Internal Rating Based Model, Bank Regulatory Arbitrage and Eurozone Crisis
Kyle Cai Liu
University of Reading, UK

For manuscript, please visiting www.kylecailiu.com

Capital Regulation
In order to increase the stability of the financial system, policymakers have been improving the regulatory framework, with particular attention to the design of bank’s capital charges. In this regard, the most important innovation in the model-based capital regulation, which is introduced around the new millennium, Basel II allows banks to choose between two different approaches to assess the risk associated with their assets as well as capital adequacy. Standardised Approach (SA) and Internal Rating Based Approach (IRB).

Regulatory Arbitrage
By applying internal based models, banks can have considerable autonomy in terms of risk assessment, which can provide extensive incentives for regulatory arbitrage. There are mainly two ways:
1. Strategic Modelling
Banks may strategically design IRB models which significantly underestimate the risk associated with assets, so that banks can save capital by switching from SA to IRB.
2. Cherry Picking
Banks may game the risk weights by avoid using IRB approach on certain exposures. The Basel Committee requires that, once a bank uses the IRB approach for one part of its asset, it must take steps to implement the IRB approach across all significant portfolios and business lines.

Eurozone Crisis
The European debt crisis erupted in the wake of the Great Recession in late 2009, and was characterized by an environment of accelerating government debt levels and increasing government bond yields. During the crisis, some countries are seriously affected — Greece, Ireland, Italy, Portugal, and Spain (GIIPS), while some others are relatively steady — Austria, Belgium, France, Germany, Netherlands (CORE). Therefore, the purpose of this paper is to explore the regulatory arbitrage behaviour of Eurozone banks and compare the difference between banks from the CORE countries and those from the GIIPS countries.

Key Variables

RW : Risk weights of a bank’s asset.
IRB% : Proportion of a bank’s asset under IRB approach.
DF : Proportion of a bank’s asset that is in Default.

Evidence of Cherry Picking
A. Total Proportion, IRBP
B. Government vs Private, IRBP
C. Proportion of Gov

Identify Manipulation
More use of IRB
Lower RW
Fair Use of IRB
Manipulation
RW in line with DF
RW not reflecting DF

RW_{IRB} = IRBP_{IRB} \times DF_{IRB} + Controls

Where (i) denotes for home country of the bank, (b) indicates the specific bank, (k) is for the country of exposure and (t) identifies the time.
Endogeneity? Yes, but it is dealt with designated IVs.

RealGIIPS Results (2SLS)

<table>
<thead>
<tr>
<th>Core Banks</th>
<th>GIIPS Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>RW</td>
<td>1.000***</td>
</tr>
<tr>
<td>IRBP</td>
<td>1.000***</td>
</tr>
</tbody>
</table>

Controls
YES | YES

Adj. R-squared | 0.61 | 0.63

Comparing to Core Banks, GIIPS BANKS are very likely to be manipulating RW with IRB approach.

| Core Banks Exposure - NonGIIPS vs. GIIPS |
| GIIPS | NonGIIPS |
| RW | 1.000*** | 0.000*** |
| IRBP | 1.000*** | 0.000*** |
| DF | 1.000*** | 0.000*** |

Data Source: FIBA Stress Test, Transparency Test and Capital Exercise.