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Article

The impact of prudential regulation on bank capital and risk-taking: The case of MENA countries

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ABSTRACT

The main purpose of this paper is to assess the simultaneous impact of regulatory pressures on banks' capital and risk-taking behavior using a panel of 24 banks operating in the MENA region over the period 2004–2012. Using many panel data estimation techniques, we provide evidence that prudential regulations fail in reducing banks' risk-taking incentives and in increasing capital. We find also that bank profitability is positively associated with capitalization level suggesting that the underdevelopment of financial markets in MENA countries leads banks to rely more on internal resources to build their capital buffer. Our findings reveal also a strong negative relationship between the bank size and risk suggesting that large banks have more experience in managing their risk levels through diversification.

1. Introduction

The global banking sector has undergone significant structural and regulatory changes from the 1980s. Banks were taken in liberalization movement activities initiated by the rule of "3D[1]", favored by the abolition of geographical boundaries.

Financial globalization and technological development have intensified competition among banks. This competition has encouraged financial innovation and the creation of new financial instruments. The absence of a risk management culture, the existence of a destructive competition and information asymmetry, all these factors represent the characteristics of a risky and constantly changing environment for banks. Thus, prudential regulations have been required to deal with this risky environment. The best-known regulatory instrument is the capital adequacy.

Despite their expansion, the impact of prudential standards on bank behavior remains a controversial issue. Traditional theories have failed to specify the nature of this relationship. Similarly, new theories have focused on the creation of conditions for proper operation of prudential instruments while taking into account the problem of moral hazard.

The issue of the impact of prudential capital regulation on bank behavior is one of the recurring topics of current events, especially after the last financial crisis. Thus, several empirical studies have focused on risk management and prudential regulation. However, those studies have been reserved to developed banking sectors by studying the experience of the US and European banks (see Shrieves and Dahl, 1992; Aggarwal and Jacques, 2001; Rime, 2001; Jokipii and Milne, 2008) and more recently developing countries such as Asian banks (see Awdeh et al., 2011; Lee and Hsieh, 2013; Zhang et al., 2008). The scarcity of studies on banks operating in the Middle East and North Africa (MENA) begs the question about their behavior concerning regulatory capital requirements.

In view of the crucial role played by banks in the economies of the MENA region, it is important to keep their soundness. Thus, MENA countries have done some serious preparations for the implementation of the regulatory measures. However, knowing if MENA banks obey the traditional assumptions of prudential regulation and adjust their capital in terms of risk is an empirical issue.

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[1] Deregulation, disintermediation and decompartmentalization.

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The purpose of this paper is to elucidate the relationship between regulatory capital and the risk level. Our findings suggest that prudential regulations fail in reducing the banks' risk-taking incentives and in increasing capital. The rest of this article is organized as follows: Section 2 outlines the main previous studies on the topic, Section 3 presents data and methodology, Section 4 reports empirical results, and Section 5 concludes.

2. Literature review

The first Basel accord, known as Basel I, issued in 1988, has induced the investigation of the impact of prudential capital regulation on banks' behavior. Nevertheless, theoretical and empirical literature has led to controversial results.

Shrieves and Dahl (1992) investigate the relationship between capital and risk partial adjustments using a sample of U.S. commercial banks over the period 1984–1986. The three main variables employed to explain the relationship between bank capital and risk-taking behavior were the risk that is apprehended by the bank's assets weighted according to risk levels divided by the total banking assets (RWA), the capital, which is defined as the ratio of equity capital reported to total assets, and the quality of loans, which is approximated by the amount of non-performing loans. The estimates given by 3SLS techniques have shown the existence of a positive relationship between the changes in risk and capital suggesting that undercapitalized banks will increase their capital in response to additional risk exposure. This finding is mainly explained by the hypothesis of managerial risk aversion and bankruptcy cost. Shrieves and Dahl (1992) demonstrate that banks are unable to instantly adjust their capital and risk levels. They conclude that observed changes in both capital and risk have endogenous (discretionary) and exogenous components.

Aggarwal and Jacques (2001) estimate a 3SLS model to examine the impact of the Prompt Corrective Action (PCA) devised by the Federal Deposit Insurance Corporation Improvement Act (FDICIA) on both capital and risk levels using a sample of US banks over the period 1993–1997. Their findings indicate that the PCA standards had pushed banks to raise their capital levels and reduce their credit risks.

Similarly, Rime (2001) analyses adjustments in capital and risk in a sample of Swiss banks. Their results suggest that regulatory pressure has a positive impact on capital ratios but no significant effect on risk levels.

Jokipii and Milne (2008) show, through a sample of European banks, that the existence of capital adjustment costs induces banks to hold a large capital buffer and may explain the slow speed of adjustment toward target levels. Their findings reveal a negative co-movement of capital buffers with the economic cycle for the case of larger commercial and savings banks, i.e. rising in recession. In contrast, small banks and co-operative banks tend to raise their capital levels during the economic upturn. They conclude that the introduction of the Basel II accord will face some challenges given its potential "pro-cyclical" impact on bank capital adequacy.

Jokipii and Milne (2011) investigate the relationship between the changes in capital buffer and in credit risk using a sample of U.S. bank holding companies and commercial banks. A positive two-way relationship is found suggesting that banks raise their capital in response to an increase in risk and they tend to take more risk if their capitalization levels increase. They demonstrate that the buffer of capital hold by the bank is the key determinant of the adjustments in capital and risk.

Awdeh et al. (2011) assess the impact of regulatory capital on bank risk-taking using a panel of Lebanese commercial banks over the period 1996–2008. They use the *Z*-score indicator to assess the credit and two ratios to proxy for bank capitalization: equity to total asset ratio (CAR) and capital equity divided by total risk-weighted assets (CRWA). The estimates given by 3SLS techniques have shown that banks engaged in risky activities quickly adjust their capital ratios than those who are risk-averse.

Jacques and Nigro (1997) examine the impact of the risk-based capital standards on changes in bank capital and portfolio risk. Capitalization is measured by the ratio of total equity (Tier 1 + Tier 2) to total risk-weighted assets (RWA); the risk level is measured by the RWA. Building on the techniques of 3SLS, they find that that the regulatory capital has a significant positive effect on capital ratios and a negative effect on portfolio risk of banks, which already met the new risk-based standards. In addition, they find a significant negative coordination between changes in capital and risk during the first year of the risk-based standards. They consider this result as expected because an undercapitalized bank can meet the risk-based requirement by raising capital, reducing portfolio risk, or both, while a bank with a ratio above the risk-based minimum may decrease capital or increase risk. By contrast, the risk has a negative but insignificant coefficient in the equation of capitalization.

Lee and Hsieh (2013) investigate the impact of bank capital on risk and profitability using a sample of Asian banks over the period 1994 to 2008. They find that increasing capital improves profitability and decreases risk. This evidence indicates that poorly capitalized banks generate less profitability and take more risk. They conclude that the negative relationship between capital and risk can be explained by the moral hazard hypothesis, while the positive association between capital and profitability can be understood under the structure-conduct-performance hypothesis.

Zhang et al. (2008) examine the effects of capital adequacy requirement on bank's risk-taking behavior in a sample of 12 Chinese commercial banks over the period 2004–2006. They find that changes in capital are negatively associated with the changes in portfolio risk.

Guidara et al. (2013) discuss the cyclical behavior of Canadian banks' capital buffers and investigate its impact on the banks' risk and performance throughout business cycles and in response to Canadian regulatory changes during various Basel regimes. Estimation results given by the two-step generalized method of moments (2SGMM) indicate the absence of a significant relationship between the variations of banks' capital buffer and banks' exposure to risks. They conclude that the well-capitalization of Canadian banks may be explained by market discipline considerations.

Similarly, Mongid et al. (2012) examine the relationship between capital, risk and inefficiency in a sample of 668 commercial banks operating in 8 countries of ASEAN over the period 2003–2008. Estimation results given by the 3SLS method reveal an inverse relationship between risk and capital suggesting that higher capitalized banks tend to reduce their risk exposure. By contrast, the risk turns out to have a negative but no significant impact on capital.

Agoraki et al. (2011) investigate the effect of competition and prudential regulation on the risk-taking for a sample of countries in Central Europe over the period 1998–2005. They find that capital requirements appear to be an effective tool as it is associated with a remarkable decrease in the risk level but has no significant effect on the probability of default.

Laeven and Levine (2009) find that the relation between risk-taking and capital regulations depends significantly on each bank's ownership structure. They demonstrate that the effect of the same regulation on a bank's risk-taking can be positive or negative depending on the bank's ownership structure.

Altunbas et al. (2007) analyze the relationship between capital, risk and efficiency for a large sample of European banks over the period 1992–2000. They find a positive relationship between bank capital and risk levels only for commercial and savings banks, and an inverse relationship for co-operative ones.

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