Box 15

BANK RATINGS AND SUPPORT ANALYSIS

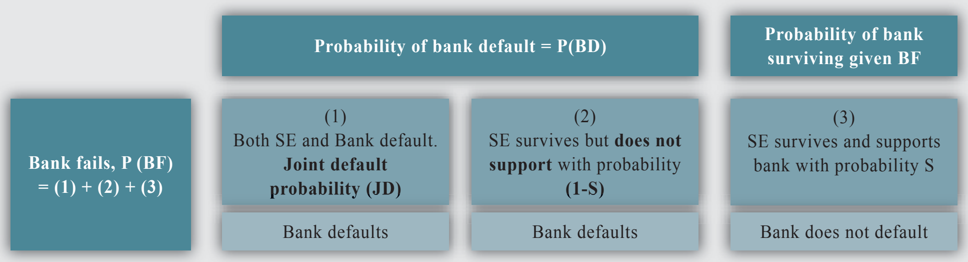
The banking system is a low-default sector in that banks default very infrequently, especially when compared with other corporate sectors. Different reasons could explain this low realised default rate. A significant one is that the banking sector is subject to supervision. Another reason, recently put forward by rating agencies, is the existence of external support which could prevent a bank in difficulties from entering into a state in which it could default. Support mechanisms can come in a variety of different forms. An important one is the potential support that a government could offer to a failed bank. Alternatively, external support could also come in the form of a parent or shareholder group injecting new funds into the troubled bank.

A debate has recently emerged between rating agencies and financial market participants on the usefulness and feasibility of explicitly accounting for such support mechanisms in bank ratings. From the investors' point of view, it can be argued that if bank ratings are meant to provide an assessment of default risk, the presence of support elements that mitigate this default risk should be taken into account. Rating agencies have been incorporating this information to varying degrees into bank ratings for a long time, but not always in a transparent or consistent way.

Explicitly accounting for support in bank ratings, while appealing, is a difficult undertaking that requires a model capable of linking the likelihood of a bank failing with the likelihood of support, S, from the supporting entity, SE (see Figure B15.1). In addition, a third element of complexity to the model is provided by the fact that the default risk of the supporting entity itself could be correlated to that of the bank, i.e. the probability that the supporting entity might jointly default with the bank with probability JD is different from zero, and JD could be so high as to make it impossible to provide support.

Once a bank has failed, three different situations can be identified that decide whether the bank will go into final default or not. First, if the supporting entity defaults, the bank would also default, as there is no longer a supporting mechanism to keep the bank afloat (State 1). Second, the supporting entity could survive but refuse to provide support, forcing the bank to default (State 2). Third, the supporting entity could survive and decide to support the failed bank, rescuing it and preventing it from defaulting (State 3). This allows the probability of default of a bank, P(BD), to be split into two additive components: first, the supporting entity defaults together with the failed bank (JD); and second, the supporting entity – while not defaulting – refuses to provide support, i.e. P(BD) = (1) + (2), as shown in Figure B15.1 below.

Figure B15.1 Bank default model with a supporting entity (SE)



To define the bank's probability of default more precisely, the probability of support (S), or no support (1-S) in States 2 and 3 also need to be defined. The probability of the supporting entity surviving and being unwilling or unable to provide support is equal to (1 - S) · (P(BF) - JD) (i.e. State 2), while the probability of the supporting entity surviving and being willing to provide support is equal to (S) · (P(BF) - JD) (i.e. State 3). This assumes that the probability of support S is linearly distributed between States 2 and 3. If P(BD) = (1) + (2), then the probability of default of a bank in the presence of support is equal to

$$P(BD) = JD + (1 - S) \cdot (P(BF) - JD). \quad (1)$$

If it is assumed, for example, that bank A has a probability of failing of 1% (P(BF)=1%), and a support entity, e.g. the government, is willing and able to support the bank with a probability S equal to 99% (1 - S = 1%), and that the joint default probability of the government and bank A is 0.05% (JD = 0.05%), then the probability of bank A defaulting with support would be equal to P(BD) = 0.05% + (1 - 99%) · (1% - 0.05%) = 0.059%.

It turns out that of the three parameters needed to calculate the probability of default from equation (1), one is relatively easy to estimate, i.e. the probability of a bank failing, whereas the other two, the JD and S, are much harder to estimate. The probability of a bank failing refers to the estimate or opinion of the rating agency of the relative stand-alone credit quality of a bank, i.e. without external support. Essentially, this opinion comes in the form of a rating which, for the purpose of the stylised model presented above, could be mapped into a probability of failure as estimated based on historical observations of bank failures. Such ratings of "stand-alone" bank credit risk are readily available – Moody's new bank rating JDA methodology terms this rating the Bank Financial Strength Rating (BFSR), while Fitch refers to it as the Individual Rating.

The probability of support is much harder to ascertain. From a statistical point of view, it is difficult to substantiate based on historical observations any support probability estimate owing to the lack of data. This estimation would require the collection and analysis of past instances in which banks have failed and defaulted (owing to a lack of support) or survived (thanks to support), as well as information on the supporting entities' own default or survival history. In practice, rating agencies would rely on a more subjective approach based on, for example, scorecards that focus on factors that could be used to forecast the preparedness for support (Moody's), the prior judgemental assessment of the ability and willingness to provide support (Fitch), or analysis of the propensity of the government to support a bank in difficulty, together with the assessment of how systemically important the bank actually is (Standard & Poor's).

Finally, the third parameter in equation (1), the joint probability of default of the bank and the supporting entity, is also difficult to estimate. Two elements are necessary for its computation: the probability of default of the supporting entity, and the default correlation between the two entities. Whereas an assessment of the default risk of the supporting entity could easily be obtained through existing ratings, for example, default correlation estimates are very difficult to compute. Owing to the lack of meaningful data from which to derive the default correlation, applications of a ratings framework for banks in the presence of support would require strong assumptions about the level of default correlation. These assumptions are however bound to be subjective, as there is no meaningful way to quantify default relationships.

The recent explicit incorporation of support analysis into final ratings for banks by one major rating agency (Moody's) has been widely cited as a way of overcoming perceived transparency and consistency problems in ratings. While any attempt to provide greater transparency and consistency to rating methodologies is welcome, it must also be recognised that incorporating support aspects into final bank ratings is bound to be challenging because, as the stylised model presented above shows, such a ratings framework would need to rely critically on estimates of the probability of support and the joint default of the bank and the supporting entity – estimates which are intrinsically very difficult to come by and, more importantly, to validate. In the absence of objective quantitative inputs for the support rating estimates, users of ratings and rating agencies' services are well advised to apply their own judgement when looking for the optimal balance between rating accuracy on the one hand and transparency and consistency on the other.[1]

1 See Moody's (2007), "Incorporation of Joint-default Analysis into Moody's Bank Rating Methodology", February; Fitch Ratings (2006), "The Role of Support and Joint Probability Analysis in Bank Ratings", May; and Standard and Poor's (2007), "External Support in Bank Ratings", March.