



# Non-performing loans, moral hazard and regulation of the Chinese commercial banking system



Dayong Zhang<sup>a,\*</sup>, Jing Cai<sup>a</sup>, David G. Dickinson<sup>b</sup>, Ali M. Kutan<sup>c,d,e</sup>

<sup>a</sup> Research Institute of Economics and Management, Southwestern University of Finance and Economics, China

<sup>b</sup> Department of Economics, University of Birmingham, UK

<sup>c</sup> Jiangxi University of Finance and Economics, China

<sup>d</sup> Southern Illinois University Edwardsville, USA

<sup>e</sup> The William Davidson Institute, University of Michigan, USA

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## ABSTRACT

Non-performing loans (NPLs) represent a major obstacle to the development of banking sector. One of the key objectives of the banking sector reforms in China has therefore been to reduce the high level of NPLs. To do so, Chinese regulatory authorities have injected significant capital into the banking system and scrutinized NPLs since 2003. This paper examines the impact of NPLs on bank behavior in China. Using a threshold panel regression model and a dataset covering 60 city commercial banks, 16 state-owned banks and joint-stock banks, and 11 rural commercial banks during 2006–2012, we test whether lending decisions of Chinese banks exhibit moral hazard. The results support the moral hazard hypothesis, suggesting that an increase in the NPLs ratio raises riskier lending, potentially causing further deterioration of the loan quality and financial system instability. Policy implications of findings are evaluated.

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## 1. Introduction

China has had a long-standing problem with non-performing loans (NPLs) as a major obstacle to the development of domestic banks. Previous work has identified that NPLs signal future financial problems for banks. Demirguc-Kunt (1989) and Barr et al. (1994) find that banks often have a high level of NPLs prior to their failure. Unlike other industries, in the banking sector the impact of failure of one bank can spread to others, causing a chain effect and likely shaking the stability of the entire system at home or even globally. The 2008 global financial crisis has shown how fragile the global financial system can be and that a financial crisis initiated in one country could affect not only the stability of the global banking system<sup>1</sup> but also be destructive to the real economy and

\* Corresponding author at: Research Institute of Economics and Management, Southwestern University of Finance and Economics, 555 Liutai Avenue, Wenjiang, Chengdu 611130, China. Tel.: +86 158 8113 9915.

E-mail address: [dzhang@swufe.edu.cn](mailto:dzhang@swufe.edu.cn) (D. Zhang).

<sup>1</sup> For example, during the recent financial crisis of 2007–2008 period, Jo (2014) shows that U.S. financial shocks were transmitted to emerging market economies through the international lending activities of U.S. banks. Gang and Qian (2015) report that China's systemic risk increased in recent years since 2009 due to the contagion from the volatile global financial markets.

financial system. Indeed, empirical evidence indicates that financial system development and banking reforms have significantly improved economic growth in China and promoted small banks (Hasan et al., 2009; Fang and Jiang, 2014; Peng et al., 2014; Lin et al., 2015).

Chinese policy makers have been moving forward with further financial sector reforms with the objective of building globally more competitive banks. As part of such efforts, Li Keqiang, the Chinese Prime Minister, signed the “Rules for Bank Deposit Insurance”, effective on May 1, 2015. Attempts to reform the banking sector further requires a good understanding of non-performing loans and its implications for banking sector and financial stability. In addition, the nature of state ownership and associated soft budget constraints likely affect the moral hazard problem in the Chinese banking sector (Shi, 2004). China's banking sector has been relatively immune from financial crises due to strict government controls, which isolate the domestic financial sector from the developments in the global financial system. It is therefore timely to consider the extent of moral hazard issues in the Chinese banking sector and how it might be related to NPLs.

Since 2003, as part of the banking sector reforms, the Chinese government has injected significant amount of capital to the

banking sector (Jiang et al., 2013), which has resulted in declining NPLs ratios (defined here as the ratio of NPLs over total loans outstanding). According to the China Banking Regulatory Commission (CBRC), the recent average NPLs ratios are maintained within less than 2% across all banks. However, this does not necessarily imply that NPLs would not become a problem in the near future. Indeed, a sign of rebound in NPLs is observed in 2014 due to economic slowdown. The NPLs amounted to 842.6 billion RMB by the end of 2014, which is 255.5 billion RMB higher than the number at the beginning of the year. Although the average NPLs ratio is around 1.25%, troubled loans have had a ratio of NPLs reaching 3.11%, which corresponds to 4.36% of loans that are potentially in trouble. Another concern for policymakers is that the distribution of NPLs ratios is uneven across bank types. For example, at the end of 2013, the average NPLs ratio for rural commercial banks was 1.67%, but at the same year it was only 0.86% for joint-stock banks.

This paper aims to examine one particular aspect of China's banking sector, namely, the extent to which domestic banks face challenges in their lending relationships and engage in a risky behavior, which may further increase the moral hazard problem of the banking sector in the near future. Our contribution to the existing literature is twofold. First, we adopt a threshold approach to study the role of NPLs in signaling moral hazard problems. Second, we apply this model to the Chinese commercial banks in order to test the hypothesis in that troubled banks have incentives to take excessive risks, causing further losses and potential insolvency. Our proposed methodology and empirical findings have important implications for Chinese regulators facing high NPLs and potential moral hazard problems in the domestic banking sector.

Applying the threshold panel regression model to a dataset of 87 Chinese commercial banks from 2006 to 2012, we investigate whether banks' lending behavior is sensitive to reaching a particular threshold level of NPLs and, more importantly, whether banks with higher NPLs ratio tend to adopt a more aggressive and riskier lending strategy. We hypothesize that banks with higher NPLs ratio take more risks in order to offset the losses associated with NPLs and hence NPLs increase further as a result of higher loan growth. In addition to NPLs, this paper also considers the usefulness of the capital adequacy ratio (CAR) as an alternative regulatory measure, which is motivated by the recent major regulatory changes in China. In particular, the CBRC started considering the implementation of the Basel Accord in 2007 and subsequently adopted a stepwise strategy requiring banks that are concerned more with their international operations to apply the Basel Accord as early as 2011 but no later than 2013. Other commercial banks could choose to follow the Basel Accord voluntarily starting in 2011. The newer and stricter Basel III are to be implemented in 2015. The capital adequacy ratio required by the Basel Accord plays an important role in maintaining the stability of Chinese banks. Using the threshold approach we provide insights whether the use of both NPLs ratio and CAR together as regulatory tools can be of value to Chinese regulators seeking to understand the degree of bank risk and monitor it.

The structure of this paper is as follows. The next section briefly elaborates upon the background of our study and summarizes relevant studies in this area. Section 3 explains the methodology and empirical strategy. Section 4 describes the data used while Section 5 reports empirical results. Section 6 reports additional empirical results based on CAR measures and compares and contrasts the effectiveness of CAR and NPLs ratio as alternative regulatory measures. Section 7 provides some robustness analysis using data for different bank categories and also addresses the potential endogeneity bias problem by reporting estimates based on an

instrumental variable approach. The last section concludes the paper with policy implications of the findings.

## 2. Background and literature review

### 2.1. Commercial banking system and regulations in China

Historically, the People's Bank of China (PBC) was the only bank in China, acting partly as the central bank and partly in the role of commercial banks ('mono-bank system', Lin and Zhang, 2009). As part of market economy reforms, initiated in 1979, the Bank of China, the China Construction Bank and the Agricultural Bank of China were established. In 1984, the Industrial and Commercial Bank of China was separated from the PBC and joined the others as one of the 'big four' state-owned banks. These banks now make up the foundation of the commercial banking system in China.

Alongside the introduction of the concept of a modern corporate system to the Chinese economy, banking reforms especially in terms of ownership structure have been taking place since the mid-1980s. The reforms are introduced in a series of joint-stock or joint-equity banks (Liang et al., 2013), such as the Bank of Communications, which was established in 1986 as the first country-wide joint-stock commercial bank; Shenzhen Development Bank Co., Ltd, which was established in 1987 as the first public listed bank; and the China Merchants Bank Co. Ltd., which was established in 1987 as the first enterprise-owned bank. In total, there are now 12 national joint-stock banks.

The reform of the commercial banking system in China has progressed further since 1994, including the establishment of policy banks and the promulgation of bank laws (i.e. the Central Bank Law and the Commercial Bank Law). Another exciting development has been the emerging of regional commercial banks with city and rural commercial banks as being the key components. By the end of 2012, there were 144 (337) city (rural) commercial banks operating in almost every province, with more than ten thousand branches across China. These banks have played quite an important role in China's regional economic development. In 2012, for example, the share of regional commercial banks in terms of asset values was around 14%, with a total value of over 18 trillion RMB (around US\$3 trillion).<sup>2</sup>

Such a rapid expansion of the banking sector calls for a more sophisticated regulation system. On 25 April 2003, the China Banking Regulatory Commission (CBRC) was established under the direct administration of the State Council. The main role of CBRC is to regulate the banking institutions through formulating supervisory rules and regulations, authorizing the establishment of banking institutions, examining and enforcing rules, encouraging better/proper governance, collecting information and finding resolutions. As the banking sector grows, regulation issues become more complicated. Bad governance and excessive risk-taking may cause serious banking system instability and contribute to an economic crisis. The 2008 US sub-prime crisis is a good example. Conflict of interest and moral hazard in the banking industry are serious threats to the stability of the Chinese commercial banking system.

### 2.2. Moral hazard problems and non-performing loans

Bank managers may have incentives to take more risky lending than the optimal level. Jensen and Meckling (1976) suggest that two kinds of moral hazard problems generate such behavior. One is managerial rent-seeking, which takes place when managers pursue their private benefits by investing in 'pet projects' or through

<sup>2</sup> Source: China Banking Regulatory Commission (CBRC).

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