

BOARD OF GOVERNORS  
OF THE  
FEDERAL RESERVE SYSTEM

**Office Correspondence**      **Date:** November 19, 1990  
**To:** Ed Ettin              **Subject:** A Simple Loan Loss Forecast Rule  
**From:** Sankar Acharya

## 1 Background Information

This memo is about a suggestion I made for an alternative loan loss forecast *rule*, not a model, in the meeting we had on November 14, 1990. It seemed that participants of the meeting showed considerable interest in the basic spirit behind the model, although some in the meeting could not follow the exact details of the rule. This memorandum is intended to provide details of the rule in simple words.

## 2 Purpose of a Loan Loss Forecast Rule

The **purpose of a loss forecast rule** should:

- (i) result in as accurate forecasts of the actual loan losses as possible, and
- (ii) give a bank as little room as possible to oppose, for example, the use of a common model in determining the specific's loan loss, on the ground that the common model is inaccurate for the specific bank.

Clearly any common forecast model we think of can be very easily contested by individual banks, especially because many banks have advanced forecast models which might more accurately forecast loan losses than a common model can for their own banks.

## 3 A Loan Loss Forecast Rule

The **loan loss forecast rule** proposed here will use an individual bank's own estimate of loan loss based on its own expertise, its own model as well as its examiners' suggestions to the extent the bank uses them. In otherwords, every bank is free to forecast its own loan loss. The regulatory rule proposed here will, however, penalize for deviations of an individual bank's own forecast from its actual loan loss in the previous period. The penalty structure will be determined in an optimal econometric procedure, and be subject to periodic updating. The proposed rule is as simple as

follows:

**Regulatory loan loss forecast = A bank's own loan loss forecast +  $\alpha$  +  $\beta \times$  The bank's previous loan loss forecast error,**

where the coefficient  $\alpha$  accounts for systemic deficiency in loan loss forecasts by banks, and  $\beta$  accounts for an individual bank's deficiency in loan loss forecast.

The advantages of this rule are:

- (i) It will discourage individual banks from under- or over-estimating their own loan losses,
- (ii) It will encourage banks to develop their best possible loan loss forecast model,
- (iii) It will reduce regulatory burden for estimating every bank's loan loss forecast, and the responsibility for any lapses.

Observe that, if  $\alpha$  is close to zero, banks will bear no systematic increases or decreases in their capitals, adjusted for loan losses. The above rule simply adjusts a bank's own loan loss forecast. The simple penalty structure is expected to ensure that banks develop their best possible forecast, and not blame the regulators for deviations.

## 4 Some Caveats and Remedies

(i) Banks may still criticize the use of constant coefficients  $\alpha$  and  $\beta$ . Recall that this criticism cannot be construed to be similar to those for the common coefficients of a loan chargeoff model. This is because, an individual bank's best estimate of loan loss forecast is accounted for in the above loan loss forecast rule, and the bank's best estimate already accounts for the bank's own coefficients and attributes. We can, however, develop bank specific  $\alpha$  and  $\beta$  when more bank-specific data are available. The added complexity is not very likely to achieve the goal of getting best loan loss forecasts. What is expected to drive the forecasts as close to the actual as possible is the penalty structure within the rule.

(ii) One set of coefficients for all time to come may not be desirable. Estimation of  $\alpha$  and  $\beta$  should be updated over time, to account for non-stationarity. Indeed, in a regime in which we implement the above loss forecast rule,  $\alpha$  will tend to be zero, although estimates of  $\alpha$  from data

from a period in which this rule was not in place may be non-zero, very likely to be negative. The same thing cannot be said, however, about  $\beta$  since a zero  $\beta$  can result in banks' not worrying about an accuracy of their loan loss forecasts.

## 5 Estimation of $\alpha$ and $\beta$

The econometric model to use for estimating  $\alpha$  and  $\beta$  is as follows:

$$DLLF_{it} = \alpha + \beta \times DLLF_{it-1} + \epsilon_{it},$$

where  $DLLF_{it}$  is the Deviation in Loan Loss Forecast of bank  $i$  at time  $t$ , which is equal to the actual loan losses of the bank minus the forecast made by the bank, and  $\epsilon_{it}$  is the error in the econometric model. The above model can be estimated either for individual banks (if sufficient data are available) or for all banks.<sup>1</sup>

## 6 Concluding Comments

Observe that we can more generally think of developing penalty coefficients  $\beta_1, \beta_2, \dots$  for deviations in forecasts in time periods ending dates  $t - 1, t - 2, \dots$ . This will result in a more smooth penalty (in terms of adjustments to banks' own loan loss forecasts). That is, the adjustments to a bank's own forecast (due to their errors in the past) will not fluctuate as much in a more general loan forecast rule as in a simpler loan loss forecast rule described above.

In any case, it seems clear that a loan loss forecast rule, as described above, can induce banks to develop their own forecasts, while alleviating the regulatory responsibility.

---

<sup>1</sup>Note that if  $x_{it}$  denotes the actual loan loss forecast of bank  $i$  at time  $t$ , and  $\bar{x}_{it}$  denotes the bank's own forecast for the period ending at time  $t$ , then  $DLLF_{it} = x_{it} - \bar{x}_{it}$ . Regulators are interested in their forecast,  $E(x_{it})$ . This is given by taking expectations of both sides of the above econometric model:  $E(DLLF_{it}) = E(x_{it}) - \bar{x}_{it} = \alpha + \beta E(DLLF_{it-1})$ . This implies that  $E(x_{it}) = \bar{x}_{it} + \alpha + \beta E(DLLF_{it-1})$ , which is the loan loss forecast rule.