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.

% latex table generated in R 4.0.3 by xtable 1.8-4 package % Fri Feb 19 13:04:35 2021

	c.summary.dt.date_q.....2007.Q1...bsize_..
Min.	16.34
1st Qu.	17.24
Median	18.27
Mean	18.22
3rd Qu.	18.98
Max.	20.40

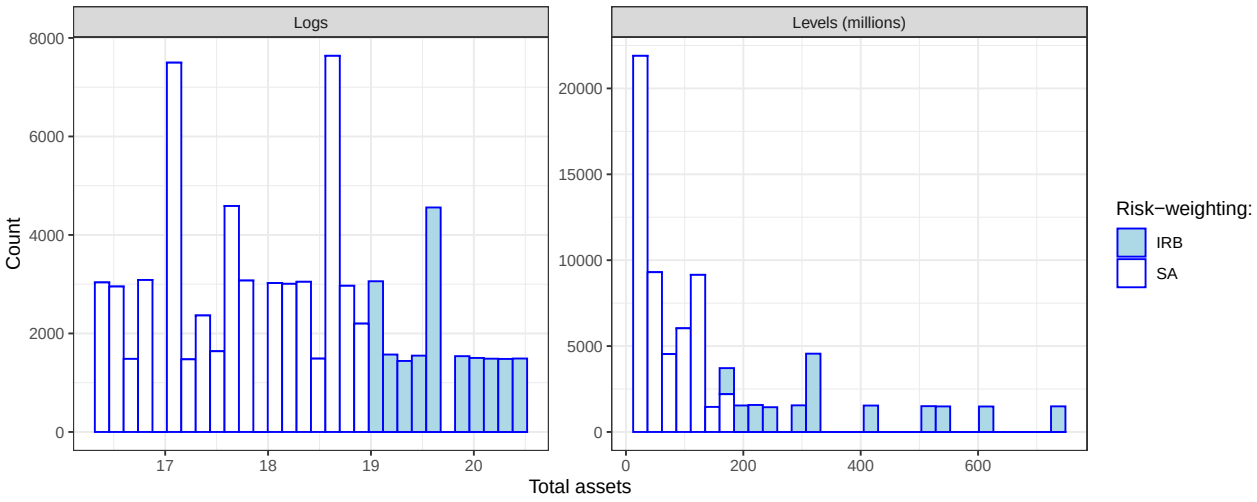

Figure 1: Histograms for banks' total assets. The left panel shows the log-distribution, while the right panel shows levels in millions of assets. Light-blue bins indicate IRB-labelled banks.

The Basel III leverage ratio can be computed form 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.

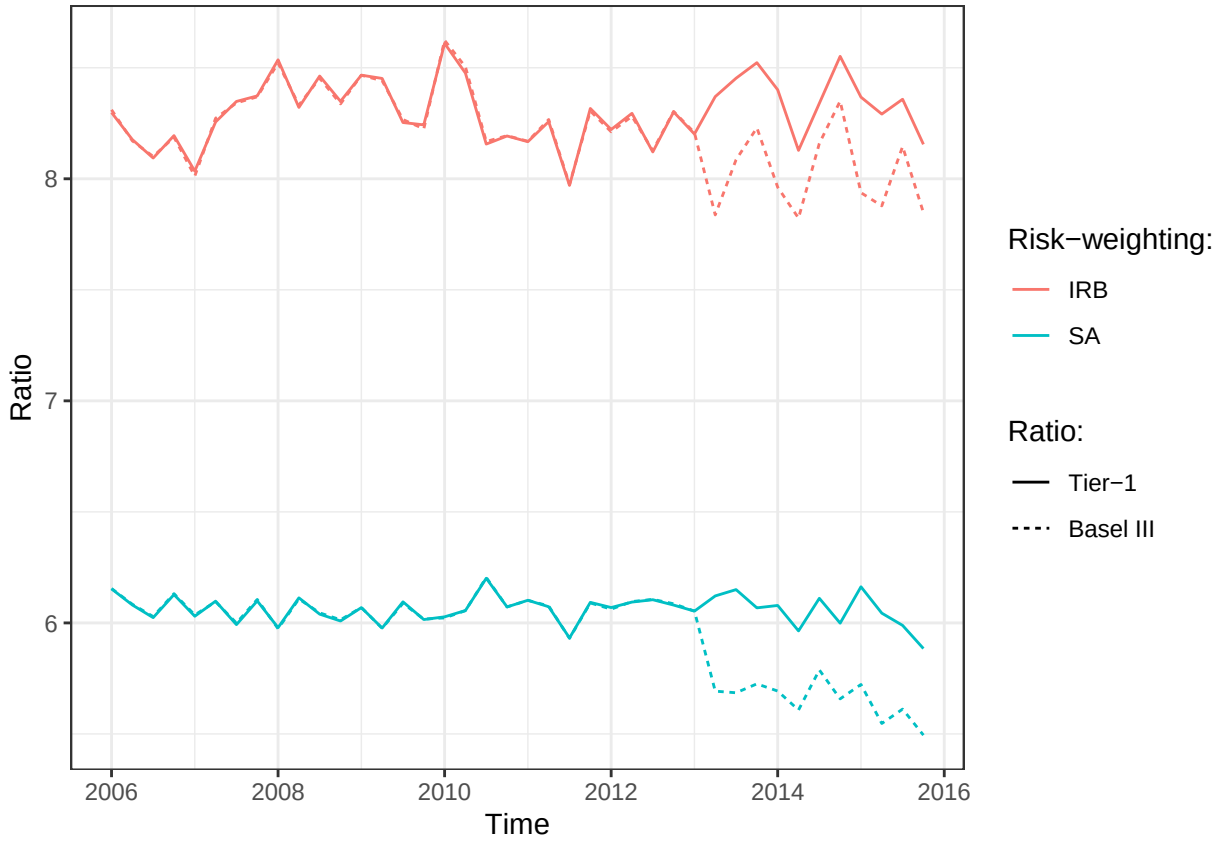

Figure 2: Evolution of leverage ratio over time.