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** Views expressed in this review are of the authors and do not necessarily reflect those of the Bank of Albania.*

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THE LINKAGE BETWEEN CREDIT INDICATORS ACCORDING TO TIME-VARYING CORRELATIONS

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1. INTRODUCTION

In general credit growth is a measure of the amount of money lent in a country's economy. When interest rates fall, businesses and households are keen to require more credit, consequently lending activity expands. An increase in lending interest rates, result in a decrease in the volume of new loans. Often, a rapid credit growth is a sign of a "financial bubble".

The literature on lending and its connection to various factors is quite extensive and constantly expanding due to the impact of different policies on loans performance and consequently, its impact on economic growth of a country. Analysis of loan and interest rates indicators applied by banks has special importance in terms of monetary policy and financial stability. Lending contributes to a more efficient allocation of resources in an economy, in terms of the impact of interest rates by the monetary authority, while it has a special significance in the banking activity. For this reason, we need a comprehensive conceptual framework on the assessment of significant developments in terms of volume of loans and interest rates applied on this volume.

As supported by the theory, the demand for credit is a function of the volume of loans that borrowers are willing to ask for a certain interest rate. A higher interest rate reduces the demand for new loans. For this reason, our paper evaluates the relationship between the loan volume and the performance of interest rate. The evolution of interest rates reflects a diversified group of factors. The main factor is the cost of financing for banks. The supporting literature, explaining the setting of interest rates, assumes that banks operate in a market in which they have "power" in setting the interest rates, and therefore these rates are adjusted with a time lag and do not reflect the full cost of financing. The cost of financing reflects reactions against the change in base interest rate, which is the priority for the implementation of monetary policy by central banks.

The purpose of this paper is to evaluate the relationship between the performance of new loans, interest rate and the quality of the loan portfolio in Albania. Our study uses the evaluation of time-varying correlations to assess the strength in the relationship between each indicator. The structure of the paper is as follows: Section 2 summarizes the main developments of the loan

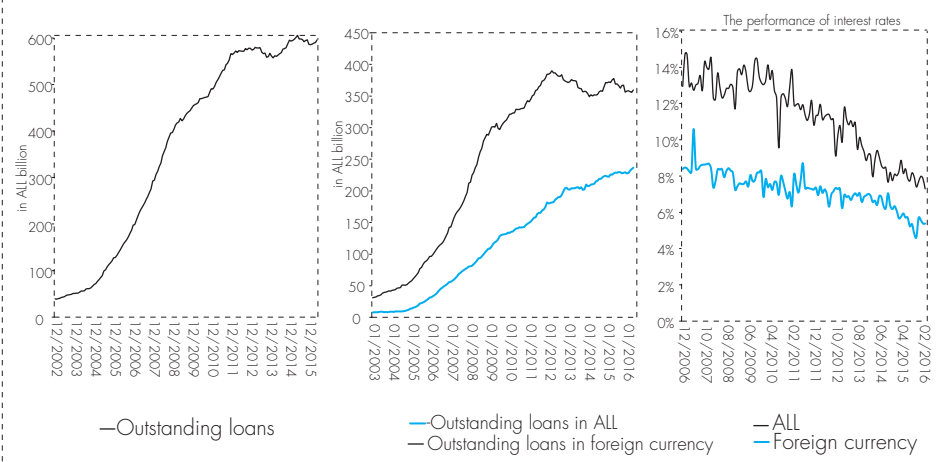
¹ *The views expressed herein are of the authors and do not necessarily reflect the views of the Bank of Albania*

portfolio indicators, before and after the global financial crisis. In section 3 we present a summary of the literature related to lending, interest rates and loan portfolio quality. Section 4 summarizes the methodology of constructing time-varying correlations, while section 5 presents the results of the evaluation.

2. KEY DEVELOPMENTS IN ALBANIAN CREDIT INDICATORS

The Albanian economy was faced with a rapid credit growth, particularly after 2004, which coincided with the privatization of the largest bank in the country, and followed the entry of well-known foreign bank groups, encouraging lending and increasing competition. Lending in foreign currency and that for businesses, recorded a significant increase during 2004-2010, giving an impact to the positive performance of loans. The ratio of foreign currency loans to total loans reached 80% in 2004, and after 2008, it has been on a downward trajectory. The rapid credit growth in foreign currency was due to the lower interest rate and the huge gap created between lending interest rates in domestic and foreign currency loans (mainly during 2004-2009). The interest rate for loans in foreign currency was significantly lower than that for loans in local currency. In the period after the crisis of 2008, banks and businesses were oriented more towards lending in local currency. This helped in supporting the reduction of high euroisation of the loan portfolio. Since the end of 2012, the annual credit performance in ALL appears to be positive, expanding significantly from year to year. Meanwhile, the outstanding loans in foreign currency during this period appeared with negative annual performance. These developments have narrowed the gap between total credit in domestic and foreign currency. Currently, loans in domestic currency occupy 40% of outstanding loans, from 33% in 2012. Credit growth in local currency in recent years, is supported by the continuing decline in the interest rate for these loans. The cost of credit in ALL has followed the performance of base interest rate (key instrument of monetary policy). The base interest rate has been changed 10 times since the end of 2012, reaching the new historical minimum of 1.5% (in April 2016). Interest rates for foreign currency loans have also declined, but their decline in the past 10 years was moderate. The difference between local-currency loans interest rates and those in foreign currency has declined significantly, supporting the portfolio shift to lending in domestic currency. Although the pace of credit growth was very high (during 2004-2011), loans-to-deposits ratio remained at low levels, which showed that banks had still spaces (and funds) to lend money.

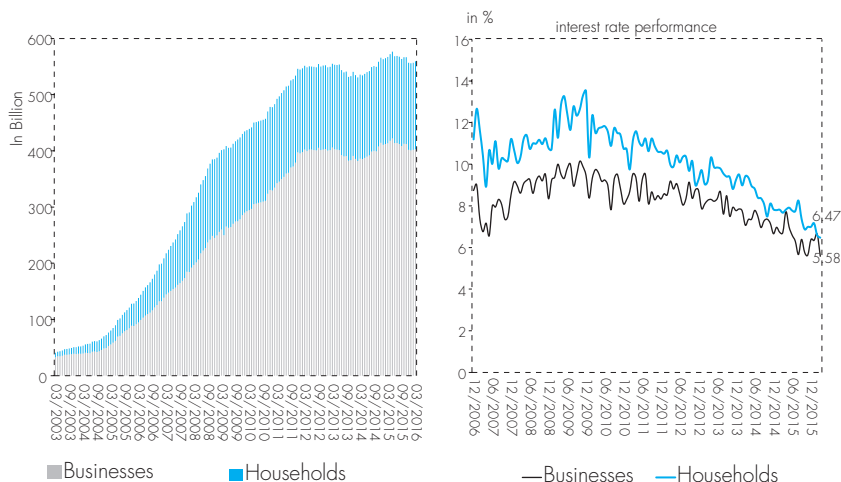
Graph 1 Performance of loans and interest rates (domestic vs. foreign currency loans)



Source: Financial Stability Department, Bank of Albania.

During 2004-2008, banks oriented their lending portfolio toward households. The loan granted to households reached its maximum share in total loans, around 37%, in 2007. After 2008, the banks shifted their focus on businesses. At the end of March 2016, loans granted to non-financial corporates, represented 68.4% of total loan portfolio, while that for households was at 26.6%. Business loans appear to be cheaper than household loans. Both of them have reported a decrease in the weighted average interest rate over the years. Considering household loans, consumer credit is more expensive than mortgage loans, reflecting the higher risk coming from the uncollateralized consumer loans. Mortgage loan accounts for about 70% of outstanding loans granted to households and its average interest rate is around 3.98%.

Graph 2 Performance of loans and interest rates (by purpose of use)



Source: Financial Stability Department, Bank of Albania.

After the outbreak of the global financial crisis, especially after 2009, credit growth started to slow down to very low levels. In March 2016, annual credit growth recorded -1.4%.

Referring to Vika and Suljoti (2015), despite the lowering of credit cost, credit remains weak and banks have used non-price credit standards to tighten the supply. The shortening of credit maturity, the increase of collateral requirements and the increase of the "income to instalment" ratio were the core elements that they have used to tighten the supply.

3. LITERATURE REVIEW ON CREDIT INDICATORS

The literature suggests that there is a strong correlation between the performance of credit and interest rate. According to Castro and Santos (2010), in a study on interest rates and loan determinants show a long-term negative relationship, thus an increase in the interest rate implies a reduction in credit. This effect is more significant for loans to households than for loans to non-financial corporations. The results also show that changes in the money market are reflected in all areas of lending, especially for consumer loans to households. According to Martins and Villanueva (2003), the impact of changes in the interest rate on long-term household borrowing is an important parameter for assessing the effectiveness of public policies. First, because the response of household borrowing to changes in interest rates helps us to understand the determinants of investing in housing wealth and second, because the amount borrowed responds negatively to the change in the interest rate, although it is difficult to interpret the magnitude of the response.

Furthermore, we extend our study on the effect of different economic policies on the performance of credit indicators. In this context, for example, an easing monetary policy with low interest rates is expected to have a number of implications on the financial stability of a country. Gambacorta (2011) suggests that low interest rates reduce credit risk in banks portfolios in the short term, since the volume of outstanding loans is larger than the volume of new loans, but they raise it in the medium term. Conversely, low long-term interest rates do not soften lending standards, they tend to amplify risk-taking, expose financial institutions to losses arising from a future tightening of monetary conditions and delay adjustment in their balance sheets. For this reason, the impact of the interest rate changes should also consider the long-term effects on financial stability.

Regarding the indicators of loan portfolio quality, our study refers to the correlation of non-performing loans with new loans allocated in the economy. Various authors focus on the impact of non-performing loans on various macro-financial indicators. According to Saba et al (2012), an increase in the NPL ratio is referred often as the failure of credit policy and the reason behind it, is a low repaying capacity of borrowers, which in turn is the result of uneconomic use of loans, low per capita, and high interest rates. The increase in the NPL ratio is the main reason for the reduction in earnings of banks; therefore, it is

clear why the NPL ratio is most crucial for banks. Determinants of this indicator involve different categories: bank specific determinants, macroeconomic variables and the regulatory framework. In bank specific factors, total loans, and credit policy are important. According to a study by Keeton and Charles (1987), macroeconomic conditions are the reasons that cause a low payback. These authors also conclude that too much loaning in a sector is the major cause of high non-performing loans and a risk-taking behaviour of banks also leads to higher loan losses.

Similar studies suggest a balanced allocation of credit across all sectors of the economy, while considering certain conservatism in credit expansion.

The deterioration of the loan portfolio quality, which in Albania accelerated and started to be problematic after 2009, is a result of rapid credit growth during the period before the crisis. This is because during the expansion of loan portfolio, it was allocated mostly to those borrowers (businesses or individuals) that usually are considered as "high risk" borrowers.

According to an IMF study (2006), during a rapid credit growth, the share of non-performing loans to total loans decreases at the beginning, because a new loan portfolio needs time to show problems. But as the loan portfolio matures, the ratio of non-performing loans begins to grow, even above previous levels. This is what in the literature is known as the "aging effect", according to which the impaired loans peak 3-4 years after loan allocation (Borio et al., 2001). According to a study by Ceca and Shijaku (2011) on a model on credit risk in Albania, the authors have come to the conclusion that there is an important effect of changes in the euro exchange rate and Euribor interest rate in the NPL ratio, while the effect of GDP growth, although low, is also of particular importance. Strengthening of euro toward local currency has increased the probability of default, expanding the ratio of non-performing loans (Ceca and Shijaku, 2011). A study made by central bank of Romania (Socol and Iuga 2010), on the correlation between the average interest rate and non-performing loans in the Romanian banking system during 2006-2010, is based on the Pearson correlation coefficient, to demonstrate how these two banks elements relate to each other. Also the outcome of this study suggests that there are other indirect channels, which affect the performance of asset quality. Through this study, authors have come to the conclusion that there is an inverse correlation between the average interest rate and non-performing loans, which is explained by the following reasons: decrease in the prices of collateral loans, especially for real estate collateralized loans; pressure through inflation, which contributes to the increase of non-performing loans; unemployment and economic contraction, etc.

In an effort to make more useful estimates, the above theoretical framework is taken into account in the selection of indicators to build dynamic correlations, application of the selected methodology and their analysis through financial stability framework.

4. METHODOLOGY AND DATA

The usage of correlations is commonly widespread in the portfolio theory, under which the aggregation of risky assets with a high correlation with each other in a certain portfolio, increases the overall risk of the portfolio, because all assets tend to co-follow the movements in the financial markets. In contrast, the low correlation between them, results in a lower risk of this portfolio. For this reason, the information coming from the correlation of different financial indicators, finds a valuable use in empirical analysis.

Unlike a simple cross correlation, the time-varying correlations enable the assessment of the relationship between different indicators dynamically. As a result, we can detect periods that reflect a strengthening of the relationship between the indicators and periods which show its mitigation. As such, the methodology of constructing this type of correlation is widely used in the construction of financial stress indices, due to the interlinkages of the sub-indices with each other².

The time-varying correlations take value in a range of $[-1, 1]$, where the lower value indicates a strong negative correlation between the two analysed indicators, while the higher value indicates a strong positive correlation between these two indices.

To aggregate the information provided by the raw data, the estimation methodology that applies is as follows:

Firstly, in order to construct the correlation between indicators with a different unit, each of the indicators is standardized:

$$z_{i,t} = \frac{\hat{z}_{i,t} - \mu_{i,t}}{\sigma_{i,t}} \quad (1)$$

Where $z_{i,t}$ is the standardized indicators at period t
 $\mu_{i,t}$ is the average of the indicator for the whole period
 $\sigma_{i,t}$ is the standard deviation of the relevant indicators

Further, each indicator is scaled from 0 to 1 through a logit transformation:

$$y_{it} = 1/[1 + \exp(\tilde{y}_{it})] \quad (2)$$

where y_{it} are relevant indicators after the logit transformation for the period t . The construction the time-varying correlations, relies on a recursive estimation

² For a financial stress index for the euro area see Hollo et al. (2012), "A composite indicator of systemic stress in the financial system" and Kota and Saje (2013), "An index of financial systemic risk in Albania" for a similar index for our country.

using the Exponentially Weighted Moving Average (EWMA). This approach means putting a higher weight to the relatively new information provided by the most recent observations compared to the more distant ones (Horasanli and Fidan, 2007). EWMA model assumes that the volatility is not constant over the estimated horizon and it uses the respective covariances-variances of the indicators as given below:

$$\sigma_{ij,t} = (1-\lambda) \sum_{k=1}^{\infty} \lambda^{k-1} \bar{s}_{i,t-k} \bar{s}_{j,t-k} = (1-\lambda) \bar{s}_{i,t-1} \bar{s}_{j,t-1} + \lambda \sigma_{ij,t-1} \quad (3)$$

$$\sigma_t^2 = (1-\lambda) \varepsilon_{t-1}^2 + \lambda \sigma_{t-1}^2 \quad (4)$$

$$\rho_{ij,t} = \sigma_{ij,t} / \sigma_{i,t} \sigma_{j,t} \quad (5)$$

where σ_{ij} , $i=1..4$, is the ij^{th} element of the variance-covariance matrix (Σ_t) of the demeaned variables, the latest denoted by \bar{s}_{it} and is the decay parameter with $\lambda \in (0, 1)$. For $i \neq j$ Eq. (5) gives estimates of the conditional covariances at time t , while for $i=j$ it estimates the time-varying variances. The value of the decay parameter λ determines the persistence in the (co)variance process. A high value of λ (i.e. $\lambda \rightarrow 1$) means high persistence and low reaction to past movements of the variables and vice versa. The closer this parameter is to one, the more weight is put on the previous period estimate relative to the current period's observation (Zivot and Wang, 2006). The value of used for our estimations is set $\lambda=0.94$.

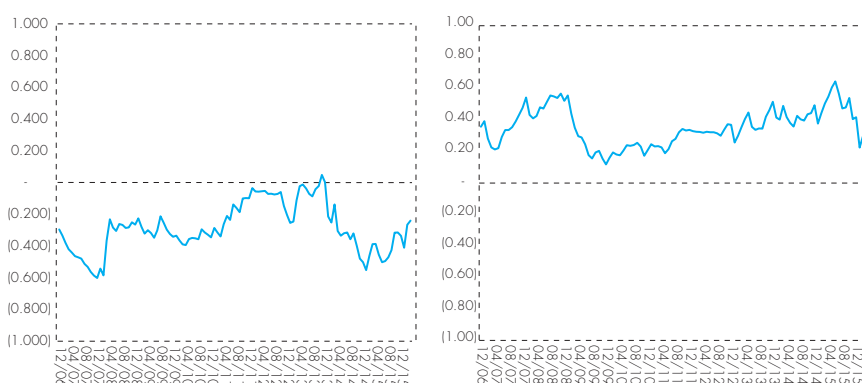
Based on the above methodology we have evaluated the dynamic relationship between different indicators in an aggregate level and their impact on the lending of our banking sector. In particular, we focus on the correlation of new loans (by currency, terms of maturity and purpose of use) with the interest rates and also on the impact of non-performing loans on new credit allocated by our banking sector. The indicators used have a monthly frequency and the time series start on December 2006 to March 2016. The new loan data means a monthly flow of loans, while the non-performing loans include "substandard", "doubtful" and "loss" loans. The criterion used to determine a loan as "non-performing" is the number of days past due (90 days). The average interest rate is calculated as the weighted average interest rate on loans with the flow of new loans for each bank of the sector for the given period of time. Meanwhile, the base interest rate is used as a monetary policy instrument to achieve the main objective of the central bank.

5. RESULTS ON TIME-VARYING CORRELATIONS

The results on the application of the methodology on the data described above are diverse and are the following:

According to the estimation of the time-varying correlation between the interest rate and new loans, the findings show a negative correlation between the base interest rate and the monthly inflow of loans in ALL. This correlation has become stronger particularly in late 2014 and has remained such throughout 2015, showing a growth of new loans in domestic currency in terms of a monetary policy easing. On the other hand, the correlation between new loans in foreign currency and the base interest rate is positive and stronger during the period in which the negative correlation between the base rate and new loans in domestic currency has reinforced, expressing a descending flow of credit in foreign currency with the fall of this rate. These correlations clearly reflect the effect of the fall of base interest rate on new loans in local currency.

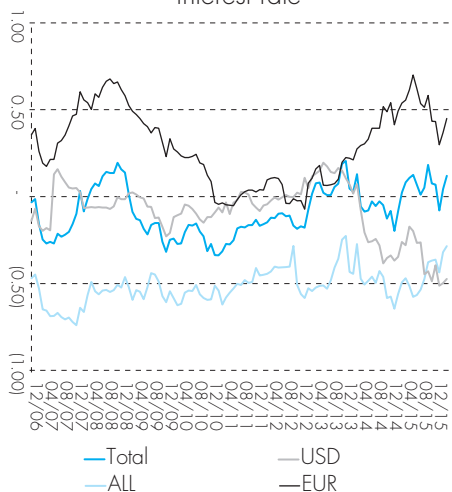
Graph 3 Correlation between new loans and key rate



Source: Financial Stability Department, Bank of Albania.

The relationship between new loans and the interest rate by currency shows a strong positive correlation between the volume of new loans in euro and the loan interest rate for this currency. This correlation has grown steadily since 2013, with the highest point at the end of the first half of 2015, with a value of 0.7, indicating a slowdown of new loans in euro despite the fall in the interest rate for this currency. On the other hand, there is a negative correlation between new loans and the interest rate in the domestic currency, showing an increase in the volume of new loans in ALL in terms of declining interest rates. Fuelled by an expansionary monetary policy in the latter years and the sources of financing, the performance of these correlations shows an orientation of the banking sector towards lending in domestic currency along with a decrease of lending in other currencies. However, the correlation between the volume of new loans and the weighted interest rate appears to be weak but remains positive, driven by the weight of foreign currency lending to total loans.

Graph 4 Correlation between new loans and interest rate

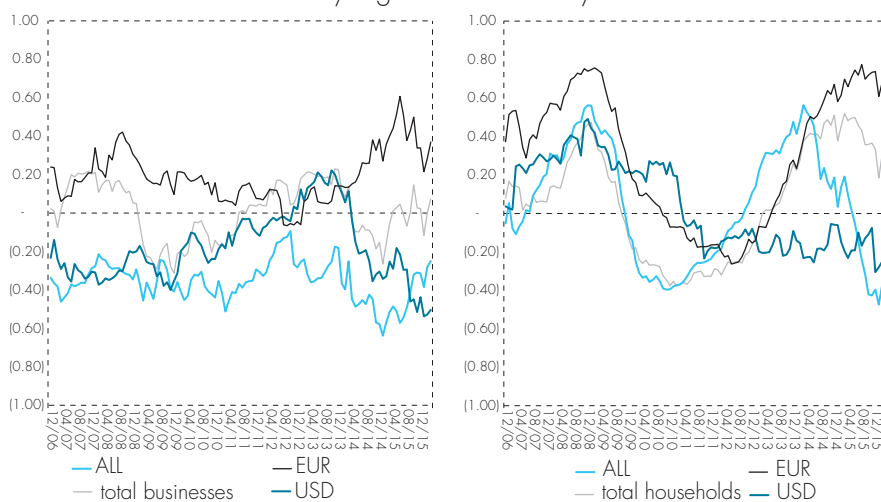


Source: Financial Stability Department, Bank of Albania.

The same trend is shown by the correlations built on new loans to businesses and the respective interest rates by currency, influencing the pace of the correlations between outstanding loans and the interest rates. Unlike businesses, the correlation between the volume of new loans and the interest rate shows another rhythm for the households. This correlation is positive since 2007, reaching the highest point in early 2009. Further on, the correlations reached a negative value, showing a trend of recovery in the flow of new loans in terms of the interest rate decline. Furthermore, the correlation between new loans and the interest rate of loans in euro and the correlation of new loans and the interest rate in domestic currency have returned to positive values, thus affecting the correlation between the total flow of new loans to households with the weighted interest rate. Finally, after the first half of 2015, the correlation between

new loans in ALL and the corresponding interest rate appears to be negative both for businesses and households, reflecting the decrease in the interest rate of loans in domestic currency in the rise of the volume of new loans. Currently, this negative correlation is stronger for households.

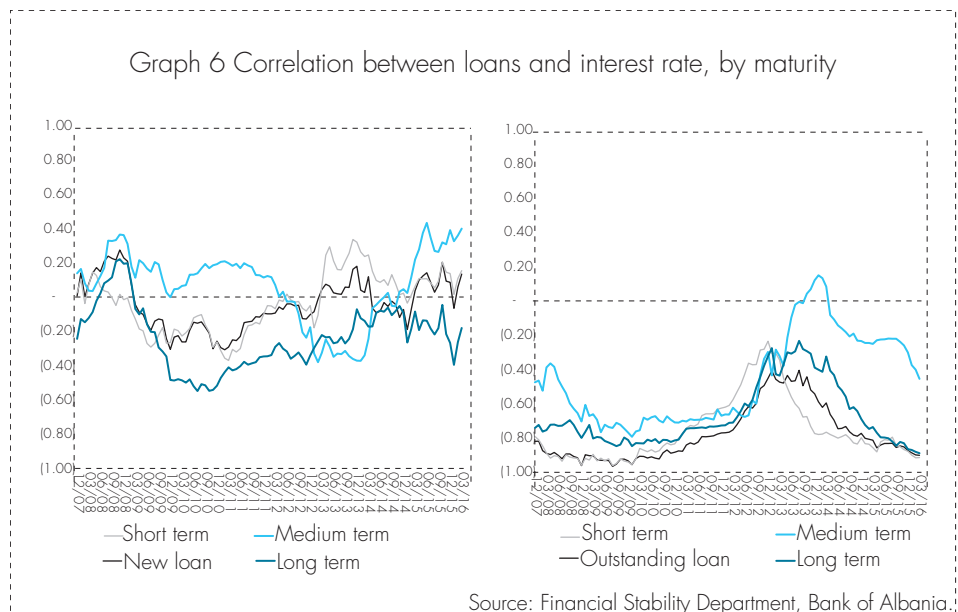
Graph 5 Correlation between new loans and interest rate, by segment and currency



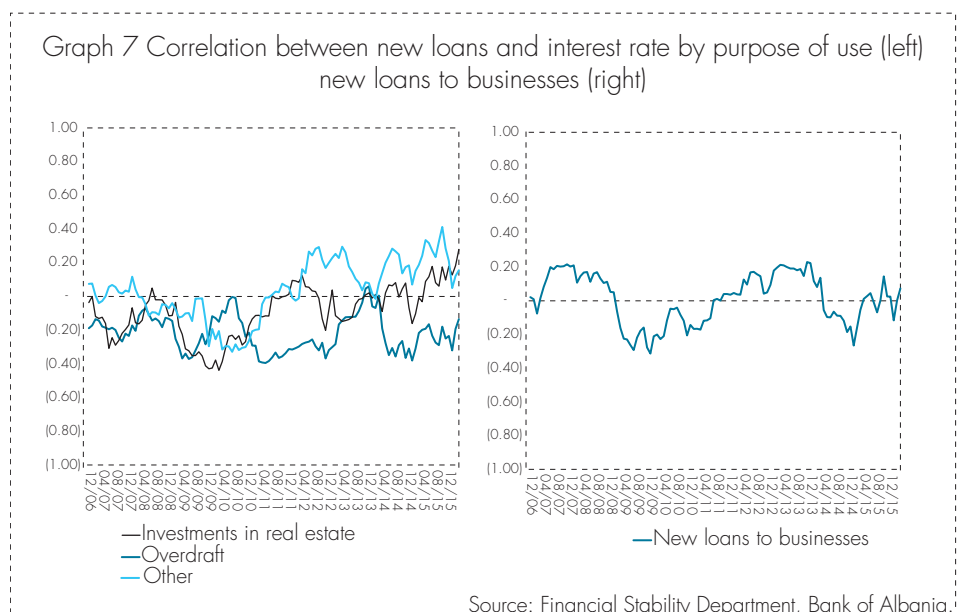
Source: Financial Stability Department, Bank of Albania.

The time-varying correlations between new loans and interest rates by terms of maturity fluctuate during the analysed time frame; however they have positive values, with the exception of the correlation between interest rates for long-term loans and new long-term loans, which shows negative values. Hence, the decline in these long-term rates is reflected in the growing volume of new loans for this term of maturity. However, the correlation between the outstanding loans and corresponding rates indicates an increase in outstanding loans in terms of declining interest rates. This correlation is negative and reinforced in the recent years, reflecting the opposite direction of changes in interest

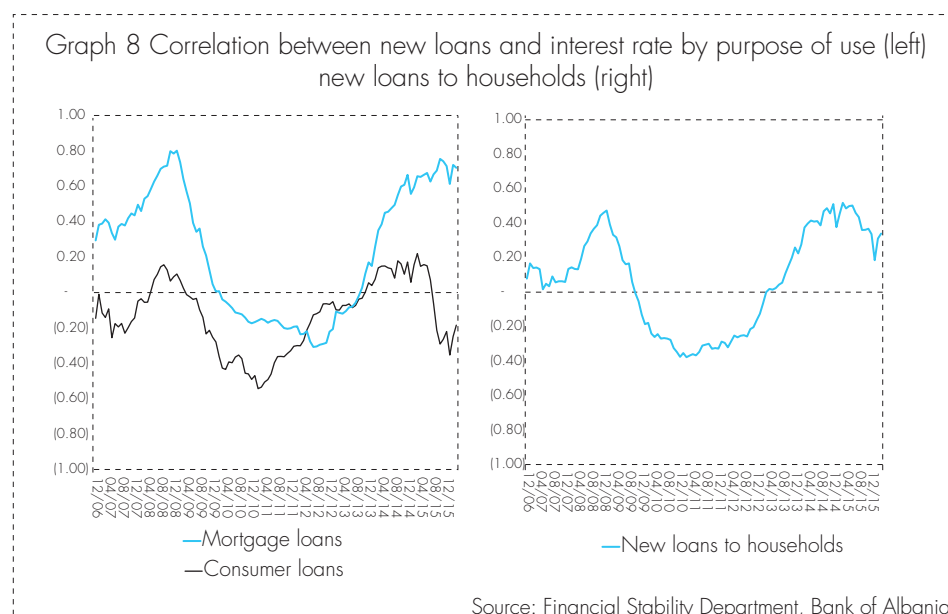
rates compared to outstanding loans, especially short-term and long term outstanding loans.



The time-varying correlations according to the purpose of use for businesses appear negative for the overdraft, showing an upward swing for this product in terms of declining interest rates, while the correlation does not appear quite strong between the new credit for real estate and the related interest rate, despite the positive values. The positive correlation of the latter has strengthened in the last year, expressing a decrease in the demand of new loans despite the continuous fall of interest rates. Other purposes which include investment in machinery and equipment purchase and working capital also give a positive correlation, reflecting changes in the same direction for new loans and the interest rates for these purposes of use. However, the share of overdraft in the structure of new loans for businesses affects in general in a weak positive correlation between interest rates and new loans for this economic agent at the end of the first quarter 2016.



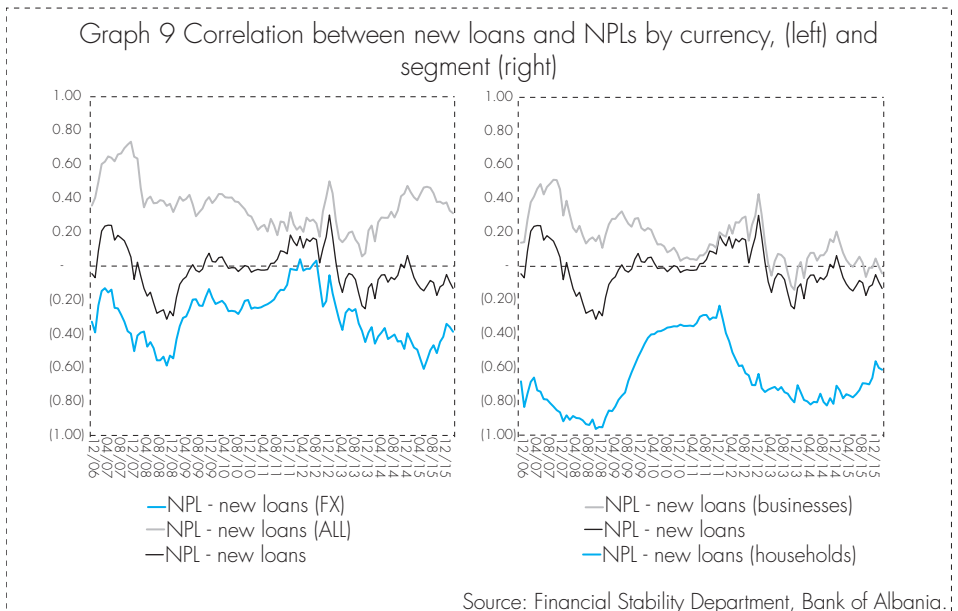
For households, mortgage loans have a positive correlation with the loan interest rate for this purpose since the end of 2013, while the time-varying correlations for consumer loans fluctuated between positive and negative values. However, this correlation appears weak, providing a relaxing effect on the correlation between the total flow of new loans and the weighted interest rate for this economic agent. The positive correlation of the mortgage loans and the corresponding interest rate could be a reflection of the developments in the housing market, the banks' lending standards and a weaker demand for real estate loans by households during this period.



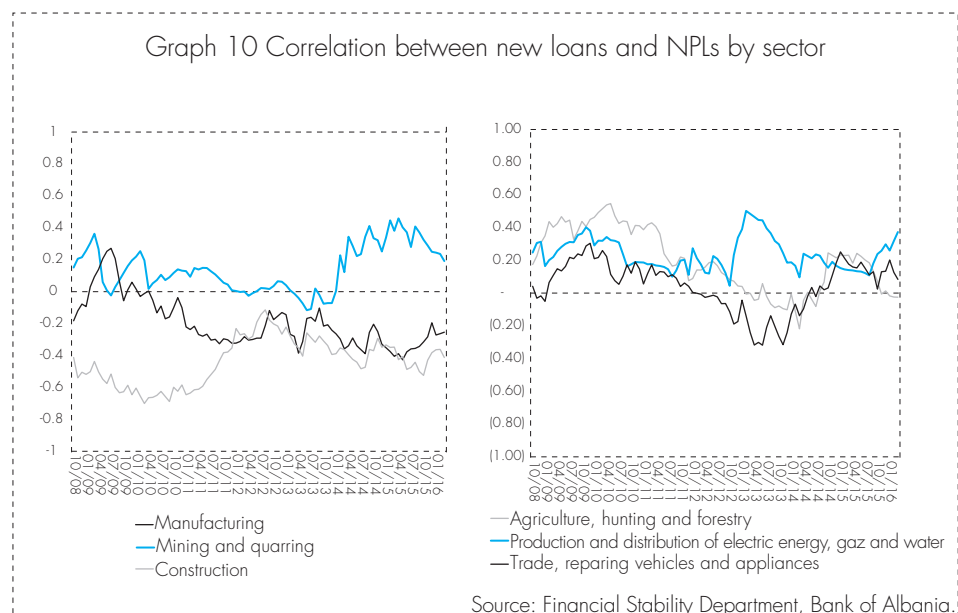
Results on time-varying correlations between non-performing loans and new loans show a weak negative relation for non-performing loans and loan inflows. This poor negative correlation comes as a balance of a positive correlation between new loans and the NPL rate for loans in domestic currency versus a negative correlation of new loans and the rate of non-performing loans in foreign currency. The positive correlation for the domestic currency does not appear strong. The continuous improvement of credit quality granted in domestic currency during the past two years, has given a smoothing effect on this correlation. As for the lending in foreign currency, periods that correspond to a decline in the ratio of non-performing loans (mainly the end of 2014 to the end of 2015) coincide with a stronger negative correlation, showing an increase of the inflow of these loans in terms of the decline in the NPL ratio. On the other hand, the period with the highest NPL has resulted in a weakening of the correlation.

The non-performing loans ratio appears weakly correlated with the business lending, while showing a pronounced negative correlation for households. Therefore, the accelerated growth of the non-performing loans (2008-2012) seems to have contributed significantly to the new credit to households, while the continuous improvement of the credit quality for households in the recent years has led to the expansion of new loans to households, resulting in a

strengthened negative correlation (NPL ratio - new loans). However, due to a higher weight of lending to businesses, the correlation between the total inflows of loans follows the path of the correlation between non-performing loans and new loans for this economic agent, although softened and characterized by values very close to zero.



The estimation of the time-varying correlations between new loans allocated to the main sectors of the economy and the non-performing loans ratio of these sectors, are negative for the construction sector and the manufacturing industry. Hence, for these two sectors, the growth of non-performing loans accompanies a lower level of new loans inflow for the period. However, these correlations do not appear very strong currently and hold onto values of lower than 0.5. For the mining and quarrying industry, the production and distribution of electricity, gas and water, as well as wholesale and retail



trade, the correlations hold positive values at present, although not very strong for each of them. Likewise the wholesale and retail trade, agriculture has fluctuated between positive and negative values, while recently maintaining values close to 0 and showing a weaker correlation between new loans and the non-performing loans ratio for this sector.

6. CONCLUSIONS

In Albania, likewise many other countries, lending has shown significant changes in the past ten years. Our study provides detailed information regarding the interconnections of the performance of interest rates and new loans, in different ways. An important factor in the performance of lending, which shows a negative time-varying correlation, is the base interest rate (the main instrument of monetary policy, whose objective is to maintain price stability). From the obtained results, we conclude that the reduction of the base interest rate has lowered the interest rate for loans in domestic currency, thus helping the domestic currency lending. Our banks have been exposed (and still are) to the indirect exchange rate risk due to approximately 60% of the loans granted in foreign currency, while almost 44% of foreign currency loans are unhedged against the exchange rate risk. The evaluation of the foreign currencies (especially of the euro), would increase the insolvency of these agents. Consequently, the decrease of the base interest rate and therefore the decrease of the interest rate for loans in domestic currency, leads to a lower weight of foreign currency lending and a rather lower indirect exchange rate risk, while expanding lending in the domestic currency. Finally, the correlation between new loans in ALL and the relevant interest rate appears negative both for businesses and households, reflecting the decrease in the interest rate for loans in domestic currency in the increasing volume of new loans. Currently, this negative correlation is stronger for households. The correlation between new loans to businesses and interest rates has shown fluctuations over the years and does not appear to be strong. Consequently, this shows that businesses are less dependent on the performance of the interest rate. Other factors, such as a narrowing credit supply by banks, unfavourable macroeconomic conditions etc., have been some important factors that have become an obstacle on the dependence on the performance of new loans on the decrease of the interest rates in recent years for businesses. For households, there is a positive correlation between the interest rate for the real estate loans and new loans for this purpose, indicating that the decline in interest rates has not helped the boost of lending for this purpose during the recent years. This approach may have reflected the developments in the housing market, the lending standards of banks and a weaker demand for real estate loans of the households during this period.

Regarding the impact of non-performing loans on new loans, there is a negative correlation between non-performing loans and the inflow of new loans, thus a negative impact of the performance of non-performing loans to the lending of the economy. The continuous improvement of the credit quality granted in domestic currency during the past two years, has given effect in the

mitigation of this correlation. The non-performing loans ratio appears weakly related to business lending, while showing a pronounced negative correlation for the households. The estimation of the correlations for new loans allocated to the main sectors of the economy and the non-performing loans ratio for these sectors, result negative for the construction sector and the manufacturing industry, negatively affecting the expansion of lending to these sectors. In these conditions, based on the above results, the improving credit quality is expected to give a positive impulse to the expansion of new loans.

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BANKING STABILITY AND ITS DETERMINANTS: A SENSITIVITY ANALYSIS ON METHODOLOGICAL CHANGES

By Gerti Shijaku, Research Department, Bank of Albania

1. INTRODUCTION

Maintaining financial stability and a well-functioning financial system is the primary target of the Bank of Albania¹, in addition to the basic objective of maintaining price stability [Bank of Albania, (2015)]. Therefore, it identifies and acts to mitigate the risks that threaten the stability of the financial system. In the one hand, this objective is supported by processes of licensing, regulation and supervision of banking activities, as well as through the implementation of initiatives to improve the payment system, which is under the responsibility of the Bank of Albania. On the other hand, within the development of macro-prudential policies, it follows a monitoring process through several indicators and methodologies, which assess different aspects of financial stability².

However, constructing a proper proxy to illuminate for the state of the financial sector poses a significant challenge for regulators. First, the choice must reflect the financial structure of the country [ECB (2007)]. In fact, the banking sector constitutes the most important segment of the Albanian financial system and as such, requires more attention when it comes to its financial analysis [Kalluci, (2011)]. Second, it must include a wide range of information to account for financial innovations that have accelerated the many financial processes [Boudebboos and Chichti (2013)]. At the same, it should allow policy-makers to monitor the stressful situations as they are developing and also such index should be applicable for cross-section comparisons. Finally, as it was the case during the Global Financial Crises, the proxy must consider the state of banks behaviour on individual basis since the sensitivity to market conditions is linked with banks individual conditions.

For these reasons, this paper presents a new methodology for calculating a stability index for the Albanian banking system, which is based on the on-site balance sheet data reported by banks and reflects the state of the banks individually. The purpose of this paper is to analytically assess bank stability after the global financial crisis, as well as empirically assess internal and external factors related to banking stability. In particular, the paper analyses the sensitivity of results to methodological changes.

The remainder of the paper is structured as follows. The next section presents the methodology with regards to model specification and data. Results are presented in Section 3. The material concludes in section 4.

¹ The role of the Bank of Albania to maintain financial stability is defined in the Law No. 8269, dated 27.12.1997 "On the Bank of Albania" and Law No 10 481, dated 17.11.2011 on amendments to Law No. 9662, dated 18.02.2006 "On banks in the Republic of Albania".

² See also Bank of Albania (2015) for more on the methodologies approach by Bank of Albania to monitor systemic risk, p. 66-67.

2. METHODOLOGY, VARIABLES AND DATA

2.1. BANK STABILITY INDICATOR

In contrast to other indexes calculated at the Bank of Albania³, the starting point of measurement and assessment of bank stability is the Uniform Financial Rating System, introduced by the US regulation in 1979, referred to as CAELS rating (Capital adequacy, Asset quality, Earnings, Liquidity and Sensitivity to market risk (See Table 2 in Appendix)⁴. First, each indicator included in each of these categories is normalised into a common scale with mean of zero and standard deviation of one⁵. The formula is given as:

$$Z_t = \left(\frac{X_t - \bar{\mu}}{\bar{\sigma}} \right) \quad (1)$$

Where, X_t represents the value of indicator X during period t ; μ is the mean and σ is the standard deviation. Second, all the normalised set of correlated indicators used within one category is then converted into a single uncorrelated index by means of the statistical procedure, namely the principal component analysis (PCA) approach, which is yet again standardised through the procedure in Eq. (3). Then, the estimated sub-index are transformed between the values [0, 1] using exponential transformation $[1 / (1 + \exp\{-Z^*\})]$. Finally, the stability indicator is derived as a sum of the estimated exponential transformed sub-indexes, as follows:

$$Y_{tw} = \omega_1 \sum_{i=1}^n Z_{t,C}^* + \omega_2 \sum_{i=1}^n Z_{t,A}^* + \omega_3 \sum_{i=1}^n Z_{t,E}^* + \omega_4 \sum_{i=1}^n Z_{t,L}^* + \omega_5 \sum_{i=1}^n Z_{t,S}^* \quad (2)$$

$$\sum_{*=a,b,c,d,e} \omega^* = 1 \quad (3)$$

Where, n is the number of indicators in each sub-index; 'C' relates to the capital adequacy; 'A' represents a proxy to asset quality; 'E' represents a proxy for earnings; 'L' represents a proxy for liquidity; and 'S' is related to the sensitivity of market risk.

³ See also Kalluci (2011); Kota and Saqe, (2013); Shijaku (2014); Saqe, et. al., (2015).

⁴ This approach is also used by International Monetary Fund Compilation Guide 2006 on Financial Soundness Indicators, but others authors e.g. Sere-Ejembi, et. al., (2014).

⁵ Normalizing the values avoids introducing aggregation distortions arising from differences in the means of the indicators.

2.2. BENCHMARK MODEL SPECIFICATION APPROACH

The empirical model specification is based on an extensive review of previous studies related to bank fragility moments, in particular those undertaken by Betz, et. al., (2014) and Black, et al. (2016), and is expressed as follows:

$$Y_{i,t} = \alpha + \beta * X'_{i,t} + Z'_{i,t} + Y'_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

Where, $Y_{i,t}$ is a stability indicator [CAELS] of bank i at time t , with $i = 1, \dots, N$ and $t = 1, \dots, T$. α is a constant term. $X'_{i,t}$ is a vector of explanatory variables grouped into three main categories: **Banking** $_{i,t}$ is a set of bank-specific explanatory variables that accounts for bank operational efficiency [EFFICIENCY] and financial leverage [LEVERAGE] patterns; **Market** $'_{i,t}$ is a set of industry explanatory variables to account market share of the bank [SIZE]; **Macroeconomics** $_{i,t}$ is a set of control variables that account for state of economy [GDP] and pass-through effect of the relatively price of higher risk [PSRISK]; $Z'_{i,t}$ is a vector of other explanatory variables that account for GFC [CRISIS], β is a vector of coefficients to be estimated. $\varepsilon_{i,t}$ is an error terms that is assumed to be identically and independently distributed with mean of 0 and variance $\sigma_u^2 A = \pi r^2$.

2.3. DATA

The dataset is composed of bank-specific, industry-specific and macroeconomics variables. The focus is restricted to the Albanian banking system, which consist of 16 banks. We use panel data with quarterly frequency for the period 2008 Q04 – 2015 Q03. That includes a total panel balanced observations with 448 observations and 28 periods.

The variables are approximated as follows. CAELS represents the bank stability condition estimated as explained in Section 3.2.1 (See also Table. 2, in Appendix). It is transformed into an index, taking as the base year the average performance during the year 2010. The bank-specific and industry specific factors are estimated individually for each bank. EFFICIENCY is proxy as gross expenditure to gross income ratio. LEVERAGE is generated as the equity-to-asset ratio. SIZE is expressed as the ratio of individual bank asset to the total banking system assets. The macroeconomic variables are aggregated indicators that represent the state of the economy. GDP represents the gross domestic production. It is transformed in real terms by deflated with the Consumer Price Index (CPI). PSRISK represents the spread between domestic 12 months T-Bills and the German 12 months T-Bills. They are transformed in real terms by subtracting the respective domestic and German annual inflation rate, measured by Albanian and German CPI. All the data represent the end-period values. They are log-transformed, besides the PSRISK that enters the model specification as first difference. CRISIS takes the value of 1 during the period 2008 Q04 – 2010 Q04, and 0 otherwise.

In addition, based on unit root test approach (See Table 2 in Appendix) some of variables included in our model specification are found to be integrated of order 0 (stable). Therefore, these variables [namely *PSRISK*, *EFFICIENCY* and *LEVERAGE*] enter the model in level. The rest enter the model in their first difference since it will transform them into a stationary stance. Finally, data on GDP and CPI are taken from Albanian Institute of Statistics (*INSTAT*). Data on the domestic T-Bills rate are taken from the Ministry of Finance. Data on German 12 months T-Bills rate and CPI are taken from Bloomberg. The rest of the data are taken from Bank of Albania.

3. RESULTS

3.1. BANK STABILITY PATTERNS

The estimated proxy for describing the bank stability condition is presented in Graph 1. It presents the state of individual banks according to two methodologies, namely the simple Average (SA), which does not include Principal Component Analysis (PCA) technics, and the one with PCA approach. The results (Table 3 in Appendix) suggest a relatively strong visual correlation between both approaches, which compiles a correlation for the whole sample at nearly 75%. Before the GFC crisis this correlation is estimated to be at nearly 76%, while it drops at nearly 66% during the crisis and reaches yet again at nearly 75%.

At the same time, results (Table 4 in Appendix) describe state of bank conditions relatively to different periods and among them. Findings based on the SA (PCA) approach suggest that 14 (15) out of 16 banks (or 87% (94%) of the banks) have been better off and at a more stable situation ex ante of the GFC period. However, none of the banks have perform better when compared to the ex post of GFC. The situation is similar with respect to both approaches. However, results demonstrate that 13% of the banks have managed to improve their position compared to the period during the GFC, which according to the PCA approach reaches at nearly 31%. First, findings suggest that most of the banks have been better off before the GFC. Second, all of them have been experienced the negative effects of the GFC, but one third of them have managed to improve their stability position. Most importantly, these results remain relatively robust to the methodological changes.

Similar, for some of the banks the reverse effect has been higher in the aftermath of the GFC. According to the SA approach, for 56% of the banks the negative effects have been higher in the aftermath of GFC compared to 44% that have suffered more during the GFC. These ratios reach in between 70% (30%) according to the CPA analyses. To that, findings show that larger banks (systemic banks) have all suffer more in the aftermath of GFC, which might be linked to the fact that their market position and capital structure have helped them to absorb any turbulent moment. On the one hand, these results imply that banks operating within the Albanian banking system have

experienced differently the effect of GFC. On the other hand, findings support the view that analysing stability condition of the banking system as a whole might limit the degree of information on the performance of banks individually.

3.2. THE EMPIRICAL APPROACH

3.2.1. THE BENCHMARK MODEL

The model is estimated through means of panel Ordinary Least Square (OLS) approach. It consider the period in aftermath of the global financial crises. The sample includes a dataset with quarterly data for the period 2008 Q4 – 2015 Q03, which includes a total panel balanced observations with 448 observations and 28 periods. The results on the parameter estimated are presented in Table 3, Eq. (1) in Appendix.

A glance at the results confirms that bank stability reacts relatively to the responses of other indicators according to the predictions obtained from the theory. In more details, as in Demigruc-Kunt and Detragiache, (2002), a better economic performance is found to have as expected a positive relationship with stability of banks. The estimated coefficient implies that an increase by 1 percentage point (pp) on GDP improves CAELS by nearly 0.7760pp. The effect is found to be statistically significant at 1 percentage (%) level. Second, findings show that CAELS decreases by -0.0102pp for any 1pp negative shocks on PSRISK. This result complements findings by Jutasompakorn, et. al., (2014), but by contrast, the marginal effect is relatively small and statistically insignificant at conventional level.

With regards, to market developments, SIZE has a positive effect on bank stability, but yet again at the magnitude of 0.0426pp this coefficient is relatively small and statistically insignificant at conventional level. Therefore, as Berger and Bouwman (2013) put forward, this is a sign that in the case of Albanian banking industry, economic of scale persist, but might be statistically insignificant due to the possibility that market share is an outcome rather than a target of policy decision-making.

At the same time, CAELS increases by nearly -0.0983pp in response of a 1pp decrease in EFFICIENCY. The coefficient is found to be statistically significant at 1% level, suggesting that efficiency in management is a robust determinant of bank stability. Capital structure is found to have a positive effect on bank stability. Results show that for any 1pp shock effect on LEVERAGE, the empirical response of CAELS is estimated to be nearly 0.0176pp. This effect is statistically significant at 1% level. Finally, both variables that capture for the effect of GFC and the inertia behaviour have negative and statistically significance coefficients. The latter has a relatively higher effect, while the negative coefficients are a sign of mean-reverting properties on bank behaviour.

3.2.2. THE ROBUSTNESS CHECK

In this section we present the results of the set of robustness checks. First, following Berger, et. al., (2013), the benchmark model is augmented to contain two fixed indicators, namely OWNERSHIP and BSIZE⁶. The former capture the degree to which foreign ownership of the bank is be more associated with more risk to the argument that foreign bank have tried to gain higher profit, due to higher spread rates, by increasing lending at the expense of lowering the lending scrutiny criteria. The latter, capture the extent to which larger bank (systemic banks) compared to smaller bank are exposed to greater risk, given their relatively more intensive activity. Second, in the one hand, the benchmark model, both with and without the inclusion of two fixed effects variables [Table 3. Eq. (3) and Eq. (4) in Appendix], is yet again re-estimated with means of OLS under the random effect (RE) approach. On the other hand, it is also re-estimated with means of OLS under the fixed effect (FE) approach [Table 3., Eq. (5) in Appendix]. Finally, all these procedure is also re-evaluated by using a bank stability indicator that follows the procedure in Section 2.1., but instead of the PCA, it is based on the simple average approach. These models are estimated in level based on the results of the Unit Root tests approach (See Table 3 in Appendix). It includes OLS estimation for the period 2008 Q04 – 2015 Q03. The results are presented in Table 3., Eq. (3) to Eq. (5). They show that the behaviour of variables does not change and findings are robust around the same findings as in Eq. (1) analysed in Section 3.2.

The bulk of evidences throughout Eq. (2) to Eq. (5) indicate either the inclusion of the set of fixed effect variables or the econometric methodology changes does not alter the results, which are generally qualitatively similar to the main results of the benchmark specification, Eq. (1). Findings demonstrate the robustness of results with respect to the sign of the coefficient and significance level. With regards to macroeconomic variables, GDP has a positive and statistically significant effect on CAELS. PSRISK continues to exhibit a reverse relationship, which is still relatively small and mostly statistically non-significant across all model specification. SIZE does still affect CAELS positively and at a statistically insignificant manner. Yet again EFFICIENCY continues to be negatively related to CAELS. At the same time, LEVERAGE contributes positively to CAELS. Both of these indicators are statistically significant through all the models. At the same time, the dummy variables on the crises effect and the other one on the inertia hold a relatively similar negative magnitude. Furthermore, turning to the set of fixed effects, the results also are robust to the previous findings. Finally, empirical findings are relatively similar to the findings of CAELS without principal components analysis.

⁶ The former takes the value of 1 if a bank is foreign-owned, and 0 if it is domestic-owned. The latter, takes the value of 1 if a bank is part of the systemic banks as referred by Bank of Albania as Group 1, and 0 otherwise

4. CONCLUSIONS

This paper assesses analytically the stability of the Albanian banking system and builds an empirical model to analyse the impact of factors specifically linked to macroeconomic and sectorial conditions and those that are specifically related to conditions of the stability of 16 banks operating in a small economy open developing, namely Albania during 2008 - 2015. In particular, the paper assesses the extent to which the results of either calculating the stability index or analysing it empirically are sensitive to methodological changes. For these reasons, this paper constructs a bank stability indicator using on-site bank balance sheet information that is provided under the CAELS criterion, following a simple average and a principal component approach. This information is analysis based on both a statistical and empirical approach. The latter includes estimating empirically through means of OLS with random and fixed effects.

First, findings suggest that most of the banks have been better off before the GFC. Second, all of them have been experienced the effects of the GFC, but one third of them have managed to improve their stability position. These results remain relatively robust to the methodological changes. In the realm of empirical findings, results suggest that the macroeconomic variables seem to significantly impact bank fragility, which is not found for the sovereignty primary risk. In return, both market-specific and bank-specific variables have a significant effect on stability condition. The latter, are found to effect stability at a higher and consistent manner. At the same time, mean-reverting properties persist over bank behaviour. The empirical results support the view that stability increase with the lower spread rates and better operations efficiency as well as through a boost in economic performance, bank capital structure and market share. Most importantly, yet again empirical results remained relatively robust and are superficial to methodological changes, which are re-conformed through means of a number of alternative ways to which we run the regression.

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APPENDIX

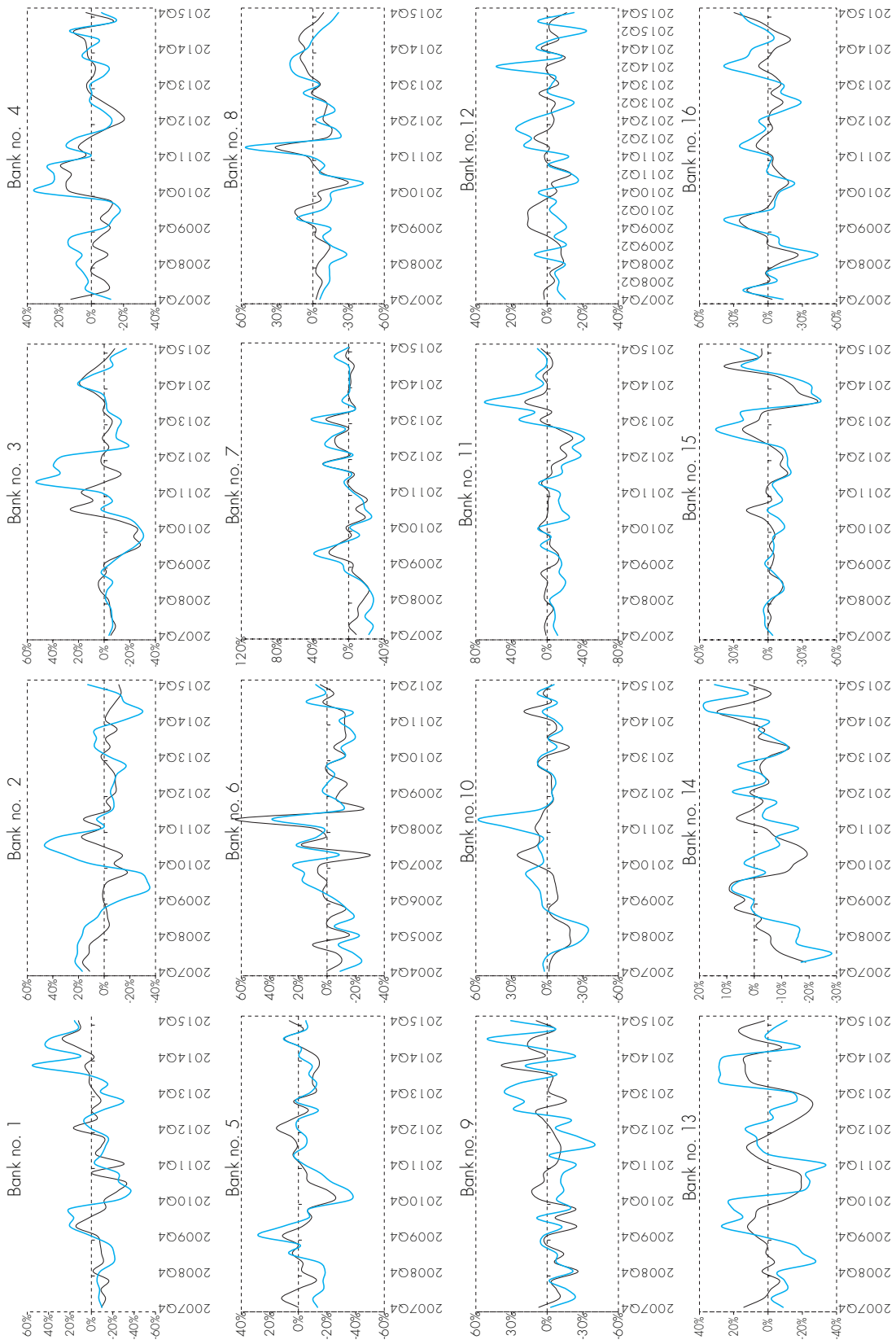
Table 1. Indicators of Bank Stability Index.

Category	Indicator	Notation	Sub-Index
Capital	Capital Adequacy Ratio	C1	ZC
	Core Capital/Total Asset	C2	
	Equity/Total Asset	C3	
	Asset growth	C4	
	Equity Growth	C5	
	Fixed Asset/Regulatory Capital	C6	
	ROE	C7	
Asset Quality	Non-Performing Loan (net)/Regulatory Capital	C*8	ZA
	Non-Performing Loan (net)/Total Loan (net)	A*1	
	Total Loan (net)/Total Asset	A2	
	Growth of Loan Portfolio	A3	
	Credit Loss (Gross)/Total Loan (Gross)	A*4	
	Large Risks (the number of beneficiaries over rate)	A*5	
	Provisions for Loan Loss Coverage/Non-Performing Loan (gross)	A*6	
Earnings	ROA	E1	ZE
	The growth of revenue from interest	E2	
	Interest revenue/Total Revenue	E3	
	Net Interest Margin	E4	
	Efficiency Ratio	E5	
	Interest Revenue (Net)/Operating Revenues (Gross)	E6	
	Dividend/Income (Net)	E7	
	The growth of net interest revenue	E8	
Liquidity	Net Loan/Average Deposits	L1	ZL
	Active Liquid/Total Asset	L2	
	Asset – Passive with a maturity of three months/Total Asset that provide profit	L3	
Sensitivity to Market Risk	Asset – Passive sensitive to interest rate with a maturity up to 3 months/Total Asset that Provide Profit	S*1	ZS
	Asset – Passive sensitive to interest rate with a maturity up to 12 months/Total Asset that Provide Profit	S*2	
	Net Open Position in foreign currency	S*3	

* linked to reverse risk order

Source: Authors' Calculations

Graph 1. Individual Bank Stability Indicator with and without Principal Component Analysis, Annual Growth Rate.



—CAELS —CAELS_PCA

Source: Authors' Calculations

Table 2. Common Sample Descriptive Statistics.

	SA	CPA
Mean	95.8	95.5
Median	95.9	95.3
Maximum	132.4	140.2
Minimum	61.1	42.2
Std. Dev.	12.0	18.0
Skewness	-0.02	0.06
Kurtosis	3.2	2.7
Jarque-Bera	0.85	2.21
Probability	0.65	0.33
Observations	464	464

Source: Author's calculations

Table 3. Correlation Analysis on CAELS: Ordinary

Sample: 2005Q4 2015Q4								
Balanced sample (list wise missing value deletion)								
Correlation, [t-Statistic] (Probability)								
Included observations:	Para KFG		Pas KFG		Pas KFG		Kampioni i tërë	
	MTh	AKK	MTh	AKK	MTh	AKK	MTh	AKK
SA	1.0	—	1.0	—	1.0	—	1.0	—
PCA	0.78	—	0.67	1.0	0.73	1.0	0.75	1.0
	[12.6]	1.0	[15.5]	—	[22.8]	—	[29.2]	—
	(0.000)	—	(0.000)	—	(0.000)	—	(0.000)	—

Source: Author's calculations

Table 4. Bank Stability during the period 2008 Q04 – 2015 Q04

	Period Mean						Sample			
	Before GFC		During GFC		After GFC		Mean		Standard Deviations	
	SA	CPA	SA	CPA	SA	CPA	SA	CPA	SA	CPA
Bank 1	120.5	115.9	102.8	97.3	76.0	71.7	100.7	92.5	21.7	22.0
Bank 2	102.1	110.5	104.7	116.6	95.3	113.2	99.9	112.6	9.5	15.3
Bank 3	132.9	140.5	116.0	118.7	109.9	115.0	122.2	124.8	14.9	15.3
Bank 4	113.0	101.4	103.4	101.3	104.3	114.2	108.0	106.9	8.2	11.4
Bank 5	112.8	130.5	106.6	105.6	89.3	73.5	102.9	100.2	12.1	27.8
Bank 6	108.9	123.7	98.5	93.5	90.8	100.1	100.3	107.2	12.2	17.6
Bank 7	118.0	141.3	96.0	94.8	95.0	99.7	103.5	113.5	13.4	26.7
Bank 8	108.2	152.9	99.3	106.0	87.6	82.6	97.3	112.3	11.7	33.7
Bank 9	133.2	149.9	107.5	104.6	98.6	79.3	112.8	109.4	17.7	36.9
Bank 10	134.0	149.4	101.1	94.4	109.6	117.3	116.6	124.1	16.9	33.2
Bank 11	106.1	136.4	101.9	101.1	88.2	71.7	97.3	100.6	11.2	31.4
Bank 12	99.6	131.0	97.2	101.4	93.0	94.5	96.2	108.9	6.7	22.2
Bank 13	90.4	109.3	97.8	90.5	81.0	80.7	87.7	92.8	9.9	16.4
Bank 14	107.7	116.0	101.7	98.4	85.9	88.7	94.0	96.4	10.9	13.1
Bank 15	116.9	138.6	102.8	101.7	93.3	81.7	105.6	114.4	14.3	21.0
Bank 16	100.5	124.5	97.3	97.4	88.5	99.7	94.5	108.1	8.9	17.8

SA – Simple Average

PCA – Principal Component Analysis

Source: Author's calculations

Table 5. Panel Unit Root Test.

Variable	ADF - Fisher Chi-square			PP - Fisher Chi-square		
	Intercept	Intercept and Trend	None	Intercept	Intercept and Trend	None
ΔCAELS	[0.0000]	[0.0000]	[0.0000]	[0.0018]	[0.0000]	[0.0000]
ΔCAELS_PCA	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
ΔGDP	[0.0000]	[0.0000]	[0.0000]	[1.0000]	[0.0000]	[0.0000]
ΔPSRISK	[0.0000]	[0.0000]	[0.0000]	[0.5971]	[1.0000]	[0.0000]
ΔSIZE	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
EFFICIENCY	[0.0000]	[0.0000]	[0.9649]	[0.0000]	[0.0000]	[0.8965]
LEVERAGE	[0.0000]	[0.0007]	[0.0001]	[0.0000]	[0.0006]	[0.0010]

Note: Δ is a first difference operator. Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: Author's calculations

Table 6. Empirical results on CAELS, with Principal Component Analysis.

	OLS				
	[1]	[2]	[3]	[4]	[5]
C	0.4100 [0.00]	0.5241 [0.00]	0.4100 [0.00]	0.5241 [0.00]	0.6129 [0.02]
ΔGDP	0.7760 [0.03]	0.7736 [0.03]	0.7760 [0.03]	0.7736 [0.03]	0.7758 [0.04]
ΔPSRISK	-0.0102 [0.14]	-0.0104 [0.13]	-0.0102 [0.14]	-0.0104 [0.13]	-0.0112 [0.11]
ΔSIZE	0.0426 [0.62]	0.0397 [0.64]	0.0426 [0.62]	0.0397 [0.64]	0.0710 [0.43]
EFFICIENCY	-0.0983 [0.00]	-0.1198 [0.00]	-0.0983 [0.00]	-0.1198 [0.00]	-0.1526 [0.01]
LEVERAGE	0.0176 [0.00]	0.0117 [0.02]	0.0176 [0.00]	0.0117 [0.02]	0.0379 [0.07]
ΔCAELS(t-1)	-0.3262 [0.00]	-0.3301 [0.00]	-0.3262 [0.00]	-0.3301 [0.00]	-0.3391 [0.00]
CRISIS	-0.0156 [0.08]	-0.0135 [0.14]	-0.0156 [0.08]	-0.0135 [0.14]	-0.0166 [0.08]
OWNERSHIP		0.0086 [0.12]		0.0086 [0.12]	
DSIZE		-0.0224 [0.02]		-0.0224 [0.02]	
Adj. R-squared	0.12	0.13	0.13	0.13	0.11
DW – stat	2.1	2.1	2.1	2.1	2.1
Cross-Section	-	-	RE	RE	FE
Nr. Obs	448	448	448	448	448
Nr Banks	16	16	16	16	16

Source: Authors' Calculations

Table 7. Empirical results on CAELS, without Principal Component Analysis.

	OLS				
	[1]	[2]	[3]	[4]	[5]
C	0.3718	0.4427	0.3718	0.4427	0.5622
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Δ GDP	0.2145	0.2127	0.2145	0.2127	0.2131
	[0.34]	[0.34]	[0.34]	[0.34]	[0.34]
Δ PSRISK	-0.0036	-0.0038	-0.0036	-0.0038	-0.0045
	[0.23]	[0.23]	[0.23]	[0.23]	[0.18]
Δ SIZE	0.0677	0.0698	0.0677	0.0698	0.0951
	[0.20]	[0.16]	[0.20]	[0.16]	[0.08]
EFFICIENCY	-0.0882	-0.1022	-0.0882	-0.1022	-0.1345
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
LEVERAGE	0.0134	0.0090	0.0134	0.0090	0.0234
	[0.00]	[0.01]	[0.00]	[0.01]	[0.18]
Δ CAELS(+1)	-0.2841	-0.2894	-0.2841	-0.2894	-0.3028
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
CRISIS	-0.0039	-0.0025	-0.0039	-0.0025	-0.0035
	[0.35]	[0.57]	[0.35]	[0.57]	[0.55]
OWNERSHIP		0.0104		0.0104	
		[0.04]		[0.04]	
DSIZE		0.0095		0.0095	
		[0.01]		[0.01]	
Adj. R-squared	0.11	0.11	0.11	0.11	0.1
DW – stat	2.0	2.0	2.0	2.0	2.0
Cross-Section	-	-	RE	RE	FE
Nr. Obs	448	448	448	436	436
Nr Banks	16	16	16	16	16

Source: Author's Calculations

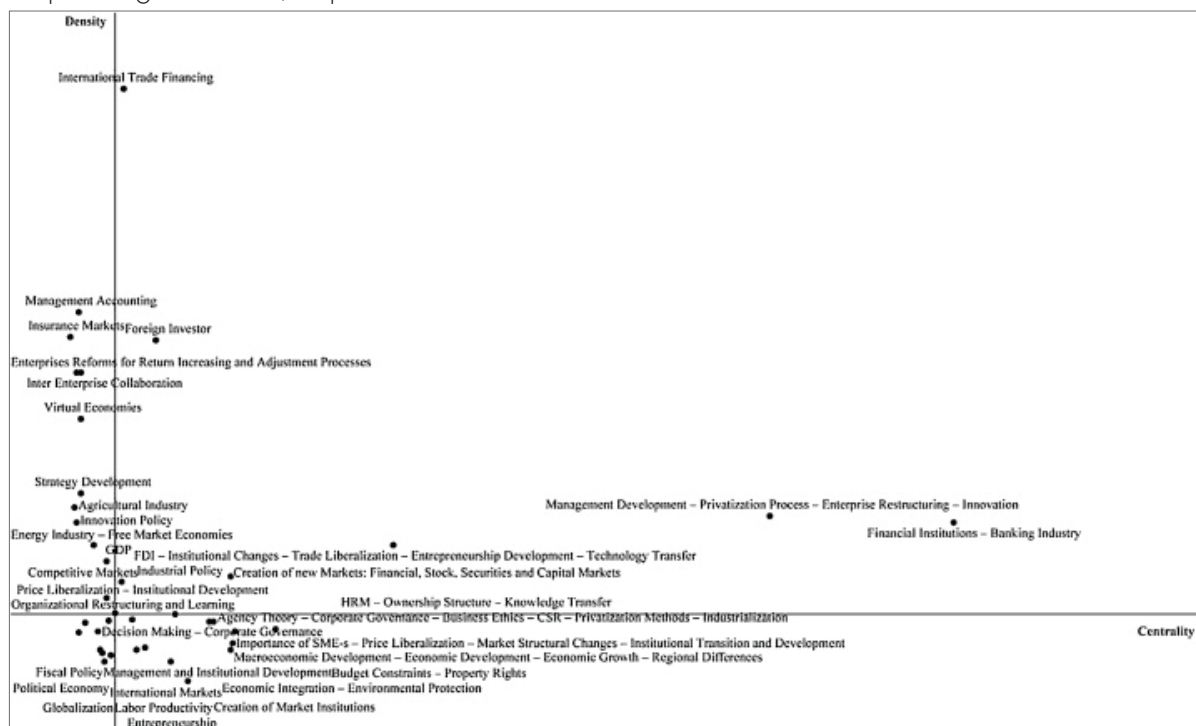
MAPPING THE EVOLUTION OF THE IMPACT OF ECONOMIC TRANSITION ON CENTRAL AND EASTERN EUROPEAN ENTERPRISES: A CO-WORD ANALYSIS (CWA)¹

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ABSTRACT

In this paper we use the Co-Word Analysis to map the intellectual structure of the research field denoted by “The impact of economic transition on Central and Eastern European enterprises” during the 1989-2013 period, as well to identify key research fields on future research. Thanks to the use of the quantitative methodology of CWA, which allows the extensive reviewing of the literature stock, it was possible to collect 2.053 relevant scholarly papers and extract their key concepts. We found a list of 39 main themes (networks) for the whole period (as shown in the diagram below), illustrating the association between the main concepts of the impact of economic transition on the enterprises: privatization, foreign direct investment, entrepreneurship, trade, banking industry, enterprise restructuring, innovation, institutional changes, corporate governance, capital and financial markets.



Source: Author's calculations.

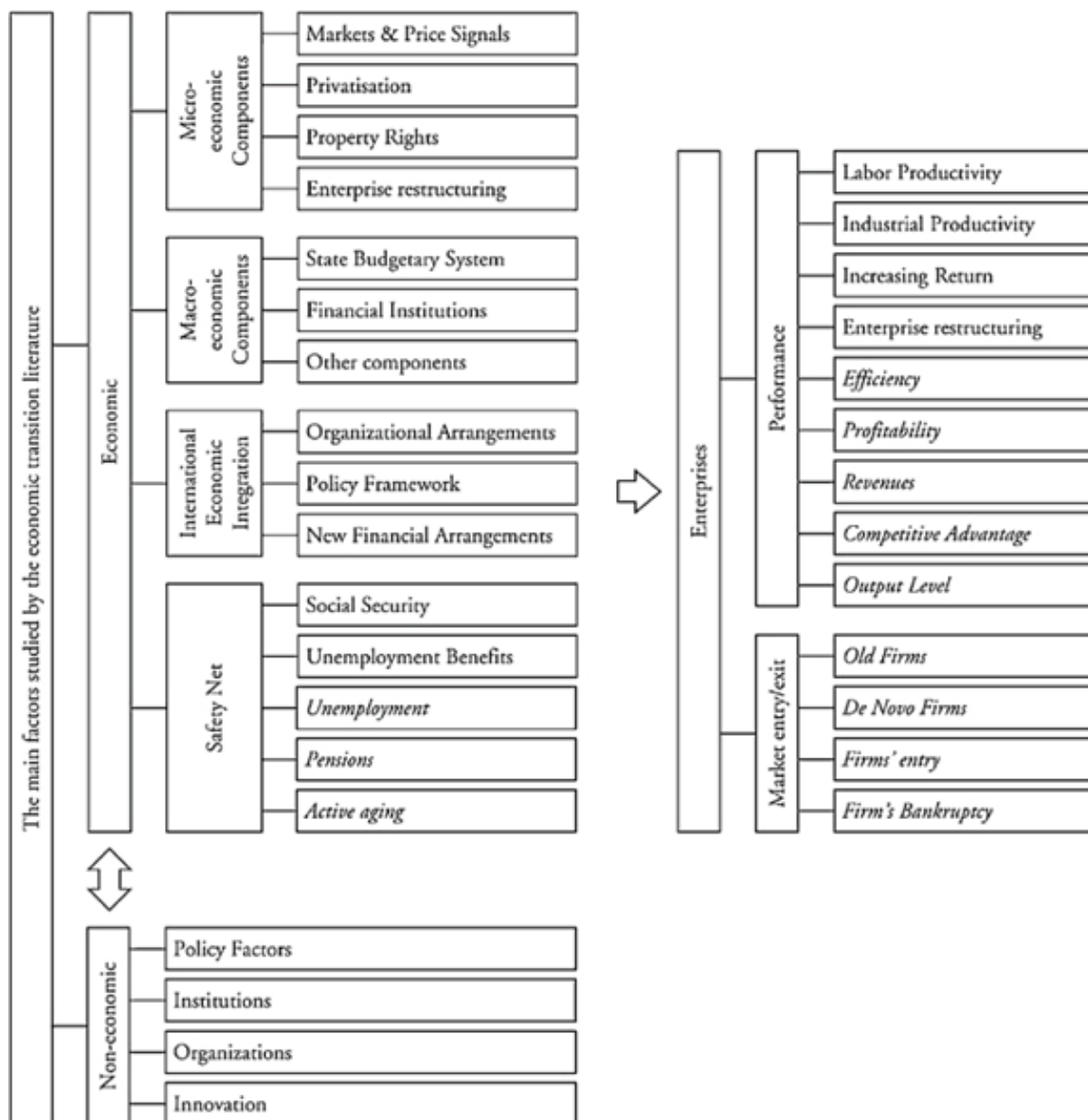
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This paper contributes to the economic transition literature by providing an empirically derived frame based on the extant literature. This framework outlines the main factors affecting enterprises during the transition process, the relationships among these factors, and their evolution over time.



Source: Author's calculations.

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THE DEVELOPMENT OF THE FINANCIAL SYSTEM AND THE IMPACT ON GROWTH IN ALBANIA

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ABSTRACT

Prior to 2008, there was a wide agreement in the literature that the growth and development of the financial sector was a positive contributor to economic growth, especially in developing countries. One financial crisis later, and this almost-axiomatic belief has been cast into serious doubt. The crisis which erupted in a global scale, halting growth and wreaking havoc from which the world has yet to fully recover almost a decade later, has forced economists to reconsider many previously held beliefs, including this one. This article examines the relationship between the growth of the sector in Albania and its impact on the overall economic performance of the country. Previous studies suggested a mild positive relationship, but new data obtained after the financial crisis and the slowdown that followed suggests that this relationship, while still present, has weakened.

1. INTRODUCTION

The relationship between finance and economic growth has been a topic of interest in the literature for a long time, given the important role that finance occupies in the development of business ventures. It should be of no surprise that most of the literature before the crisis was of the opinion that finance was generally a positive contributor to economic growth. Goldsmith (1969) was one of the first studies to observe the existence a positive relationship between finance and growth for a cross-section of countries, and therefore is often considered as pioneer of the field. However, Goldsmith failed to provide clear evidence of a causal relationship and could not build an overarching theory on the interaction between the two variables, mostly due to the poor quality of data at the time. King and Levine (1993) is one of the first papers to provide empirical analysis on the issue on a cross-section of countries. Following an empirical strategy that closely resembles future studies, the authors regress output per capita on a set of explanatory variables which include various indicators of financial development and capital accumulation. They provide evidence that initial levels of financial development are strongly correlated with future growth and capital accumulation. Rajan and Zingales (1998) explore

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1980s data for a wide range of countries. They attempt to overcome the issue of causality by exploiting economic theory. Going back to Schumpeter (1911), economists have theorized that the main channel through which finance helps economic growth is by eliminating the risks and moral hazard of outside financing which firms often need in order to grow. According to Rajan and Zingales it is the industrial sector that is more in need of outside financing. Accordingly, they find that a positive relationship exists between a developing financial sector and an increasing gross value added (GVA) contribution from the industrial sectors to overall economic growth. By providing this evidence, not only do the authors establish the usual positive correlation between finance and growth, but they also believe to have overcome the endogeneity issue by proving a theoretical result. Levine (2005) provides an extensive overview of the literature up to that point in time. While subject to countervailing opinions, most of the research conducted up to that point agreed with two main propositions. First, financial intermediaries and markets matter for growth and this result is not driven solely by reverse causality. Second, by providing the necessary conditions for financial systems to grow, policy makers have an important policy tool to aid the growth of their economies.

Dushku (2010) attempts to provide an answer to this issue for the case of Albania. The paper finds that a positive long-run relationship between finance and growth can be established in the case of Albania as well. However, the results are inconclusive in the short-run with some evidence suggesting that overall improvements in the economic fundamentals induce a growth of financial intermediation. Kalluci (2012) finds that credit growth in Albania has been within equilibrium levels for a country engaged in a catch-up growth process. It should be mentioned that both of these studies use pre-crisis data. It is appropriate to state that some economists had previously wondered about possible negative side effects from the growth of finance. Minsky (1974) and Kindleberger (1978) emphasized the relationship between the growth of finance and macroeconomic volatility. Tobin (1984) suggested that a large financial sector may induce talented individuals to move away from productive sectors of the economy and therefore be inefficient from the social planner's point of view. Robinson's (1952) statement that "where enterprise leads, finance follows" encapsulated a further belief according to which finance was simply a by-product of growth.

Zingales (2015) provides an extensive overview of the recent criticism that grew in the aftermath of the financial crisis and calls for economists to respond to it. Zingales describes many channels through which the growth of finance can go astray and therefore needs to be properly overseen. Arcand, Berkes, and Panizza (2015) released a highly influential paper that calls into question the usefulness of the financial sector and states that in certain scenarios, finance can be "too much of a good thing". Cecchetti and Kharroubi (2012 and 2015) provide theoretical and empirical evidence that is similar to Arcand et al (2015). The IMF (2015) released an extensive report that also warned of the risks that are associated with the quick growth of the financial sectors. The report finds that there is a positive correlation between finance and growth that begins to vanish for very large financial sectors. Additionally, speed matters

as rapid credit booms not only have a negative effect on growth but also on macroeconomic stability. A similar finding is presented in Taylor (2015) that focuses more on this latter channel of economic stability as the main risk emanating from large financial sectors.

This article's aim is to reexamine the development of the financial system in Albania and its relationship with economic growth prior to and after the crisis. Specifically, the article asks whether a positive causal relationship exists between the growth of the financial system and the rate of growth in the country. As a second phase, an attempt is made to explore whether there is a threshold level beyond which the growth of the financial system was unhelpful for the overall health of the Albanian economy. The second section provides a descriptive analysis of the Albanian data and presents the empirical methodology. The fourth section provides then main empirical findings. The article concludes with final remarks and possible future research points.

2. DATA AND METHODOLOGY

2.1 METHODOLOGICAL APPROACHES

Levine (2005), in addition to the results, also provides an overview of the data and empirical methodologies that have been used in the literature. One can also notice that there have been three main methodological trends that researchers have followed to shed light on the finance-growth nexus. The first types of studies relied on cross-section or panel data by including multiple countries. The approach was centered on the quite familiar growth regression methodology that usually utilizes output or output per capita at a given time as the dependent variable, and a large set of control variables on the right hand side of the regression to serve the role of growth determinants. Various proxies of financial development were included as dependent variables in addition to other typical controls for indicators like education, infrastructure, property rights etc. This approach started to become heavily criticized in the 1990s. Quah (1993) and Sala-i-Martin (1997) pointed out that there are very unrealistic assumptions at work during the estimation of such regressions. A much larger issue is the failure to properly control for the endogeneity between output per capita and the control variables, which in turn leads to biased estimates.

As a response to the critique towards the growth regression approach, the empirical literature on the subject would move towards the use of time series econometric estimation. Kugler and Neusser (1998), Rousseau and Wachtel (1998, 2000) were some of the studies that attempted to apply time series methodologies. The approach consists in using mostly VAR/VECM methods to estimate initially whether a significant long-run relationship existed between growth and finance. As a second step, Granger causality tests are used to estimate the direction of causality between the variables. Most studies end up finding a statistically significant relationship between financial development and growth, regardless of the country under consideration. The results are

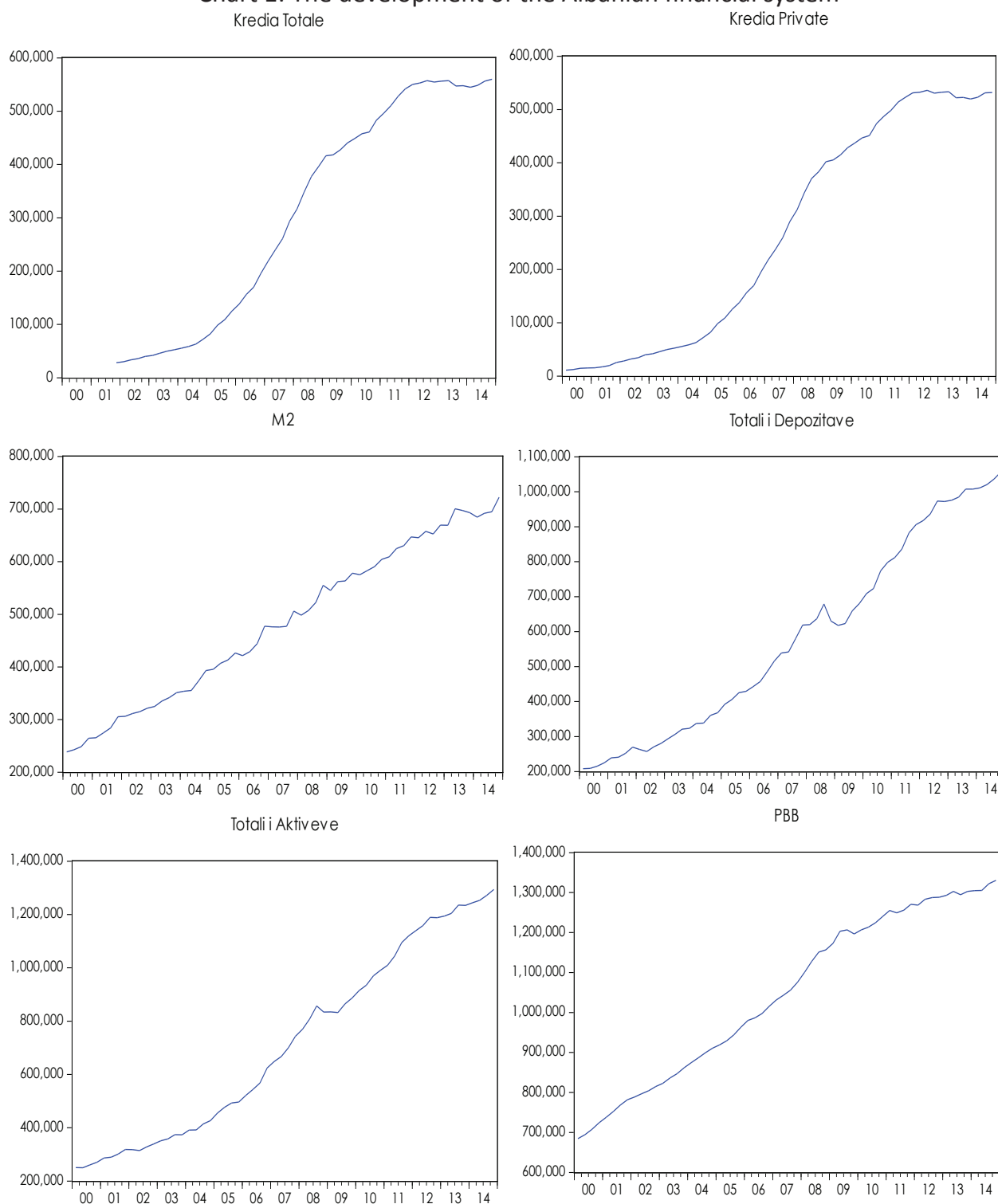
more mixed in the second stage of the analysis where Granger causality tests differ. While a majority of cases find that the development of financial systems “Granger causes” growth, there is also a minority, but still significant amount, of cases where this type of causality is not found. Dushku (2010) conducts a similar empirical exercise for Albania and the results are consistent with the broad trends described above.

Most recent studies employ a third approach, which relies on micro-level data. This is a result of the advances in the theoretical literature which is attempting to provide a more formal description of the channels through which financial development has an impact on growth. The Rajan and Zingales (1998) study is a prime example of this approach. While undoubtedly this approach appears to be the most complete one in order to shed light on the relationship between finance and growth, it also has a drawback. It requires data of very good quality which is not always readily available for developing countries. This article will therefore employ the second approach to estimate the relationship between finance and growth in the Albanian case.

2.2 THE ALBANIAN BANKING SECTOR

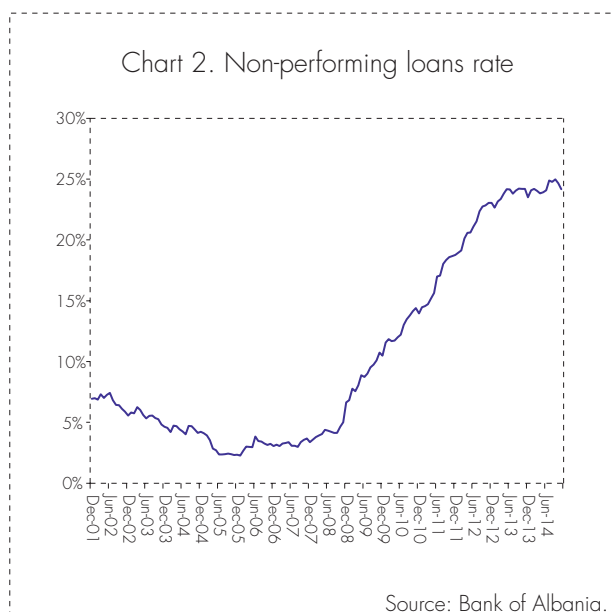
A watershed moment for the commercial banking sector in Albania was the privatization of the National Savings Bank in 2004 which liberalized the market and allowed other actors to enter the market. There was a period of sustained growth in the banking industry after 2004 measured by any standard indicator. This rapid development was occurring in a period of sustained high growth in the economy of over 6%. These developments are presented in Figure 1. The variables included in the figure, besides GDP, are total credit, private credit, the M2 monetary aggregate, total deposits and total assets. These are the most common variables used in the literature as proxies that capture the aggregate developments in the financial sector of a given economy.

Chart 1: The development of the Albanian financial system



Source: Bank of Albania, INSTAT.

The global financial crisis did not cause a sudden stop to these developments as it occurred in most of the developed world. Credit and economic growth, besides a relatively minor slowdown, would reassume their previous trends. However, the crisis would have a more pronounced long-term effect in Albania by reducing growth to levels close to 2% in most recent years. Meanwhile, the balance-sheet of the commercial banks would suffer from these developments as the ratio on non-performing loans would begin to rise after 2008, as Figure 2 shows.



These developments would seem to suggest that the relationship between finance and growth in Albania might have changed after the events of 2008, similar to many other cases around the world. The rise in the NPL ratio that followed the quick growth of credit, while the GDP growth rate was also slowing down, provides the necessary motivation for a reinvestigation of the relationship between the two.

3. EMPIRICAL RESULTS

In order to estimate the relationship between finance and growth, this study follows the time-series approach previously used by Dushku (2010), Rousseau and Wachtel (1998), and which is also

found in Cecchetti and Kharroubi (2012). This approach requires the use of macro variables as proxies for the financial system. As described in the previous section, five such variables are chosen.²

According to the VECM approach, initially data is tested for presence of unit roots. All variables in the dataset are $I(1)$, which is required to test for co-integration. Subsequently, pairwise regressions are conducted for each proxy of the financial system and the GDP series. Results are shown in Table 1. They indicate with the exception of the total credit data, all other series are found to be co-integrated with GDP.

Table 1 Co-integration Johansen Test (p-values)

Variable	Trace Test	Max Test
Credit	0.0606	0.1647
Private Credit	0.0115	0.0161
M2	0.0091	0.0374
Total Deposits	0.0296	0.0889
Total Assets	0.0236	0.0688

Source: Author's Calculations

The presence of co-integration allows for further estimation to be conducted with the data. The relationship between GDP and total credit on the other hand is analyzed with a simple Granger causality pairwise test, with results shown

² The regressions of the empirical estimation use the logarithm of the proxy-to-GDP ratio and the logarithm of GDP.

in Table 2. Unlike Dushku (2010), the recent data shows that GDP tends to “Granger” cause total credit. For at least one indicator, we have some proof of Robinson’s (1952) theory that finance follows economic growth.

Table 2 Granger Causality test, non-cointegrated data

Direction	Pairwise Test
GDP does not Granger Cause Credit	0.2382
Credit does not Granger Cause GDP	0.0024

Source: Author’s Calculations

For the rest of the series, t-tests and chi-square tests are conducted once the VECM specification has been established. The tests are run for both causality directions, the finance proxy to GDP and the opposite. The results are presented in Table 3. The results are similar to those presented in Dushku (2010). They suggest that a long-run relationship can be established for all variables. A short-run relationship on the other hand cannot be established for the first two variables, private credit and M2. Comparing these results to Dushku (2010) however, one can notice that the probability values appear to be weaker. Therefore, it can be stated that while the crisis has not led to a complete breakdown of the relationship between finance and growth, it has certainly made it weaker.

Table 3 Causality test, co-integrated data

	ttest on ECM		Chi-square I	
	Finance -> GDP	GDP -> Finance	Finance -> GDP	GDP -> Finance
Private Credit	-3.71 **	2.4 **	1.01	0.04
M2	-4.22 **	7.12 ***	0.01	0.03
Total Deposits	-7.85 ***	3.52 **	5.12 ***	8.21 **
Total Assets	-4.42 ***	-5.37 ***	5.96 ***	9.53 ***

Source: Author’s Calculations

Shënim: *, **, *** show the statistical importance of respectively the 10%, 5% and 1% levels.

As a final step of the empirical investigation, using the specification suggest by Arcand et al. (2015) and IMF (2015), a non-linear regression for estimating a possible threshold value is conducted. The results are inconclusive, with different proxies leading to different conclusions. Furthermore, the diagnostic tests seem to suggest that coefficients might be biased. Therefore, no final conclusion is made on whether the Albanian financial system has reached a possible plateau in size.

4. CONCLUDING REMARKS

This article attempts to re-estimate the relationship between growth and finance for Albania after the events of the financial crisis. Whereas previous academic literature on the subject was mostly of the opinion that there was a positive relationship between the two, this has changed after the events of 2008. Economists who had published research providing proof of the positive relationship are the ones now claiming that a more cautious approach is justified.

Albania also experienced a period of rapid credit growth after 2004, when the financial sector was liberalized. This credit boom fuelled a period of sustained high economic growth. While this did not stop suddenly in 2008, slowly but surely, growth decreased to very low levels in recent years. This was accompanied by a rise in the level of non-performing loans in the banking sector, which has become a major worry for policymakers.

Current estimates suggest that the relationship between growth and finance continues to be positive even after the financial crisis. However, this result is weaker than previous research estimated, which is in line with the current trends of the academic literature. No threshold level for the size of the banking sector in Albania can be established up to this point.

Future research should attempt to estimate the relationship separately for the pre and post-crisis periods. However, longer data is needed for that purpose. Also, looking at recent trends in the literature, a micro-data level approach is suggested in order to better identify the channels through which the development of the financial sector impacts agents and economic growth.

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