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BANK'S CAPITAL BUFFERS AND BUSINESS CYCLE: EVIDENCE FROM GCC COUNTRIES, 2004-2011

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Abstract

This paper empirically investigates the relationship between the capital buffers maintained by banks and the business cycle in a panel covering 70 banks drawn from all six GCC countries during the period 2004-2011. We estimate a standard partial adjustment model accounting for GDP per capita growth, the chosen measure of economy-wide business cycle, and a set of control variables using dynamic GMM panel estimation. We find banks' capital buffers and the business cycle to be robustly and negatively associated. However, we also find this evidence to be stronger for the case of large banks where the access to capital equity markets and public support is likely to constitute a strong incentive to increase credit exposure and lower capital bases accordingly. On the other hand, for small banks, the negative effect was attenuated by their small size, which could be explained by their limited access to equity markets and the difficulty they face in re-building their capital bases during economic recessions. Not surprisingly, therefore, our finding coheres with the observation that small banks are more likely to adopt more conservative practices where capital buffers are less responsive to short run changes of the business cycle.

JEL Classification: C26, G21, G28

Keywords: Bank capital buffer, Credit risk, regulation.

ملخص

تقوم هذه الورقة بالتحقيق تجريبيا في العلاقة بين مخازن رؤوس الأموال التي تحتفظ بها البنوك ودورة الأعمال في مسح يغطي 70 بنكا تم اختيارهم من جميع دول مجلس التعاون الخليجي الست خلال الفترة 2004-2011. نقوم بتقدير النموذج القياسي الجزئي المعدل لنمو الناتج المحلي الإجمالي للفرد، والمقياس المختار من دورة الأعمال على مستوى الاقتصاد، ومجموعة من المتغيرات للسيطرة على استخدام ديناميكية تقدير المسح GMM . نجد أن العلاقة بين مخازن رؤوس أموال البنوك ودورة الأعمال سلبيه. ومع ذلك، نجد أيضا هذا الدليل ليكون أقوى لحالة البنوك الكبيرة حيث الوصول إلى أسواق الأسهم الرأسمالية ودعم الرأي العام من المرجح أن يشكل حافزا قويا لزيادة التعرض لمخاطر الائتمان وانخفاض قواعدها الرأسمالية وفقا لذلك. من ناحية أخرى، بالنسبة للبنوك الصغيرة، فالتأثير سلبي بسبب صغر حجمها، والذى يمكن أن يفسر محدودية فرص وصولهم إلى أسواق الأسهم والصعوبة التي يواجهونها في إعادة بناء قواعدها الرأسمالية خلال الركود الاقتصادي. وليس من المستغرب، أن النتيجة لدينا تتفق مع ملاحظة أن البنوك الصغيرة هي أكثر عرضة لتبني ممارسات أكثر تحفظا حيث مخازن رأس المال أقل استجابة للتغيرات على المدى القصير من دورة الأعمال.

1. Introduction

The credit slumps that happened in the aftermath of the recent global economic crisis have highlighted the importance of the monetary transmission mechanism, and specifically the role of the banking sector, in propagating monetary policy impulses. It has also showed that Basel agreements (Basel I and Basel II) on capital requirements are not enough to avoid business cycles fluctuations and especially the decrease in banks' lending activity over the downturn side of the cycle. The financial turmoil has also pushed the Basel Committee on Banking Supervision to update the regulations to mitigate risks and practices that would exacerbate cyclical trends. In this regard, a large part of the new regulations targets pro-cyclicality through building buffers of resources that would be used in bad times.

The new Basel requirements (or Basel III) for mitigating pro-cyclicality are provided for by a new framework called "*macro-prudential overlay.*" The key idea behind this framework was driven by the observation that even properly capitalized banks have fallen prey to systemic risks; hence the need for adding a macro-prudential dimension to the firm level supervision. The macro-prudential framework would aim at building up buffers during booms that could, in turn, be used by banks during periods of stress.

The proposed countercyclical capital buffer stock would range from 0 to 2.5% of the total risk weighted assets that should be built across periods of high loans growth with the agreement of the Central Bank. This new buffer earmarks a new era in international financial regulations, where the macro dimension comes into play as a key complement to the micro level supervision, thus creating a more comprehensive and, hopefully, more effective, framework for dampening an economy's credit cycle. To protect the banking sector from the excess loans growth generally related to systemic-risk build-ups, the Basel Committee on Banking Supervision (BCBS, 2010a) recommends using the deviations of the Credit-to-GDP ratio with respect to its trend as the main macroeconomic measure that would influence the variation of the buffer[1].

Many contributions across the literature have tried to address the procyclicality of capital requirements through highlighting the negative correlation between banks' capital and the business cycle. Jopikii and Milne (2006), using a panel 486 banks over the period 1997-2004 in a cross section of countries, found that bank capital buffers and output gap are negatively correlated. Moreover, capital buffers of large banks exhibited a countercyclical relationship with the economic cycle. However, for small banks, capital ratios tend to rise with the economic cycle.

Repullo and Suarez (2009), using a dynamic general equilibrium model, studied the procyclical effects of the bank capital regulation. They found that the large buffers held by banks in expansions are not enough to avoid substantial contraction in lending supply during recessions. In their critical assessment of the new Basel updates (known as Basel III) and its countercyclical buffer, Repullo and Saurina (2011) found that the mechanical application of the buffer would entail higher capital requirements during the recession of the economy and lower capital ratios during expansion. This may end up exacerbating inherent pro-cyclicality of risk-sensitive bank capital regulation

Tabak et al. (2011) provided empirical evidence based on data covering 134 banks operating in Brazil during the period 2000-2010. They estimated a loans growth equation to test whether bank lending affects capital buffers and found that the economic cycle has a negative impact on the surplus capital and that capital buffers affect bank lending. Deriantino (2011) studied the effect of the business cycle on bank's capital buffer and the effect of this latter on bank's loan supply for a sample of 63 commercial banks operating within the Association of Southeast

[1]The guide for monetary authorities operating the countercyclical capital buffer was published in 2010 (BCBS (2010b)).

Asian Nations (ASEAN). The study showed that banks reduce their loan growth during the recession period because of the impaired lending capacity resulting from the need to increase capital buffer to mitigate riskiness of credit default.

Coffinet et al. (2011), in their study of a sample of French banks over the period (1993-2009, assessed the extent to which capital buffers intensify the cyclical behavior of credit. The authors found that capital buffers tend to exacerbate cyclical credit movements arising from the business cycle, which give support to a countercyclical financial regulation whose objective is to achieve a smooth loan growth.

Notwithstanding the expanding literature on developing and emerging economies, there is, however, very little empirical research on the effect of countercyclical buffers on bank loans in GCC countries. To a very large extent these countries depend on oil revenues where hydrocarbon accounts for roughly 50% of the region's GDP and more than 80% of exports. Moreover, the GCC monetary regimes are anchored by a hard peg to the US Dollar[2], which raises the stakes for the need to use non-price instruments, such as the buffer stocks, for mounting counter-cyclical monetary policy. Moreover, given the bank-based nature of their financial systems and possible presence of financial frictions, there is no clear picture on the nature of the relationship between bank loans and the cyclical nature of economic activity.

This paper attempts to shed more light on this issue by analyzing the determinants of the cyclical nature of bank loans in GCC countries using GMM estimation techniques where data are collected from banks' balance sheets over the period 2004-2011. More specifically, we investigate the relationship between short-run adjustments in bank capital buffers and the business cycle and we use a partial adjustment approach that allows taking into consideration a set of control variables considered as relevant for banks' lending behavior. We also test for weather bank-specific characteristics, such as size and liquidity, tend to influence their behavior in terms of capital buffers during the business cycle.

The remainder of the paper is organized as follows. Section 2 discusses some key stylized facts about the relationship between banks' capital buffers and economic growth in the GCC. Section 3 presents a standard empirical model for analyzing the determinants of banks' capita buffers; discusses summary statistics of major correlates; and presents the estimation results. Section 4 concludes and offers some policy recommendations.

2. Stylized Facts

This paper investigates the impact of banks' capital buffers on the business cycle in the GCC countries. It begins by looking into the historical behavior of bank capital buffers, lending and GDP growth in these countries. We use for that a data set on 70 banks operating in GCC countries over the period 2004-2011 extracted from Bankscope Database (2013). The capital buffer is measured as the difference between the observed capital ratio in bank *i* in period *t* and the minimum regulatory capital in the country. The latter is equal to the level set by Basel II accords unless the local regulations indicate a higher level. Basel II regulations set the minimum capital adequacy ratio (CAR) at 8% but the new updates of these regulations (Basel III) have raised it to 10.5%. In some of the GCC countries the regulatory authorities set the minimum CAR ratio a bit higher than international levels. For example, in the UAE the minimum capital to risk-weighted assets ratio was set by the Central Bank at 10% since 1993, which was then increased to 12% in June 2010 in a precautionary bid to strengthen the soundness of the banking sector in the aftermath of the financial crisis.

As for lending growth, it is measured by the rate of loans in bank *i* in period *t* compared to period *t*-1 and the loans are also extracted from the Bankscope Database (2013). Finally, for

[2] With the exception of Kuwait where the peg is made to a basket composed of US dollar and Euro.

the GDP growth we use the International Financial Statistics (IFS) of the International Monetary Fund (IMF) (2013).

Table (1) shows the evolution of these variables in the GCC countries during the period 2004-2011. The co-evolution of banks' lending growth and GDP growth, especially during the pre-crisis period in almost all countries, can clearly be seen. This observation is in line with the assumption that bank loans increase when risks are perceived to be weak (i.e., during upturns). Moreover, the figures also show a countercyclical behavior of capital buffers with respect to the business cycle.

This means that during economic upturns, banks tend to build lower capital buffers, while continuing to expand their lending activities and if the capital ratio increases it is simply because of higher earnings and lower risk weighted assets (RWA). Conversely, during downturns, banks increase their capital ratios through cutting loans, as equity capital becomes very expensive in such circumstances.

It is also worth noting that the post crisis period witnessed a substantial increase in the capital buffers in Bahrain, Saudi Arabia and especially United Arab Emirates (UAE) that were accounted for by a remarkable jump in capital ratios. The latter is due to the forceful intervention by the authorities in these countries that helped contain the impact of the financial crisis (see Table (2)). The intervention included, among other measures, capital and liquidity injections into the hard hit banks. It also included the lowering of interest rates, reductions of reserve requirements and relaxation of prudential loan-to-deposit ratios (Khamis and Senhadji 2010).

3. An Empirical Model for Banks' Capital Buffers in the GCC

To test whether the capital buffers have an effect on the business cycle, we use the partial adjustment framework developed for the case of Spain by Ayuso and Saurina (2004) and for the USA by Estrella (2004). Specifically, this approach focuses on the behaviour of banks in their bid to attain the optimal capital buffer $BUFF^{*}_{i,t}$ given the observed capital buffer

$BUFF_{i,t-1}$using a partial adjustment framework:

$$\Delta BUFF_{i,t} = \delta(BUFF^{*}_{i,t} - BUFF_{i,t-1}) + \varepsilon_{i,t} \quad (1)$$

Where Δ is the difference operator, i refers to the bank (i= 1, N) and t to time (t = 1, T). δ is a parameter that stands for the speed of adjustment of the observed capital buffer $BUFF_{i,t-1}$ to its optimum level $BUFF^{*}_{i,t}$ and $\varepsilon_{i,t}$ is an error term.

If we add $BUFF_{i,t-1}$ to both sides of equation (1), this latter becomes as follows:

$$BUFF_{i,t} = \delta BUFF^{*}_{i,t} + \theta BUFF_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Where θ= (1-δ). Since the optimal capital buffer $BUFF^{*}_{i,t}$ is unobservable, we instrument it by observable variables such as bank specific variables, credit risk and the business cycle. This suggests transforming equation (2) into the following empirical specification:

$$BUFF_{i,t} = \alpha_0 + \theta BUFF_{i,t-1} + \beta X_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where X represents a vector of control variables that includes GDP growth rate (*Growth*) to account for the business cycle; bank-specific characteristics, such as profitability (*ROAE*), size (*Size*), liquidity (*Liq*), rate of growth of loans (*Dloans*) and the ratio of loans to total assets (*LA*). It also includes other interactive variables to test whether the effect of real growth on bank capital buffers is conditional on size or liquidity characteristics of the bank. Thus, to separate large banks from small banks, we introduce the *Growth size* variable and to distinguish

banks with high liquidity levels from those with low liquid assets add *Growth liq* to the determinants of the capital buffer in the above equation.

To take into consideration the effect of the global financial crisis we add a dummy variable called *Crisis* that takes the value of one (1) in 2008 and 2009 and zero elsewhere. Country-specific effects are also accounted for through the dummy variable *Country* that takes the value 1 for a given country while it is equal to zero for the remaining ones. For the error terms, we assume that $\varepsilon_{i,t} = \rho_{i,t} + u_{i,t}$ where ρ_i is an idiosyncratic component that is uncorrelated with the different regressors included in the vector $X_{i,t}$. Finally, $u_{i,t}$ is a white-noise disturbance.

As we estimate equation (3) for a panel of GCC countries, we add the index *k* as follows:

$$BUFF_{i,k,t} = a_0 + qBUFF_{i,k,t-1} + j X_{i,k,t} + e_{i,t} \quad (4)$$

Where *k* refers in equation (4) to the country ($k = 1, \ldots, K$). Since the main objective of the paper is to test whether or not capital buffer displays countercyclical behavior, the sign of the parameter of the GDP growth variable is of pivotal importance. As discussed a negative sign would suggest that during expansion phases banks tend to increase their lending and consequently capital buffers fall. In contrast, during contraction periods, banks tend to build up their capital bases by boosting their capital levels. This is the so called "*short-sightedness*" in the literature (Borio et al. 2001) and several studies have corroborated such behavior in the empirical literature (Jopikii and Milne 2008 and Stolz and Wedoo 2011).

For the profitability measure, the sign of the coefficient of the profitability indicator which is the return on average equity (ROAE) is expected to vary significantly over the business cycle. In particular, during the economic downturn the banks are expected to experience decreasing (or even negative) profitability indicators, while during expansion they are likely to enjoy higher rates of profitability. And, for *Size*, which is measured by the total assets of each individual bank minus the average total assets of all banks, we have:

$$Size_{it} = \log A_{it} - \frac{1}{N}\sum_{i=1}^{N} \log A_{it} \quad (5)$$

Where *A* represents the assets of the bank of bank *i* during the period *t* (expressed in logarithmic form) and *N* is the number of banks. The variable *Size*, as presented in equation (5) captures differential rather than level effects. It tends to measure the degree of monopoly of the bank in the market. A higher size of the bank is indicative of a monopoly power while a lower size means that we have a small bank whose asset is close to the average. Finally, for the liquidity variable of the bank, we choose a measure that takes into consideration the risk of liquidity shortage following withdrawal of deposits. Unlike the size variable, this variable is measured in the form of differences with respect to the bank average:

$$Liq_{it} = \frac{LA_{it}}{A_{it}} - \frac{1}{T}\sum_{t=1}^{T} \frac{LA_{it}}{A_{it}} \quad (6)$$

Where *LA* refers to liquid assets, $\frac{LA_{it}}{A_{it}}$ is the ratio of liquid assets over total assets and $\frac{1}{T}\sum_{t=1}^{T} \frac{LA_{it}}{A_{it}}$ is the average over of this ratio latter ratio. Therefore, the liquidity variable expresses the excess or shortage of liquidity with respect to the bank's liquidity average over time. In other words, as the concept of liquidity is bank specific, equation (6) presents the

liquidity measure as the difference between the actual bank's liquidity ratio and its own optimum liquidity ratio[3].

To estimate equation (4), we use the Generalized Method of Moments (GMM), due to Arellano and Bond (1991) and Arellano and Bover (1995), which is recommended for dealing with dynamic structure specifications in a panel data context. Following Blundel and Bond (1998), we adopt the two step system GMM that combines regressions in differences as well as in levels; hence permitting the full exploitation of both the long and short-run information contained in the data.

The consistency of estimates depends on two major assumptions: (*i*) the validity of instruments and (*ii*) the absence of serial correlation between the errors. To test for the first assumption, we use the Hanson's approach of over-identifying conditions. The overall specification of instrument is accepted if the null hypothesis of over-identifying restriction is not rejected. For the second test examines the presence of second order auto correlation in the errors and if the null hypothesis is accepted this means that the errors are not serially correlated.

3.1. Data description

The data used in the empirical investigation was collected using the Bankscope Database and it includes 70 national and foreign banks based in the GCC countries. The variables are extracted from the yearly consolidated accounts of each bank over the period 2004 – 2011. However, a number of variables were missing in some of the years causing the estimations to be carried out on an unbalanced dataset.

A close inspection of the data reveals that capital buffers of the selected banks varies between 2.8% and 73.6% with an average of11.73 (see Table (3)). This high level of capital buffers can be attributable to several reasons. First, it might be due to the unstandardized risk assessments carried out in the different GCC banks which allow these financial institutions to set the most appropriate capital levels according to their own assumptions of risk behavior (Tabak 2004). Second, banks may like to show a state of soundness in the market only for assessment purposes so as to satisfy the rating agencies through holding excess capital (Jackson et. al., 1999). Capital buffers also display some volatility as the standard deviation stands at a high of 7.52%. This result might suggest a different evolution between risk weighted assets (RWA) and capital.

The growth rate shows the same pattern with an average exceeding 5% but varying between -14% and 15%. These growth achievements seem to be accounted for by banks' lending whose average equals to 8.32% but with a maximum standing at a high of 72% (see Table (3)) and it is in line with the finance and growth nexus hypothesis (Levine 1997, 2004); Levine, Beck and Loayza 2000). The correlation coefficient between economic growth and bank loans seems providing support to that as it is also positive, significant and equal to 0.41 (See Table (4)).

The correlation coefficient between capital buffer and economic growth (-0.038) indicates an inverse relationship where banks' capital ratios tend to be high during expansionary periods. On the contrary, these ratios would decline during contractionary periods. Furthermore, what is more interesting in the above outcome is the negative coefficient between bank size and capital buffer. This result implies that the bigger the bank; the lower the capital buffer it tends to hold.

As for the return on average equities (ROAE), the coefficients of Table (4) show the expected negative sign. The rationale behind it is that any increase in the cost of equity capital would likely reduce capital buffers. Finally, it appears that the bank's liquidity coefficient does not have the expected sign as it is found to be positive. In fact, any increase in liquid assets helps banking institutions to maintain lending for a given level of banks' capital buffers.

[3]This optimal liquidity ratio of the bank depends on its own size, degree of exposure to risky activities, nature of customers….).

3.2 Estimation results

The section presents the results of the estimations of equation (4) carried out using a data set on 70 banks operating in GCC countries over the period 2004-2011. Table (4) displays the outcome of a basic regression that includes the GDP growth as a business cycle indicator and, *ROAE* as a profitability indicator, the rate of growth of loans (*Dloans*) and the ratio of loans to total assets (*LA*). We add also dummies to account for the effect of the crisis and GCC countries.

Column (1) of Table (5) shows that the estimated coefficient of the GDP growth is negative and highly significant at the 1% level, which means that capital buffers are countercyclical with respect to economic activity in GCC countries, as has been illustrated in the stylized facts. This suggests that banks operating in GCC countries tend to raise their capital ratios during contraction phases and increase them during booms. We also find that there large and significant inertial effect, as given by the positive coefficient of the lagged capital buffer. Moreover, the recent global financial crisis was estimated to have had a highly significant and negative effect on the capital buffer.

In column (2), bank size (*size*) was added to the baseline regression 1 and was found to be negative and significant at the 5% level, suggesting that large banks tend to lower their capital buffers. Others results remain unchanged as in regression 1, except that the negative effect of ROAE has now become moderately significant (at slightly more than 5% significance level).

In regressions 3 and 4, we add an interaction term between growth and bank size and find that in both regressions the associated coefficients were negative and highly statistically significant. These results suggest that large banks tend to hold lower capital buffer during booms. This is an additional effect over and above the direct negative effects due to booms or size of banks. This result corroborates the earlier finding obtained by Jopikii and Milne (2008) for banks operating in the European Union composed of 15 countries (EU15).

One explanation of this heterogeneous behavior of banks in GCC countries is that most of large banks in the region are totally or partially state-owned and have access to public funding and equity markets more easily than small banks. This fact might be considered as a major incentive for these banks to lower their capital buffers during economic expansions without taking major risks. Nevertheless, for small banks, it could be more costly to re-build their capital bases after a reduction of their buffers in response to a short-term change of the business cycle.

The fact that capital buffers present such a significant relationship with short-run changes of the business cycle for large banks might have implications for monetary policy transmission mechanisms. Indeed, during economic downturns and because credit risk cannot be completely absorbed by previously built capital buffers, these banks will be called to raise their regulatory capital ratio. This could be done either though increasing capital or cutting lending. However, because of the relatively high cost of equity capital, these banks will tend to reduce their credit exposure which will raise the capital ratios through its effect on risk weighted assets. Under such circumstances, the reduction of credit is likely to amplify the business cycle and the monetary policy transmission will, therefore, hinge on the response of capital buffer over the bust cycle (Garcia-Suarez et al. 2012).

In Table (6), we estimate the same equation (4) with bank size replaced by liquidity characteristic (*Liq*). The estimated coefficient of this latter variable in column (1) was positive and significant but when interacted with the growth variable, it turned negative and significant, while its direct effect is no longer significant. The negative and significant effect of the interactive variable remains after removing the liquidity variable in column (3). This result means that banks with more liquid assets tend to reduce their capital buffers during booms and increase them during busts. In other words, capital buffers behave countercyclically for banks

with high liquid assets. This result should not be surprising for banks operating in the GCC since when they have an access to liquidity they have incentives to lower their capital ratios during economic expansion. However, the results could also be a reflection of the moral hazard phenomenon.

4. Conclusion and Policy Recommendations

Using a panel of banks operating in GCC countries over the period 2004-2011, we carried out an empirical investigation on the behavior of banks' capital buffers during periods of economic expansions and recessions during the period 2004-2011. We used a partial adjustment approach and a set of control variable to test the behavior of bank's capital buffers over the business cycle.

The results show that capital buffers and the business cycle vary in seemingly opposite way. Furthermore, we found that this negative relationship is rather related to large banks. These latter banks are in most cases state-owned with a monopoly behavior and easy access to equity capital markets and public funds, which is considered as an incentive to increase exposure and incurring major risks during economic expansion and to lower their capital bases accordingly.

In the case of small banks, the behavior is found to be different as they found that access to equity capital is very costly and it is difficult to re-build capital bases during downturns. This is a major reason that pushes them to adopt a conservative behavior that makes their capital buffers less responsive to short run variations in the business cycle.

Bank liquidity is also found to be a distinctive feature in the behavior of GCC banks' capital buffers during the business cycle. In fact, evidence shows that more liquid banking institutions tend to lower their capital buffers more during the upturn, while for banks with low liquid assets the optimal capital buffer is less reactive to changes of the business cycle.

An interesting implication of all these finding is the key role of monetary authorities in the supervision and surveillance of risk management practices. Specifically, from a macro-prudential policy perspective, central banks in GCC countries are called to adopt more sophisticated instruments to deal with credit risk in the banks operating in the region. The idea standing behind such recommendation is that even the safe framework laid down by the new Basel accords (Basel III), the procyclicality between banks' capital buffers and the business cycle cannot be avoided without a new regulatory framework of risk classification that allows capturing the risk profile of loan books.

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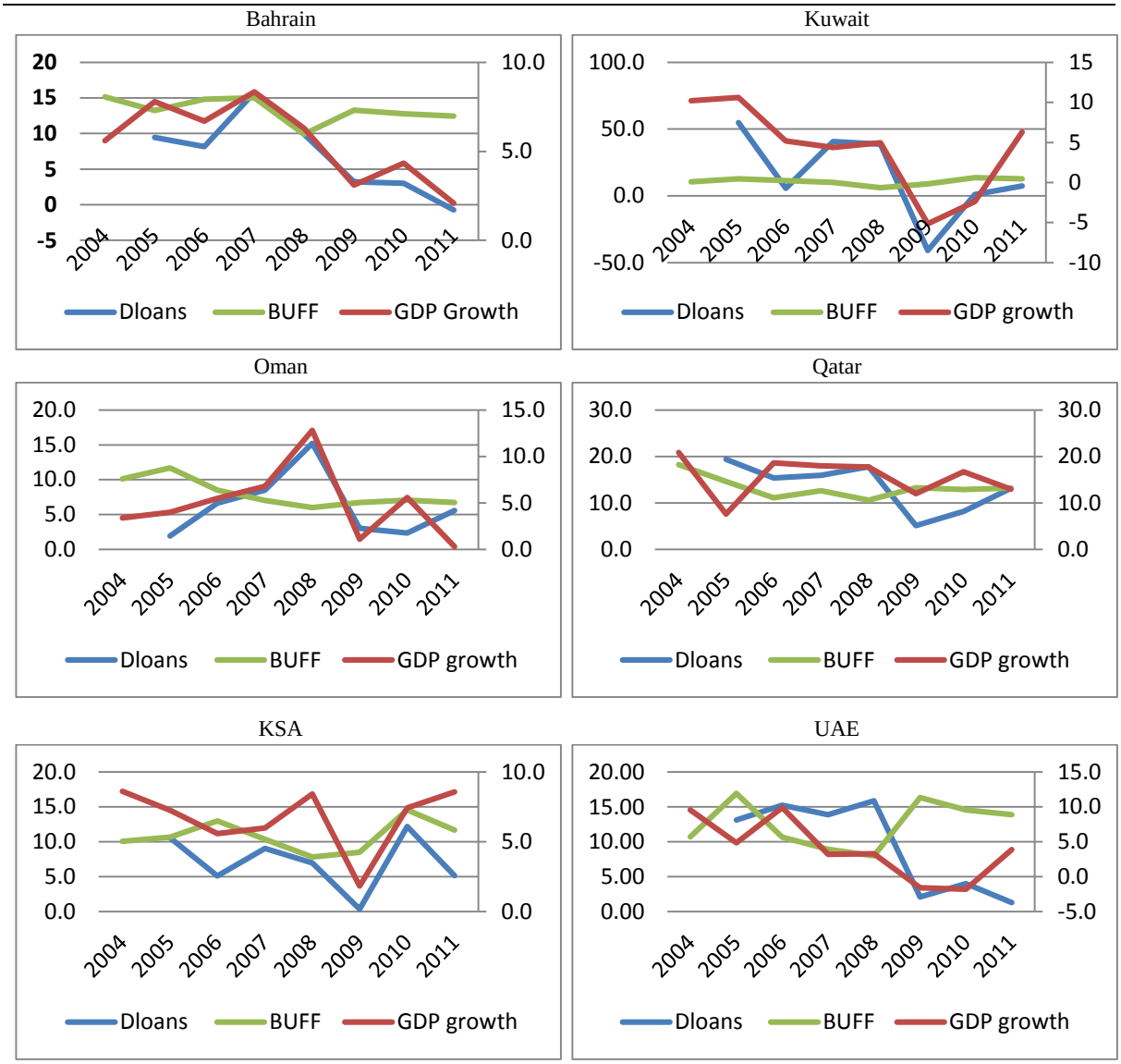
Table 1: Capital Buffers, Loans Growth Rates and GDP Growth Rates in GCC Countries: 2004-2011



Source: Bankscope Database (2013) and International Monetary Fund (2013).

Table 2: Government Intervention to Counteract the Impact of the Financial Crisis

Country	Deposit Guarantees	Central Bank Liquidity Support	Long-Term Government Deposits	Capital Injections	Bank Asset Purchases	Stock Market Purchases	Monetary Easing
Bahrain		√	√				
Kuwait	√	√	√	√		√	√
Oman		√	√			√	√
Qatar		√	√	√	√		√
KSA	√	√	√				
UAE	√	√	√	√			√

Source: Khamis and Senhadji (2010)

Table 3: Summary of Descriptive Statistics

	Obs.	Mean	Std. Dev.	Min.	Max.
Buffer	424	11.73	7.52	2.8	73.6
Growth	490	5.12	6.29	-14.0	15.0
ROAE	447	16.28	9.10	0.04	41.26
Dlaons	410	8.42	15.08	-4.50	72.0
LA	474	57.07	14.29	4.50	89.58
Size	485	0.02	0.43	-1.47	1.09
Liq	560	0.001	0.11	-0.43	0.67

Source: authors' computations.

Table 4: Correlation Coefficients

	Buffer	Growth	ROE	Dlaons	Loanass	Size	Liq
Buffer	1.000						
Growth	-0.038	1.000					
ROAE	-0.199	0.226	1.000				
Dlaons	0.014	0.413	0.172	1.000			
LA	-0.319	-0.037	0.038	-0.023	1.000		
Size	-0.337	-0.065	0.116	-0.082	0.079	1.000	
Liq	0.284	0.041	-0.095	0.141	-0.561	-0.424	1.000

Source: authors' computations.

Table 5: GMM Estimates for GCC Countries: 2004-2011

	(1)	(2)	(3)	(4)
BUFF(-1)	0.588***	0.539***	0.531***	0.580***
	(0.081)	(0.082)	(0.081)	(0.082)
ROAE	-0.007	-0.007**	-0.008**	-0.007**
	(0.004)	(0.004)	(0.004)	(0.005)
Dloans	-0.414	-0.453	-0.446	-0.400
	(0.252)	(0.284)	(0.300)	(0.243)
LA	-0.249	-0.268	-0.274	-0.285
	(0.161)	(0.292)	(0.274)	(0.141)
Growth	-0. 014***	-0. 011***		
	(0.003)	(0.003)		
Growth*size			-0. 002***	-0. 003***
			(0. 001)	(0.001)
Size		-0.268**	-0.258**	
		(0.125)	(0.124)	
Crisis	-0.188***	-0.158***	-0.154***	-0.179***
	(0.056)	(0.055)	(0.054)	(0.053)
Country Dummies	Yes	Yes	Yes	Yes
Constant	1.108***	2.263***	2.240***	1.110***
	(0.191)	(0.191)	(0.657)	(0.175)
Hanson	0.99	0.99	0.99	0.99
AR(2)	0.35	0.40	0.45	0.42
Period	2004-2011	2004-2011	2004-2011	2004-2011
Observations	334	334	334	334

Notes: ***, **, and * indicate significance levels at 1, 5, and 10 percent, respectively.

Table 6: GMM Estimates for GCC Countries: 2004-2011

	(1)	(2)	(3)
BUFF(-1)	0.556***	0.557***	0.592***
	(0.079)	(0.081)	(0.073)
ROAE	-0.007*	-0.008*	-0.006
	(0.004)	(0.004)	(0.005)
Dloans	-0.470**	-0.525**	-0.576
	(0.214)	(0.263)	(0.341)
Loanass	-0.215	-0.091	-0.425
	(0.386)	(0.343)	(0.283)
Growth	-0. 010***		
	(0.004)		
Growth*Liq		-0. 045***	-0. 042***
		(0.016)	(0.017)
Liq	0.398**	0.905	
	(0.751)	(0.731)	
Crisis	-0.158***	-0.153***	-0.144***
	(0.050)	(0.049)	(0.055)
Country Dummies	Yes	Yes	Yes
Constant	1.105***	1.079***	0.987***
	(0.201)	(0.237)	(0.223)
Hanson	0.99	0.99	0.99
AR(2)	0.35	0.27	0.36
Period	2004-2011	2004-2011	2004-2011
Observations	334	334	334

Notes: ***, **, and * indicate significance levels at 1, 5, and 10 percent, respectively.