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Response on

"The New Basel Capital Accord"

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A main innovative aspect of the New Accord is the translation of banks' estimates for default probabilities into capital requirement. This emphasis on banks' risk management and assessment capabilities is aimed to bring regulatory and economic capital requirements more closely together which means that a bank's risk position over a predefined future period should be reflected in regulatory capital. Thus, it is natural that economic as well as regulatory capital will change through time.

The New Basel Accord specifies the time horizon for the future probability of default (PD) as one year (cf. 254). This is consistent with the use in banking practice and in prevalent credit risk models. Thus, one-year PDs are definitely the parameters to be estimated for calculating regulatory capital (cf. 376).

On the other hand the proceedings for estimating PDs are not as clear-cut at all. Cf. 254 states: "For corporate and bank exposures, the PD is the greater of the one-year PD associated with the internal borrower grade to which the exposure is assigned, or 0.03%" whereas cf. 376 asserts: "Although the time horizon used in PD estimation is one year, banks must use a longer time horizon in assigning ratings." Cf. 409 states: "PD estimates must be a long-run average of one-year realized default rates for borrowers in the grade."

In the light of these statements some crucial questions concerning the understanding of the default risk under consideration should be answered.

Default event and probability of default (PD)

Firstly one needs clarification about the definition of the default event and of the probability of default one wants to estimate. Let us assume that the default event is defined as "borrower defaults during the next year" (according to the Basel II criteria).

In this case we are looking for the probability of this future event. In other areas such as survival analysis in medicine or event history analysis in the social sciences this (conditional) probability is called a discrete-time hazard rate, given all relevant information (including survival) up to now. This probability is in general time-varying and unknown, and a major task is to estimate it properly. In the framework of Basel II the main goal is to forecast the future one-year probability of default.

PD estimation using historical averages of default rates

From a statistical viewpoint a historical average of default rates is only meaningful if the underlying default probability of a rating grade is constant over time and fluctuations are pure random shocks. An example for this kind of situation is exhibited in the graph below. This in turn means that the rating is Point-in-Time and changes in credit quality are immediately reflected in up- and downgrades.

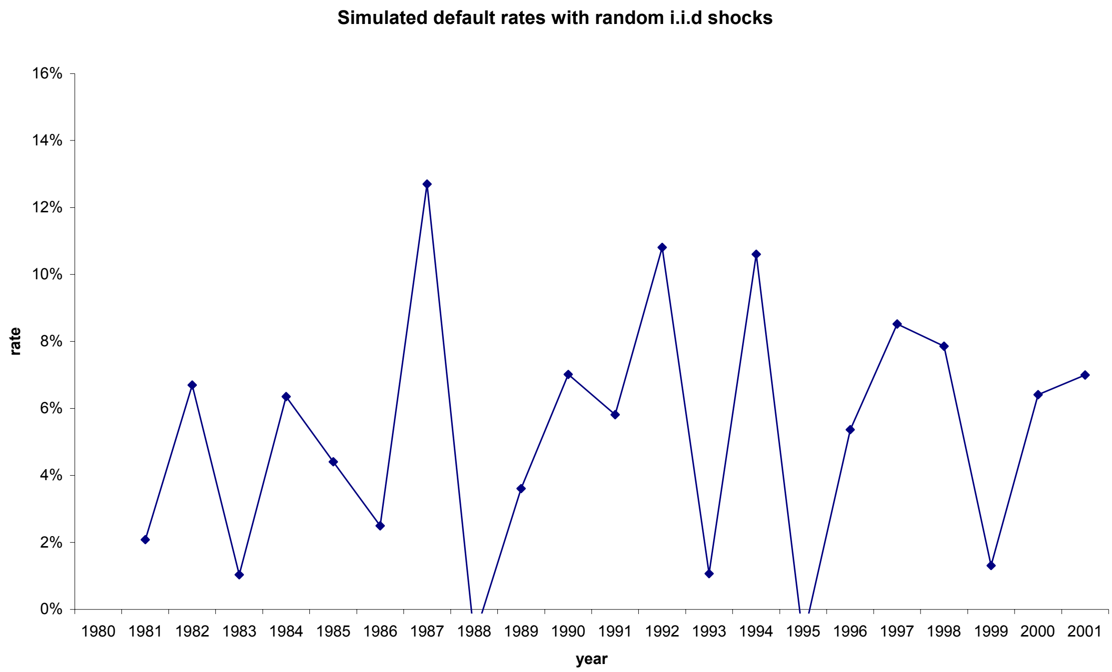

Exhibit 1: Simulated default rates with constant mean and random shocks

Next we ask what kind of PD can be estimated by long-run historical averages using Through-the-Cycle-Ratings or a mixture of Through-the-Cycle- and Point-in-Time-Ratings.

In the following example the probability of default of all borrowers in a rating grade is estimated for year 2001 using long-run historical averages (5, 7, and 10 years respectively) of one-year realized default rates (as specified in Cf. 409). Note that we used default rates from Standard & Poor's who aim to rate "through the cycle". Note also that the three different time periods used for averaging lead to different forecast (from 4.5% to 5.5%).

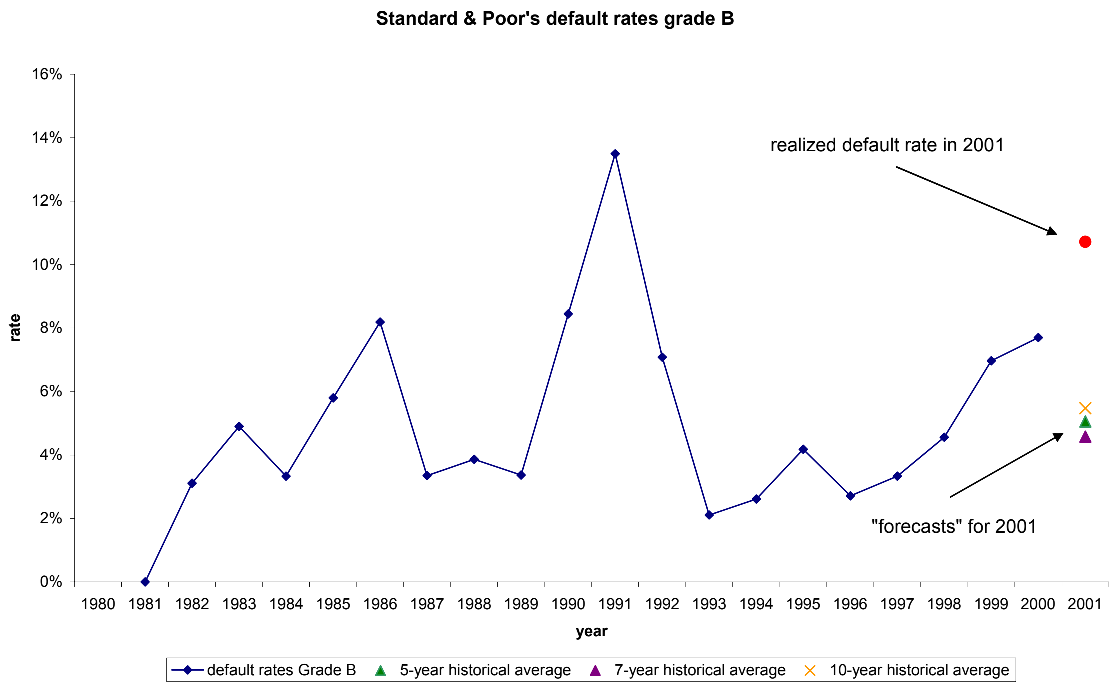

Exhibit 2: Standard & Poor's default rates grade B

The first question to answer is: *Which one* of these forecasts should be used?

The next question arises if one looks at the *actual realized default* rate in year 2001 (which was more than 10.7%): Is *any one* of these forecasts appropriate?

Pattern of the Credit Cycle

The graphical illustration suggests that the fluctuations are not random. Rather the fluctuations seem to be cyclical and caused by changes in the macroeconomic surrounding (see Hamerle/Liebig/Rösch, 2002).

If fluctuations are originated by *systematic* forces, a *model* for the credit cycle is needed. This model could give guidance on which parameters are estimated by historical default rate averages.

As an extreme case a credit cycle is assumed which periodically repeats itself (such as a sine function). That is, recessions and booms will alternate with always the same pattern and will affect default rates always exactly in the same way. Such a situation is illustrated in Exhibit 3. Then one could use a long-term average “Through-the-Cycle” for estimating the “overall-mean” of one year default probabilities. If one compares this pattern with Exhibit 2 one has to admit that real default rates, and credit cycles respectively, hardly look as if they are repeating themselves at regular intervals.

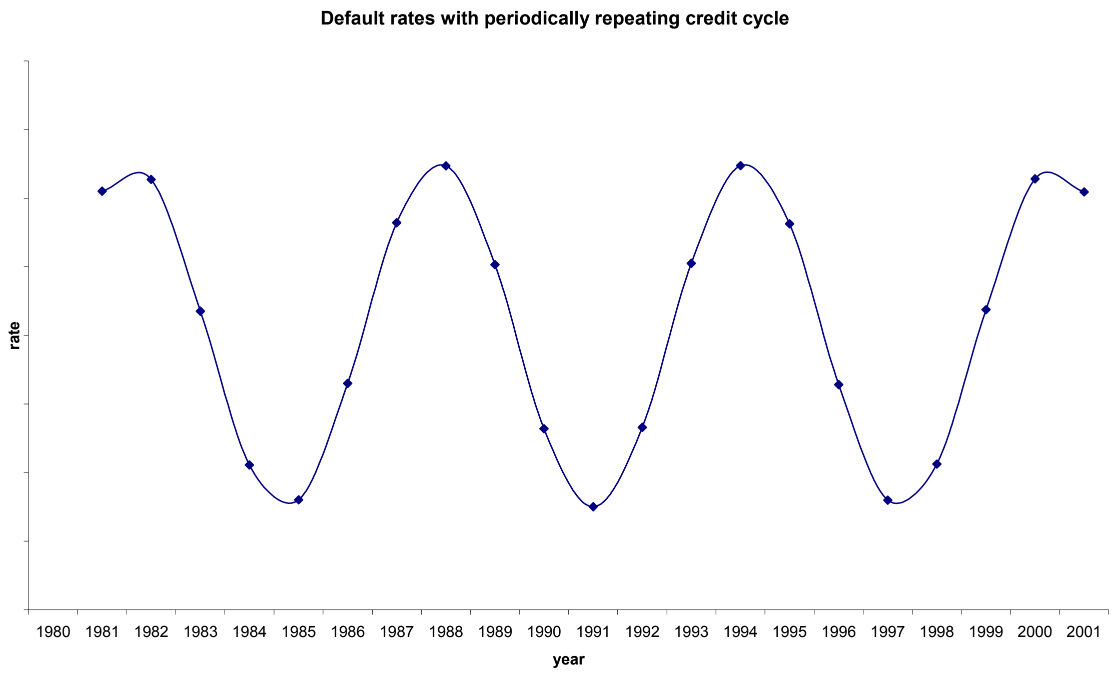

Exhibit 3: Default rates with periodically repeating credit cycle

Validation

As a consequence one has to face several severe practical problems. Firstly, if cyclical fluctuations are assumed to be random, this misspecification will lead to an overestimation of volatilities, and correlations respectively. Then, approaches for validating PD estimates (such as comparing PD estimates with actual defaults) will produce misleading results. If one computes confidence bounds for the true PDs using these overstated correlations, nearly any realization of default rates will be compatible with the forecasts, thus detaining a Banking Supervisor from rejecting inaccurate PD forecasts.

Regulatory Capital Requirements

Furthermore, there may be impacts on the effectiveness of regulatory risk capital. If default probabilities are estimated via long-term average default rates of Through-the-Cycle-Ratings the systematic component of default risk is ignored. Thus, except for an "average year" the resulting regulatory capital requirements will barely reflect a bank's actual risk position, and may overstate the true risk in times of booms and understate the true risk in times of recessions. Notwithstanding the concerns about procyclical behaviour of capital charges, it is our understanding that this problem should be mitigated otherwise than by providing biased inputs for default probabilities.

References

Hamerle, A., Liebig, T., Rösch, D. (2002): Credit Risk Factor Modeling and the Basel II IRB Approach, Working Paper, University of Regensburg, Deutsche Bundesbank.