



# A Metric Approach to Risk Management

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## Executive Summary

Financial risk is an integral part of overall firm risk, and must be managed if the firm is to remain competitive and healthy. Corporate risk management increases firm value because management is in the best position to measure financial risks and then appropriately hedge them in a timely and efficient manner.

However, the value-added that risk management makes is often not recognized because that value is not explicitly measured. Without defining the metrics to measure that value, the default metric will be whether the hedging was profitable in an accounting sense, a loser's game for Treasury. A robust, metric-based financial risk management framework is introduced that is applicable to corporate commodity, foreign exchange, interest rate and investment risks.

## Skepticism About Corporate Risk Management

Despite the above arguments, at many companies there is skepticism about risk management, a skepticism grounded in several beliefs and arguments. The first could be called "naïve purchasing power parity." It expresses the belief that since financial rates even out over time, corporate risk management is a zero sum game. The second tries to apply the Miller & Modigliani arguments on corporate debt vs. equity to other financial risks. Finally, in a variant of the old Groucho Marx joke about not wanting to join any club that would accept him, there's the belief that only real bank traders could possibly be good at risk management. In other words, anyone who was good at risk management wouldn't be working in corporate treasury.

As a result, corporate risk man-

agement is often a weak function. Minimal investment is made in the infrastructure of strong policies, systems, and processes needed to make it successful. Without strong policies and procedures, the exposure information flow is inadequate. Without systems, risk measurement is non-existent. Little is expected, so performance benchmarking is rarely done. What value-added Treasury does provide is not recognized. The skepticism becomes a self-fulfilling prophecy.

## The Counterarguments

To get out of this box, Treasury must change the mindset about the true purpose of corporate risk management and be willing to hold itself accountable for its risk management activities. As part of this effort, Treasury must also restate its risk management objectives and mea-

surements into a conceptual framework that the rest of the company can easily understand.

Regarding the naïve purchasing argument, let's leave unhedged for some period of time — 5 years, 10 years, or even 20 years — the foreign currency flows of any two large multinationals, say a Siemens and an IBM. Then what else could the statement "things even out over time" mean but that both Siemens' and IBM's cumulative net FX gains and losses would be zero! How could the same exchange rates miraculously offset both companies' constantly changing — and different — foreign currency inflows and outflows and end up at zero?

The second is an ersatz M&M argument that states it is really up to the company's shareholders to hedge the company's financial risks. If the shareholders don't like the financial risks, then the shareholders can

either diversify the risks themselves with other stockholdings or otherwise directly hedge them. But how can any shareholder figure out the magnitude and timing of IBM's or Siemens' foreign currency flows to be able to diversify them? And just how many shareholders in this world have the capability to hedge these risks as timely and as efficiently as an IBM or Siemens?

The Groucho Marx belief is really an expression of the idea that the only way to evaluate risk management is whether the hedging made money, and to make money in derivatives one must have the highly paid skills of a bank trader. Risk is volatility, and the skills needed to reduce volatility and improve the risk/return distribution are widely available at the major corporate treasury level.

Going back to the IBM and Siemens example, can anyone doubt that the caliber of Siemens' or IBM's risk policies, treasury staff, and processes are such that their management of their FX flows would be significantly better than if those same flows were managed using the policies, treasury staff and processes of a typical \$1 billion company?

Policies, expertise and processes do matter. It is not a zero sum game.

In fact, as Chart 1 shows, risk management increases firm value by improving both the numerator and the denominator of the standard corporate finance equation of firm value, the net present value of future operating flows discounted by the weighted average cost of capital.

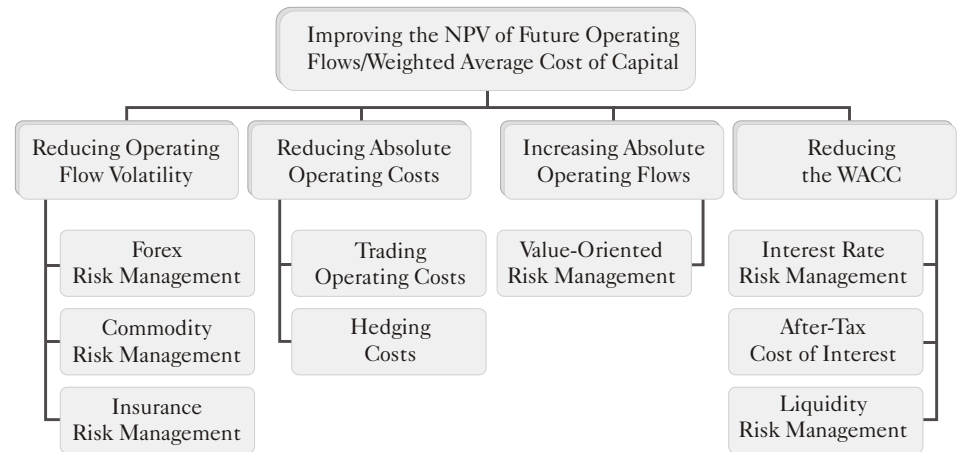
### Conceptual Risk Management Framework

Developing an effective risk management policy is often difficult and time-consuming. It is an iterative

ent risk classes can provide valuable insights into risk tolerances and important risk class differences.

Chart 2 on the next page shows a framework that addresses the fundamental nodes or decision points relevant to formulating any risk management policy to deal with a major risk class, such as foreign exchange risk, debt interest rate risk, investment risk, or a commodity risk such as natural gas. It separates the decision points into four distinct categories in the order that these issues are best addressed: Fundamental Considerations, Key Policy Parameters, Group Issues, and

**Chart 1:** How Corporate Risk Management Increases Firm Value



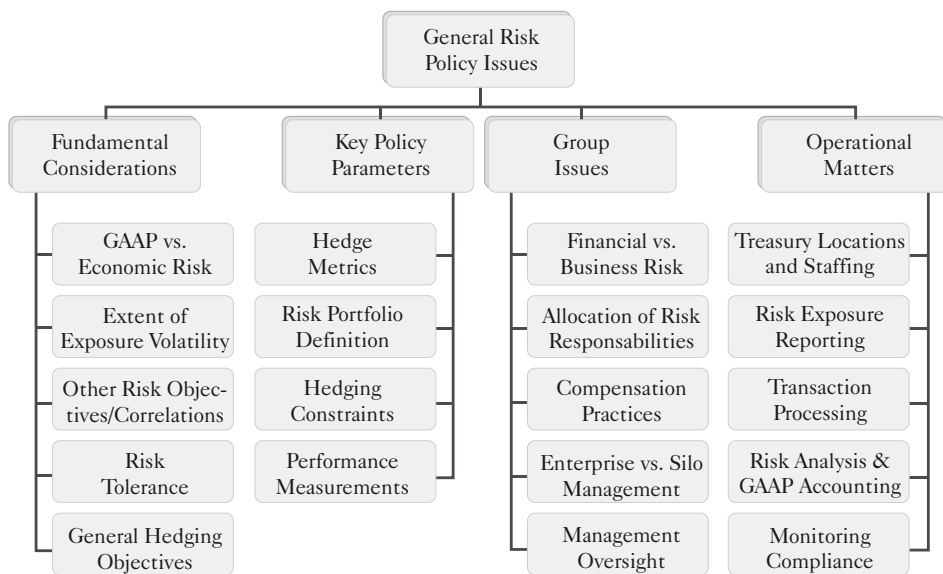
process of first understanding and then resolving a number of interrelated issues. Just as FAS 133 accounts for FX, interest rate, and commodity risk within the same accounting framework, corporate risk management is best done within a single conceptual framework. By using the same framework, much time can be saved because how one manages one kind of financial risk is often quite relevant to the management of another kind of financial risk. Inconsistencies in managing differ-

Operational Matters.

### Fundamental Considerations

Fundamental Considerations involve the company's general attitude to a given risk class. For that particular risk, are we most concerned about the variables that GAAP measures, such as interest expense, or about the variables an economist would measure, such as total value of the debt portfolio? How volatile are the risk exposures, which will help determine

**Chart 2: A Conceptual Financial Risk Management Framework**



how the risk can be managed? For example, the interest rate risk exposure of a debt portfolio is easily determined compared to the currency risk exposure of expected foreign currency sales, which may be subject to additional risk from forecast error.

Are there any risks that impact the management of this risk? For example, the need to manage supply risk by entering into a long-term floating rate commodity contract may be the real driver of the commodity risk program. Similarly, liquidity risk can influence the appropriate debt portfolio duration, which may affect the mix of fixed vs. floating rate debt.

Related to this is the degree of correlation between the financial risk to other financial risks, to the business risks of the firm, and the “correlation” with how the firm’s major competitors are hedging the same risks. A high correlation may significantly impact how the risk should be managed. Hedging does change competitive position, and evaluating

how one’s competitors are hedging is a critical factor in the overall hedging policy process.

What is the corporation’s overall tolerance for that risk? For example, companies with large profit margins may be willing to incur more FX risk than companies with smaller profit margins. A specific commodity risk may be so small as to be not worth the effort to manage it.

Evaluated together, these individual risk considerations provide the rationale for the company’s general hedging objective for the risk: adding value only, reducing or eliminating volatility, or improving the risk/return distribution. These are the right questions to ask. But one often gets quite general answers. These questions take a much stronger bite when we consider them again after we consider various different policy parameters.

**Key Policy Parameters**

The American poet Robert Frost once

said that writing a poem that doesn’t have a meter is like playing tennis without a net. Similarly, we believe that managing financial risk without a performance metric is a waste of corporate resources. What is the point of the exercise otherwise? A performance metric is the only way Treasury can show everyone the value-added its risk management provides to the firm. If Treasury doesn’t choose a metric, then the default metric is always going to be “Did the derivative trading make money?” — and that is a loser’s game.

The winner’s game is defining an easy to understand metric(s) that is applied to a well-defined portfolio or portfolios of transactions with the associated risks, subject to various constraints in how the hedging is applied. The post-hedging results of the metric(s) are then compared to a *fair* benchmark that tells us unequivocally whether Treasury did a good job or not.

There’s no room to hide in this approach. By focusing on numeric outcomes, this metric approach forces senior management to squarely confront what exactly they want to achieve in hedging, the extent of the hedging, and the related investment in resources that may be necessary to achieve that objective, and what is a reasonable performance benchmark. In other words, management’s desire that Treasury magically hedges to protect the budget rate meets the economic reality that by the time the budget is finished, current market hedge rates may bear little resemblance to the budget’s FX rate assumptions.

The Budget FX rate is a metric, and it will always be Treasury’s cross to bear. However, it is not a fair metric and for that reason should not be the only metric. It is up to Treasury to do the hard work of figuring out what is fair given the magnitude of the risk—and the resources devoted to managing it. After that is done and the metrics are embedded in the risk policy, anyone then focusing solely on hedge losses can be easily positioned by Treasury as either “just not getting it” or not being team players.

Chart 3 expands on the decision points associated with each individual risk policy parameter, followed by a detailed explanation of each

portfolio statistics. Flow values can be P&L line items such as revenues, operating income, or net income, or actual cash flow or a combination such as EBITDA. Ratio values are average transaction rates (e.g., the average euro/dollar transaction rate) or a weighted average return, which is relevant for investments or debt interest rate risk. Portfolio statistics can be total portfolio value or a risk measure, such as Earnings-at-Risk (“EaR”) or Value-at-Risk (“VaR”). While a risk measure can be a hedge metric, more often risk measures are used as hedging constraints, and are discussed in that section below.

Having chosen a metric, we must

to-future (future value) basis?

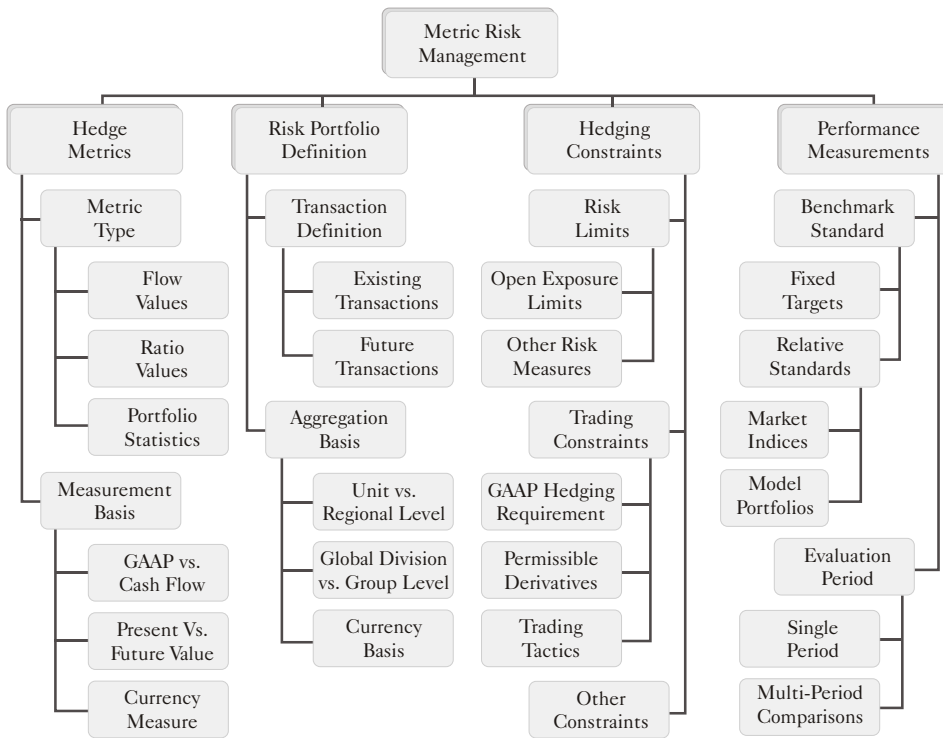
A marking-to-future basis is often better because corporate risk management is largely focused on future period forecast risks. For example, say one is hedging expected third quarter euro sales and the hedge metric is GAAP Revenues, which includes both actual booked revenues and the FAS 133/ IAS 39 AOCI reclass of the effective portion of the FX hedges. A Revenues metric that calculates the future value of the derivatives in place and the value of any unhedged revenues at current forward rates provides a market valuation of what the third quarter Revenues currently are. How this metric changes quarter-to-quarter as we approach the third quarter can be an excellent way to evaluate the effectiveness of the FX hedging.

The most important measurement basis is the currency base. Are we calculating the metric in local currency terms or in parent currency terms? Are we hedging to protect parent currency operating income or local currency operating income (and the right answer is not both!) Are we managing the dollar risk of a commodity or its local currency risk?

In many companies, the current management evaluation and compensation process is the de facto risk policy. As discussed further in Group Issues below, any hedge metric that is not consistent with this process will either be ineffective or require a change in how management is evaluated and compensated.

**Risk Portfolio Definition.** Only transactions have risks, and most corporate risk management involves

**Chart 3: Key Risk Policy Parameters**



parameter.

**The Hedge Metric.** The hedge metric should be easily understood and appropriate to the risk class. There are three different types of metrics: flow values, ratio values, and

choose the exact measurement basis. Will it be based upon GAAP accruals or will it be based on pure economic cash flows? Be pre-tax or post-tax? Be calculated on a marking-to-market (present value) basis or on a marking-

hedging a portfolio of transactions. Transactions can be actuals, such as a commodity inventory position, or they can be forecasts.

With forecast transactions, there is always a concern about forecast error risk. One way to deal with the latter is to divide the forecast transactions into two portfolios: core exposures that we are highly confident will occur and non-core exposures. These two portfolios could be hedged using the same metric, but with different performance standards. All forecast portfolios should define the time horizon of the forecast and how often the time horizon is extended, e.g., every quarter, the FX risk portfolio is extended to include an additional three months of forecasts.

Transactions are generally aggregated by how the business is managed. So a decentralized company might aggregate at the individual operating unit level while more centralized companies would find it logical to aggregate on a regional or global division or even on a consolidated group dimension.

Currency is another important dimension. Are we managing the total multi-currency debt portfolio or the major debt currency portfolios separately? Do we group together highly correlated currency transactions, such as SEK or CHF transactions, with Euroland transactions? Of course, in many situations portfolios are created reflecting both business organization and currency dimensions.

**Hedging Constraints.** Based largely on their risk tolerance,

companies constrain corporate hedging largely through risk limits and trading constraints. Risk limits include open exposure limits such as absolute position limits, minimum hedge ratios, or min/max range hedging ratios. Other kinds of risk limits involve portfolio statistics such as VaR or EaR, fixed/floating debt ratios, portfolio duration or convexity, etc.

Constraints on trading activities include requirements that the hedging qualify for GAAP hedge deferral accounting (a key requirement for most corporates), allow only specific kinds of permissible derivatives, or prohibit certain trading tactics. The latter could involve day trading, overhedging, etc.

In addition, other hedging constraints can delineate the extent of using imperfectly correlated derivatives to the underlying (“proxy hedging”), require sub-portfolio allocation rules as in a stock and debt pension portfolio, restrict leverage, and limit counterparty credit exposure.

**Performance Measurement.** After hedging, the hedge metric is then compared to a benchmark standard over a defined evaluation period. Benchmark standards can be absolute numbers, such as zero or greater than zero (i.e., no losses!) or fixed numeric targets based upon Budget rates or Budget line items.

Benchmarks can also be relative standards, such as a third party index (e.g., GE Capital’s 30-day CP rate or the S&P 500) or some kind of achievable market rate. The latter

can become more sophisticated using a model portfolio, in which the portfolio is theoretically hedged per passive trading rules or in which the portfolio is hedged in some “optimum” manner. An example of the latter is simulated after-the-fact hedging with 20-20 hindsight.

As fair measures, any of these standards should be adjusted for any forecast error. A model portfolio approach is often the easiest way to do this.

The evaluation can be made for a single period (a month vs. a quarter vs. a year) or for multiple periods. An example of the latter is a performance metric in which the year-to-year change of the hedge metric must be within  $\pm 10\%$  of the prior year.

In an iterative process, once a metric and the risk portfolio have been defined, it is critical to evaluate the volatility of the metric and understand its risk/return distribution as we apply various hedging constraints to it. In this manner, we can then develop fair benchmarking standards given the general hedging objectives developed in Fundamental Considerations. An unsatisfactory result may then lead us to reconsider the feasibility of the original general hedging objective or to develop a more suitable metric.

## **Group Issues**

Once the hard work of the first two categories is provisionally completed, Group Issues represent decisions involving how the management of the risk class is best integrated within the business. This is driven by the

magnitude of the risk vis-à-vis the overall business risk of the firm. This then helps determine who should be assigned responsibility for risk management — treasury or the local units or global sectors.

Tied closely to the above considerations is how the results stemming from risk management activities are integrated with the company's evaluation and compensation practices. If the company's practices do not support the risk management policy and are not changeable, then the risk management policy is dead on arrival. New metrics will need to be developed that are consistent with the evaluation and compensation practices.

Another key senior management decision is whether the company's major risk classes will be managed on some sort of portfolio enterprise basis or on a silo basis. Enterprise risk management requires a sophisticated understanding of risk and of state-of-the-art analytics. Essentially, enterprise risk management is dynamically hedging one risk class against another, and taking advantage of portfolio diversification. There are opportunities, as not all risks are created equally, with some likely to be more positive than others. Done properly, there can be considerable savings in hedging costs and in hedging activity.

However, enterprise risk management requires an enlightened senior management, one that really understands portfolio diversification and is able to see beyond the results of individual P&L line items. There are also practical issues of how one

keeps individual operating units whole that are bearing risks excessive for them, but which are good for the entire company. For these reasons, companies would be well advised to make sure the silo risk management is working well before tackling the considerable complexities of enterprise risk management.

Finally, the last Group Issue is the most important factor in the success of any risk management policy: the extent of senior management oversight and involvement. A risk *oversight* (not a tactical decision-making) committee can be an effective way of ensuring compliance by all parts of the company of what they must do under the risk policy. It can be an excellent forum to further Treasury's risk management agenda and for increasing a risk management awareness or culture within the company.

### **Operational Issues**

Operational Issues deal with the nuts and bolts of how the risk management function is staffed and organized on a worldwide basis, how exposures are reported and analyzed, the transaction processing, the back office controls and systems, and risk and GAAP reporting issues. Unlike the first three categories of issues, in which there can be wide disagreement among reasonable people about what is best for a given firm, Operational Issues are pretty much cut and dried common sense. For advice on best practices in this area, download the free *Group of 31 Report: Core Principles for Managing*

*Multinational Foreign Exchange Risk* (1999, Association of Finance Professionals), which is based upon a study sponsored by General Motors, from [www.greenwichtreasury.com](http://www.greenwichtreasury.com).

As an aside, most corporate risk management policies would be more effective (and, not incidentally, more readable) documents if they only discussed the decisions relating to the first three categories of the conceptual framework. The decisions regarding the Operational Issues should be included in a detailed operating manual that lists the procedures for implementing the risk management.

### **Conclusions**

The advantage of this integrated metric approach to risk management is that it forces accountability. But this accountability belongs on senior management more so than on Treasury. The process requires senior management to become accountable for what they want Treasury to do and for them to deal with the economic reality of how Treasury can achieve it. In so doing, senior management can be taught that the financial market definition of risk is volatility, and that two worthwhile risk objectives are either to reduce volatility or to improve the risk/return distribution of the desired metric.

But corporate risk management is more than just the hard quantitative effort portrayed above. There are important qualitative issues as well. Major corporations are like the Titanic, and are often too big to react quickly enough to external or internal

events (i.e., risks). They have to anticipate rather than react. Risk management is also a process designed to help companies anticipate, plan and mitigate the impact of internal and external shocks. It is about changing from a reactive management to a proactive management of the business.

This requires the active support of the business people, which is another way to say that it requires a cultural change. Culture changes when the business groups see the value of risk management to their business equation. Risk management, as shown in Chart 1, does improve the business equation. It is Treasury's job to develop the metrics that prove it.

### **Acknowledgements**

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Any errors and all interpretations in this article are his sole responsibility. Jeff welcomes your comments at [jeff.wallace@greenwichtreasury.com](mailto:jeff.wallace@greenwichtreasury.com)

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Jeffrey Wallace, Managing Partner of Greenwich Treasury Advisors LLC, founded firm in 1992. GTA provides independent advice to corporate clients on risk management and international treasury issues. Unaffiliated with Greenwich Associates, GTA is also known for its corporate best practices benchmarking programs. Jeff was Vice President International Treasury at American Express, and was Assistant Treasurer of both Seagram and of Dun & Bradstreet. He is also a CPA, formerly with Price Waterhouse, and is a recognized expert on FAS 133.



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