

Risk Budgeting for Banks

Leslie Rahl; Nicholas Le Pan

Capital Market Risk Advisors; Canadian Imperial Bank of Commerce

While risk budgeting was originally developed as a tool for institutional investors, it can also be adapted as a useful tool for banks, but the evolution of risk budgeting for banks is probably where we were for pension funds when the first edition of this book was published in 2000. This chapter explores the issues in applying risk-budgeting concepts to banks.

While pension plans embraced risk budgeting earlier than banks and in many ways are more sophisticated in their use of it to drive risk-adjusted compensation than banks, banks generally have more sophisticated risk metrics and tools than are available to a pension plan.

The risk-budgeting process is actually two parallel processes: first, the numerically driven process (driven mainly by historic or projected financial results); and, second, a qualitative-driven process or “expert judgement”. Both are needed; one without the other does not work.

CONCEPTUAL ISSUES IN APPLYING RISK BUDGETING TO BANKS

For pension funds or investment portfolios, risk budgeting is based on several key concepts. The principle is that asset-allocation decisions can benefit from measurement of active risk from a specific aspect of the portfolio and allocation of that active risk to different aspects of a portfolio – eg, to individual asset classes or individual managers. Fundamental is the notion that risk should be taken to the point where the ratio of incremental impact on performance to the

incremental impact on portfolio (or fund) risk is the same for all asset classes (see Chapter 5). Value-at-risk (VaR) came to be used as a key metric in measuring risk. Determining risks in strategic benchmark portfolios and choosing a benchmark is a key part of the framework.

For banks, the continuum of risks is larger. In addition to market risk (which is the main risk inherent in the risk-budgeting decision for investment funds), banks are exposed to credit and liquidity and interest-rate risk. Operational risk is also key. So, the decision as what to optimise is more complex. One choice is asset composition, where assets (consumer versus commercial versus corporate, trading, etc) differ in risk characteristics. In addition, not all assets are amenable to VaR measures as a reliable measure of risk, especially since a good part of the asset side of the balance sheet is not marked to market (or to model). Conceptual issues – as well as in the long-running controversy over issues in accounting regarding fair-valuing loan books – complicate the equation. An alternative is to optimise the liability structure of the bank, which can have significant effects on liquidity risk and interest-rate risk. Here again, complex assumptions and models of how various liability holders, including depositors, react to market events is key to estimation of risk positions.

In addition, banks are different from pension funds in that they have many kinds of customers, and getting in and out of businesses can be problematic. Yet, sometimes, decisions to exit/de-emphasise businesses need to be made for reasons of external stakeholder relations and credibility. Also, in a bank, some businesses are interconnected in a way that internal management financial reporting doesn't do justice to. For example, cutting retail brokerage business might hurt a bank's investment banking business.

The optimisation process for a bank behaves like a linear programming problem: the goal is to maximise return on economic capital, subject to risk and regulatory constraints (risk-weighted assets, footings, funding, other risk limits (VaR, credit concentration limits, etc)) and other constraining factors (for example, taxable capacity, if trading strategies are dependent on the bank's ability to absorb tax deductions).

The optimal capital level for the bank is also a very important decision for the organisation. Less levered banks (higher-capitalised ones)

will presumably earn lower return on equities. But they will also be less susceptible to issues arising from surprises that could deplete capital and should gain some market advantage from being well capitalised.

Further, we think a key point they make is that the above constraining factors evolve and shift over time. For a particular time, funding might be the constraining factor, but, given the circumstances, taxable capacity might be the more constrained in the future. And therefore we agree the constraints can be very bank-specific – so the key is to understand the current dynamics in the bank and risk budget appropriately.

Classic Modigliani Miller (MM) proposition argues that (under assumptions regarding tax policy and market operations) a bank's cost of capital should be independent of its capital structure. But some argue that various real-world constraints and imperfections mean that capital structure matters. Bank regulators have increasingly focused on their own measure of capital and on raising capital requirements as an essential part of the financial stability agenda. In essence banks can be seen as optimising their own capital structure subject to constraints imposed by regulators.

Given the approach many banks are taking in making large and non-controlling investments in operating companies – either as an investment or strategic toehold – the risks are real but not part of daily risk MIS, and require modelling and incorporating risks into a risk budgeting process, as well.

All these factors mean that the risk-budgeting process for banks cannot be as precise as for investment funds, and needs a higher contribution of expert judgement at this stage in its development. That by itself is not a bad thing. However, it does mean that the role of expert judgement needs to be explicitly recognised in the risk-budgeting process. It needs to be documented and a review process needs to be in place to validate the judgements, challenge them and vary them as appropriate.

ROLE OF REGULATION

Banks also face various regulatory constraints that need to be considered conceptually in the optimisation process. Until recently there were few explicit constraints on the composition of the asset side of their portfolio. This is changing with the introduction of

rules limiting so-called “proprietary trading” or forcing separation of investment banking from retail banking (reference the Volcker rule and Vickers). However, bank regulatory capital rules have for some time required a risk-weighted calculation of assets that greatly affect the risk–return tradeoff for various asset choices. This has been directed at raising the capital requirements for a variety of trading-book assets. It has also involved specifying additional metrics for measuring risk, including stressed VaR.

In addition a number of regulators (US, Canada) have for a long time imposed a required leverage limit. This is effectively a limit on assets (unweighted) relative to capital. Under the Basel III rules, leverage limits will likely become more widespread (though the precise nature and calibration are not agreed internationally). These limits and the risk-weighted capital calculation interact. For example, a bank might want to hold more lower-risk-weighted assets (such as mortgages and sovereign debt) for risk-weighted capital purposes but will find that by doing so the size of its balance sheet relative to its capital becomes the operative constraint. Again, the impact of the desired balance sheet for risk-weighted capital purposes could affect funding the bank through, say, wholesale funds (and thus liquidity risk), if funding that balance sheet requires many more liabilities than it has deposits. Then funding and impact on liquidity risk may become the operative constraint.

These constraints affect the possible risk-budgeting-optimised outcomes and need to be factored into the analysis. Banks may have their own measures of economic capital as well as regulatory capital – both have to be part of the process. In any given situation it may be that the scarce risk resource is one that is intrinsic to the bank’s assessment of risk–return or it may be that the scarce resource is due to a regulatory constraint.

Also, banks’ rating by debt rating agencies is also based on certain rules of thumb, such as capital calculations or concentration tolerances. They will need to be taken into account in the risk-budgeting process.

MEASUREMENT OF RISK

Banks are leveraged institutions with varying assets and liabilities over time, as contrasted with pension funds with set assets under

management (AUM) and inflows and a given liability stream, but, if we can agree on what risk is, it can be allocated/budgeted, at least approximately.

The investment fund risk-budgeting approach relies on using a comprehensive consistent system for measuring risk. Unfortunately, risk measurement has developed differently in many banks. Historically, market risk was measured by VaR techniques while credit risk was measured by more historical cost measures. While economic capital measures of credit risk are more available, banks may not use them extensively in decision making on a regular basis.

Basel II processes supported many major banks developing their economic capital processes to cover credit risk and operational risk. Other developments have propelled better measurement of credit risk in trading portfolios as well as enhanced VaR measures of risk, including in stress conditions. However, further development on incorporating liquidity, volatility and complexity factors is needed, and is under way in many banks.

Measurement of liquidity risk tends to be more based on survival horizon measures of some nature under “conservative” assumptions about run-off of liabilities and assets. Basel III liquidity measures reinforce this approach. Banks have made progress in embedding liquidity premium in risk-based pricing of products, but there is still work to be done in incorporating liquidity considerations in VaR and other metrics.

While for a bank the constraints are different from those of a pension fund, risk is a scarce resource. So what “risk unit” should a bank budget/allocate? Banks could adopt the approach taken on the buy side and use VaR. They, like the buy side, would need to apply add-ons for liquidity, embedded leverage, difficulty in valuation, etc. And a bank would need to include non-trading VaR. But economic capital is probably a better starting point, as economic capital includes considerations of counterparty and operational risk. Some businesses, like asset management, have low VaR but use higher economic capital, because economic capital incorporates operational and reputational risk. But for some banks it is risk-weighted assets or funding or leverage ratio that is a more binding constraint than economic capital.

Banks also use stress or scenario testing as a key input into risk

decisions and risk appetite. This is encouraged by regulatory rules. Indeed, appropriate scenario testing is a key input into decisions by management and boards of directors about their desired capital and their desired buffer of capital over regulatory required minimums. In the trading books, stress testing is a key part of the day-to-day process with explicit limits against certain scenarios. Stress/scenario testing can be done at an enterprise-wide level and at the level of individual businesses or portfolios. Bank-wide risk-appetite metrics can express tolerance that stress losses should not exceed so many quarters' earnings (see Chapter 1 for a further discussion of risk appetite). It is possible to conceive of allocating or budgeting this stress/scenario "capital" to individual businesses.

As well, stress/scenario testing is a key process for imparting a forward-looking dimension to risk–return assessment. Given that a number of a banks' strategic decisions resulting from risk budgeting do not involve "liquid" assets that can be reasonably continuously adjusted, it is important to assess how robust the risk-budgeting decisions are in various plausible future states of the world, not only in today's world.

A WAY FORWARD

This chapter suggests that banks use a holistic process to risk budgeting.

One approach is to identify the scarce risk resource and budget on that. For example, if a bank is liquidity-constrained, liquidity might be the unit that is "budgeted", while, if a bank is VaR-constrained, then it might be VaR that is "budgeted". Another approach would be to budget adjusted economic capital, but constrain and optimise the allocation by constraints on funding requirements, leverage, liquidity, Level 3 assets, the ratio of stress losses/VaR or the ratio of forward-looking stress losses/economic capital.

So how can adjusted economic capital and stress losses be combined as a risk unit to be allocated? Or is it necessary to combine them? Perhaps adjusted economic capital should be allocated/budgeted and stress losses should be subject to a limit. Regardless, there is likely not to be one best approach. Rather, it will depend on a bank's situation and the development of its strategic risk–return process. Also, the exact nature of the optimisation problem now may be different from how it will be in five years' time. That will

be not least because of the ongoing development of regulatory requirements.

So, rather than approach it in this fashion as a formal optimisation (and thereby create another black box), it appears better to approach this as a step-by-step process (as detailed below) as part of strategic and resource planning. That will also make clearer – for debate and resolution – the judgements necessary for success.

Here are the five steps in the process.

1. First, identify and be clear about the basis for measurement of major risks and returns and the major risk-budgeting categories for strategic decision making on both the asset and liability sides. This should likely be at major risk buckets – broad asset allocations, broad business-mix categories. This also means being clear about the limitations of various risk measures and a willingness to use more than one, or to make ad hoc adjustments. A bank's capability to measure risks and risk-adjusted returns, including conducting stress testing, should be a key factor in deciding on the initial degree of granularity in the risk-budgeting process. This presumes that banks have a viable enterprise-wide risk–return framework that is shared across key decision makers.

Forward-looking assessment of return possibilities as well as historical calculations for risk-adjusted return on capital (RAROC), subject to rigorous challenge for realism, can also be key to a successful process. This is because notions of where returns might be higher than current market expectations (including from a bank's unique advantages) is important input into the process.

2. Banks should ensure that they have identified and are able to assess the major linkages between risks in these various buckets. That would include business linkages, such as the fact that in certain stress conditions asset quality in certain businesses will suffer, but so will returns from related businesses. Another example would be a good understanding of how treasury funding choices affect product pricing and profitability.
3. Banks should overlay regulatory constraints that will impact on both individual decisions and the relationship between key variables.
4. Banks should identify their scarcest risk resource and the optimisation method they wish to use. That will vary from bank to bank. For example, for some banks in the current environment

that will be risk-based capital as regulatory and market expectations rise, especially for systemically important financial institutions (SIFIs). Basel III and the global financial crisis have greatly increased the focus on liquidity ratio and funding profile and for some this will be the greatest constraint. For some banks leverage may be the constraint. For others it will be a judgement based on a combination of variables subject to a regulatory capital constraint.

Then banks should rank strategic decisions regarding businesses/asset allocation/balance-sheet variables according to various key metrics, including this scarce resource. For example, if wholesale funding is the scarce constraint, strategic decision processes might have information on the RAROC of various businesses, their economic capital and the funding they need. This is likely an iterative process if various factors and interrelationships are to be effectively taken into account.

5. Lastly, businesses/strategies where future-looking stress scenarios have greater losses than historical stresses need special focus, and this should be incorporated into the risk-budgeting analysis in some fashion. That it is done is likely more important than how it is done. Banks could use scenario analysis to test the outcome of the risk-budgeting decision. That could both test how the decision matrix would look under stress conditions. If the bank has an enterprise-wide or business-wide stress tolerance as part of its risk appetite, the stress tolerance might be allocated or budgeted (disaggregated) to various business units as part of the process.

Another approach to incorporating the banks stress analysis into risk budgeting could be to gross up the usual risk metrics for these businesses/strategies to reflect this increased risk based on current nightmares versus historical stresses, as well as to reflect liquidity, complexity and other factors that are not currently well quantified. Consideration could be given to limits as to the amount of historical risk that should be allocated to these businesses/strategies as the future risks could well exceed these levels.

RISK BUDGETING AS AN ERM PROCESS FOR BANKS

As noted in the first edition of this book, the strategic risk–return process benefits from a number of key attributes that are likely to contribute to its success, in addition to those mentioned above.

One is the link to explicit risk-appetite statements/tolerances at the bank. It is essential that risk-appetite statements not be considered as fixed and immutable. Particularly, the details need to be flexible to change depending on the results of evolving risk-budgeting processes. For example, a risk-budgeting process may identify the importance of one risk-scarce resource whose importance was not previously understood. That would call for a change to the risk-appetite statement. What is not desirable is that unwillingness to evolve a risk-appetite metrics result in risk-budgeting strategic decisions drifting from what the risk appetite was. That will seriously undercut the credibility of both processes. Better to explicitly accept and communicate changes and the reasons for them.

A second and related attribute is a robust, developed process that is capable of involving senior management and the board in risk–return strategic decisions. That requires involvement, education and trial-and-error learning as to what works best for the particular bank. A degree of sophistication in the risk and strategic function, as well as at the board level, is also necessary. This can be developed with well-crafted education sessions for the board.

Risk budgeting should be approached as a dynamic process. That means revisiting regularly the results of the risk-budgeting process.

Part of the dynamic process is a need for banks to determine at some stage in the evolution how to best link risk budgeting to the compensation system. Risk considerations are already having much more impact on compensation systems following market developments and the Financial Stability Board recommendations, but that tends to be one way – consideration of additional risk acts to reduce compensation. But risk budgeting has developed in investment funds to emphasise that there is an optimum level of risk relative to return and it is possible that risk budgeting indicates that more risk ought to be added to a portfolio for optimum results. More interestingly from the point of view of risk budgeting for banks, it might be that part of the bank does not come close to using the risk budget that was determined during the planning process. If that

occurs, it will be important for management and board to understand why that was. It might be because conditions have changed relative to those that were assumed when the risk budget was set (for instance, a view of the world might be different before a large crisis than after). On the other hand, is it possible to have a too risk-averse implementation of the risk-budgeting decisions that itself is creating longer-term strategic challenges for the organisation?

CONCLUSION

Banks are in the business of risk taking and risk management, and profitable, successful operations are the best bulwark, supporting safety and soundness. While risk budgeting is only one component of the risk framework outlined earlier, it is one where pension funds have advanced further than banks and where cross-industry learning can be valuable.

Nicholas Le Pan and Leslie Rahl would like to thank Tom Woods (SEVP and CRO at CIBC) and Brian O'Donnell (EVP Risk Management at CIBC) for their insight and helpful comments whilst working on this chapter.