Regulating Market Risk in Banks—The Options

Market risk has become an increasingly important issue for banks and consequently for bank regulation. Regulators, concerned about the costs of bank insolvency and of systemic risk arising from the volatility of bank trading portfolios, have developed three different approaches to setting risk-based minimum capital adequacy standards for market risk. This Note evaluates those three approaches—building blocs, internal models, and precommitment—and their possible implications for bank capital, competition, and profitability and pricing decisions.

There are four major categories of risk that arise in financial institutions in general and in banks in particular: market risk, credit risk, legal risk, and operating risk. There is also systemic risk, which occurs if any of these four risks, or any combination of them, causes a disruption to a firm, which is transmitted and magnified across the whole of the financial system. Market, or position, risk, the focus of this Note, occurs when there is a change in market factors that alters the value of a position in a financial instrument or portfolio of instruments. Recent attempts by the European Union and the Basle Committee on Banking Supervision to incorporate such risk into the framework of risk-based capital standards were prompted largely by the deregulation and liberalization of banks’ activities, developments that have led to increased securities, foreign exchange, and derivatives trading by banks.

Modern portfolio theory suggests that the only appropriate way to measure risk is an overall portfolio approach to the bank’s positions. That is because risk is context-dependent: the marginal contribution of a position to total portfolio risk is a function of what else is in the portfolio. Because it is still impossible to measure risk in this way, piecemeal capital requirements focusing on categories of risk have developed instead.

Bank regulators have two main concerns about market risk. First, trading activity can lead to rapid changes in bank capital because of the potential volatility of the trading portfolio’s value. And second, the failure of large banks involved in trading can lead to systemic failure. Motivated by these concerns, regulators have explicitly introduced market risk into risk-based capital adequacy standards. They have developed three main regulatory approaches to measuring—and allocating capital against—this market risk in banks: the building blocs approach, the internal models approach, and the precommitment approach. Another important and more recent regulatory objective—international harmonization of rules—is to prevent regulatory arbitrage and reduce compliance costs.

There is a trade-off between the cost of imposing capital requirements and their benefit. Thus, an assessment of the three regulatory approaches must consider the extent to which they are neutral between financial institutions and they reduce the efficiency of the banking system by imposing substantial compliance costs.

The building blocs approach

The building blocs approach to regulating market risk is a single model to be applied to
all banks. It consists of a set of rules that assigns specific risk charges to specific financial categories and crudely accounts for certain portfolio effects (diversification and correlation) on banks' risk exposures. This approach uses a "building bloc" framework similar to that of the 1988 Basle Accord on capital standards for credit risk.

Two regulatory frameworks incorporate this approach, the Capital Adequacy Directive (CAD) issued by the European Union (EU) and the Basle Standardized Measure (BSM) established by the Basle Committee on Banking Supervision. The CAD had to be implemented by banks in EU member countries by January 1, 1996, and the BSM is to be adopted on a voluntary basis and by internationally active banks by January 1, 1998. Both the BSM and the CAD are minimum standards, leaving national authorities considerable latitude to apply additional requirements, generally or to specific institutions. There are only small differences between them in the parameters they set.

Central to both frameworks is the distinction they make between the trading and the banking books. The principal regulatory target is position risk in the trading book, while the required market risk capital supplements the capital required for credit risk standards. To contribute in part towards market risk capital, a third tier of capital made up of short-term subordinated debt subject to various restrictions was introduced, in addition to pre-existing core and supplemental capital.

Under the building blocs approach, capital charges are determined separately, using different procedures for each of the four major market risk categories (interest rate, foreign exchange, equity, and commodities) and then aggregated. The fundamental structure is therefore additive. Institutions must be in continuous compliance, requiring that daily monitoring and compliance mechanisms be in place.

The experience with the Basle Credit Accord—which because of its simplicity many countries were willing to implement—points to an important advantage of the building blocs approach: it is relatively simple to follow and therefore more likely to be adopted. Several criticisms have been raised against the approach, however. First, neither the concept of two books nor the division of risk by instrument is consistent with a portfolio approach to risk. Moreover, both divisions open possibilities for significant regulatory arbitrage or gaming—switching funds between the books or among instruments so as to minimize the regulatory capital required. Second, the capital provisions have been criticized as arbitrarily set and unnecessarily high. Third, the provisions are static and inflexible, making it difficult to adapt them to new products. Finally, doubts remain about the usefulness of the third tier of capital in times of crisis (such as extreme market movements and market illiquidity) because of its short-term nature.

Most of the criticisms stem, inevitably, from the fact that the approach is a "one-size-fits-all" model that focuses on the classification of instruments. The fundamental problem is that its procedure for measuring market risk is crude, and at variance with industry best practice in risk measurement—using sophisticated in-house models.

The internal models approach

The internal models approach bases capital charges on banks' own estimates of their market risk exposure, prepared using internal risk measurement models. This estimate would become the basis for the regulatory capital charge. Regulators impose restrictions on these internal models to standardize them and thus ensure rough comparability across banks. The Basle Committee recently accepted the internal models approach for use as an alternative to the BSM for capital provision for market risk.

A central feature of the approach is its use of value-at-risk (VAR) models. VAR is a statistical approach to evaluating market risk. Its aim is to consistently calculate the likely loss for a speci-
fied probability, over a certain holding period, that a bank is likely to experience on its portfo-
lio as a result of an adverse market movement. There are three main VAR approaches—variance-
covariance, simulation, and Monte Carlo—but as yet no industry consensus on the best method for calculating VAR. Like any statistical model, VAR depends on assumptions whose choice is
 dictated by the user’s awareness and aversion to those assumptions.

The assumptions underlying the internal models approach are that banks are in a better position than regulators to devise models that produce accurate measures of risk exposure, and that the regulatory authority can verify that each bank’s model provides such a measure. In effect, the regulators piggyback on a bank’s risk management model to determine the levels of risk capital the bank should hold.

Setting capital adequacy standards under this regime is a three-stage process. First, the regulators set the quantitative standards (risk parameters) for calculating capital, such as the confidence interval, the holding period for the portfolio, and a minimum scaling factor to reflect their conservatism regarding the model’s results. Second, the regulators validate the models and processes the banks use to measure risk using qualitative standards, such as senior management oversight of the daily risk management process and the existence of an independent risk control unit. Third, the bank estimates and maintains VAR capital requirements on a daily basis, and periodically uses stress test simulations to test the trading book exposures for extreme market movements.

The internal models approach has three main advantages. Compared with the building blocks approach, it results in better alignment of the incentives of banks and regulators—it is much less likely to be in a bank’s interest to “game” its own VAR model. It encourages the development of sophisticated risk management. And some observers have argued, though not very convincingly, that it may simplify the supervisory task since it requires the regulator only to set the risk parameters and validate each bank’s method for measuring risk.

But the approach may also pose some problems. The regulators may find it difficult to verify the accuracy of sophisticated risk management models. And some analysts have criticized the constraints the regulators impose on banks’ internal models as too conservative, resulting in less efficient capital determination than the models allow. So banks that can measure their market risk more accurately using these models have little to gain: their regulatory capital set-asides will be much the same as they would be if calculated using the building blocks approach.

Another problem with the approach is that setting up such internal systems is costly. As a result, only a few major banks currently carry full VAR models. Most banks still rely on either stress tests or a combination of stress tests and VAR models for individual lines of business (for example, foreign exchange trading) as a way to measure market risk and allocate capital against it.

The precommitment approach

The precommitment approach is based on work by Federal Reserve economists Paul Kupiec and James O’Brien. An alternative to models-based regulation, this approach focuses on the goal—maintaining sufficient capital to cover trading losses—rather than the means and leaves it to banks to determine the best models and the best inputs to those models for achieving that goal.

Under this approach, which has not yet been seriously considered by regulators, each bank precommits the amount of capital needed to cover what it believes to be its maximum trading loss exposure over a given regulatory period. This capital becomes the focus of regulation. A bank would be in breach of this precommitment if cumulative losses from the beginning of the period exceed its capital commitment on any close of business mark-to-market during the period.
Setting penalties becomes all-important for regulators in this approach, because it sets the tone for incentives for compliance. Penalties must align the incentives of regulators and banks well, to avoid over- or undercommitment of capital. In addition to the discipline of public disclosure, the penalties may include fines, a capital surcharge in future periods, or some other regulatory discipline.

The precommitment approach is thought to have several significant advantages. It removes the need for supervisors to verify the accuracy of a bank’s loss estimates. Its incentive structure uses the self-interest of banks to induce them to allocate adequate capital and develop risk management systems. Moreover, it is flexible, though explicit, about the type of penalties imposed: penalties are tailored to the bank and in proportion to the regulatory risk incurred.

Precommitment has problems, however. It is still relatively new, and the effects of its penalties are untested. Though it relies on the safety net of deposit insurance, it removes from supervisors the right to determine instances of unusual financial stress, because firms are free to choose all quantitative parameters. And critics have argued that because precommitment encourages banks to rely more on stop-loss behavior in order to limit cumulative losses, it can increase systemic risk.

Implications for business

The outcome of minimum capital regulations for market risk will depend to a large extent on how the national authorities implement them, as well as on the institutional framework, particularly accounting practices. Of the three approaches, the internal models approach currently appears to be the most reliable, market-friendly, effective, and eventually achievable method for regulating market risk. The reason is that it conforms to financial institutions’ best practices much more than does the building blocks approach, while severe doubts remain about the effects of adopting the precommitment approach. But that does not mean that most banks will choose the internal models approach in the near future. Few banks now have the technological capability to adopt sophisticated risk measurement and management systems.

The implications for business of imposing market risk–based capital requirements can be seen in three dimensions: capital, competition, and profitability and pricing decisions.

- **Capital.** Many banks’ initial reaction to the new Basle rules on market risk is that, if implemented, they will not result in requirements to hold significantly higher levels of capital. The effect is likely to be smaller for the bigger banks, which are better able to measure risk, though not much smaller, given the conservative parameters that regulators have imposed. The existing rules on credit risk will continue to dominate the overall regulatory effect for banks.

- **Competition.** An international accord on market risk capital is unlikely to have a major effect on competition among banks in different countries. But banks will intensify the search for new non-capital-consuming lines of business, and barriers to entry for proprietary trading may increase.

- **Profitability and pricing.** The new Basle rules will add to the costs of most firms conducting securities business, particularly through the need to install new risk measurement and internal control systems. But regulatory capital is only one factor among many in firms’ pricing decisions, and so it is not expected that implementation of the rules will substantially alter pricing policies.


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