sup> However, when we used  $i^r$  instead, we found that credit to private sector would rise by around 1.021 to 1.273 percent due to a decrease in the lending rate by 1 pp. This effect is found to be more statistically significant than in the case where  $i^{\text{spread}}$  is used.

debt. This result is statistically significant and supports the crowding-out/crowding-in hypothesis in the case of Albania. Considering the efficiency of bank credit, we found that the loan portfolio quality is another supply determinant that influenced bank credit behaviour, and apparently still does, given banks' aversion to risk. Consistent with findings in McGuire and Tarashev (2008), and Guo and Stepanyan (2011), a less healthy banking sector tends to extend less credit to the private sector. The estimated impact is statistically significant and bank credit would diminish by around -0.03% in respond of 1% increase in  $\sigma^{NPL}$ .

Table 1: Results of the determinants of bank credit to the private sector based on VECM specification techniques (t-statistics in [ ])

Explanatory Variables	Model (1)	Model (2)
C	3.606 [-4.6]	7.004 [-5.4]
$\gamma$	0.165 [-5.1]	0.220 [-4.8]
$\omega^n$	-1.280 [ 17.4]	-1.299 [ 15.5]
$D^{tot}$	1.795 [-25.8]	1.684 [-19.8]
$\varphi$	.03148 [-43.6]	.03129 [-33.0]
$i^{spread}$	-.01017 [ 8.9]	-.01292 [ 8.7]
$\pi^{REER}$	0.535 [-5.2]	0.331 [-2.4]
$\sigma^{NPL}$	-0.030 [ 2.0]	
$\tau$		-0.413 [ 2.5]
ECM	-0.699 [-25.0]	-0.489 [-23.6]
Adj-R <sup>2</sup>	0.76	0.71
SSR	0.0155	0.0191
AIC	-4.478	-4.322
SIC	-4.051	-3.938
LM-Test	0.22	0.82
White	0.27	0.29
JB-Prob	0.89	0.21
$\chi^2$	80.2	69.9

Source: Authors Calculations.

Furthermore, with regards to the estimated coefficients, we found that, in the long run, bank credit to the private sector is more sensitive to developments of the financial and banking sector. Thus, policies that affect positively the financial intermediation and disposable banking system funds would have a significant effect on bank credit behaviour. Regarding the magnitude of other indicators, these effects are followed by wealth effects, population capacity to attract credit and the impact of lending costs. The magnitude of the price of domestic currency against the currency of main trading partners (REER) is followed by the effect of borrowing demand by government to finance its fiscal policies and performance of economic activity. Nevertheless, we found that a healthy banking sector is important, but it still has a low effect in bank credit to the private sector.

Most importantly, the sign of the coefficients and the statistical significance of the error term at the 1% significance level also suggest that, in the long run, bank credit to the private sector is cointegrated with other explanatory variables across all specified models. According to Granger (1986), this confirms that the long run equilibrium is achievable. There is a long run cointegrated relationship between the dependent and independent variables and an error correction mechanism, which brings bank credit back to equilibrium. This also reveals that the specified equations may be describing both demand and supply behavioural relationships. Meanwhile, the magnitude of the coefficients might be considered as relatively high. Overall, we found that the speed of adjustments takes a value around -0.489 to -0.699 across both specified models. This suggests that in case the stock of loans deviates from their equilibrium level, this should be adjusted approximately within 3 to 4 quarters. This coefficient is higher than the adjustment coefficient found in money demand studies by Tanku (2006) and Shijaku (2007).

Finally, some additional conclusions can be made based on results and diagnostics check on both equations. First, based on the parameter magnitude, the wealth effect and the cost and financial liberalisation relating effects are found to be lower in eq. 1 compared to those in eq. 2. But, the impact of banking and

financial development is found to be higher in model 1. This is also true regarding the results on the greater impact of exchange rate found in model 1. Second, the error correction mechanism is found to be higher in model 1. Further information indicates that parameters in model 1 are all more statistically significant. As such and based on the coefficient of adj-R<sup>2</sup> and diagnostics checks, we can conclude that eq. 1 represents a better formulation for identifying the determinants of bank credit to the private sector.

## 5. CONCLUDING REMARKS

This paper studies the determinants of bank credit to the private sector in the case of Albania. Using the Johansen VECM methodology, the study identifies a cointegrating relationship linking real bank credit to the private sector, real GDP, net wages, banking and financial developments, financial liberalization indicators, exchange rate, non-performing loans and interest rates. Across all specified models, the error term is found to have the expected negative sign and is statistically significant at 1% level of significance. The magnitude of the speed of adjustment confirms that any deviation from the equilibrium level would be corrected relatively fast. Further, this also reveals that the specified equations may be describing both demand and supply behavioural relationships.

Besides, other estimated empirical results we have obtained help to identify factors that would further boost the future bank credit to the private sector. Bank credit would enhance with a better economic activity performance, a higher confidence among different economic agents, and the ability to support a sustainable economic growth. Banking sector development is a vital element for promoting further lending to the private sector. The extent to which banking and financial sector is able to attract more deposits and promote greater financial intermediation would determine further extension in bank credit disbursements. Also, in the long run, bank credit is positively related to exchange rate and negatively to the crowding-out effect caused by government domestic borrowing. The latter is found to have a greater impact. On the other hand, a stable macroeconomic situation, policies leading to lower credit cost and greater financial liberalization would simultaneously boost lending and lower the risk of lending to the private sector. At the same time, lower level of non-performing loans is found to determine greater loan supply by the banking system. Improving the efficiency of bank lending and reducing NPLs will reduce the perceived credit risk and, therefore, encourage the credit supply. Based on the results, providing more sound economic growth policies and improving the efficiency of banks would attract more deposits and reduce overhead costs. On the other hand, maintaining and reducing the government deficit supports financial intermediation. Sound financial sector policies

that stimulate banking sector funding and limit non-performing loans remain essentials for robust credit growth.

Future research should be directed towards at least two additional issues. First, further research should distinguish between different types and forms of lending. For instance, it may be worth taking into consideration the fact that most of bank credit is provided in foreign currency, or that manufacturing, trade and construction are the main sectors affecting the credit demand. Second, an analysis by maturities would provide further insight about the cyclicity and elasticity behaviour of short run versus long run lending.

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# APPENDIX

Table 2: Unit Root Tests [Prob] with Null Hypothesis: Unit Root

Indicators	ADF test			PP test			ADF test			PP test		
	Intercept	Intercept and trend	None	Intercept	Intercept and trend	None	Intercept	Intercept and trend	None	Intercept	Intercept and trend	None
	Level						First Difference					
$C^{pr}$	[.1790]	[.9671]	[.9046]	[.3637]	[.9971]	[1.0000]	[.0298]	[.0870]	[.3069]	[.0154]	[.0067]	[.0475]
$\gamma$	[.9279]	[.0952]	[1.0000]	[.7287]	[.0680]	[1.0000]	[.0005]	[.0035]	[.4828]	[.0000]	[.0000]	[.0020]
$\omega^n$	[.7642]	[.1387]	[.9933]	[.8863]	[.7860]	[.9999]	[.0170]	[.0730]	[.2202]	[.0204]	[.0859]	[.0221]
$D^{int}$	[.9448]	[.5447]	[1.0000]	[.0000]	[.0001]	[.2951]	[.0000]	[.0001]	[.2951]	[.0000]	[.0003]	[.0004]
$\varphi$	[.7119]	[.8184]	[.8902]	[.0576]	[.1713]	[.0289]	[.0576]	[.1713]	[.0289]	[.5620]	[.1691]	[.0326]
$\delta^{spread}$	[.0354]	[.0975]	[.4634]	[.2790]	[.0727]	[.4611]	[.0000]	[.0000]	[.0000]	[.0000]	[.0000]	[.0000]
$\pi^{REER}$	[.4061]	[.7284]	[.7685]	[.5402]	[.7667]	[.7736]	[.0287]	[.0000]	[.0017]	[.0000]	[.0000]	[.0000]
$\sigma^{NPL}$	[.9936]	[.6795]	[.9984]	[.9986]	[.7017]	[1.0000]	[.0039]	[.0080]	[.0079]	[.0039]	[.0076]	[.0079]
$\tau$	[.0550]	[.3513]	[1.0000]	[.5040]	[.0333]	[.9450]	[.0000]	[.0000]	[.0035]	[.0000]	[.0000]	[.0000]

<sup>a</sup> automatic lag selection based on Schwarz Info Criterion (SIC)

Table 3: Results of the Johansen Cointegration Test Summary, with 1 lag

Data Trend	Test Type	Model (1)	Model (2)
No Intercept	Trace	5	5
No Trend	Max-Eig	3	3
Intercept	Trace	5	5
No Trend	Max-Eig	4	3
Intercept	Trace	5	5
No Trend	Max-Eig	4	3
Intercept	Trace	6	5
Trend	Max-Eig	5	4
Intercept	Trace	5	4
Trend	Max-Eig	5	4

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