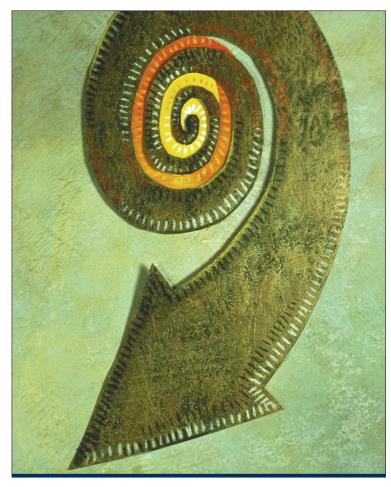# Avoiding pro-cyclicality

David Cosandey and Urs Wolf argue that, for small to medium-sized enterprises, Basel II is pro-cyclical because of double-counting of the risks. They present two main directions for possible capital rules that would circumvent the pro-cyclicality problem

The current proposal for the new Basel capital Accord (Basel II) aims at greater risk sensitivity by using ratings. The ratings might originate internally from the banks or externally from agencies. While it is desirable to be ratings-sensitive, a possible downside of this, especially in the internal ratings-based (IRB) approach, could be that it leads to pro-cyclical capital requirements (see, for example, *Credit Risk* October 2001, page S28). During difficult economic times, commercial banks would be required to have more capital for each loan on average than during quiet times, because the general rating of their portfolio would be lower. This could lead to credit crunches that might worsen economic recessions. Basel II would thus trigger a new systemic risk on its own.

We believe this unwelcome pro-cyclical capital effect could be especially dramatic for small to medium sized enterprises (SMEs) – now under heavy discussion and political dispute. Banks' internal ratings of SMEs rely heavily on yearly financial statements. These obviously tend to fluctuate over economic cycles. Furthermore, banks assign a borrower to 'default' as soon as it is expected to be unable to repay capital or interest in due time, even if that borrower still pays trustfully. As a consequence, the probability of default (PD) varies more with changing economic conditions.

The pro-cyclical effect could be felt strongly despite a Basel II-proposed risk-weight curve that becomes flatter with higher PDs – and even if the overall level of regulatory capital is reduced, on average over time, for IRB-abiding banks.

We suggest the pro-cyclicality short-comings stem from a 'double-counting' of the risks. According to Basel II, capital is derived as a multiple of the expected loss. This works in quiet times, when expected losses are near average. The requested capital is significantly larger than the expected loss, reflecting the possibility that much more difficult times might come. But when a severe recession strikes, the bank enters the tail of the loss distribution, so obtaining the capital by multiplying the much larger

expected losses for this year by the same factor makes little sense. It would imply that one still expects increasingly worse times to come.

This observation holds if one believes in the mathematical distribution selected by Basel to describe the distribution of credit losses, and to derive the risk factors. If Basel does not believe in its curve, it has to revise it. Assuming the curve holds, then the conclusion is inescapable that a double-counting occurred by deriving capital through multiplying the expected losses of crisis times by the same factor as that of quiet times.

To escape the bottleneck of risk double-counting, we propose two alternatives – a weaker and a stronger one. The

weaker alternative would be to define a rule leading to constant regulatory capital along the economic cycle, comparable to a long-term average, where cycle effects would be smoothed out. This would provide a stability similar to that of Basel I, albeit with ratings included. The second, stronger alternative we suggest would be to define anti-cyclical capital. Capital would be allowed to come up in good economic times and go down in difficult times, to serve as a buffer. This second possibility would assume that capital is really a safety cushion. Both schemes offer the advantage that banks with different risk profiles will need to have different capital levels at any time along the cycle.

A constant capital

Defining capital requirements relying on ratings but not changing in time can be done in several ways. We propose two possibilities here, but there could be many more. The idea is to always smooth-out economic cycles, to obtain a long-term average view.

A first possibility would be to scale all default probabilities internally calculated by a bank by a factor reflecting the state of the economy. This factor would be country-wide, unique for all exposures linked to this country. It would typically be derived from the corporate failure rate of the last year measured over the whole country. The PDs associated with the different ratings would then have to be divided by this national factor. The equation would read:

$$regulatory\ PD\ for\ rating\ i$$
$$= \frac{PD\ of\ current\ year\ for\ rating\ i}{alpha\ factor\ for\ current\ year}$$

where:

$$alpha\ factor =$$
$$\frac{national\ corporate\ failure\ rate\ of\ current\ year}{long-term\ average\ of\ corporate\ failure\ rate}$$

With the exception of this correction, all present rules of Basel II would remain the same.

That first methodology has the limitation that all PDs are divided by the same factor, although some rating classes are more volatile than others. This would be an approximation, but still, it would reduce pro-cyclicality effects on capital. To improve on it, banks could rely on several failure rates, one for each rating class. With sufficiently long (internally measured) time series of defaults, banks could then extract a long-term average, and hence an alpha factor, for each rating class.

An even more refined possibility would be to define a national rating migration matrix each year – a return-to-average migration matrix. This matrix would reflect how much the present distribution of all companies in the country differ from the long-term average distribution along the rating axis. This matrix would be the same for all exposures and banks within the country. Applying the matrix on the bank's portfolio (by matricial multiplication on the position vector) would lead to the long-term-average expected loss of the portfolio. The formula would read:

$$EL_L = V x M x V$$

where EL_L = long-term expected loss, V = vector of a bank's credit exposure, one component per rating class, and M = national (regulatory) return-to-

average rating migration matrix for current year.

The return-to-average migration matrix for the current year would have to be determined according to the state of the economy, for example, with the help of the GDP growth of the preceding year. This matrix would actually be the inverse of the 'shift-operator' used in Tom Wilson's credit risk model 'CreditPortfolioView'. This operator transforms a long-term-average rating migration matrix into a matrix valid for the current year. To build this operator, the model compares the current year's default rates per rating class with the long-term-average default rates. But getting a national return-to-average matrix might not be straightforward, since the rating systems differ from bank to bank.

In practice, neither of these two calculation rules (national default rate and return-to-average migration matrix) would lead a static portfolio to a perfectly constant capital requirement, because of inaccuracies in ratings, in the national return-to-average matrix, etc. But it would come much closer to a constant capital than the present Basel II rules.

Both suggested rules would satisfy an essential requirement, namely that banks with different risk profiles within the same country receive different capital requirements. Banks with higher risk profiles would be requested more capital, since the return-to-average transition matrix and the alpha factor will maintain the original gap in the risk profile between both banks.

Anti-cyclical capital

The second option we propose to alleviate the pro-cyclicality problem of Basel II goes further. Here, we question the implicit assumption that more capital should be required in bad times. If capital is meant for covering unexpectedly large risks in difficult situations, then it might not be so useful to increase it right then. With this in mind, regulators should allow capital to fluctuate, that is, to come down in bad times, whereas it should rise in good times.

An obvious counter-argument is: what if a deep economic slump lingers longer than expected, longer than any crisis before (so that the default rate distribution assumed by Basel II was too optimistic)? Won't banks lowering their capital be driven to disaster? The obvious answer is yes, of course, but in such a situation of long and extreme economic decline, bank failures will follow anyway, whatever the regulatory rules.

Clearly, this issue brings us back to the fundamental question: what does capital actually stand for? If one accepts the view of capital as being, functionally speaking,

a reserve, then regulators should allow capital to be lowered when bad times strike. To calculate exactly how much, we suggest the following possible methodology: a bank should start with Basel I regulatory requirements. Every year, the bank should add or subtract capital according to the general state of the economy. When the economy is doing fine, it has to add capital. When the economy is going down, it is authorised to reduce capital. To determine how much to add or subtract each year, the bank estimates the long-term average loss on its credit portfolio, and adds/subtracts exactly the difference between last year's loss and the long-term average yearly loss. To estimate the long-term average loss, the bank applies the preceding formulas (either relying on national default rates per rating or using a return-to-average matrix). The formulas read:

$$\delta C_i = L_{long-term} - L_{i-1}$$
$$C_i = C_{i-1} + \delta C_i$$

where C_i = capital in year i, δC_i = capital change in year i, $L_{long-term}$ = long-term average portfolio loss and L_i = effective loss in year i.

This is nothing new, actually. Age-old wisdom says good times should be exploited to prepare reserves for bad times.

Could a sell-out of capital happen in a recession? Regulatory capital represents only a minimum. Many banks will still maintain more capital on their balance sheet than requested by regulators. More capitalised banks enjoy lower risk premiums. Moreover, the banks would know that the following year could bring a higher capital requirement, making a sell-off quickly counter-productive. Thus no material attack on capital would be necessary. But pro-cyclicality systemic risk embedded in the present Basel II rules would be significantly reduced.

Conclusion

Variable, anti-cyclical capital might be a long way off, but constant, long-term-average capital should not be so far-fetched. Thus it seems reasonable to suggest that Basel II adopt the option of a credit risk capital that is rating-sensitive, but smoothed-out over economic cycles. □

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