Basel III: How Have Czech Banks Reached Higher Capital Ratios?[1]

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Abstract

According to the Czech National Bank, the average capital adequacy of Czech banks increased from 14.1% in 2009 to 17.1% in 2013. For the sample of 17 Czech banks we aim to identify the strategies that Czech banks adopted in order to increase their capital ratios. Our analysis shows that as with the large multi-national banks from advanced economies, retained earnings have played a major role in increasing the average capital ratio of Czech banks. In addition, the Czech banks have decreased their risk to strengthen the overall ratio. The results of our analysis are useful mainly from a regulatory point of view as currently the countercyclical buffer is set to its minimum of 0% of risk-weighted assets and the Czech National Bank may increase the buffer up to 2.5% in the medium or long-term.

Keywords: *Basel III, capital adequacy, bank capital*

JEL Classification: G21, G28

Introduction

In late 2009, in response to the financial crisis, the Basel Committee on Banking Supervision (BCBS) published the first version of the Basel III regulation. Among other goals, Basel III specifically aims to improve the quantity of capital which banks have to hold by providing additional stability through new capital buffers. In addition, it aims to improve the quality of capital by redefining Tier 1 and Tier 2 capital.

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Czech banks started to react to the new regulatory framework promptly. As a result, as the CNB (2014b) data shows, the average capital adequacy of Czech banks increased significantly from 14.1% at end-2009 to 17.1% at end-2013.

Based on sample of 17 Czech banks we aim to identify the strategies that Czech banks adopted in order to increase their risk-weighted capital ratios from 2009 to 2013. We address the following questions: Have the Czech banks increased their capital ratios by decreasing risk, increasing capital or both? What has played the major role? How has the average portfolio risk changed? Is there a difference in adjustment strategy between different groups of banks?

We answer these questions by decomposing the change in risk-weighted capital ratio from end-2009 to end-2013. In general, there are three factors that influence the increase in capital ratio: change in capital, change in portfolio riskiness and change in total assets. We separate, measure and describe contribution of each of the three factors in increasing capital ratio.

The results of our analysis are useful from a regulatory point of view. The countercyclical buffer, which was introduced by Basel III, is currently set in the Czech Republic to its minimum of 0% of risk-weighted assets. It may be increased by the Czech National Bank (CNB) up to 2.5% in medium or long-term.

As already suggested, a bank has a variety of options when it aims to improve its risk-weighted capital ratio. A bank's choice of strategy will determine the macroeconomic impact of increase in its capital ratio. The main contribution of this paper is in identifying the major strategy of Czech banks, measuring its importance and discussing its potential macroeconomic effect: who and how is mostly affected by the strategy.

Research based on Czech banking sector is interesting because, as Horváth, Seidler and Weill (2014) note, it does not contain very large banks. It contains banks of various sizes with mainly small banks. The research on channels of capital ratio adjustment might be of particular importance because small banks face greater difficulties in increasing their capital ratios.

This paper is organized as follows:

Section 1 describes the new capital requirements and summarizes related literature.

Section 2 introduces a methodology for strategy analysis and presents our dataset.

Section 3 presents the results of an empirical analysis: how bank capital, portfolio risk and total assets interacted in increasing capital ratios. The results are compared among different groups of banks.

Section 4 discusses our results and the last section concludes and provides motivation for further research.

1. Basel III Capital Requirements and Literature Review

This section consists of two parts. In the first part we discuss the current regulatory framework and we introduce the tightened capital requirements under Basel III. The second part presents related literature.

1.1. Capital Requirements under Basel III

The financial crisis showed that not all banks had satisfactory capital levels. Moreover, some banks had capital of low quality, and so could not absorb the losses. Basel III reacts to both weaknesses. It requires banks to hold substantially more capital of higher quality compared to Basel II. The new capital requirements are tightened so that bank shareholders rather than taxpayers will bear most or all of the downside risk of bank losses.

In The European Union, Basel III regulation has been put into practice via the legislative package Capital Requirements Directive (the so-called CRD IV package). The CRD IV package came into force on 17 July 2013, and applies from 1 January 2014.

The primary focus of this study is the adjustment of banks to higher capital requirements, so we discuss the rules on quantity and quality of capital in more detail. According to the new definition (BCBS, 2011), capital comprises two components: going-concern Tier 1 capital and gone-concern Tier 2 capital. Tier 1 capital consists of Common Equity Tier 1 (CET 1) capital and Additional Tier 1 Capital.

CET 1 capital is the highest quality capital. Common shares and retained earnings must form the predominant part of CET 1. The quantity of minimum capital levels (compared to Basel II) is required as follows:

a) minimum requirement for CET 1 capital is more than doubled from 2% to 4.5% of risk- -weighted assets (RWA);

b) minimum requirement for Tier 1 capital is increased from 4% to 6.0% of RWA;

c) minimum total capital, which consists of Tier 1 and Tier 2, remains unchanged and totals 8% of RWA.

The new capital ratios are calculated after a number of regulatory deductions and adjustments are made. This includes the deduction of goodwill, other intangibles or deferred tax assets from Tier 1. IRB banks have to deduct any shortfall of provisions to expected losses from Tier 1.

On top of changes in the structure of Tier 1 and Tier 2 capital, Basel III introduces two new buffers: a capital conservation buffer of 2.5% and a countercyclical buffer of 0 – 2.5%. Both buffers need to be covered by the highest quality

CET 1 capital. Additional capital surcharges of up to 3.0% for systemically important financial institutions (SIFIs) are effective as well. The SIFI surcharge needs to be covered by CET 1 capital.

1.2. Literature Review

From the broad perspective of banking regulation, Stiglitz (2009) or Freixas and Rochet (2008) summarizes the basic arguments (market failures such as information asymmetry and incentive structures) of mainstream theory regarding the necessity of financial regulation. Mandel and Tomšík (2011) analyze banking regulation from the point of view of economic theory. They explain that different schools of economic thought (the Austrian school, monetarists or post-Keynesian economists) have different views on banking regulation. All theoretical schools, however, agree on the need for some form of banking regulation. Other classical works on regulation include Stigler (1971), Dewatripont and Tirole (1994), Mishkin (2000) or González (2005). For an overview of contemporary theories and empirical studies on banking regulation we refer to Santos (2001) or Tchana (2009).

The literature on the channels of adjustment to the new Basel III requirements shows that capital ratios have increased since the financial crisis in 2008 for banks worldwide. For example, Cohen and Scatigna (2014) conclude that for a sample of 94 large banks from advanced and emerging economies, which cover 64% of the assets of the top 1,000 global banks, capital ratio increased from 11.4% at end-2009 to 13.9% at end-2012. During the same period, for a sample of top 16 US banks the ratio increased from 14.0% to 17.6% and for a sample of 35 large European banks the ratio rose from 12.1% to 14.5% during the same period. Their analysis shows that retained earnings account for the bulk in increase in capital ratio with reductions in risk playing a lesser role. Cannata et al. (2013) on a sample of 13 Italian banking groups state similarly that the improvement in capital ratios during end-2010 and end-2012 was driven more by capital increase than a decrease in risk.

In recent years many observers have expressed concerns that if banks have to hold more capital, this will have a negative macroeconomic impact as the banks may pull back from lending to finance investment. As a response, a number of studies have evaluated the potential macroeconomic impact of Basel III. An analysis of the potential increase in lending spread and decrease of annual GDP growth rate was carried out by Miles, Jing Yang and Marcheggiano (2013), Šútorová and Teplý (2013), Roger and Vlček (2011), Slovik and Cournede (2011), IIF (2011), Kashyap, Stein and Hanson (2010), MAG (2010) or King (2010). The impact estimates of one percentage point increase in capital ratio on lending

spread and on annual GDP growth rate differ even within the same region. For example, for the EU area Roger and Vlček (2011) predict that one percentage point increase in capital ratio leads to an increase of lending spread of 65 basis points while Šútorová and Teplý (2013) predict an increase of only 19 basis points. When comparing the impact of Basel III on global growth, MAG (2010) predicts a decrease of only 5 basis points over 4 years while, for example, IIF (2011) forecasts a total drop of 30 – 60 basis points over 5 years.

2. Methodology and Data

This section consists of two parts. The first part introduces the model used for empirical analysis. The second part presents the dataset of 17 Czech banks in sample.

2.1. Methodology

In order to understand how banks have responded to tighter capital requirements, we analyze the changes in the risk-weighted capital ratio and distinguish the basic components. We follow the methodology presented by Cohen and Scatigna (2014).

There are three factors that influence the change in capital ratio: change in capital, change in riskiness of portfolio (risk-weighted assets to total assets) and change in total assets. Equation 1 isolates the changes from time 0 and time 1 as follows:

$$\frac{CAR_1}{CAR_0} = \frac{K_1 / K_0}{\left(\frac{RWA_1 / TA_1}{RWA_0 / TA_0} \right) \frac{TA_1}{TA_0}} \tag{1}$$

where

CAR_i – capital adequacy ratio at time i,
K_i – regulatory capital at time i,
RWA_i – risk-weighted assets at time i,
TA_i – total assets at time i.

In contrast to Cohen and Scatigna (2014), we do not focus our analysis on changes in common equity but our approach is more direct. We focus on changes in regulatory capital. Regulatory capital is likely to be less than the capital reported on balance sheets because of the deduction for goodwill, other intangible assets, deferred tax assets and other items, as noted in section 1.

In order to better understand the impact of different factors on percentage point change in the capital adequacy, it is helpful to transform the equation 1 so that different quantities can be expressed as additive components. To do this, we take logarithms of equation 1.

$$Log\left(\frac{K_1 / RWA_1}{K_0 / RWA_0}\right) = Log\left(\frac{\frac{K_1}{K_0}}{\left(\frac{RWA_1 / TA_1}{RWA_0 / TA_0}\right)\frac{TA_1}{TA_0}}\right) \tag{2}$$

Then we multiply both sides of the equation 2 by a common factor, so the resulting equation is as follows:

$$\frac{K_1}{RWA_1} - \frac{K_0}{RWA_0} = F \cdot Log\left(\frac{K_1}{K_0}\right) - F \cdot \left(Log\left(\frac{RWA_1}{TA_1}\right) - Log\left(\frac{RWA_0}{TA_0}\right)\right) - F \cdot Log\left(\frac{TA_1}{TA_0}\right) \tag{3}$$

Where F, the normalization factor, equals:

$$F = \frac{\frac{K_1}{RWA_1} - \frac{K_0}{RWA_0}}{Log\left(\frac{K_1}{RWA_1}\right) - Log\left(\frac{K_0}{RWA_0}\right)} \tag{4}$$

We use the equations 3 and 4 to decompose the increase in capital ratio in section 3 so we show sources of changes in bank capital normalized to percentage points (p. p.) of risk-weighted assets.

2.2. Data

According to the Czech National Bank (CNB, 2014b) statistics, as of December 2013 there were 23 commercial banks (including five building societies with a specialized banking license) and 21 foreign bank branches operating in the Czech Republic, hence 44 banks in total. The total assets of the Czech banking sector stood at CZK 5,142 billion at the end-2013. The vast majority of Czech banks are foreign-owned. Czech banks maintain a traditional, conservative business model concentrated on the domestic market, i.e. providing loans to households and to non-financial corporations. Bank business activities are mainly financed from high volume of domestic deposits, which is well illustrated with relatively stable and low loan-to-deposit ratio constantly under 80%, which is exceptional in Europe.

The Czech banking sector structure is fairly stable, however, from a long-term perspective. Four large banks (by current methodology over CZK 250 billion in assets), ČSOB (KBC Group), Česká spořitelna (Erste Group), Komerční banka (Le Groupe Société Générale), and UniCredit Bank – manage approximately 59% of all assets. As noted in the Czech Banking Association (2013) report, all competition indicators reflect an environment of healthy competition among Czech banks.

European Banking Federation report (EBF, 2012) summarizes that Czech banks have been only marginally hit by the financial, mortgage and sovereign--debt crisis of 2008 – 2012. There was neither public assistance nor taxpayers' money needed to be pumped into the banking sector for a number of reasons. The banks have held very few exotic 'toxic assets', their exposure to Greece's government bonds is low. They report very favorable loan-to-deposit ratio and favorable liquidity position leading to a very low dependence on the inter-bank market. Moreover most banking activities are undertaken in domestic currency (both on the assets' and liabilities' side of the balance sheets) implying low exposure to foreign exchange.

Finally, as already noted, they maintain traditional conservative business model, they enjoy excellent capital adequacy and most of the capital is made up of high-quality Tier 1 capital (as of December 2013 the capital ratio for the sector stood at 17.1% and Tier 1 capital ratio came to 16.8%). Good capitalization has enabled the Czech banks to sustain even extremely stressful scenarios simulated by conservative supervision of the Czech central bank. The Czech banking sector has remained consistently very profitable throughout the crisis with return on equity (ROE) between 15 and 20%. Czech National Bank (CNB, 2014a) concludes this figure significantly outperforms not only the Eurozone's average but Western-European regional peers as well.

To get data on individual Czech banks we use the Bankscope database. In order to analyze the adjustment strategy between December 2009 and December 2013 we exported the dataset of all Czech banks that existed at the beginning and end of that period. End-2009 is a starting point of our observation period because in 2009 the BCBS published first set of documents (e.g. BCBS, 2009) which revised Basel II standards, hence, in 2009 it published the first version of Basel III which suggested higher capital requirements.

New banks which started to operate in 2010 or later (such as Air Bank) and state owned banks which have specialized banking (such as Česká exportní banka) were not included in the sample. In addition, foreign bank branches (not to be confused with subsidiaries of foreign banks) are not included in the sample because they do not hold any equity in the Czech Republic.

The list of 17 commercial banks with total assets of CZK 4,692 billion at end-2013 is the starting point for our analysis. Our sample of 17 banks accounts for 94% of total assets of 23 Czech banks which have to hold capital. For the list of banks in the sample, their total assets at end-2013 and their capital adequacy ratios see the table below.

T a b l e 1

List of Banks in Sample

#	Name	Total assets bil. CZK (2013)	Capital adequacy (2013)	Capital adequacy (2009)	Capital adequacy change (2013 – 2009)	Size**	Under press.	Build. savings bank
			a	b	c = a – b			
1	ČSOB	1 034.8	15.6%	15.0%	0.6%	L		
2	Česká spořitelna	968.7	18.6%	12.2%	6.4%	L	•	
3	Komerční banka	864.0	15.8%	14.1%	1.7%	L		
4	UniCredit Bank	464.6	15.4%	12.6%	2.8%	L	•	
5	Hypoteční banka	213.9	33.8%	40.2%	–6.4%	M		
6	Raiffeisenbank	197.0	13.7%	11.1%	2.6%	M	•	
7	Českomor. stav. spoř.	165.6	16.1%	15.7%	0.3%	M		•
8	GE Money Bank	134.6	23.7%	19.1%	4.6%	M		
9	J&T BANKA	110.2	15.9%	11.8%	4.1%	M	•	
10	PPF banka	105.0	11.6%	10.5%	1.1%	M	•	
11	Stav. spoř. České spoř.	99.2	13.4%	23.5%	–10.1%	M		•
12	Modrá pyramida	82.2	21.1%	11.1%	10.0%	M	•	•
13	Raiffeisen stav. spoř.	81.9	13.9%	10.1%	3.7%	M	•	•
14	Sberbank CZ	70.5	15.8%	15.5%	0.3%	M		
15	Wüstenrot stav. spoř.	43.0	14.4%	10.5%	3.9%	S	•	•
16	LBBW Bank CZ	31.5	15.8%	12.9%	2.8%	S	•	
17	Wüstenrot hypo. banka	25.0	11.1%	12.1%	–1.0%	S	•	
	Total*	4 691.8	16.4%	14.3%	2.1%			

* Total for columns a, b, c = weighted average using end-2013 assets as weights.

** L – large, M – medium, S – small.

Source: Bankscope; author's calculations.

The average capital adequacy of the banks in the sample increased from 14.3% at end-2009 to 16.4% at end-2013. These capital figures comfortably exceed the 2014 benchmark of the 10.5% minimum limit (Tier 1 plus Tier 2 plus the conservation buffer). Even the four largest banks considered to be systemically important reported capital ratios higher than the required 11.5 – 13.5% (Tier 1 plus Tier 2 plus the conservation buffer plus the SIFI surcharge). Their capital ratios exceeded 15% at end-2013.

The CNB average figures are slightly different. According to the CNB (2014b), the average capital ratio increased from 14.1% in December 2009 to 17.1% in December 2013. Our figures differ for two reasons. Firstly, our sample

does not include all Czech banks, only those that existed at both: end-2009 and end-2013. Secondly, we show a weighted average using end-2013 assets as weights.

In addition to analyzing the whole sample of 17 banks we created six additional subsamples where we focused on 'banks under regulatory pressure'. The remaining five subsamples included banks not under regulatory pressure, large banks, medium banks, small banks and building saving banks. We traced and compared the adjustment strategy between different groups of banks as we expected that there would be differences among the groups of banks.

The banks under regulatory pressure can be identified in several ways. We adopted a simple approach wherein the bank was under regulatory pressure if the bank´s capital was below the 13% level as of December 2009. The 13% capital ratio is arbitrary. It consists of the 8% regulatory minimum, the 2.5% conservation capital and the 2.5% countercyclical buffer. We set the ratio to 13% as this was the minimum level at which a bank was prepared for the implementation of the conservation and the countercyclical buffer in full amount.

Table 1 shows that our sample included the 10 banks with a capital ratio below the 13% threshold at end-2009. Hence, these banks were considered to be 'under regulatory pressure'. We expected that these banks would boost their capital more than their peers as they were closer to the minimum limits. We wanted to analyze whether these banks behaved differently compared to other banks. The complementary group is the group of banks with capital ratio above 13% at end-2009. These were the banks 'not under regulatory pressure'.

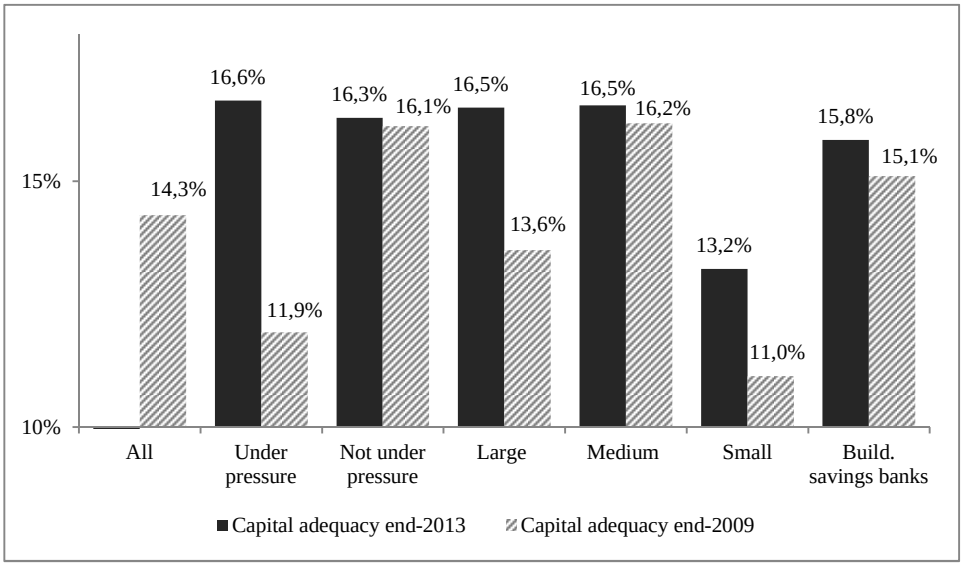
Following the CNB definitions, large banks were banks with total assets (at December 2013) above CZK 250 billion medium banks with total assets between CZK 50 and 250 billion and small banks with total assets below CZK 50 billion. The last group of banks that we recognized was building savings banks which are specialized banks. There were five building savings banks in the Czech Republic.

Figure 4 shows the changes in risk-weighted capital ratios from end-2009 to end-2013 for 'all banks' and the additional six subgroups: banks under pressure (10 banks), banks not under pressure (7 banks), large banks (4 banks), medium sized banks (10 banks), small banks (3 banks) and building savings banks (5 banks). The figures are shown in terms of weighted averages using end-2013 total assets as weights.[2]

[2] Unless stated otherwise, the capital ratio figures in text, graph and tables are weighted averages using end-2013 total assets as weights. This applies not only for the full sample of 17 banks but for each of the six subsamples as well.

F i g u r e 1

Change in Bank Capital Ratios, end-2009 to end-2013



Source: Bankscope; author's calculations.

As already mentioned, the banks in our sample increased their risk-weighted capital ratio by 2.1 p. p, from 14.3% at end-2009 to 16.4% to end 2013. However, we noticed big differences among different groups of banks.

Figure 1 shows that the increase was driven mainly by the banks which were under regulatory pressure in 2009. The banks under regulatory pressure increased their capital ratio by 4.7 p. p. from 11.9% at end-2009 to 16.6% at end-2013.

The banks which were not under regulatory pressure saw almost no change in their capital ratio, their capital ratio increased only by 0.2 p. p. during the 4-year period. The reason is that the capital ratio of the banks not under pressure was already rather high in 2009. These banks did not have any strong motivation to increase their capital levels. From the perspective of size, figure 1 shows that it was mainly the small banks that had low capital adequacy at end-2009, therefore this group of banks needed the most to boost their capital.

In the next chapter we attempt to answer the question in the title and in the introduction of our study. Did the Czech banks increase their capital ratios by decreasing risk, increasing capital or both? What played the major role? How did the average portfolio risk change? Was there a difference in adjustment strategy between different groups of banks?

3. Empirical Analysis

Regulatory capital of the banks in the sample increased during the 2009 – 2013 period by more than 30%, from CZK 281 billion to CZK 378 billion (Table 2). The rise was considerable for the banks under pressure. They accounted for CZK 71 billion of the CZK 97 billion increase. Capital rose for all groups of banks, as shown in table 2 and 3. Total assets (TA) and risk-weighted assets (RWA) rose for all of the groups as well.

T a b l e 2

Bank Capital and Assets, 2009 – 2013 (in CZK billion)

	Count	End-2013			End-2009		
		Total assets	RWA	Regulatory capital	Total assets	RWA	Regulatory capital
All	17	4 692	2 209	378	3 810	1 967	281
Under pressure	10	2 109	1 153	188	1 634	979	117
Not under pressure	7	2 583	1 055	190	2 176	988	164
Large	4	3 332	1 476	244	2 674	1 375	185
Medium	10	1 260	682	127	1 061	544	90
Small	3	99	51	7	75	48	6
Build. savings banks	5	472	138	22	457	128	18

Source: Bankscope; author's calculations.

Measured in relative terms, Table 3 shows three important findings. Firstly, regulatory capital grew substantially in most of the subsamples. The most notable capital increase was in the group of banks under pressure where the capital rose by 70%, from CZK 117 billion in 2009 to CZK 188 billion in 2013. By contrast, the banks not under pressure increased their capital less, only by 12% from CZK 164 billion in 2009 to CZK 190 billion in 2013.

T a b l e 3

Change in Bank Risk, Capital and Total Assets, 2009 – 2013 (in %)

	Count	RWA/TA 2013	RWA/TA 2009	Change in risk	Change in regulatory capital	Change in total assets
		a	b	c = a/b –1	d	e
All	17	0.45	0.50	–9.2%	36.7%	28.4%
Under pressure	10	0.55	0.62	–11.2%	69.9%	41.6%
Not under pressure	7	0.38	0.42	–7.6%	11.5%	18.4%
Large	4	0.44	0.53	–15.8%	30.9%	27.1%
Medium	10	0.47	0.45	6.5%	49.6%	29.8%
Small	3	0.48	0.58	–16.2%	41.4%	50.0%
Build. savings banks	5	0.29	0.28	9.4%	25.5%	3.4%

Note: Weighted averages using end-2013 total assets as weights are shown.

Source: Bankscope; author's calculations.

Secondly, all the banks enjoyed high growth of total assets, apart from the building savings companies where the business remains under pressure, lending continues to fall and is losing to mortgages, and the volume of the savings has been stagnating since 2010 as the state support falls. Finally, a rather surprising finding: on average Czech banks grew in size and lowered their average risk. Risk we define as the ratio of risk-weighted assets to total assets (RWA/TA). The average risk, decreased from 0.50 in 2009 to 0.45 in 2013, hence, the average risk was about 9% lower in 2013 than four years earlier.

The most significant decrease in risk we observed in the group of small banks where the ratio dropped from 0.58 at end-2009 to 0.48 at end-2013, hence a 16% decrease in average risk. By contrast, the building savings banks were the only group of banks which increased its portfolio riskiness, from 0.28 in 2009 to 0.29 in 2013.

However, Table 3 confirms that the average risk of building savings banks was substantially lower than in other commercial banks. Average risk of the building savings banks totaled 0.29 at end-2013 while for the full sample the figure amounted to 0.46. It is worth noting that the average risk of the banks under pressure was noticeably higher than the average risk of the banks that were not under pressure, 0.55 and 0.38 respectively at end-2013.

Decrease of risk was an important source of the increase in capital ratio. Comparing the change in average risk between the banks not under pressure and the banks under pressure, we can conclude that the development was similar. Both groups decreased their risk by 8% and 11% respectively.

This result suggests that Czech banks shifted their assets to classes with lower risk weights. A decrease in portfolio risk may be natural especially when demand for loans is weakening. If demand for loans drops then the bank's ratio of loans to total assets decreases and the portfolio riskiness falls as well if a bank holds the proceeds of loan repayments in government bonds. A natural decrease in portfolio risk does not constrain investment and consumption.

On the other hand, it may also indicate, as BIS (2014) warns on a global level, that something more than a genuine reduction in assets' riskiness has been at play. There is a risk that since the financial crisis banks might have redesigned their risk models in order to lower capital requirements by underestimating risk and providing optimistic asset valuations. This concern would be intensified if we observed that risk weights for similar assets varied substantially across banks.

In order to better understand the impact of different factors on risk-weighted capital ratios, we use equation 3 to express different components of capital adequacy change as additive factors. Calculating elements of equation 3 gives us the results presented in Table 4.

T a b l e 4

Sources of Changes in Bank Capital Ratios, 2009 – 2013 (in percent, normalised to percentage points of risk-weighted assets)

	Count	Capital adequacy 2013	Capital adequacy 2009	Change in capital adequacy	Change in regulatory capital	Change in risk	Change in total assets
		a	b	c = a – b = d + e + f	d	e	f
All	17	16.4%	14.3%	2.1%	4.2%	1.4%	–3.4%
Under pressure	10	16.6%	11.9%	4.7%	6.9%	1.8%	–4.0%
Not under pressure	7	16.3%	16.1%	0.2%	2.0%	1.0%	–2.9%
Large	4	16.5%	13.6%	2.9%	3.7%	2.6%	–3.4%
Medium	10	16.5%	16.2%	0.4%	5.3%	–1.5%	–3.4%
Small	3	13.2%	11.0%	2.2%	3.7%	2.3%	–3.8%
Build. savings banks	5	15.8%	15.1%	0.7%	2.4%	–1.2%	–0.5%

Note: Weighted averages using end-2013 total assets as weights are shown.

Source: Bankscope; author's calculations.

Table 4 shows how the change in capital adequacy from 14.3% at end-2009 to 16.4% at end-2013 (see 'All' banks row), which represents an increase of 2.1 p. p., can be broken down as follows: roughly 4.2 p. p. of the overall increase reflected higher capital; an additional increase of 1.4 p. p. resulted from a decline in risk-weighted assets. These two positive effects, totaling 5.6 p. p. (of which 75% reflected higher capital and 25% resulted from a decline in risk-weighted assets), were counteracted by the rise in total assets, less the equivalent of 3.4 p. p. from the ratio which gives us (after rounding down) the final 2.1 p. p. of capital adequacy change.

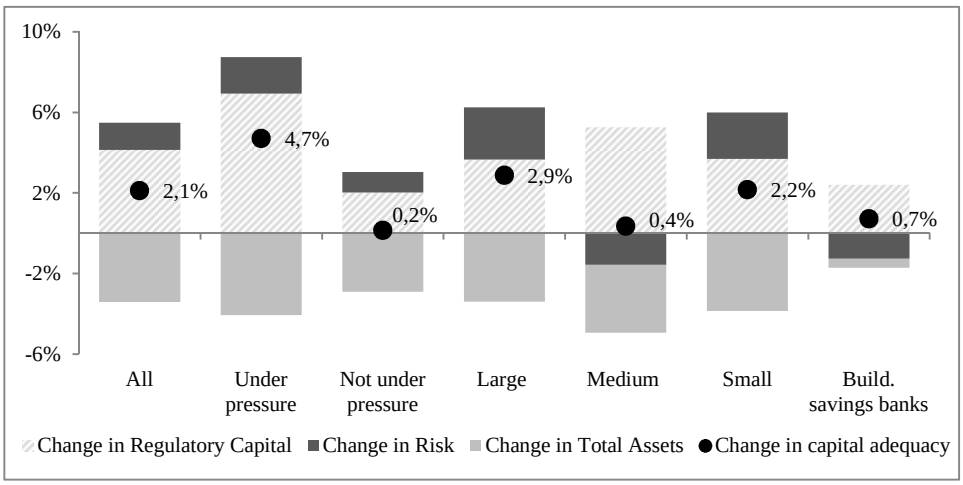
Table 4 confirms our previous conclusions. The increase in reported risk--weighted capital ratios largely resulted from higher capital. The increase in capital drove the overall ratio higher in all six subsamples. The shift to assets with lower risk weights played a secondary, additional role. Increase in overall ratio was slowed down because the Czech banks enjoyed high asset growth. Figure 2 is a graphic illustration of the results presented in Table 4.

Figure 2 shows that boosting capital was a major source of increasing the capital ratios, and decrease in risk was a minor source. These were the two main adjustment strategies for all subgroups of banks, apart from the building savings banks. As already noted, the building saving banks increased their risk slightly which subtracted 1.2 p. p. from the overall ratio.

Perhaps the most interesting findings come from a comparison of banks from the regulatory pressure view. The banks under regulatory pressure increased their risk-weighted capital ratio by 4.7 p. p. This reflected a distinct increase in capital, which added 6.9 p. p.; a decrease in risk added 1.8 p. p. and an increase in total assets subtracted 4.0 p. p.

F i g u r e 2

Sources of Changes in Bank Capital Ratios, 2009 – 2013



Source: Bankscope, author's calculations.

The banks not under pressure increased their capital much less than the banks under pressure. Their overall ratio increased only by 0.2 p. p. Higher capital contributed 2.0 p. p., lower average level of risk-weights added 1.0 p. p. and an increase in total assets reduced the ratio by 2.9 p. p., which resulted in a final increase of 0.2 p. p. (after rounding up).

Figure 3 illustrates a number of additional findings. For example, it shows that there was no group of banks for which the bulk of the increase in capital ratio resulted from lower risk rather than higher capital. To put it more simply, there was no group of banks for which decreasing portfolio riskiness was the major strategy: it was the supporting strategy.

In the next section we analyze what was the major source of capital increase. Was it retained earnings or something else, such as an issue of new shares?

Sources of Changes in Bank Capital

Retained earnings (net income minus dividends) accounted for most of the increase in capital from 2009 to 2013. Table 5 breaks down the increase in regulatory capital into its components. The last term (other sources of capital) is residual and it comprises share issue or change in goodwill.

For the full sample of banks, as noted in a previous section, regulatory capital increased from CZK 281 billion at end-2009 to CZK 378 billion at end-2013. Retained earnings accounted for the bulk of the increase; it totaled CZK 83 billion of the CZK 97 billion increase. Other changes to capital amounted only to CZK 14 billion.

T a b l e 5

Sources of Changes in Regulatory Capital, 2009 – 2013 (in CZK billion)

	Count	**Regulatory capital 2013**	**Regulatory capital 2009**	**Increase in regulatory capital**	**Net income 2009 – 2012**	**Dividends 2010 – 2013**	**Retained earnings**	**Other sources of capital**
		a	b	c = a – b = f + g	d	e	f = d + e	g
All	17	378	281	97	228	–145	83	14
Under pressure	10	188	117	71	85	–37	48	23
Not under pressure	7	190	164	26	143	–108	35	–10
Large	4	244	185	59	170	–117	54	5
Medium	10	127	90	37	57	–28	29	8
Small	3	7	6	1	1	0	1	1
Build. savings banks	5	22	18	4	20	–13	7	–3

Source: Bankscope, author's calculations.

Reduced dividends helped to increase retained earnings. While the banks not under pressure paid in dividends 76% of the 2009 – 2012 net income (CZK 108 billion dividends from CZK 143 billion net income), the dividend payout ratio totaled only 44% for the banks under pressure (CZK 37 billion dividends from CZK 85 billion net income).

4. Discussion

In general, as Cohen and Scatigna (2014) explain, a bank has a variety of options when it aims to improve its risk-weighted capital ratio. Firstly, it can make changes on the asset side of the balance sheet in order to decrease the riskiness of the portfolio. The strategy is to replace the assets with high risk weights by the assets with lower risk weights. The second option for increasing capital ratio is to issue new equity via the issue of new shares on the open market, or rights issue to existing shareholders. This option may not be attractive for existing bank shareholders as new shares tend to reduce the market value of existing shares. An alternative, third way of increasing capital (and capital ratio) is to boost retained earnings. An example of straightforward option for increasing retained earnings is to decrease dividends. However, as with equity offering on the open market, this option is also not very attractive to existing shareholders.

A bank's choice among a variety of strategies will determine the macroeconomic impact of any increase in capital ratio. For example, if a bank chooses the first strategy, the bank will reduce portfolio riskiness and it will reduce lending to riskier projects. Alternatively, a mortgage bank can choose to reduce or stop lending on mortgages with high loan-to-value ratio which will have a major

impact on bank clients. These are two examples where bank strategy constrains investment and consumption. Evidence that the slowdown results from reduced bank lending supply, as opposed to decrease of consumer demand for loans (a decrease in portfolio risk is natural in this case), would emerge in the form of tighter bank lending standards.

Our research on Czech banks brings three key findings. First, capital increase is the major source of improved capital adequacy ratios. The banks deliver about three-quarters of increased capital requirements by increasing capital and about one-quarter by reducing portfolio risk. Second, accumulation of retained earnings played a key role in supplying fresh capital. Third, it was mainly the banks under regulatory pressure which increased their risk-weighted capital ratios.

Our findings confirm the results of Cohen and Scatigna (2014) who study large international banks. The authors conclude that US banks, European banks, and banks from other advanced economies achieved most of their adjustment in recent years through the accumulation of retained earnings. Despite the Czech banking sector does not contain very large banks, and when compared to Eurozone countries, it still remains relatively underdeveloped, the behavior of Czech banks is similar to the behavior of very large, advanced-economy banks.

The results of our analysis are useful mainly from a regulatory point of view as currently the countercyclical buffer is set to its minimum of 0% of risk-weighted assets and the CNB may increase the buffer up to 2.5% in the medium or long-term.

The strategy to increase capital through retained earnings, which is the major strategy of Czech banks, has little or no macroeconomic impact compared to other strategies such as decreasing portfolio riskiness in the environment of growing demand for loans. It is mainly existing shareholders of Czech banks who are affected by this strategy; the shareholders do not receive dividends or receive only reduced dividends, and only a share of net income is paid out. The returns received by foreign shareholders of Czech banks are reduced.

Conclusion

The Czech banking sector has made progress in adjusting to the new regulatory environment. According to the Czech National Bank, the Czech banks increased their average regulatory capital ratio from 14.1% of risk-weighted assets in 2009 to 17.1% in 2013. Our sample of 17 Czech banks in this paper shows that increasing capital was the major strategy to increase the reported risk-weighted capital ratios. Accumulation of retained earnings played a key role in supplying fresh capital. A supporting driver of the improvement in banks' capital

ratios was the reduction in the average risk weight in bank portfolios. A comparison of our results with other studies suggests that the behavior of small Czech banks is similar to the behavior of large multi-national banks from advanced economies.

Comparing different groups of Czech banks, it was mainly the banks under regulatory pressure which increased their risk-weighted capital ratios. Banks not under pressure reported only a minor increase in the ratio as their motivation to increase the ratio was limited. Their capital ratios had already comfortably exceeded the 2014 benchmark by 2009.

The results of our analysis are useful mainly from a regulatory point of view as currently the countercyclical buffer is set to its minimum of 0% of risk-weighted assets and the Czech National Bank may increase the buffer in the medium or long-term. The strategy to increase capital through accumulation of retained earnings has little or no impact on the broader macro-economy. It is mainly foreign shareholders of Czech banks who are affected by this strategy; they receive reduced returns.

Further research is needed to evaluate whether the decline in average risk weight in bank portfolios assets was a result of bank management business decisions as a response to the financial crisis (this would have a major impact on bank clients, their investment and macro-economy) or whether it was only a natural outcome of the weakening demand for loans, where the macroeconomic impact is lower; or, finally, as BIS (2014) warns on a global level, whether it was an outcome of redesigned risk models with the aim of lowering capital requirements.

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