CREDIT RISK MANAGEMENT IN RURAL COMMERCIAL BANKS IN CHINA

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Abstract

This paper examines the importance of credit risk management (CRM) for rural commercial banks (RCBs) in China, and attempts to develop a CRM framework for RCBs. This study has contributed to the literature that studies CRM in financial institutions in general and RCBs in particular. This study critically identifies the current lack of studies specifically addressing the RCBs and their CRM, and proposes a CRM framework for RCBs. The framework considers financial and non-financial variables. Using nonfinancial variables along with financial variables as predictors of company failure significantly improves credit analysis quality and accuracy. Also, this study recognises guanxi in the context of China as risk potentials affecting the business of SMEs and farming households, which are the main clients of RCBs and includes guanxi risks in the framework. The consideration of guanxi in credit risk analysis fits well with China's business environment.

Key words: China, Credit risk management, Guanxi, Rural commercial banks, SMEs

JEL Code: JEL: G21

Introduction

Credit risk is a major risk faced by financial institutions as it takes up to 60.0% of risks that banks normally face (McKinsey & Company, 1997). Credit risk management (CRM) has long been the focus of governments, regulators and financial institutions as most major banking problems have been either explicitly or indirectly caused by weaknesses in CRM. China's fast-growth economy has led to a remarkable development in its financial institutions. However, Chinese financial institutions have been facing huge credit risk exposure reflected in the high level of bad debt.

In China, rural commercial banks (RCBs) were originally derived from rural credit co-operatives that specifically work for rural population with low income. China's RCBs were developed under the authorities' initiatives to provide financial services to rural areas and

Sannong (pinyin: sān nóng) related business. Sannong refers to agriculture, rural areas and peasants. China's RCBs are different from the majority of rural credit cooperatives in other countries whose business operation focused only on agriculture, rural areas and farmers. In Chins, RCBs also serve SMEs as their key customers and provide them with lending service. There has been a significant increase in the number of RCBs in China since the beginning of this century and the number had reached 85 up to the end of 2010. At the end of 2010, the total assets of Chinese RCBs registered RMB2.8 trillion, the total liabilities RMB2.6 trillion and the after-tax profit RMB27.99 billion. Chinese RCBs took a rising proportion in banking financial institutions from 1.15% in 2006 to 2.90% in 2010. At the end of 2010, the non-performing loan ratio of Chinese RCBs turned out to be 2.34% and the balance of bad loans amounted to RMB28.82 billion, an increase of RMB1.71 billion from the beginning of 2010. RCBs became the sole category that featured the rising bad loan balance among various banks in China (China RCBs Market Report, 2010-2011).

RCBs are exposed to risks inherent to specific rural commercial banking business and in particular, Sannong-related loans and services, in addition to usual risks faced by financial institutions. For many RCBs, their business focus is to provide high-quality financial services to SMEs in rural and county areas and serve the needs of Sannong. Consequently, RCBs had generally presented relatively higher risks than large city commercial banks, partially because their primary source of income is interest income and their ability to generate fee and commission income is limited.

At the moment, many RCBs adopt the traditional CRM approaches used by large commercial banks. It is questionable if these approaches would be effective in managing credit risks of RCBs that are operated in a different business environment. Research in CRM of Chinese RCBs is in scarcity. This research attempts to develop a CRM framework for Chinese RCBs. The framework incorporates main factors that affect credit risk facing RCBs in relation to environmental, operational, financial and guanxi variables contributing to failures of SMEs and farming households, the main customers of RCBs in China.

This paper is organized as follows. The next section introduces China's banking reform and the development of China's RCBs. The third section provides a literature review on CRM. The fourth section analyses factors contributing to failures of SEMs and farming households and proposes a CRM framework for RCBs in China. The final section concludes the paper and highlights the limitations and future research directions.

Rural Commercial Banks in China

The Chinese government realises the potential of microfinance in poverty alleviation and has actively promoted microfinance since 1993 (Rahman and Luo, 2011). In 2005, China established microcredit companies in Sichuan, Guizhou, Shaanxi and Inner Mongolia Provinces, continuing to enlarge microfinance market in China (He et al., 2009). China Association of Microfinance (CAM) was launched in 2005, which is a self-regulated association to uphold microfinance in China.

Chinese RCBs are largely formed under the government initiatives. The authorities require RCBs to allocate a certain percentage of newly issued loans to support the Sannong development each year. Consequently, RCBs are very much exposed to risks associated with Sannong-related industries. Compared to the city-based large commercial banks in China, the products and services currently offered by RCBs are relatively simple. Customer deposits remain RCBs' primary funding source. RCBs rely heavily on deposit and loan business, and less on fee- and commission-based business and investment. They also rely on favourable government policies and initiatives[1] in respect of county area development and the Sannong reform. Internet banking is less developed in RCBs.

With regard to RCBs' lending activities, there are several characteristics: 1) loans are relatively small and generally unsecured; 2) loans are made normally to customers that have strong quanxi with the banks and local governments; 3) internal monitoring, political and social sanctions are often used to enforce RCB loan contracts. Although the cooperative nature of RCBs greatly reduces asymmetric information problems, due to low understanding of the operations of finance and lending system, the borrowers did not have much role to play in the process and risk management. Unlike larger lenders, it is very difficult for RCBs to diversify spatially. This leaves RCBs highly vulnerable to correlated risk exposure from events such as natural disasters.

Due to limitations on the information, resources or tools available, RCBs are facing some difficulties to address the risks in their operations effectively or respond to sudden changes in business environments in a timely manner. Table 1 reveals non-performing loans (NPLs) of China's commercial banks. RCBs have the highest percentage of NPLs in their total loan portfolios.

[1] Such policies and initiatives include, among others, providing public finance to support the county area development, introducing financial products such as business start-up loans to the Sannong-related businesses, developing insurance services in the county areas in China to manage risks from catastrophic events and health and safety accidents, as well as providing subsidies for purchasing electronic products, farm equipment, vehicles and construction materials.

Tab. 1 NPLs of China's commercial banks in 2010

Unit: RMB100 million, percent

Items / Institutions	Commercial banks in total	Large commercial banks	Joint-stock commercial banks	City commercial banks	Rural commercial banks	Foreign banks
Outstanding balance of NPLs	4,336.0	3,125.2	5,65.7	3,25.6	270.8	48.6
Substandard	1,619.3	1,106.1	183.0	166.2	148.8	15.1
Doubtful	2,052.2	1,580.3	227.7	109.5	116.0	18.7
Loss	664.5	438.8	155.0	49.9	6.0	14.8
Share in total loans	1.1	1.3	0.7	0.9	1.9	0.5
Substandard	0.4	0.5	0.2	0.5	1.1	0.2
Doubtful	0.5	0.7	0.3	0.3	0.8	0.2
Loss	0.2	0.2	0.2	0.1	0.0	0.2

Source: CBRC (2011), p.160.

Literature Review

Credit Risk

Credit risk is generally defined as the potential that an institution borrower or counterparty will fail to meet its obligations in accordance with agreed terms. According to the Basel Committee on Banking Supervision (2001), the most common cause that leads the banks to bankruptcy is credit risk. The main sources of credit risk that have been identified in the literature include, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, massive licensing of banks, poor loan underwriting, reckless lending, poor credit assessment, laxity in credit assessment, poor lending practices, government interference, inadequate supervision by the central bank, and information asymmetry (Stiglitz and Weiss, 1981; Chen et al., 2006).

To measure credit risk is the key to manage credit risks. The credit rating assessment becomes an important part of credit risk assessment, involving risk parameters such as financial, business, industry and management areas (Jin et al., 2012). In addition to measuring and controlling it, banks also try mitigating their credit risk. A variety of approaches can be adopted to mitigate its credit risks, including, among others, risk-based pricing, covenants, credit insurance, credit derivatives, collaterals, engaging in credit guarantee scheme.

Credit scoring systems can be found in virtually all kinds of credit analysis, ranging from individual consumer credit to giant commercial loans. The idea across different

categories is literally the same: Pre-define certain key factors that determine probability of default (or repayment), and combine or weight them into a quantitative score. Beaver (1967) first utilises several financial ratios to investigate corporate default. The cut-off point of default companies and non-default companies is derived out of the historic sample. Then the financial ratios are calculated to compare with the cut-off point in order to differentiate the corporate bankruptcy. Based on previous study, Altman (1968) constructs the classical Z-score model to predict the possibility that a firm will go bankruptcy. In this study, 22 variables were taken from the financial reports of a matched sample of 66 companies, divided into two groups, 33 each. The 22 variables were categorised into five explanatory indices by multiple discriminant analysis. The model assumes that the sample data are normally distributed and the covariance remains the same. The best fitting scoring model for commercial loans is a linear combination of five usual business ratios, weighted by estimated coefficients. A critical point was applied to determine the risk level of corporate loan in a certain period of time. The higher the score was, the "healthier" the company was. The option of the best critical might change due to economic conditions. When the economy is expected to go down, the critical point would be raised to compensate. This will reduce the model's Type 1 Error (lending to customers with bad credit), but lead to the increases of Type 2 Error (customers with good credit will be denied).

The above model has been amended and expanded over time and the ZETA model was developed later on. The major evolution of ZETA model from Z-score is that five variables are extended into seven. The ZETA model presents more precise result than its ancestor owing to improvement of the variables chosen and better stability of new variables. The Z-score model is widely adopted in the literature because it is straightforward to operate and simple to accommodate into different economic environments. For example, Pille and Paradi (2002) take the Z-score model in predicting the failure of Credit Unions in Ontario, Canada. Altman (2005) revises the Z-score model for emerging market corporate bonds rating in Mexico. Recently, the type of model has performed less well. Mester (1997) reports that 56 per cent of the 33 banks that used credit scoring as a way of approving credit card applications failed to predict loan quality problems.

The literature on the modelling of credit risk for large, listed companies is extensive and gravitates toward either of two approaches: the Z score approach of using historical accounting data to predict insolvency; and models that rely on securities market information. In city commercial banks, risk modelling can be undertaken using very large samples of high-frequency corporate data and combinations of in-house portfolio data (e.g., payment history)

and data from the credit reference agencies to develop proprietary models. Due to a lack of data, modelling approaches have limited applicability to RCBs where credit risk is managed mainly on an ad hoc basis.

Research Methods

RCBs' clients are a distinct kind of client with specific needs and peculiarities that require risk-management tools and methodologies specifically developed for them. The problem of obtaining accurate information about the health of SMEs, while not new, is particularly relevant for patterning firms' bankruptcy or default. In the past decades, considerable research has been conducted to determine the rates and causation of such default. Early research into corporate bankruptcy prediction involved determining which accounting ratios best predict failure, primarily employing multiple discriminant analysis (MDA) or logit/probit models. In most of these accounting ratio-based studies, ratios are calculated at a predetermined time before bankruptcy (usually one year) and as such these models are often referred to as static models. For example, Altman and Sabato (2007) apply a distress prediction model estimated specifically for the US SMEs based on a set of financial ratios derived from accounting data. They demonstrate that banks should not only apply different procedures (in the application and behavioural process) to manage SME clients as compared with large corporate firms, but these organisations should also use scoring and rating systems specifically addressed to the SME portfolio. Other studies focus on the use of data other than accounting data.

The literature has predominantly adopted quantitative approach in CRM research. The quantitative research usually concentrates on measurements and numbers with a view to finding out the association between variables. A number of methods have been used to develop CRM models, including, for example, discriminant function analysis, regression analysis, principal component analysis and factor analysis.

A qualitative research approach was chosen for this study because of its greater exploratory nature and therefore its applicability to this research domain as it focuses on gaining a general understanding of the subject area at an earlier stage. This was vital in light of this study because there has been very little research conducted on CRM of RCBs in China. Also, quantitative data and credit risk information are not readily available. Moreover, the customers of RCBs are mainly SMEs and farming households with limited information available on their business failures. Qualitative assessment of credit risk has been suggested in the literature (Ribeiro et al., 2011).

The research also uses the case study approach to investigate the CRM issues faced by RCBs. The case study of a RCB was screened initially through eight face-to-face interviews conducted in August 2010, and then subsequent e-mail and telephone conversations. The case is a local RCB located in Jiangsu province, in the eastern part of China where SMEs were well developed. This case bank is one of the early developed RCBs in China and has developed a relatively comprehensive CRM system. Information-gathering techniques implemented during execution of the case study included obtaining historical data and documentation, as well as conducting semi-structured interviews with CRM personnel and bank managers in the case bank. Each interview has duration of approximately one hour and conducted in Chinese in the bank offices. The semi-structured interviews ensured that the researchers maintained control over each interview, without discouraging the discussion of any valuable, additional information. The information from the case and transcripts of interviews were analysed to identify risk factors facing SMEs and farming households.

A Credit Risk Management Framework

The focus of CRM for RCBs is to analyse failures of RCBs' customers (i.e., SMEs and farming households). It is extremely important to distinguish between failures and closures. Watson and Everett (1996) note that closing firms could have been financially successful but closed for other reasons. To define failures they create five categories: ceasing to exist (discontinuance for any reason); closing, or a change in ownership; filing for bankruptcy; closing to limit losses; and failing to reach financial goals.

In the proposed framework, it is essential for RCBs to carry out this kind of analysis before starting to develop a default prediction model concerning their SME and farming household clients. Separating the cases of closures from the ones of failures improves the quality of the available information and of the prediction power of a model. In the credit analysis, RCBs should take into account only clients that entered into liquidation, administration or receivership.

In this study these risk factors are categorised into four clusters: environmental, financial, operational, and guanxi risks. Different from the previous literature, this study considers both financial data and non-financial data in analysing credit risk. The literature recognises that quantitative variables are not sufficient to predict SME default and qualitative variables (e.g., the number of employees, the legal form of the business, the region where the main business is carried out, the industry type, etc.) should be considered along with

quantitative variables in predicting the failures of SMEs. The framework is profiled in Diagram 1.

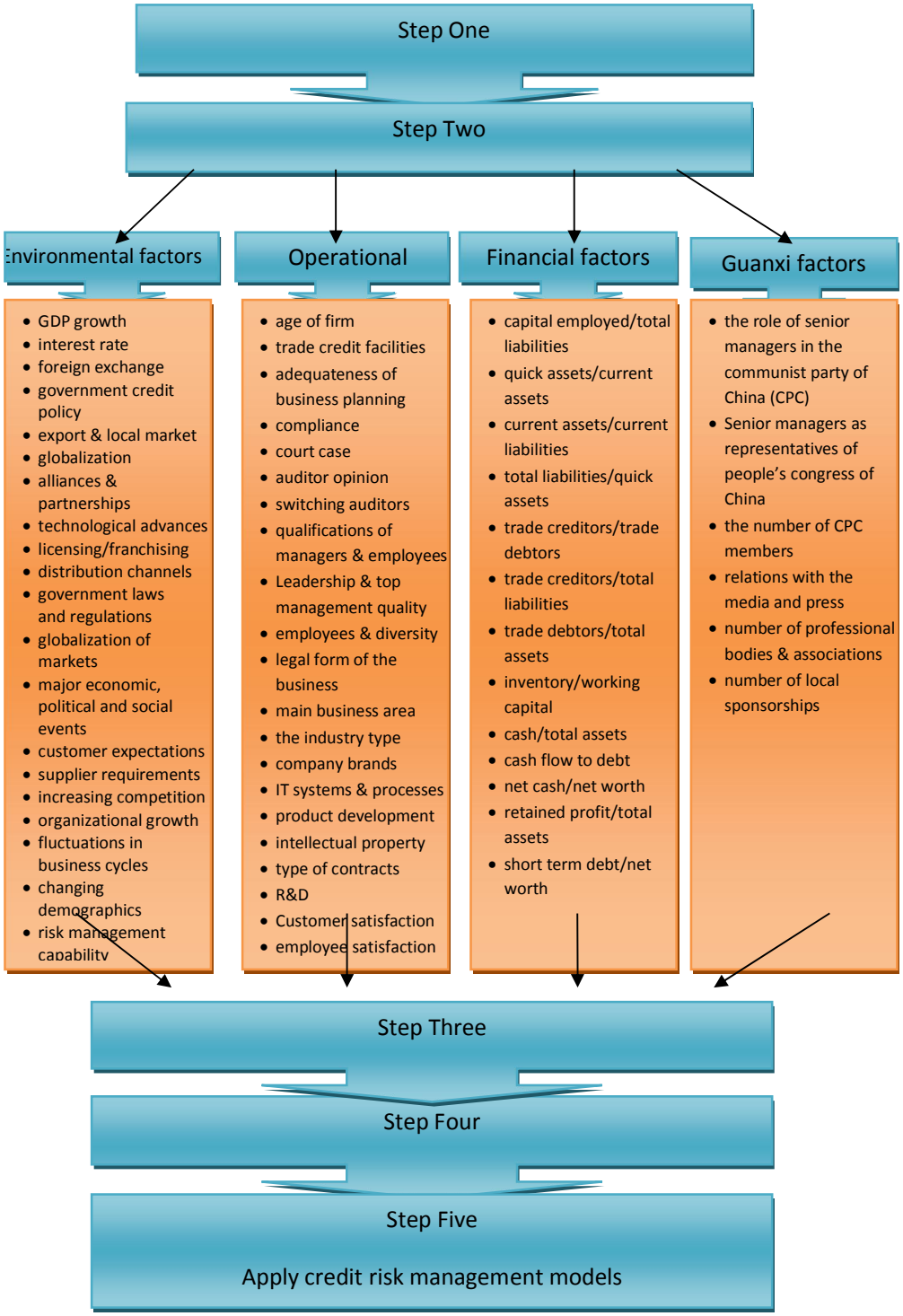
The framework is divided into five steps. 1) To distinguish business failure and closure. In credit risk analysis, the focus should be on the failure. Business closure does not mean the failure. 2) To identify factors contributing to the failure from environmental, operational, financial, and guanxi dimensions. Some factors may appear in one case, but not in other cases. 3) To identify the principal factors by using specific techniques (such as principal components analysis). Based on the key factors, RCBs design credit risk analysis models with a focus on the analysis of these key/principal factors (step four). 4) To use the credit risk analysis model to manage credit risks of their portfolios and individual loans.

Environmental Risk

One overriding factor that contributes to ineffective risk management in SMEs is a lack of infrastructure, risk management skills, human capital and adequate management knowledge and training (Alquier and Tignol, 2006). Gao et al. (2012) acknowledge the limited risk management capability building in Chinese SMEs largely due to lack of adequate education and qualification, higher staff turnover and negative attitudes of both owner-managers and employees towards the use of technology, learning and training.

Operational Risk - Operational risk of SMEs and farming households is one of the major risk clusters to be considered for RCBs with regard to assessing credit risk of their loan portfolio. Due to the nature of SMEs and lacking of data, SME failure rates are very often difficult to track properly. Two of the main reasons businesses suffer unexpected closures are identified as insufficient capitalisation and lack of planning. When RCBs consider a SME for a load, they promptly look at all the planning documents and financial models applicable to the firm. Usually, the bank requires three years of taxes, current proof of any income, a financial statement and, if the company is already operating, financials for the company for at least two years. As such, banks take into account only a snapshot of the firm's current financial status and performance but do not consider the ability of the applicant to bring the loan to maturity, which depends on a number of non-financial factors and future development of the economy (both international/national and local/regional).

Fig. 1 Proposed CRM framework for RCBs



SMEs often rely heavily on trade finance from suppliers when bank finance is not available to them. Moreover, small companies extend trade credit to customers as a means of gaining and

retaining customers. The use and extension of trade credit makes the business vulnerable to cash flow difficulties.

Financial Risk - In the financial variables, our variable selection reflects the importance of working capital for the survival of SMEs firms and farming households. The literature on trade credit suggests that smaller firms both extend more credit to customers and take extended credit from suppliers when facing decline and financial stress. Trade credit forms a large proportion of a firm's liabilities, especially for small firms.

Guanxi - In this proposed framework, guanxi is included as a major cluster of factors in credit analysis. Guanxi is an indigenous Chinese construct describing an informal connection between two or more individuals or groups involving shared social experience, the exchange of favours and trust. Guanxi has dominated all business and social activities that occur throughout China. For more than 2,500 years – since the time of Confucius – guanxi has been critically important to Chinese society.

Guanxi variables can be represented in a number of relations, including: government relations, community relations, customer relations, industrial relations, supplier relations, relations with the Chinese communist party (CPC), relations with the local trade association and professional bodies, and the social relations of individual employees with the society in general. Strong relations with these stakeholders provide a potential for business to win contract, gain favourable treatments and receive supports from them once the firm has difficulty. In consequence, firms with strong relations with these stakeholders are less likely to be failure comparing with firms with no relations or weak-relations with these stakeholders. In the case interviews, several interviewees indicated the importance of Guanxi in predicting the failure of SMEs.

Conclusion

In practice, the building of credit risk models for SMEs and farming households and their lending portfolios is limited by data availability. Most Chinese SMEs are not required to disclose cash flow information that is very important for the classification of failed and non-failed firms. RCBs in China also expose specific risks connected to rural commercial banking business and in particular, farming-related loans and services.

We adopt a qualitative analysis approach to identify key factors contributing to the failure of RCBs' customers and develop a CRM framework for RCBs in China. The framework is based on the identification of business failures of RCBs' customers and factors contributing the

failures of SMEs and farming households. The framework embraces both financial and non-financial variables as using nonfinancial variables along with financial variables as predictors of company failure significantly improves credit analysis quality and accuracy. Also, this study recognises guanxi as risk potentials affecting the business of SMEs and farming households and includes guanxi risks in the framework.

In conclusion, RCBs operate in a different business environment and expose some unique risks, which require adopting a different CRM approach to incorporate environmental, operational, financial, and guanxi risks faced by RCBs' customers.

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