POSSIBLE IMPLICATIONS OF BASEL II ON MARKET RISK MANAGEMENT OF BANKS IN SRI LANKA

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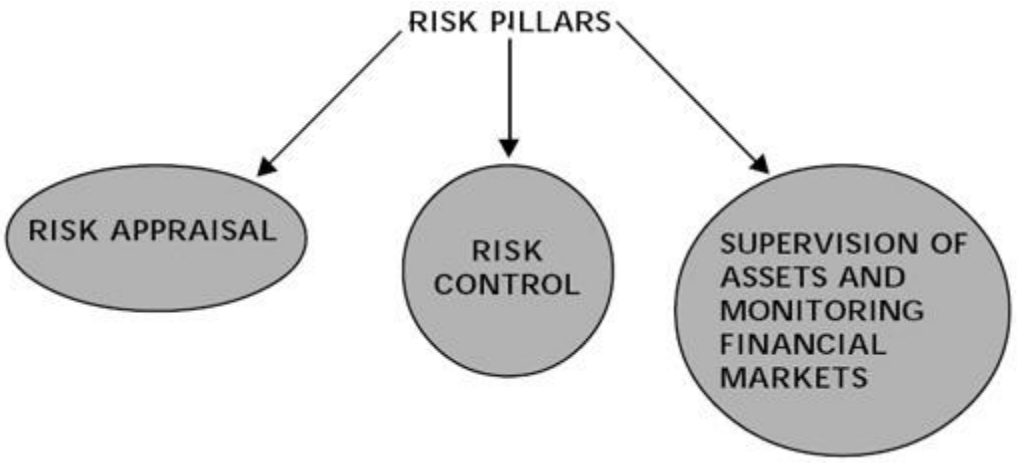
The Framework of the Basel II Accord

The main difference between the Basel I and Basel II accords is that the latter permits the banks to adopt more than one option to measure the risks involved, viz credit, operational and market risks. The definition of the regulatory capital and the minimum required ratio are both unchanged. The objective is to lay equal emphasis on the three risks involved. Market risk was added to the framework nearly a decade ago in 1996. However compliance has not been made mandatory as yet. This article serves to look at implications for Sri Lankan banks once compliance in full or part is made compulsory. The accord is structured on three pillars.



The new accord gives flexibility in terms of selecting a measurement option to both the banks and the local supervisor in setting measurement parameters and setting up financial models to measure the same. Thus the spirit of the accord remains the same in that the capital adequacy ratio is truly representative of all manifest, measurable risks a bank is exposed to, at any given time.

The overall effect of the Basel II had been to make regulatory capital more sensitive to risk. The objective is therefore to make banks undertake capital allocation on a risk sensitive basis. The supervisor's role is to create awareness among banks on the need for investment in risk management systems which include both people and information technology. Such a risk management system would encompass a risk policy, identifying risks, monitoring and controlling risks. The longer term goal which would come with the required compliance is a risk culture. Each risk must be measurable in terms of the capital at stake, be it credit or any other type of risk. Any such risk should be priced into the product which carries such risk
for long term stable profitability and a sound capital base.

Developing countries like Sri Lanka which are vulnerable to external shocks to their respective economies, resulting in high event risk would find compliance with the new framework, daunting.

Training of human resources to manage risks which includes risk setting, risk taking, risk monitoring and controlling, in both banks and the supervisory authorities, is still an ongoing process. However some banks will feel the pressure more quickly than others, based on their dependence on institutional funds from developed countries which require compliance with the new framework. The loan covenants would invariably begin to reflect the need for compliance indirectly.

As far as capital requirements for banks are concerned, these will come into effect in the foreseeable future. Banks which are not adequately capitalized will face fundamental issues of acquiring capital rather than optimising capital structures.

However this article will discuss only those banks which do not have to face this fundamental issue under the new regulations. Since flexibility is allowed to select a method to measure market risk, the framework expects internal development of models. The objective of the model is to make a reasonably accurate calculation of the capital at risk. Such an internal model must be validated by the supervisory authority of the country. The other option is to use the standardized approach which is developed by the Basle Committee on Banking Supervision. Its salient feature is a risk weighting process.

The regulatory requirements proposed under Basel II stipulate that a bank electing to use an internal model approach to measure market risk be subject to eight standards.

Currently banks in Sri Lanka (local banks) do not have internally developed fully fledged, functioning, validated models.

Market Risk

Market risk is the risk of loss to the bank from its debt and equity trading portfolios due to changes in interest rate, foreign exchange rate, equity and commodity price fluctuations which will result in a fall in value of the price of such portfolios.

The eight standards listed under the Basle Committee on Banking Supervision criteria to measure market risk are applicable to a statistical method of risk measurement called Value-At-Risk (VaR). VaR, in simple words is a function of the volatility of rate fluctuations, prices and corresponding sensitivity of the bank's trading assets and liabilities.

It is also a technique dedicated to measure market risk and extendable to cover credit and interest rate risks.

Implications for Managing Market Risk

In all internal models advocated by the Basel II the underlying assumption is that historic data is the best estimator of the future. We will look at each standard to understand its implications in managing market risk in Sri Lankan banks.

1. VaR computed daily at a 99%(one-tailed) confidence level of estimated maximum loss.

Example
On a fixed income securities portfolio if the VaR is LKR 100 Mn at a 99% (onetailed) confidence level, it means, there is a 1% chance that the maximum loss at any given time could exceed LKR 100 Mn.

The implication is that the required confidence level is extremely high. Therefore the maximum loss could be relatively larger. However given the high event risk in Sri Lanka, VaR would necessarily have to be supported by stress testing to avoid unlimited unexpected losses. However, compromising on the confidence level would lead to a lesser capital charge and a lesser maximum loss that lead to stricter risk limits. If the event risk proves to be low, this will result in a cost which is the cost of compliance i.e. missed opportunities.

2. Holding period for VaR measurement must be 10 business days.

In the Sri Lankan market where depth is limited, a period of 10 days is insufficient to take corrective action on imminent market risk. Further, once event risk recedes, liquidity will increase and the potential loss situation would also be mitigated.

3. The model must measure all material risks incurred by the institution

This envisages a portfolio spanning across fixed income, foreign exchange, equity, commodities etc. Whilst appreciating the fact that VaR is an enterprisewide risk measurement, it would be difficult to gauge accurate factor sensitivities for each asset class. For example, duration of a fixed income portfolio is a function of its tenor to maturity, coupon and the frequency of coupon payments while the beta of a stock measures the sensitivity of an equity
price to market changes.

4. The model could accommodate historical correlations among broad categories of risk factors but not within categories. (Different risk categories are Interest rates, FX rates & Equity prices)

For example, as far as fixed income investments are concerned, a correlation between a 3 year government security and a 3 year corporate debt cannot be accommodated. However in a Sri Lankan context relationships between risk categories may not be accurate due to the high level of market fluctuations.

5. The non-linear price characteristics of options must be adequately addressed.

This is difficult to measure as a non-linear relationship will compel the banks to build models on further assumptions and such assumptions are subjective, given the local market conditions.

6. The historical observation period for data to be a minimum of one year.

This does pose problems due non-availability of accurate information specially on the fixed income market to Sri Lankan banks. Primary auction rates are not a representative yardstick to measure relationships at all times.

7. Data updating shall be once a quarter and more often if market conditions warrant it.

Although this requires a lot of effort, it is not a difficult task as long as accurate information is easily obtained. Further market aberrations due to event risk must be avoided if the effects are transient in nature. Integrity of source of data and data entry is of paramount importance.

8 Yield curve per currency must be modeled on at least six risk factors.

Main risk factors for modeling a yield curve would be duration, benchmark and liquidity. Liquidity would be difficult information to gather unless the supervisor imposes stringent data submission which would make available such valuable information.

While the Basel Accord II's requirements are clearly to measure all material risks, it is evident that its dependency on modeling incorporating strong statistical capabilities is extremely high. The parameters to build the model are clearly highly suitable for markets where information is transparent and available to all and markets are deep.

The methodology entails a capital at risk, number based on which factor sensitivities will determine trading profit/loss limits, duration, class and series of asset to invest. Any methodology is only as good as its input data. The input data must be of a high integrity as Management Action Triggers will be placed at the wrong level of loss unknowingly to the bank.

Possible Measures Banks Could Adopt to Identify, Measure and Monitor Market Risk in Sri Lanka

- Develop human capital to enable internal model development. This will require intensive training. The challenges would be to maximize profits by correctly pricing the risks into all products to avoid losses, margins and costs. Each incorrectly priced product is a burden on the capital. On the other hand Basel II will require extensive documentation for the internal model methodology. Such documentation needs model approval and model reviewal processes.

- Adopt the most suitable model out of Variance-Covariance (Delta Normal), Historical Simulation and Monte Carlo models. The Variance-Covariance model is the simplest to build and administer.

- Determine factor sensitivities with data of a very high integrity which can be validated by a supervisor. Since each and every model must carry the afore-mentioned eight standards, weights for each to be given based on the bank's own individual perspectives on risks faced.

- Set limits for market risk flowing down from an affordable capital charge which should be coupled with sufficient Management Action Triggers (MATs) lest the signals of potential losses could go unnoticed.

- Develop a derivatives strategy to hedge general risk arising out of market risk with cost/benefit trade off.

- Diversification of specific market risk

- Establish review procedures for internal models to validate the assumptions made, calculation methods used and check if risks are meaningfully measured.

Role of Management, Risk Takers Within the Banks, Supervisory Authorities

Management's priority will be to ensure that they comply with the regulator's requirements at best cost and risk to the bank. Senior officers will need to look at the risk model frequently with a good technical understanding. Such feedback and involvement bodes well for the integration of modeling and compliance with the process of risk management in the bank. However the dilemma faced by banks in the face of mandatory compliance with the new Basel accord is the level of capital adequacy. Regulator's minimum must be kept with a pool of risks which give the best cost/benefit trade off. Anything in addition for safety would constraint growth and limit risk taking. To limit the adverse impact of a high level of capital adequacy, a reality check with actual market conditions or in the alternative, a stress testing to verify the potential losses in situations of high event risk must be performed to optimize capital and meet the regulator's requirements.

In Sri Lankan banks, risk controllers, unlike for credit risk, are still untrained to a large extent in understanding the results of internal modeling or the risks at hand. Risk controllers must be independent from risk takers at each and every level of the hierarchy. It must ideally converge only at the top. Risk takers in Sri Lankan banks will need to refocus their trading strategies as the room for maneuvering becomes limited with the conditions imposed by Basel II.

In the absence of a uniform VaR model validated by the supervisor, each bank will work independently and have varying degrees of VaR. In times of opportunity, the risk taker with a bank who has generous limits will benefit over the bank which has set lesser limits.

Pricing risks into products is the risk taker's specialty. If a risky asset which was not subject to capital adequately becomes so after the new accord, such assets should be priced higher. Risk averseness will decline required capital but reduce returns as well. However the danger would be, as far as market risk is concerned, the capital required is lesser than for credit risk which leads to risk takers seeking higher risks to look for extraordinary gains which poses a threat to the banking industry as well.

Risk taking is aided by quantitative risk management but is always a partly qualitative decision. The measurement should in no way substitute for the judgemental decision making ability of traders and management. Since risk management could be a bottom up process too where risks are originated, consolidated, monitored and made consistent with global regulations such as Basel II, this component in the risk taking decision is vital.

Practical Issues Faced by Sri Lankan Banks in Managing the Implications if Basel II

Diversification of specific market risk

Business line profitability measurement systems are still primitive at best as most of these do not

allocate expenses over common customers but over different products. As such finding positively correlated cash flows and negatively correlated cash flows in a bank to understand the diversification benefits is difficult.

Lack of a derivatives market

Derivatives market is still in its infancy in Sri Lanka and hedges will be hard to come by to reconstruct the balance sheet and the capital structure. Optimal capital structure and human resources Compliance with market risk forces the banks to closely monitor their trading portfolios and trader activities. Therefore internal controls whittling down to correct human resources in trading becomes mandatory as mistakes accidental or deliberate are crucial.

Lack of adequate Management Information Support

Compliance with market risk requires tremendous management information support in a bank. The VaR limit is set at a 99% (one tailed) confidence level over a 10 day period. The minimum regulatory capital requirement to support the VaR limit (maximum potential loss) is equal to

C	=	V x Scaling Factor
Where C	=	Minimum capital required
V	=	Most recent 60 day average of VaR estimates
Scaling Factor	=	3

This presupposes the ability to calculate volatility on a daily basis after setting up, testing and validating the model which set the VaR in the first place.

Conclusion

In conclusion, the possible impact of compliance with Basel II accord for Sri Lankan Banks as far as market risk management is concerned, is that they require to redefine their business strategy with the new capital structure. Such a structure optimization is inevitable when a charge on activities hitherto not liable is levied upon them. The riskier the activity-the higher the return, but may not attract an equally higher charge for capital as there is no single independent model for calculating the Value at Risk. This will result in an imbalance in the market as certain banks' internal VaR will be higher or lower than a competitor. The new focus would be not only to acquire customer business but use capital structure and its management as a competitive advantage. Further skills for internal model development, testing and maintenance is inadequate and will take considerable time to develop internally. Most banks would have to resort to external help and rethink their organizational structures and training of staff to gear their institutions up for compliance.

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