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Review

The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region

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Abstract

The global financial crisis has induced a series of failures of most conventional banks. This study investigates the main sources of banking fragility. We use a sample of 49 banks operating in the MENA region over the period 2006–2013 to analyze the relationship between credit risk and liquidity risk and its impact on bank stability. Our results show that credit risk and liquidity risk do not have an economically meaningful reciprocal contemporaneous or time-lagged relationship. However, both risks separately influence bank stability and their interaction contributes to bank instability. These findings provide bank managers with more understanding of bank risk and serve as an underpinning for recent regulatory efforts aimed at strengthening the joint risk management of liquidity and credit risks.

JEL Classification: F3; G21; O16; 053

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1. Introduction

The recent financial crisis has led to bank failures that have had a negative impact on the real economy. Therefore, a particular attention to the consequences of financial instability on the economy has been established (Agnello & Sousa, 2012). Furthermore, in an environment characterized by market imperfections, it is imperative to protect the depositors against bank failures (Dewatripont & Tirole, 1994). Consequently, the banking system needs to identify the sources of banking fragility. On the other hand, banks are exposed to several financial risks. According to Cecchetti and Schoenholtz (2011), these financial risks include the chance that depositors will suddenly withdraw their deposits (liquidity risk), borrowers will not repay their loans on time (credit risk), interest rates will change (interest rate risk), the bank's computer systems will fail or their buildings will burn down (operational risk). Nevertheless, among these risks, credit and liquidity risks are not only the most important risks that banks face, but they are also directly linked to what banks do and why banks fail.

What is the relationship between liquidity and credit risk in banks? The classic theories of the microeconomics of banking support the view that liquidity and credit risks are closely linked. Both industrial organization models of banking, such as the Monti-Klein framework and the financial intermediation perspective in a Diamond and Dybvig (1983) or Bryant (1980) setting, show that a bank's asset and liability structures are closely connected, particularly, with regard to the fund withdrawals and borrower defaults. In their financial intermediation, banks create liquidity in the economy, either from their balance sheets by generally financing risky projects using the deposits of their clients, or from off-balance sheets, by

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opening credit lines (Holmstrom & Tirole, 1998; Kashyap et al., 2002). Based on these models, a body of literature has recently evolved focusing on the interaction between liquidity and credit risks and their implications on the banking stability (Acharya & Mora, 2013; Acharya & Viswanathan, 2011; Acharya, Shin, & Yorulmazer, 2010; Cai & Thakor, 2008; Gatev, Schuermann, & Strahan, 2009; Goldstein & Pauzner, 2005; Gorton & Metrick, 2011; He & Xiong, 2012a,b; Imbierowicz & Rauch, 2014; Wagner, 2007).

Anecdotal evidence from bank failures during the global financial crisis further supports these theoretical and empirical results. According to official reports of the FDIC[1] and OCC,[2] the majority of commercial bank failures during the recent financial crisis is caused by the joint occurrence of liquidity and credit risks. Dermine (1986) find that as liquidity risk is seen as a profit-lowering cost, a loan default increases this liquidity risk because of the lowered cash inflow and depreciations it triggers. Therefore, according to the literature, liquidity and credit risks are positively correlated. However, during the crisis, banks moved from a risk of withdrawal of deposits, or even from bank runs, to a risk of drying up other funding sources, specifically the interbank market (Borio, 2010; Huang & Ratnovski, 2011). On the other hand, due to the information asymmetries in the loan market, banks were exposed to credit risk (Heider et al., 2009). Therefore, a mutual reinforcement between credit and liquidity risks resulting in bank failures has been witnessed.

In this context, the liquidity problems, even self-reinforcing between credit and liquidity risks, appear to have played a major role in the amplification of banking failures. In light of these facts, it seems important to consider the influence of interdependence between liquidity and credit risks on the soundness of banks. Moreover, authors like (Acharya & Mora, 2013; Acharya, Mehran, & Thakor, 2016; Brunnermeier, Crocket, Goodhart, Persaud, & Shin, 2009; Calomiris, Heider, & Hoerova, 2015; Distinguin, Roulet, & Tarazi, 2013; He & Xiong, 2012c; Imbierowicz & Rauch, 2014; Vazquez & Federico, 2015) suggest that liquidity and credit risks can be jointly regulated. Tirole (2011) and Acharya, Shin, and Yorulmazer (2011) propose to explicitly regulate liquidity. Yet, when banks are heavily dependent on the interbank market, increasing capital requirements can be interpreted as a prudential measure of both insolvency and liquidity risks.

Even if He and Xiong (2012c), Hieider et al. (2009), and Acharya and Viswanathan (2011) have already showed that credit and liquidity risks simultaneously interact and influence the stability of banks, this empirical work examine, in addition, how credit and liquidity risks affect banking stability. One can mention the contribution of Imbierowicz and Rauch (2014), which from a sample of US commercial banks, show that credit and liquidity risks jointly influence the soundness of banks and Vazquez and Federico (2015) which on the basis of a set of European and American banks, conclude that a simultaneous exposure to credit and liquidity risks amplifies the difficulties of the banks during the crisis. Nevertheless, this paper provides a complementary approach by empirically analyzing the issue above in the banking system of the MENA region.

We examine the influence of liquidity and credit risks on bank stability employing an extended sample period since the recent financial crisis. One of the issues behind the motivation of this paper is examining the relationship between liquidity risk and credit risk and also how two categories of risk influence bank stability. In a first step, we investigate whether there is a reciprocal relationship between liquidity risk and credit risk, and if this relationship is positive or negative. On the light of this first result, we test, in a second step, if liquidity and credit risks individually and/or jointly contribute to bank instability.

The scarcity of studies that analyze the impact of liquidity and credit risks on banking stability in the Middle East and North Africa (MENA) countries during the recent financial crisis begs the issue about their behavior. Most studies employed credit risk and/or liquidity risk as the determinants of bank stability, but the emphasis has not been on cyclical effects of these risks. Thus, we have chosen the MENA region for several reasons. First, credit growth rates in the MENA countries have been more volatile, which may raise concerns about the stability of the financial system, and in particular, a higher credit growth is often followed by the financial crisis (Crowley, 2008). Second, the MENA countries attract bankers and investors worldwide. This strategic position makes the MENA region more susceptible to political instability and thus to economic and financial instability. Third, the MENA region is facing numerous changes, such as the commercial banks, which operate alongside and compete with their Islamic counterparts, the opening up of certain markets to foreign competition and the increased role of bank lending. Therefore, it is necessary to analyze the effect of credit and liquidity risks on banking stability in the MENA region.

In view of the crucial role played by banks in the economies of the MENA region, it is important to maintain their stability. Despite the ongoing debate on the importance of the relationship between risk and stability, there are no empirical studies that have examined the impact of credit and liquidity risks on bank stability in the MENA region. Our study differs from the previous studies because as far as we know, no existing studies have employed the Z-score rather than the commonly used the default probability variable as the dependent variable in the literature. However, we define bank stability is equal to the mean of return on assets plus the capital asset ratio (equity capital/total assets) divided by the standard deviation of asset returns, this definition is a better proxy to capture the bank stability.

The present paper's modest contribution lies in providing bankers with some tools whereby bank stability can be more effectively managed through staff monitoring of the credit and liquidity risks involved factors. Indeed, bank managers may take advantage of recognizing the defects and try to re-conduct

[1] Federal Deposit Insurance Corporation.
[2] Office of the Comptroller of the Currency.

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