Empirical Evidence on the Effects of Capital Buffer Release

Yi-An Chen[1] Vasja Sivec[2] Matjaž Volk[3]

Teaser

In this paper we study a unique policy experiment, which closely mimics the functioning of countercyclical capital buffer. We use the experiment to study the effects of capital buffer release on bank lending and loan loss provisioning. We find firms had 11 p.p. higher credit growth in banks with 1 p.p. higher capital buffer. Our results also reveal that banks used additional loss absorption capacity to provision more for defaulted borrowers.

[A] Motivation

In response to the recent financial crisis banking regulation introduced several macroprudential instruments. The instruments are designed to work against the accumulation of systemic risk and to make banks more resilient to different shocks. One of the key instruments introduced in Basel III is countercyclical capital buffer (CCyB). Its purpose is to smooth the credit cycle in both the expansionary and recessionary part of the cycle. In the periods of excessive credit growth and build-up of system-wide risk, banks will be required to build a capital buffer (of up to 2.5% of risk weighted assets) in the form of Common Equity Tier 1 capital. When the crisis hits the buffer could be released and banks would thus have additional capital at hand. With additional loss absorption capacity, banks are expected to maintain credit supply also in the crisis period or at least to decrease it by less had the buffer not been in place.

There is, however, very little empirical evidence on the effect of CCyB or similar instruments on bank behaviour. The main reason is that CCyB was officially introduced in January 2016 in Eurozone, and none of the member countries have set CCyB higher than 0%. This paper tries to fill this gap by providing empirical evidence on the effects of capital buffer release on bank lending and loan loss provisioning.

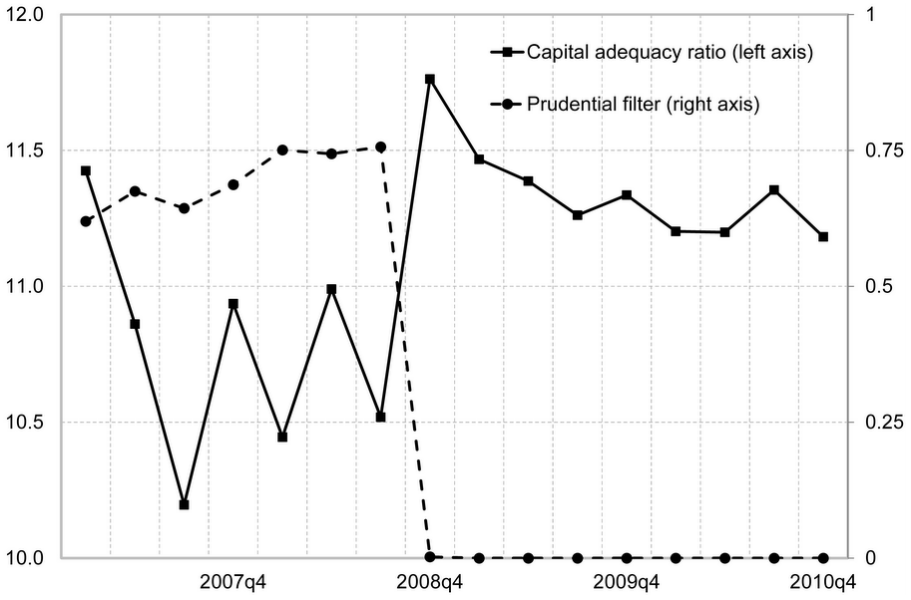
[A] Policy experiment

We study a unique policy experiment where Slovenian banks were allowed to release their capital buffer in 2008q4, at the start of the financial crisis. In 2006 Slovenian banks adopted

[1] Amazon.com. Email address: yiachen@amazon.com
[2] STATEC/ANEC. Email address: vasja.sivec@statec.etat.lu
[3] Bank of Slovenia. Email address: matjaz.volk@bsi.si

International Financial Reporting Standards (IFRS). Under the IFRS the loan loss provisioning requirement was calculated differently than under the approach of the Slovenian Reporting Standards that were valid until 2006. Banks held on average less provisions under IFRS. Being prudential, Bank of Slovenia required banks to use the difference in the amount of provisions under the two approaches as a deduction item in the calculation of their capital adequacy ratio. As a result, banks held additional capital that resulted from the so-called prudential filter, from 2006q1 to 2008q3. Eventually, banks were allowed to release the prudential filter to mitigate the impacts of financial crisis in 2008q4. As can be seen in Figure 1 this resulted in increase in capital adequacy ratio in 2008q4. We show that prudential filter, which at the time of release amounted to 0.8% of risk weighted assets (RWA), acted like a counter-cyclical buffer, where banks accumulated capital in good times and the capital requirement was released in a bad times.

Figure 1: Capital adequacy ratio and prudential filter for total banking system in % of RWA

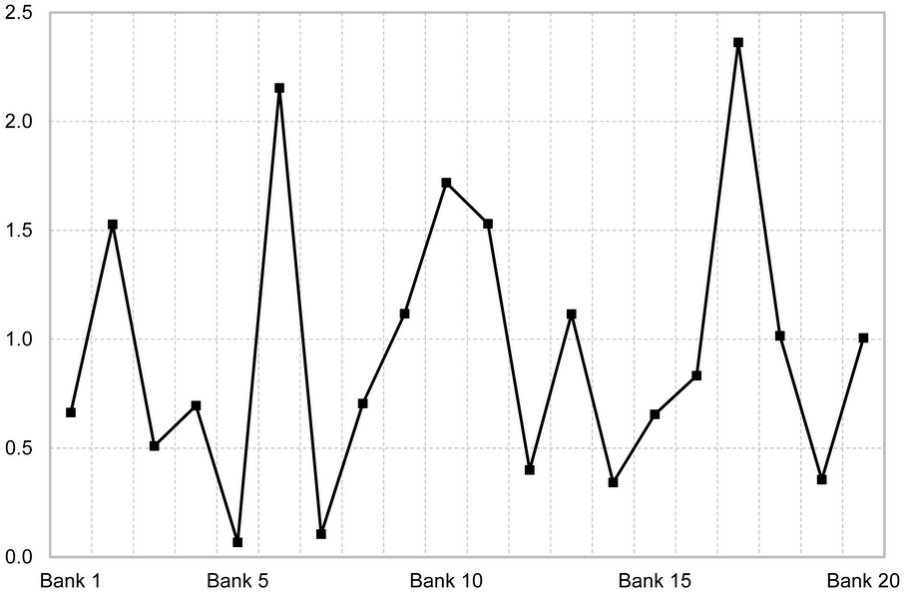


Source: Bank of Slovenia, own calculations

Figure 2 shows the amount of prudential filter in 2008q3, just before it was released, in percent of RWA. This is our main policy variable. We use it in loan level model and test if banks with higher amount of prudential filter lent and provisioned more at the beginning of the crisis. For our identification strategy it is important that this variable varies across banks. The distribution is dispersed. Nine banks had prudential filter that was above 1% of RWA, 9 banks had values within a band of 0.3-1% and two banks had prudential filter that was close to 0% These amounts

directly contributed to an increase in capital adequacy ratio once the prudential filter was released.

Figure 2: Prudential filter in 2008q3 in % of RWA, across banks



Source: Bank of Slovenia, own calculations

[A] Methodology and results

Our identification strategy adopts the methodology proposed by Khwaja and Mian (2008). We estimate how a firm credit growth differs between two (or more) banks with different amount of prudential filter at the time when it was released. The comparison is across banks for the same firm, and firm-specific shocks such as demand or firm risk are absorbed by the firm fixed effect. Therefore, loan demand is fully controlled for and the observed effects identified by our model can be attributed to differences in loan supply between banks that stem from different amount of capital buffer.

We now turn to our main results. We are interested if banks with higher amount of prudential filter, which translated to higher capital adequacy after the release, lent more at the beginning of the crisis. Next we check to which firms was this lending directed. Lastly, we estimate if banks used additional loss absorption capacity that occurred with buffer release, to provision more for bad loans. By answering this questions, we can know whether the policy of capital buffer release in bad times is effective and serves its main goals.

Table 1 shows the results for the effect of buffer release on bank lending. Dependent variable is firm *i* credit growth in bank *j* in the period 2008q3-2009q3[4]. We control for firm specific demand with firm fixed effects and include several controls for other influences. Model (1) in Table 1 shows our baseline results. We find that for the same firm borrowing from at least two different banks that differ in the size of the prudential filter, credit growth was 11.1 p.p. higher if the bank had 1 p.p. higher capital buffer. By using standard errors clustered at bank level, this coefficient is statistically significant at conventional level.

Table 1: The effect of capital buffer release on bank lending

	(1)	(2)
Prudential filter	0.111**	0.124**
Capital adequacy ratio	0.016	0.017
Share of NPL	0.024*	0.024
Total assets	-0.000*	-0.000*
Prudential filter*I(Overdue>0)		-0.212**
Constant	-0.124	-0.134
Firm FE	Yes	Yes
Number of observations	11043	11043

Source: Bank of Slovenia, own calculations.
Significance level: * p < 0.10, ** p < 0.05, *** p < 0.01.

Our next set of results checks to which firms the identified positive effect of lending was directed to. Note that this was the period when the crisis began and non-performing loans started accumulating in banking books. In such environment banks might have an incentive to engage in evergreening of loans to riskier firms in order to reduce the pressure of loan loss provisions on capital. This phenomenon is well documented by Peek and Rosengren (2005). If capital buffer is used for this purpose, this would be an undesired effect.

To verify this we interact prudential filter with a variable indicating firm riskiness, which equals one if firm *i* repays debt to bank *j* with delay. Model (2) in Table 1 shows this result. The interaction term is negative. In addition, the sum of the coefficients for prudential filter and for the interaction term is also negative. This means that the positive effect of prudential filter release is not only reduced for borrowers that have difficulties with loan repayment, but is even

[4] We show that the results are robust to different horizon selection that span from one to four quarters after the buffer release.

negative. Overall, we can conclude that firms who gained the most from capital buffer release were solid and less risky firms.

We use the same methodological approach also to test if banks used additional loss absorption capacity to provision more for defaulted borrowers. We find for a sample of firms that defaulted close to buffer release that their coverage of loans with loan loss provisions increased by 8.6 p.p. more in banks with 1 p.p. higher prudential filter.

[A] Contribution and policy implications

We contribute to the literature on the effects of macroprudential instruments, which is very scarce. Since there is no data on CCyB release, current research relies on models which identify the change of capital ratio as a proxy for CCyB.[5] However, there are several flaws to this approach. First, the capital ratio is slow to adjust. CCyB release is sudden and generates structural shifts in capital ratios. The data that is used by previous research does not feature sudden changes in capital and fails to articulate the real effects of a CCyB release. Second and most important, changes in capital ratios are to a large extent endogenous. They are subject to banks' own decisions (say recapitalization) and banks' own decisions are likely to have a different effect on credit supply than the CCyB release. We, on the other hand, employ a policy experiment where the release of prudential filter is exogenous with respect to the Slovenian banking system.

Our paper is closest to Jimenez et al. (forthcoming). Like us, they study a unique policy experiment. They use exhaustive loan-level data and show that release of dynamic provisions increased credit supply in Spain when the crisis hit. To our knowledge, Jimenez et al. (forthcoming) and us are the only two research studies that use a policy experiment to gauge the effects of a CCyB release. An important difference is that the dynamic provisioning follows a formula, so banks can anticipate future releases better than in our experiment, where the release is caused by a crises, which was truly unexpected and exogenous for Slovenian banks. In addition, we provide also evidence on loan loss provisioning, which is another desired goal of CCyB policy.

[5] Gross et al. (2016) use Global VAR. Noss and Toffano (2016) use sign restrictions to identify shocks in past data that match a set of assumed directional responses of other variables to future changes in aggregate bank capital requirements.

Our findings have several important implications for policymakers and regulators. We show that CCyB is effective tool to increase bank lending in crisis period. This would, however, have very limited effect on real economy if banks would use this additional capital to solve problems in their balance sheets. To reduce pressure of non-performing borrowers on capital, banks might have an incentive to rather lend to borrowers that are close to default (see Peek and Rosengren 2005 and Iosifidi and Kokas 2015). This is not what we find. Our results show that firms that benefited the most from capital buffer release were less risky firms, without overdue in loan repayment. This is desired as it intensifies a positive effect of capital buffer release on real economy. Additional desired effect is fast recognition of losses. Delays in loss recognition can prolong and intensify the effect of the crisis. Our findings show that capital buffer was effective at the beginning of the crisis as banks with higher amount of it provisioned more. Note however that Slovenian banks suffered huge losses in period 2009-2014 that amounted to 10% of total banking assets from pre-crisis period. To prevent those more needs to be done in expansionary period, when the culprit usually takes place. CCyB is intended to work also on this front, but it's effect can be only limited (Jimenez et al. forthcoming). Bank loan allocation and risk taking should be closely monitored.

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Biographies

Yi-An Chen, PhD, is currently working as an economist at Amazon.com. He is producing forecasting model for supply chain. He was a statistical consultant in an e-commence start-up mmwooo.com. He builds demand prediction models for thousands of fashion accessories and lifestyle product and provides data driven business strategies. Previous to that, he was a researcher at the department of Financial Stability and Macro-prudential policy at the Bank of Slovenia. He was also a member of the operational macro-prudential research task force in European Central Bank. Dr. Chen completed his PhD in economics at the University of Washington in 2015.

Vasja Sivec, PhD, is an applied researcher. He is interested in Macroeconomics, Time Series Analysis and the link between financial and real economy. He is working on the effects of macroprudential policy and output GAP measurement. He worked as an intern at the European Investment Bank, researcher at the Bank of Slovenia and a TA at the Faculty of Economics, Ljubljana. He has joined ANEC/STATEC research division in September, 2016, where he works as an applied researcher. He holds a PhD from the European University Institute, Florence (2015).

Matjaž Volk is a researcher at the Bank of Slovenia. In 2016 he worked as Financial stability expert at European Central Bank. He holds a PhD from the University of Ljubljana. His research is mainly micro oriented, focusing on credit risk, financial constraints, misallocation of assets and macroprudential policies.