Kingston University London

Economics Discussion Papers 2016-10

RISK MANAGEMENT OF THE VIETNAMESE BANKING SYSTEM: A MARKET RESEARCH SURVEY

Roman Matousek — *University of Kent, Canterbury, UK*

Thao Ngoc Nguyen — *Nottingham Trent University, Nottingham, UK*

Chris Stewart — *Kingston University, London, UK*

20 June 2016

Abstract

The purpose of this paper is to examine risk management of the Vietnamese banking system. This is the first such study of the Vietnamese banking system. To be able to carry out a comparative analysis and provide policy recommendations for risk management, we carry out an original survey of Vietnamese commercial banks using a questionnaire. 42% of the interviewees are General/Deputy General Directors and 58% are Heads/Deputies of a risk management department. The Kruskal-Wallis, Pearson chi-square and other tests are employed to examine the relationship between risk management and bank efficiency. The survey results indicate that there is a difference between banks in terms of risk area identification, risk intensification methods prioritised, risk monitoring methods, efficiency improvement suggestions, awareness of other banks' risk management systems and credit risk analysis.

Keywords: Banking; Risk Management; Efficiency; Vietnam

JEL codes: C12; C14; G21; L25

Acknowledgements: We are grateful to the participants of the research seminars at Vietnam Finance Association International (VFAI) Conference in DaNang on 9th and 10th June 2016 and Vince Daly for their helpful suggestions on an earlier version of this paper. Any remaining errors are the responsibility of the authors.

Address for correspondence: Thao Ngoc Nguyen, Nottingham Business School, Nottingham Trent University, Burton street, Nottingham NG1 4BU, Email: thao.nguyen@ntu.ac.uk or nnthao2k6@yahoo.com , Tel: +44 (0) 11 5848 3878.

1. Introduction

Vietnam has become one of Asia's economic success stories in recent years. Average economic growth has been 7.8% per annum in the last decade. Since the 2008 Global financial crisis, Vietnam entered a period of slower growth. Besides manufacturing and agriculture, other sectors of industry have been adversely affected by slower growth and the banking sector is no exception (KPMG, 2013). Generally, there are certain challenges for the banking system in Vietnam. Firstly, as a new industry, compared to other banking systems in the region and the world, Vietnamese banks are influenced by movements in the economy and governmental policies. Since the early months of 2008, inflation and the trade deficit have become more serious concerns. The government priority is to restrain inflation by tightening monetary policy to reduce money supply circulation – which is regarded as the main reason for high inflation. The banking system, the bridge for economic capital, has been directly influenced by this policy since 2008. Secondly, to guarantee the competitive ability of domestic banks after joining the World Trade Organisation (WTO), the government issued Decree No. 141/2006/CP to define minimum legal capital for commercial banks as 1,000 billion VND and 3,000 billion VND in 2008 and 2010 respectively. This is a disadvantage for small commercial banks. Moreover, after joining the WTO, foreign banks with advanced technology, products and professional management seem to be the greatest obstacles to the domestic banking system's progress in the coming years. Lastly, many banks have not regarded risk management as one of the important targets. The faster the banking system develops, the more important the role of risk management becomes. The largest banks in the US and the UK might be in difficulties if they could not control emerging risks.

The objective of this paper is to analyse the type of risk methods banks employ; which risk management procedures they use and how risk management is related with efficiency (Stewart et al., 2016) and other variables. These variables are the type of bank in terms of asset size (small and large banks), shareholders (banks with and without foreign shareholders) and the number of years since establishment.

For this purpose, we conduct, for the first time, an original survey questionnaire of Vietnamese commercial banks to generate a unique data set for statistical analysis. Our target is to obtain one answer from a bank that represents the bank's whole philosophy. Therefore, the interviewee should

be in the highest position within the bank or be a person who understands all business areas in general and risk management in particular. This survey was conducted between June and July 2011. 42% of the interviewees are General/Deputy General Directors and 58% are Heads/Deputies of a risk management department.

The forms of survey questions are matrix (five-point Likert scale from "strongly agree" to "strongly disagree"), multiple choice, choice by rank, close-ended and open-ended questions. Seventeen questions are used which are arranged as four sections, namely: risk identification, risk monitoring system, credit risk analysis and efficiency improvement suggestions (see Appendix I). Kruskal-Wallis, Pearson chi-square and other tests are employed to test for relations between bank risk management, efficiency and other variables. This is the first study to examine the risk management of the Vietnamese banking system in this way.

The rest of the paper is structured as follows. The next section details developments in the Vietnamese banking system while Section 3 contains a brief review of the empirical literature on bank risk management. Section 4 deals with methodology. Analyses of the survey data and empirical results are presented in Sections 5 and 6, respectively. Section 7 concludes.

2. The Vietnamese banking system

From 1986 the Vietnamese banking system was transformed from a mono to a two-tier banking system. The two-tier banking system has the State Bank of Vietnam (SBV) as the central bank (tier 1) and four specialised state owned banks (tier 2). Table 1 shows the number of Vietnamese commercial banks from 1990 to 2009. Beside these commercial banks, there are also the Social Policy Bank and Vietnam Development Bank which are operating as non-profit institutions. With extended networks in almost all provinces and larger cities, state owned commercial banks have a competitive edge in providing banking services. Although joint stock commercial banks increased their numbers immediately after their appearance in 1990 (in 2009 there were 37 joint stock commercial banks), the leading positions in the market still belonged to state owned commercial banks. Three out of five state

owned commercial banks accounted for 45% of customer deposits, 41% of total assets and 51% of customer loans of the banking system in 2009.

Non-state owned commercial banks consist of joint stock commercial banks, branches of foreign banks, joint venture commercial banks and foreign commercial banks.[1] Unlike state owned commercial banks a number of joint stock commercial banks make profits due to good performance. Joint stock commercial banks have achieved average returns on equity between 15% and 30%.[2] The number of branches of foreign banks has increased from 18 banks in 1995 to 48 banks in 2009. However, each foreign bank normally has one branch in either Hanoi or Ho Chi Minh City. Hence, their assets, loans and deposits are very small compared to state owned commercial banks, joint stock commercial banks and joint venture commercial banks. Despite Foreign Direct Investment in US dollar terms growing by a factor of eight between 1990 and 2005, foreign companies are still hesitant as whether or not to choose domestic banks when they enter this new market. The number of joint venture commercial banks has increased slightly from four to six banks between 1995 and 2009. The first foreign commercial bank (being HSBC) had a license to set up a wholly foreign-owned bank from 2008 (Dufhues, 2003, p.32; VCSC, 2008 and SBV, 2009).

Figure 1 shows that the ratio of non-performing loans to outstanding total loans (NPLs/TLs) in the Vietnamese banking system increased from 9.3% in 1996 to 13% by the end of 1998, and decreased in the next seven years to 2.85% in 2004. The proportion of non-performing loans plunged sharply to 3.17% in 2005. Non-performing loans over total loans were quite low in this period. With the high development of the economy, non-performing loans decreased from 2.6% in 2006 to 1.5% in 2007. Due to the financial crisis in 2008 non-performing loans rose to 2.13% in 2008 before falling slightly to 1.99% in 2009 (Kousted *et al.*, 2005, p.43; VCSC, 2008 and SBV, 2009).

[1] Foreign commercial banks normally transformed out of branches of foreign banks. Data on assets, loans and deposits of branches of foreign banks are very small compared to other banks. Therefore, in our application non-state owned commercial banks consist of joint stock commercial banks, joint venture commercial banks and one foreign commercial bank.

[2] Being less than 15 years old joint stock commercial banks are relatively young and they can be divided into three groups: (1) the top five large urban banks; (2) a smaller group of banks that are either growing rapidly or have established a niche; and (3) twelve small rural joint stock commercial banks. The top five urban banks are, Techcombank, Sacombank, VIBBank, Asia Commercial Bank, and East Asia Commercial Bank. The smaller urban joint stock commercial banks include HabuBank, Viet A Bank and Saigon Bank. Small rural commercial banks were all transformed into city commercial banks at the end of 2010, such as, An Binh Bank, Saigon-Hanoi Bank, Petrolimex Group Bank, Dai A Bank, etc. These banks developed throughout the country, not just in rural areas and with help from big business and foreign investors they also performed well in the 2000s.

In terms of regulation, the State Bank of Vietnam aimed to create a banking supervision development (following Basel) from 2010 onwards. Meanwhile, the coverage, measures and procedures of banking supervision and monitoring were to be reformed in accordance with the development of internet technologies and banking technology. This was to be done by applying key principles of international standards on banking supervision (Basel I and Basel II). The old capital adequacy ratio standards for banks in Basel I and Basel II are 8% and 12%, respectively. The capital adequacy ratio for the Vietnamese commercial banks was to be adjusted to 9% (as Circular No. 13/TT-NHNN dated 20th May 2010 of the State Bank of Vietnam).[3]

In parallel with the speed of the country's economic development, the loan growth rate rose dramatically in 2008. The credit growth rate of the banking system increased to 37.8% per year in 2007 and peaked at an alarming 63% in the first quarter of 2008 (WB, 2008, p. 3). This has been the highest growth rate in the past decade. When the inflation rate and trade balance deficit had become more serious, the government applied a traditional tightening of monetary policy in order to reduce money supply circulation, which affected the banking system. Compulsory measures were necessary for banks to reorganise and strengthen their organisations.

3. The literature review

Risk management plays a very significant part in the operation of financial institutions, and especially for banks where their operational risks are also often financial risks (Carey, 2001). However, it is important to acknowledge that there are several sources of risk that exist outside banks' control. Abraham (2008) added that the fractional reserve system acts as a source of instability to most commercial and investment banks. This is because the main purpose of investment banks is to ensure the efficient operation of financial markets and hence the efficient allocation of risk. Another critical factor influencing the risk management practices of banks is the competing influences of individual and organisational judgements of the risks faced by banks. Value at risk analysis is relevant to any

[3] On 1st March 2012, the plan on the restructuring of the system of credit institutions was approved by the Prime Minister under Decision No. 254/QD-TTg. The State Bank of Vietnam Governor later signed Decision No. 734/QD-NHNN setting the plan of action for the banking sector to implement Decision No. 254. These decisions are to prevent collapse and keep banking operations under state control. The process of reorganizing, strengthening and restructuring the credit institution system helps minimize losses and expenses incurred by the state budget for tackling the problems of the system (SBV, 2014).

consideration of risk management and assessment, as it is a risk quantification tool with a long history of use in trading risks (Leong, 1996). Indeed, more recently it has been used to evaluate the levels of interest rate risk and credit risk that banks carry on their bank balance sheets, making it a critical part of any risk management strategy (Leong, 1996). Oldfield and Santomero (1997) described three risk mitigation strategies as follows: (1) simple business practices aimed at eliminating risks; (2) the transfer of risk to other participants better able to bear it; and (3) the active management of risks. The financial sector needs to focus on actively managing risks, through their balance sheets and other financial products. However, there is still evidence that credit risk poses a significant risk to a bank's continued operations. Lang and Nayda (2008) examined how various credit segmentation strategies could aid in the prevention of credit card default, thus assisting banks in achieving better risk mitigation and hence higher returns on capital. Evidence from this study indicated that using fully updated information on the financial histories of consumers would make it possible for banks to mitigate much of the credit risk, and hence almost eliminate the need to compensate for higher risks. Al-Tamimi (2007) estimated the degree to which the UAE banks use risk management practices and techniques in dealing with different types of risk. The study was based on a primary data questionnaire and secondary data. Their study revealed that UAE banks were efficient in credit risk management but there were significant differences between UAE banks and foreign banks regarding risk management. Hussain and Al-Ajimi (2012) used a questionnaire to investigate risk management practices of conventional and Islamic banks in Bahrain in 2009-2010. The levels of risks faced by Islamic banks are found to be significantly higher than those faced by conventional banks. Similarly, country, liquidity, operational, residual and settlement risks are found to be higher in Islamic banks than in conventional banks.

In Vietnam, the problem of data collection made it difficult to investigate the issue through the survey method. No previous study has explicitly considered the whole system's bank risk management using a questionnaire. Dinh and Kleimeier (2007) proposed a credit scoring model (CSM) for Vietnamese retail loans. To develop this CSM they used a database of all retail loans signed between 1992 and 2005 of only one Vietnamese commercial bank. Their results showed that a CSM can reduce loan default. By replacing its informal credit assessment method with a CSM, the bank can expect a decrease in its default ratio from 3.3% to 2%.

4. Methodology

Our research investigates the type of risk management methods that banks employ; which risk management procedures they use and how risk management is related with efficiency and other variables. We use a questionnaire to help us answer these questions. Generally, two methods are used to analyse survey data, being parametric and non-parametric methods.

The parametric method (one-way or one-factor ANOVA) is used to detect differences between the population mean of more than two groups, in terms of one variable measured over these groups. It requires data measured at the interval or ratio levels. However, business data are not always at these levels of measurement which hinders the use of parametric methods. Market research regularly produces data at the nominal (for example, “agree” versus “disagree” with a proposition about product) and ordinal (for example, ranked preferences) levels. Serious doubts about the normality assumption even when the data are at interval or ratio levels provides another reason why nonparametric methods may be preferred to parametric ones. On the other hand, many authors refer to nonparametric methods as distribution-free, in that they make relatively few assumptions about the nature of the population distribution. The Kruskal-Wallis test is a nonparametric method that is applied when there are more than two independent samples. The Kruskal-Wallis test is the most efficient in that it uses more of the information available in the sample readings (Coshall, 2011, p. 137).

In our research, a qualitative interview-based study is used to achieve our research objectives. Good personal relationships between researchers and interviewees play a crucial role in gathering and securing relatively sensitive information that is not normally in the public domain. Our target is to obtain a single answer to each question from each bank that represents the bank’s whole philosophy. Therefore, the interviewee should be in the highest position in the bank or a person who understands all business areas in general and risk management in particular. Firstly, we tried to contact General Directors/Deputy General Directors of banks, and brief them on the nature of the research. They could decide whether to answer the questionnaire directly or whether to pass it to those directly involved in risk management (mostly the head of the risk management department or credit department). Secondly, if we could not contact General Directors/Deputy General Directors of the banks we would

liaise with the Head/Deputy of risk or relevant risk management department. Lastly, if this fails we would contact the bank directly.

This survey was conducted between June and July 2011. However, preparatory work, including establishing relationships, was carried in 2009 and 2010. In total, respondents from 38 out of 48 banks,[4] located in Hanoi, Ho Chi Minh City and some other provinces in Vietnam, were interviewed (see Table 2). This sample provides a relatively robust cross section of bank risk management in Vietnam. The PASW[5] package is employed for entering data. All interview data is transcribed and stored verbatim.

5. Survey data analysis

5.1. Information on survey respondents

In Table 2, we provide summary information for the survey data. Fifteen interviewees are General Directors/Deputy General Director and one interviewee is a Chairman. Some of these first-level respondents pass the questions to second-level risk management managers (Head/Deputy of risk or relevant risk management department).[6] First and second-level interviewees account for 76.3% (29) of the 38 respondents. Third-level interviewees (head of the supervisory board, special assistant in risk management, secretary to the management board or head of the international settlement department) constitute 23.7% (9) of the 38 respondents. There are nineteen banks with assets less than 20,000 billion VND. Seventeen banks have been established less than 15 years. Fifteen banks have foreign shareholders. In our sample 26 banks have efficiency scores below 0.89 (the efficiency scores are obtained from Stewart et al. (2016), and are constructed using a double DEA bootstrap method).

[4] These 48 banks account for more than 90% of total customer loans, total customer deposits and total assets of the whole banking system (Stewart et al., 2016). There are 10 banks where we could not obtain answers or where the respondents were not qualified to act as our target.

[5] Predictive Analytics Software.

[6] In reality, some banks do not have specific risk management departments or are establishing this department. Several banks use other departments such as credit risk, credit-reassessment and debt departments to function as the risk department.

5.2. Statistical methods[7]

The Kruskal-Wallis test examines the differences in average (mean) ranks of variables allocated to each sample to assess if they are sufficiently similar to be likely to have been drawn from populations with the same distribution. If the Kruskal-Wallis statistic exceeds its critical value obtained from the chi-square distribution (equivalently, the probability value is below 0.05) the null hypothesis that the populations have the same distribution is rejected (we use a 5% level of significance for all tests). Similarly, the Pearson chi-square statistic tests whether the row and the column variables in a contingency table are independent. A probability value of the Pearson test below 0.05 indicates rejection of the independence null. In the case of 2X2 tables, the formulae for Pearson chi-square tests is modified by the inclusion of Yates' continuity correction which is reported in the row denoted "Continuity correction". If any expected frequency in a 2X2 contingency table is less than or equal to five, then PASW automatically uses Fisher's exact test instead of the chi-square statistic to assess the notion of independence (Coshall, 2011, p. 97). In this case, Fisher's exact test is favoured for inference over Pearson's chi-square test (with Yates' continuity correction). A 2-sided probability value of Fisher's exact test below 0.05 indicates rejection of the independence null.

Further, one should not use the Pearson chi-square contingency statistic if more than 20% of the cells have expected values less than or equal to five when using contingency tables larger than 2X2. In this case, the Mantel-Haenszel test is used for inference. The Mantel-Haenszel statistic is found in the row labelled "Linear-by-Linear Association" of the tables. It tests whether the variables under study are linearly related. The likelihood ratio statistic is also reported in the contingency table. It is an alternative to the Pearson's chi-square test and is valid in large samples (the two statistics yield very similar results).

6. Testing hypotheses

A questionnaire consisting of seventeen questions is created and divided into four parts, including risk identification, risk monitoring system, credit risk analysis, and efficiency suggestions. The first part of four questions sought to shed light on banks' understanding of risk. The reason we include these

[7] We could not produce useful variables for questions Q11, Q25, Q31, Q33, Q34, Q41, Q42 and Q43. This means there was no difference in responses across respondents. In other words, all interviewees answered in the same way to these questions. Another problem arose with the chi-square contingency statistic.

questions is to see how banks understand and clarify the risks they are coping with. Moreover, when banks rank their kinds/areas of risks, we can identify differences in the choices of banks. The second part consists of five questions that identify which risk management procedure banks use. The third part has four questions and examines credit risk management. The purpose of these questions is to look at credit risk analysis. Credit risk is normally the most important type of risk as it presents the main function of banks. The last part comprises four questions that focus on relationships between bank risks and bank efficiency. The reason for these questions is to see the difference between performance, structure and efficiency.

The hypotheses that we statistically assess are given below:

- *Hypothesis 1:* there is a difference between banks with small and large asset size (20,000 billion VND in 2009) in terms of risk identification and risk monitoring system.
- *Hypothesis 2:* there is a difference between banks with and without foreign shareholders in terms of risk intensification methods prioritised.
- *Hypothesis 3:* there is a difference between the degree of efficiency of banks in terms of risk identification, risk monitoring system and efficiency improvement suggestions.
- *Hypothesis 4:* there is a difference between banks with different number of years since establishment in terms of risk awareness.

We discuss our results regarding each hypothesis below.

6.1. Hypothesis 1

Table 3 reports the Kruskal-Wallis test statistic with banks categorised by asset size. On the left hand side of Table 3, the first column specifies variables (kind of risks, risk departments and training programmes) and the second column indicates the type of bank in terms of asset size. There are small banks (defined as total assets being less than 20,000 billion VND in 2009) and large banks (where total assets were more than 20,000 billion VND in 2009). The third column gives the number of banks, headed N, while the fourth column gives the mean rank of the variables that are ranked by the size of

the variable.[8] The Kruskal-Wallis test is based on the ranking of the bank by the variable. Banks are ranked in ascending order where the bank with the smallest value of the variable is assigned the lowest rank of one, while the bank with the largest value of the variable receives the highest rank of N.

In Table 3 the mean rank is greatest for larger asset size banks for the number of departments variable (question 21, denoted Q21), which suggests that large banks have move departments than small banks. In contrast, the mean rank is larger for small banks compared to large banks for the variables risk identification (question 13, Q13) and risk monitoring system (question 22, Q22). Q13 originally had ten options for interviewees. However, after analyzing the data, we divided Q13 into two groups: (1) credit risk, liquidity risk and operational risk and (2) credit risk, liquidity risk and foreign exchange risk. All banks chose credit risk and liquidity risk as the most two important types of risk. Nevertheless, the mean rank of Q13 indicates that small banks regard credit, liquidity and foreign exchange as their priority risks while large banks are more concerned with credit, liquidity and operational risk. Q22 on training programmes attended also has five options for respondents which we divide it into two groups: (1) bank has training programme of less than a quarter or no training and (2) bank has training programme of one year. The mean rank of Q22 indicates that small banks have less frequent training programmes than large banks.

The right-hand side of Table 3 gives the Kruskal-Wallis chi-square test statistic. For all variables the test statistics reject the null hypothesis at the 5% level indicating a significant difference between small and large banks in terms of risk identification, the number of training programmes attended and risk monitoring systems. These results are consistent with our expectations.

Table 4 shows the results from the contingency analysis and the chi-square tests with the type of bank categorised by asset size and variables (in the columns headed Kind of risks (Q13), Risk departments (Q21) and Training programmes (Q22)). The rows specify the type of bank by asset size. The rows labelled Count represents the number of banks in a category while the rows below it give, respectively, the percentage of banks in a category according to size and the percentage of banks in a category by the variables

[8] The mean rank indicates the relative average ranking of a particular variable between the categories of small and large banks.

From Table 4 we see that all banks deal with the two most important types of risks, namely credit risk and liquidity risk whereas some banks focus on operational risk and others on foreign exchange risk. There are 7 (36.8%) of the 19 small banks (with total assets below 20,000 billion VND) that consider operational risk as one of the three main risks which is 33.3% of the 21 banks that concentrate on operational risk. There are also 14 (73.7%) of the 19 large banks (with total assets above 20,000 billion VND) that consider operational risk as one of the three main risks which is and 66.7% of the 21 banks that concentrate on operational risk. In contrast, 12 (63.2%) of the 19 small banks consider foreign exchange risk as one of the three most important risks, which is 70.6% of the 17 banks that focus on foreign exchange risk. 5 (26.3%) of the 19 large banks consider foreign exchange as one of the 3 most important risks, which is 29.4% of the 17 banks that that focus on foreign exchange risk. This indicates that large banks paid more attention to operational risk management. They are more aware of the possible failure of a bank's systems, controls or other management failure (including human error) than small banks. In contrast, small banks have problems with foreign currency suggesting that they generally do not have a strong budget of foreign currency that can sponsor activities relating to assets, liabilities and off-balance sheet items. Small banks typically have difficulties obtaining foreign currency, this was especially so during the 2008-financial-crisis.

All except one of the chi-square statistics reject the null of independence between asset size and kind of risks are presented at the bottom of Table 4. The Continuation correction tests is the only one that (only just) does not reject the null and this is not a favoured test because one of the expected frequencies is 5 in this 2x2 contingency table.[9] We therefore conclude that kind of risks depend on bank size.

A similar analysis for the other variables (risk departments and training programmes), also presented in Table 4, suggests that the null of independence from bank size is rejected by all reported tests. In particular, the results indicate that larger asset sized banks have more risk departments than smaller banks. Further, banks of larger asset size provide more frequent risk training programmes for staff than do smaller banks. In general, our results confirm Hypothesis 1 that there is a significant difference

[9] A 2X2 contingency table is used for the kind of risks tests where one expected frequency is equal to five in absolute value. Hence, Fisher's exact test is more appropriate than the Pearson chi-square or Continuation correction tests () to assess the notion of independence.

between small and large banks in terms of risk identification (kind of risks) and risk monitoring systems (the number of risk departments and the frequency of training programmes).

6.2. Hypothesis 2

The lower section of Table 5 reports the Kruskal-Wallis, and other test statistics, for independence between the categories of risk intensification and whether or not they have foreign shareholders. Question 23 (Q23) about risk intensification had eight options which we divide into the following two distinct groups: (1) restructure the organisation, internal control, banking services, credit growth and new technology and (2) funding sources, loan types, internal control, banking services, credit growth and new technology (see Table 5).[10] All test statistics reject the null hypothesis at the 5% level.[11] Therefore, we find that there is a significant difference between banks with and without foreign shareholders in terms of risk intensification.

The contingency analysis is reported in the top section of Table 5. Four (26.7%) of the fifteen banks that have foreign shareholders prioritise restructuring, which is 20% of the 20 banks that regard restructuring the organisation as the most important method to intensify risk management. Sixteen (69.6%) of the 23 banks without foreign shareholders prioritise restructuring, which is 80% of the 20 banks prioritising the restructure of the organisation. In contrast, eleven (73.3%) of the fifteen banks that focus on internal control have foreign shareholders, which is 61.1% of the eighteen banks that employ internal control as the priority method to intensify risk management. Only seven (30.4%) of the 23 banks without foreign shareholders focus on internal control, which is 38.9% of the eighteen banks that use internal control. This suggests that banks without foreign shareholders tend to focus on organisational restructuring to intensify risk management while banks with foreign shareholders typically emphasise the importance of internal control and audit system for this purpose.[12] This is consistent with our expectation.

[10] All respondents are in either group 1 or group 2.
[11] In Table 5 one expected frequency (being four) is less than five in absolute value in the 2X2 contingency table, hence Fisher's exact test is preferred to the Pearson chi-square or Continuation correction tests for inference. As for the other reported tests, Fisher's test rejects the null hypothesis of independence.
[12] The mean rank for banks with foreign shareholders (being 24.43) is greater than that for banks with non-foreign shareholders (16.28), which confirms this inference.

Hence, our hypothesis 2 is confirmed: there is a difference between banks with and without foreign shareholders in terms of risk intensification methods prioritised.

6.3. Hypothesis 3

To assess the correlation between the efficiency scores and the factors of interest (risk area identification, risk monitoring methods and efficiency improvement suggestions) we employ average efficiency scores using a 0.89 cut-off point to distinguish more efficient from less efficient banks (see Stewart et al., 2016). Question 14 (Q14) on risk area identification originally had seven options however, after analysing the data, we divided Q14 into two groups: (1) unsecured loans, securities and credit cards and (2) unsecured loans, securities and consumption loans. All banks chose unsecured loans and credit cards as the two most risky areas hence it is the third most risky area that distinguishes the categories. Question 24 (Q24) on risk monitoring methods originally had six options for interviewees. All banks consider the following methods should be employed by the SBV to prevent risks: provide information through the credit information centre, improve the legal framework, apply IT to management and coordinate macro policies. A distinguishing feature is that some banks also consider inspection of the SBV as the next method while others prefer management of liquidity and risk training programmes. Question 44 (Q44) is an open ended question asking for suggestions to improve bank efficiency. This is separated into two categories: (1) those with no suggestions (do not know) and (2) those with specific suggestions such as Basel II, Internal control, Human resources, IT and banking services (see Table 7).

Table 6 reports mean rank of banks categorised by average efficiency scores and the factors discussed above. For all 3 factors the mean rank is larger for more efficient banks. This indicates that less efficient banks (with average efficiency scores less than 0.89) generally regard credit cards as the third riskiest area after unsecured loans and securities whereas more efficient banks consider consumption loans as the third riskiest area (see Q14). Further, comparatively inefficient banks focus on strengthening inspection of the SBV as the next most important method to prevent risks whereas more efficient banks concentrate on management of liquidity and risk training programmes (Q24). This is consistent with our expectation.

Table 7 reports the output from the contingency analysis (top section) and the chi-square tests (lower section) with the type of bank categorised by average efficiency scores and the variables (risk area identification, risk monitoring methods and suggestions for bank efficiency). The Kruskal-Wallis tests rejects independence between the level of efficiency score and all 3 variables. In fact, all except for two tests (the continuity correction test for Q24 and Q44) reject the null. However, because all 3 variables' use a 2X2 contingency table where at least one expected frequency is less than or equal to five in absolute value, the continuity correction test is not favoured for inference and we therefore reject the null hypothesis of independence at the 5% level. Therefore, we find that there is a significant difference between high and low efficiency banks in terms of the risk areas identified, risk monitoring methods and suggestions for bank efficiency improvements. This is consistent with our expectation.

In response to Q14, all of the banks specified unsecured loans and securities as the two highest risk areas in the banking businesses. However, some banks regard credit cards as the third highest risk area while others consider this to be consumption loans. We therefore distinguish banks according to their specification of the third highest risk area. The upper section of Table 6 indicates that 24 (92.3%) of the 26 less efficient banks emphasise credit cards as the third highest risk area. This represents 77.4% of the 31 banks that specify credit cards as the third highest risk area. Seven (58.3%) of the 12 more efficient banks specify credit cards in the top three risk areas, which is 22.6% of the 31 banks that suggest credit cards are the third highest risk area. In contrast, only 2 (7.7%) of the 26 less efficient banks indicate consumption loans to be one of the three main risky areas, which is 28.6% of the 7 banks that consider consumption loans as the third highest risk area. Further, 5 (41.7%) of the 12 more efficient specify consumption loans in the top three risks, which constitutes 71.7% of the 7 banks that choose consumption loans as the third highest risk area. Overall, this suggests that more efficient banks are less concerned with credit card risks, probably because they have good systems to control such risks, while less efficient banks have problems with this type of business.

Regarding risk monitoring methods, all the banks consider that the SBV should employ the following methods to prevent risks: (1) provide information through CIC;[13] (2) improve the legal framework; (3) apply IT to management and (4) coordinate macro policies. However, less efficient banks tend to

[13] Credit Information Centre.

regard inspection of the SBV as more important than liquidity management and staff training than more efficient banks. Further, more efficient banks tend to suggest more solutions to improve bank efficiency than less efficient banks (see Table 7).

In brief, hypothesis 3 is confirmed. There is a significant difference between less efficient and more efficient banks in terms of risk area identification, risk monitoring methods and efficiency improvement suggestions.

6.4. Hypothesis 4

Table 8 reports, respectively, the output from the contingency analysis (top section) and the chi-square tests (lower section) with the type of bank categorised by the number of years since establishment and a bank's degree of risk awareness of other banks' risk management systems. The Kruskal-Wallis and all other chi-square tests reject the null of independence, except for the version with the continuity correction. However, because this is a 2X2 contingency table where one expected frequency is less than five in absolute value the continuity correction test is not favoured for inference and we reject the null hypothesis of independence at the 5% level. Therefore, we find that there is a significant difference between young and old banks in terms of their risk awareness, which is consistent with our expectation.

The upper section of Table 8 indicates that 9 (52.9%) of the 17 young banks are aware of the strengths and weaknesses of other banks' risk management systems. This represents 33.3% of the 27 banks that understand the risk management systems of other banks. Eighteen (85.7%) of the 21 older banks understand other banks' risk management systems, which accounts for 66.7% of the 27 banks that are aware of other banks' risk management systems. On the other hand, 8 (47.1%) of the 17 younger banks do not understand other banks' risk management systems, which 72.7% of the 11 banks that are not aware of other banks' risk management systems. Further, 3 (14.3%) of the 21 older banks have no knowledge of other banks' risk management systems, which is 27.3% of the 11 banks that are not

aware of the risk management systems of other banks. Thus, older banks tend to have better information about other banks' risk management systems than younger banks.[14]

7. Conclusion

This study produces original primary data from a survey of Vietnamese banks and for the first time employs nonparametric methods to statistically assess whether there are differences in the following risk characteristics of banks in Vietnam. Are small and large banks different in terms of risk identification and risk monitoring systems? Are banks with foreign shareholders different from banks without foreign shareholders in terms of risk management intensification methods prioritised? Are less efficient banks different from more efficient banks in terms of risk area identification, risk monitoring methods and efficiency improvement suggestions? Are older banks different from younger banks in terms of risk awareness?

We find that the two most important types of risks identified by all Vietnamese banks are credit risk and liquidity risk. However, there are significant differences in terms of the third most important risk identified by bank size. Almost all small banks consider foreign exchange as the third most important type of risk while larger banks typically regard operational risk as one of the three riskiest areas. In terms of risk monitoring, our data also suggest that small banks typically have fewer risk departments and less training programmes for staff than larger banks. Our results indicate that the methods prioritised to intensify risk management and financial capacity are also significantly different in terms of bank ownership. Banks with foreign shareholders tend to focus on developing internal control and audit systems while banks without foreign shareholders typically prefer to restructure the organisation and operations. In our survey all banks identified unsecured loans and securities as the two most important risk areas. However, there are significant differences regarding the third most important area of risk. Less efficient banks regard credit cards as the third most important risk area while more efficient banks identify consumption loans as the third riskiest area. There are also significant differences regarding risk monitoring. Less efficient banks prefer to strengthen the inspection of the SBV to help prevent risks while more efficient banks favour the management of liquidity between SBV

[14] The mean rank is larger for banks that have been established for more than 15 years (being 22.94) than those that are less than 15 years old (16.71) which confirms that older banks are more aware of the strengths and weaknesses of other banks' risk management systems than younger banks.

and banks as well as risk training programmes for staff. Further, more efficient banks generally provide more suggestions to improve bank efficiency (referring to, Basel II, internal control, human resource management, IT, customer services, etc.) than less efficient banks. Finally, we find that banks that have been in existence for more than 15 years are generally more aware of the strengths and weaknesses of the risk management systems of other banks than younger banks.

This is the first time that a survey of risk management in the Vietnamese banking system has been carried out, which provides new information. The results confirm all of our expectations as specified by our four hypotheses. The most interesting finding is that credit and liquidity are the two most important types of risks with 38 top bank managers. This may be expected given that the survey was conducted shortly after the 2008 global financial crisis which impacted the Vietnamese banking system. Credit and liquidity risks are also priority concerns of the State Bank of Vietnam and the Vietnamese government. Top managers of banks provided the following policy recommendations to improve bank efficiency: (1) application of Basel II; (2) increase internal control; (3) improve human resource management; and (4) improve IT and quality of customer services. Hence the first policy recommendation is that inspection by the SBV is needed to prevent potential risks. Another policy recommendation is the intensification of risk management. Almost all bank managers prefer to restructure the banking system because some small banks are not sufficiently efficient in the market. Hence, merger and acquisitions should be the popular trend in the coming years. Further, the SBV needs to have policies for restructuring the system and promoting competition in the banking sector of Vietnam. This also aligns with recent policies from the State Bank of Vietnam to promote mergers and acquisitions and increasing the financial autonomy of banks. The State Bank of Vietnam targeted 6 to 7 mergers and acquisitions in the banking sector in 2014, and a 50% reduction in the number of commercial banks in the period of 2015-2017 (WB, 2014).

References

Abraham, H. (2008). Bank runs: A risk management perspective: A note. *South African Journal of Business Management, 39*(4), 63-65.

Al-Tamimi, H. (2007). Bank's risk management: A comparison study of UAE national and foreign banks. *The Journal of Risk Finance, 8*(4), 394-409.

Carey, A. (2001). Effective risk management in financial institutions: The Turnbull approach. *Balance sheet, 9*(3), 24-27.

Coshall, J. (2011). *SPSS for Windows - A user's guide.* London: London Metropolitan University.

Dinh, T.T.H. and Kleimeier, S. (2007). A credit scoring model for Vietnam's retail banking market. *International Review of Financial Analysis, 16*, 471-495.

Dufhues, T. (2003). Transformation of the financial system in Vietnam and its implications for the rural market - An updated. *Journal of Institutional Innovation, 7*, 29-41.

Hussain, H.A. and Al-Ajmi, J. (2012). Risk management practices of conventional and Islamic banks in Bahrain. *Journal of Risk Finance, 13*(3), 215-239.

Kousted, J., Rand, J., Tarp, F., Nguyen, D.T., Nguyen, V.H., Ta, M.T. and Luu, D.K. (2005). *From mono bank to commercial bank: Financial sector reforms in Vietnam.* Singapore: Institute of Southeast Asian Studies.

KPMG. (2013). *Vietnam Banking Survey.* Hanoi: KPMG.

Lang, W. and Nayda, W. (2008). Is advanced credit risk management worth the plunge? *Risk Management Association Journal, 90*(8), 35-41.

Leong, K. (1996). The right approach: Value at risk. *Risk Special Supplement*, 14.

Oldfield, G.S. and Santomero, A.M. (1997). Risk management in financial institutions. *Sloan Management Review, 39*(1), 33-46.

SBV. (2009). *Annual Report.* Hanoi: SBV.

SBV. (2014). *Annual Report.* Hanoi: SBV.

Stewart, C., Matousek, R. and Nguyen, T.N. (2016). Efficiency in the Vietnamese banking system: A DEA double bootstrap approach. *Research in International Business and Finance, 36*, 96-111.

VCSC. (2008). *Vietnam banking system: Reality and forecast.* Ho Chi Minh city: VCSC.

WB. (2008). *Taking stock: An update on Vietnam's recent economic developments in 2008.* Hanoi: Annual Consultative for Vietnam.

WB. (2014). *Taking stock: An update on Vietnam's recent economic developments in 2014.* Hanoi: Annual Consultative for Vietnam.

Appendix I. The Questionnaire

Risk identification

Please give your rating: SA (strongly agree), A (agree), N (neutral/undecided), D (disagree), SD (strongly disagree).

SA	A	N	D	SD

Q11 Risk management is an important part of management reporting (Business plan for the next year).

Q12 The bank is aware of the strengths and weaknesses of risk management systems of other banks.

Q13 What kinds of risks is the bank dealing with most at the moment? (Please rank each of these kinds of risk to indicate how risky they are to your bank. Place 1 in the box next to the most risky, 2 in the second most risky and so on. Do not place the same number in more than one box).

☐ Credit risk ☐ Liquidity risk ☐ Operational risk
☐ Market risk ☐ Interest rate risk ☐ Foreign exchange risk
☐ Solvency risk ☐ Model risk ☐ Systematic risk
☐ Other risks: Country, Settlement, Performance, etc.

Q14 What are the highest risk areas in your banking businesses (Please rank each of these areas to indicate how risky they are to your bank. Place 1 in the box next to the most risky area, 2 in the second most risky area and so on. Do not place the same number in more than one box).

☐ Securities related loans ☐ Property (real estate) related loans ☐ Credit Cards
☐ Consumption loans ☐ International Settlement ☐ Foreign exchange
☐ Others (please specify)

_____
_____
_____

Risk monitoring system

Q21 Which of the following departments does the bank have?

☐ Risk management centre ☐ ALCO ☐ Inspection department
☐ Internal audit teams ☐ None of the above

Q22 How often does the bank have regular training programmes for staff in the area of risk management?

☐ Never ☐ Weekly ☐ Monthly ☐ Quarterly ☐ Yearly

Q23 What methods does the bank employ to intensify risk management and financial capacity in the future? (Please rank each of these methods to indicate how important they are to your bank when the bank decides to employ. Place 1 in the box next to the most important method, 2 in the second most important method and soon. Do not place the same number in more than one box).

☐ Restructuring the organisation and operations.

☐ Developing the internal control and audit system.

☐ Applying new technology in banking operations.

☐ Diversify banking services and improve quality of banking services and care of customers.

☐ To control credit growth, NPLs decrease with focus on credit quality.

☐ To decrease lending in foreign currencies, cut down the amount of short-term loans for mid and long-term lending.

☐ To actively seek funding sources for investment and indirect investment into valuable papers to mitigate credit risks.

☐ Others (please specify).
_____
_____
_____

Q24 What methods should be adopted by the SBV to prevent banking risks? (You can choose more than one).

☐ Strengthen the role of the state management in settlements.

☐ Provide necessary information of customers for commercial banks through CIC (Credit Information Centre).

☐ Improve the legal framework for operations of the systems.

☐ Apply IT to strengthen the effectiveness of inspection over the systems.

☐ To closely coordinate monetary policy with fiscal policy to ensure macroeconomic stability for the system.

☐ Others (please specify).
_____
_____
_____

Q25 Please give your rating: SA (strongly agree), A (agree), N (neutral/undecided), D (disagree), SD (strongly disagree).

Do you think that after the recent financial crises, the increase in the minimum of Capital Adequacy Ratio (CAR) from 8% to 9% (Basel) for the Vietnamese banking system is necessary at the moment?

SA	A	N	D	SD

Credit risk analysis

Q31 Please give your rating: SA (strongly agree), A (agree),N (neutral/undecided), D (disagree), SD (strongly disagree).

SA	A	N	D	SD

This bank's policy requires collateral for granting all loans.

Q32 What is the maximum loan amount for unsecured loans (loans without guarantee) in your bank?

- ☐ None (The bank does not have unsecured loans).
- ☐ VND1 - VND 19,999,999.
- ☐ VND 20,000,000-VND 39,999,999.
- ☐ VND 40,000,000-VND 59,999,999.
- ☐ VND 60,000,000-VND 79,999,999.
- ☐ VND 80,000,000-VND 99,999,999.
- ☐ VND 100,000,000 or more please specify (if possible).....

Q33 What are the guarantees for loans most used by customers of your bank? (You can choose more than one)

☐ Home ☐ Land ☐ Automobile ☐ Credit cards
☐ Saving books ☐ Saving accounts ☐ List stocks
☐ Unlisted stocks ☐ Physical Gold ☐ Foreign currencies in cash

Q34 Please give your rating: SA (strongly agree), A (agree), N (neutral/undecided), D (disagree), SD (strongly disagree).

In measuring credit risk of loans, the bank adopts guidance provided in Decision No. 493/2005/QĐ-NHNN dated 22nd April 2005 and Decision No. 18/2007/QĐ-NHNN dated 25th April 2007 of the SBV.

SA	A	N	D	SD

Efficiency improvement suggestions

Please give your rating: SA (strongly agree), A (agree), N (neutral/undecided), D (disagree), SD (strongly disagree).

SA	A	N	D	SD

Q41 Do you think that banks with good performance also have good risk management?

Q42 Do you think that risk management is an important competitive condition of the bank in the system?

Q43 Do you think that banks adopting successful risk management would have higher total assets/total loans/total deposits than others?

Q44 What would you suggest to improve bank efficiency?

_____

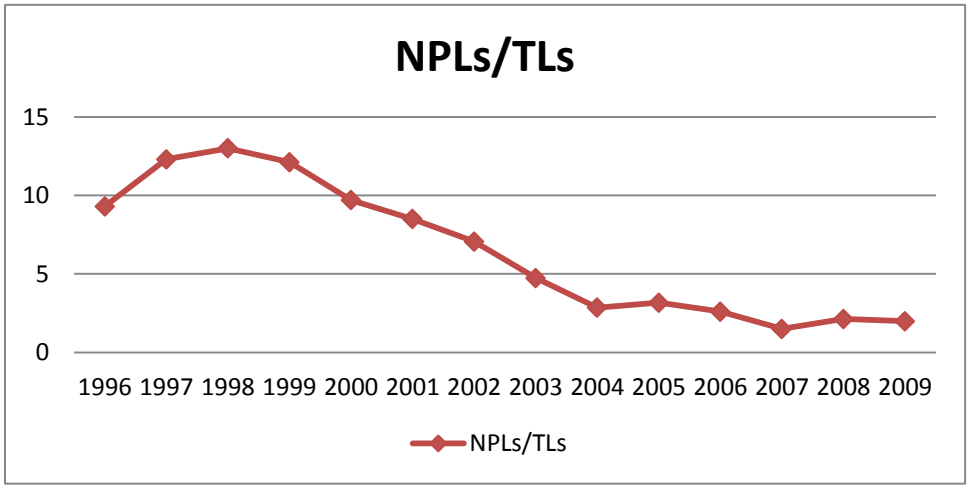
_____

Table 1: The number of commercial banks from 1990 to 2009

Type of banks	1990	1995	2000	2005	2009
State owned commercial banks	4	4	5	5	**5**
Non-state owned commercial banks					
Joint stock commercial banks	0	36	39	37	**37**
Branches of foreign banks	0	18	26	31	**48**
Joint venture commercial banks	0	4	5	5	**6**
Foreign commercial banks	0	0	0	0	**5**
Total	4	62	75	78	101

Sources: Dufhues (2003, p.32); VCSC (2008) and SBV (2009).

Figure 1: Non-performing loans (percentage of total outstanding loans) from 1996 to 2009



Sources: Koustedet al. (2005, p.43); VCSC (2008) and SBV (2009).

Table 2 Frequency statistics of respondents

Criteria	Choices	Frequency	(%)
Position	(Deputy) General Director/Chairman	16	42.1
	(Deputy) Head of Risk/Credit/Credit-reassessment/Debt-Fund Dept.	13	34.2
	(Deputy, Assistant, Member) Head of supervisory/secretary/international settlement dept.	9	23.7
Type of bank in terms of asset size in 2009 (20,000 billionVND)	Assets less than 20,000 billion VND	19	50.0
	Assets more than 20,000 billion VND	19	50.0
Establishment	Less than 15 years (from 1999)	17	44.7
	More than 15 years (from 1999)	21	55.3
Foreign shareholders	With foreign shareholders	15	39.5
	Without foreign shareholders	23	60.5
Average efficiency score using a 0.89 cut-off point	Less than 0.89 (low efficiency)	26	68.4
	More than 0.89 (high efficiency)	12	31.6

Sources: Replies from 38 bank managers.

Table 3: The Kruskal-Wallis test between type of bank by asset size and the variables (kind of risks, risk departments and training programmes)

	Rankings			Kruskal-Wallis test		
Variables	Type of bank by asset size	N	Mean Rank	Chi-square	df	Asymptotic p-value
Kind of risks (Q13)	Assets below 20,000 billion VND	19	23.00	5.078	1	.024
	Assets above 20,000 billion VND	19	16.00			
	Total	38				
Departments (Q21)	Assets below 20,000 billion VND	19	15.16	6.589	1	.010
	Assets above 20,000 billion VND	19	23.84			
	Total	38				
Training programmes (Q22)	Assets below 20,000 billion VND	19	23.50	6.578	1	.010
	Assets above 20,000 billion VND	19	15.50			
	Total	38				

(Q13): What kind of risks is the bank dealing with most at the moment?; (Q21): Which of the following department(s) does the bank has?; (Q22): The bank has regular training programmes for staff in the area of risk management; Sources: Replies from 38 bank managers.

Table 4 Contingency analysis and Chi-square tests between bank size and variables (kind of risks, risk departments and training programmes)

Contingency analysis		Kind of risks (Q13)		Risk departments (Q21)			Training programmes (Q22)	
		Credit-Liquidity-Operational	Credit-Liquidity-Foreign exchange	≤2 depts	3 depts	4 depts	≤Quarter	1 year or no training
Below 20,000 billion VND	Count	7	12	9	8	2	6	13
	Row percentages	36.8%	63.2%	47.4%	42.1%	10.5%	31.6%	68.4%
	Column percentages	33.3%	70.6%	69.2%	61.5%	16.7%	30.0%	72.2%
	Residual	-3.5	3.5	2.5	1.5	-4.0	-4.0	4.0
Above 20,000 billion VND	Count	14	5	4	5	10	14	5
	Row percentages	73.7%	26.3%	21.1%	26.3%	52.6%	73.7%	26.3%
	Column percentages	66.7%	29.4%	30.8%	38.5%	83.3%	70.0%	27.8%
	Residual	3.5	-3.5	-2.5	-1.5	4.0	4.0	-4.0
Total	Count	21	17	13	13	12	20	18
	% of all asset sizes in 2009	55.3%	44.7%	34.2%	34.2%	31.6%	52.6%	47.4%
	% within variables	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-square test	Kind of risks (Q13)			Risk departments (Q21)			Training programmes (Q22)		
	Value	AS	ES	Value	AS	ES	Value	AS	ES
Kruskal-Wallis	5.078	.024		6.589	**.010**		6.578	.010	
Pearson Chi-Square	5.216	.022		7.949	.019		6.756	.009	
Continuity Correction[a]	3.832	.050		---	---		5.172	.023	
Likelihood Ratio	5.348	.021		8.494	**.014**		6.974	.008	
Fisher's Exact Test	---	---	**.049**	---	**---**		---	---	**.022**
Linear-by-Linear Association	5.078	.024		6.589	**.010**		6.578	.010	
N of Valid Cases	38			38			38		

(Q13): What kind of risks is the bank dealing with most at the moment? (Q21): Which of the following department(s) does the bank has? (Q22): The bank has regular training programmes for staff in the area of risk management.

AS: Asymptotic significance (2-sided); ES: Exact significance (2-sided); a. Computed only for a 2x2 table.

Q13 and Q22: If any expected frequency in a 2X2 contingency table is less than or equal to five, then PASW automatically uses Fisher's exact test instead of the chi-square statistic to assess the notion of independence

Table 5 Output from the contingency analysis and Chi-square test between banks with foreign shareholders and risk intensification

Contingency analysis		**Risk intensification (Q23)**		**Total**
		Restructure-Inter control-Services-Credit growth-New technology	Inter control-Service-Credit growth-Loan type-New technology-New funding sources	
Foreign shareholders	Count	4	11	15
	% within banks with foreign share holders	26.7%	73.3%	100.0%
	% within Risk intensification	20.0%	61.1%	39.5%
	Residual	-3.9	3.9	
No foreign shareholders	Count	16	7	23
	% within banks with foreign share holders	69.6%	30.4%	100.0%
	% within Risk intensification	80.0%	38.9%	60.5%
	Residual	3.9	-3.9	
Total	Count	20	18	38
	% within banks with foreign shareholders	52.6%	47.4%	100.0%
	% within Risk intensification	100.0%	100.0%	100.0%

Chi-square test	**Risk intensification (Q23)**			
	Value	**AS**	**ES**	
Kruskal-Wallis	6.525	.011		
Pearson Chi-Square	6.702	.010		
Continuity Correction[a]	5.091	.024		
Likelihood Ratio	6.909	.009		
Fisher's Exact Test	---	---	**.019**	
Linear-by-Linear Association	6.525	.011		
N of Valid Cases	38			

(Q23): What methods does the bank employs to intensify the risk management and financial capacity in the future?
AS: Asymptotic significance (2-sided); ES: Exact significance (2-sided); a. Computed only for a 2x2 table.

Table 6 Output from the Kruskal-Wallis test between efficient banks (average efficiency score using a 0.89 cut-off point) and risk area identification, risk monitoring methods and efficiency improvement suggestions

	Rank		
	Banks	N	Mean Rank
Risk areas (Q14)	low efficiency	26	17.46
	high efficiency	12	23.92
	Total	38	
SBV methods (Q24)	low efficiency	26	17.42
	high efficiency	12	24.00
	Total	38	
Bank efficiency (Q44)	low efficiency	18	16.11
	high efficiency	20	22.55
	Total	38	

(Q14): What are the highly risky areas in your banking businesses? (Q24): What are the methods should be done by the SBV to prevent banking risks?; (Q44): What would you suggest to improve bank efficiency? Sources: Replies from 38 bank managers.

Table 7 Output from the contingency analysis and Chi-square test between efficient banks (average efficiency scores using a 0.89 cut-off point) and the variables (risk area identification (Q14), risk monitoring methods(Q24) and Suggestions for bank efficiency (Q44))

Contingency analysis		**Risk areas (Q14)**		**Risk monitoring (Q24)**		**Total**	**Suggestions for bank efficiency (Q44)**		**Total**
		Credit cards	Consumption loans	Inspection of SBV	Liquidity management and training		Do not know	Risk management (Basel II)-Internal control-People-IT-Service	
low efficiency	Count	24	2	22	4	26	16	2	18
	% within efficient banks	92.3%	7.7%	84.6%	15.4%	100.0%	88.9%	11.1%	100.0%
	% within the variables	77.4%	28.6%	78.6%	40.0%	68.4%	59.3%	18.2%	47.4%
	Residual	2.8	-2.8	2.8	-2.8		3.2	-3.2	
high efficiency	Count	7	5	6	6	12	11	9	20
	% within efficient banks	58.3%	41.7%	50.0%	50.0%	100.0%	55.0%	45.0%	100.0%
	% within the variables	22.6%	71.4%	21.4%	60.0%	31.6%	40.7%	81.8%	52.6%
	Residual	-2.8	2.8	-2.8	2.8		-3.2	3.2	
Total	Count	31	7	28	10	38	38	11	38
	% within efficient banks	81.6%	18.4%	73.7%	26.3%	100.0%	100.0%	28.9%	100.0%
	% within the variables	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-square test	**Risk areas (Q14)**			**Unsecured loans (Q24)**				**Suggestions for bank efficiency (Q44)**			
	Value	AS	ES	Value	AS	ES		Value	AS	ES	
Kruskal-Wallis	6.140	.013		4.940	.026			5.151	.023		
Pearson Chi-Square	6.306	.012		5.074	.024			5.290	.021		
Continuity Correction[a]	4.248	.039		3.445	.063			3.771	.052		
Likelihood Ratio	5.904	.015		4.841	.028			5.644	.018		
Fisher's Exact Test	---	---	**.022**	---	---	**.045**		---	---	**.033**	
Linear-by-Linear Association	6.140	.013		4.940	.026			5.151	.023		
N of Valid Cases	38			38				38			

(Q14): What are the highest risky areas in your banking businesses?; (Q24): What methods should be adopted by the SBV to prevent banking risks?; (Q44): What would you suggest to improve bank efficiency? (CIC): credit information centre.

AS: Asymptotic significance (2-sided); ES: Exact significance (2-sided); a. Computed only for a 2x2 table.

Table 8 Output from the contingency analysis and Chi-square test between the number of years since establishment and risk awareness

Contingency analysis		**Risk awareness (Q12)**			**Total**
		Agree	Disagree or Undecided		
Young banks	Count	9	8		17
	% within the number of years since establishment	52.9%	47.1%		100.0%
	% within Risk awareness	33.3%	72.7%		44.7%
	Residual	-3.1	3.1		
Old banks	Count	18	3		21
	% within the number of years since establishment	85.7%	14.3%		100.0%
	% within Risk awareness	66.7%	27.3%		55.3%
	Residual	3.1	-3.1		
Total	Count	27	11		38
	% within the number of years since establishment	71.1%	28.9%		100.0%
	% within Risk awareness	100.0%	100.0%		100.0%
Chi-square test		**Risk awareness (Q12)**			
		Value	AS	ES	
Kruskal-Wallis		4.777	.029		
Pearson Chi-Square		4.906	.027		
Continuity Correction[a]		3.442	.064		
Likelihood Ratio		4.995	.025		
Fisher's Exact Test		---	---	**.037**	
Linear-by-Linear Association		4.777	.029		
N of Valid Cases		38			

(Young banks): Banks have been in existence for less than 15 years in 2009; (Old banks): Banks have been in existence for more than 15 years in 2009; (Q12): The bank is aware of the strengths and weaknesses of the risk management system of other banks.
AS: Asymptotic significance (2-sided); ES: Exact significance (2-sided); a. Computed only for a 2x2 table.