Technical appendix

Pre-TLAC the GSIB surcharge is calibrated so that the expected cost of resolution is equal across GSIBs and non-GSIBs:

$$PD_{GSIB} \times LGD_{GSIB} = PD_{non-GSIB} \times LGD_{non-GSIB} \quad (1)$$

With the new TLAC regulation it is the case that $PD_{GSIB}^{TLAC} = (1 - 0.3) \times PD_{GSIB}$ and it is also the case that $LGD_{GSIB}^{TLAC} = (1 - 0.1) \times LGD_{GSIB}$. Substituting each of these into the above relation yields:

$$PD_{GSIB}^{TLAC} \times LGD_{GSIB}^{TLAC} = 0.7 \times PD_{GSIB} \times 0.9 \times LGD_{GSIB} < PD_{non-GSIB} \times LGD_{non-GSIB} \quad (2)$$

In order to restore the balance in this relationship the levels of capital of the GSIB must be decreased so that the expected resolution cost of a GSIB rises to be equal to that of a non-GSIB. The amount by which the GSIB surcharge needs to be reduced depends on the precise relationship between capital and the probability of default. In finalizing the GSIB surcharge in 2015, The Federal Reserve released a whitepaper explaining their calibration that posited a specific relationship between capital levels and default probabilities. The specific function is reproduced below:

[Figure 3 From https://www.federalreserve.gov/aboutthefed/boardmeetings/gsib-methodology-paper-20150720.pdf]

Next, the TLAC adjustment to the GSIB surcharge takes the following steps:

$$0.63 \times PD_{GSIB} \times LGD_{GSIB} = PD_{non-GSIB} \times LGD_{non-GSIB} \quad (3)$$

Re-arranging yields

$$PD_{GSIB} \times LGD_{GSIB} = \frac{1}{0.63}(PD_{non-GSIB} \times LGD_{non-GSIB}) \quad (4)$$

Finally, using the specific relationship posited by the Federal Reserve the TLAC-adjusted GSIB surcharge is equal to:

$$k_{GSIB} = 2.18 \times \ln\left(\frac{LGD_{GSIB}}{LGD_{non-GSIB}}\right) + 2.18 \times \ln(0.63) \quad (5)$$

with the last term, $2.18 \times \ln(0.63)$, equal to -1.0072.

To taking into account the elevated holdings of high-quality liquid assets due to Basel III liquidity requirements, Covas and Lindgren (2018) estimate the LCR haircut to the GSIB surcharge to be 25%. Thus, the combined impact of the TLAC and LCR adjustments is equal to:

$$k_{GSIB} = (1 - 0.25) \times \left[2.18 \times \ln\left(\frac{LGD_{GSIB}}{LGD_{non-GSIB}}\right) + 2.18 \times \ln(0.63)\right]. \quad (6)$$