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Stimulating Firm-specific Investment through Risk Management

Heli Wang, Jay B. Barney and Jeffrey J. Reuer

This article suggests a rationale for firm risk management that has been largely ignored in financial economics literature. It presents an argument for harnessing the influence of a company's stakeholders who, whether as employees, suppliers or customers, make a valuable investment specific to the company. Such investments are crucial for a firm's competitive advantage, yet because they are firm-specific and therefore cannot be transformed or transferred, stakeholders are often concerned about the risks involved in making them. A company's efforts to manage risk can therefore persuade stakeholders to make even greater firm-specific investments, bringing benefits to shareholders and stakeholders alike.

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Introduction

Every business has its own exposures to a variety of risks. Examples of these risks are potential reductions in product demand due to shifts in consumer taste shifts, political and exchange rate risks associated with international operations, the possibility of R&D project failure, and so on. The question is whether executives should engage in activities to manage risks such as these? Intuitively, the answer to this question seems obvious. After all, who is in a better position to understand the risks associated with business decisions made in a firm than that firm's managers? And thus, who is in a better position to manage the level of risk a firm is exposed to than those same managers? Thus, it seems reasonable to expect corporate executives to engage in risk management activities.

However, the conventional wisdom in financial economics is inconsistent with this intuitive conclusion. Financial economists argue that, in fact, a firm's equity holders are in a better position to manage business risks than are a firm's managers. This is because equity holders can invest in a diversified portfolio of equity investments and completely eliminate the business risks associated with investing in a particular firm. Moreover, equity holders can invest in this portfolio at very low cost. Put differently, the conventional wisdom in financial economics is that equity holders

do not hire a firm's managers to engage in risk management activities that these equity holders can do on their own.¹ Rather, equity holders hire a firm's managers to generate higher rates of economic profit, even when obtaining these levels of profit involves substantial risk taking on the part of a firm.

Despite the conventional wisdom in financial economics, clearly many corporate executives do engage in risk management activities. For example, the number of firms that are using financial hedging instruments to manage risks associated with fluctuations in the value of currency and raw materials continues to increase. In the latest Wharton survey of non-financial services corporations, 42 per cent of the firms that use hedging and derivatives contracts to manage risk are increasing their usage of these contracts, while only 13 per cent are decreasing their use. Firms can also alter their capital structures, invest in real options, and use product market or geographic diversification to manage risks.² For example, despite significant restructuring during the 1990s, the percentage of assets in the US economy owned by highly diversified corporations continue to increase. Such risk-management diversification is hard to understand in light of the conventional wisdom in financial economics.

So are corporate executives wrong in their efforts to manage risk, or is something wrong with the conventional wisdom taken from financial economics? The purpose of this paper is to suggest that the conventional wisdom is limited in some important ways and that, in fact, risk management by a firm's executive team can sometimes be consistent with maximising returns to a firm's equity holders. Our argument depends on four simple observations:

- 1 One of the most important sources of economic value for a corporation and ultimately equity holder wealth are the firm-specific investments made by its stakeholders.
- 2 While a firm's equity holders can use portfolio diversification to efficiently manage the risks associated with investing in a particular firm, other stakeholders cannot use diversification to manage the risks associated with their significant firm-specific investments.
- 3 The risks associated with the firm-specific investments made by stakeholders are directly linked to the probability that a company will experience financial distress.
- 4 An important way to encourage stakeholders to make firm-specific investments—the kind of investments that can create real economic value for a firm and its equity holders—is to manage the riskiness of these investments by engaging in risk management activities that reduce the probability that a company will experience financial distress.

It is important to note that the major argument made in this paper is still consistent with conventional finance literature in that it maintains the assumptions that: (1) the objective of a firm is to maximise equity holder wealth; and (2) equity holders are risk neutral while stakeholders are risk averse. However, the important departure of the view proposed here from financial theories is that this article recognises that the overall risk level of a company, which is not supposed to affect equity holder wealth directly, can have a significant impact on the incentives of stakeholders to make firm-specific investments. Put differently, while traditional financial theory argues that managing risks for stakeholders is not necessary, or is even value destroying, this paper submits that managing risks for stakeholders can actually be consistent with equity holders' interests because risk management can stimulate firm-specific investments by stakeholders, which are in turn important sources of firm value and competitive advantage.

After discussing the nature and effects of company-specific investments, we consider the relationship between risk management and firm-specific investment.³ We then introduce and compare a few important risk management mechanisms that companies can employ. We conclude with a brief summary of the implications of this risk management perspective for corporations' risk management policies and future research on the topic.

Firm-specific investments

What are firm-specific investments?

A variety of stakeholders make different kinds of investments in companies. Equity and debt holders provide financial capital, employees provide human capital, suppliers provide raw materials and other supplies, customers provide demand for a firm's products, and so forth. Despite this variety, stakeholders' investments can be divided into two broad categories: specific and general. Specific investments are investments that have more value in a particular exchange than in alternative exchanges. Specific investments therefore cannot be redeployed to other exchanges without a significant loss in value. By contrast, the value of general investments does not vary across different exchanges.

Stakeholders' firm-specific investments take many different forms. Employees' specific investments include a worker's close relationships with others in a firm, knowledge about a firm's culture, and knowledge about how to manage critical processes within a firm; suppliers' firm-specific investments include production systems designed by suppliers for unique products or co-located facilities; customers' firm-specific investments include the purchase of products that request a great deal of customised knowledge to use. The common feature of all these investments is that they cannot be transferred to some other business setting without a significant loss in value.

Benefits of firm-specific investments for equity holders

Equity holders can benefit from the specific investments made by a firm's stakeholders because equity holders are "residual claimants" and because specific stakeholder investments increase a firm's ability to generate economic profits. As residual claimants, equity holders receive payment on their investment in a firm only after all other claims are satisfied. In order for there to be some residual to pay equity holders, the total economic value created by integrating all the assets made available to a firm by all of its other stakeholders must be greater than the payments required to induce these other stakeholders to make their resources available to a firm.

Previous work suggests that the total economic value created by a firm can be increased when a firm uses valuable, rare, costly-to-imitate and non-substitutable resources in developing and implementing strategies.⁴ One important class of these resources are the specific investments made by a firm's employees, suppliers, and customers. Because these firm-specific investments can often be valuable, rare, costly-to-imitate and non-substitutable, they can often be sources of superior economic performance that can then be used to make residual payments to a firm's equity holders. Thus, a firm's equity holders have a strong incentive to induce its other stakeholders to make large specific investments in that firm.

Benefits of firm-specific investments for other stakeholders

Naturally, the simplest way to induce employees, suppliers and customers to make specific investments in a firm is for the firm to share some of the economic value these specific investments create with these stakeholders.⁵ While the residual payment received by equity holders will be smaller than what would have been the case if this extra value had not been shared, without sharing, there may have been no specific investments made in the first place. Thus, self-interested equity holders will want a firm to share enough of the value created by the specific investments made by employees, suppliers and customers with these stakeholders to induce them to make these investments.

The sharing in the economic value created by these specific investments made by stakeholders can take many forms. For example, employees that have made significant firm specific investments may receive higher levels of compensation than employees that have not made these investments. This is one reason that employee compensation is often tied to employee tenure—the longer an employee stays with a firm, the more likely that this employee will have more firm-specific investments with the firm, and this employee will be more likely to receive a larger share of the profits. Customers that have made specific investments may gain access to new products or technologies

before their competitors. Suppliers that have made these investments may be able to continue selling to a firm long after other suppliers have been cut off.

Impediments to firm-specific investments

Since both a firm's equity holders and its employees, customers, and suppliers potentially benefit from firm-specific investments made by stakeholders, it is reasonable to expect that these stakeholders will be willing to make these investments. However, an important problem that employees, customers, and suppliers face when they make firm-specific investments is that it is often very difficult for these stakeholders to manage the risks associated with these investments. The level of that risk is a function of the probability that a firm will experience financial distress some time in the future. When a firm experiences financial distress, none of its stakeholders, including equity holders, receive their expected payment for investing in a firm.

Equity holders recognise these risks. However, as we described earlier, equity holders are able to manage them at low cost through investing in a diversified portfolio of firms. The risks associated with some of the investments that employees, suppliers and customers make in a firm can also sometimes be managed at low cost. For example, employees can manage some of their risk exposure by "cashing out" their pension funds in a particular firm and using this money to invest in a diversified portfolio. Suppliers can sell their accounts receivable and invest in a diversified portfolio. And customers may invest in options to hedge risks associated with price changes in key commodities they buy from a firm.

Firm specific investments cannot be transformed into assets that can be more widely traded

However, the risks associated with one class of investments by stakeholders are often very costly to diversify: the risks associated with firm specific investments. Because the value of these investments depends on their use in the transaction between a particular stakeholder and a particular firm, they cannot be transformed into assets that can be more widely traded without losing much of their value. Since these investments cannot be transformed into tradeable assets, the risks associated with them cannot be efficiently diversified. Because employees, suppliers and customers cannot efficiently diversify the risks associated with their specific investments in a firm, these stakeholders may be reluctant to make these investments. At the very least, they may invest less in these firm-specific assets than equity holders would prefer.

Let us take a look at a specific example. An employee who works in the R&D department of a company may be required to engage in significant investments that are specific to the R&D team. For example, the employee needs to learn about how best to co-operate with its team members, and they may need to teach each other some complementary skills. In addition, some of the knowledge and skills invested may be also only specific to the firm's products and operations. Clearly, much of these investments will not be able to be easily applied to another business setting. In this case, if the firm would become financially unviable, the employee who already made investment specific to the project may find himself in a disadvantageous situation: his specific knowledge about working in the R&D team may not be easily transferred to a different company. Anticipating this, the employee will be less willing to make these specific investments at the first place. Instead, he would rather spend more effort in developing his general (marketable) skills.

Similarly, suppliers may not want to build a plant next to a firm, for they may suffer a significant cost if the firm experiences financial distress. Customers as end-users may not want to purchase a product with high switching costs, if the firm that sells the product has substantial business risks.

The role of risk management

Why risk management matters

Senior executives therefore face a dilemma. On the one hand, firm-specific investments made by employees, suppliers and customers can, in principle, benefit both a firm's equity holders and these other stakeholders. On the other hand, concerns with the risks associated with these investments can lead key stakeholders to avoid making such investments. Thus, the task facing firms is to implement strategies that have the effect of reducing the impact of these impediments on the willingness of employees, suppliers and customers to make specific investments, and to do so at the lowest cost possible. When effective, these strategies will have the effect of reducing the probability that a firm will experience financial distress.

Alternative risk management mechanisms

There are a variety of risk management mechanisms that can be used to reduce the probability that a firm will experience financial distress. A few of the commonly-used risk management tools will be examined, including (1) altering capital structure, (2) trading financial hedging contracts, (3) investing in real options, and (4) diversifying into other businesses.

Altering capital structure

A firm is likely to be under financial distress or may even be liquidated if it cannot generate enough income to pay its creditors. Thus, everything else equal, a firm with a higher debt burden will have a higher probability of financial distress than a firm with lower debt burden. A firm can retire debt or issue equity to change its capital structure and thus reduce its probability of financial distress. Thus, by changing a firm's capital structure, managers can change stakeholders' incentives to make firm specific investments: a firm that chooses a lower level of debt will lower the probability that it will face financial distress and thereby induce more firm specific investments by its stakeholders.

Consider the following examples of firms following this approach:

- CMI Industries manufactures textile products that serve a variety of markets, including the home furnishings, woven apparel, elasticised knit apparel and industrial/medical markets. The firm tried to restructure its capital structure "for the benefit of the creditors and other relevant stakeholders". According to Joseph L. Gorga, president: "[CMI]... continues to express its appreciation to all of its customers, vendors and associates for their continued support..."⁶
- After lower first quarter financial results in 2001, La-Z-Boy emphasised the potential costs of financial distress for its employees and customers and sought to tightly control inventories and accounts receivable in order to allow the firm to generate strong cash flows to reduce debt by \$49 million over a six-month period.⁷

Although it may appear relatively easy for a firm to reduce its debt by issuing more equity, adjusting a firm's capital structure can sometimes not be enough to reduce the probability that a firm will experience of financial distress. As long as this probability remains high, stakeholders may still be reluctant to make specific investments in a firm. Consider the following limitations to adjusting capital structure as a way to manage risk.

- There are many other important factors that influence the optimal capital structure of a firm besides the impact of capital structure on the probability of financial distress. These other factors—including agency costs, product/input market interactions, corporate control and taxes—must be accounted for when making capital structure decisions.
- Managers will be reluctant to issue equity during periods in which they believe their stock is undervalued. If managers do issue new equity, it sends a strong signal to the stock market that

the managers think their shares are overvalued. In fact, research statistics show that when companies issue stock, on average the price of that stock tends to fall by about 3 per cent.

- Other factors besides capital structure may be more relevant in affecting a company's financial stability. Therefore, even though reducing a firm's level of debt can reduce its probability of financial distress, it does not eliminate that probability. Indeed, as the recent burst of the "new economy" bubble indicates, even all equity firms can experience financial distress.

Trading financial hedging contracts

As suggested earlier, firms are beginning to use hedging contracts more frequently as a risk management device. Perhaps the most basic type of investment tool is the forward contract. With a forward, the user promises to buy or sell an asset—say, oil, Treasury bills or yen—at a specified price on a specified date. Long positions enable hedgers to protect themselves against price increases in the underlying asset; short positions protect hedgers against price decreases. Other commonly used financial hedging contracts are futures, swaps and options.

These financial instruments can sometimes be used to reduce the probability of a firm's financial distress at low cost. This will particularly be the case when the probability of such financial distress depends on the price of raw materials and commodities, or risks associated with short-term movements in exchange rates or interest rates. On the other hand, for many other risk factors, such as those that have a longer time horizon or those that are not priced directly (e.g., moves by key competitors), such instruments will be significantly less effective.

Another potential cost of using financial contracts is that there have been financial disasters that are associated with derivatives. Numerous cases of derivatives trading have backfired in the last few years. Procter & Gamble's losses in customised interest-rate derivatives and Metallgesellschaft's losses in oil futures are two of the most prominent examples. In the case of Metallgesellschaft, more than \$1 billion was lost due to derivatives trading because they took positions in derivatives that did not fit well with their corporate strategies. Therefore, in using financial hedging contracts to hedge firm risks, managers need to be aware of the danger of taking positions to try to beat the market.

Investing in real options

Unlike financial options, real options come into existence through the opportunities created by the firm's strategic investments. For an investment to create a real option, it must create (1) the right, (2) but not the obligation, (3) to take some specified action in the future in order to (4) minimise the firm's downside risk while (5) providing access to upside opportunities.

This asymmetry between *right* and *obligation* makes real options attractive from a risk management perspective: the *right* component means the firm can pursue opportunities if it is in the firm's best interest to do so after new information arrives in the form of external and internal cues. The fact that the firm is not obligated to act in the future means that the downside can be limited to the initial investment, at least in theory. Real options are attractive relative to financial options because the market for financial options is incomplete and the time horizon for many real options is much longer than the time horizon for typical financial options.

Real options come in many varieties. For example, *growth* options enable the firm to capture value by expanding if market conditions prove to be unexpectedly favourable. For instance, Siemens has argued that having an explicit option agreement in a joint venture with Allis-Chalmers was one of the most important provisions of their collaborative agreement. If a demand shock materialises for the venture's product or a technology proves to be more attractive than initially anticipated, the firm is in a position to buy out a partner at a capped price. However, if the situation is worse than expected, the firm is not compelled to expand through acquisition.

Switching options enable the firm to shift production or other value chain activities to attractive plants or host countries based on foreign exchange rate movements, other price changes, and other sources of uncertainty. Consider the following two examples:

- General Electric and ABB, for instance, reallocated production to Asian countries following the Asian currency crisis, enabling them to achieve a lower overall cost structure than counterparts bearing the risks associated with the market in which their production capacity is concentrated.
- American Electric Power (AEP) arrays generating stations in its transmission grid based on each station's "spark gap", or the difference between the daily spot price of electricity and the cost of production, in order to achieve higher daily margins and reduce the downside while fulfilling consumers' requirements. The firm also alters inputs to the power generation process by burning lower sulfur coal and trading emission allocation rights with other firms over time or sharing them across generating units.

There are many other types of real options, including options to abandon, delay, switch outputs, alter scale, and so forth that are valuable in differing degrees in different sectors. One of management's objectives in using real options to manage risks is to frame the firm's operations and future investment decisions using a taxonomy of real options. Using the lens of real options, executives can also creatively design options into M&A, supply contracts and other deals.

While real options hold out considerable promise for firms to manage risks, they also have a number of characteristics that differ from financial options and that also make them far more difficult to manage in practice:

Using the lens of real options, executives can design options into M&A, supply contracts and other deals

- Unlike financial options, real options often require additional investments over time, and these "carrying costs" imply that the downside risk of real options is often far greater than simply the initial price of obtaining the option. For example, firms often need to continue to invest in collaborative relationships or undertake unexpected investments in the development of a technology to keep follow-on options open.
- Real options also are often considerably more difficult to value as risk management tools compared with financial options as the former sometimes involve underlying assets that are not traded in liquid markets; shared claims on underlying assets; multiple sources of uncertainty (e.g., *rainbow* options), some of which like competitors' moves and internal learning are difficult to model; and multiple options that are interdependent (e.g., *compound* options).
- "Dividends" in the form of competitor pre-emption, skills degradation, and so forth must enter into a firm's valuation efforts and exercise calculus, as might potential changes in the exercise price over time and complex internal and external cues of value, all of which challenge risk management via real options.
- The management of real options is further complicated by the firm's organisational capacity to manage the appropriate exercise of a portfolio of options in the form of acquisitions, divestitures, and so forth. For example, Apache, a small independent oil and gas company, purchased a large portfolio of non-producing and undeveloped wells from Amoco. Given the firm's relatively small size, it might face difficulties managing the simultaneous exercise of thousands of options to exploit these wells in the event of a rise in oil prices. Similarly, firms with poorer manufacturing capabilities will be less able to exercise switching options and will therefore experience higher levels of risk exposure relative to firms with better manufacturing capabilities and lower switching costs.

Diversifying into other businesses

A firm that diversifies increases the number of its sources of cashflow, and to the extent that these cashflows are not perfectly correlated over time, diversification reduces the chance that serious

problems in one particular business will put the entire firm at risk. Thus, diversification can reduce the probability of financial distress and can therefore stimulate firm specific investment by the firm's stakeholders.

Although diversification may reflect many other strategic motivations beside risk management (e.g., market power, economies of scope, knowledge transfers, etc.), some anecdotes provide evidence that risk reduction plays an important role in firms' diversification efforts:

- After the acquisition of 15 full service branches of EquiCredit Corp, Douglas K. Freeman, chairman and CEO of RBMG, said: "The addition of these 15 ... branches ... further strengthens our position in the risk-based lending arena and provides us a better balance and diversification in our product mix, allowing us to better manage the cyclical nature of the mortgage market."⁸
- According to news reports, the merger of AngloGold and Normandy, Australia's largest gold miner, is due to "depressed gold prices and the ability to spread risks across several geographic regions".
- The merger of Medical Assurance Inc. (MAI) and Professional Group Inc. (PICM) is similarly about geographic diversification, so that the MAI "will not be dependent on any one state".⁹

Risk management through diversification carries its own benefits and liabilities. On the one hand, the types of risks that diversification can manage are much broader than financial hedging instruments, and the risk reduction effect of diversification is also greater than altering capital structure. On the other hand, diversification is a comparatively blunt instrument that can involve significant costs due to the manipulation of real assets. For example, managerial actions may alter the underlying risk profiles of the combined businesses. Although managers can intervene in positive ways, they may introduce new sources of variance through improper planning, implementing and controlling of the diversification process.

Moreover, in order for diversification to reduce the risks of each business effectively, it requires an active internal capital market to allocate resources from high performing divisions to divisions that have financial problems. However, there are opportunity costs associated with allocating resources in such a manner, especially when resources are limited and therefore involve opportunity costs. Specifically, when headquarters uses resources to cross-subsidise weak divisions, it foregoes the opportunity of using these resources to invest in projects with better growth opportunities.

While each of the risk management mechanisms discussed above can be effective in some settings, they each involve unique benefits and costs. Therefore, they sometimes may be substitutes to one another and sometimes may be valuable when used in combination with one another. The challenge for executives, therefore, is to select risk management tools that serve the firm's objective of encouraging stakeholders to make firm specific investments and to do so in the most efficient manner.

Discussion

So far we have provided a rationale for firm risk management that is different from that suggested by traditional finance theory. We have also described a variety of risk management mechanisms at firm's disposal that may induce stakeholders to make firm-specific investments. Since most of the arguments above have been made in a general sense, it is important for top executives and risk managers to understand the relevancy of the arguments to their specific companies. Below, we will discuss the application of the arguments to specific organisational settings, and we will suggest how risk management activities may benefit firms differently.

- 1 Private versus public firms. Although throughout our discussion we have explicitly or implicitly focused our attention on publicly-traded, large corporations with dispersed ownership structures, the arguments can be equally applied to a private firm setting or to public firms with

more concentrated ownership structures. The reason for our focus is that, traditionally, finance theory's argument that risk management does not add to firm value is more closely applied to publicly traded firms with dispersed ownership structure. This is because it is efficient for shareholders of such firms to reduce business risks by diversifying their investment portfolios. Put another way, while risk management by private firms and public firms with concentrated ownership structure can be relatively easily justified due to their owners' or large shareholders' inability to diversify, public firms with dispersed ownership structure have lacked a sound rationale for risk management efforts under traditional perspectives.

- 2 Risk management costs. Our argument for the benefit of firm risk management does not imply that it is always value-enhancing for a firm to engage in risk management activities, since there are costs associated with virtually any type of risk management mechanism. For example, even though financial hedging is generally considered the most cost efficient way to manage risks, it still involves potentially large opportunity costs. The human resources that are used to engage in hedging activities may be applied in other functional areas to add firm value. Moreover, firms can go so far in trading financial contracts that they take positions in hedging activities, which, instead of reducing firm risks, can run the danger of increasing the company's risk exposure. Thus the potential benefits gained from risk management need to be weighed against the costs associated with risk management activities.
- 3 Role of firm strategy. Another factor that affects the risk reduction benefit to the firm is the degree to which a firm relies on specific investments by its stakeholders. Although firm-specific investments are important to almost all firms, the degree of their importance differs across firms and industries. Specifically, firms that implement a differentiated strategy with more unique products are generally more dependent on stakeholders to make firm-specific investments. Thus, it would be more important for these firms to engage in risk management activities in order to encourage their stakeholders to make these investments. On the other hand, firm-specific investments may be less important for a firm that produces commodity products or services. And for these firms, it is less likely that risk management significantly adds to firm value.

In addition to the above factors that affect the relevance of risk management for a firm, other factors may also determine which risk management mechanism is more or less appropriate for a particular firm. For example, a firm that has the unique capability of forming alliances may find itself more likely to adopt real options approach to manage its risk exposures, while another firm can be better off managing its risks through reducing its debt obligations. In the end, it is the task of managers to appropriately evaluate the cost-benefit tradeoffs within and across the risk management mechanisms discussed above.

Conclusion

In recent years, managers have become increasingly aware of how their organisations can suffer from various risks. As illustrated in this article, one of the important reasons that a firm should manage risk exposures concerns the firm-specific investments made by its employees, suppliers, and customers. These firm-specific investments can be important sources of a firm's competitive advantage, but also are risky for stakeholders to make. Thus, reducing stakeholders' risks associated with these investments can encourage stakeholders to make more of these investments, to the benefit of stakeholders and equity holders alike. Although received wisdom offers little room for risk management efforts by firms seeking to enhance their equity values, we have provided a rationale for risk management that links such efforts to the competitive advantages of firms, and in so doing we reach very different conclusions on the role of risk management.

We have described a variety of risk management mechanisms at firms' disposal that may induce stakeholders to make firm-specific investments. These mechanisms differ in terms of their bluntness or specificity, their costs and risk reduction potential, their time horizons, and their implementation complexity.

If firm-specific investments by a company's stakeholders are central to the company's competitive advantage, and risk management can facilitate the incentives for the stakeholders to make firm-specific investments, then the company should take risk management seriously. We propose the following agenda for executives and risk managers contemplating how to set up a specific risk management strategy.

- 1 First, evaluate the extent to which the company depends on firm-specific investments by its stakeholders. The evaluation can focus on the company's core employees, suppliers and customers by exploring the answer to the following question: Would these core stakeholders' investments be less valuable if they switch to the different firm? To what extent does this shape their willingness to make specific investments?
- 2 The second step is to evaluate the riskiness of the company's current business(es) and the specific risk factors that affect the level of the company's risk exposures. Specifically, if the answer to the question in step 1 is yes, then we ask here "What's the probability that the business will be in financial distress and stakeholders need to switch to the different firm?"
- 3 As a last step, we compare the effectiveness of alternative risk management mechanisms. The central question for this analysis is, which risk management mechanism or what combinations of risk management mechanisms would be the most efficient way for the company to manage its risk exposures?

Finally, it is worth noting that risk management is not a task only for a company's risk management functional department. As risk management directly affects the company's core stakeholders' incentives to engage in value-enhancing firm-specific investments, risk management should be incorporated into the company's strategic planning. And this requires the effort and involvement of not only risk managers, but those who craft the firm's strategy within and across business units.

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