

Capital Adequacy Arbitrage and Risk-taking

Research proposal:

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Introduction

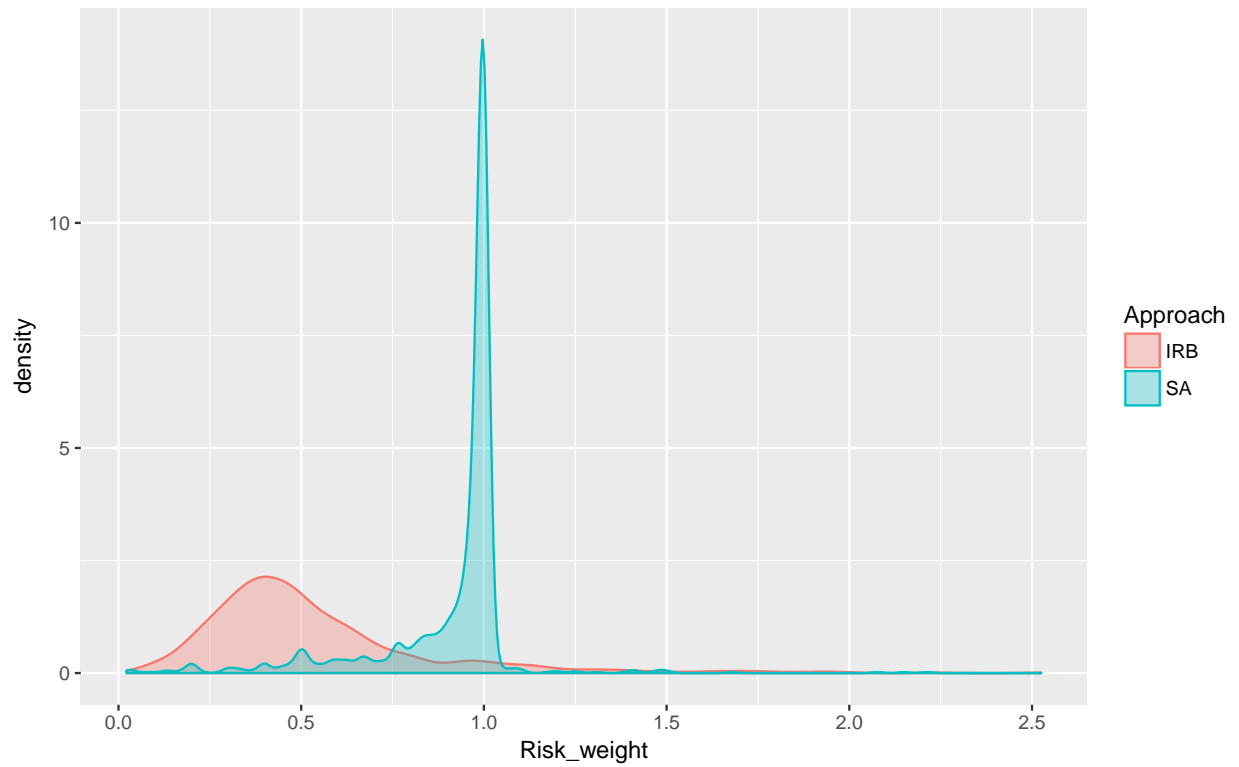
The Basel II framework introduced the possibility of banks to use, upon approval by the supervisory agency, internal risk models (internal rating-based or IRB) to calculate the risk-weights used for capital adequacy ratio. The argument in favor of IRB versus the fixed risk weights standard approach (SA) is that the IRB approach would improve banks' efficiency as "banks optimize risk weights and better account for the specific risk of each asset" (Beltratti and Paladino (2016)). Cucinelli et al. (2017) also point to the risk models having improved with the IRB approach as those models have to be approved by regulators.

However, Döme, Kerbl, and Behn (2017) show that the location where banks are headquartered is a significant explanatory variable of risk-weights across european banks. Within the Basel II framework, those differences driven by location are unintended as they do not reflect heterogeneity in risk, but rather, point to regulatory arbitrage. In this recent literature on capital adequacy risk-weights, while some papers study the determinants of differences in risk-weights across banks (Döme, Kerbl, and Behn (2017), Beltratti and Paladino (2016) and Montes et al. (2016)) others focus on the impact of the IRB versus the SA on lending. Behn, Haselmann, and Wachtel (2016) found that, in response to an exogenous shock to credit risk, banks decrease more lending under the IRB approach relative to the SA. Behn, Haselmann, and Vig (2016) show that banks underestimate risk for portfolios under the IRB while interest rate are higher, suggesting that banks are aware of the higher risks of those loans.

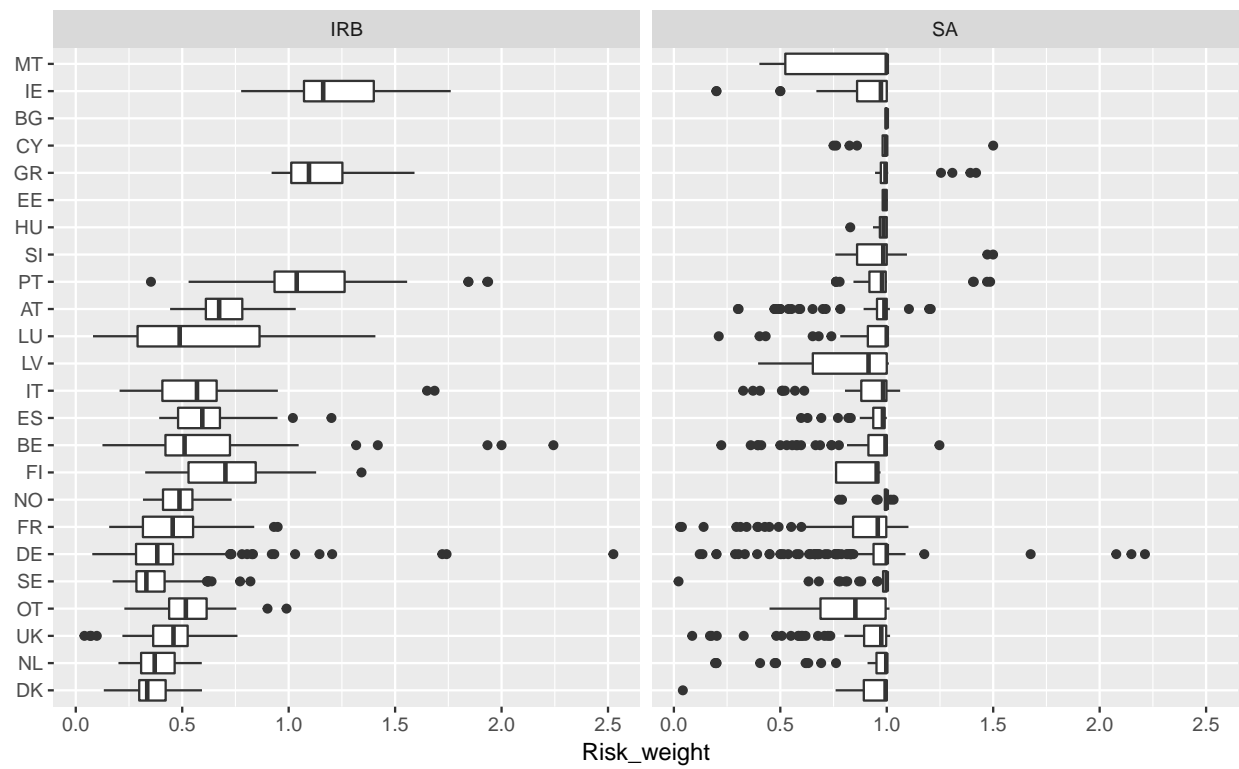
My proposal is to fill the gap between those two lines in the literature: study the impact on bank lending coming from *unintended* differences in risk-weights across IRB portfolios of European banks. Following prior evidence (Behn, Haselmann, and Vig (2016), Efung (2016)) I expect a risk-taking channel to be stronger for banks headquartered in more relaxed regulatory environment.

Stylized facts

The figure below shows the density function of risk weights for corporate exposures. While risk weights under the SA approach are concentrated around 100%, risk weights are more evenly distributed and concentrated at relatively lower values.



The next figures show the distributions of risk-weights for corporate exposures across headquarters and approaches (IRB and SA).



Data and empirical strategy

For the bank-level information on risk-weights and other regulatory variables we can use the EU-wide transparency exercises. Those dataset are public available. There are in total four exercises for two periods each (December, 2012; June, 2013; December, 2014; June, 2015; December, 2015; June, 2016; December, 2016 and June 2017). 132 European banks are included in the last exercise and 64 in the first. Further bank level information can be merged from the Orbis dataset.

In order to

$$Exposure_{i,c,t} = \beta_0(\hat{RW}_{i,c,t}^{SA} - RW_{i,c,t}^{IRB}) + \beta_1 NPL_{i,c,t} + \beta_2(\hat{RW}_{i,c,t}^{SA} - RW_{i,c,t}^{IRB}) \times NPL_{i,c,t} + \alpha_{i,t} + \alpha_{c,t} + \varepsilon_{i,c,t},$$

$Exposure_{i,c,t}$ is the total asset of bank i in country c at time t . $NPL_{i,c,t}$ is the amount of defaulted exposure. $RW_{i,c,t}^{IRB}$ is the risk weight of an exposure under the IRB approach. $\hat{RW}_{i,c,t}^{SA}$ is the predicted value using the characteristics of $RW_{i,c,t}^{IRB}$ from the following regression:

$$RW_{i,c,t}^{SA} = \delta_0 NPL_{i,c,t} + \alpha_{i,t} + \alpha_{c,t} + \varepsilon_{i,c,t}.$$

This variable is a proxy of what would be the risk weight under SA for an exposure that is actually calculated using the IRB approach. Hence, $\hat{RW}_{i,c,t}^{SA} - RW_{i,c,t}^{IRB}$ is our measure of regulatory risk weight strigency. Higher values indicate lower strigency.

β_2 captures the risk taking channel from regulatory arbitrage.

References

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