ENHANCING SHAREHOLDER VALUE WITH CORPORATE RISK MANAGEMENT

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Unexpected changes in foreign exchange rates, interest rates, and commodity prices are important financial risks to which firms are exposed in their increasingly global business activities. Nevertheless, nonfinancial firms can employ financial or operative hedging to shield their performance against these financial risks. In particular, financial derivatives are instruments that constitute efficient and effective hedging tools, and surveys of corporate risk management practices document the increasing use of these instruments by nonfinancial firms.[1] As a matter of fact, the global market for derivatives has grown tremendously over the last decade, attaining notional amounts outstanding of $111.1 trillion and $23.7 trillion at year-end 2001 for over-the-counter (OTC) and exchange-traded derivatives, respectively.[2]

Despite this evidence on corporate hedging activity, it is not obvious whether financial hedging is apt to create shareholder value. Neo-classical finance theory, such as the Modigliani–Miller theorems, seems to imply that corporate risk management has no impact on firm value. Nevertheless, recent research demonstrates that corporate risk management can enhance shareholder value in the presence of capital market imperfections. These capital market imperfections consist of agency costs, costs of external financing, direct and indirect costs of financial distress, and taxes.[3]

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EXECUTIVE SUMMARY

- *Companies face financial risks such as unexpected changes in foreign exchange rates, interest rates, and commodity prices. However, it is not obvious whether financial risks should be managed and if so by whom—the firm or its shareholders.*
- *This article argues that shareholder value can be increased through risk management at the firm level in the presence of capital market imperfections, such as agency conflicts, costly external financing, direct and indirect costs of bankruptcy, and taxes.*
- *In particular, corporate risk management can enhance the value of a firm to the benefit of its owners by reducing the agency costs of diverging shareholders', bondholders', and managers' interests; coordinating corporate financing and investment policies; lowering the expected costs of bankruptcy and financial distress, and reducing the corporate tax burden.*

RATIONALES FOR CORPORATE RISK MANAGEMENT

The following section explains the several rationales for corporate risk management.

Mitigating the Underinvestment Problem

Agency costs can arise from conflicting interests of the firm's managers, shareholders, and bondholders. In particular, when a firm has high financial leverage and when firm value is volatile, conflicts of

interest between shareholders and debtholders can lead to suboptimal investment behavior of the firm. Generally, while investment decisions are made such that projects with a positive net present value (NPV) are realized and those with a negative NPV are rejected, managers acting in the interests of shareholders may decide to pass up some profitable investment opportunities if the company is highly leveraged (the underinvestment problem).[4] This result comes from the fact that shareholders have only a residual claim on the assets of the firm—i.e., bondholders have priority claims. As a consequence, in the face of high leverage and low but volatile firm value, investment projects that primarily increase the probability that debt payments can be met but that only marginally benefit shareholders may be rejected even if they have a positive NPV.

The more investment projects and growth options a firm has, the more severe is the underinvestment problem. The associated conflicts of interest and the welfare loss of forgone investment opportunities can be eliminated or mitigated through corporate risk management by reducing the volatility of firm value. Situations of low firm value in which the conflict of interest occurs are then less likely, leading to lower agency cost and thus higher firm value. At the same time, lower volatility of firm value allows the firm to increase financial leverage and benefit from additional tax shields.

Reducing the Asset Substitution Problem

Another reason why the interests between shareholders and debtholders may diverge is that the owners of a leveraged firm have

...represents a means to avoid conflicts of interest between management and shareholders.

a strong incentive to engage in very risky projects (the asset substitution problem).[5] This effect can be derived from the fact that the residual claims of shareholders effectively represent a call option on the assets of the firm. Since the value of an option generally increases with the volatility of the underlying asset, risky investment projects that increase the volatility of firm value increase the value of the shareholders' position.[6]

As a consequence, debtholders justifiably attempt to hinder this wealth transfer to shareholders. They can protect themselves against the shareholders' opportunistic behavior by demanding a higher price for providing capital and/or by imposing debt covenants that restrict corporate investment and financing policies.[7] These agency costs can be reduced or avoided through risk management at the firm level if it reduces the risk of the investment projects. Consequently, shareholders as well as debtholders will approve the less risky positive NPV projects.

Management Incentive Structures

Agency costs can also result from diverging interests of management and shareholders. While managers act in principle on behalf of the owners of the firm, they may also pursue personal agendas. Managers have a highly undiversified wealth position in the sense that their employment and income, as well as nonmonetary compensation such as reputation, is tied to the firm. As a result, it may not be unrealistic to assume that the corporate risk management strategy managers implement may also to some extent reflect their personal circumstances and degree of risk aversion.[8] While this article argues that corporate risk management is generally also in the interest of shareholders, some forms of risk reduction that managers may implement, such as conglomerate diversification, have been shown to reduce firm value and are thus not in the shareholders' interest.[9]

Management incentive structures are, however, also in part determined by a firm's compensation scheme. In particular, the use of accounting targets may give rise to conflicts of interest because the use of accounting information gives management an incentive to take a short-term perspective, as opposed to the shareholders' long-term horizon. In contrast, interests of the managers and owners of the firm may be pooled through evaluation schemes that appropriately link the managers' compensation to the stock price and that adjust their degree of risk aversion. As a consequence, managers face incentives to reflect shareholders' perspective in corporate policies and to avoid value-destroying strategies. Corporate risk management represents, therefore, a means to avoid conflicts of interest between management and shareholders.[10]

Since factors such as exchange rate risk that are outside management's control reduce the link between corporate strategies and corporate performance, corporate risk management may also be a value-creating activity because it

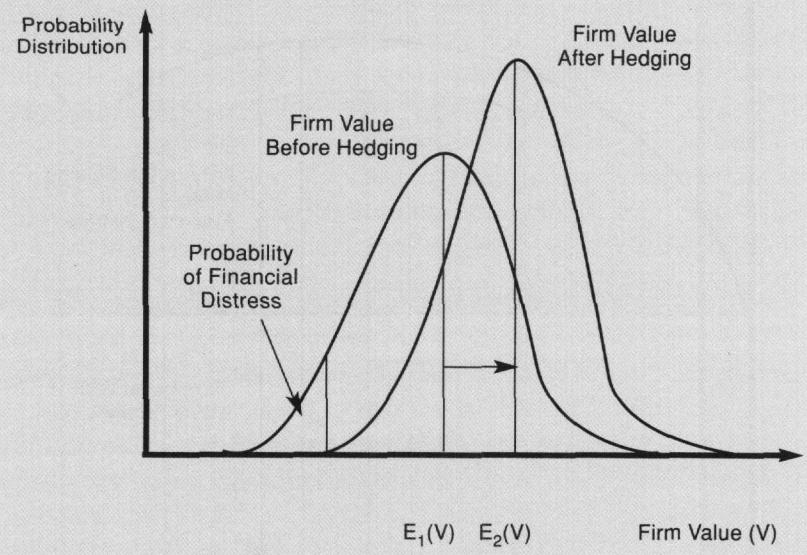
reduces the "noise" in performance measurement and thus renders the compensation scheme more effective. At the same time, shareholders can more easily identify good management skills. Therefore, good managers have a strong incentive to communicate their skills by hedging effectively, while less qualified managers may prefer to hinder the assessment of their performance through the effect of financial risks.[11]

Reducing Bankruptcy and Financial Distress Costs

Corporations have contractually fixed payment obligations, such as wages and interest payments, that have to be fulfilled each period regardless of how good the profitability and solvency of the firm is. Since corporate cash flows are volatile, corporations may face situations where the available liquidity is insufficient to fully meet all payment obligations on time. As a result, direct and indirect costs of financial distress and bankruptcy occur. These are generally a function of the probability of facing liquidity problems and the actual cost associated with this situation.[12]

The direct costs of financial distress consist of various legal expenses, such as legal fees, that occur when a firm files for bankruptcy. But even before this stage, indirect costs of bankruptcy have to be borne if employees, customers, suppliers, creditors, and other stakeholders attach a high probability to insolvency coming about.[13] To illustrate, the threat of economic failure significantly reduces the value of goods whose quality is hard to assess (experience goods) as the trust of customers is diminished. By the same token, the value of service and warranties to the customers of a firm is reduced through financial distress. Similarly, suppliers will be less willing to adjust their production to the needs of a customer whose solvency—and thus future existence—is at risk, and they may be justifiably hesitant to extend credit, as will other creditors.

EXHIBIT 1
Hedging and the Cost of Financial Distress



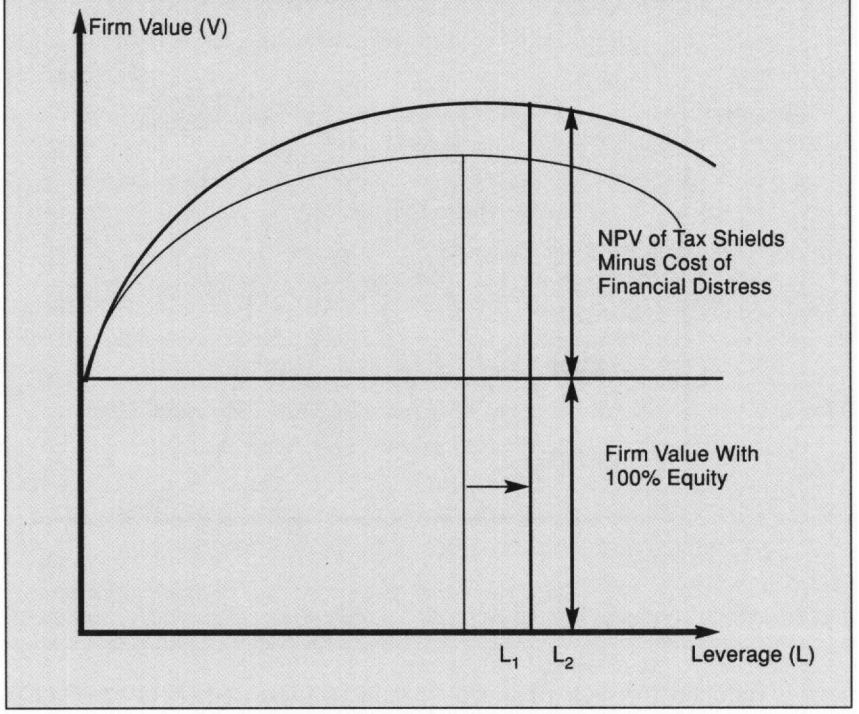
Employees may fear losing their jobs if the company does file for bankruptcy. As a result, they may either seek employment elsewhere or demand a risk premium. Thus, even potential illiquidity may cause high turnover, loss of human capital and reputation, as well as distracting executives from their focus to search for and seize profitable investment opportunities. Corporate risk management can significantly reduce the expected cost of financial distress by lowering the volatility of corporate cash flows. As a result, the probability of encountering a situation where all fixed payment obligations exceed the available liquidity is reduced and firm value is increased ($E_1(V) > E_2(V)$) (see Exhibit 1).

Further benefits of corporate hedging originate from the fact that a lower cost of financial distress increases the debt capacity of the firm. Since interest payments of debt (in contrast to dividend payments) are made out of pre-tax income, the firm benefits from the tax shields of the additional debt. As a result, a higher optimal leverage ratio, determined through the trade-off between the cost of financial distress and the benefits of tax shields, is attained and firm value increases owing to the additional tax shields (see Exhibit 2).[14]

Harmonizing Financing and Investment Policies

In the face of imperfect capital markets, corporations can also benefit from a coordination of financing and investment policies through corporate hedging.[15] This argument rests on the observation that firms with volatile cash flows may in some periods face a short-

EXHIBIT 2
Hedging and the Optimal Leverage Ratio



age of internal funds in order to realize their optimal investment program. As a result, firms incur opportunity costs of forgoing some profitable investment projects. Alternatively, they can raise external funds in the capital market to fund the investment program. However, in imperfect capital markets, the marginal costs of equity and debt financing are increasing, because they are associated with various transactions and agency costs, rendering additional external capital expensive as well.

In particular, debt financing is costly due to the associated agency costs (direct and indirect costs of financial distress).[16] Existing information asymmetries between management and investors similarly make issuing new shares costly. Investors generally have to assume that managers issue new shares only when they believe the shares to be overvalued, since the resulting wealth transfer from new shareholders to old shareholders is in the interest of existing shareholders. As a result, the capital market typically perceives the issuance of new equity as a negative signal that is associated with a lower share price.[17] In addition, both types of external financing are associated with various transaction costs such as bank fees, syndication fees, etc.

A lack of internal funds, therefore, results either in higher cost of capital, because of costly external funding, or opportunity cost, because of passed-up opportunities to increase firm value. As some of the cash flow volatility originates from financial risks, corporate risk management can increase firm value by coordinating the need for and availability of internal funds. As a result, the investment program can be realized and higher cost of funds can be avoided. In this context, it has to be considered that the investment program may depend on financial risks as well. Oil companies, for example, find it generally more attractive to explore new oil fields when the price of crude oil is high. At the same time, a high oil price will guarantee high internal funds from the oil sales of the firm. Thus, corporate hedging is needed to a smaller extent than for a firm with constant investment requirements and opportunities.[18]

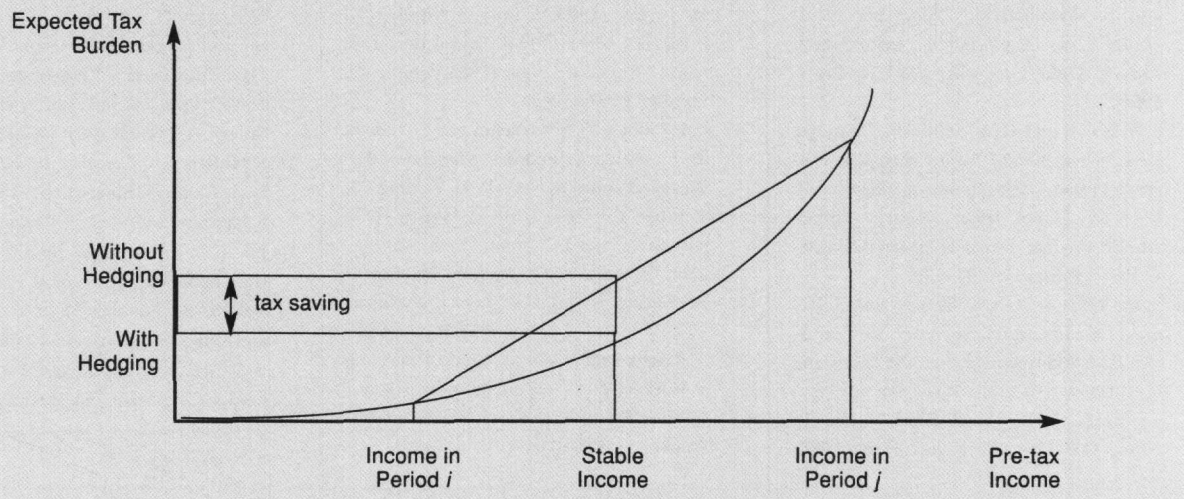
Reducing the Corporate Tax Burden

Corporate risk management can also enhance shareholder value if firms face a convex tax regime with progressively increasing marginal tax rates. By the same token, various tax regulations, such as limits on carrying losses forward or backward, foreign tax credits, etc., can also induce convexity to the tax function since they cannot (or can only later) be benefited from in case of low income or even losses. As a result, pre-tax income that is very volatile across periods entails a higher corporate tax liability compared to a situation where the volatility of income is reduced through corporate hedging (see Exhibit 3). The tax savings through risk management will be more pronounced in situations where income is very volatile, where the tax functions exhibit strong convexity, and where a large part of corporate income is subject to the convex region of the tax schedule.[19]

SUMMARY AND CONCLUSION

Recent research in financial economics suggests that the value of a firm to its owners can be increased through hedging at the firm level (as opposed to risk management by stock owners) in the presence of imperfect capital markets. In

EXHIBIT 3
Hedging and the Corporate Tax Burden



particular, corporate risk management can enhance shareholder value by reducing the agency costs stemming from underinvestment and asset substitution problems. Moreover, hedging at the firm level is apt to reduce the expected cost of financial distress and bankruptcy by lowering the probability of entering into bankruptcy. At the same time, the firm benefits from additional tax shields of increased debt capacity.

In imperfect capital markets, the marginal cost of external equity and debt financing is increasing. As a result, a firm faces either higher cost of capital or the opportunity cost of forgoing positive NPV projects if internal funds are not sufficient to fund the investment program. However, these costs can be alleviated through a risk management policy that coordinates investment and financing activities and, thus, harmonizes the need for and availability of funds. Finally, if the corporate tax regime is convex, reducing the volatility of pre-tax income through corporate risk management can increase shareholder value by lowering the average corporate tax burden. ■

Notes

1. See G.M. Bodnar, G.S. Hayt, and R.C. Marston, "1998 Wharton Survey of Financial Risk Management by US Non-Financial Firms," *Financial Management* (1998, Volume 27, Number 4): 70–91.
2. BIS, *Quarterly Review: International Banking and Financial Market Developments,* Basel, Switzerland: Bank for International Settlements, 2002.
3. S.M. Bartram, "Corporate Risk Management as a Lever for Shareholder Value Creation," *Financial Markets, Institutions and Instruments* (2000, Volume 9, Number 5): 279–324.
4. R.D. McMinn, "Insurance and Corporate Risk Management," *Journal of Risk and Insurance* (1987, Volume 54, Number 4): 658–677; S.C. Myers, "Determinants of Corporate Borrowing," *Journal of Financial Economics* (1977, Volume 5): 147–175.
5. McMinn, 1987, 658–677; M.C. Jensen and W.H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics* (1976, Volume 3): 305–360.
6. S.P. Mason and R.C. Merton, "The Role of Contingent Claims Analysis in Corporate Finance," in: E.I. Altman and M.G. Subrahmanyam (eds.), *Recent Advances in Corporate Finance,* Homewood, Ill.: Irwin, 1985, 7–54.
7. D. Mayers and C.W. Smith, "Corporate Insurance and the Underinvestment Problem," *Journal of Risk and Insurance* (1987, Volume 54, Number 1): 45–54; D. Mayers and C.W. Smith, "On the Corporate Demand for Insurance," *Journal of Business* (1982, Volume 55): 281–286.
8. R.M. Stulz, "Managerial Discretion and Optimal Financing Policies," *Journal of Financial Economics* (1990, Volume 26, Number 1): 3–27; R.M. Stulz, "Optimal Hedging Policies," *Journal of Financial and Quantitative Analysis* (1984, Volume 19, Number 2): 127–140; Mayers and Smith, 1982, 281–296.
9. Y. Allayannis and J. Weston, "The Use of Foreign Currency Derivatives and Firm Market Values," *Review of Financial Studies* (2001, Volume 14, Number 1): 243–276; D.J. Denis, D.K. Denis, and A. Sarin, "Managerial Incentives and Corporate Diversification Strategies," *Journal of Applied Corporate Finance* (1997, Volume 10, Number 2): 72–80; P.G. Berger and E. Ofek, "Diversification's Effect on Firm Value," *Journal of Financial Economics* (1995, Volume 37, Number 1): 39–65.
10. L.M. Han, "Managerial Compensation and Corporate Demand for Insurance," *Journal of Risk and Insurance* (1996, Volume 63, Number 3): 381–404; T.S. Campbell and W.A. Kracaw, "Optimal Managerial Contracts and the Value of Corporate Insurance," *Journal of Financial and Quantitative Analysis* (1987, Volume 22, Number 3): 315–328; J.T. Hacket, "Concepts and Practice of Agency Theory Within the Corporation," in: E.I. Altman and M.G. Subrahmanyam (eds.), *Recent Advances in Corporate Finance,* Homewood, Ill.: Irwin 1985, 163–171; C.W. Smith and R.M. Stulz, "The Determinants of Firms' Hedging Policies," *Journal of Financial and Quantitative Analysis* (1985, Volume 20, Number 4): 319–405; R.M. Stulz, "Optimal Hedging Policies," *Journal of Financial and Quantitative Analysis* (1984, Volume 19, Number 2): 127–140.
11. C.W. Smith, "Corporate Risk Management: Theory and Practice," *Journal of Derivatives*

(1995, Volume 2, Number 4): 21–30; R.M. Stulz, "Rethinking Risk Management," *Journal of Applied Corporate Finance* (1996, Volume 9, Number 3): 8–24; D. Breeden and S. Viswanathan, "Why Do Firms Hedge? An Asymmetric Information Model," Duke University Working Paper, 1996.

12. S.W. Rawls and C.W. Smithson, "Strategic Risk Management," *Journal of Applied Corporate Finance* (1990, Volume 2, Number 4): 6–18; S.C. Myers, "Determinants of Corporate Borrowing," *Journal of Financial Economics* (1977, Volume 5): 147–175.

13 Stulz, 1996, 8-24; A.C. Shapiro and S. Titman, "An Integrated Approach to Corporate Risk Management," in: J.M. Stern and D.H. Chew (eds.), *The Revolution in Corporate Finance,* New York: Basil Blackwell, 1986, 215–229; Smith and Stulz, 1985, 391–405; Mayers and Smith, 1982, 281–296.

14. S.C. Myers, "Still Searching for Optimal Capital Structure," *Journal of Applied Corporate Finance* (1993, Volume 6, Number 1): 4–14; S.C. Myers, "The Capital Structure Puzzle," *Journal of Finance* (1984, Volume 39, Number 3): 575–592.

15. K.A. Froot, D.S. Scharfstein, and J.C. Stein, "A Framework for Risk Management," *Harvard Business Review* (1994, Volume 72, Number 6): 91–102; K.A. Froot, D.S. Scharfstein, and J.C. Stein, "Risk Management: Coordinating Corporate Investment and Financing Policies," *Journal of Finance* (1993, Volume 48, Number 5): 1629–1658.

16. J.E. Stiglitz and A. Weiss, "Credit Rationing in Markets With Imperfect Information," *American Economic Review* (1981, Volume 71, Number 3): 393–410.

17. S.C. Myers, 1993 pp. 4-14; P. Asquith and D.W. Mullins, "Equity Issues and Offering Dilution," *Journal of Financial Economics* (1986, Volume 15, Number 1/2) 61-89; S.C. Myers and N.S. Majluf, "Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have," *Journal of Financial Economics* (1984, Volume 13, Number 2): 187-221.

18. S.M. Bartram, *Corporate Risk Management.* Bad Soden: Uhlenbruch, 1999; Froot, Scharfstein, and Stein, 1994, pp. 91-102.

19. J.R. Graham and C.W. Smith, "Tax Incentives to Hedge," *Journal of Finance* (1999, Volume 54, Number 6): 2241–2263; Smith and Stulz, 1985, 391–405; H. DeAngelo and R.W. Masulis, "Optimal Capital Structure Under Corporate and Personal Taxation," *Journal of Financial Economics* (1980, Volume 8, Number 1): 3–29.