1 Reflection

What didn't go right: From the model, we have G^i, the systematic factor for issuer i. At the same time, we have CDS-based times series $\{G_n^i\}$ used to calibrate the default correlation structures. The *mistakes* we had in past versions are

- treating the CDS-based time series as some data that can reflect the economical condition. The quantities are the changes of CDS levels. One could have
- by intersecting the CDS data with the Moody's data, we had to ignore a large amount of data prior to 2005.
- missing the point that the factor variable G is an abstract variable. It can be interpreted differently in the recovery rate model calibration. In particular, I was not free to think that we can separate the correlation model and recovery model. In other words,
  - CDS data are *just* for correlation model
  - Moody's data are *just* for recovery rate model

2 Recollection

Regulatory *Guidelines on LGD Estimates*: `https://eba.europa.eu/sites/default/documents/files/documents/10180/2551996/f892da33-5cb2-44f8-ae5d-68251b9Final%20Report%20on%20Guidelines%20on%20LGD%20estimates%20under%20downturn%20conditions.pdf?retry=1`

2.1 On LGDs

- Recall that we are supposed to consume the LGDs coming from Credit.
  - For sovereigns, where the firm have the largest exposures, they seem to calculate LGDs as part of IRB, in fact,*downturn* LGDs.
  - For large corps, they have both through-the-cycle and downturn LGDs.

- As JK clearly articulated, the fall-back LGD method described in the current methodology would lead to closer to downturn LGDs. This is because there would be a number number of default positions during stressed periods, so taking the average over a long term means that the estimate is biased to the recovery rates from stressed periods.

- The project team proposes to use the F-IRB method to provide fall-back LGDs. Interestingly, the LGD for typical unsecured senior positions under F-IRB is 40%. This is much lower than the standard 40% LGD level used in other areas such as CDS valuations.

  If 60% is not a mistake (despite it has been the case for many years), it is certainly not a downturn LGDs.

  We have yet to find out whether the project team has spoken to Credit on F-IRB in depth.

2.2 On PDs

- PDs should be estimated per issuer based on its credit situation *as of now*. Indeed, there is no concept of downturn PDs in the regulatory guide.

- The fall-back PD method in the current methodology is calculated by averaging the annual default ratios over a long period by rating. The expectation is that the rating information for each issuer is fully up-to-dated to reflect the current credit quality.

2.3 On Moody's data

We can derive the following quantities from the Moody's default historical data from circa 1900:

- $\{p_n\}$:
  - annual default ratio (DR) = (num of defaults)/(num of issuers)
  - varying between 0.5% and 5.5%
- $\{r_n\}$:

  - anuual average recovery rates of those defaulted names
  - varying between 20% and 70%.

p_n and r_n are visibly opposite to each other. When p_n is high, r_n is low, and vice versa. JK produced a nice time series plot and this should be included in the methodology doc.

Notes:

- p_n can be thought to represent the economic condition. Higher it is, more stressed the economy is.
- Whilst r_n is inversely related to p_n, it is not perfectly. So, we would have something like
$$r \sim ap + b + \sigma\epsilon \tag{1}$$
where a would be a negative number.
- At the issuer level, we have to consider an additional idiosyncratic factor as well.
$$r^i \sim ap + b + \sigma\epsilon + \eta^i\epsilon^i \tag{2}$$