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Commercial banking stability determinants in European Countries

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Abstract
The purpose of this paper was to investigate the determinants of banking stability in European countries. This study used a sample of 280 commercial banks in 26 European Banks from 2002-2019. The bank stability most common measure is the insolvency risk (Z-Score). We used the GMM estimator technique described by Arellano and Bover (1995) to estimate the impact of bank specific and macroeconomic variables on European bank stability across different European regions by subdividing the original sample into five sub-samples. We find significant differences in the determinants of stability between banks from East, South, North, South and Central European countries, respectively. We show that the impact of bank specific factors on bank stability differs across different European regions. We showed that the macroeconomic variables, especially the real GDP growth rate and inflation rate, have a strong effect on the bank stability. Therefore, an increase of the GDP growth rate systematically generates an increase of bank stability.

Keywords: bank stability, financial crisis, gmm estimation

Introduction

During the past two decades, many countries have experienced significant episodes of systemic banking crises. The financial crises experienced in recent decades prompted efforts to develop models that could help identify the possible factors underlying the bank risk excess. Indeed, the global financial crisis of 2007–2008, followed by the European sovereign debt crisis late in 2009, provides a natural experiment that allows us to investigate the determinants of bank stability. Banking stability is defined as the absence of banking crises, achieved through the stability of all banks in the banking system or sector (Brunnermeier *et al*., 2009) [16]. In fact, the role and development of commercial banks has always attracted the attention of academic research. In fact, commercial banks are known to play an important role in the economic development of a country, and that an efficient and profitable banking system is a crucial condition for economic growth. In addition, the recent global financial crisis has emphasized the importance of an early identification of riskier banks, as this allows for solving the problems at a lower cost (Baselga-Pascual *et al*. 2015) [8]. Laeven and Levine (2009); Barrell *et al*. (2010); Ozili (2018) [37] and Albaity *et al*. (2019) [3] found that bank stability is closely tied to several microeconomic and macroeconomic factors. Furthermore, Salas and Saurina (2002) [38] combined macroeconomic as well as microeconomic variables to explain nonperforming loans of Spanish Commercial and Savings banks from 1985 to1997. They found that bank-specific factors may serve as early warning indicators for future changes in bank stability.

According to this study, various economic and institutional features differ amongst different European regions. In this paper, we investigated why commercial banks stability varies across these groups of countries and whether bank stability determinants depend on the bank specific characteristics and their macroeconomic environment. Our study sought to shed light on the determinants of bank stability and how the subdivision of the sample affected these determinants. The role of banks remains central in the financing of the economic activity in general, and in different segments of the market in particular (Athanasoglou *et al*. 2008) [6]. The banks' stability helps to predict financial crises because a profitable banking sector has a better ability to withstand negative shocks.

For this purpose, we used a sample of over 280 commercial banks from 26 European countries[1] over the time period spanning from 2002 to 2019. We analyzed which external and internal environmental factors that have an impact on bank stability and whether the determinants vary amongst banks operating in different regions of European countries. We investigated the effect of bank-specific (e.g., capital ratio, bank size) and macroeconomic determinants (e.g. Inflation and GDP growth) on bank stability. The global sample was divided into five sub-samples (Eastern Europe; Western Europe; Northern Europe; Southern Europe and Central Europe). By separately considering these groups, we were able to analyze how the relevant determinants affect bank stability and how these effects differ between the different regions categories. Through this paper, we wanted to investigate the determinants of bank stability and whether the various economic and institutional features across groups of European countries have an impact on these determinants. By applying a dynamic GMM technique, we were

[1] The sample includes 280 listed Commercial banks from Germany, Austria, Belgium, Bulgaria, Cyprus, Denmark, Spain, Estonia, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Czech Republic, Romania, United Kingdom, Slovakia, Slovenia, Sweden and Finland.

able to account for stability persistence and potential endogeneity problems. The existing literature on bank stability is quite large and provides a comprehensive examination of the effects of bank-specific and macroeconomic determinants on bank stability.

Most of the papers, however, study this topic within a single-country setup or a small group of countries from either developed or developing countries. A wide range of results from these studies strongly suggests that microeconomic and macroeconomic factors have an important impact on bank stability. Only a few papers, however, have dealt with bank stability for a larger sample of countries and opted to sample subdivision.

This research study is thought to contribute to the existing literature in important ways. First, to the best of our knowledge, this is one of the pioneering studies for European countries to examine the bank stability determinants between different European sub-samples. Most studies that have focused on this aspect are primarily based on US economy (Shrieves and Dahl, 1992) [40] or on other developed countries (Stolz, 2007) [41] and emerging markets (Godlewski, 2005) [31]. Second, it is the first paper among empirical banking studies to combine bank-specific and macroeconomic variables to test their impact on European bank stability. Third, to control for unobserved heterogeneity as well as endogeneity issues, we relied on the generalized method of moments (GMM) estimators, also referred to as the difference–GMM and system–GMM estimators, developed by Arellano and Bond (1991) [4], Arellano and Bover (1995) [5] and Blundell and Bond (1998) [14] for dynamic panel data models.

This dynamic panel GMM technique aims to address problems of endogeneity, heteroscedasticity, autocorrelation (Doytch and Uctum, 2011) [27] and to monitor individual and time specific effects. The use of the dynamic approach allows for the persistence of stability estimation.

The remainder of the paper is structured as follows. Section 2 surveyed the relevant literature. Section 3 detailed our model, as well as the dependent and independent variables used in our analyses. Section 4 described and discussed the results of our empirical analysis and Section 5 provided the relevant conclusions drawn from this study.

Literature Review

Undoubtedly, bank stability has been extensively studied. The respective empirical studies have focused their analyses either on cross-country evidence or on the banking system of individual countries. According to the related literature, (Houston *et al*., 2010 [33]; Agoraki *et al*. 2011 [1]; Delis *et al*. 2012 [20]; Beck *et al*., 2013 [10]; Fernández *et al*., 2016 [29] and Ahamed and Mallick 2017 [2]; Ozili, 2018 [37] and Albaity *et al*. 2019) [33, 1, 20, 10, 29, 2, 37, 3], bank stability has always been measured by z-score. The employed measure is expressed as a function of internal and external determinants. The internal determinants include bank-specific variables whereas the external ones reflect the environmental variables that are generally expected to affect the stability of financial institutions. In most studies, variables such as bank size and capital ratio serve as internal determinants of banking stability (Demirguc-Kunt and Huizinga, 1999 [22]; Javaid *et al*. 2011; Tan and Anchor, 2017) [42].The external determinants of bank stability, as presented in the literature, include factors such as the inflation rate and GDP growth rate. Most studies (Athanasoglou *et al*. 2008; Jokipi and Monnin, 2013 and Ozili, 2018) [46, 34, 37] have shown a positive relationship between inflation, GDP growth and bank stability.

Specific banks factors

In general, banks with high capital ratios are considered safer (than their counterparts). The conventional risk-return hypothesis would thus imply a negative relationship between the equity to assets ratio and bank stability. Furthermore, banks with higher equity-to-assets ratios normally have a reduced need for external funding, which has again a positive effect on their stability. Given that we have effects pointing in opposite directions, the overall effect of this variable is indeterminate from a theoretical point of view. Delis *et al*. (2011) [19] argued that bank capitalization is negatively related to bank risk-taking. This finding seems to be intuitive since a higher equity capital, as a consequence of stricter capital requirements, implies a more prudent bank behavior. Low bank capitalization leads to an increase in bank risk taking bases on the moral hazard theory. Berger and De Young (1997) [12] argued that bank managers increase their loan portfolio risk if banks are less capitalized. We referred to the capital ratio, the cost-to-income ratio and bank size as internal determinants of bank stability. In line with previous research of Athanasoglou *et al*. (2008) [6] among others, the ratio of equity to assets (capital ratio) was used as a measure of capital strength.

Bank size is often considered an important determinant of its stability. As in most studies in banking (e.g., Athanasoglou *et al*.2008; Demirguc-Kunt and Huizinga, 1999) [6, 22], we used total assets of the bank as a proxy for its size. Larger banks are more likely to have economies of scale advantages than smaller banks. We thus expected a positive effect of size on bank stability, (Pasiouras and Kosmidou, 2007). However, Stiroh and Rumble (2006), Berger *et al*. (1987) and Pasiouras and Kosmidou (2007) have shown that banks that have become extremely large exhibit a negative relationship between size and stability due to bureaucratic and other size-related reasons. Accordingly, the overall effect needs to be investigated empirically.

Macroeconomic factors

The macroeconomic environment plays an important role in banking sector stability. We chose two macro variables. First, we used the real GDP growth rate where we expected a higher growth reflects better conditions for financial stability. However, in countries where credit and real economy cycles are highly correlated the opposite might occur.

Next, we used the inflation rate and assumed that price stability contributes to the stability of the banking sector. Furthermore, an important element of the macroeconomic analysis is the study of the link between business cycle fluctuations and a banking sector stability. Indeed, Männasoo and Mayes (2009) [35] argued that during favorable macroeconomic conditions, the GDP growth and bank stability are significantly and negatively related. Bad economic conditions can worsen the quality of the loan portfolio generating credit losses, which eventually reduces a bank stability. Furthermore, banks stability might be pro-cyclical because GDP growth also influences net interest income via the lending activity as demand for lending increases (decreases) in cyclical upswings (downswings). We thus expected a positive impact on a bank stability, according to the literature on the association between economic growth and financial sector stability (Demirguc-Kunt and Huizinga, 1999; Athanasoglou *et* *al*. 2008; Baum *et al*., 2013; Calderon and Schaeck, 2016) [22, 8, 9, 17].

The effect of inflation on bank stability depends on whether wages and other operating expenses increase at a faster rate than the inflation. Most studies (e.g., Bourke, 1989; Molyneux and Thornton, 1992) [36] found a positive relationship between inflation and stability. However, if inflation is not anticipated and banks do not adjust their interest rates correctly, there is a possibility that costs may increase faster than revenues and hence affect bank stability adversely. Demirguç-Kunt and Detragiache (2005) [25] showed that inflation is highly significant in increasing the probability of bank risk of developed and developing countries over the period running from 1980 to 1995 using a multivariate Logit model. Jimenez *et al*. (2008) found that a strict monetary policy is associated with a higher bank stability in the Spanish context. Ioannidou *et al*. (2009) found similar results using the monetary policy decision as an exogenous variable for the Bolivian banking industry.

Data and Methodology

This section identified the sources of our data, presented the data and described the regression model we used to investigate the effects of internal and external factors on bank stability.

Data

Our main data source for the bank-specific characteristics is the Fitch-IBCA Bankscope (BSC) database, which provides annual financial information on banks in 26 countries around the world. The macroeconomic factors, namely inflation and GDP growth were collected from the IMF World Economic Outlook database. The Demirguç-Kunt *et al*. (2008) [24] database was used for the deposit insurance variable. The most common bank stability measure is the insolvency risk (Z-Score).

Methodology

We empirically investigated the internal and external factors effects on bank stability using a dynamic linear model given by:

$LogZscore_{i,t} = \beta_0 + \beta_1 LogZscore_{i,t-1} + \beta_2 H_{i,t} + \beta_3 I_t + \eta_i + \upsilon_{i,t} \forall i, t (1)$

Where $Logzscore_{i,t}$ represents the stability of bank i at time t, with i = 1, N, t = 1, T, β_0 is a constant term, β_1 is the bank persistence coefficients for stability. $H_{i,t}$ Denotes the bank-specific explanatory variables; I_t denotesthe macroeconomic explanatory variables; η_i represents the individual random effects and $\upsilon_{i,t}$ denotes the error terms. As a consequence, we specified a dynamic model by including a lagged dependent variable within the regression, i.e., $Logzscore_{i,t-1}$isthe one-period lagged profitability

$ZScore_{i,t} = (ROA_{i,t} + CAR_{i,t}) / \sigma_i(ROA_{i,t}) (2)$

Where $ROA_{i,t}$represents the rate of return on assets of bank i at year t; $CAR_{i,t}$ represents the ratio of equity capital to total assets for the bank i at year t; $\sigma_i(ROA_{i,t})$ is the estimate of the standard deviation of the return on assets rate of bank i at year t. While several authors used the Z-Score variable as indicated above Laeven and Levine (2009), among others applied the natural logarithm of the Z-score as the insolvency bank risk (log Zscore). Roy (1952) and Boyd *et al*. (1993) argued that Z-score represents a measure of a bank's distance from insolvency, which is defined as a situation in which losses exceed equity. A higher Z-Score level indicates that the bank is more stable. Following Roy (1952), Boyd *et al*. (1993) [15] and Laeven and Levine (2009), we examined the impact of internal and external factors on bank stability in terms of bank specific and macroeconomic variables. The variable definitions and the data sources are described in table (1).

Insert Table 1 about here

We adopted a two-step dynamic panel data methodology as proposed by Arellano and Bond (1991) [4]; Blundell and Bond (1998) [14]. The GMM technique was used to address the issues of endogeneity, heteroscedasticity, autocorrelation in the data and to monitor individual and time specific effects. The number of lags was determined by Arellano–Bond autocorrelation test and test for over identification (Hansen, 1982) [32]. It is worth noting that the system GMM estimator also controls for unobserved heterogeneity and for the persistence of the dependent variable. Overall, this estimator has been found to yield consistent estimations of the parameters (Delis and Kouretas, 2011) [19]. Given the focus of our study, we reported the estimation results for the full sample. In addition, we separately estimated the model for each of the five sub-samples as defined above. Finally, because the simultaneous inclusion of certain variables could raise concerns of multicollinearity, we computed several tests to make sure that multicollinearity issues do not affect our results.

The descriptive statistics on the different variables used in this analysis are reported in Table 2. It should be noted that the stability variables high standard deviations indicate the existence of substantial cross-sectional variation in the bank stability levels of the European commercial banks.

Empirical results

The bank stability determinants for the European sampled institutions were examined and then the different sub-panels were checked separately (Eastern Europe; Western Europe; Northern Europe; Southern Europe and Central Europe). Furthermore, the impact of bank specific and macroeconomic variables on European bank stability across different European regions was investigated by separating the full sample into five sub-samples. Table 2reports the descriptive statistics for the variables used in our analyses. We report the mean and the standard deviation for the full sample, and for our five sub-samples.

Insert Table 2 about here

We thought it would be interesting to briefly highlight a few observations. The bank stability proxy high standard deviations suggest that there is a substantial cross-sectional variation in the bank stability level. As expected, there is a large heterogeneity across the country categories. The stability among banks tends to vary, which is explained by a higher homogeneity of institutions. The capitalization of banks also differs considerably between country categories. In fact, banks in East and West European countries are better capitalized than those in Northern and Southern Europe countries. These observations can be partly explained by regulatory interventions, which also differ between countries indifferent economic development stages. Finally, we considered the macroeconomic factors included as explanatory variables in our analyses. The inflation rates are on average higher in North and Central European countries. This is partly related to an often inflationary monetary policy and a less stable macroeconomic environment, in general. Table 3 reports the regression results for our main stability measure. We provided separate estimations for five sub-sample categories. The first column of the table displays the results when the banks from all countries are simultaneously considered, whereas columns two through six show the estimation results by region. Our estimation results have stable coefficients. The Wald-test indicates fine goodness of fit for the estimated model and the Saran test shows no evidence of over-identifying restrictions. The equation indicates the existence of negative first-order autocorrelations. However, this does not imply that the estimates are inconsistent. Inconsistency would be implied if there was a second-order auto-correlation (Arellano and Bond, 1991) [4]. The test value of the second-order autocorrelation (AR 2 errors), however, implies that the moment conditions of the model are valid. The significance of the coefficient on our lagged dependent variable across all models confirms the use of a dynamic model. We remarked that our stability measure reveals a high persistence degree proving the validity of our GMM model.

Insert Table 3 about here

The results for the determinants of our stability measure provide further insights that are worth emphasizing. The positive and significant coefficient of the size variable for the whole sample as for Eastern European, Western European and Northern European samples in our bank stability regressions confirms some empirical support for the economies of scale market-power hypothesis (Diamond, 1984) [26]. Larger banks might achieve efficiency gains that are reflected in higher earnings because they do not operate in very competitive markets. Therefore, the theoretical basis of the linkage between size and bank stability is mixed.

On the one hand, there are arguments in favor of a negative relationship between size and bank stability (see Saunders *Et al*.1990) [39]. The existence of a negative relationship between size and risk is related to the justification for the existence of banks.

The argument is the diversification by size. Indeed, larger banks of ten have a greater diversification capacity which implies a higher risk compared to smaller banks.

The capital ratio, which is defined as equity over total assets, has a positive and significant effect on bank stability for Eastern and Western Europe commercial banks only. It is negatively related to bank stability for Northern, Southern and Central Europe banks. The negative coefficients show that bearing more capital has a negative impact on the bank stability. This observation reflects the fact that banks with relatively more equity are automatically less stable. As outlined above, the capital ratio is a measure of bank risk and may have an a priori ambiguous effect on bank stability. Indeed, better-capitalized banks are safer compared to those with lower capital ratios and may face lower costs of funding due to lower prospective bankruptcy costs. In concrete terms, an increase of the capital ratio by 1% leads to an increase of the bank stability of 0.026% for the whole sample. This result confirms the empirical evidence of Bourke (1989), Demirguc-Kunt and Huizinga (1999) [22], as well as Berger and Bouwman (2013) [11]. Considering the external factors related to the macroeconomic environment of the countries in which the banks are operating, we found that the inflation rate has a positive and significant effect on bank stability in East and North European countries. Bank management in these countries seems to forecast future inflation satisfactorily, which, in turn, implies that interest rates have been appropriately adjusted to achieve a higher stability. Our results are consistent with the findings of Flaming *et al*. (2009); Ozili (2018) [37] and Albaity *et al*. (2019) [3]. However, this result contradicts with Demirguç-Kunt and Detragiache (2005) [25]; Drakos *et al*. (2014) and Chen *et al*. (2015). They found that a higher inflation generates an increase of bank instability. The effect of GDP growth on bank stability is statistically significant and positive across different sub-samples which means that bank stability in these countries usually increases in prosperous economic times. This result is similar to that of Drakos *et al*. (2014) and Chen *et al*. (2015). Indeed, they argued that Drakos *et al*. (2014) showed that a higher real GDP growth rate leads to stable banks and greater returns and generates a decrease of bank failure.

Focusing on columns (2) and (3) related to Eastern and Western European banks, we achieved the same findings for the whole sample. We remarked a significant impact of macroeconomic variables on bank stability. This result can be explained by the emergence of financial crisis which influenced the banking stability and generated a high bank risk level of financial institutions in the world and especially in the European banking industry. The regression results for Central European banks are reported in column (6). We notice that the bank stability variable is negatively related to bank specific factors; however, it is positively related to the GDP growth rate. By subdividing the whole sample of commercial banks into five sub-samples, we remarked important differences in the bank stability behavior.

Conclusion

Different determinants of the banks' stability have been investigated in the literature. While most of the papers focus on the individual banks and developed markets, only a few were achieved dealing with the banking sector stability in European commercial banks. Furthermore, banking stability around the world differs widely as commercial banks have to cope with different macroeconomic environments and different institutional realities. Applying the GMM estimator technique described by Arellano and Bover (1995) [5] on a cross-country data set of commercial banks across 26 European countries over the period 2002 to 2019, this paper analyzed the main determinants of bank stability.

We subdivided the whole sample of 280 banks across the 26 European countries cited above into five sub-samples (East, West, North, South and Central European countries) to show the stability determinants differences across different regions. We used the z-score for measuring the bank stability and reached sound findings. The results show that the bank capitalization influences the banks' stability. Consequently, a positive relationship is notice able meaning that a well-capitalized banking sector is also a stable one. Therefore, banks with a higher equity to assets ratio are relatively more stable. This result seems very interesting and of great importance, to oin light of the current discussions concerning the capital adequacy ratios (Basel III). We also revealed remarkable results with respect to bank size. We pointed out that, bank size has negative and significant effects on bank stability.

Significant differences were noted in the determinants of stability between banks from East, South, North, South and Central

European countries, respectively. We observed differences between different sub-samples with respect to significance, sign as well as of coefficients. We showed that the impact of bank specific factors on bank stability differs across different European regions. This may be explained by differences in bank regulation, size of the economy, institutional environment. However, we found the same relationship between bank stability, bank-specific and macroeconomic factors for the whole sample, for East and West European banks. Specifically, the estimation results indicate that the macroeconomic variables coefficients are fairly stable across different regions. We showed that the macroeconomic variables, especially the real GDP growth rate and inflation rate, have a strong effect on the bank stability (Laeven and Levine 2009; Barrell *et al*. 2010) [7]. Therefore, an increase in the GDP growth rate generates an increase in the bank stability.

Our results are relevant from several points of view. First, the variables included in our analyses confirm and complement findings from former studies on bank stability. Second, we provided evidence relying on contemporary data, including the latest financial crisis. Third, the analysis of a large sample of banks from 26 countries grouped into five sub-samples allowed us to better understand how the determinants of bank stability depend on a European country subdivision. Future research could focus on the impacts of the governmental and legal environment on bank stability. This issue will be addressed in a future work.

Table 1: Variables description and data sources this table presents different dependent and independent variables used in our estimations. The dependent variable (LogZscore) is used to capture bank stability. Bank specific variables are bank size and bank capitalization. Macroeconomic variables include inflation and GDP growth rate.

Variable	Descriptions	Sources
	Bank stability proxy	
Log Zscore	It is defined as the inverse of the probability of insolvency and is equal to the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. The z-score measures the distance from insolvency. We use the natural logarithm of the Z-score which is less skewed and follows the normal distribution. A higher z-score indicates that the bank is more stable	Bankscope
	Bank specific variables	
LnTA	Bank size : The natural logarithm of total assets	Bankscope
BC	Bank capitalization ratio (%) =Total equity divided by total assets	Bankscope
	Macroeconomic variables	
INF	The inflation rate	World Development Indicators
GDP	The GDP growth rate	

Notes: Bank-level variables include bank capital and bank size. Macroeconomic variables include GDP growth rate and inflation rate. Domestic credit to private sector and real interest rate. The Bureau Van Dijk Banks cope data baseis the main source of the financial statements. The macroeconomic data are obtained from WDI.

Table 2: Descriptive statistics

		Full sample		Eastern Europe		Western Europe		Northern Europe		Southern Europe		Central Europe	
Variable	**Correlation**	**Mean**	**Std. dev**	**Mean**	**Std. dev**	**Mean**	**Std. dev**	**Mean**	**Std.dev**	**Mean**	**Std.dev**	**Mean**	**Std. dev.**
Log Zscore		2.574	1.019	2.129	0.781	1.812	2.022	1.892	1.248	2.847	1.111	2.125	0.568
Ln TA		7.614	1.134	6.119	2.116	7.325	1.523	6.159	1.714	7.432	1.548	8.456	1.369
BC		6.977	4.784	7.325	2.238	6.546	5.638	0.285	0.293	0.113	0.197	6.824	2.215
GDP		2.132	2.124	1.835	4.258	0.547	1.814	1.145	2.695	0.645	1.256	1.213	3.784
INF		1.795	1.823	0.625	1.877	1.194	1.017	2.136	3.281	1.109	1.456	2.122	1.695

Notes: Dependent variable is bank stability; Log Zscore. Independent variables are bank size (Ln TA); bank capitalization (BC); (GDP) growth rate and inflation rate (INF).

Table 3: GMM System Estimation Results

Variable	Full Sample	Eastern Europe	Western Europe	Northern Europe	Southern Europe	Central Europe
$Logzscore_{(t-1)}$	0.652***	0.621***	0.589***	1.106***	0.639***	0.914***
	(0.000)	(0.002)	(0.007)	(0.005)	(0.007)	(0.006)
Ln TA	0.024**	0.124**	0.056**	0.821**	-0.123**	-0.064*
	(0.034)	(0.043)	(0.049)	(0.028)	(0.046)	(0.071)
BC	0.026***	0.214***	0.061***	-0.071***	-0.118***	-0.224***
	(0.000)	(0.000)	(0.008)	(0.008)	(0.004)	(0.001)
GDP	0.015***	0.195***	0.012***	-0.087**	0.047*	0.113***
	(0.005)	(0.000)	(0.002)	(0.021)	(0.069)	(0.002)
INF	-0.032**	0.215	-0.054***	0.254**	-0.071**	-0.091*
	(0.030)	(0.524)	(0.004)	(0.019)	(0.038)	(0.064)
Constant	-0.324	-0.741**	0.396	-1.196*	0.346***	0.236**
	(0.604)	(0.059)	(0.417)	(0.098)	(0.009)	(0.049)
Sargan test	38.475	31.265	19.875	1.894	12.200	12.380
	(0.825)	(0.698)	(0.073)	(0.896)	(0.641)	(0.930)
AR(1) test	-3.257	-1.692	-2.958	-1.431	-1.658	-1.514
	(0.079)	(0.081)	(0.023)	(0.231)	(0.081)	(0.174)
AR(2) test	-0.678	1.214	-1.268	-0.765	-0.129	1.892
	(0.529)	(0.348)	(0.623)	(0.514)	(0.748)	(0.635)

Notes: Dependent variable is bank stability; Log Z score. Independent variables are bank size (Ln TA); bank capitalization (BC); (GDP) growth rate and inflation rate (INF).

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