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## Cyclical adjustment of point-in-time (PIT) PD

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### ABSTRACT

The EU Capital Requirements Directive 2006/48/EU stipulates that to calculate minimum regulatory capital requirements “long run averages of one year PD” should be used (AVII/P4/59). Typically, in a logistic regression framework relates, client characteristics are related to default information on the same sample of clients one year later. The level of PD predicted by the model will then reflect the proportion of defaults in the sample, which is not equal in general to the long run average. This gives rise to a calibration problem that may be addressed in a variety of ways.

In this paper we propose and consider a way to solve this problem. Using a quarterly set of intra-bank loss data over 15 years we set up a state-space model of the credit cycle, following Harvey (1989). To obtain a time-structure, each loss observation is time-stamped with its default date instead of its write-off date. In accordance with the philosophy of the credit cycle implicit in the Basel II regulation, we assume that the structure of the credit cycle is well represented by a stochastic cycle and a deterministic long-run average term, as well as a random noise process. The model is estimated using a Kalman-filter and continually updated as new loss data becomes available.

To make the long-run adjustment to an individual one-year predicted PD using this model, three kinds of information are needed. They are the PIT PD estimate, the predicted state of the credit-cycle and the value of the long-run average. Each PD prediction is then scaled appropriately for the average portfolio PD to accord with the estimated long run average term of the model.

This approach to cyclical adjustment has some interesting implications. Among them:

- ✓ PD becomes more comparable across asset classes, e.g. between through-the-cycle (TTC) corporate models and PIT retail scoring models.
- ✓ Obligors switch PD classes only due to idiosyncratic movements and not due to cyclical trends.
- ✓ PD will inevitably need to be adjusted downwards at some time or another.

The paper concludes with a discussion of some issues that may arise, e.g. the implication of using loss and not PD to construct the cycle, as well as the stability of the credit cycle.