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## Bank regulatory arbitrage via risk weighted assets dispersion<sup>☆</sup>

Giovanni Ferri<sup>a,\*</sup>, Valerio Pesic<sup>b</sup>

<sup>a</sup> Department of Economic, Political Sciences & Modern Languages, LUMSA University, Via Pompeo Magno, 22, 00193 Rome, Italy

<sup>b</sup> Department of Management, Sapienza University, Via del Castro Laurenziano, 9, 00161 Rome, Italy

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### ABSTRACT

Increased dispersion of Risk Weighted Assets (RWA) troubles regulators as potentially undermining prudential supervision. We study the determinants of RWA/EAD (Exposure-At-Default) on data painstakingly compiled from Basel Pillar-Three for 239 European banks over 2007–2013. We improve on most previous studies, which consider instead RWA/TA (Total Assets). Indeed, Internal-Rating-Based (IRB) models allow lawful capital-saving Roll-Out effects which RWA/TA analyses disregard and likely misidentify as regulatory arbitrage. Instead, encapsulating Roll-Out effects, RWA/EAD avoids false positive identification. We find that regulatory arbitrage: (i) was present; (ii) likely materialized via risk weights manipulation with IRB models; (iii) was stronger at Advanced-IRB vs Foundation-IRB banks.

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### 1. Introduction

Regulatory arbitrage occurs when a bank engages in practices that, while being formally legitimate, end up in reducing (eluding a rise of) regulatory capital while risk doesn't decrease (increases). This would lead to a reduction of the Risk Weighted Assets (RWAs) density, as given by the ratio of RWAs to Exposures At Default (EADs). The issue has become topical as evidence mounted of sizable dispersion in RWA density across otherwise similar banks. By endangering fair treatment and raising systemic risk, this could prove particularly nasty for regulators. Calculating RWAs largely remains, in fact, with a bank's regulatory accounting choices. If two otherwise equivalent banks show different RWA density, this might imply that one of them underrates risk and artificially reduces its capital requirements. Moreover, should that be widespread across banks in a country, that country would be prone to high systemic risk.

Deplorably, though, we know little on the true size of this phenomenon and its causes remain largely unexplored. In spite of Basel II third pillar's obligations, micro data is still lacking.

This paper has two main aims. First, we provide fresh evidence on RWA dispersion extending the analysis to a relatively ample number of European banks. Second, we assess how much RWA dispersion stems not just either from a "roll out" effect – i.e., shifting larger EAD shares from Standard to Internal-Rating-Based (IRB) model – or from a business specialization effect but is liable to the suspicion of regulatory arbitrage. To this end, we also compare Foundation-IRB (F-IRB) to Advanced-IRB (A-IRB) banks, the latter having more latitude for risk weights manipulation. To accomplish our task, given that during the observation period Eurozone countries underwent the asymmetric euro sovereign crisis, we also control for the macroeconomic conditions of the country where a bank is established.

In the remainder of the paper, Section 2 summarizes the existing literature on the topic. Section 3 presents the data that we painstakingly compiled. In Section 4 we report and comment the results of our econometric estimates. Finally, Section 5 recaps and discusses policy implications.

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\* Corresponding author.

E-mail addresses: [g.ferri@lumsa.it](mailto:g.ferri@lumsa.it) (G. Ferri), [valerio.pesic@uniroma1.it](mailto:valerio.pesic@uniroma1.it) (V. Pesic).

## 2. Balancing stability and profitability of banks in the economics literature

Prudential supervision of banks considers an adequate level of capital as a necessary, though not sufficient, condition to reach financial stability of a single bank and of the whole banking system (BCBS, 2012). However, how to determine an adequate threshold of capital able to ensure banking soundness and stability is still quite an unresolved issue. In particular, as the level of capital to comply with the regulatory framework can affect banks profitability, by enlarging the denominator of their return on equity (ROE), since the inception of the Basel Accord (BCBS, 1988) supervisors tried to minimize the negative effects of their requirements on profitability. The tools supervisors used to that end varied over time. At first, supervisors allowed including in regulatory capital resources besides common shares and retained earnings, granting the option to alternatively comply with capital requirements without issuing too much capital, which would depress financial performance (Ayadi et al., 2016). Later on, supervisors considered an increasing number of typologies of risks under the Risk Weighted Assets (RWAs) formula, so to contemplate the evolution of banking activity and avoid model obsolescence (BCBS, 1996, 1997, 1999). Also, over time they reviewed the modality of capital requirements calculation by different approaches, so to stimulate more sophisticated and relevant banks to invest in more advanced methodologies of risk evaluation (BCBS, 2005). These should eventually achieve sounder risk management together with lower capital absorption. Lastly, the Basel III framework aimed to improve the resilience of the banking sector by increasing the quality and quantity of the regulatory capital base, enhancing the risk coverage of the capital framework, proposing a new leverage ratio to protect against model risk and measurement error (Brei and Gambacorta, 2016), and finally introducing a number of macro-prudential elements to dampen the pro-cyclicality of prudential supervision (BCBS, 2011).

A key potential pitfall of this regulatory framework is that banks might aggressively seek ways to reduce capital absorption. Especially the more significant banks – which generally relied most on funding sources other than common equity – might make discretionary use of regulation to upgrade their capitalization. For one, they could optimize their risk profile, e.g. moving from high capital absorbing (e.g. loans) to less capital consuming assets (e.g. state bonds and other financial assets). Also, they could improve the quality of portfolio assets, as well as choose risk measurement methods possibly lowering capital requirements. To this end, under Basel II and Basel III, using the Internal-Rating-Based (IRB) model can be decisive, because of both its significant differences vis-à-vis the alternative Standard model and the many portfolio assets considered in its calculation.

Yet, a growing literature deems that sophisticated methodologies, such as all IRB – and chiefly A-IRB – models, embody large discretion. Specifically, via regulatory arbitrage banks might lower their capital commitments through lawful ways, alas not justified by sounder risk management. In this, large RWA dispersion may signal that, ceteris paribus, some banks engineered lower capital absorption by more leniently exploiting the regulatory framework (Fig. 1). The most fitting evidence of strategic risk-modelling via risk weights manipulation is by Mariathasan and Merrouche (2014) who study the relationship between banks' IRB model approval and the ratio of RWAs to total assets across 115 banks from 21 OECD countries. Consistent with a risk-weight manipulation view, they find that RWA density drops after regulatory approval, and show that the decline in risk-weights is larger: i) at weakly capitalized banks; ii) in jurisdictions with weak legal supervisory framework, and iii) in countries with many supervised IRB banks.

However, the dispersion among RWAs has become evident even across banks operating in the same region (e.g. Europe)

and with similar business specialization. So, supervisory worries about regulatory arbitrage taking place at banks via RWA calculations surfaced repeatedly. For instance, the European Banking Authority (EBA, 2013a) reviews RWA consistency via a top-down assessment of the banking book, EBA (2013b) performs an analogous exercise for low default portfolios, EBA (2013c) reports on the comparability of supervisory rules and practices, EBA (2013d) tells on the pro-cyclicality of capital requirements under the IRB Approach, EBA (2013e) reports on variability of RWAs for Market Risk Portfolios, and EBA (2014) testifies technical standards on supervisory benchmarking of internal approaches for calculating capital requirements.<sup>1</sup>

However, also other supervisory bodies have addressed the issue as the Basel Committee on Banking Supervision (BCBS, 2013a, 2013b, 2013c) or Argimón and Ruiz-Valenzuela (2010); Ledo (2011), and Arroyo et al. (2012), at the Banco de España, or Cannata et al. (2012) at the Banca d'Italia, or Gustin and Van Roy (2014) at the National Bank of Belgium, or Das and Sy (2012) and Le Leslé and Avramova (2012) at the IMF. In turn, Fratianni and Pattison (2015) show how the same Basel Accord can take significant deviations in national level implementations, suggesting that RWA dispersion might be easier where supervisors apply some form of benign neglect.

All these contributions conclude that analogous amounts of RWAs may hide different levels of risk across countries/banks. However, these studies usually rely on few observations. For instance, Cannata et al. (2012) analyze 24 banks, Le Leslé and Avramova (2012) study 51 banks (18 Asian, 21 European, and 12 American).

Three papers studying the sensitivity of RWAs to banks' policies and macro circumstances are Beltratti and Paladino (2016), Vallascas and Hagendorff (2013), and Bruno et al. (2014). They all find significant indications of regulatory arbitrage. However, these studies either consider also non-European countries – B&P study 45 countries but only 22 of them are European with fewer than 150 banks, while V&H consider 41 countries but only 16 are European with only 61 banks – or rely only on the 50 largest European banking groups (B&A). Furthermore, V&H do not use information on EAD while B&P have EAD values only for a subsample of 86 banks (they don't report how many of these are from Europe). Thus, to satisfy our perspective these studies should be improved. First, their results might depend on the variability entailed by comparing very different jurisdictions (B&P; V&H) and could thus have little bearing for regulatory arbitrage, when differences across countries are abated. Second, failing to consider the role of IRB models – as they don't have EADs – V&H cannot really identify the type of regulatory arbitrage we have in mind; while B&P and B&A in their EAD analysis come close for Europe to the small sample of banks as Cannata et al. (2012). Third, B&P, and V&H stop their analysis in 2010, which does not allow them to tell whether European banks regulatory arbitrage intensified with the euro-crisis.<sup>2</sup>

Table 1 synthesizes the 13 papers most relevant for the issue of RWA dispersion. Although close to previous studies on the determinants of RWA density, our research question is relatively new. In fact, the literature only recently started to investigate how the use of IRB methods, introduced by Basel II, likely contributes itself to boost RWA dispersion. Thus, we compare those papers listing: their methodology, whether they consider the IRB model and/or the Roll-Out effect, the number of banks analyzed, the number of countries

<sup>1</sup> The importance the EBA assigns to this problem is testified also by the fact that it organized a specific workshop on it hosting some relevant papers (e.g., Bruno et al., 2014).

<sup>2</sup> In terms of span of the data we improve only by one year on Bruno et al. (2014) who reach up to 2012.

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