The Capital Regulation Supervision Used In Vietnamese Commercial Bank Sector

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Doctoral Thesis Summary

Tomas Bata University in Zlín

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Faculty of Management and Economics

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The Capital Regulation Supervision Used In Vietnamese Commercial Bank Sector

Bankovní regulace a dohled uplatňovaný v rámci komerčních bank ve Vietnamu

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ABSTRACT

State Bank of Vietnam (SBV) set a plan of full application of Basel supervision and regulation framework (Basel III). By the end of 2018, all commercial banks should comply with the regulation. In 2010 SBV has issued regulatory framework which incorporates some principles and rules of Basel II. Before the full implementation of the regulation, Pilot study is currently being conducted. This pilot study will demand reliable analysis in order to deepen banking regulation and to make the banking system sound, transparent and prepared for further development. In this thesis, the author review the current state of knowledge related to the banking regulation, conduct an empirical analysis and synthesise findings. Most importantly, the author suggests indicators which should be monitored; the author points to the most vulnerable and problematic issues Vietnamese commercial banks face and proposes a methodological framework which should be followed to achieve successful transition to a new banking environment under the Basel III framework. Given the complexity of studied area, this thesis focus mainly on the capital regulation and supervision. On average, the empirical evidence shows that Vietnamese commercial banks pursued credit growth at a higher priority than capital regulation requirements. Retained earnings and risk-weighted assets are permutations to account for the bulk of both higher risk-weighted capital ratio and capital-to-total-assets ratio, while the shares issuance played a lesser role. The author finds that the manner of the adjustment by the Vietnamese commercial banks to the capital target led to a loss in efficiency. Also, the empirical analysis was conducted on the same sample as the original Pilot program. Using quantitative analysis, this thesis also acquires a deeper understanding of the associations between the capital regulation implementation and the operation of banking business, and the associations between the capital regulation implementation and banks' efficiency, adding a case study of Vietnamese commercial bank sector in the pilot period of the regulatory application Basel framework. These contributions could benefit to both theory and practice.

ABSTRAKT

Státní banka Vietnamu (SBV) stanovila plán implementace Basilejského regulačního rámce (Basel III). Do konce roku 2018 by všechny komerční banky měly dodržovat toto nařízení. V roce 2010 vytvořila SBV regulační rámec, který naplňuje některé zásady a pravidla Basel II. Před zavedením zmíněného regulačního rámce se v současné době provádí pilotní studie. Tato studie vyžaduje spolehlivou analýzu s cílem prohloubit bankovní regulaci a učinit bankovní systém zdravý, transparentní a připravený pro další rozvoj. V rámci této práce autor zkoumá současný stav v oblasti bankovních regulací, provádí empirickou analýzu a syntetizuje získané poznatky. Následně autor navrhuje ukazatele, které by měly být v této souvislosti sledovány. Autor dále poukazuje na nejproblematičtější oblasti týkající se vietnamských komerčních bank a navrhuje metodologický rámec, který by měl být dodržen za účelem úspěšné transformace na nové bankovní prostředí v rámci Basel III. Vzhledem k rozsáhlosti řešené problematiky se tato práce zaměřuje především na regulaci kapitálu a dohled nad ním. Empirické důkazy poukazují na fakt, že vietnamské komerční banky upřednostňovaly růst úvěrů před požadavky kapitálové regulace. Nerozdělený zisk a rizikově vážená aktiva jsou permutacemi, které se podílejí na převážné většině poměru rizikově váženého kapitálu a kapitálu k celkovým aktivům, zatímco emise akcií hrály menší roli. Autor zjistil, že změny prováděné vietnamskými komerčními bankami za účelem dosažení kapitálového cíle, vedly ke ztrátě efektivity. Provedená empirická analýza byla realizována na stejném vzorku jako původní pilotní program. Tato práce prostřednictvím kvantitativní analýzy přináší hlubší pochopení mezi vztahem implementace kapitálové regulace a fungováním bankovního podnikání, a mezi vztahem implementace kapitálové regulace a efektivnosti bank. Práce také přináší případovou studii vietnamských komerčních bank v pilotním období regulačního uplatňování Basilejského rámce. Prezentované výsledky přináší jak teoretické, tak praktické poznatky.

CONTENTS

1. INTRODUCTION

This thesis is aimed at supervision the capital regulation implementation of the Vietnamese commercial banks (here after is VcB). It concerns VcB which have adopted the Basel standard.

The State Bank of Vietnam (here after is SBV) has issued several documents which specify requirements and regulations to VcB. In which, the requirement of minimal amount of own capital was issued in 2006, topics of capital ratio, risk-weighted assets (RWA); maximum ratio of lending loans in 2010 (SBV, principle number 13, 2010). Recently, in early of 2015, the SBV selected ten commercial banks in the pilot study to test the application of some Basel regulatory standards. Then, after the evaluation of the pilot study period will be in 2018, all commercial banks in Vietnam will have to apply Basel regulation (SBV, decree number 1601, 2014).

This thesis considers the approach and the indicators to access the capital regulation implementation and supervision for the Vietnamese commercial banks. By examination of Basel pilot implementation empirical results of Vietnamese commercial banks in the period from 2008Q3 to 2015Q3. To examine the implementation, the author uses partial adjustment model and regression to assess the implementation process to target capital and the optimal of banks' ROA along with the process to achieve the target. The process is a good opportunity for an empirical analysis to study economic integration on the case of a country, where the Basel regulatory implementation is at the starting stage.

On average, the empirical evidence shows that Vietnamese commercial banks pursued credit growth at a higher priority than capital regulation requirements. Retained earnings and risk-weighted assets are permutations to account for the bulk of both higher risk-weighted capital ratio and capital-to-total-assets ratio, while the shares issuance played a lesser role. In the post-regulation period, the banks adjusted to the risk-weighted capital target lower than in the pre-regulation period. The adjustment to the capital-on-total-assets ratio was invert in compare with the risk-weighted capital. The author finds that the manner of the adjustment by the Vietnamese commercial banks to the capital target led to a loss in efficiency.

Whereby, the findings of this thesis suggest the indicators, information that should be monitored for more regulatory constraints to the capital improvement of the VCB and to control the Basel regulation implementation.

2. CURRENT STATE OF THE TOPIC

2.1. Basel Committee Regulation Framework

Basel Committee regulation framework has three pillars. Those are minimum capital requirement, supervisory review process, and market discipline; and has three objectives to regulate: The requirement of capital ratio, the risk-weight assets of bank, and the leverage ratio of bank.

2.2. Capital Ratio

There are two capital ratios and a leverage concerned in the Basel framework, the capital to risk-weighted assets and the capital to total assets (core capital).

2.2.1 Capital Regulation of Risk-Weighted-Assets (RWA)

Shimizu (2015) found that banks adjusted the composition of their assets faster than their asset size to achieve the RWA targets; banks that had less capital surplus shifted their portfolio composition toward lower-risk assets without reducing the total assets. Cipovova & Belas (2012) found advanced methods for credit risk measurement are more flexible on class change of corporate exposures in the portfolio. Internal rating is worked out a much lower capital adequacy than the standardised approach without assigned external rating.

2.2.1 Leverage Ratio

In 2014 the Basel Committee issued a formula of leverage (Basel Committee on Banking Supervision, 2014):

$$\text{Leverage ratio} = \frac{\text{Capital measure}}{\text{Exposure measure}} \quad (2.2-1)$$

The numerator of formula (2.2 – 1) is Tier 1 under the risk-based framework, while the elements in the denominator are (i) On-Balance-Sheet exposures; (ii) Off-Balance-Sheet exposures; (iii) derivative and securities transaction exposures. Thus, the review of these elements is respective.

i. On-Balance-Sheet Exposures

The risk-weights of the assets on the bank's balance sheet.

ii. Off-Balance-Sheet Exposures

Karim et al. (2013) use logic approach and Granger-cause test to investigate banking crises in 14 OECD countries, authors recognise that the fluctuation of real house price causes the change of off-balance-sheet. Duran and Lozano-Vivas (2013) suggested that if assets quality on off-balance-sheet is low, the ratio is positive relationship with liquidity and credit risk. The findings illuminate that off-balance-sheet exposure should be considered and need the market discipline.

2.3. Bank Supervision

Basel Committee issued the Basel 3 has 29 principles to a framework of minimum standards and is considered universally applicable. Those principles are broadly categorised into three groups: the first group (Principles 1 to 13) focuses on powers, responsibilities, and functions of supervisors, the second group (Principles 14 to 29) focuses on prudential regulations and requirements for banks; third is disclosure. This accounts for the increase from 25 principles (Basel 2) to 29 Principles.

The supervision should look at the regulation compliance of banks and predict the risk of the banking business. Supervision is the positive effect on the grown of banks. The interbank capitals are not set forth any benchmark or approach for the supervision.

2.4. Regulation and Bank Efficiency

Many studies supposed that the capital regulation and the efficiency of bank have a positive relationship (Angkinand, 2009a; Angkinand, 2009b; Fiordelisi et al., 2011; Barth et al., 2013; Lee et al., 2013; Manlagnit, 2015; Apătăchioae, 2015; Pessarossi & Weill, 2015). The authors suggested that the capital regulation should be considered when the capital implementation runs in difference environment of situation.

2.5. The Regulatory Background of Vietnamese Banking Industry and Research Gaps of the Regulation in Vietnam

At present, 36 of 37 banks in Vietnam are joint-stock commercial banks. Laws for Vietnamese credit institutions issued in 2010. In the official letter number 1601/2014-NHNN/TTGSNH dated on Mar 17th, 2014 by SBV, the governor expressed that the SBV intended to apply the full Basel regulation requirement into all Vietnamese commercial banks in 2018. In Vietnam, there are two management agencies to supervise the commercial banks, the Committees of National Financial Supervision and Department of legislation which is belonging to the SBV. But these authorities did not have any offcial approach to supervise the compliance of the VcB.The process is a opportunity for an empirical analysis to study and to contribute the case of a country, where the Basel regulatory implementation is at the starting stage.

In 2006, the SBV issued the requirement of minimal amount of own capital, topics of capital ratio, risk-weighted assets (RWA). In 2010, maximum ratio of lending loans issued (SBV, principle number 13, 2010).

The author use partial adjustment models (here after is PAM) to analyse the implementation of the VcB. PAM address not only the factors that effect on the capital requirement implementation, but could detect whether the recent capital regulation implementation improved the VcB's efficiency or not. According to the author's knowledge, in Vietnam, until the time of this thesis is finished, there is no others thesis is similar to this thesis in both the topic and the approach.

3. OBJECTIVE OF THE THESIS

3.1. Research Problem

To examine capital regulation adoption by Vietnamese commercial banks in the pre- and post-regulation periods and to assess the effects of contributing factors (level of bank's operations and bank's financial performance) on the regulation adoption speed and the bank efficiency.

3.2. Objective of the Thesis

To suggest an approach that applicable in regulation and supervision to Vietnamese Commercial Banks sector with the focus on the capital regulation requirements following the Basel regulatory framework.

3.3. Research Questions

To achieve the objective of this thesis, three research questions generated as below:

Research Question 1: Which factors or indicators should be monitored in the capital regulation supervision? Did the factors or indicators have different importance in the pre & post-regulation periods?

The expected result from an empirical analysis the data of VcB will uncover and list out the criteria, methods that should be supervised to compliance the regulations.

Research Question 2: How did the recapitalisation associate with the ROA?

Question number two is to detect whether the implementation improves or debases the ROA of the VcB. The empirical evidence answers this question, and to encourage the capital requirement implementation efficiently.

Research Question 3: What should regulatory and supervisory rules be applied in the Vietnamese commercial banks to achieve sound and efficient banking system?

The answers for research question number three is the core contents in the process and meet the objective of this thesis.

3.4. Hypothesis

3.4.1. The Indicators of Banks Operation Influence on the Capital Regulation Implementation of Banks

H_1: The "Bank operations" factor was a significant determinant of the capital prudential ratios when they recapitalised in the period from 2008Q2 to 2015Q4 in the sector of Vietnamese commercial banks. And diferent between the pre-regulation (from 20108/Q1 to 2010/Q4) and port-regulation (from 2011/Q1 to 2015/Q4)

3.4.2. The Capital Regulation Implementation and Banks' ROA

H_2: The level of capital prudential indicators were positively associated with the banks' ROA.

4. RESEARCH METHODOLOGY

This thesis is conducted by quantitative, namely empirical analysis.

Analyse the Capital Regulation Implementation

This process has two steps. ***Firstly***, to assess the capital regulation implementation of the VcB, the author uses the PAM to estimate the adjustment speed of the capital ratios, and recognise the changes between the pre- and post-regulation periods. The evidence from the first analysis could provide the answer for the questions: "Which factors or indicators should be monitored in the capital regulation supervision? Did the factors or indicators have differences in the pre & post-regulation periods?".

Analyse the Influence of the Capital Implementation on the Banks Efficiency

Secondly, ROA is the most used in the banking industry. To answer the question: "How did the recapitalisation associate with the ROA?", The author collects the evidence from **three records**. ***The first*** is the relevant line charts. ***The second*** is the estimations ROA by model (3b.3) and (3b.4). The evidence expected that the influence factors of the capital ratios' adjustment speed also effect on ROA. ***The third*** is the association of banks performance and ROA.

These information could be used to suggest the criteria of the factors that should be monitored and considered together with the bank efficiency.

4.1. The Models

The validity of H_1 and H_2 will be decided upon answering from the regression estimations, and the several relevant tests. The regression model formed for the hypothesis respectively as follow:

$$Y_{mit} = \beta_{m0} + \sum_{n=1}^{n} \beta_{mn} X_{nit} + \phi D_{ir} + \sum_{n=1}^{n} \beta_{mn} X_{n,i,t} \times D_{ir} + \sum_{h=1}^{h} \delta_{mh} C_{hit} + \varepsilon_{mit} \quad (4.1\text{-}1)$$

$$ROA_{it} = \alpha_0 + \sum_{k=1}^{k} \alpha_{kit} P_{kit} + U_{mit} + \varphi D_{ir} + u_{it} \quad (4.1\text{-}2)$$

Where Y_m are respectively the proxies of regulation indicators, *m(1,2);* X_n are respectively the proxies of bank's operation indicators, *n(1,7);* P_k are respectively the proxies of banks' performance indicators, *k(1,2);* C_h are the control variables, *h(1,2), (m, n, k and h* are listed in table 3.5 – 1*)*. D is dummy variable for the pre and post-regulation periods, this variable take value 1 for the post-regulation period (*r;* from 2011Q1 to 2015Q4) and 0 in the pre-regulation period (from 2008Q1 to 2010Q4). *t* is quarter *t* in the full period, *i* is bank *i.* U_m are unobserved factor estimated from (4.1-1).

The partial adjustment models:

In long-run the regulation or the bank's performance indicator is a function of the factors that effect on its

$$Y^*_{i,t+1} = \sum_{j=1}^{j} \beta_j X_{j,i,t} \quad (4.1-4)$$

Where Y are respective the regulation and the bank's performance of bank i, the X_j are the vector of factors jth those affect the adjustment speed of the dependent variable, t is the quarter point time in the period from 2008Q1 to 2015Q4.

$$Y_{i,t} - Y_{i,t-1} = \lambda\left(Y^*_{i,t} - Y_{i,t-1}\right) + \varepsilon_{i,t} \quad (4.1\text{-}5)$$

$$Y_{i,t} = \sum_{n=1}^{n} (\lambda\beta_n) X_{n,i,t} + (1-\lambda) Y_{i,t-1} + (\lambda\delta_h) C_{h,i,t} + \varepsilon_{i,t} \quad (4.1\text{-}6)$$

Accordingly, the dummy variables are added to model (4.1-1), it modified to:

$$Y_{m,i,t} = \beta_{m,0} + \sum_{n=1}^{n} (\lambda_m \beta_{m,n}) X_{n,i,t} + \sum_{n=1}^{n} (\lambda_m \beta_{m,n})_d X_{n,i,t} \times D_{i,1}$$
$$+ (1-\lambda_m) Y_{i,t-1} + (1-\lambda_m)_d Y_{i,t-1} \times D_{i,1} + \sum_{h-1}^{h} (\lambda_m \delta_h) C_{h,i,t} + \varepsilon_{m,i,t} \quad (4.1\text{-}7)$$

4.2. Variable Definition

According to the concerning and suggestion from the previous relevant studies, author suggests a list of the variables and their measurements for the empirical analysis of the VcB data. The first and the second indicator are the capital regulation these are the dependence variables for model (4.1-6), (4.1-7); the ROA is the dependence variable for model (4.1-2) and (4.1-6). Indicators from the forth to the twelfth are the independence variables for model (4.1-6) and (4.1-7). Indicators from thirteen to seventeen are the independence variable for model (2). These indicators are as follow:

Table 4.2-1 Variable summary

Variable	Description	Calculation	Related suggestion
CPR1 *(m = 1)*	Capital prudential ratio 1	$\frac{\text{Tier 1}_t}{\text{Total assets}_t}$	Basel framework Bordeleau et al. (2009); Distinguin et al. (2013); Gombola et al. (2016)
CPR2 *(m = 2)*	Capital prudential ratio 2	$\frac{\text{Tier 1}_t}{\text{Average RWA}_t}$	Gombola et al. (2016) (Lepetit et al. (2015) (*)
ROA	The return on average total assets	$\frac{\text{Net income}_t}{\text{Average total assets}_t}$	
$CPR1_{t-1}$	First lag of CPR1	$\frac{\text{Tier 1}_{t-1}}{\text{Total assets}_{t-1}}$	

$CPR2_{t-1}$	First lag of CPR2	$\frac{\text{Tier 1}_{t-1}}{\text{Average RWA}_{t-1}}$	
Share_G (n = 1)	The growth of common share number	$\frac{\text{Share number}_t - \text{Share number}_{t-1}}{\text{Share number}_{t-1}}$	(**)
RE_S (n = 2)	Retained earnings to common share number	$\frac{\text{Retained earnings}_t}{\text{Share number}_t}$	(**)
TGL_TA (n = 3)	Total non-bank lending to total assets	$\frac{\text{Total non - bank lending}_t}{\text{Total assets}_t}$	Coffinet et al. (2012); Allen et al. (2012); Jokivuolle et al. (2015); Song&Ryu., (2016)
IBL_Ch (n = 4)	The change of the interbank lending	$\frac{\text{Interbank lending}_t - \text{Interbank lending}_{t-1}}{\text{Interbank lending}_{t-1}}$	Koch(2014) (**)
Depo_Ch (n = 5)	The change of the deposits	$\frac{\text{Total deposits}_t - \text{Total deposits}_{t-1}}{\text{Total deposits}_{t-1}}$	Koch(2014); The Federal Deposit Insurance Corporation(FDIC). Shimizu (2015) Gombola et al. (2016)
RWA_Ch (n = 6)	The change of the average RWA	$\frac{\text{Average RWA}_t - \text{Average RWA}_{t-1}}{\text{Average RWA}_{t-1}}$	Cohen et al. (2014) Shimizu (2015)
Log_TA	The bank size	$\text{Log(Total assets}_t\text{)}$	Cook&Tang (2010); Shimizu (2015); Ly et al. (2017)
LP_TA *(k = 1)*	Total loss provision to total assets	$\frac{\text{Total loss provition}_t}{\text{Total assets}_t}$	Lindquist (2004); Distinguin et al. (2013a); Gombola et al. (2016) (**)
LA_TA *(k = 2)*	Loan loss allowance to total assets	$\frac{\text{Loan loss allowance}_t}{\text{Total assets}_t}$	Chang et al. (2008) Gombola et al. (2016)
IER *(k = 3)*	Interest earning ratio	$\frac{\text{Interest earning}_t - \text{Interest expenditure}_t}{\text{Total liabilities \& Share holder equity}_t}$	(*)
U_{31}	The residual from the CPR1 estimated	Residual is calculated when CPR1 is estimated by model (3b)	(**)
U_{32}	The residual from the CPR2 estimated	Residual is calculated when CPR2 is estimated by model (3b)	(**)

(*): Indicator recently used in the VcB; (**): Suggest by author
Source: Author

4.3. Overview of the Processing

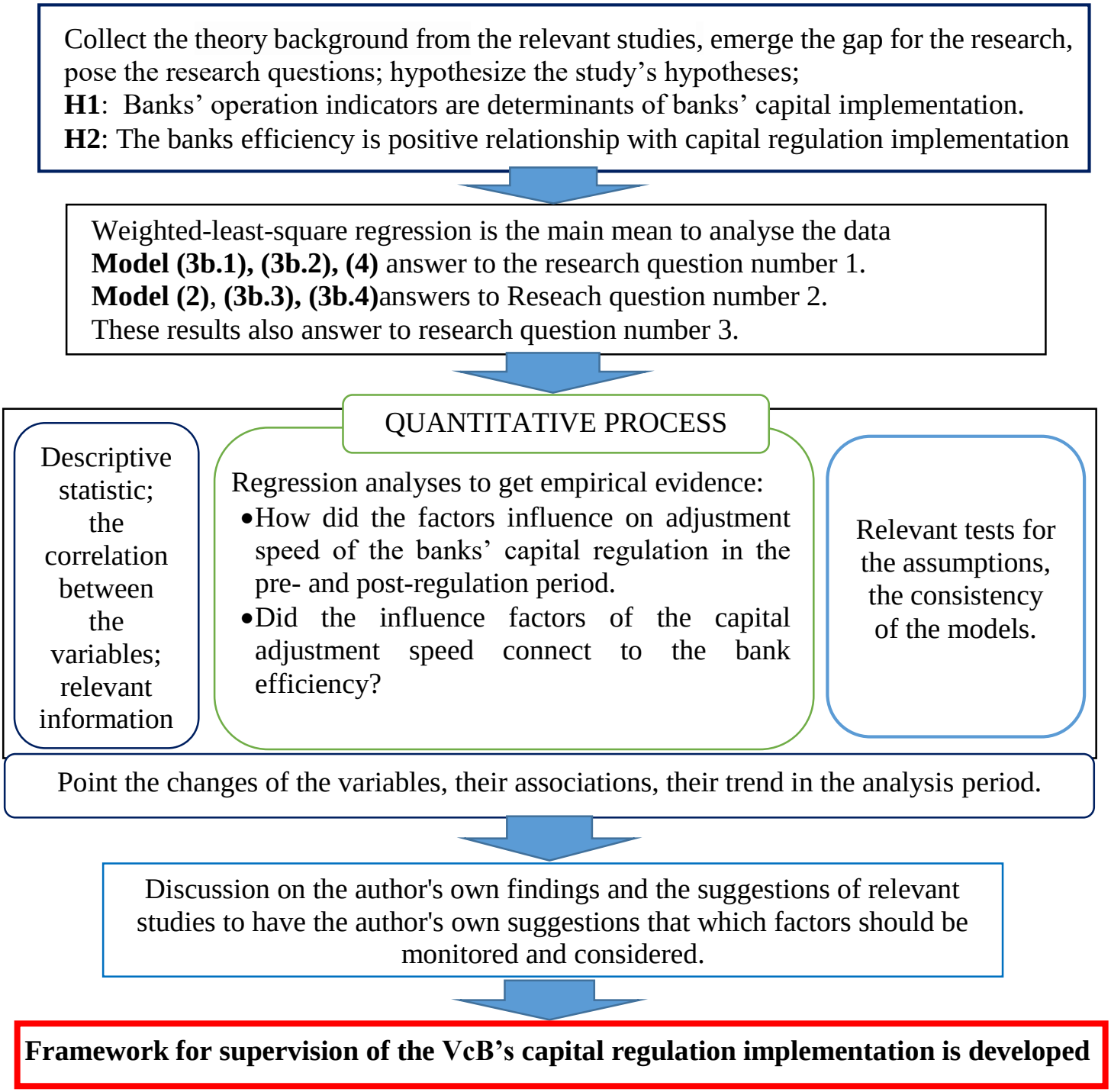
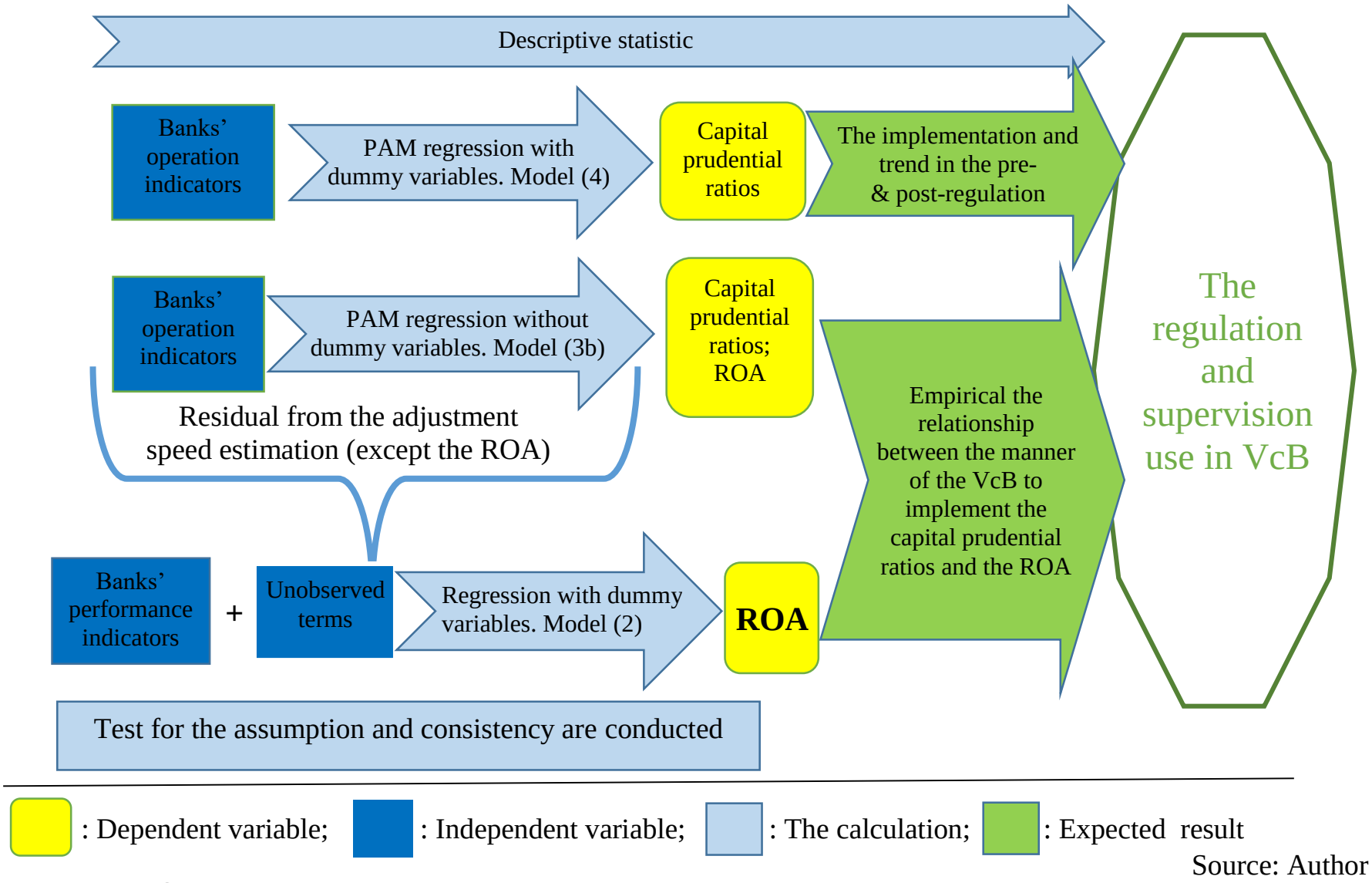


Figure 4.3-1 Conceptual framework Source: Author

4.4. Data

Panel data from Data stream of the Thomson Reuters selected from the quarterly released financial statements of VcB which are available in the period from 2008Q3 to 2015Q4, includes 225 observations from these banks. Besides the variables listed in Table 4.4 – 1, Additional, the author calculated and shows the charts of the variables in the averages. These charts and the relevant information are the addition information



Source: Author

Figure 4.4-1 Quantitative process

5. RESULTS FROM QUANTITATIVE ANALYSES

5.1. Summary of Description Statistic

In this section, the author shows the information of descriptive statistic. For a convenient view, the author interprets the information of the dependent variables first, then the independent variables.

Table 5.1 – 1 provides descriptive statistics of all indicators that introduced in section 4.2. In which, the first and the second are dependent variables for model (4.1-6) and model (4.1-7), the fourth to the tenth indicators are the independent variables of these models; ROA is dependent variable of model (4.1-2) and (4.1-6), the other remainders are the explanatory variables for ROA in model (4.1-2).

Table 5.1-1 Data summary

Name	vars	N	Mean	Sd	median	Min	Max	se
CPR1	1	225	0.0727	0.0234	0.0693	0.0397	0.1790	0.0016
CPR2	2	225	0.0742	0.0222	0.0726	0.0387	0.1662	0.0015
ROA	10	225	0.0025	0.0018	0.0025	-0.0038	0.0060	0.0001
Share_G	3	225	0.0496	0.1406	0.0000	-0.0653	0.8354	0.0098
RE_S	4	225	0.1575	0.0922	0.1482	-0.0620	0.3663	0.0064
TGL_TA	5	225	0.4549	0.1043	0.4639	0.2359	0.6336	0.0072
IBL_Ch	6	225	0.0646	0.2800	0.0440	-0.4524	1.2850	0.0195
Depo_Ch	7	225	0.0566	0.1001	0.0483	-0.1517	0.3656	0.0070
RWA_Ch	8	225	0.0543	0.1058	0.0406	-0.1821	0.3983	0.0074
log_TA	9	225	14.3441	0.3639	14.3665	13.4552	14.9572	0.0253
LP_TA	11	225	0.1216	0.1039	0.0960	0.0021	0.4987	0.0072
LA_TA	12	225	0.0077	0.0037	0.0076	0.0022	0.0163	0.0003
IER	13	225	0.7260	0.2191	0.7242	0.2922	1.2952	0.0152

Source: Calculated by the author

Figure 5.1 – 1 provides the line charts of the variables which are used in the regression analyses by models (4.1-6) and (4.1-7). The three on top of this figure are information of CPR1, CPR2 and ROA respectively; the second and the third rows are information of the independent variables of the models (4.1-6) and (4.1-7).

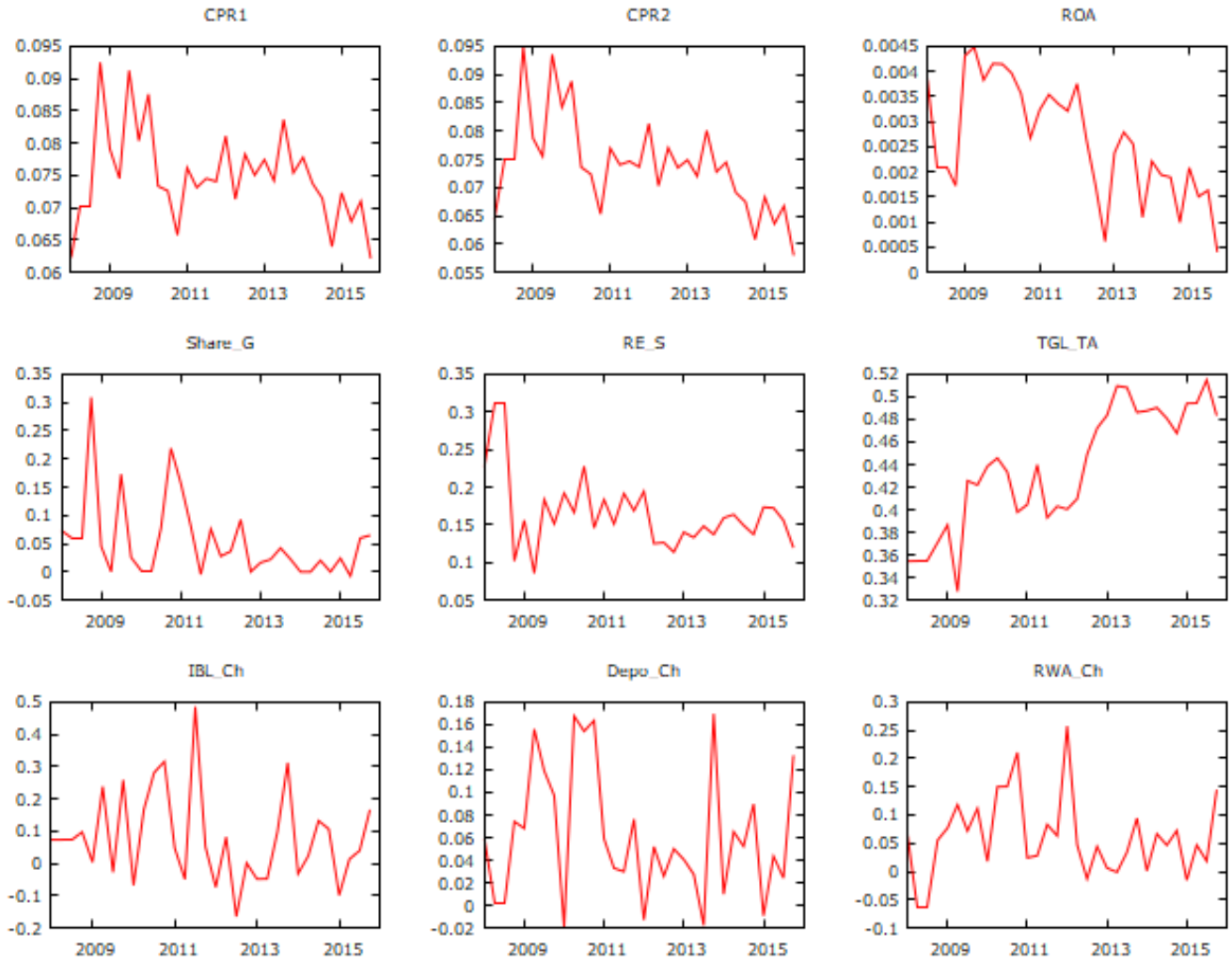


Figure 5.1-1. Line charts the variables of model (4.1-6), (4.1-7), in averages

Source: Author

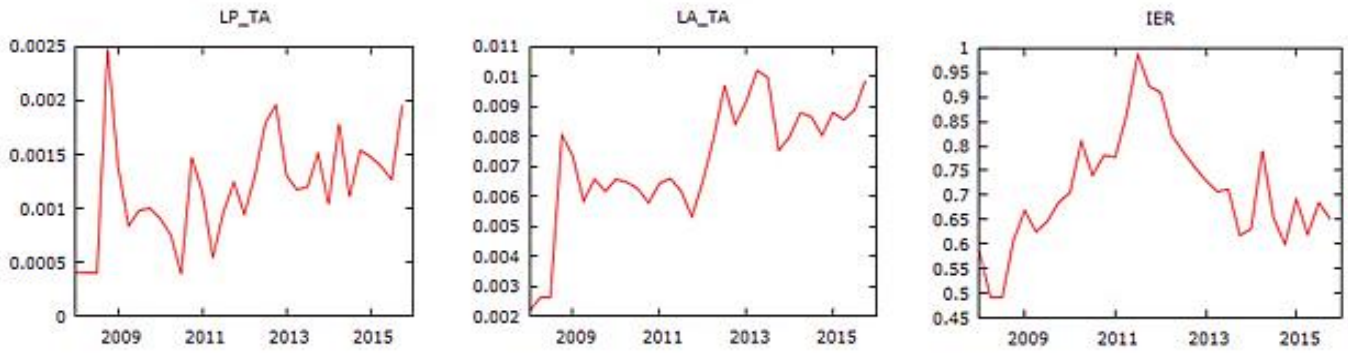


Figure 5.1-2 Line charts the variables of model (4.1-2), in averages

Source: Author

5.1.1. The Capital Prudential Ratios – CPR1 & CPR2

In the pre-regulation period, the fluctuation amplitude of both CPR1 and CPR2 was higher than in the post-regulation period. However, in the pre-regulation period, the

average of the capital prudential ratios was higher than the average of the capital prudential ratios in the post regulation period. It means that in the post-regulation the capital ratios that calculated on both book value and risk-weighted assets became lower. The information implies that in the post regulation period, the average of RWA increased more than the increase of the total assets. This is a considerable signal for the regulator and supervisor about the capital regulation implementation especially is the risk-weighted assets management.

5.1.2. The ROA

In average, the ROA in the pre-regulation period varied in a higher percentage level than that in the post-regulation. The trend of the average ROA is similar to the trends of the capital prudential ratios and might be in the line of the studies support a positive association between capital regulation and bank ROA.

5.1.3. The Number of Common Shares – Share_G

The relevant information indicates that the VcB might less use the issuance share as a main source to increase their capital.

5.1.4. The Retained Earnings to Number of Shares – RE_S

The information implies that the VcB might intend to keep the RE_S stable in throughout the periods.

5.1.5. The Non-bank Lending to Total Assets Ratio – TGL_TA

In the throughout periods, the TGL_TA ratio was creased continuously.

5.1.6. The Change of the Interbank Lending – IBL_Ch

The trend of the interbank lending to total assets implys that from the second quarter of 2012 to the second quarter of 2013 the VcB the decrease of the interbank lending to cover the increase of the non-bank lending.

5.1.7. The Change of the Deposits – Depo_Ch

The information of the deposits provides that almost all of throughout the periods, the VcB increased this main funding source. The deposits in the total liabilities became higher, especially in the post-regulation period.

5.1.8. The Change of the RWA – RWA_Ch

In overall, the RWA in the pre-regulation and early of the post-regulation were higher than from the second quarter of 2012 till the end the post-regulation.

5.1.9. The Ratio of Loss Provision to Total Assets

In the post-regulation period, the LP_TA was higher than its level in the pre-regulation period. The direction of the LP_TA was similar to the directions of the RWA to total assets.

5.1.10. The ratio of loss allowances to total assets

The information of LA_TA could hint that the loss allowance might positive increase together with the increase of non-bank lending and the RWA, meaning that recently the business of the VcB might became riskier.

5.1.11. The Ratio of Interest Income - IER

This ratio continuously increased from early of 2008 till first half of 2012 when it got the highest value, then IER continuously dropped in five quarters. IER stopped its drop at almost 0.6 in quarter third of 2013, then varied between 0.6 and 0.8 till the end of the post-regulation period.

Summary the Descriptive Statistic:

In the post-regulation CPR1, CPR2 and ROA had a simultaneous decline.

The Share_G had the fluctuations upper zero, but in the post-regulation period, this indicator showed a less increase of the share number than in the pre-regulation period.

The TGL_TA increase continuously throughout the periods, especial in one year after the launch of the capital regulation requirement. Meanwhile, the interbank lending was almost invert. The trend direction of the TGL_TA looked similar to the one of Vietnam's GPD.

The Deposits were ascending increase, but the gap between the deposits and the total assets descended.

In the post-regulation scale of the RWA to total assets increased ascendingly. Connect with the others relevant indicators, while the RWA increase, the scale of the non-bank lending, the scale of the loss provision to total assets, the scale of the loss allowance to total assets increase as well. Meanwhile, the capital prudential ratios, the ROA, the interbank lending and the IER decrease. Only the RE_S looked most stable at all.

The information hints that the VcB did not concentrate on the capital regulation implementation, while the increase on the total assets together with the increase of the RWA recently might lead to the business of the VcB became riskier and loss of efficiency.

5.2. Result From Regression Analyses

The capital prudential ratios are positive correlate with the ROA but negative correlate with the LP_TA and LA_TA, indicate that the banks could have efficiency when their capital is improved, and the loss lead to the worse of the capital regulation implementation as well as, the worse of the ROA. The information of this table is also consistency with the regression results of models (3b), (4a) and (4b).

Table 5.2-1 Correlation matrix

	CPR1	CPR2	CPR11	CPR21	Share_G	RE_S	TGL_TA	Ch_IBL	Depo_Gw	RWA_Gw	log_TA	ROA	LP_TA	LA_TA	IER
CPR1	1	0.985	0.906	0.890	0.014	0.025	0.097	-0.133	-0.133	-0.141	-0.392	0.158	-0.190	-0.114	0.176
CPR2		1	0.891	0.896	0.009	0.033	0.170	-0.156	-0.147	-0.133	-0.367	0.112	-0.099	-0.051	0.223
CPR11			1	0.987	-0.051	-0.091	0.042	0.076	0.103	0.153	-0.411	0.067	-0.143	-0.163	0.109
CPR21				1	-0.071	-0.083	0.101	0.093	0.104	0.146	-0.382	0.036	-0.093	-0.112	0.145
Share_G					1	-0.055	-0.086	0.043	0.170	0.216	-0.014	-0.015	0.139	-0.012	-0.091
RE_S						1	0.098	0.008	-0.098	-0.072	0.448	0.446	0.048	0.400	0.339
TGL_TA							1	-0.210	-0.090	-0.162	0.406	-0.022	0.326	0.477	0.277
Ch_IBL								1	0.397	0.637	-0.002	-0.003	-0.041	-0.131	-0.145
Depo_Gw									1	0.728	-0.048	0.017	0.110	-0.127	-0.122
RWA_Gw										1	-0.069	-0.052	0.222	-0.118	-0.141
log_TA											1	0.163	0.334	0.535	0.181
ROA												1	-0.279	-0.049	0.407
LP_TA													1	0.406	0.197
LA_TA														1	0.241
IER															1

Source: Calculated by the author

The PAM for CPR1 and CPR2 are without dummy variable, model (4.1-6):

$$CPR1_{i,t} = \beta_{1,0} + (\lambda\beta_{11})Share\_G_{i,t} + (\lambda_1\beta_{12})RE\_S_{i,t} + (\lambda_1\beta_{13})TGL\_TA_{i,t} + (\lambda_1\beta_{14})IBL\_Ch_{i,t} + (\lambda_1\beta_{15})Depo\_Ch_{i,t} + (\lambda_1\beta_{16})RWA\_Ch_{i,t} + (1-\lambda_1)CPR1_{i,t-1} + (\lambda_1\beta_{17})log\_TA_{i,t} + U_{31,i,t} \quad (5.2-1)$$

$$CPR2_{i,t} = \beta_{2,0} + (\lambda_2\beta_{21})Share\_G_{i,t} + (\lambda_2\beta_{22})RE\_S_{i,t} + (\lambda_2\beta_{23})TGL\_TA_{i,t} + (\lambda_2\beta_{24})IBL\_Ch_{i,t} + (\lambda_2\beta_{25})Depo\_Ch_{i,t} + (\lambda_2\beta_{26})RWA\_Ch_{i,t} + (1-\lambda_2)CPR2_{i,t-1} + (\lambda_2\beta_{27})log\_TA_{i,t} + U_{32,i,t} \quad (5.2-2)$$

The U_{31}, U_{32} are saved to be the regressors in model (5.2-7) and (5.2-7) below.

The PAM for CPR1 and CPR2 with dummy variables, model (4.1-7):

$$CPR1_{i,t} = \beta_{1,0} + (\lambda_1\beta_{11})Share\_G_{i,t} + (\lambda_1\beta_{11})Share\_G_{i,t}\times D_{i,1} + (\lambda_1\beta_{12})RE\_S_{i,t} + (\lambda_1\beta_{12})RE\_S_{i,t}\times D_{i,1} + (\lambda_1\beta_{13})TGL\_TA_{i,t} + (\lambda_1\beta_{13})TGL\_TA_{i,t}\times D_{i,1} + (\lambda_1\beta_{14})IBL\_Ch_{i,t} + (\lambda_1\beta_{14})IBL\_Ch_{i,t}\times D_{i,1} + (\lambda_1\beta_{15})Depo\_Ch_{i,t} + (\lambda_1\beta_{15})Depo\_Ch_{i,t}\times D_{i,1} + (\lambda_1\beta_{16})RWA\_Ch_{i,t} + (\lambda_1\beta_{16})RWA\_Ch_{i,t}\times D_{i,1} + (1-\lambda_1)CPR1_{i,t-1} + (1-\lambda_1)_d CPR1_{i,t-1} + (\lambda_1\beta_{17})log\_TA_{i,t} + \varepsilon_{1,i,t} \quad (5.2-3)$$

$$CPR2_{i,t} = \beta_{2,0} + (\lambda_2\beta_{21})Share\_G_{i,t} + (\lambda_2\beta_{21})Share\_G_{i,t}\times D_{i,1} + (\lambda_2\beta_{22})RE\_S_{i,t} + (\lambda_2\beta_{22})RE\_S_{i,t}\times D_{i,1} + (\lambda_2\beta_{23})TGL\_TA_{i,t} + (\lambda_2\beta_{23})TGL\_TA_{i,t}\times D_{i,1} + (\lambda_2\beta_{24})IBL\_Ch_{i,t} + (\lambda_2\beta_{24})IBL\_Ch_{i,t}\times D_{i,1} + (\lambda_2\beta_{25})Depo\_Ch_{i,t} + (\lambda_2\beta_{25})Depo\_Ch_{i,t}\times D_{i,1} + (\lambda_2\beta_{26})RWA\_Ch_{i,t} + (\lambda_2\beta_{26})RWA\_Ch_{i,t}\times D_{i,1} + (1-\lambda_2)CPR2_{i,t-1} + (1-\lambda_2)_d CPR2_{i,t-1} + (\lambda_1\beta_{27})log\_TA_{i,t} + \varepsilon_{2,i,t} \quad (5.2-4)$$

The model to analyse the effect of the capital implementation on the ROA also is model (4.1-6):

$$ROA_{i,t} = \beta_{3,0} + \beta_{31}Share\_G_{i,t} + \beta_{32}RE\_S_{i,t} + \beta_{33}TGL\_TA_{i,t} + \beta_{34}IBL\_Ch_{i,t} + \beta_{35}Depo\_Ch_{i,t} + \beta_{36}RWA\_Ch_{i,t} + \mathbf{\beta_{37}CPR1_{i,t-1}} + \beta_{38}log\_TA_{i,t} + U_{33,i,t} \quad (5.2-5)$$

$$ROA_{i,t} = \beta_{4,0} + \beta_{41}Share\_G_{i,t} + \beta_{42}RE\_S_{i,t} + \beta_{43}TGL\_TA_{i,t} + \beta_{44}IBL\_Ch_{i,t} + \beta_{45}Depo\_Ch_{i,t} + \beta_{46}RWA\_Ch_{i,t} + \mathbf{\beta_{47}CPR2_{i,t-1}} + \beta_{48}log\_TA_{i,t} + U_{34,i,t} \quad (5.2-6)$$

Diagnostic tests for panel was conducted. The tests show that fixed effect is consistency for the models fitting. There is no multicollinearity problem to the models.

5.2.1. The Adjustment Speed Estimates

Table 5.2 – 2 reports the estimations of models (5.2-1) and (5.2-2), these estimations were without the dummy variables. Table 5.2 – 3 provides results of estimated models (5.2-3) and (5.2-4), with the dummy variables for the pre and post-regulation periods.

i. The CPR1

In a quarter VcB adjusts **19.9% per quarter**(1 – 0.801) the gap of their one percent change of the CPR1. In another word, according to the estimation, the VcB need mostly one year and a half to reach one percent change of their CPR1 target (100%/**19.9%/quarter**=5.03 quarters). In the pre-regulation period the CPR1 adjusted at speed **16.6%/quarter**, then the adjustment speed had a small increase in the post-regulation, speed was **18.14%/quarter**.

ii. The CPR2

The adjustment speed estimate of the CPR2 was **15.84% per quarter** (1 – 0.8416). In the pre-regulation period, the adjustment speed of the CPR2 was **18.99%/quarter**. In the post-regulation period was 14.94%/quarter.

In overall, the CPR1 adjusted faster than the CPR2. In the post-regulation period, the CPR1 got a faster adjustment speed than that in the pre-regulation. Meanwhile, the CPR2 was contrary. The situation could be caused by both the total assets and the RWA increased all the times with the higher level than the increase of the Tier 1. And in the post-regulation period, the adjustment speed of the CPR2 decreased because of the fluctuation amplitude of the RWA became smaller.

5.2.2. The Effect of Influence Factors on the Capital Regulation Implementation

The columns (2), (4), (6) and (8) in Table 5.2 – 3 show the calculations of the β and λ, in which the variables added "Reg" together with its name show the β and λ for the post-regulation.

i. The Growth of Common Share Number – Share_G

The Share_G estimates show the statistically significant positive effect on the capital ratios. In the pre-regulation period, the coefficient of the Share_G reports that this indicator was the second magnitude factor influenced on the CPR1. Then, even though its influence had a decrease but the Share_G still is the second magnitude factor that influenced on the CPR1. The issuance shares was not the most important channel to built the capital prudential ratios.

ii. The Retained Earnings Ratio – RE_S

The coefficients of the RE_S show that this indicator is the highest influence factor on the CPR1, while is the second influence magnitude factor on the CPR2. All the estimations of the RE_S report the statistically significant positive associations.

iii. The Non-bank Lending Ratio – TGL_TA

The TGL_TA estimates are statistically significant negative association with the CPR2 in the pre-regulation period then positive in the post-regulation period. While the predictions of TGL_TA for the CPR1 show the statistically significant positive in whole the sub periods. The difference association of the TGL_TA and the CPR1 in between the sub-periods imply that other approaches to the assets rating might carry others analysis result.

Table 5.2-2 Regression of partial adjustment models – equation (5.2-1) and (5.2-2)

Dependent variable	CPR1						CPR2					
WLS estimation	Within			Pooling			Within			Pooling		
	(1)		(2)	(3)		(4)	(5)		(6)	(7)		(8)
Share_G	0.0297	***	0.1492	0.0244	***	0.1654	0.0225	***	0.1421	0.0291	***	0.1584
	(0.0011)			(0.0006)			(0.0005)			(0.0009)		
RE_S	0.0460	***	0.2313	0.0362	***	0.2458	0.0524	***	0.3307	0.0344	***	0.1873
	(0.0040)			(0.0005)			(0.0006)			(0.0016)		
TGL_TA	0.0133	***	0.0669	0.0139	***	0.0945	0.0116	***	0.0730	0.0177	***	0.0962
	(0.0022)			(0.0006)			(0.0009)			(0.0012)		
IBL_Ch	-0.0074	***	-0.0374	-0.0013	***	-0.0089	-0.0010	***	-0.0062	-0.0078	***	-0.0422
	(0.0006)			(0.0002)			(0.0002)			(0.0008)		
Depo_Ch	-0.0219	***	-0.1102	-0.0131	***	-0.0892	-0.0121	***	-0.0763	-0.0265	***	-0.1440
	(0.0021)			(0.0006)			(0.0004)			(0.0018)		
RWA_Ch	-0.0312	***	-0.1568	-0.0551	***	-0.3742	-0.0565	***	-0.3569	-0.0258	***	-0.1407
	(0.0031)			(0.0006)			(0.0006)			(0.0026)		
$CPR1_{t-1}$	0.8010	***	**[0.1990]**	0.8527	***	**[0.1473]**	--		--	--		--
	(0.0108)			(0.0016)								
$CPR2_{t-1}$	--		--	--		--	0.8416	***	**[0.1584]**	0.8163	***	**[0.1837]**
							(0.0023)			(0.0044)		
log_TA	-0.0061	***	-0.0305	-0.0082	***	-0.0555	-0.0039	***	-0.0243	-0.0087	***	-0.0474
	(0.0015)			(0.0002)			(0.0003)			(0.0003)		
Multiple R-square	0.91			0.93			0.94			0.90		

Number in square parenthesis [ ] are the values of λ, numbers in parenthesis ( ) are the standard errors. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Source: Calculated by the author

Table 5.2 - 3 Regression models (5.2-3), (5.2-4)

Dependent variable	CPR1				CPR2			
WLS estimators	within		pooling		within		pooling	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share_G	0.0363 ***	0.2187	0.0360 ***	0.2402	0.0368 ***	0.1938	0.0360 ***	0.2049
	(0.0003)		(0.0006)		(0.0002)		(0.0006)	
RE_S	0.0626 ***	0.3771	0.0524 ***	0.3467	0.0669 ***	0.3523	0.0522 ***	0.2968
	(0.0009)		(0.0008)		(0.0008)		(0.0037)	
TGL_TA	0.0083 ***	0.0437	0.0156 ***	0.0821	-0.0045 ***	-0.0237	0.0155 ***	0.0814
	(0.0009)		(0.0004)		(0.0013)		(0.0014)	
IBL_Ch	-0.0056 ***	-0.0337	-0.0064 ***	-0.0427	-0.0008 **	-0.0042	0.0026 ***	0.0145
	(0.0003)		(0.0031)		(0.0003)		(0.0004)	
Depo_Ch	-0.0250 ***	-0.1506	-0.0271 ***	-0.1808	-0.0100 ***	-0.0527	-0.0036 **	-0.0205
	(0.0010)		(0.0010)		(0.0009)		(0.0012)	
RWA_Ch	-0.0289 ***	-0.1741	-0.026 ***	-0.1734	-0.0671 ***	-0.3533	-0.0599 ***	-0.3409
	(0.0017)		(0.0001)		(0.0014)		(0.0016)	
$CPR1_{t-1}$	0.8340 ***	[**0.1660**]	0.8501 ***	[**0.1499**]	0.8101 ***	[**0.1899**]	0.8243 ***	[**0.1757**]
	(0.0012)		(0.0009)		(0.0018)		(0.0066)	
log_TA	-0.0090 ***	-0.0542	-0.0085 ***	-0.0567	-0.0084 ***	-0.0442	-0.0090 ***	-0.0512
	(0.0006)		(0.0005)		(0.0002)		(0.0006)	
Dummy	0.0017 ***	0.0102	0.0002 ***	0.0013	0.0006 **	0.0032	0.0011 ***	0.0063
	(0.0002)		(0)		(0.0002)		(0.0002)	
Share_G:Reg	-0.0071 ***	0.1610	-0.0092 ***	0.1566	-0.0093 ***	0.1841	-0.0092 ***	0.1793
	(0.0052)		(0.0004)		(0.0003)		(0.0004)	
RE_S:Reg	-0.0196 ***	0.2370	-0.0203 *	0.1859	-0.0178 ***	0.3286	-0.0255 ***	0.1783
	(0.0005)		(0.0088)		(0.0011)		(0.0023)	
TGL_TA:Reg	0.0052 ***	0.0744	0.0017 .	0.1011	0.0117 ***	0.0482	-0.0012	0.0953
	(0.0011)		(0.0009)		(0.0015)		0.0018	
IBL_Ch:Reg	-0.0010 ***	-0.0364	-0.0011 **	-0.0441	-0.0011 ***	-0.0127	-0.0042 ***	-0.0110
	(0.0003)		(0.0005)		0.0004		(0.0005)	
Depo_Ch:Reg	0.0043 ***	-0.1141	0.0048 ***	-0.1303	0.0031 **	-0.0462	-0.0041 ***	-0.0515
	(0.0012)		(0.0015)		(0.0010)		(0.0009)	
RWA_Ch:Reg	0.0026	-0.1450	-0.0020 **	-0.1403	0.0076 ***	-0.3983	-0.0021 .	-0.4147
	(0.0018)		(0.0001)		(0.0011)		(0.0012)	
$CPR1_{t-1}$:Reg	-0.0154 ***	[**0.1814**]	-0.0212 ***	[**0.1711**]	0.0405 ***	[**0.1494**]	0.0262 ***	[**0.1495**]
	(0.0033)		(0.0020)		(0.0067)		(0.0077)	
Multiple R^2	0.92		0.89		0.92		0.92	
Hausman Test for regressors within versus random chisq = 125.57, df=9, p-value < 2.2e-16					Hausman Test for regressors within versus random, chisq = 80.355, df=9, p-value = 1.374e-13			

Number in square parenthesis [ ] are the values of □, numbers in parenthesis ( ) are the standard errors. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 Source: calculated by the author

iv. The Change of the Interbank Lending – IBL_Ch

The coefficients of the IBL_Ch report the least influence of this indicator on both the capital ratios. This result is the novel findings, adds to the empirical evidence of the capital regulation implementation. In the previous studies, the researchers did not analyse association between the capital ratio and the interbank lending separately.

v. The Change of the Deposits – Depo_Ch

The coefficients of the Depo_Ch are the negative association with both the capital ratios in throughout the periods. The coefficients of the Depo_Ch had a reduce in the post-regulation period imply that the regulations made the banks be supplied a fewer deposit than before.

vi. The Change of the RWA – RWA_Ch

In the columns (2) of the Table 5.2 – 3 and Table 5.2- 4, the estimates show that the RWA_Ch is the highest influence on the CPR2, while the influence of RWA_Ch on CPR1 is the third magnitude. The matter might indicate that in the post-regulation period, the VcB increased their average RWA while the size of the total assets also increased but the fluctuation of the average RWA different from the fluctuation of the total assets on the capital ratios.

5.2.3. The Capital Implementation and the Banks' ROA

i. The Second Record

The second record is the estimation result from the equations (5.2-5) and (5.2-6). In Table 5.2 – 5, columns (1), (2) show that almost all of the factors that influence on the capital implementation are also effect on the ROA.

ii. The Third Record

In this section, the author reports the estimation result of the capital regulation requirement implementation influence on the ROA, the regression model (4.2-2) was modified and used for the analyses as models below:

$$\mathrm{ROA}_{i,t} = \alpha_{0,31} + \alpha_{1,31}\mathrm{LP\_TA}_{i,t} + \alpha_{2,31}\mathrm{LA\_TA}_{i,t} + \alpha_{3,31}\mathrm{IER}_{i,t} + \boldsymbol{\alpha_{31}U31_{i,t}} + \mathrm{Dummy}_{i,1} + u_{31,i,t} \quad (5.2\text{-}7)$$

$$\mathrm{ROA}_{i,t} = \alpha_{0,32} + \alpha_{1,32}\mathrm{LP\_TA}_{i,t} + \alpha_{2,32}\mathrm{LA\_TA}_{i,t} + \alpha_{3,32}\mathrm{IER}_{i,t} + \boldsymbol{\alpha_{32}U32_{i,t}} + \mathrm{Dummy}_{i,1} + u_{32,i,t} \quad (5.2\text{-}8)$$

Table 5.2 – 5 shows the correlation of the variables in models (5.2-7) and (5.2-8).

Table 5.2 – 6 reports the regression estimation. The relationship between the ROA and independent variables in the models (5.2-7) and (5.2-8), especial with the residuals provides an evidence that almost all of the influences which connect to the adjustment of the capital ratios also effect on the ROA. The Hausman test indicates that fixed effects is consistency.

Table 1.1-4 Regression equation (5.2-5) and (5.2-6)

Dependent variable	ROA			
	Model (5.2-5)		Model (5.2-6)	
WLS estimators	Within	Pooling	Within	Pooling
	(1)	(2)	(3)	(4)
Share_G	-0.00001*	0.00008***	0.00001	0.00014***
	(0)	(0.00002)	(0.00001)	(0.00001)
RE_S	0.00114***	0.00091***	0.00112***	0.00089***
	(0.00002)	(0.00002)	(0)	(0.00003)
TGL_TA	-0.00066***	-0.00021***	-0.00066***	-0.00024***
	(0.00001)	(0.00003)	(0)	(0.00003)
IBL_Ch	0.00004***	0.00007***	0.00003***	0.00077***
	(0)	(0)	(0)	(0)
Depo_G	0.00023***	0.00028***	0.00021***	0.00028***
	(0.00002)	(0.00004)	(0.00001)	(0.00003)
RWA_Ch	-0.00049***	-0.00051***	-0.00049***	-0.00057***
	(0.00003)	(0.00003)	(0.00002)	(0.00003)
$CPR1_{t-1}$	0.00010	0.00010	--	--
	(0.00008)	(0.00018)		
$CPR2_{t-1}$	--	--	0.00056***	0.00061**
			(0.00004)	(0.00021)
log_TA	-0.00016***	0.00004*	-0.00014***	0.00008***
	(0.00001)	(0.00002)	(0.00001)	(0.00002)
Multiple R-square	0.51	0.53	0.51	0.30

Numbers in parenthesis ( ) are the standard errors. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Source: calculated by the author

Table 1.1-5 Correlation matrix of the variables in models (5.2-7) and (5.2-8)

	ROA	LP_TA	LA_TA	IER	U_{31}	U_{32}
ROA	1	-0.298	-0.069	0.476	0.141	0.164
LP_TA		1	0.439	0.176	0.112	0.052
LA_TA			1	0.223	-0.016	0.002
IER				1	0.005	-0.059
U_{31}					1	0.898
U_{32}						1

Source: Calculated by the author

Table 1.1-6 Regression the models (5.2-7) and (5.2-8)

Dependent variable:	ROA			
	Model (5.2-7)		Model (5.2-8)	
WLS	Within	Pooling	Within	Pooling
	(1)	(2)	(3)	(4)
LP_TA	-0.00093 ***	-0.00070 ***	-0.00088 ***	-0.00065 ***
	(0.00001)	(0.00001)	(0.00002)	(0.00002)
LA_TA	-0.01319 ***	0.00069	-0.01279 ***	-0.00014
	(0.00078)	(0.00042)	(0.00048)	(0.00040)
IER	0.00034 ***	0.00050 ***	0.00037 ***	0.00047 ***
	(0.00001)	(0)	(0)	(0)
U31	0.00565 ***	0.00525 ***		
	(0.00029)	(0.00030)		
U32	***		0.00635 ***	0.00683 ***
			(0.00020)	(0.00021)
Dummy	-0.00005 ***	-0.00013 ***	-0.00006 ***	-0.00011 ***
	(0)	(0)	(0)	(0)
Multiple R-square	67.77	42.75	68.16	46
Hausman Test chisq = 1104, df = 5, p-value < 2.2e-16			Hausman Test chisq = 1772.4, df = 5, p-value < 2.2e-16	

Numbers in parenthesis ( ) are the standard errors. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Source: Calculated by the author

iii. The Expected Loss – LP_TA and LA_TA

Both the LP_TA and LA_TA are statistically significant negative influence on the ROA. The LA_TA with a higher coefficient than the LP_TA indicates the damage that stands by the ROA clearly and practically.

iv. Interest Income Rate – IER

IER shows a statistically significant positive effect on ROA, meaning that in the whole period, the coefficients of the IER is smallest in the independent variables of the model (5.2-7) and (5.2-8). The very low coefficient of IER reports that IER had a very little effect on ROA.

v. The Unobserved Terms From the Regulation Implementation Estimates – U_{31}&U_{32}

Both of the residuals from regression models (5.2-1) and (5.2-2) has a statistically significant influence on the ROA. These empirical evidences confirmed the expectation of the author, in the same line with a finding of Hoque et al. (2015) that a higher capital regulation control leads to a higher bank's performance, capital requirements can improve cost efficiency.

5.3. Discussion the Empirical Analysis

5.3.1. The Adjustment Speed Toward the Capital Regulation And the Contribution Factors

In this section, the author groups the independent variables to three groups to represent three channel contributed to the adjustment of the capital ratios, those are the RWA channel, the equity channel with the Share_G and the RE_S, and the operating channel with the lending and deposits.

i. The Adjustment Speed and the Contribution of the RWA

In overall, in one quarter, the adjustment speed of CPR1 was 19.9 while the one of CPR2 was 15.84. It means that the adjustment of capital prudential ratio which calculated on RWA adjusted slower than the capital that calculated on the assets actual, it takes almost a year for the adjustment to get the capital prudential ratio (CPR1 and CPR2) target. Similar to the highest adjustment speed in comparison with the analyses of De Jonghe & Öztekin (2015). This speed should be a criterion for the regulation and supervision the compliance of the VcB.

The relationship of the capital ratios and the RWA also indicates a similar empirical evidence to a conclusion of Song & Ryu (2016). That is, when the adjustment speeds of the CPR1 and CPR2 became significant different each other, the gap between the capital ratios became wider and encouraged the RWA to increase. Thus, to control for a good capital regulation implementation, the regulators should consider the gap between the to capital prudential ratios.

In Vietnam, on the one hand, the SBV not only set the credit risk criteria but also set the asset risk criteria. On the other hand, the SBV allows the banks adopt the IRB approach. However, the criteria list of risk weights was issued by the SBV did not classify the credit assessment for the counterparty, in stead, there were the groups of the counterparties. Therefore, the regulation and supervision should carry a reasonable approach which would be updateable to complement the risk weighs list of the SBV.

ii. The Contribution of the Share_G and the RE_S

Almost all the VcB did not use equity issuances to recapitalise as the priority solution. Instead, the VcB kept a stable retained earnings as the most source to build their CPR1. The retained earnings is a good source for own capital developing. However, the weak of this source is its limit of the volume for the improvement of the capital aggregation; it could not contribute to a requirement for a fast capital improvement. Thus, the harmonisation control the Share_G and RE_S should combine the pros and aims of these indicators in the context of the economic environment.

iii. The Contribution of the Lending and the Deposits

The TGL_TA and the Depo_Ch were almost the least influence factors on the adjustment speed of the capital prudential ratios.

The IBL_Ch was the factor had least influence on the adjustment speed of the capital ratios, in the post-regulation period, the coefficients of this indicator showed an increase. Economically, a cut down of this lending might be to cover the increase of the non-bank lending, shift to other assets or reduce the total assets. The cut of the interbank lending might cause a systemic risk to the VcB as argued in Tung (2017).

5.3.2. The Capital Implementation and the ROA

The three records were support the author that the manner of the adjustment by the Vietnamese commercial banks to the capital target leads to the efficiency for the banks. The ROA of the VcB was decreased in the post-regulation period. At the same time, the capital prudential ratios decreased as well. These trends could imply that ROA has a positive association with the CPR1 and CPR2. All of the independent variables in models (5.2-5) and (5.2-6) are statistically significant influence on ROA.

All of the independent variables in models (5.2-7) and (5.2-8) also reported the statistically significant influence on ROA. LA_TA was the highest effect on the ROA. The IER shows a smallest effect on the ROA, while the residuals from models (5.2-1) and (5.2-2) shows a higher influence on ROA compare with the influences of the LP_TA and the IER.

i. The Expected Loss Increased and Effected on ROA

Suppose that the LP_TA and the LA_TA could represent the certain of the banking business situation, an increase of these indicators could imply a worse business situation bank faces, or inverse otherwise. The coefficients of them in Table 5.2 – 6 provides that these variables are statistically significant negative effect on ROA and the coefficient of the LA_TA is higher than that of the LP_TA. Meaning that the VcB's ROA stood the loss of the bad loans and bad investment more than stood the loss provision. Whatever, the LP_TA and LA_TA increases, they associate with the decrease of ROA. This result consistency the findings of Lee et al. (2013) that the capital improvement of commercial banks in middle income Asian countries has a high negative effect on risk while also has a positive effect on profitability.

ii. The IER Was the Least Influence Factor on ROA

The coefficient of IER is statistically significant positive effect on ROA. This small coefficient indicates that the VcB did not use their assets efficiently and might have the surplus liabilities. There were two reasons: ***first***, the increase of LP_TA and LA_TA could understand as the increase of risks; ***second***, in 2011, a new rule of Vietnamese's law in which a clause allows the interest rate be negotiable and independent of the basic interest rate of the State Bank of Vietnam. The rule triggered off the competition in the VcB each others. But according to the analyses above, the VcB tended to do business riskier rather than an interest rate competition.

iii. The Residual From Models (3b.1) and (3b.2) Shows a Higher Influence on the ROA

As expected, both of the residuals from models (3b.1) and (3b.2) confirmed a statistically significant positive effect on ROA. These results could be interpreted that a part of the VcB's capital implementation shared to the effective of ROA, especial in the post-regulation period. The decision for bank's financial management might reflect through the behaviour of adjusting the CPR2 with perceptions on expected profits (Delis & Tsionas, 2012; Lepetit et al., 2015; Shimizu, 2015).

5.3.3. The Scholarly Views on these Issues

The monetary policy and capital regulation requirement are popular and used to control the lending of banks. Analysis the influence of these two instruments, Aiyar et al. (2016) found evidence from UK banks that the capital regulation requirement policy was more significant effect to control the credit supply than the monetary policy. If the monetary policy will be used to control the lending of VcB, there will have no difference effect of this instrument on all the VcB; the policy builder might achieve the credit control target. But, on the other hand, the cost funding of loans might increase and makes the IER worse, then the banks' ROA, the adjustment of the capital ratios might be more harmful.

The interbank lending could be priority be decreased to have a more impact on the adjustment speed of the capital prudential ratios. The lending of the VcB was financed by the deposits and cutting interbank lending, especial in the post-regulation period and leads to a potential of systemic risk through the cut of the interbank lending (see Tung (2017). Thus, the capital regulation requirement should consider together with the systemic risk via the interbank change.

Concerning to control the increase of lending, on the point of view of a bank regulator, some researchers suggested that the regulation should have a threshold for the banks' leverage. Control the increase of banks' lending together with the increase of banks' equity or banks' leverage benchmark. Strengthen the deposit insurance management, control the systemic contagion risk via the interbank lending and so on (Bordeleau et al., 2009; Distinguin et al., 2013; Lepetit et al., 2015; Gombola et al., 2016; Tung, H.T., 2017).

Concerning to the risk-weighted assets adjusting to achieve the capital regulation requirement, Jokipii & Milne (2011), Cipovova & Belas (2012) highlighted that the banks could choose a method which has calculated the lowest amounts of capital requirement. This manner lead to the distortion ratings to work out with a much lower capital than the requirement. Accordingly, to avoid the distortion ratings, the supervision must follow up the rating or credit risk measurement. This suggestion is in the line with Fratzscher et al. (2016).

6. THE RECOMMENDATION

According to the empirical analyse above, to supervise the capital regulation implementation of the VcB. The supervisor should select the information of the factors that influence on the adjustment of the banks' capital. The author lists the indicators in two groups. The first group is the list of the indicators that connect to the capital implementation, the second group to consider the policy while control the implementation. The indicators are listed in an ascending order based on its influence level on the capital adjustment or it association with the banks' ROA.

6.1. The Indicator For the Regulation and Supervision

6.1.1. The Capital Ratios

The author suggests to use the CPR1 and CPR2. The regulation requirements for the achievement could consider the adjustment speed estimated in this thesis.

The supervisor should pay attention on gap between these capital ratios. Song et al., (2016) pointed that when the gap between actual capital and target capital is narrower, the lowers the growth rate of total assets, RWA, and loan requirements; the capital to total assets increases with a higher degree than capital to RWA. The estimated result provides the imagine how the banks adopted the regulation requirement, whereby, use the models for the estimation, the regulators might consider the policy to control the implementation.

6.1.2. Complement the RWA

The recommendation for RWA regulation and supervision are to improve the risk assessment and to implement the disclosure the RWA of the off-balance sheet.

In Vietnam, on the one hand, the SBV not only set the credit risk criteria but also set the asset risk criteria. On the other hand, the SBV allows the banks adopt the IRB approach. Thereby, a reasonable and updatable risk weight is a need for the effective regulation and supervision.

The second issue concerns to RWA is the off-balance sheet disclosure. If the calculation of RWA is a shortage of this information lacking, the RWA will not reflect precisely the risky that the bank can cover.

6.1.3. The Retained Earnings

Assume that there is no change of the share number and other factors in the model (3b). Using the model (3b.1), (3b.2), (3b.3) and (3b.4), the banks may simulate a breaking-point at how high the RE_S should be to reach the maximum influence on the improvement of the capital ratios. And not damage the ROA, as well as not impair the market value of their equity incidentally.

6.1.4. The Issuance Shares

If the regulators need a prompt increase of the banks' equity, the regulation requirements must consider on the macroeconomic situation. During the recessions

time, the regulation requirement should issue together with a policy that could encourage the banks to decide a new share issuance, a temporary change of the income tax for example.

6.1.5. The Lending Indicators

The author suggests a separation of the lending total to non-bank lending TGL_TA and interbank lending IBL_Ch.

Monitor the TGL_TA may evaluate the capital regulation implementation trend. In during the time of the capital regulation requirement, if the coefficient of this factor will become higher than the others, meaning the banks more focus on the increase of lending than use the other channel for their capital regulation implementation.

The IBL_Ch is a channel that provide the short-term liquidity for the banks (see Garcia et al., 2016; Craig et al., 2015). A sharp cut down this lending might lead to potential systemic. If there will be no change, this potential systemic might become the most threat after two years from the occurred of a reduction (see Tung, 2017). Thereby, the supervision should pay attention to the trend of this lending. A warning should be released if the banks reduce their interbank lending continuously.

6.2. The Indicators Help Refer to the Improvement of the Capital Ratios Indirectly

6.2.1. The Loss Provision

The high rate of this ratio sounds the unhealthy of the banks' business and might unpredictable. Therefore, when the estimation of the LP_TA is going up close to zero or might not statistically significant associate with the ROA, that implies of the good risk management, or invert otherwise.

6.2.2. The Loss Allowance

If the models (2a) and (2b) show a statistically significant negative coefficient higher than the coefficient in the previous, meaning that the banks face more loss than the loss during the last. Thus, the monitoring of the LA_TA should consider both the fluctuation of this ratio and the variation of its coefficient.

6.2.3. The Interest Earning Ratio

IER had a minimal influence coefficient on the ROA; this indicator could indicate the efficient of the liabilities use through its coefficient in the regression model (2a), (2b). A high degree of this coefficient would imply that the banks minimise the surplus financing and improve the asset use. Indirectly, this improvement encourages the improvement of the capital implementation. Otherwise, the supervisors might suggest a process of cutting down the liabilities for the development.

6.3. The Regulation and Supervision

6.3.1. The Regulation

i. Capital Regulation Requirements

Require the capital regulations with both the approaches, the calculate on the assets actual and the calculate on the RWA included RWA of the off-balance sheet. Require the application refer to the adjustment speed estimation for the capital regulation requirements. The author supposes that the adjustment speed estimated above should be a reasonable speed for the implementation. The control might base on the policy made by considering the relevant indicators used in this thesis.

ii. Issue an Updateable For the RWA Calculation

The regulation and supervision should carry a reasonable approach which would be updateable to complement the risk weighs list of the SBV.

6.3.2. The Supervision

i. Supervise the Degree of the Capital Ratios

According to the regulation requirement, the supervisors monitor the evolution of the capital degree and report the deviation timely for the appropriate regulatory action.

ii. Supervise the Speed of the Implementation

The supervisors may supervise the capital requirement implementation by using the PAM models as used in this thesis.

iii. Supervise the Gap Between the CPR1 and CPR2

Additionally, the supervisors might take the information from the gap between the capital ratios. If this gap became wider than before, it encourage the increase of RWA. The supervisors might go in advance with the forecasting the asset or RWA fluctuations to simulate the adjustment speed then control the compliance with the given time.

iv. Supervise the Fluctuation of the RWA

The RWA fluctuation causes the negative association with the capital ratios. The RWA also indicate how risk the banks face for their business. The supervisors may observe the ratio of the RWA to total assets together with the RWA_Ch. When both these indicators increase continuously means that the banks' going to break the benchmark of the capital to RWA then potential harm to the capital implementation. Besides, the RWA must be a positive association with the LP_TA. Therefore, the monitoring of the RWA should together with the control of the LP_TA. Moreover, when the estimation of the LP_TA is closer to zero or insignificant, meaning that the risk management of banks is very well, or invert otherwise.

v. Supervise the Evolution of the Retained Earning

The RE_S is a stable source and most contribution factor to build the bank's capital. The supervisors may simulate a breaking-point at how high the RE_S should be to reach the maximum influence on the improvement of the capital ratios. And not damage the ROA, as well as not impair the market value of the banks' equity.

7. CONTRIBUTION TO SCIENTIFIC AND PRACTICE KNOWLEDGE

7.1. Contribute To Scientific Knowledge

7.1.1. Developing and Introducing the Models, the Indicators that Could Be Used For the Regulation and Supervision in Vietnamese Commercial Bank Sector

The models have the great explanation, consistency and reasonable to help the author achieve the aim of this thesis. The variables are useful and may represent the activities of the banking and the related regulations. The regulators and supervisors may refer or use directly the models, variables for the regulation and supervision.

7.1.2. Proving the Approaches and the Findings and Suggestions From Previous Relevant Studies

To have the approach for this study, the author reviewed the previous studies and choose a method that appropriate to solve the research problem of the thesis.

7.1.3. Acquiring a Deeper Understanding of the Associations Between the Capital Regulation and the Banking Business, and the Relationship Between the Capital Regulation and Bank Performance

The results added empirical evidence to both the confirmation for previous studies and the specific case of the VcB; a deeper understanding the associations between the capital regulation and the banking business, and the relationship between the capital regulation and bank performance. Enrich the knowledge of a banking system.

7.1.4. Adding a Case Study of Vietnamese Commercial Bank Sector in the Pilot Period of the Regulatory Application Basel Framework

This study could be a case study of Vietnamese commercial bank sector in the pilot period of the Basel framework application, might be useful for a similar situation.

7.2. Contribute To Practice Knowledge

7.2.1. Providing the Critical Evaluation of the Capital Regulation, Their Association With the Channels that Built the Capital Ratios and the Bank Efficiency in the Implementation

The author provided the empirical evidence of the capital implementation of the VcB. The author also indicated how the banks' efficiency associate with the implementation. The information is not only focused on the Basel application but also consider the most important target of the business, the efficiency.

7.2.2. The Usefulness of This Study's Approach

The significant explanation of the approach used to solve the research problem could be useful to apply in such the similar research. When the researchers aim to calculate the implementation, especial it concerns to the capital structure, the approach used for this thesis might appropriate for their consideration.

7.3. Contribute To Education

The empirical analysis is appropriate to use for a similar objective to this thesis's aim. The PAM is applicable to analyse the capital structure and the panel data. Add a case study of research in the beginning applicant of the Basel regulation.

8. CONCLUSION

The objective of this thesis is to suggest a methodological approach applicable to Vietnamese Commercial Banks system. This approach will be built upon state-of-the-art bank's regulation and supervision methods used, focused on the capital regulation requirement in accordance with the Basel regulatory framework. The author used the empirical analysis approach to achieve the objective.

Through the examination how chosen pilot banks in Vietnam have taken action to achieve required capital regulation requirements in the context of the Basel regulation frameworks. The author uses partial adjustment models to analyse the banks' quarterly financial statement releases from 2008/Q1 to 2015/Q4, for which from 2010/Q4 to 2015/Q4 was the post-regulation period. On average, the empirical evidence shows that Vietnamese commercial banks pursued credit growth at a higher priority than capital regulation requirements. Retained earnings and risk-weighted assets are permutations to account for the bulk of both higher risk-weighted capital ratio and capital-to-total-assets ratio, while the shares issuance played a lesser role. In the post-regulation period, the banks adjusted to the risk-weighted capital target slower than in the pre-regulation period. The adjustment to the capital-on-total-assets ratio was invert in compare with the adjustment of the risk-weighted capital. The author finds that the manner of the adjustment by the Vietnamese commercial banks to the capital target led to a loss in efficiency. The result implies the need for high tighten the capital regulation implementation to the Vietnamese commercial banks.

The analyses also indicate the need to complement the RWA calculation, the monitoring and control of the factors which had high contribution on the implementation of the VcB. Those are the RWA, the retained earnings and the issuance share. The results also provide the information that the supervisors, the regulators and the policy-makers should pay attention to have a convincible decision for their regulation and supervision. The approach, models, variables in this thesis could be useful and applicable in both the relevant research and in practise.

Before the full implementation of the regulation, Pilot study is currently being conducted. Follow up the knowledge related to the banking regulation, this thesis achieved its objective. Empirical analysis was conducted on the original Pilot program and suggested indicators which should be monitored. The author also pointed the most vulnerable and problematic issues Vietnamese commercial banks face and propose a methodological framework which should be followed to achieve a successful transition to a new banking environment under the Basel III framework. This thesis also acquires a deeper understanding of the associations between the capital regulation and the stability of banking business, and the associations between the capital regulation and banks' performance, and adds a case study of Vietnamese commercial bank sector in the pilot period of the regulatory application Basel framework.

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