Tung, H. T., Belás, J., & Baideldinova, T. (2018). How do banks implement the capital regulation requirement?. *Journal of International Studies, 11*(3), 161-175. doi:10.14254/2071-8330.2018/11-3/14

Journal of International Studies

Scientific Papers

How do banks implement the capital regulation requirement?

Ho Thanh Tung
Department of Management and Economics,
Tomas Bata University in Zlin,
Czech Republic
Department of Finance and Banking, Ton Duc Thang University,
Vietnam
hothanhtung@tdtu.edu.vn

Jaroslav Belás
Department of Management and Economics,
Tomas Bata University in Zlin,
Czech Republic
belas@fame.utb.cz

Tatyana Baideldinova
Department of Law,
Al-Farabi Kazakh National University
Kazakhstan
tatyanabaideldinova@gmail.com

Abstract. This paper studies the capital regulation implementation by commercial banks. Specifically, the authors examine how commercial banks achieve the required capital regulation requirements in the context of the Basel regulation frameworks and whether this compliance promotes banks' efficiency. The authors use partial adjustment models to analyse the banks' quarterly financial statement releases in both pre- and post-regulation periods. On average, the empirical evidence shows that the 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 faster than in the pre-regulation period. Adjustment to the capital-on-total-assets ratio was slower. The authors find that the manner of the adjustment by these commercial banks to the capital target led to a loss in efficiency. The result implies the need to tighten the capital regulation implementation and improve risk-weighted assets management.

Received: January, 2018
1st Revision: April, 2018
Accepted: June, 2018

DOI: 10.14254/2071-8330.2018/11-3/14

Keywords: bank regulation, capital regulation, Basel regulation, bank efficiency, adjustment speed, Vietnamese commercial banks.

JEL Classification: D24, E51, G21, G28

1. INTRODUCTION

Stability of the banking system is in close connection to economic health of a country. The recent downturn of the world economy was triggered by the crisis of the banking industry. Bank regulations of the Basel committee aim to stabilize the banking worldwide. Besides this standard implementation being mandatory for the Basel Committee members, it is also voluntarily applied by the non-member countries.

Capital regulation supervision under the Basel framework for banks provides two capital regulation approaches, the risk-weighted and unweighted capital regulations. To implement the capital regulation requirements, the banks can choose to either increase their capital, or adjust their risk-weighted assets, or combine both actions. The first action might be achieved by shares' issuance and accumulation of retained earnings. The second action would be to adjust the assets within the bank portfolio.

This study examines the capital regulation implementation by Vietnamese commercial banks (hereafter is VcB) together with the pilot study recently conducted to apply the Basel framework in Vietnamese commercial banking . The implementation started at the beginning of 2011, and the State Bank of Vietnam intended to apply the full Basel regulation requirement to all Vietnamese commercial banks in 2018. Thus, it seems to be relevant and important to contribute with an empirical analysis of the implementation procedure. This study contributes to the field with the empirical analysis of a specific case of the Basel framework application in a developing country, where economic integration is still in progress. To the best of our knowledge, this is the first study to analyse the capital regulation implementation of the Basel frameworks in Vietnam.

Prior to 2000, all Vietnamese banks belonged to the government. At present, 36 out of 37 banks in Vietnam are joint-stock commercial banks. The growth of Vietnam's GDP in 2008/Q1 was 7.4%; in 2011/Q1, at the beginning of the post-regulation period, GDP growth was 5.43%; in 2015/Q4 the GDP growth was 7.01%. Meanwhile, the CPR1 was 6.43%, 7.7% and 5.8% respectively. Whereby, some findings of this article suggest there is a need for more regulatory constraints to the capital improvement of the VcB to match the criteria of the Basel regulations.

2. LITERATURE REVIEW

Gorton & Winton (2003) point that raising capital requirements forces banks to be supplied fewer deposits, this finding supported for Boot& Thakor (1997) that raising equity capital is more expensive than deposits and tend to the reduction of banks' lending. In the case of the VcB, throughout the post-regulation period, total assets of the VcB increased 212.7%, while the scale of the lending to non-bank on total assets increased continuously from 38.9% to 48.3%. This matter propounds a highly consider the loans and the deposits in the capital regulation implementation of the VcB.

Effective capital regulation requires information on the state of a bank at the certain stage of its development, especially in crisis situations, for example, on the basis of bank patterns analysis held based on Kohonen self-organizing maps or separating systemically important banks (Kozmenko, Shkolnyk, & Bukhtiarova,2016; Kozmenko & Belova, 2015; Kodasheva, Parusimova, Rispekova, & Uchkampirova, 2017).

In addition, Adrian and Shin (2010) find that Basel III had more approached to measure RWA, required of liquid assets. Using the formula of Basel, the authors found that outflows and inflows depend on only a few sources. When cash flow is dependence on a few sources, the credit is limited to extend. Moreover, Cipovova & Belas. (2012) studied risk approach under Basel 3 and found that advanced methods for credit risk measurement were more flexible on class change of corporate exposures in the portfolio. These findings imply that banks could adjust their risk-weighted assets to achieve the capital regulation requirements especial their loans. In this context are very important rating models of commercial banks. Kliestik et al. (2018) state that it is increasingly challenging to predict bankruptcy risk as corporations have become more global and more complex and as they have developed sophisticated schemes to hide their actual situations under the guise of "optimization" for tax authorities.

In a same line with the studies that concerned the RWA (Adrian & Shin, 2010; Cipovova & Belas, 2012; Allen et al., 2012; Shimuzu, 2015) provides an empirical evidence from Japan that banks adjusted the composition of their assets faster than their asset size to achieve the RWA targets. These findings hint that to achieve the capital requirements, both the composition of banks' assets and composition's size on risk-weighted based were used frequently to adjust.

Partial adjustment models have been used significantly to analyse the capital structure adjustment (Cook & Tang, 2010; Dang et al., 2014; Zhou et al., 2016) and the capital regulation implementation (Cohen et al., 2014; Shimizu, 2015; Ly et al., 2017; Tung, 2017, Kunitsyna et al., 2018). In which, Cohen et al. (2014) suggest that the accumulation of retained earnings, adjustments in lending or assets, adjustments the risk-weighted assets, and new equity issued are the strategies that banks used to build capital or to adjust for the capital target achievement. Consider the findings above, the models and the influence factors to analyse the capital regulation implementation of the VcB were built.

Many studies analysed the relationship between the capital regulation and the efficiency of bank (for example Aniunas et al, 2017; Balcerzak et al., 2017; Bhasin, 2016; Bobriková & Harčariková, 2017; Duhnea et al, 2017; Gavurova et al., 2017; Kozubíková et al., 2015, 2017; Ohanyan & Androniceanu, 2017; Popovic & Paunovic, 2018; Xu et al., 2018). Almost all of the previous studies supposed that the capital regulation and the efficiency of bank have a positive relationship (Angkinand, 2009; Apătăchioae, 2015; Fiordelisi et al., 2011; Barth et al., 2013; Gombola et al., 2016; Lee et al., 2013; Manlagnit, 2015; Pessarossi & Weill, 2015). Accordingly, the latter analysis in this article addresses whether the manner that the VcB implemented the capital regulation requirements was efficient to the banks or not.

3. METHODOLOGY

The analysis of this article aims to answer for the questions: "How do the VcB implement the capital regulation requirement in throughout the periods, and is there any difference of the implementation between the pre- and post-regulation period?". And: "whether the manner of the adjustment by the VcB to the capital target leads to the efficiency for the banks?".

To achieve the aim of this article, the procedures have two steps. *Firstly*, to assess the capital regulation implementation, the partial adjustment models are used to estimate the adjustment speed of the capital ratios and the contribution of the factors in the adjustment channels that build the capital ratios. The dummy variables are added to detect the different effect of the regressors in the pre- and post-regulation period. *Secondly*, to answer the question: "whether the manner of the adjustment by the VcB to the capital target leads to the efficiency for the banks?", the authors collect the evidence from three records concern to ROA. The first is a vision of the ROA trend provided by the line charts of ROA versus the two capital ratios. The second is the estimations of ROA with the same estimators for the capital ratio adjustment speeds. This record could prove that the factors influence on the capital ratio adjustment speed also influence on the ROA. The third is collected from the regression result of the residuals saved after estimated the adjustment speed of the capital ratios by equation (3). If these residuals be confirmed its association with the ROA, the authors will get a stronger evidence. It means that almost all of the manner of the adjustment by the Vietnamese commercial banks to the capital target connects to the efficiency of the banks.

3.1. Model

To estimate the implementation speed of the VcB, in the long-run, the capital ratio is a function of the factors that effect itself;

$$Y*_{i,t+1} = \sum_{j=1}^{j} \beta_j X_{j,i,t} + \theta_n C_{n,i,t}, n = 1 \tag{1}$$

Y* is the capital ratio target, the partial adjustment model of the capital ratio and its target:

$$Y_{i,t} - Y_{i,t-1} = \lambda\left(Y*_{i,t} - Y_{i,t-1}\right) + \varepsilon_{i,t} \tag{2}$$

Where Y are respective the capital on total assets ratio and the capital on risk-weighted assets ratio of bank i, the Xj are the vector of factors jth those affect the adjustment of the capital ratios and the Cn is control variable, t is the quarter point time in the period from 2008Q1 to 2015Q4; λ is the gap or speed of adjustment during a point time, ($0 \leq \lambda \leq 1$). Substituting equation (1) into equation (2), then a model that the speed of adjustment (λ) is estimated as follows:

$$Y_{i,t} = \sum_{j=1}^{j} \left(\lambda\beta_j\right) X_{j,i,t} + \left(\lambda\theta_n\right) C_{n,i,t} + \left(1-\lambda\right) Y_{i,t-1} + \varepsilon_{i,t} \tag{3}$$

The equations (3) is use to provide the second record that connects the banks' efficiency with the capital regulation implementation, whereby the ROA replaces the capital ratios in the left site of this equation.

In order to point out the structure break of the Xj factors in the full period, the authors divide full period to be two sub-periods, those are the pre- and post-regulation periods. The dummy variables Dj are added to interact with the Xj vectors and Yi,t-1. D receives value 0 for the pre-regulation period and 1 for the post-regulation period. Equation (3) becomes:

$$Y_{i,t} = \sum_{j=1}^{j} \left(\lambda\beta_j\right) X_{j,i,t} + \sum_{j=1}^{j} \left(\lambda\beta_{j,d}\right) X_{j,i,t} \times D_{j,i,t} + \left(1-\lambda\right) Y_{i,t-1} + (1-\lambda_d) Y_{i,t-1} \times D_{j,i,t} + \left(\lambda\theta_n\right) C_{n,i,t} + \varepsilon_{i,t} \tag{4}$$

Where D is dummy of the post-regulation period. Equation (4) is used to analyse the adjustment speed of the capital ratios and the contribution of the factors in the adjustment channels that build the capital ratios.

One more regression analysis is conducted to estimate the association between the residuals and the ROA. In this analysis, the loss provision, loan loss allowance measurement and interest earning ratio of the banks' are the predictors, added to the regression together with the residual, to provide the third record of the banks' efficiency.

$$\begin{aligned} ROA_{i,t} &= \alpha_0 + \alpha_1 \text{Loss provition ratio}_{i,t} + \alpha_2 \text{Loss allowance ratio}_{i,t} \\ &+ \alpha_3 \text{Interest earning ratio}_{i,t} + \alpha_4 \boldsymbol{\varepsilon}_{i,t} + u_{31,i,t} \end{aligned} \tag{5}$$

Weighted-least-square is used in regression to avoid the bias and the heteroscedasticity might issue in the process. The relevance consistency tests of the partial adjustment models fitted are shown together with the regression results. Diagnostic tests for panel data processing were conducted to select the effect of the models. The tests show that pooled and fixed effects are consistent. The multicollinearity testable regressions reported that, there is no multicollinearity problem to the models.

3.2. Variable definitions

In the capital structure studies, the authors frequently added a variable in their models which represent the characteristics of firms or banks as the control variables. This factor is the natural logarithm of bank's total assets, called frequently SIZE (Cook & Tang, 2010; Hovakimian & Li, 2011; Shimizu, 2015; Ly et al., 2017; Tung, 2017). The SIZE is expected to have a negative association with the predicted variables.

The capital ratio variables are denoted as CPR1 and CPR2, are the ratios of the banks' tier 1 capital divided to total assets and risk-weighted assets respectively. On the nominator side of these ratios, the authors assume that the tier 1 is the growth of the tier 1 which is generated by share issuances and from the retained earnings of bank. Meanwhile, the denominator of the CPR2 is the risk-weighted approach, the change of average risk-weighted assets could represent the assets' composition size under this approach.

The growth of common shares' number represents the share issuances of the VcB, is named Share_G. Share_G is calculated by the difference of the number of common shares at time t and t-1 divided to the number of common shares at time t-1. Share_G is expected to show a positive influence to the capital ratios. But the association of the Share_G for the ROA might be ambiguous.

The retained earnings on common shares of the VcB is a ratio counted by the retained earning divided to the number of common shares. It is denoted as RE_S. The retained earnings is net income minus dividends. The more retained earnings, the more the tier 1 is increased. The expectation for the relationships between RE_S and the capital ratios are positive. Practically, the RE_S has a positive relationship with ROA.

The lending is separated to the non-bank lending and interbank lending. The non-bank lending ratio denoted as TGL_TA, calculated by the gross loans of non-bank lending divides to total assets; IBL_Ch is named to represent the change ratio of the interbank lending in between the time t and t – 1. These different calculations of the two lending categories are to avoid a high correlation when both the TGL_TA and the IBL_Ch are the predictor variables in a same model. In the capital requirement regime of Basel 2 & 3, the lending growth continuously was reported by the Basel committee (see Cohen et al., 2014). On the other hand, the capital and leverage regulation requirements could constrain the deposits (Gorton & Winton, 2003), both the requirements make bank must consider the lending operation while the funding sources were limited. Then, the banks' corresponding loans must be operated by the combination of non-bank lending and interbank lending. Accordingly, the separation of TGL_TA and IBL_Ch is expected to contribute more evidence to the previous studies.

The deposits are the most funding source of the commercial banks. As mentioned above, the deposits connect to the banks' lending and the bank's leverage. Therefore, the deposits might have a negative relationship with the capital ratios and theoretically, have a positive relationship with the ROA. The change ratio of the deposits in between the time t and t – 1 is a predictor variable, is named Depo_Ch.

The RWA is an adjustable channel to achieve the target of capital to risk-weighted ratio. In this study, this is a ratio calculated by the change of average risk-weighted assets in between the time t and t – 1 divided to average RWA at time t – 1. The RWA_Ch reflects the change of the denominator of the CPR2, relevantly, RWA_Ch is expected to have a negative association with the capital ratios. RWA_Ch is expected to provide an evidence relationship with the ROA.

Loss provision divided to total assets represent the provision loss of the banks' risky assets, named LP_TA. Loan loss allowance divided to total assets represents the reserve for bad loans, denoted as LA_TA. These indicators are the predictor variables for the ROA only. Economically, both LP_TA and LA_TA are negative influence on the ROA. While IER is a ratio, calculated by the difference between the interest earning and the interest expenditure then divided to the total liabilities. the IER always has a positive association with the ROA.

The residual generated from the formula (3) estimated, denoted as U1 and U2, respectively are the residuals from the CPR1 and CPR2 estimations. Statistically, these residuals are the unobservable factors that relate to the adjustment speed estimations. Whereby, to add more information with the other evidences, the authors add the U1 and U2 respectively together with the LP_TA, LA_TA, IER to explain the ROA through the regression analyses. The authors expect that these residuals might have a statistically significant association with the ROA to support a stronger conclusion of the connection between the ROA and the capital ratio adjustment manner of the VcB.

The ROA represents the banks' efficiency, will be a predicted variable in formula (3) in order to identify whether the factors influence of the capital ratios also influence on the ROA. Then, the ROA is predicted by the LP_TA, LA_TA, IER and the U1 or U2. The analyses are to detect how the capital ratio adjustment manner of the VcB connects to their efficiency.

3.3. Data

Data for the analysis is an unbalance panel data, was collected from the quarterly released financial statements of Vietnamese commercial banks which were available in the period from 2008/Q1 to 2015/Q4. In this article, this unbalance panel data is used for the adjustment analyses, similar to the use of data in Shimizu (2015) to analyse the adjustment of denominators capital ratio in Japanese banks, Ly et al. (2017) investigated the effect of Net Stable Funding Ratio adjustment speed, Tung (2017) estimated the adjustment speed of the interbank lending. The whole period above is divided into two sub-periods, one is the pre-regulation period from 2008/Q1 to 2010/Q4 and the next one is from 2011/Q1 to 2015/Q4, the post-regulation period.

Table 1

Data summary

	vars	n	mean	sd	median	Min	max	Se
CPR1	1	207	0.0727	0.0234	0.0693	0.0397	0.1790	0.0016
CPR2	2	207	0.0742	0.0222	0.0726	0.0387	0.1662	0.0015
Share_G	3	207	0.0496	0.1406	0.0000	-0.0653	0.8354	0.0098
RE_CS	4	207	0.1575	0.0922	0.1482	-0.0620	0.3663	0.0064
TGL_TA	5	207	0.4549	0.1043	0.4639	0.2359	0.6336	0.0072
Ch_IBL	6	207	0.0646	0.2800	0.0440	-0.4524	1.2850	0.0195
Depo_Gw	7	207	0.0566	0.1001	0.0483	-0.1517	0.3656	0.0070
RWA_Gw	8	207	0.0543	0.1058	0.0406	-0.1821	0.3983	0.0074
SIZE	9	207	14.3441	0.3639	14.3665	13.4552	14.9572	0.0253
ROA	10	207	0.0025	0.0018	0.0025	-0.0038	0.0060	0.0001
LP_TA	11	207	0.1216	0.1039	0.0960	0.0021	0.4987	0.0072
LA_TA	12	207	0.0077	0.0037	0.0076	0.0022	0.0163	0.0003
IER	13	207	0.7260	0.2191	0.7242	0.2922	1.2952	0.0152

Source: Calculated by the authors

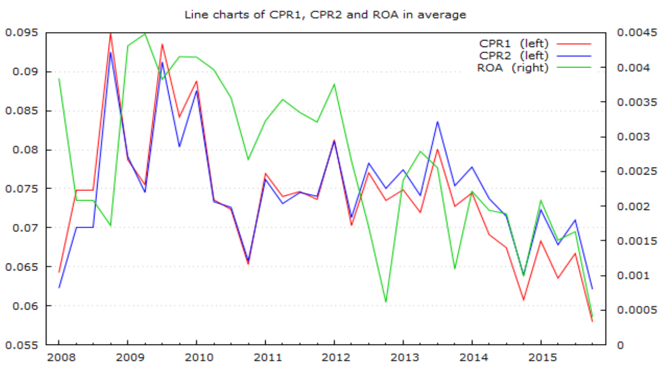

Figure 1. The line charts of the dependent variables of model (3), (4) and (5), shown in time series average

Source: Calculated by the authors

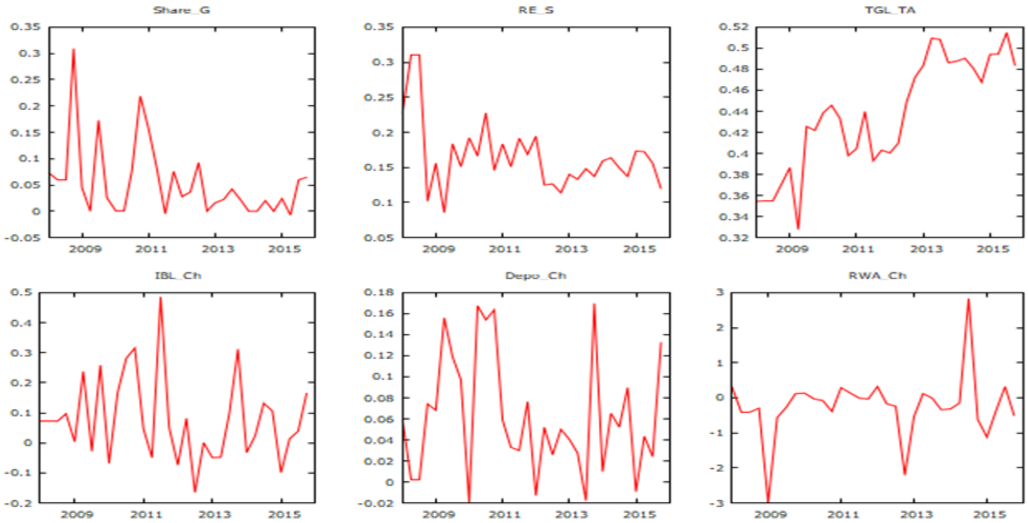

Figure 2. The plots of the independent variables of model (3) and (4), shown in time series average

Source: Calculated by the authors

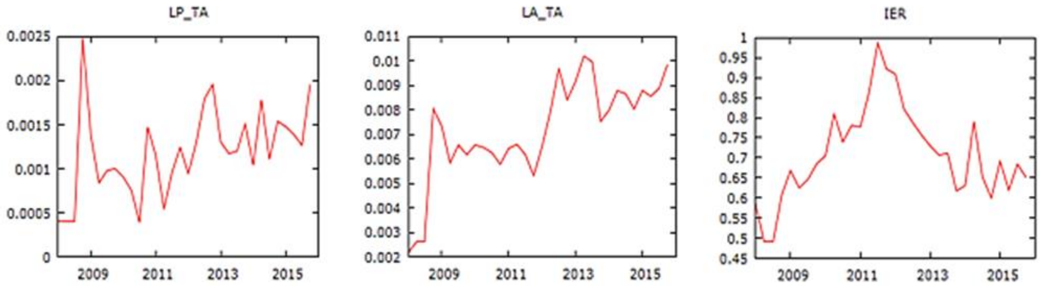

Figure 3. The plots of the independent variables of model (5), shown in time series average

Source: Calculated by the authors

4. EMPIRICAL RESULTS

The adjustment speed of the capital ratios represents the capital regulation implementation. An additional intention is to distinguish whether the influence factors have a different effect on the capital ratios in the sub-periods. To do so, model (4) with the dummy variables are estimated. The weighted-least square regression technique is used to estimate the capital ratios adjustment speed and the channels that contribute to the adjustment. Respectively, the models that compute the panel data are the fixed effects andpooled weighted-least square models. In Table 2, columns (2), (4) show the estimation of the CPR1, columns (6), (8) show the estimation of the CPR2.

The estimation for the relationship between the ROA and the factors contributed to of the capital regulation implementation is reported in Table 3. This is the second record that mentioned above. To collect the third record, the estimations for the capital ratios are calculated by equation (3). A similar test for the panel data processing consistency are conducted. These results are shown in Table 4. The residuals from the consistent models are saved and added to a regression to analyse the relationship between these residuals and the ROA. In order to save place, the authors select only the residual from the fixed effects estimation to add to the next analysis.The prediction for ROA also passes a similar procedure as the previous. The ROA prediction results in which the U1 and U2 are the predictors are shown in Table 5.

4.1. The capital regulation implementation

In general, the coefficient of the SIZE shows a consistency result with the previous studies which used this indicator as a control variable in the model. Actually, SIZE is close related to the denominator of the capital ratios in this study. Therefore, the statistically significant negative relationship between the SIZE and the capital ratios could imply the significant use of this control variable and provides a confirmation to the previous studies.

The adjustment speed of the capital ratios

The adjustment speed estimations of both the CPR1 and CPR2 by fixed effects in the columns (2) and (6) of Table 2 show a faster adjustment of these indicator in the pre-regulation period. In addition, in the post-regulation period, the adjustment speed of the CPR1 decreased while the one of the CPR2 increased. These results provide an important evidence of the capital regulation implementation. Economically, the results might imply that in the post-regulation period the VcB tends to adjust their risk-weighted assets composition faster than to adjust the size of the total assets. According to the fixed effects estimations, in the pre-regulation period, the VcB might adjust their CPR1 at 18.99% (1 – 0.8101) to achieve the CPR1 target in a quarter. Meaning that the VcB might complete a one percent change of the CPR1 in almost one and a half year. Similarly, with the speed at 16.6%, the CPR2 might achieve one percent change of it after one and a half year, a few slower than the CPR1. But in the post-regulation period, the situation is inverted. Again, according to the fixed effects estimations, the CPR2 might complete a one percent change in almost six quarters while it takes the CPR1 more than seven quarters to achieve its target.

The contribution of the influence factors

The Share_G estimates in the columns (2) and (6) in Table 3 show a statistically significant positive effect on the capital ratios. The result is consistent with the expectation and economic. The dummy of this indicator shows a decrease of this factor's contribution to the adjustment of the capital ratios in the post-regulation period. According to the fixed effects estimations, the coefficients of the Share_G report that this indicator is the third magnitude factor influences on the CPR1 and is the second magnitude factor that influences on CPR2. Even though there were some decreases of the coefficients between the pre- and post-regulation period but these influence degrees were not different. The results imply that the Share_G is more sensitive to the CPR2 than to the CPR1.

The coefficients of the RE_S in the columns (2) of Table 2 and Table 3 show that this indicator is the highest influence factor on the CPR2, while is the second influence magnitude factor on the CPR1. All the estimations of the RE_S report the statistically significant positive associations, consist with both the expectation and economics. Similar to the results of the Share_G, the estimates of the RE_S in the post-regulation also show few decreases in its coefficients but the influence degrees were unchanged. Thus, the effect of the RE_S is more sensitive to the CPR2 than to the CPR1.

The TGL_TA estimates are statistically significant negative association with the CPR1 in the pre-regulation period then positive in the post-regulation period. While the predictions of TGL_TA for the CPR2 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 results. In this case, the association between the TGL_TA and the CPR1 in whole the sub-periods could report the different trends of this association between the two sub-periods, meanwhile, the risk-weighted assets approach could not.

Table 2

Regression of partial adjustment models – equation (4)

Dependent variable:	CPR1				CPR2			
WLS estimation:	Within		Pooling		Within		Pooling	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share_G	0.0368 *** (0.0002)	0.1938	0.0360 *** (0.0006)	0.2049	0.0363 *** (0.0003)	0.2187	0.0360 *** (0.0006)	0.2049
RE_S	0.0669 *** (0.0008)	0.3523	0.0522 *** (0.0037)	0.2968	0.0626 *** (0.0009)	0.3771	0.0524 *** (0.0008)	0.2968
TGL_TA	-0.0045 *** (0.0013)	-0.0237	0.0155 *** (0.0014)	0.0814	0.0083 *** (0.0009)	0.0437	0.0156 *** (0.0004)	0.0814
IBL_Ch	-0.0008 ** (0.0003)	-0.0042	0.0026 *** (0.0004)	0.0145	-0.0056 *** (0.0003)	-0.0337	-0.0064 *** (0.0031)	0.0145
Depo_Ch	-0.0100 *** (0.0009)	-0.0527	-0.0036 ** (0.0012)	-0.0205	-0.0250 *** (0.0010)	-0.1506	-0.0271 *** (0.0010)	-0.0205
RWA_Ch	-0.0671 *** (0.0014)	-0.3533	-0.0599 *** (0.0016)	-0.3409	-0.0289 *** (0.0017)	-0.1741	-0.0260 *** (0.0001)	-0.3409
$CPR1_{t-1}$	0.8101 *** (0.0018)	**[0.1899]**	0.8243 *** (0.0066)	**[0.1757]**	--	--	--	--
$CPR2_{t-1}$	--	--	--	--	0.8340 *** (0.0012)	**[0.1660]**	0.8501 *** (0.0009)	**[0.1757]**
SIZE	-0.0084 *** (0.0002)	-0.0442	-0.0090 *** (0.0006)	-0.0512	-0.0090 *** (0.0006)	-0.0542	-0.0085 *** (0.0005)	-0.0512
Dummy	0.0006 ** (0.0002)	0.0032	0.0011 *** (0.0002)	0.0063	0.0017 *** (0.0002)	0.0102	0.0002 *** (0)	0.0063
Share_G:Reg	-0.0093 *** (0.0003)	0.1841	-0.0092 *** (0.0004)	0.1793	-0.0071 *** (0.0052)	0.1610	-0.0092 *** (0.0004)	0.1793
RE_S:Reg	-0.0178 *** (0.0011)	0.3286	-0.0255 *** (0.0023)	0.1783	-0.0196 *** (0.0005)	0.2370	-0.0203 * (0.0088)	0.1783
TGL_TA:Reg	0.0117 *** (0.0015)	0.0482	-0.0012 (0.0018)	0.0953	0.0052 *** (0.0011)	0.0744	0.0017 . (0.0009)	0.0953
IBL_Ch:Reg	-0.0011 *** (0.0004)	-0.0127	-0.0042 *** (0.0005)	-0.0110	-0.0010 *** (0.0003)	-0.0364	-0.0011 ** (0.0005)	-0.0110
Depo_Ch:Reg	0.0031 ** (0.0010)	-0.0462	-0.0041 *** (0.0009)	-0.0515	0.0043 *** (0.0012)	-0.1141	0.0048 *** (0.0015)	-0.0515
RWA_Ch:Reg	0.0076 *** (0.0011)	-0.3983	-0.0021 . (0.0012)	-0.4147	0.0026 (0.0018)	-0.1450	-0.0020 ** (0.0001)	-0.4147
$CPR1_{t-1}$:Reg	0.0405 *** (0.0067)	**[0.1494]**	0.0262 *** (0.0077)	**[0.1495]**	--	--	--	--
$CPR2_{t-1}$:Reg	--	--	--	--	-0.0154 *** (0.0033)	**[0.1814]**	-0.0212 *** (0.0020)	**[0.1495]**
Multiple R-square:	0.92		0.89		0.92		0.92	
Hausman Test for regressors within vs. random, chisq = 80.355, df=9, p-value = 1.374e-13					Hausman Test for regressors within vs. random chisq = 125.6, df=9, p-value < 2.2e-16			

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; ":Reg" is the dummy variable of the post-regulation period.

Source: Calculated by the authors

Table 3

Regression of partial adjustment models – equation (3)

Dependent variable:	CPR1				CPR2			
WLS estimation:	Within		Pooling		Within		Pooling	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share_G	0.0225 *** (0.0005)	0.1421	0.0291 *** (0.0009)	0.1584	0.0297 *** (0.0011)	0.1492	0.0244 *** (0.0006)	0.1654
RE_S	0.0524 *** (0.0006)	0.3307	0.0344 *** (0.0016)	0.1873	0.0460 *** (0.0040)	0.2313	0.0362 *** (0.0005)	0.2458
TGL_TA	0.0116 *** (0.0009)	0.0730	0.0177 *** (0.0012)	0.0962	0.0133 *** (0.0022)	0.0669	0.0139 *** (0.0006)	0.0945
IBL_Ch	-0.0010 *** (0.0002)	-0.0062	-0.0078 *** (0.0008)	-0.0422	-0.0074 *** (0.0006)	-0.0374	-0.0013 *** (0.0002)	-0.0089
Depo_Ch	-0.0121 *** (0.0004)	-0.0763	-0.0265 *** (0.0018)	-0.1440	-0.0219 *** (0.0021)	-0.1102	-0.0131 *** (0.0006)	-0.0892
RWA_Ch	-0.0565 *** (0.0006)	-0.3569	-0.0258 *** (0.0026)	-0.1407	-0.0312 *** (0.0031)	-0.1568	-0.0551 *** (0.0006)	-0.3742
$CPR1_{t-1}$	0.8416 *** (0.0023)	**[0.1584]**	0.8163 *** (0.0044)	**[0.1837]**				
$CPR2_{t-1}$					0.8010 *** (0.0108)	**[0.1990]**	0.8527 *** (0.0016)	**[0.1473]**
SIZE	-0.0039 *** (0.0003)	-0.0243	-0.0087 *** (0.0003)	-0.0474	-0.0061 *** (0.0015)	-0.0305	-0.0082 *** (0.0002)	-0.0555
Multiple R-square:	0.94		0.90		0.91		0.93	
Hausman Test for regressors within vs. random chisq > 16.572, df=8, p-value = 0.0464					Hausman Test for regressors within vs. random chisq > 15.6995, df=8, p-value = 0.0502			

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 authors

The coefficients of the IBL_Ch report the least influence of this indicator on the capital ratios. However, the interbank lending is a part of the bank's total lending, therefore, the statistically significant negative effect of the IBL_Ch in whole the sub-periods indicates that this part has a different trend to the remained lending. In the previous studies concerned above, the researchers did not analyse association between the capital regulation and the interbank lending separately from the total lending. Whereby, these IBL_Ch estimations are the novel findings, could add to the empirical evidence of the capital regulation implementation especially is the case of the Basel application in a developing country.

The coefficients of the Depo_Ch in the columns (2) and (6) of Table 2 are the statistically significant different association in between the sub-periods. In the post-regulation period, the Depo_Ch is negative association, then positive association with the capital ratios. This result might be opposite with the suggestion of Gorton & Winton (2003), points that in the post-regulation period raising capital requirements does not force banks to be supplied fewer deposits. However, in overall throughout the two sub-periods, the coefficients are the negative effect on the capital ratios and still confirm the suggestion of Gorton & Winton (2003).

It is surprise that the CPR1 is more sensitive with the change of RWA_Ch than the CPR2. In Table 2, the estimate in column (2) show that the RWA_Ch is the highest influence on the CPR1, while in column (6) the influence of RWA_Ch on CPR2 is the third magnitude, lower than the influence of the RE_S and the Share_G. These results provide evidence that the RWA_Ch is a high contribution channel for the adjustment of the capital ratios.

4.2. The capital regulation implementation and bank's efficiency

Table 4 shows the results of the regression analyses. The ROA is estimated with the same factors that estimated the adjustment speed of the capital ratios. Except the estimates of the IBL_Ch and the Dopo_Ch, the remains estimated by the fixed effects are consistent with the correlation coefficients.

Table 4

Regression equation (3)

Dependent variable	ROA			
WLS estimators	Within	Pooling	Within	Pooling
	(1)	(2)	(3)	(4)
Share_G	0.00001 (0.00001)	0.00014 *** (0.00001)	-0.00001 * (0)	0.00008 *** (0.00002)
RE_S	0.00112 *** (0)	0.00089 *** (0.00003)	0.00114 *** (0.00002)	0.00091*** (0.00002)
TGL_TA	-0.00066 *** (0)	-0.00024 *** (0.00003)	-0.00066*** (0.00001)	-0.00021*** (0.00003)
IBL_Ch	0.00003 *** (0)	0.00077 *** (0)	0.00004*** (0)	0.00007*** (0)
Depo_G	0.00021 *** (0.00001)	0.00028 *** (0.00003)	0.00023*** (0.00002)	0.00028*** (0.00004)
RWA_Ch	-0.00049 *** (0.00002)	-0.00057 *** (0.00003)	-0.00049 *** (0.00003)	-0.00051 *** (0.00003)
$CPR1_{t-1}$	0.00056 *** (0.00004)	0.00061 ** (0.00021)	--	--
$CPR2_{t-1}$	--	--	0.00010 (0.00008)	0.00010 (0.00018)
SIZE	-0.00014 *** (0.00001)	0.00008 *** (0.00002)	-0.00016 *** (0.00001)	0.00004 * (0.0000)
Multiple R-square:	0.51	0.30	0.51	0.53

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

Source: calculated by the authors

The second record, in overall, shows that all of the factors that influence on the speed of the capital regulation implementation statistically significant effect on the ROA. The R-square in Table 4 is significant to explain the ROA, indicates that the manner that the VcB implemented the capital regulation requirements were highly connected to the banks' ROA.

Theoretically, the estimates of the RE_S, Depo_Ch and the SIZE are consistent and confirmed. While the Share_G might evidence that the improvement of the banks' own capital is a positive relationship with the banks' earnings, supports and adds an evidence with Gombola et al. (2016).

In addition, in the two parts of the banks' lending, the statistically significant negative influence of the TGL_TA on the ROA indicates that the increase of the non-bank lending ratio did not support to the ROA while the IBL_Ch evidenced an inverse. These findings add to the previous studies a detail of the banks' lending behaviour in the Basel capital regulatory regime. In the case of Vietnam, in the banks' total lending, the increase of interbank lending could contribute to the improvement of the ROA while the remains might cause the increase of the credit risk, thereby the ROA became worse.

The RWA_Ch estimate shows a negative relationship with the ROA, similar to its relationship with the capital ratios. The influence of RWA_Ch is the third magnitude in the six estimator variables and statistically significant. The result indicates that when the VcB shifts to a higher average RWA, their ROA might be inferior and inverse otherwise.

Table 5

Regression equation: $ROA_{k,i,t} = LP\_TA_{i,t} + LA\_TA_{i,t} + IER_{i,t} + U_{k,i,t} + \mu_{k,i,t}$, k=1,2

Dependent variable	ROA1		ROA2	
WLS estimators:	Within	Pooling	Within	Pooling
	(1)	(2)	(3)	(4)
LP_TA	-0.00091 *** (0)	-0.00070 *** (0.00002)	-0.00093 *** (0.00001)	-0.00487 *** (0.00025)
LA_TA	-0.01943 *** (0.00067)	-0.00183 *** (0.00042)	-0.01564 *** (0.00071)	-0.00112 ** (0.00035)
IER	0.00034 *** (0)	0.00048 *** (0.00001)	0.00033 *** (0.00001)	0.00046 *** (0.00001)
U_1	0.005.73 *** (0.00018)	0.00726 *** (0.00034)	--	--
U_2	--	--	0.00487 *** (0.00025)	0.005.58 *** (0.00022)
Multiple R-square:	0.67	0.42	0.67	0.41

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

Source: Calculated by the authors

The third record supports all the authors' expectations of the relationship between the ROA and LP_TA, LA_TA, IER, U1 and U2. In which, the relationship between the ROA and LP_TA, LA_TA, IER are economically confirmed, similar to the findings of of Lee et al. (2013) that the capital improvement of commercial banks in middle income Asian countries has a negative effect on risk while also has a positive effect on profitability. Moreover, the relationship between the ROA and the residuals shown in Table 5 provides an evidence that almost all of the influences which connect to the adjustment of the capital ratios also effect on the ROA, in the case of the VcB.

5. DISCUSSION

In the pre-regulation period, the adjustment speed of CPR1 is 18.99 while the one of CPR2 is 16.6. It means that the adjustment of capital prudential ratio which calculated on RWA adjusted slower than the capital that calculated on the assets actual. Then, in the post-regulation period, the CPR1 adjusts at the speed 14.94 while the adjustment speed of the CPR2 is 18.14. Compare with the analyses of De Jonghe & Öztekin (2015) in the period from 1994 to 2010, the average adjustment speed estimate across 64 countries in a year is 29.7%. The adjustment speed of the VcB is over twice faster (18.99 x 4 and 16.6 x 4), similar to the maximum which is 74% in Panama. De Jonghe & Öztekin (2015) also identified that the undercapitalized banks mainly increase in the capital ratio using equity issuances to recapitalize rather than downsizing the bank. In the case of Vietnam, all of the VcB in the dataset of this article are the undercapitalized banks. Because of the prolong downturn of the stock market in Vietnam which occurred from 2009 till 2014, almost all the VcB did not using equity issuances to recapitalize as the priority solution, instead, the banks changed their RWA and aggregate retained earnings. The different sensitivity of the capital ratios on the influences of the RWA_Ch and the Share_G between the two sub-periods, the high coefficients of the RE_S in whole the sub-periods consolidated this argument. Unfortunately, the capital ratios show a decrease trend recently.

Practically and empirically, the banks which have a capital ratio that lower than the requirement often shift their risk-weighted asset portfolio to achieve the regulation requirement. In the case of the VcB, on the one hand, the State Bank of Vietnam set the risk-weighted for every asset of the VcB. On the other hand, the credit risk-weighted measurement or rating is handled by banks themselves. Thereby, if the VcB want to lower their riskiness assets, the most available assets for the risk-lowering should be the loans. To do such the lowering, banks might shift their lending from the higher risk loans to the lower risk loans. The lending volume of the VcB increased continuously in the throughout periods implies that the loans scale on the banks' assets became larger, might provide the VcB a higher RWA average shiftable. Therefore, to avoid the distortion ratings, the supervision must follow up the rating or credit risk measurement. Fratzscher et al. (2016) suggested that to assess the influence of capital regulation on domestic credit growth and banking stability, the capital regulation measurement should consider whether valuation gains may count towards the capital base or which rating based approaches are used to calculate the minimum capital requirements.

Theoretically, the banks' lending could be control by some instruments. 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. The reason that the small banks could not access the non-depositary debt markets as the large banks when they face the monetary policy, so they could not avoid the cost funding loans from a variety of domestic macroeconomic shocks. In the situation of the VcB, the authors suppose that the monetary policy effect is different from the argument of Aiyar et al. (2016) because all the VcB have a same problem as the small UK bank about the ability to approach the non-depositary debt markets and this market of Vietnam is not develop as the level in the developed countries. Therefore, if the monetary policy will be used to control the lending of VcB, there will no difference effect from these instruments on all the VcB. Consequently, the VcB might transfer the cost funding loans by means of increase the credit prices and experiment with the riskier loans (Lazányi et al., 2017).

The ROA has a negative association with the TGL_TA, RWA_Ch, LP_TA and LA_TA while has a positive association with the IBL_Ch, Depo_Ch and the IER. These empirical analyses might be interpreted that the banks spread their non-bank lending together with the riskier loans. Thus, the banks must finance for these higher expected losses as are represented by the LP_TA and the LA_TA. Even the IER has a positive influence on the ROA, but both the LP_TA and LA_TA show a higher negative influence on the ROA than the the influence from IER, consequently, the situation could cause the decrease of the ROA.

6. CONCLUSION

The empirical evidence indicates that the VcB have a high ability to adjust their capital ratios. In the post-regulation period, the VcB adjusted their risk-weighted capital ratio faster than the capital-to-total-assets ratio. However, both the capital ratios showed a decreased trend in recent.The banks used retained earnings and shifted the RWA rather than used share issuance for the implementation.

In throughout the periods, the lending andthe RWA increased continuously. The continuous increase of RWA caused the increase of loss provision and loss allowance. In accounting, these losses are deducted from capital. Consequently, although the VcB used retained earnings, share issuance to increase their capital but finally, adventure with RWA they lost their capital and had a worse ROA.

Even though the non-bank lending supported to the increase of the capital ratios, but this indicatorhad a negative association with the ROA and might cause the increase of the riskier loans. While the interbank lending was totally inverted.

The empirical analyses the ROA indicate that all the factor contributed to the adjustment speed of the capital ratios also had the associations with the ROA.

The result indicates that the supervision and regulation in Vietnam should control more to the capital improvement of the VCB in order to match the criteria of the Basel regulations, thereby the improvement of the ROA might be expected.

ACKNOWLEDGEMENT

The authorsare thankful to the Internal Grant Agency of FaME TBU No. IGA/FaME/2017/010: "Financial Constraints on Economic Activities", for financial support to carry out this research.

REFERENCES

Adrian, T., & Shin, H. S. (2010). Liquidity and leverage. *Journal of Financial Intermediation*, *19*(3), 418-437. https://doi.org/10.1016/j.jfi.2008.12.002

Aiyar, S., Calomiris, C. W., & Wieladek, T. (2016). How does credit supply respond to monetary policy and bank minimum capital requirements?. *European Economic Review*, *82*, 142-165. https://doi.org/10.1016/j.euroecorev.2015.07.021

Allen, B., Chan, K. K., Milne, A., & Thomas, S. (2012). Basel III: Is the cure worse than the disease? *International Review of Financial Analysis*, *25*, 159-166. https://doi.org/10.1016/j.irfa.2012.08.004

Angkinand, A. P. (2009). Banking regulation and the output cost of banking crises. *Journal of International Financial Markets, Institutions and Money*, *19*(2), 240-257. https://doi.org/10.1016/j.intfin.2007.12.001

Aniunas, P., Gipiene, G., Valukonis, M., & Vijuna, M. (2017). Liquidity risk management model for local banks. *Transformations in Business & Economics*, *16*(1), 153-172.

Apătăchioae, A. (2015). The Performance, Banking Risks and their Regulation. *Procedia Economics and Finance*, *20*, 35-43. https://doi.org/10.1016/S2212-5671(15)00044-1

Balcerzak, A. P., Kliestik, T., Streimikiene, D., & Smrčka, L. (2017). Non-parametric approach to measuring the efficiency of banking sectors in European Union Countries. *Acta Polytechnica Hungarica*, *14*(7), 51-70.

Barth, J. R., Lin, C., Ma, Y., Seade, J., & Song, F. M. (2013). Do bank regulation, supervision and monitoring enhance or impede bank efficiency?. *Journal of Banking & Finance*, *37*(8), 2879-2892. https://doi.org/10.1016/j.jbankfin.2013.04.030

Bhasin, M. (2016). Challenge of mitigating bank frauds by judicious mix of technology: Experience of a developing country. *Economics, Management and Sustainability, 1*(1), 23-41. https://doi.org/10.14254/jems.2016.1-1.3

Bobriková, M. & Harčariková, M. (2017). Financial engineering with options and its implementation for issuing of new financial innovations. *Montenegrin Journal of Economics*, *13*(3), 7-18.

Boot, A. W., & Thakor, A. V. (1997). Financial system architecture. *Review of Financial Studies*, *10*(3), 693-733.

Cipovova, E., & Belas, J. (2012). Assessment of Credit Risk Approaches in Relation with Competitiveness Increase of the Banking Sector. *Journal of Competitiveness*, *4*(2), 69-84. https://doi.org/10.7441/joc.2012.02.05

Cohen, B. H., Scatigna, M., & Bank for International Settlements. (2014). *Banks and capital requirements: channels of adjustment.*

Cook, D. O., & Tang, T. (2010). Macroeconomic conditions and capital structure adjustment speed. *Journal of Corporate Finance*, *16*(1), 73-87. https://doi.org/10.1016/j.jcorpfin.2009.02.003

Dang, V. A., Kim, M., & Shin, Y. (2014). Asymmetric adjustment toward optimal capital structure: Evidence from a crisis. *International Review of Financial Analysis*, *33*, 226-242. https://doi.org/10.1016/j.irfa.2014.02.013

De Jonghe, O., & Öztekin, Ö. (2015). Bank capital management: International evidence. *Journal of Financial Intermediation*, *24*(2), 154-177. https://doi.org/10.1016/j.jfi.2014.11.005

Duhnea, C., Vancea, D.P.C., Frecea, L.-G. (2017). IPO Underpricing in Emerging Capital Markets: A Comparative Study of Romania, Bulgaria and Hungaryю *Transformations in Business & Economics*, 16(2A), 478-494.

Fiordelisi, F., Marques-Ibanez, D., & Molyneux, P. (2011). Efficiency and risk in European banking. *Journal of Banking & Finance*, *35*(5), 1315-1326. https://doi.org/10.1016/j.jbankfin.2010.10.005

Fratzscher, M., König, P. J., & Lambert, C. (2016). Credit provision and banking stability after the Great Financial Crisis: The role of bank regulation and the quality of governance. *Journal of International Money and Finance*, *66*, 113-135. https://doi.org/10.1016/j.jimonfin.2016.02.015

Gavurova, B., Belas, J., Kocisova, K., Kliestik, T. (2017). Comparison of Selected Methods for Performance Evaluation of Czech and Slovak Commercial Banks. *Journal of Business Economics and Management, 18*(5), 852-876 https://doi.org/10.3846/16111699.2017.1371637

Gombola, M. J., Ho, A. Y.-F., & Huang, C.-C. (2016). The effect of leverage and liquidity on earnings and capital management: Evidence from U.S. commercial banks. *International Review of Economics & Finance*, *43*, 35-58. https://doi.org/10.1016/j.iref.2015.10.030

Gorton, G., & Winton, A. (2003). Financial intermediation. *Handbook of the Economics of Finance*, *1*, 431-552.

Hovakimian, A., & Li, G. (2011). In search of conclusive evidence: How to test for adjustment to target capital structure. *Journal of Corporate Finance*, *17*(1), 33-44. https://doi.org/10.1016/j.jcorpfin.2010.07.004

Kliestik, T., Misankova, M., Valaskova, K., & Svabova, L. (2018). Bankruptcy prevention: new effort to reflect on legal and social changes, *Science and Engineering Ethics,* 24(2), 791-803. https://doi.org/10.1007/s11948-017-9912-4

Kodasheva, G, Parusimova, N, Rispekova, M. & Uchkampirova, A. (2017). Actual problems of development of the banking sector in the economy of Kazakhstan. *Banks and Bank Systems*, *12*(3), 257-268. doi:10.21511/bbs.12(3-1).2017.10

Kozmenko, S, Shkolnyk, I., & Bukhtiarova, A. (2016). Dynamics patterns of banks evaluations on the basis of Kohonen self-organizing maps. *Banks and Bank Systems*, *11*(4-1), 179-192. doi:10.21511/bbs.11(4-1).2016.09

Kozmenko, S., & Belova, I, (2015). Peculiarities of identification of systemically important banks and assessment of their impact of the occurrence of economic crisis. *Banks and Bank Systems*, *10*(3), 39-48.

Kozubíková, L., Homolka, L., & Kristalas, D. (2017). The Effect of Business Environment and Entrepreneurs' Gender on Perception of Financial Risk in The Smes Sector. *Journal of Competitiveness, 9*(1), 36-50. https://doi.org/10.7441/joc.2017.01.03

Kozubíková, L., Belás, J., Bilan, Y., & Bartoš, P. (2015). Personal characteristics of entrepreneurs in the context of perception and management of business risk in the SME segment. *Economics and Sociology*, *8*(1), 41-54. https://doi.org/10.14254/2071-789X.2015/8-1/4

Kunitsyna, N., Britchenko, I., & Kunitsyn, I. (2018). Reputational risks, value of losses and financial sustainability of commercial banks. *Entrepreneurship and Sustainability Issues*, *5*(4), 943-955. https://doi.org/10.9770/jesi.2018.5.4(17)

Lazányi, K., Virglerová, Z., Dvorský, J., & Dapkus, R. (2017). An Analysis of Factors Related to" Taking Risks", according to Selected Socio-Demographic Factors. *Acta Polytechnica Hungarica*, *14*(7), 35-50.

Lee, T.-H., & Chih, S.-H. (2013). Does financial regulation affect the profit efficiency and risk of banks? Evidence from China's commercial banks. *The North American Journal of Economics and Finance*, *26*, 705-724. https://doi.org/10.1016/j.najef.2013.05.005

Ly, K. C., Chen, Z., Wang, S., & Jiang, Y. (2017). The Basel III net stable funding ratio adjustment speed and systemic risk. *Research in International Business and Finance*, *39*, 169-182. https://doi.org/10.1016/j.ribaf.2016.07.031

Manlagnit, M. C. V. (2015). Basel regulations and banks' efficiency: The case of the Philippines. *Journal of Asian Economics*, *39*, 72-85. https://doi.org/10.1016/j.asieco.2015.06.001

Ohanyan G., & Androniceanu, A. (2017). Evaluation of IMF program effects on employment in the EU. *Acta Oeconomica*, *67*(3), 311-332.

Pessarossi, P., & Weill, L. (2015). Do capital requirements affect cost efficiency? Evidence from China. *Journal of Financial Stability*, *19*, 119-127. https://doi.org/10.1016/j.jfs.2014.11.002

Popovic, Z. & Paunovic, M. (2018).The Dependence of the Cost of Capital on Degree of Diversification. *Montenegrin Journal of Economics*, *14*(1), 53-67.

Shimizu, K. (2015). Adjusting denominators of capital ratios: Evidence from Japanese banks. *Journal of Financial Stability*, *19*, 60-68. https://doi.org/10.1016/j.jfs.2015.05.005

Tung, H. T. (2017). Adjustment of interbank lending in pre- and post-regulation periods: Empirical analysis of Vietnamese commercial banks. *Journal of International Studies*, *10*(3), 64-76. https://doi.org/10.14254/2071-8330.2017/10-3/5

Xu, J. X., Li, N., & Ahmad, M. I. (2018). Banking performance of China and Pakistan. *Entrepreneurship and Sustainability Issues*, *5*(4), 929-942. https://doi.org/10.9770/jesi.2018.5.4(16)

Zhou, Q., Tan, K. J. K., Faff, R., & Zhu, Y. (2016). Deviation from target capital structure, cost of equity and speed of adjustment. *Journal of Corporate Finance*, *39*, 99-120. https://doi.org/10.1016/j.jcorpfin.2016.06.002