

Spillovers from Prudential Policies Implemented at Consolidated Level: Evidence from the EBA's 2011 Capital Exercise and its Effect in Slovenia

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In this paper I research the spill-over effects of EBA's 2011/2012 capital exercise in Slovenia. By using loan level data from the Slovenian credit register and employing an identification a la Khwaja and Mian (2008), I find that the introduction of the higher capital requirements with the exercise led the subsidiaries of the capital exercise banking groups in Slovenia to tighten their credit. Hence, while there was an ongoing deleveraging with adverse effects on real economy, these banks did not substitute for the reduced lending by the stressed banks in spite of having comparatively stronger balance sheets.

[A] Introduction

The European Banking Authority (EBA) introduced its Capital exercise in 2011 with the aim to restore confidence in the EU banking sector against the aggravating sovereign debt risks in Europe. Several studies have pointed at the almost quasi-natural nature of this policy experiment and studied it for a better design of the capital-based policies (Gropp *et. al.* (2018), Mesonnier and Monks (2016))¹. One of the marked features of the exercise was its cross-country dimension as the EBA targeted the major and internationally active European banking groups. In this paper I focus on the cross-border dimension and study the impact of the exercise on bank lending through the subsidiaries of the banking groups in Slovenia.

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¹ Both studies found the EBA's Capital exercise led the shortfall banks to reduce their credit supply.

EBA announced the capital exercise in October 2011. Major European banking groups, selected being ranked according to their respective shares in their national banking sectors, were required to increase their core tier 1 (CT1) capital ratios at the highest consolidation level to 9% by June 2012². The EBA's capital exercise took place in a context of depressed activity and its timing, although the EBA urged in its Recommendation (EBA (2011)) the banks and the national authorities to use first the private resources and acquire new capital, made the exercise susceptible to the adverse procyclical effects. Particularly in Slovenia, there was already an ensuing credit crunch.

Table 1 presents CT1 ratio and RWAs figures for the sample with a breakdown of shortfall, non-shortfall banks and it includes information on the Slovenian subsidiaries' parent groups. Table shows that shortfall banks improved their capitalisation acquiring new capital. Nonetheless, asset-side adjustments are not negligible and visibly larger for the shortfall banks.

Table 1. Changes in EBA capital exercise banks' capitalisations and exposures

	CT1 / RWA		CT1 capital			RWA		
	sep-11	jun-12	sep-11	jun-12	Growth	sep-11	jun-12	Growth
All exercise banks (61)	10.40	11.65	954.8	1,063.3	11.37	10,147.7	9,680.2	-4.61
Shortfall banks (27)	7.82	10.13	395.7	468.5	18.38	4,920.5	4,561.2	-7.30
Non shortfall banks (34)	12.45	12.86	559.1	594.9	6.40	5,227.2	5,199.0	-2.07
Slovenian subsidiaries' parents (5)	8.33	10.22	118.4	133.7	12.89	1,397.8	1,296.6	-7.24

Note: First two columns present the CT1 ratios for two periods as the averages across the banks in percentages. Other columns present the CT1 and RWA figures, in million euros, for all exercise banks, shortfall banks and the Slovenian subsidiaries' parents that were in the EBA sample, together with the growth rates in percentages across two periods. Number of banks in each group is indicated in parenthesis. *Source:* EBA Capital exercise databases, publicly available on WEB.

My paper is relevant to the developing literature on prudential regulation spillovers and particularly on the so called 'outward' transmission of the prudential policies that stands for the effect of a policy activation in one country on the others (a comprehensive collection of evidence on outward and inward spillovers can be found in Buch and Goldberg (2017)). A measure applied at consolidated level, as it was in the EBA's capital exercise, would particularly be susceptible to outward spillovers (Fahr and Zochowski (2015)). This is a significant issue in Eurozone where the market share of subsidiaries, which are in fact regulated by host country authorities and need to comply with host country capital regulations on standalone basis, was on average 41% across the member states by the end of 2016 (ECB (2017)).

² The EBA aimed to cover at least 50% of the banking assets in the member states. Selected banks were also required to add capital buffers against their sovereign exposures and the total shortfalls were assigned accordingly.

[A] Sample and the methodology

The sample covers all the 21 banks that were operating in Slovenia during the sample period, which consists of two observation points: 2011 Q3 and 2012 Q2 (the last quarter before the introduction of the exercise and the date the banks were required to comply with the target). Slovenia was hosting subsidiaries of five EBA exercise groups in this period, of which four were assigned shortfalls. Two domestic Slovenian banks participated in the exercise directly.

By 2011 Q3, the market share of the subsidiaries of EBA shortfall banks in Slovenia was 16.7%. On average, their CT1 ratio was 10.1%. Subsidiaries of the EBA exercise groups in Slovenia contracted their less than the system average in the exercise period, where the overall bank credit growth was -6.1% their credit contracted by 1.3%. However, the ratio of non-performing loans (NPL) was much lower, at 4.1% (5.4% at 2012), for the EBA exercise subsidiaries than the overall ratio across all Slovenian banks, which was already at 11.4% by 2011 Q3 (14.3% at 2012 Q2). These figures underscore the importance of the empirical strategy. First, banks' NPLs ratios impacted the banks' capital position and ability to supply credit differently. Second, the treated banks and the banks in the control group seem to have been lending to different types of borrowers regarding their risks. Particularly the banks in the control group could have faced a procyclical demand during the downturn.

Failing to adequately control for credit demand, which is unobservable, would lead to an 'omitted variable bias' in my estimates to the extent credit demand is correlated with the determinants of the credit supply by the banks. I use matched firm-loan level data from the Slovenian credit register and employ the identification strategy of Khwaja and Mian (2008), which constitutes a standard in the empirical banking literature, to isolate the bank related drivers of credit growth. This strategy entails constructing a sample with multiple bank relationship firms and using firm fixed effects in regressions to absorb the demand with the identifying assumption that the loan demand for the same firm is constant across the banks. In the case of Slovenia, firms that borrow from multiple banks constitute a representative sample covering about 85% of all loans in 2011. Following Amiti and Weinstein (2018), I also take into account the share of each firm in the loan portfolio of a bank.

The equation below describes the regression that is estimated to identify the causal effect of the EBA capital shortfalls:

$$\Delta L_{ij} = a_i + b_1 * EBA_shortfall_j * F_j + b_2 * EBA_shortfall_j * D_j + b_3 * X_j \quad (1)$$

ΔL_{ij} in eq. (1) stands for the growth of loans to firm i from bank j in some interval around the EBA exercise in percentages. Firm fixed effects are introduced by a_i to absorb the firm related, demand side drivers of the loan growth. $EBA_shortfall_j$ stands for the shortfall (or the surplus if the bank had a capital ratio higher than the requirement, with different signs) by September 2011 (2011 Q3) of the domestic bank or the parent group for the Slovenian subsidiary bank j as assigned by the EBA. F_j (D_j) is a dummy variable and it stands for the foreign (domestic) ownership and is set 1 (0) if the bank is foreign subsidiary (domestic). Coefficients b_1 , b_2 stand for the effect of the shortfall in respective cases. Vector X_j contains appropriate bank level controls (ratios that represent certain aspects of the banks' balance sheets).

[A] Results

The result from estimating equation (1) are given in Table 2. Regarding my research question, I am primarily interested in the effect of the new requirements on the provision of the credit in Slovenia through the subsidiaries of the exercise banks. This effect is represented by the coefficient of *EBA shortfall x Foreign* in the table. Each regression includes the control variables capital adequacy ratio, share of NPLs and total assets.

I estimate that 1 p.p. higher capital requirements at consolidated level led subsidiaries of the EBA exercise banks contract their credit by in annualized terms 2.7 p.p. and 4.6 p.p. (2 p.p. to 3.4 p.p., over nine months)³. My estimates show that the introduction of the higher capital ratio requirement with the EBA's capital exercise led these banks to tighten their credit standards⁴.

³ The coefficient of *EBA shortfall x (1-Foreign)* is not significant and therefore the capital exercise is found to have no effect on domestic banks that participated directly. However, these two domestic participants constituted special cases. One participant, NKBM, was initially a surplus bank but could not keep up with the exercise due to increasing impairments and fell below the minimum requirement by June 2012 and there was a recapitalisation by the state of the latter bank NLB.

⁴ The paper contains a complementary analysis on the real effects and it suggests the firms that were borrowing from the Capital exercise banks' subsidiaries could not isolate themselves fully by switching their source of funding.

Table 2. The effect of EBA shortfalls on bank lending

	(1)	(2)	(3)	(4)	(5)
	ΔL	ΔL	ΔL	ΔL	ΔL
EBA shortfall x Foreign	-0.022***	-0.022***	-0.034***	-0.024***	-0.020***
EBA shortfall x (1-Foreign)		-0.003	0.001	0.000	0.004
ΔL_{-1}			0.034***	0.026***	0.024***
Foreign (dummy)				-0.022**	-0.017*
Capital adequacy ratio	0.002	0.002	-0.002	-0.003*	-0.002
Share of NPL	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
Total assets	-0.003	0.001	0.013**	0.006	0.000
Constant	0.004	-0.042	-0.166	-0.045	0.031
Firm FE	YES	YES	YES	YES	YES
Number of observations	10,240	10,240	10,240	10,240	10,240

Note: The table reports the estimation results for the loan level difference-in-difference models as described by the equation (1). Dependent variable in all the equations is firm i loan growth in bank j in percentages in period 2011 Q3 – 2012 Q2. EBA Shortfall is the amount of the EBA shortfall (surplus) in 2011 Q3 and positive (negative) values stand for being below (above) the target. At specification (5) +1 is added on the shortfall variable. Capital adequacy ratio, Share of NPLs and Total assets are taken from 2011 Q3. ΔL_{-1} is bank specific credit growth in 2011 Q3 over the previous quarter. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Models (3) to (5) provide the robustness checks. ΔL_{-1} is prior bank specific credit growth in 2011 Q3 over the previous quarter. 'Foreign' variable is a dummy that is set 1 for any subsidiary in Slovenia. Although these variables have significant explanatory power, the coefficients regarding the effect of the exercise remain significant with comparable sizes as before. Finally, the banks might have targeted to keep a safe margin above the minimum requirement. In specification (5) the shortfall/surplus is calculated as if the requirement was 1% higher. One group that was compliant with the requirement initially had only a slight margin above %9 and therefore at regression (5) the number of the treated banks increases to five⁵.

[A] Conclusion

My results show that the causal effect of the EBA's Capital exercise through the subsidiaries of the bank groups that were required to increase their capital ratios was contractionary in Slovenia. This result is inline with the earlier findings in the literature and point at the importance of incorporating the macroprudential perspective in policy decisions.

⁵ The paper also contains a 'placebo test' where the sample period is the three quarters between 2010 Q4 ~ 2011 Q3, instead of 2011 Q3 ~ 2012 Q2, with the aim to provide a further robustness check whether the results were indeed driven by the EBA exercise. This test confirms the effect of the exercise.

My study provides empirical evidence that the 'outward' regulatory spillovers can be significant with negative cross border effects. The results are relevant for the European Union context, which is a financially integrated union with limited risk sharing mechanisms that might lead home supervisors of the internationally active bank groups prioritize reducing risks at home. In particular, implementation of macroprudential policies at consolidated level has the potential to be destabilizing when home country of the parent of a bank group and the countries that host the affiliates of the group are at different phases of the cycle.

References

- Amiti, M. & Weinstein, D.E. (2018). How much do bank shocks affect investment? Evidence from matched bank-firm loan data. *Journal of Political Economy*, 126. no. 2. (April 2018): 525-587.
- Buch, C. M. & Goldberg, L. S. (2017). Cross-border prudential policy spillovers: how much? How important? Evidence from the International Banking Research Network. Bundesbank Discussion Paper No. 02/2017.
- EBA (2011). EBA recommendation on the creation and supervisory oversight of temporary capital buffers to restore market confidence. *EBA REC 2011 1* on December 8, 2011
- ECB (2017). Report on financial structures. October 2017.
- Fahr, S. and Żochowski, D. (2015). A Framework for Analysing and Assessing Cross-Border Spillovers from Macroprudential Policies, *Financial Stability Review*, 1, issue, number 1.
- Gropp, R., Mosk T., Ongena S. & Wix, C. (2018). Bank response to higher Capital Requirements: Evidence from A Quasi-Natural Experiment. Swiss Finance Institute, Research Paper Series N°16-70.
- Khwaja, A. & Mian, A. (2008). Tracing the impact of bank liquidity shocks: Evidence from an emerging market. *American Economic Review* 98(4), 1413-1442.
- Mesonnier, J-S & Monks, A. (2015). Did the EBA capital exercise cause a credit crunch in the Euro area? *International Journal of Central Banking*, June 2015, 75–117.