

Cross Border Effects of Macroprudential Policy: The case of Albania¹

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Abstract

This paper aims to estimate the possible impact of changes in international regulation on banks' credit growth in Albania, following the inward transmission approach described in Buch and Goldberg (2016). We analyze two potential channels of regulatory spillovers: (i) the transmission of policy through the international exposure of banks and (ii) the transmission of policy via affiliates of foreign-owned banks. We find that the developments in the lending market in Albania are largely associated to local market developments and that the cross border effects of changes in prudential policy abroad have a relatively weak impact on domestic lending.

Keywords: Cross-border spillovers, Macro prudential policies, Inward transmission.

[A] Introduction

In the aftermath of the global financial crisis, most central banks/other institutions increased efforts in implementing macroprudential policies to mitigate systemic risk. Such policies included important changes mostly in the banking regulation at national level targeting lending growth, banks resilience to shocks, mispriced assets markets etc. Even though the scope and target of each measure is well defined, the desired effect and the reach of the policy are not always clear. Among other reasons, foreign regulation may also play an important role through various cross-border effects. This matter has raised questions on how changes on macroprudential regulations in a given country might affect the *evolution of credit* granted in another country. This is especially important for emerging and developing economies which are host to international banks, therefore being highly vulnerable to potential cross-border deleveraging, while financial market access is difficult.

Our research takes inspiration from the work done under the International Banking Research Network (IBRN) projects and aims to empirically assess the presence of cross-border effects of changes in international regulations on banks' loan growth in Albania and the importance of balance sheet characteristics in reducing or enhancing these effects. We follow the *inward transmission* approach described in Buch and Goldberg (2016) and other research works done

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under the IBRN project (such as Bonfim and Costa (2017), Jara and Cabezas (2017) and Gajewski and Krzesicki (2017)), which allows the analysis of two potential channels of regulatory spillovers: (i) the transmission of policy through the international exposure of banks through the assets and liabilities that banks hold in different jurisdictions around the world and (ii) the transmission of policies in parent bank countries via foreign banks affiliates (branches or/and subsidiaries). Our findings suggest that the developments in the lending market in Albania are largely associated to local market rather than international developments, and that the spillover effects of changes in prudential policy abroad have a relatively weak impact on domestic lending. When comparing the two specifications included the inward transmission, we find stronger spillover effects through the parent/subsidiary relationship rather than through the international exposure of banks.

[A] Data description

Following the baseline approach in the 2015 IBRN project, we try to evaluate the potential impact of changes in foreign prudential policies and regulations on domestic credit granted from banks in Albania, or the so-called *inward transmission* effect. We use data from different data sources, including: (i) *bank-level data* on balance-sheet characteristics; (ii) *country-based information* on changes in prudential instruments in countries where our banks are exposed and where their parent banks are situated, and (3) *financial cycle data* for the parent bank countries. Our analysis period starts in 2008Q4 and ends in 2018Q2.

[B] Bank –level data

As at end of June 2018, the banking sector in Albania consisted of 16 standard commercial banks: 13 foreign-owned banks accounting for 81% of total assets, and 3 domestic banks, accounting for 19% of the total banking sector assets.

Table 1. Albanian Banking System Structure (end of June 2018).

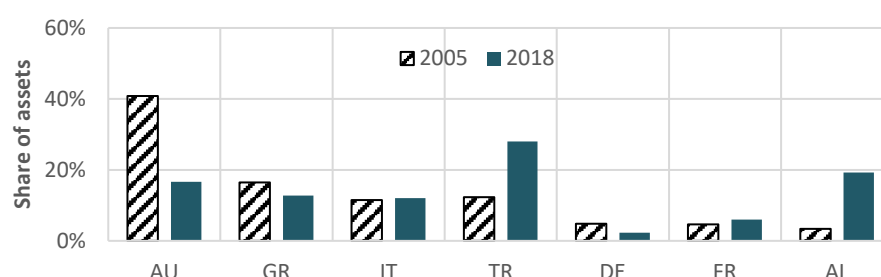
	Big (more than 7% of market share)	Medium (2%-7% of market share)	Small (less than 2% of market share)	Total
Number of Banks	4	7	5	16
Domestically Owned Banks	1	2	-	3
Foreign-owned banks	3	5	5	13
Total Assets (in billion ALL)	973	390	62	1.425
- Domestically Owned Banks	185	89	-	274
- Foreign-owned Banks	788	301	61	1.150

Source: Bank of Albania, author's calculations.

Based on their *ownership structure*, banks can be grouped into: EU countries-owned banks (56% of the total shareholders' equity), other foreign-owned banks (30%) and domestically owned banks (15%). The EU countries sourcing the foreign banks' capital include Austria, Italy, Greece, Germany, Bulgaria and France. Other foreign-owned banks include Turkey, Malaysia, Saudi Arabia and Kuwait. Regarding *the international activity* of Albanian banks, their reliance on external sources of funding has been generally limited, accounting for almost 20% of total sector's assets in terms of investments in non-residents and 7% in terms of liabilities to non-residents.

After the global financial crisis, some EU banking groups significantly reduced their activity in Albania (as in other in SEE countries) as part of their overall consolidating strategies. Consequently, their market share has decreased while the importance of domestic banks has been increasing (see Figure 1).

Figure 1. Largest foreign investors in Albanian banking sector (share of assets).



Source: Bank of Albania, authors' calculations.

Our baseline estimations are performed using the *log quarterly changes of the total loans* as the *main dependent variable*. To explain changes in domestic lending activity, we control for a set of banks' balance sheet characteristics, including: (i) *log of total assets*; (ii) *the ratio of tier 1 capital to total assets*; (iii) *illiquid asset ratio*, computed as the ratio of banks' portfolio of illiquid assets to total assets and (iv) *the ratio of core deposits to total assets*. To include in the analysis the international activity of banks, compute two additional variables: (v) *international exposure ratio*, measured as the sum of foreign assets and liabilities to total assets and (vi) *net due to head office ratio*, proxied by the difference between liabilities and assets each bank holds in the country where the headquarters are based. Table 2 below shows some descriptive statistics for the balance-sheet and lending data for domestically owned banks and foreign owned banks, as well as for the whole banking sector.

Table 2. Summary statistics on lending data and banks' characteristics.

Variable	All banks (nr.obs.= 624)			Domestic owned banks (nr.obs.= 78)			Foreign owned banks (nr.obs.=546)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Dependent variables									
Δ Total Loans	1.169	0.714	6.384	3.420	2.680	4.397	0.846	0.407	6.560
Δ FC Loans	0.889	-0.161	7.402	3.024	2.897	5.460	0.582	-0.433	7.595
z-score	16.757	11.855	16.88	10.509	8.690	7.039	17.649	11.855	17.68
Independent variables									
Log Assets	10.483	10.575	1.354	10.885	10.737	0.770	10.425	10.553	1.409
Capital Ratio (Tier 1) (in %)	13.190	8.900	13.19	7.253	7.100	1.009	14.038	9.200	13.89
Illiquid Assets Ratio (in %)	70.350	71.550	10.06	76.396	76.900	4.238	69.486	70.250	10.36
International Activity (in %)	14.965	11.500	11.78	8.376	8.500	2.552	15.907	13.00	12.28
Net intragroup funding (Net due) (in %)	2.445	1.400	6.522	-	-	-	2.649	2.050	6.749
Core Deposits Ratio (in %)	75.793	82.175	16.01	84.385	84.850	2.765	74.565	81.000	16.73

Source: Bank of Albania. Author's calculations. Data are observed quarterly from 2008Q4-2018Q2.

[B] *Data on Prudential Instruments.*

We use a measure of changes in prudential policies of countries where our banks are exposed through their foreign activity and through their relation with the parent banks, relying on the Prudential Instruments Database Cerutti et al. (2017) over the period 2000Q1 through 2014Q4, and the IMF Macroprudential Policy Survey and ESRB database for the period 2015Q1- 2018Q2. For each prudential tool, the database from Cerutti et al. (2017) includes one index for its change - where a negative value corresponds to a loosening, a positive value to a tightening and zero signals that no change has occurred in the quarter - and also a *summary measure of the changes* in all the above tools, called *PruC*. This takes the value 1(tightening), 0 (unchanged) and -1(loosening), when the sum of indices for the individual tools is respectively ≥ 1 , 0 and ≤ -1 .

Table 3 summarizes the changes in *PruC* in the countries where Albanian banks were exposed during 2008-2014 and that were included in Cerutti et al. (2017) database (about 33 countries) and also during 2015-2017 (our extension of the database), including about 24 countries.

Table 3: Summary statistics of the changes in aggregated index of prudential policy (PruC).

Period	Countries of banks' exposure			Countries of parent banks ³		
	No. of country-time changes	No. of country-time changes (Tightening)	No. of country-time changes (Loosening)	No. of (parent) country-time changes	No. of country-time changes (Tightening)	No. of country-time changes (Loosening)
	(1)	(2)	(3)	(4)	(5)	(6)
2008Q4- 2014Q4	139	103	36	37	27	10
2015Q1- 2018Q2	134	131	3	47	47	0

Source: Cerutti et al. (2017), IMF 2017 Macroprudential Policy Survey, authors calculations.

[B] *Credit cycle data*

Last, as suggested by Buch and Goldberg (2016), we include in the analysis the relevance of the *financial cycle* of the countries where the parent banks are located. It is measured by the *credit-to-GDP*, calculated as the difference of credit-to-GDP from its long-run trend in percentage points⁴.

[A] Empirical Method and Regression Results.

We try to empirically estimate the inward transmission of changes in foreign regulations on the domestic credit through: (i) banks exposures and (ii) through the parent-affiliate relationship. In both cases, we run simple OLS regressions controlling for banks' balance sheet characteristics (lagged by one quarter), banks' fixed effects and time effects.

[B] *Exposure-Weighted Inward Transmission of Macroprudential Policies*

To study the inward transmission of prudential policies of country j at time t ($P_{j,t}$) that comes from the exposure of bank b to country j at time t , first we need to compute the weighted

³ Austria, Italy, Greece, France, Turkey, Bulgaria, Saudi Arabia, Kuwait, Malaysia.

⁴ https://www.bis.org/statistics/c_gaps.htm.

exposure of these changes named as $(ExpP_{b,t})$. This variable captures the effect of changes in the prudential policy of the country j , weighted by the assets and liabilities held by bank b in country j ($A_{b,j}$ and $L_{b,j}$) respectively.

$$ExpP_{b,t} = \sum_j \frac{(A_{b,j,t-1} + L_{b,j,t-1})P_{j,t}}{(A_{b,t-1} + L_{b,t-1})}$$

Then the following regression is estimated:

$$\Delta Y_{b,t} = \alpha_0 + (\alpha_1 ExpP_{b,t} + \alpha_2 ExpP_{b,t-1} + \alpha_3 ExpP_{b,t-2} + \alpha_4 ExpP_{b,t-3}) + \alpha_5 X_{b,t-1} \quad (1) \\ + (\beta_1 ExpP_{b,t} X_{b,t-1} + \beta_2 ExpP_{b,t-1} X_{b,t-1} + \beta_3 ExpP_{b,t-2} X_{b,t-1}) + f_b + f_t + \epsilon_{b,t}$$

where $\Delta Y_{b,t}$ is the quarterly log change in domestic credit of bank b at time t , $X_{b,t-1}$ is the vector of bank control variables, which captures the degree in which banks are exposed to changes in prudential policy abroad through ex-ante balance sheet composition and market access, and $ExpP$ is the weighted prudential policy changes (as explained before), evaluated at time t and after two lags. $(ExpP_b X_b)$ represents the interaction term, which measures how the structure of banks' balance sheets affects the response of bank lending to changes in foreign regulation. This term takes into account the possibility that the response to countries' policies may not be homogenous across all banks in the sample.

The results of the estimation of equation (1) show (Table 4) that lending developments in Albania are largely associated to local market rather than international developments. Control variables in terms of *asset growth* and *illiquid asset ratio* are found to be significant and with a notable contribution on credit portfolio. Lower *illiquid assets* are largely associated with less lending provided by banks, as expected. Also, internationally active banks (high international ratio, high net due ratio) are found to provide less lending.

Table 4. Estimation results of equation (1) - Change in domestic credit as dependent variable.

Independent Variables	Coefficient	t-statistic	Probability
Exp_Pt	0.115	0.539	0.589
Log Total Assets_{t-1}	-0.059	-3.539	0.000
Tier 1 Ratio _{t-1}	0.229	1.609	0.108
Illiquid Assets Ratio_{t-1}	0.165	3.287	0.001
International Ratio_{t-1}	-0.151	-2.608	0.009
Net Due Ratio_{t-1}	-0.145	-2.186	0.029
Core Deposits Ratio _{t-1}	-0.081	-1.126	0.261
<i>Observations</i>		468	
<i>R-squared</i>		0.33	
<i>Adjusted R-squared</i>		0.20	
<i>No. of banks</i>		16	
<i>Time Fixed Effects</i>		Yes	
<i>Bank Fixed Effects</i>		Yes	

Note: Variables in bold are significant at 1%, 5% and 10% confidence level.

[B] Inward Transmission of Home Macroprudential Policy via Affiliates

The second specification aims to estimate whether foreign banks affiliates modify their activity in response to the changes in prudential regulations in their parent banks home countries. The following equation is estimated over the panel of 13 foreign-owned banks.

$$\begin{aligned} \Delta Y_{b,t} = & \alpha_0 + (\alpha_1 HomeP_{j,t} + \alpha_2 HomeP_{j,t-1} + \alpha_3 HomeP_{j,t-2} + \alpha_4 HomeP_{j,t-3}) + \alpha_4 X_{b,t-1} + \alpha Z_{j,t} \\ & + (\beta_1 HomeP_{j,t} X_{b,t-1} + \beta_2 HomeP_{j,t-1} X_{b,t-1} \\ & + \beta_3 HomeP_{j,t-2} X_{b,t-1}) + f_b + f_t + \epsilon_{b,t}. \end{aligned} \quad (2)$$

$HomeP_j$ is the variable of the prudential policy changes in country j where the parent of the foreign affiliate (or bank b) is locate and $Z_{j,t}$ as a measure of financial cycle in home country j at time t . Table 5 shows the results of this estimation. They also confirm that domestic lending activity is mostly determined by internal market developments. Control variables in terms of *assets growth* and *illiquid assets* are found to be significant. The interactions between the home prudential policy and banks' characteristics (international ratio and illiquid assets) are found to be positively related to domestic lending and statistically significant with respectively 2 and 3 time lags of the implementation of such policies. This means that foreign banks subsidiaries relying more on funding from parent banks are more vulnerable to changes in the home-country regulations. In case of a tightening in the parent bank's country regulation, the more internationally active banks tend to increase domestic lending.

Table 5. Estimation results of equation (2) - change in domestic credit as dependent variable.

Independent Variables	Coefficient	t-statistic	Probability
HomeP _t	0.013	0.802	0.423
Log Total Assets_{t-1}	-0.088	-4.537	0.000
Tier 1 Ratio _{t-1}	0.059	0.399	0.689
Illiquid Assets Ratio_{t-1}	0.200	3.074	0.002
International Ratio _{t-1}	-0.100	-1.296	0.196
Net Due Ratio _{t-1}	-0.129	-1.101	0.272
Core Deposits Ratio _{t-1}	-0.123	-1.405	0.161
Fin_Cycle_Home	0.000	0.297	0.766
HomeP_{t-2} * International Ratio_{t-1}	0.414	2.443	0.015
HomeP_{t-3} * Illiquid Assets Ratio_{t-1}	0.349	3.485	0.000
<i>Observations</i>		340	
<i>R-squared</i>		0.43	
<i>Adjusted R-squared</i>		0.26	
<i>No.of banks</i>		13	
<i>Time Fixed Effects</i>		Yes	
<i>Bank Fixed Effects</i>		Yes	

Note: Variables in bold are significant at 1%, 5% and 10% confidence level.

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