

Problem Set 2

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1.

Investigate bank balance-sheet data and show whether IRB- banks use internal models to reduce capital holdings. You should use both statistical and graphical tools.

To make things clearer we reformat the date variable `date_q`:

The table below shows a summary of the distribution of bank's total assets. Figure 1 provides a visual summary. The left panel shows the log-distribution, while the right panel shows levels in millions of assets. Light-blue bins indicate IRB-labelled banks.

Total assets (logs)	
Min.	16.34
1st Qu.	17.24
Median	18.27
Mean	18.22
3rd Qu.	18.98
Max.	20.40

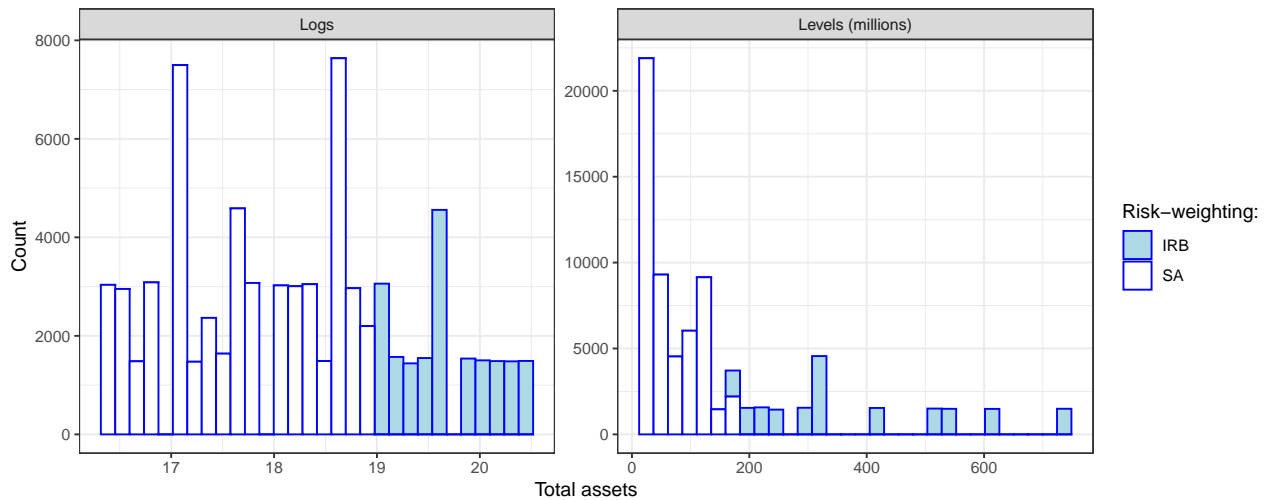


Figure 1: Histograms for banks' total assets as of 2017 Q1. The left panel shows the log-distribution, while the right panel shows levels in millions of assets. Light-blue bins indicate IRB-labelled banks.

The Basel III leverage ratio can be computed from the available data as $\ell_{\text{Basel}} = \frac{\ell_{\text{Tier-1}} A_{\text{risk-weighted}}}{A}$ where $\ell_{\text{Tier-1}}$ denotes the Tier-1 Capital Ratio, $A_{\text{risk-weighted}}$ denotes risk-weighted capital and A denotes banks' total assets. Since assets (`bcet1_bsize_`) are provided in log-terms we need to make a small adjustment for that and take exponentials (although not accounting for only leads to a relatively error):

Then the following code generates Figure 2. The top panel shows time series of the different leverage ratios differentiated by bank type. The black vertical stalk indicates 2007 Q1. The bottom panel shows the difference in leverage ratios between IRB- and SA-labelled banks indexed to 2007 Q1. Upon visual inspection the difference between leverage ratio increased following the regulatory change in 2007 Q1.

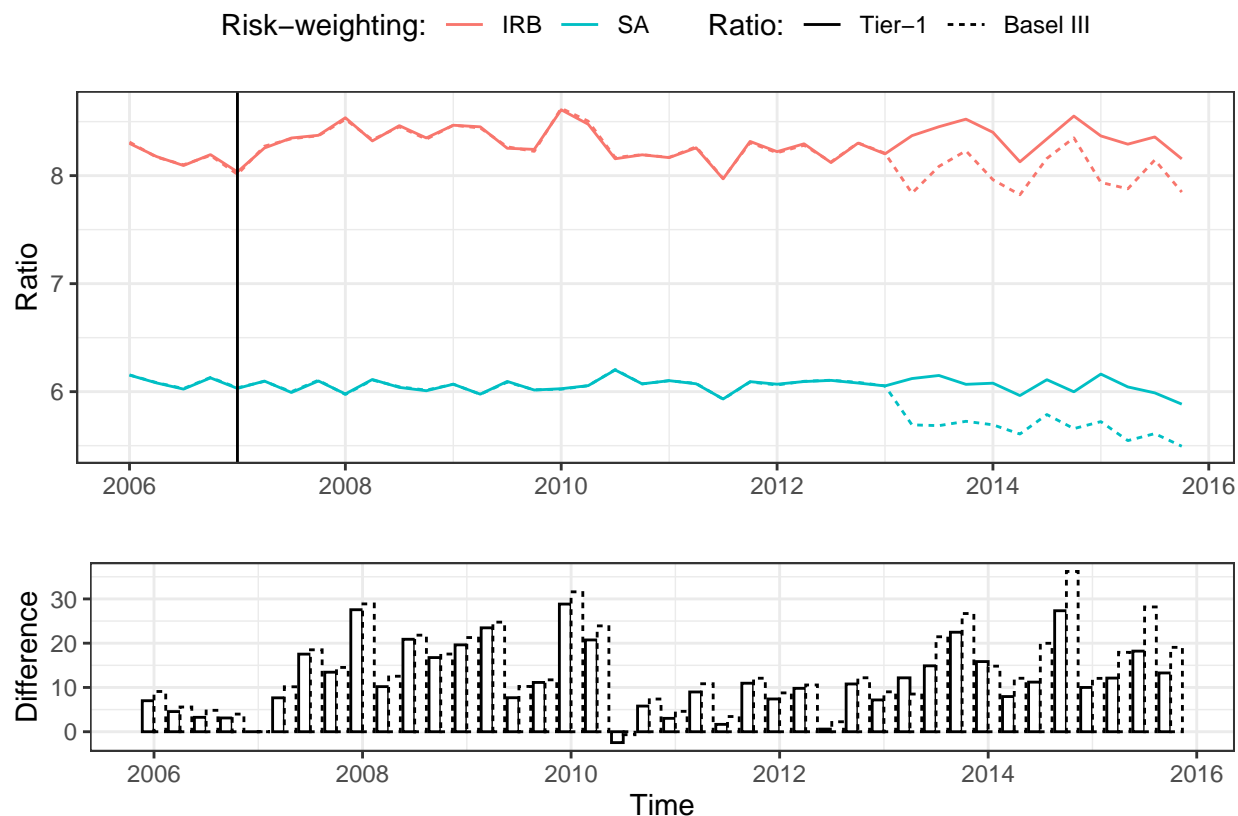


Figure 2: Evolution of leverage ratio over time. The top panel shows time series of the different leverage ratios differentiated by bank type. The black vertical stalk indicates 2007 Q1. The bottom panel shows the difference in leverage ratios between IRB- and SA-labelled banks indexed to 2007 Q1.

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