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Risk, capital and efficiency in Chinese banking

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ABSTRACT

We assess the relationship between bank efficiency, risk and capital for a sample of Chinese commercial banks employing three efficiency indexes and four risk indicators under a three stage least square method in a panel data framework. The empirical evidence suggests that there is a positive and significant relationship between risk (loan-loss provision as a fraction to total loans or LLPTL) and efficiency in Chinese banking industry, while the relationship between risk (*Z*-score) and level of capitalization is negative and significant.

1. Introduction

The banking sector in China plays an important role in the development of financial system and the economy as a whole. Since 1997 several rounds of reforms have been started by Chinese government to increase bank efficiency and create a competitive environment in the banking sector. In other words, all the banks are forced to operate closer to the best practice or efficient production function. However, Hellmann et al. (2000) argue that increase in competition will result in greater risk-taking behaviour due to the fact that market power of banks is reduced and their charter values are decreased (Salas and

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Saurina, 2003; Goddard and Wilson, 2009).[2] The capital adequacy plays a more and more important role for the purpose of counterbalance the risk.

A number of studies have investigated the impact of capital (Gropp and Heider, 2010), operating efficiency (Casu and Girardone, 2009) on bank risk.[3] Furthermore, there are few studies assessing the relationship between risk, capital and efficiency for European banking area.[4] Surprisingly, there is no study examining the relationship between capital, risk and efficiency for Chinese banking industry. The investigation on the relationship between them becomes very important because of the financial crisis happened from 2007 in Asia.[5]

Two important issues in Chinese banking industry are considered in this paper. First, the relationship between bank efficiency and risk is examined. The negative relationship is expected by the fact that lower levels of efficiency will force banks to boost their returns through increasing the levels of credit risk; on the other hand, increases of banks' credit risk levels which involves additional costs and managerial efforts lead to declines in banks' levels of technical efficiency. Further, the impact of bank capital on the trade off between bank risk and efficiency is assessed. Banks tend to have lower capital levels due to the fact that higher levels of efficiency provide them advantage to increase their capital levels in the future. On the other hand, banks seem to be thinly capitalized because lower levels of efficiency induce bank managers to balance their higher operating costs with lower volumes of funding via expensive capital. Eventually, capital and efficiency have influences on the risk-taking behaviour of banks. Efficient banks with higher capital levels tend to allocate less funds to monitor loans which results in higher levels of credit risk, while inefficient banks with lower capital levels tend to increase the levels of credit risk in order to maximize their revenues. To deal with these issues, we extend previous literature and assess the relationship between efficiency, risk and capital levels in Chinese banking sector. We use large dataset of Chinese banks over the period 2003–2009. Our main variables of interest include different measures of bank risk, three different measures of bank efficiency (technical, pure technical and scale efficiency) and bank productivity.

According to 2009 annual report from China Banking Regulatory Commission (CBRC), the non-performing loan ratio of Chinese banks drops dramatically from nearly 20% in 2003 to 1.58% at the end of 2009, while large proportion of non-performing loans is from the state-owned commercial banks. Further, Yao and Jiang (2010) suggest that the state-owned commercial banks are least efficient comparing to the joint-stock and city commercial banks in China over the period 1995–2008. Hence, it is interesting to examine whether higher risk decreases the bank efficiency, and lower efficiency induces Chinese banks to take on higher risk.

At the end of 2009, the capital adequacy ratio of Chinese banks reaches 11.4% which is higher than the international level; this higher level of capitalization is largely attributed to the capital injection by the government especially to the state-owned commercial banks. According to 2009 Almanack of China's Finance and Banking report (China Finance Society, 2009), during the period of 2003–2008, the Chinese government injects capitals to the state-owned commercial banks in different forms such as using the foreign reserve and writing-off the non-performing loans. This free capital injection to the banks may reduce bank managers' efforts which leads to a decline in bank efficiency and an increase in bank risk.

Our paper makes several contributions to the literature on the relationship between bank efficiency, capital and risk in Chinese banking. First, this study includes the latest banking data from 2003 to 2009; this includes the last round of banking reform in China which focuses on the efficiency improvement in financial institutions. Second, comparing with other related studies which focus on either cost efficiency[6] or profit efficiency[7] for US or European banking industry, this is the first empirical study

[2] Their finding is in direct contrast with Boyd and De Nicolo (2005) who argue that the relationship between intense competition and increased bank's risk taking behaviour is weak.

[3] The impact of bank competition on bank risk and efficiency is analyzed by previous literature (see Boyd and De Nicolo, 2005; De Nicole and Lucchetta, 2009; Casu and Girardone, 2009).

[4] See Altunbas et al. (2007) and Fiordelisi et al. (2011b).

[5] See Festic et al. (2011).

[6] See Kwan and Eisenbeis (1997), Berger and De Young (1997), Williams (2004) and Altunbas et al. (2007).

[7] See Berger and Banaccorsi di Patti (2006).