Does Primary Sovereignty Risk Matter for Bank Fragility? Evidence from Albanian Banking System.

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Abstract

The paper studies the pass-through effect of primary sovereignty risk on bank stability. For this reason, we followed a new approach using on-site bank balance sheet information to construct our proxy that represent each bank stability condition and use a variety of internal and external factors to estimate a balance panel dynamic two-step General Method of Moments (GMM) approach for the period 2008 Q3 – 2015 Q03. We found no supportive evidence that pass-through effect of primary sovereignty risk does affected bank stability. Rather improving macroeconomic and financial market condition are found to be important components through which banks are more immune. The rest of results imply that other bank-specific indicators, namely the extent of intermediation, off-balance sheet active, excessive capital, credit risk and profitability do not have a significant affect.

JEL Codes: C26, E32, E43, G21, H63,
Keywords: Bank Fragility, Primary Sovereignty Risk, Panel Data, Dynamic GMM,

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1. INTRODUCTION

The recent Global Financial Crises highlighted yet again that stability of Albanian financial sector is largely dependent on reliance of the banking system [Bank of Albania, (2015)] as it constitutes the spinal cord of economic activity, which is seriously hampered if the banks, the most prominent agents in the financial markets, exhibit some turbulent moments and cannot execute their financial function properly. This became even more factual in the view of the possible Greek default crisis to which banking system across most of Central East and South Eastern European countries, in particular in Albania, was faced with some important challenges. First, banks had to finance non-austerity fiscal policy, at a time when financial markets started questioning the solvency of countries with high fiscal deficits (debt burden) in the verge of the possibility of Greek defaults, while rising spreads became the main driver in the run-up in systemic risk for European banks, especially in late 2011 and summer of 2012 [Black, et. al., (2016)]. Second, the spill-over effects and banks' balance sheets problems triggered a contraction of the flow of bank lending to the other sectors of the economy to the need to de-leverage. To that, despite an accommodated monetary policy, rising spreads were associated with rising banking system instability (See Graph 1 in Appendix) that show tightening of financing conditions in some sectors and significant withdrawals on economy equity and debt funds making it more costly and difficult to support economic activity through lending.

The existing literature provides a fairly comprehensive review of the main internal and external determinants on bank stability, but of these cases still one question need to be answered empirically as there is no evidence on how primary sovereignty risks influences bank stability, in particular in the case of an emerging economy, namely Albania. Therefore, this paper analyses empirically the effect of primary sovereignty risk on bank stability, which might ultimately lead to bank fragility. For these reason we follows a five-step procedure. First, we constructed a composite individual stability indicator by compelling the on-site bank balance sheet information and expressed it as a function of internal and external variables using an unbalance panel with quarterly data for the period 2008 Q04 – 2015 Q03. Then, we used a dynamic two-step General Method of Moments (GMM) approach, particularly the first difference transformation approach. Additionally, we performed a variety of robustness checks. First, we include a set of control variables to mitigate in return potential omitted-variables problems which ranges across bank-specific and market-specific indicators. Second, we augmented further the model to evaluate the extent to which off-balance-sheet activities, in which banks are engaging, might have an effect on bank stability.

The main findings support the view that the pass-through effects of primary sovereignty risks does affected bank stability. Rather, we found that banks are more sensitive to economic performance. To that, other sovereignty risks linked to financial market condition, fiscal stance and possible price bubble are also found to significantly disturb bank stability. The trade-offs with stability condition is observed in relation to the efficiency operations, while it appears to be promoted in line with higher market share and higher capital ratio. We also found that the scale of off-balance sheet actives is negative, but relative small and non-significant. The rest of results imply that other bank-specific indicators, namely the extent of intermediation, excessive capital, credit risk and profitability do not have a significant affect.

This paper is a modest contribution to the literature. First, we follow a new approach to describe individually the state bank stability based on a wide set of on-site examination bank balance sheet indicators and the principal component analyses approach. Second, to the best knowledge, no previous paper has either analysed the effect of primary sovereignty risk on bank stability or address stability issues regarding an Emerging Market Economy (EME), particularity in the case of Albania banking system. Third, we use a recent dataset that provides new insight into potential leading indicators from the theoretical and empirical studies and test their ability to dictate bank fragility that relates only to the period in the aftermath of the global financial crises, which might be relevant to both investors and regulators.

The remainder of the paper is structured as follows. The next section discusses the literature review. Section 3 presents the methodology with regards model specification and data. Results are presented in Section 4. The material concludes in section 5 with the final remark and policy implications.

2. LITERATURE REVIEW

The theoretical literature review offers many, and sometimes contrasting, approaches, but among many authors, Boudebbous and Chichti (2013) agree that bank stability is difficult to define and measure due to the constant changes of the financial and banking environment. Others view it in the absence of excessive volatility, stress or crises and as a "steady state" in which the financial system efficiently performs its key economic functions", such as allocating resources and spreading risk as well as settling payments [Deutsche Bundesbank, (2003) and Jahn and Kick (2012)]. The literature review can be distinguished among those that make use and those that focus on analysing the determinants of stability indicators. The former ranges among studies that use single or composite indexes variables or studies that identify leading indicators of bank fragility, as well as build models of early warning signals model to which they empirically evaluate the causes of instability periods in an ex post approach. In the macro-prudential regulatory frameworks, some have succeeded in developing one-stop indicators that combines macroeconomics and bank level data to which they use binary approach to signal instability periods [Illing and Liu (2006), Jahn and Kick, (2012), Cevik, et. al., (2013)]. However, Hagen and Ho (2007) argue that this methodology may be misleading for two main reasons. First, bank interventions may occur even in the absence of an acute crisis in the banking sector. Second, not every crisis leads to a visible policy intervention, as central banks and regulators may be able to fend off the crisis successfully with less spectacular means. In return, among non-probit method, Fiordelisi, et. al., (2011) approached the bank risk through the means of a cumulative Expected Default Frequency for each bank calculated by Mood's KMV and Ötker and Podpiera (2010) create distress events using Credit Default Swaps. Other papers use the accounting risk-taking measurements such as Z-score [Cleary and Hebb, (2016)], to the belief that it allows the analysis of the entire variable profile of a firm simultaneously, rather than sequentially examine the individual characteristics. Black, et. al., (2016) uses a distress insurance premium risk indicator, which integrates the characteristics of bank size (total balance-sheet liabilities), probability of failure (credit default swaps (CDS) and correlation (equity return correlations) and explore the source of systemic risk as well as the contribution from individual banks and countries.

In the realm of the determinants of bank stability, as Hutchison (2002) states, the theoretical literature falls under three groups of models: "bank-run models" as in e.g. Diamond and Dybving (1983); "adverse shock/credit channel" models, as in e.g. Bernanke, et. al., (1992); and "moral hazard" models, as in e.g. Demirgüç-Kunt and Detragiache (2002). The empirical framework identifies several variables consistent with one or more theoretical models that falls under two main categories, namely the internal and external determinants. The former consist of indicators that are influenced by the management policy objectives and their ability to monitor risks and thereby focuses on the characteristics banks' balance sheet indicators such as size and asset quality, state of capital structure and liquidity, operational efficiency and leverage. Among these studies, Caprio and Klingebiel (1997) mention as the main source of bank fragility their ability to monitor lending quality, while Dell'Ariccia, et. al. (2008) shows that standards may decline more during credit and house price in order to get into the game. Diamond and Rajan (2005) conduct that the reason bank failures are contagious is also the same reason that bank assets are illiquid and a systemic liquidity shortage in the interbank money market and increasing financial integration can make funding liquidity pressures readily turn into issues of systemic insolvency [Jutasompakorn, et. al., (2014)]. Berger and Bouwman (2013) found that strong capital structure is essential to absorb any negative shocks during turbulent episodes.

The other category comprises of macroeconomic and industry-specific variables that are outside the prerogative of bank-specific decisions and policies. Among these studies, Honohan (2000) finds that crisis often occur in the latter part of boom – bust cycles, while a number of papers reports crises are less likely to happen in countries with strong or positive real growth, lower volatility of inflation pressure, better management of international capital [Demirguc-Kunt and Detragiache (2005)]. To that, Eichengreen and Rose (1998) place more role to high interest spreads, which either as a sign of banking problems or to cure inflation or to defend exchange rate, is likely to hurt bank balance sheets, even if they can be passed on to borrowers, due to the tendency to lower solvency condition. Kaminsky and Reinhart (1998) also found large and deteriorating fiscal deficits tend increase bank crises probability, while the effect of monetary base is negligible. At the same time, Boudebbous and Chichti (2013) reports that high rates of credit expansion may finance an asset price bubble that increase bank fragility which are often preceded by deteriorating terms of trade, but also by an exchange rate appreciation, even though Domac and Martinez-Peria (2003) conclude that the duration of crises does not seem to be affected by developments in the exchange rate. Jahn and Kick (2012) concluded that the likelihood of bank distress is linked higher concentration ratio in the bank loan portfolios, which is link to the fact that specialised banks tend to be more stable than more diversified banks. Pill and Pradhan (1997) confirm the positive correlation regarding credit boom. To that, another group falls under heading problems of supervision and regulation patterns that consist of issues link to legal system and contract enforcement, bureaucracy and accounting standards, as well as the state of financial and banking system development and deposit insurance instruments [Demirguc-Kunt and Detragiache (1998)].

3. METHODOLOGY, VARIABLES AND DATA

3.1. BENCHMARK MODEL SPECIFICATION APPROACH

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

$$CAELS_{i,t} = \alpha + \beta_1 * X'_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where, $CAELS_{i,t}$ is a stability indicator of bank i at time t, with i = 1, ..., *N* and t = 1, ..., T. α is a constant term. $X'_{i,t}$ is a vector of explanatory variables grouped into three main categories: (1) $Banking'_{i,t}$ is a set of bank-specific explanatory variables; $Market'_{i,t}$ is a set of industry explanatory variables; $Macroeconomics'_{i,t}$ is a set of control variables that account for state of economy; 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 $\sigma_u^2 A = \pi r^2$.

The model is estimated through means a dynamic two-step General Method of Moments (GMM), particularly the first difference transformation approach as suggested by Arellano and Bond (1991)[2] to the assumption this would eliminate endogeneity of some of the explanatory variables with the dependent variable and the individual fixed effects [Anderson and Hsiao (1981)] and inconsistent of small sample time [Han and Phillips, (2010)]. Then, based on Roodman (2009), we use all the past information of $X'_{i,t}$ up to 4 lags as instruments variable. Furthermore, the model is estimated with GMM weights differences (AB-1-step) would resolve for un-ward (down-ward bias in standard errors (t-statistics) due to its dependence to estimated values (as it uses the estimated residuals from one-step estimator), which might lead to unrealistic asymptotic statistical inference [Judson and, Owen, (1999); Bond and Windmeijer (2002); Ansari and Goyal (2014)] especially in the case of data sample with relatively small cross section dimension [Arellano and Bond (1991)]. The Haussmann test is used for over-identifying restrictions based on the sample analogy of the moment conditions adapted in the estimation process, thereby as to determine the validity of the instrument variables (i.e. tests of the lack of serial correlation and consistency of instruments variables). To that, from our viewpoint, we consider our bank stability indicator to be a sensitive "thermometer" indicator that is affected contemporaneously by other factors.

3.2. THE VARIABLE SELECTION APPROACH

3.2.1. DEPENDENT VARIABLE

The empirical literature provides a good description of how one might attempt to build a composite indicator of stability, but obviously this paper follows the Uniform Financial Rating System approach, 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)[3]. First, using the statistical methods, each indicator included in each of these categorises is normalised into a common scale with mean of zero and standard deviation of one[4]. The formula is given as:

[2] See also Arellano and Bover, (1995) and Blundell and Bond, (1998).

[3] This approach is also used by International Monetary Fund Compilation Guide 2006 on Financial Soundness Indicators, but others authors e.g. Altman (1986), Sere-Ejembi, et. al., (2014) and Cleary and Hebb (2016).

[4] Normalizing the values avoids introducing aggregation distortions arising from differences in the means of the indicators.

$$Z_t = \left(\frac{X_t - \bar{\mu}}{\bar{\sigma}}\right) \quad (3)$$

Where, X_t represents the value of indicators X during period t; μ is the mean and σ is the standard deviation. Second, all the normalised values of the 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 BSI is derived as a sum of the estimated exponential transformed sub-indexes, as follows:

$$BSI_{t,w} = \omega_1 \sum_{i=1}^{n} Z^*_{t,C} + \omega_2 \sum_{i=1}^{n} Z^*_{t,A} + \omega_3 \sum_{i=1}^{n} Z^*_{t,E} + \omega_4 \sum_{i=1}^{n} Z^*_{t,L} + \omega_5 \sum_{i=1}^{n} Z^*_{t,S} \quad (4)$$

$$\sum_{*=a,b,c,d,e} \omega^* = 1 \quad (5)$$

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 to earnings; '*L*' represents a proxy to liquidity efficiency categorises; and '*S*' is related to the sensitivity of market risk. Z* is the exponential transformed simple average of the normalised values of each indicator included into the sub-index of the individual bank stability index. Then, the estimated index is a relatively measurement, where an increase in the value of the index at any particular dimension indicates a lower risk in this dimension for the period, compared with other periods.

The advantage of this approach is fourfold. First, CAELS represents a useful "complement" to on-side examination, rather than a substitute for them [Betz, et. al., (201], and thereby creates an internal comprehensive monthly-based supervisory "thermometer" measurement to evaluate bank stability in real time and on an uniform basis and for identifying those institutions requiring special supervisory attention and concern with regards to both the present and future banking sector conditions. Second, as suggested by ECB (2007), it reflects more the Albanian financial structure by attaching more weight to banking sector as it is the most prominent agents in the financial markets, while it takes advantages of a broad range of bank level data. Third, the PCA approach highlights the most common factor identifying the patterns in the data without much loss of information, which at the same time solves for any problem of endogeneity mention above. Four, it does not take the probability form of the binary approach, which might expose it either to limitations of insufficient number of episodes or to the vulnerability of the methodology employed to calculate the threshold level, which might even provide falls banking distress signals. Rather it consists of a simpler approach that is easier to explain and implements and most importantly allows analysing the state of the bank as it develops and to that it is applicable for cross-section comparisons. Finally, the estimated index is a relatively measurement, where an increase in the value of the index at any particular dimension indicates a lower risk in this dimension for the period, compared with other periods.

3.2.2. THE SET OF INDEPENDENT VARIABLES

The structure of bank balance sheet can influence the vulnerability of banks to both internal and external shocks. First, bank size, which also referred to as an indicator of market share, is included on the argument that banks assess their performance relatively to each other on this basis [Berger and Bouwman (2013)]]. It is expected to have a positive coefficient, assuming that probability to cope with instability periods increase with bank size, compared to smaller banks. However, some theories imply that under certain circumstances increasing market share could be counter-productive. If higher market share comes through higher capital or/and more aggressive policies, this might then lead to more attractiveness of innovative, but risky products that concludes in higher deposits or/and higher leverage, perversely increases bank risk taking and therefore the probability of default [Besankoa and Kanatasb, (1996)].

Second, Hughes and Mester, (2009) advocates inclusion of efficiency indicators, while Fiordelisi et. al., (2015) believes that supervisory authorities may allow efficient banks (with high quality management) a greater flexibility in terms of their overall stability condition, ceteris paribus, and vice versa. To that, any policy-decision by the bank authority to be more attractive or/and more competitive and vice versa would be reflected to the bank balance sheet income-cost indicators. Therefore, it is expected to have a negative sign to our assumption that a decreasing efficiency would deteriorate bank health positions.

Third, sufficient amount of capital, which serves as a safety cushion, is important to bank's operations in that it acts as a buffer against financial loses, protecting banks from solvency risk [Betz, et. al., (2014)], as well as are able to fulfil minimum capital adequacy ratio under potential solvency risks Betz, et. al., (2014)]. Therefore, we assume any policy-making reflects the strength of capital structure and thereby stability is condition to their financial leverage. It is expected that solvency risk diminishing with higher ratio of capitalisation, which allows bank to absorb any shock that it may experience thereby it is expected to a positive association with bank stability.

Finally, to solve the problem of omitted variable bias in the regression and capture the adverse macroeconomic shocks that hurt bank stability condition, we include also an economic activity and primary sovereignty risk indicator. The former captures the state of the economy. Thereby a higher economic growth or upward movement in the expectations over economic performance, which enhance the ability for economic agents to meet their commitments, make bank instability less likely. That is why we expected it will have a positive sign. The latter, present a collection of concentrated risks (e.g. political risk, exchange rate risk, economic risk, sovereign risk and transfer risk) associated with investing in a foreign country, which can reduce the expected return on an investment and must be taken into consideration whenever investing abroad. It is expressed as the as the spread between the domestic rate and a considered risk-free rate Jutasompakorn, et. al., (2014)[5]. Therefore, as Domac and Martinez-Peria (2003) puts forward, a higher sovereignty risk that induces a higher domestic interest rates make solvency condition harder and adversely affect banks solvency and making bank stress more prominent, and vice versa. Therefore, we expect that an increase in the sovereignty spreads would affect negatively bank stability.

3.3. DATA

The study analyses the effect of the sovereignty risk on the bank soundness condition through a GMM panel approach. 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 unbalanced 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* 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. *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. All the data represent the end-period values. They are log-transformed, besides the *PSRISK*.

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 stable. Therefore, these variables [namely CAELS, *EFFICIENCY* and *LEVERAGE*] enter the model in level. The rest of other variables enter the model in their first difference since it will transform them into a stationary stance. Finally, data on *GDP*, *CPI* and *HPI* 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

[5] These authors use the Libor and Overnight Index Swap (OIS) spread on the belief that is a generous accepted widely used proxy for the repo haircuts. The former is the unsecured interbank borrowing rate. The latter, is a risk free rate, as it is an accurate measure of investors' expectations of the effective repo rate or the monetary authority target.

T-Bills rate and German Consumer Price Index are taken from Bloomberg. The rest of the data are taken from Bank of Albania.

4. RESULTS

4.1. THE BENCHMARK MODEL

The panel GMM model considers 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 model includes cross-section fixed effects and makes uses of 'White Cross-Section' standard errors and covariance (d.f. corrected). The Haussmann test (Prob. of J-Statistics) supports the validity and consistency of the instrument variables. The results on the parameter estimated are presented in Table 4, Eq. (1) in Appendix.

A glance at the results confirms that bank stability patterns react relatively to the responses of other indicators according to the predictions obtained from the theory[6]. 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 1.034pp. The effect is found to be statistically significant at 1 percentage (%) level. This means that the performance of economic activity play relatively a crucial role for bank stability behaviour and at the same time banks place a relatively consider manner to the economic conditions in which they operate, since an upward movements in economic activity would improve the situation of the banking system through a higher financial intermediation or for low risks related to bank sovereignty risks[7]. At the same time, the magnitude of the coefficient higher than unitary is possible due to the fact that as a scale variable it capture the effect of other variables namely, exchange rate and/or inflation pressure.

Second, *PSRISK* has the expected reverse effect on bank stability. Findings show that *CAELS* decreases by -0.0489pp for any 1pp negative shocks on *PSRISK*[8]. This result complements the findings of Jutasompakorn, et. al., (2014), but by contrast, this marginal effect is considered to be relatively small, even though it is statistically significant at 10% level. This suggests that banks do consider shock related to primary sovereignty risk, even though such effects on bank stability play a relatively small effect. The reason is fourfold. First, public borrowing has been orientated towards longer term maturities and towards foreign borrowing. This has lowered the pressure on banks and at the same time has provided the market with more foreign liquidity. Second, the government has taken structural reforms to minimise possible fiscal risks. Third, but not the least, banks in Albania operates under a flexible interest rate to which they place a marginal fixed rate. Therefore, any negative shock that leads to an interest rate hint is reflected immediately to their interest barging, making them to some extend hedge to interest rate. Finally, not the least, different from other countries, banks in Albania have been well-capitalised and despite the recent trends and financial disintermediation were not vulnerable to a shortage of liquidity.

The picture on the bank stability patterns is much clearer by analysing the market and bank specific developments. First, the extent to which bank is position with respect to their market share, *SIZE*, which also incorporates the effect of economies of scale in bank behaviour, as expected has a positive effect on bank stability. Results show that *CAELS* improves by nearly 0.1496pp in response to 1pp positive shock on *SIZE, but* . The coefficient is statistically significant at 5% level. On the one hand, stability patterns are positive linked with a positive shock due to a policy decision-making that heads banks towards greater market share. On the other hand, it is a sign that in the case of Albanian banking industry, economic of scale persist. Therefore, as Berger

[6] However, as instrumenting is technically difficult in the Arellano-Bond model, we also apply a standard a panel Ordinary Least Square (OLS) approach with random effect and with fixed effect, including the lagged dependent variable as an additional regressor. The former included also some fixed effect factors that distinguish for two important components, namely small versus large banks and foreign-owned versus domestic-owned. Results came out to be relatively similar to our findings through the difference GMM approach, while findings through means of fixed effects were more consistent and robust to the estimation through random effects. Results are also relatively robust and similar to findings when CAELS is estimated based on the simple average approach rather the PCA approach and the model is estimated with panel first difference GMM with the second step difference approach. Finally, they are also robust to the estimation of the two-step GMM estimation approach.

[7] These results are relatively similar to the inclusion of GDP with no lags effect.

[8] To assure the authenticity of our results, under the assumption of robustness checks, we also specified the model by using a primary sovereignty indicator that accounts only for the effect of monetary policy shock, proxy in this model as the spread between real term overnight rate and the real EONIA rate. The results were relatively the same. The estimated effect is found to be relatively small, even though statistically significant.

and Bouwman (2013) put forward, our interpretation is that bank size and the market share value could be a source of economic strength for the bank, which, just like capital, could make banks more attractive and more confident to either support higher loan level at lower costs or to support turbulent moment caused by both endogenous and exogenous factors.

At the same time, bank operation patterns are found to have a negative relationship with their stability condition. The estimated coefficient implies that a decrease by 1pp on *EFFICIENCY* boosts *CAELS* upward by nearly 0.4404pp. The coefficient is found to be statistically significant at 10% level, suggesting that efficiency in management is a robust determinant of bank stability. Therefore, bank should be aware that any policy-decision making to make bank more attractive, but that might lead to lower productivity growth (expenses that is channels to lower profits) would put more pressure to the stability condition. The reason is twofold. First, in order to be competitive and attractive, banks find may find it difficult to pass all the cost to their clients. Second, a few large banks dictate the rule interest rate policy, so the others need to follow them, and that does not allow them to "overcharge".

Finally, capital patterns are found to have the expected positive effect on bank stability condition. Results show that for any 1pp shock effect on *LEVERAGE*, the empirical response of *CAELS* is estimated to be nearly 0.6121pp. This effect is statistically significant at 5% level. This suggests that increasing bank capital is a very important factor and stability condition improves as bank become more capitalised. By contrast, based on size of the coefficient, bank capitalisation is the second most important factor in effecting the stability behaviour of the bank, under the specified model.

4.2. THE ALTERNATIVE AUGMENTED MODEL

To control a potential omitted variables problem, following Berger, et. al., (2013), our benchmark model is augmented to contain a second broad set of control variables, *Z*, to the extent that is allows us to analyse the determinants of bank stability by including simultaneously an extra control variable to the benchmark model. These control variables consist among a group of macroeconomic and bank specific variables. The former includes variables such as *DEBT* proxy for the fiscal policy stance, *FSI* proxy for the financial market stress condition and *HPI* proxy for the housing market price index[9]. The latter, includes a set of variables namely, *DL* to account for the extend of intermediation effect; *DEPOSIT* (*LOAN*) to account for bank sensitivity to the level of deposits (loans) patterns within the bank; *CAPITAL* the effect that excessive capital have on bank stability; and finally, *NPL represent the effects of non-performing loans*[10]. The model is estimated in level based on the results of the Unit Root tests approach (See Table 4 in Appendix). It also includes cross-section fixed effects and makes uses of 'White Cross-Section' standard errors and covariance (d.f. corrected). The results are presented in Table 4., Eq. (2) to Eq. (11). 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 4.1.

The bulk of evidences throughout Eq. (2) to Eq. (9) indicate that the inclusion of the set of control variables does not alter the results, which are generally qualitatively similar to the main results of the core variables in our benchmark specification, Eq. (1). Findings demonstrate the robustness of results with respect to the sign of the coefficient, even though in some cases their level of significance changes. With regards to macroeconomic variables, *GDP* has a positive and statistically significant effect on *CAELS*. To that, *PSRISK* continues to exhibit a reverse relationship, which continues to have the smallest effect smallest effect among the core variables, albeit with non-statistically significant properties in some of the model specification. Other results show that *SIZE* does still affect *CAELS* positively, even though it becomes statistically insignificant. Yet again *EFFICIENCY*

[9] *DEBT* represents the ratio of total public debt (internal and external) to the nominal GDP. *FSI* represent a proxy for the Albanian financial stability condition and follows the methodology by Shijaku (2014)]. It is transformed into an index, taking the base year the average performance during the year 2010. The estimated *FSI* is a relatively measurement, where an increase in the value of the index at any particular dimension indicates a higher risk in this dimension for the period, compared with other periods. *HPI* presents the inflation rate on the real estate market, calculated as the first difference of the log-transformed of the housing price index. Data are log-transformed. *DEBT* enters the model in first difference, while the rest is included in their stationary form.

[10] *DL* represents the ratio of deposit-to-loan of individual banks. *DEPOSIT* (*LOAN*) represents the ratio of deposit-to-asset (loan-to-asset) of individual banks. *NPL* represents the ratio of non-performing loan to total bank loan. *CAPITAL* represents the excessive capital over the minimum regulatory threshold level. It is generated as the difference between the actual capital adequacy ratio calculated as the ratio of equity over risk-weighted assets and the 12 percentage threshold level required by Basel II capital adequacy regulations. NII represent the revenues from non-interest activities divided by the total revenues. All the data are log-transformed, besides the *CAPITAL*. They enter in the model specification into their stationary form.

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.

Turning to our set of control variables, we found that the financial market stance has the expected negative effect on bank stability. Results show that a decrease in *FSI* by 1pp improves *CAELS* by nearly -0.2109pp. this effect is also found to be statistically significant at 5% level. This is a potentially due to the fact that banking sector and financial sectors developments are more interconnected, even though the state of financial sector in Albania is not fully development. Similarly, as expected, bank stability is found to have a reverse statistically significant relationship with the fiscal policy stance, which similarly to the findings of Demirguc-Kunt and Detragiache, (2005). *CAELS* improve by nearly 0.5560pp in response of a positive shock that reduces *DEBT* by nearly 1pp. Therefore, any policy action that leads to lower borrowing or/and improves fiscal stance is found to have an inverse important relationship with bank stability. However, this relationship is found to be statistically insignificant at conventional level. This could potentially be explained by the fact that, even though banking system has been well capitalised and in the verge of lower bank credit leverage government bond instrument was an investment opportunity, still banks in Albania are more sensitive to the effect that deteriorating fiscal stance has on the interest rates. To that, in a weaker financial position, it is less likely that it can quickly take precautions to recapitalise banks problems and avoid a crisis situation.

Concerning the pressure from housing market, results show the behaviour *HPI* has a statistically significant effect on bank stability, even though by contrast, at a magnitude of nearly -0.0935pp, banks are relatively sensitive up-turn or/and downturn rapid changes in housing market development, since a great portion of their lending is concentrated to mortgages loans, but not to the extent of the other risk examine above. This could be explained by the fact that Albania has not suffer any significant asset price bubble or/and any consistent price reduction after the global financial crises. In addition, bank exposed to asset price bubble, are covered to the extent that they provide mortgage loan though collateral coverage. In general, throughout the banking system, this collateral coverage does not go below 120% of the mortgage loan provided. This means that well covered to the explosion of real estate patterns.

Among the other bank-specific variables, results show that all indicators have the expected sign, but besides *CAPITAL*, are estimated to be statistically insignificant and relatively small. Among the bank intermediation indicators, we found that an increase in the *DL* by 1pp appears to improve the *CAELS* by nearly 0.0974pp. This means higher intermediation level boost bank confidence, but the effect is found to be relatively small and statistically insignificant. At the same time, a higher ration of deposit-to-asset is found to positively affect bank stability. The parameter shows that a 1pp higher level of *DEPOSIT* would boost bank stability by nearly 0.0684pp, even though the effect is found to be statistically insignificant at conventional levels. As the parameter of bank funding sources is as expected positive, higher loan-to-asset ratio implies lower bank stability. The results show that *CAELS* decreases by nearly -0.0986pp to a 1pp shock increases in *LOAN*[11].

Regarding other variables, the regulatory capital variable is also positive and statistically significant suggesting that the higher excessive capital may raise bank stability. In particular, a rapid increase in excessive capital above the required level by nearly 1pp would boost bank stability by nearly 0.0215pp. Finally, *NPL* is found to affect CAELS significantly. The magnitude of the coefficient suggests that CAELS improves by nearly 0.0826pp in response of a reduction in NPL by 1pp[12]. Such relationship is consistent with a priori expectations and in line with previous empirical findings of Cleary and Hebb, (2016). The negative coefficient suggests that Albanian bank lack efficiency in their asset quality.

4.3. OTHER REBOUSTNESS CHECKS

In this section we present the results of another set of robustness checks. This time, to scrutinize the robustness of our results further, we augmented further the Eq. (2) by including as in Mirzaei, et. al., (2013) an off-balance-sheet activities indicator (*OFFBALANCE*[13]) to evaluate the extent to which non-traditional activities in which banks are engaging, might have an effect on bank stability. In fact, Casu and Girardone, (2005) argue that the

[11] The results, is similar even when we tested for the effect of loan to GDP ratio or the effect of loan concentration to mortgage lending.

[12] The inclusion of the loan loss provision variable does not alter the results. Indeed, its effect is higher and is statistically significant.

[13] The off-balance sheet items include the total acceptances and given commitments (namely financial, loans, securities and guarantees commitments), which are then scale by total asset. It is log-transformed. Then, it enters the model in first difference based on the unit root test results.

empirical studies would lead to biased results without the role of off-balance sheet activities. Cleary and Hebb (2016) considered it to be certainty anecdotal evidence (e.g. Leman Brothers) to which they were not clear if it was true more generally. However, through their empirical research, they report a statistically significant, but small negative relationship. DeYoung and Torna (2009) also find that non-traditional activities influence bank stability. The augmented model is estimated in level. Hausmann test yet again support the consistency of our instrument variable.

The estimated parameters are reported in Table 5 in Appendix. The first column reports the results of our benchmark augmented model. The following columns report the results when we include the set of control variables examined in section 4.2. Similarly to our base line results, first we evaluate our benchmark-augmented model. Overall, through the reported parameters in column 1, we observed that our previous findings are insensitive towards the inclusion of the variable in our augmented model specification. The impact of *GDP* remains positive. *CAELS* increases by nearly 1.037pp in response of a 1pp boost in economic activity. To that, at a response of nearly -0.051pp, *PSRISK* continues to exhibit the relatively small negative, but statistically significant, effect on *CAELS*. By contrast, the effect of *SIZE* on *CAELS* shrinks to nearly 0.064pp. At the same time, with regards to the bank-specific variables, the magnitude of the coefficient shows that *CAELS* is affected negatively by nearly -0.346pp to a 1pp shock effect on *EFFICIENCY* and positively by nearly 0.537pp in response of 1pp shock effect on *LEVERAGE*. In addition, most importantly, increasing off-balance sheet actives is found to associate with a positive effect on bank stability. Findings show that *CAELS* rises by nearly 0.012pp to a 1pp shocks on *OFFBALANCE*. This suggests that the increasing anticipation to off-balance sheet activities which includes mostly guarantee on mortgage loans exposes bank to a more secure position. The reason can potentially be explained by the fact that the higher are the guarantee commitments a bank gives or/and takes the safer is its position to turbulent moments due to these guarantee commitments. However, by contrast this relationship is considered to be relatively small and statistically insignificant. The reason is twofold. First, the exposure of bank to such activities is most concentrated to commitments given to collateral coverage for mortgage loans. Second, banks' exposure to commitments taken constitutes only a relatively small portion, to which most of it relates to financial consolidated and well-capitalised companies.

Furthermore, when we extend the analysis on other model specification [columns (2) to (9)], we find that the inclusion of the set of control variables also does not alter the results. The estimated parameters of our core variables are generally qualitatively similar to the main results found through our benchmark specification, Eq. (1). Most importantly, the sign of the coefficients remained unchanged and their magnitude converge relatively to the same conclusions. These results also hold with respect to the set of control variables.

5. FINAL REMARKS AND POLICY IMPLICATION

This paper empirically investigates the effects of macroeconomic, market and bank-specific characteristics on stability conditions of 16 banks operating in a small opened emerging economy, namely Albania during the period 2008 – 2015. In particular, we assessed the extent to which the primary sovereignty risk can be attributed to bank fragility. Despite the global financial crises, which were not originated within the country, the Albania economy and bank sector is still lingering the negative consequences. Therefore, we introduce a continue stability indicator for the Albanian banking sector, which widely reflects the financial structure of the country and allows the desion making to analyse bank stability condition as it developments at a given moment. The indicator comprises a wide set of indicators under the CAELS criteria, which is meant to provide a macro-prudential analysis tool for banking supervisors and policy makers. At the same time, the adaption of the principal component analysis helps to solve any endogeneity problems during the empirical approach. The empirical study is based on the difference GMM approach.

The macroeconomic variables seem to have a significant effect on bank stability, which is not found for the sovereignty primary risk. In return, both industry-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. It appears that there is little difference in terms of assessing bank stability through the set of control variables. The findings from these regressions remained also robust, albeit with minor variation on significance changes, to a number of alternative ways to which we run the regression. The empirical results support the view that stability decreases with the higher interest spreads, but the extent of the effects of a higher sovereignty primary risk is relatively small. The findings can be summarised as follows. Bank stability is promoted through better economic performance and diminishes with deteriorations of financial market conditions, fiscal policy and to asset prices bubble. The latter could also be an alternative way to the sovereignty risk. The trade-offs with stability condition is observed in relation to the efficiency operations. Our results, however, do not confirm an overall outstanding explanatory power of bank intermediation indicators for the whole Albanian banking system. Nor do findings suggest leading indicator indices with regards to excessive capital. However, credit risk remains a relatively important concern given its estimated impact and statistically significant level. We also found that the scale of off-balance sheet actives is positive, but relative small and non-significant. Moreover, stability appears to be promoted in line with higher market share and higher capital ratio. The latter seems to have the highest effect among the bank-specific variables.

This paper shed some light on the determinants of the bank fragility, which have several implications for policy makers in emerging market. First, regarding the external factors economic performance has the highest importance. Therefore, macroeconomic policies that contribute to economic growth would have positive effect on Albanian banking sector stability. Second, the implication of this study is to re-emphases the important role of policy makers in ensuring that sovereignty risk within and out-side banks remain low. Therefore, primary sovereignty risk remain low, but the reverse effect of fiscal policy and financial market stance, as well as the exposure to asset price bubble should remain to the focus and sensitivity with regards to bank stability concerns. Additionally, since the internal factors are those that are a results of bank policy and management and banks have means to influence them, which in our case is operational management and capital structure. This implies the importance of banks to continue the work on two main directions. On the one hand, there is a need to undertake policies that in a way improve cost efficiency. On the other hand, of particular importance is continue work on developing appropriate technics to capital management, and in accordance to it, the assessment of adequate level of bank capital as well as the improve the capital structure of the bank. However, apart from bank specific variables, the extent to which bank aim to increase their market share seems to help them secure a more confident and stable condition.

Beyond the scope of this paper, future work should focus to the fact that further research is needed to develop indicators that adequately map increasing bank cross-section exposures risk that came importantly during the recent financial crisis of 2008 – 2009. First, we have to control for the robustness check of our bank fragility index by constructing an index that includes also a sub-index on Management, such that our index becomes under the criterion of CAMELS. Second, while our paper show that more concentrated banking system is less likely to suffer systemic risk, we do not explore this mechanism. Nor do we examine the channels though which competitiveness impact bank stability.

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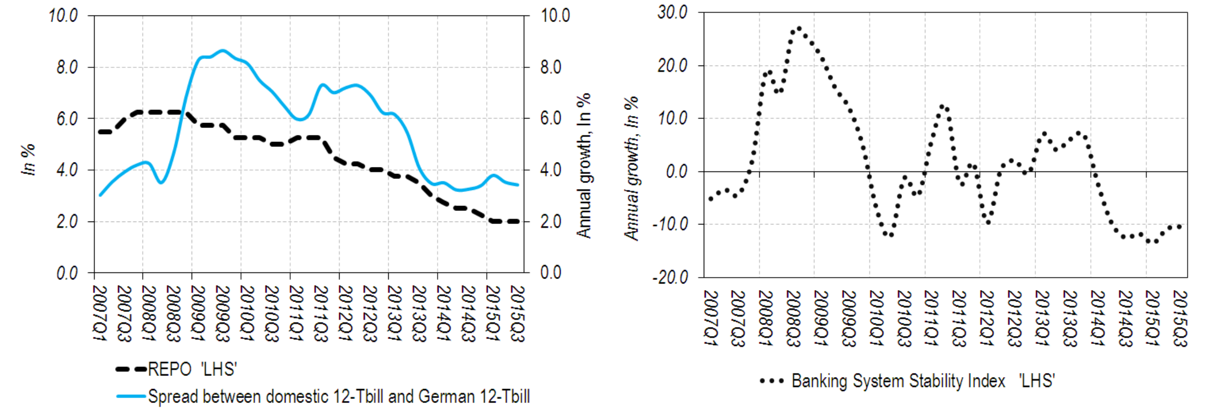
APPENDIX

Graph 1. Spread and Banking System Stability



Source: Bank of Albania; Bloomberg; Authors' Calculations

Table 1. Indicators of Bank Stability Index.

Category	Indicator	Notation	Sub-Index
Capital	Capital Adequacy Ratio	C_1	Z_C
	Core Capital/Total Asset	C_2	
	Equity/Total Asset	C_3	
	Asset growth	C_4	
	Equity Growth	C_5	
	Fixed Asset/Regulatory Capital	C_6	
	ROE	C_7	
	Non-Performing Loan (net)/Regulatory Capital	C^*_8	
Asset Quality	Non-Performing Loan (net)/Total Loan (net)	A^*_1	Z_A
	Total Loan (net)/Total Asset	A_2	
	Growth of Loan Portfolio	A_3	
	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	E_1	Z_E
	The growth of revenue from interest	E_2	
	Interest revenue/Total Revenue	E_3	
	Net Interest Margin	E_4	
	Efficiency Ratio	E_5	
	Interest Revenue (Net)/Operating Revenues (Gross)	E_6	
	Dividend/Income (Net)	E_7	
	The growth of net interest revenue	E_8	
Liquidity	Net Loan/Average Deposits	L_1	Z_L
	Active Liquid/Total Asset	L_2	
	Asset – Passive with a maturity of three months/Total Asset that provide profit	L_3	
Sensitivity to Market Risk	Asset – Passive sensitive to interest rate with a maturity up to 3 months/Total Asset that Provide Profit	S^*_1	Z_S
	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

Table 2. 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]
ΔGDP	[0.0000]	[0.0000]	[0.0000]	[1.0000]	[0.0000]	[0.0000]
ΔPSRISK	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[1.0000]	[0.0000]
FSI	[0.0071]	[0.0000]	[0.0899]	[0.0000]	[0.0000]	[0.0001]
ΔDEBT	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
HPI	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[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]
ΔDL	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
ΔDEPOSIT	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
ΔLOAN	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
ΔNPL	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
CAPITAL	[0.0424]	[0.0537]	[0.3042]	[0.0000]	[0.0000]	[0.1607]
OffBALANCE	[0.0002]	[0.0149]	[0.9760]	[0.0000]	[0.0001]	[0.9669]

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 3. Correlation Matrix for the Period 2008 Q04 – 2015 Q03

	CAELS	GDP	PSRISK	SIZE	EFFICIENCY	LEVERAGE
CAELS	1.0	0.126	-0.083	0.025	-0.099	0.001
GDP	0.126	1.0	-0.054	0.021	0.007	-0.003
PSRISK	-0.083	-0.054	1.0	0.022	-0.029	0.049
SIZE	0.025	0.021	0.022	1.0	0.001	-0.023
EFFICIENCY	-0.099	0.007	-0.029	0.001	1.0	0.386
LEVERAGE	0.001	-0.003	0.049	-0.023	0.386	1.0

Source: Author's calculations

Table 4. Empirical results on CAELS through means of GMM approach.

Model Specification	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
ΔGDP	1.0344	1.3619	1.2117	1.0584	0.9774	0.9960	0.9754	1.1559	1.1657
	[0.027]	*[0.001]*	*[0.007]*	*[0.012]*	*[0.055]*	*[0.020]*	*[0.052]*	*[0.015]*	*[0.022]*
ΔPSRISK	-0.0489	-0.0225	-0.0287	-0.0610	-0.0428	-0.0495	-0.0436	-0.0402	-0.0389
	[0.094]	*[0.277]*	*[0.229]*	*[0.016]*	*[0.176]*	*[0.079]*	*[0.169]*	*[0.022]*	*[0.222]*
ΔFSI		-0.2109							
		[0.034]							
ΔDEBT			-0.5560						
			[0.163]						
ΔHPI				-0.0935					
				[0.002]					
ΔSIZE	0.1496	0.1207	0.1431	0.1193	0.1137	0.1749	0.0813	0.0608	0.1423
	[0.027]	*[0.395]*	*[0.293]*	*[0.421]*	*[0.430]*	*[0.249]*	*[0.695]*	*[0.675]*	*[0.445]*
EFFICIENCY	-0.4404	-0.4528	-0.5055	-0.4622	-0.4597	-0.4283	-0.4478	-0.6496	-0.4239
	[0.079]	*[0.056]*	*[0.045]*	*[0.069]*	*[0.055]*	*[0.073]*	*[0.071]*	*[0.005]*	*[0.074]*
LEVERAGE	0.6121	0.4141	0.6533	0.6217	0.4820	0.4281	0.6509	0.0839	0.6403
	[0.011]	*[0.021]*	*[0.004]*	*[0.003]*	*[0.037]*	*[0.059]*	*[0.009]*	*[0.745]*	*[0.010]*
ΔDL					0.0974				
					[0.469]				
ΔDEPOSIT						0.0684			
						[0.551]			
ΔLOAN							-0.0986		
							[0.521]		
ΔCAPITAL								0.0215	
								[0.054]	
ΔNPL									-0.0826
									[0.061]
Number of Observations	448	448	448	448	448	448	448	402	428
Cross-sections included:	16	16	16	16	16	16	16	16	16
Prob J-Statatistics	0.28	0.23	0.50	0.19	0.28	0.20	0.34	0.17	0.48

Source: Authors'Calculations

Table 5. Empirical Results through means of an extended GMM approach.

Model Specification	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
ΔGDP	1.037	1.374	1.191	1.058	0.984	1.043	1.032	1.001	1.168
	[0.02]	*[0.00]*	*[0.01]*	*[0.01]*	*[0.04]*	*[0.01]*	*[0.03]*	*[0.02]*	*[0.02]*
ΔPSRISK	-0.051	-0.024	-0.033	-0.063	-0.043	-0.049	-0.041	-0.060	-0.039
	[0.07]	*[0.24]*	*[0.16]*	*[0.01]*	*[0.15]*	*[0.07]*	*[0.13]*	*[0.01]*	*[0.13]*
ΔFSI		-0.233							
		[0.02]							
ΔDEBT			-0.487						
			[0.20]						
ΔHPI				-0.096					
				[0.00]					
ΔSIZE	0.064	0.026	0.049	0.034	0.017	0.101	0.025	0.001	0.120
	[0.60]	*[0.83]*	*[0.68]*	*[0.80]*	*[0.89]*	*[0.52]*	*[0.90]*	*[0.99]*	*[0.49]*
EFFICIENCY	-0.346	-0.355	-0.401	-0.355	-0.368	-0.349	-0.359	-0.436	-0.281
	[0.11]	*[0.09]*	*[0.06]*	*[0.10]*	*[0.08]*	*[0.09]*	*[0.06]*	*[0.09]*	*[0.16]*
LEVERAGE	0.537	0.352	0.577	0.596	0.403	0.345	0.552	0.011	0.527
	[0.01]	*[0.03]*	*[0.00]*	*[0.00]*	*[0.05]*	*[0.06]*	*[0.01]*	*[0.67]*	*[0.01]*
ΔOFFBALANCE	0.012	0.014	0.012	0.015	0.013	0.012	0.009	0.011	0.034
	[0.58]	*[0.49]*	*[0.59]*	*[0.48]*	*[0.50]*	*[0.55]*	*[0.82]*	*[0.51]*	*[0.11]*
ΔDL					0.119				
					[0.32]				
ΔDEPOSIT						0.092			
						[0.25]			
ΔLOAN							-0.070		
							[0.64]		
ΔCAPITAL								0.011	
								[0.51]	
ΔNPL									-0.106
									[0.08]
Number of Observations	431	431	431	431	431	431	432	385	423
Cross-sections included:	16	16	16	16	16	16	16	15	16
Prob J-Statatistics	0.18	0.15	0.34	0.17	0.14	0.14	0.21	0.08	0.14

Source: Authors'Calculations