

Opportunities for Action in Corporate Finance and Strategy

Integrating Value and Risk in Portfolio Strategy

THE BOSTON CONSULTING GROUP



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Risk and uncertainty are inherent to any corporate portfolio. Just as the potential for value creation varies across a set of businesses, so too does the type of risk and its likely impact. Good portfolio strategy requires senior executives to assess not only differences in potential value among assets and their strategic fit but also the inevitable uncertainties and risks associated with that value.

The idea that there is a relation between risk and returns has been a cornerstone of modern portfolio theory for more than 50 years. It has had a profound impact on the way investors and financial institutions manage value and risk in a portfolio of financial assets. And yet, with relatively few exceptions, the concept has not affected the way companies manage the real assets of the corporate portfolio.

Some companies continue to simply ignore uncertainty and risk: they calculate single-point estimates of the likely value of each of their businesses, despite significant uncertainties associated with the underlying value drivers and cash flows. Others treat risk more or less intuitively: they develop a few scenarios (worst case, best case, and base case) to bound the range of outcomes. Still others do quantify both downside and upside uncertainty, but only for a few assets or in the context of just a few decisions. A few treat risk assessment largely as a functional responsibility—to be handled by the finance department, perhaps—but only after the portfolio strategy has been set. It's the rare company that integrates a rigorous assessment of uncertainty and risk into the very process of setting portfolio strategy.

Companies that fail to integrate value and risk in portfolio strategy are missing a big opportunity. Our experience suggests that many of the techniques and metrics used to assess and manage risk in financial assets can, with some adaptation, be applied to real assets across a wide range of industries. Doing so, however, requires assessing the value of the corporate portfolio in a probabilistic, not a deterministic, fashion. It also requires a well-defined, systematic process to identify and quantify the main sources of risk, as well as the interactions and offsets that determine the variability of the portfolio as a whole. The result is a far more comprehensive and realistic approach—one that can fundamentally transform how senior executives manage the corporate portfolio.

Beyond Determinism

Many companies have a clear picture of the main factors that drive value in their businesses. The starting point for the integrated approach is to enrich that picture by developing a detailed understanding of the degree to which each of those drivers and the resulting cash flows are uncertain, reflecting underlying risks.

Why is it that more companies do not consistently do this? Often the initial response of managers is that it is impossible to reliably quantify the uncertainty affecting many key value drivers. They're wrong. In recent years, a number of organizations—in contexts as varied as military combat, Coast Guard search-and-rescue missions, and oil exploration—have developed creative approaches to estimating and quantifying uncertainty. These techniques can be applied to almost any industry.

For example, *expert opinion* can provide carefully weighted estimates of, say, the ranges of prospective success rates for oil and gas exploration in a particular

area or the time required for clinical testing of new cancer drugs. *Projections from historical data* can help estimate the variability of the capital cost involved in laying cross-country fiber-optic cable or the potential for future catastrophic loss in the insurance industry. *Group opinion* can be a surprisingly effective guide to quantifying hard-to-estimate factors such as the potential distribution range of exploratory reserves in an offshore oil field, the likely take-up rate for new products or services, or the lead-time for new-product development in the software industry.¹ Finally, certain known *physical and logical limits* can be used to determine variables like the maximum number of channels possible in a fiber-optic network or the maximum effective yield in semiconductor production.

Given adequate care in targeting multiple sources of data—and in aggregating those data through a variety of complementary approaches (for example, simple weighted averages, Bayesian inferences, and nonlinear regressions)—it is possible to arrive at reasonable bottom-up estimates for what are often highly uncertain parameters.

Once a company has quantified the drivers of uncertainty affecting an asset or initiative, it is in a position to express the likely financial value created not as a single-point estimate but as a distribution of possible outcomes. Modern statistical techniques, such as Monte Carlo analysis, then make it possible to calculate and express traditional value metrics, such as net present value (NPV), as probabilistic distributions.

1. Group opinion is often dismissed as inaccurate and unreliable. Yet recent research suggests that appropriately structured and analyzed group opinions can yield better results than even expert opinion. See James Surowiecki, *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies, and Nations* (Doubleday, 2004).

They also allow managers to quantify value and risk simultaneously using metrics that express the risk-return tradeoffs faced by investors and the extent of the variability associated with different desired or expected outcomes. For example, *value at risk* (VAR), a measure of the likely distribution of value in a business, is a good indicator of downside risk. *Return on value at risk* (ROVAR), which is the ratio of NPV to VAR, is a normalized measure of the value generated by a business relative to the downside risk. And simple standard deviations represent overall variability—on the upside as well as the downside.

But it's not enough to estimate the value and risk for each stream of cash flow and then simply add them together. Often there are systemic connections across the portfolio—for example, ways in which the risks in one area correlate to or offset the risks in another. In a precious-metals-mining business, for instance, the price of gold is likely to track, to some extent, with the price of other metals, such as platinum and silver. And the price of oil in the North Sea is likely to be linked to that in West Texas. Unless a company understands these correlations, it can significantly misjudge the degree of risk in its portfolio.

These correlations can also be estimated and analyzed. The most relevant linkages will vary according to the specific business situation, the industry, and the company. In the restaurant business, for example, overall consumer spending has a differential impact on volume for different brands depending on their price points. In the building-supply industry, the portion of demand driven by new housing may be closely correlated to interest rates, whereas the portion driven by repairs and upgrades may not be. When such linkages are well understood, the resulting view of the value creation potential and risks of the entire portfolio is likely to be far more realistic.

An Integrated View of Value and Risk

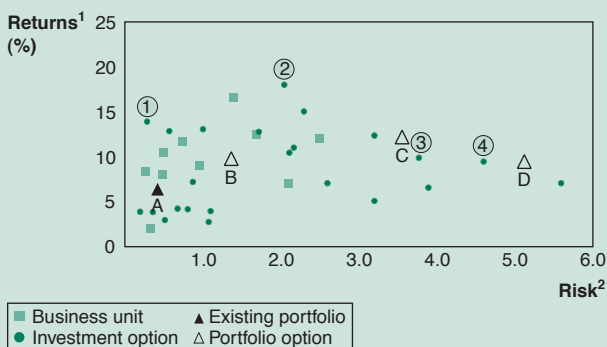
An integrated approach to value and risk can yield critical insights. For example, one company discovered, to its surprise, that a key operational metric it was using to inform its earnings guidance for Wall Street analysts had only a 30 percent probability of being achieved by the portfolio as a whole. When the company became aware of just how uncertain its estimates were, it revised its approach.

Another company discovered that the newest growth projects in its portfolio had a much poorer risk-return profile than its other initiatives. If the company continued to pursue those new projects, the result would be an increase in the overall portfolio's value at risk from 10 percent of enterprise value to 30 percent. Although such an increase is not right or wrong per se, the information forced a reexamination of the underlying strategy. Because the likely incremental value creation from the newer elements in the portfolio was not commensurate with the incremental risks, the company decided to reshape its portfolio by delaying some of the longer-term, riskier investments and putting a higher priority on investments with more attractive risk-return profiles.

The goal is to construct an integrated view of the entire portfolio in terms of value and risk. This perspective allows a company to compare diverse assets and businesses on a consistent risk-reward basis and can be a powerful tool for driving decisions about capital and other resource allocation, growth initiatives, new-product development, and mergers and acquisitions.

In the exhibit "One Company's Integrated View of Value and Risk," each square represents one of a company's existing business units; each dot represents a

One Company's Integrated View of Value and Risk



SOURCE: BCG analysis.

¹Ten-year average annual total-business return.

²Expressed as a measure of normalized risk: the ratio of value at risk (VAR) to net present value (NPV).

future investment option. The solid triangle A represents the risk-return profile of the existing portfolio; the three clear triangles (B, C, and D) represent alternative combinations of existing business units and future investment options.²

As the exhibit suggests, the various portfolio elements differ greatly, not only in their expected returns but also in the risks associated with achieving those returns. For example, the growth initiatives labeled 1 and 2 provide fundamentally more attractive risk-return tradeoffs than do initiatives 3 and 4. Furthermore, initiative 4 has substantially higher relative risk than 3 without offering a commensurate increase in return potential. So initiatives 3 and 4 will need to

2. Of course, another important dimension is the absolute size of each investment option, business, and portfolio. For the purposes of this discussion, we have chosen not to include the size dimension in the exhibit, but it is a critical input to any portfolio analysis.

have other compelling rationales (related to the strategic or diversification goals of the portfolio) in order to be credible alternatives to 1 or 2. Similar observations can be made about the individual businesses and their relative risk-return profiles.

At the portfolio level, the exhibit shows that the company's existing portfolio, A, is at the conservative end of the risk spectrum in relation to the alternative portfolios. Clearly the company could increase its returns by taking on more risk. For example, portfolio option B has the potential to boost average annual returns significantly. However, the added risk of this portfolio is also substantial. Options C and D, by contrast, vastly increase the risk relative to A and B without bringing commensurate increases in returns. Again, without some other compelling strategic logic, a move to C or D would be difficult to justify. However, in the absence of such an integrated value-and-risk perspective, executives might well think C is the most attractive option (since it has the highest potential return).

Of course, an integrated view of the portfolio, by itself, cannot tell a senior management team everything about the choices it should make. Executives also need to consider the strategic fit among assets, the appetite of the company's investors for both risk and returns, and other factors relevant to the specific situation. However, in our experience, the ability to array a complex set of options on a consistent, quantified risk-return matrix serves as a powerful catalyst to the right senior-management debates: Do the large uncertainties and risks of pursuing certain growth initiatives outweigh the attractiveness of their apparent value-creation potential? Are initiatives that have compelling risk-return tradeoffs getting appropriate priority over those that don't? Given knowledge of the specific drivers, what can be done to reduce uncertainty

and mitigate the risk of otherwise attractive options? Is the risk tolerance of the company's board of directors and shareholders consistent with their demands, targets, and recommended pathways for value creation and growth? What portfolio-shaping moves are necessary to hit the "sweet spot" of value creation and risk for the company?

* * *

The integrated approach to portfolio strategy creates a common language that allows senior executives to make value-and-risk comparisons across diverse businesses a standard part of portfolio management. It allows them to confront and manage key tradeoffs across the portfolio, make better-informed decisions, have a critical dialogue about risks, and take action to mitigate them. That is why integrating value and risk is likely to become the next wave in modern corporate portfolio strategy.

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