Comment

Value and risk [☆]

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Abstract

The corporation is often viewed as a nexus of contracts. That view is slightly altered here. The corporation is viewed as a nexus of risks. The management of the corporation may then be thought of as the selection and management of the risks in a way that creates value. This I perspective is applied in a discussion of the three articles presented in this session. © 2002 Elsevier Science B.V. All rights reserved.

Risks are commodities that may be exchanged. The corporation, long viewed as a nexus of contracts, may also be viewed as a nexus of risks. The corporation may be described as a composite commodity or bundle of risks that may be further aggregate or separated. "... the history of the development of risk instruments is a tale of the progressive separation of risks, enabling each to be borne in the least expensive way," (Kohn, 1999). An economy may achieve an efficient allocation of risks as well as resources through separation and trading, i.e., see Arrow (1963) or Debreu (1986). Risk has long been studied but despite the progress and the new perspectives the notion is still elusive.

Both the 1958 Modigliani–Miller theorem (Modigliani and Miller, 1958) and the capital asset pricing model (CAPM) (Sharpe, 1964; Mossin, 1966) have had an impact on the intellectual environment and so on the perception of risk

and value. The message of both is that, ceteris paribus, hedging does not increase value. An entire literature has been generated that deals with the issue of risk and value; this literature provides a few tentative steps in the establishing a positive connection between risk management and value, e.g., Jensen and Meckling (1976), Mayers and Smith (1982), Green (1984), Myers and Majluf (1984), MacMinn (1987a,b) and Garven and MacMinn (1993). One important implication of these theoretical constructs is that risk management is about the creation and preservation of value rather than the elimination or reduction of risk. Risk is not a bad to be eliminated rather it is a commodity to be created, managed and exchanged.

The intellectual climate is important and causal but the historical imperative has not changed and has not been altered by the intellectual climate. The risk markets are changing so rapidly that it seems that those changes are currently having more of an impact on the intellectual climate and activity than the reverse. Part of the challenge for economists studying insurance and finance is generalizing the notion of risk so that process of separating risks and allocating risks to minimize agency and other costs becomes more transparent. The challenge includes the choice of instruments and markets. What contractual forms and markets should be used for the risks?

The papers in this session on risk management include the link between an expanded notion of risk and of leverage, the selection of convex or concave risk management strategies for value maximizing firms, and the link between a CEOs incentives and the corporate risk management strategy. All are pieces in the puzzle that links risk and value.

The first paper, i.e., "Measuring Off-Balance Sheet Leverage," deals with risk and leverage. This paper is important because it shows that our standard notion of leverage does not capture the increase in leverage that can be generated by some financial operations. The standard concept of leverage, of course, is the on-balance sheet notion, e.g., the asset to equity ratio or one plus the debt to equity ratio. According to one of the stories, a corporation sells a yen denominated bond in the first layer of leverage. The proceeds of the sale are exchanged for U.S. dollars and used as collateral to short sell on-the-run government bonds; the proceeds of the bond short sale are used to purchase off-the-run government bonds in the second layer of leverage. The long position in off-the-run government bonds is then used as collateral to borrow funds under a repurchase agreement in the third layer of leverage. The borrowed funds are used to purchase floating rate notes issued by U.S. investment banks. The corporation could, of course, continue this levering process by lending the floating rate notes, etc. Each additional layer is off-balance sheet and each increases leverage. Leverage such as this can unravel quickly due to margin calls when expectations are not met, e.g., in the fall of 1998 due to the Russian debt crisis. This and other stories motivate the notion that the standard leverage measures do not provide an accurate assessment of either the proba-

bility of financial distress or the probability of bankruptcy. The paper not only provides an interesting story line but also a suggested methodology for dealing with on and off balance sheet leverage. The method involves establishing the existence of an asset portfolio that duplicates the derivative or other leverage transaction. With such equivalence the leverage measure can be constructed in the standard way, i.e., the asset to equity ratio. [1]

The second paper, i.e., ''Risk Management and the Cost of Capital,'' addresses one of the rudimentary concerns in risk management. If the firm manages risk to maximize stock value then how can we characterize the portfolio of contracts that accomplish that objective? An even more rudimentary concern must be motivating the necessity for value management or risk management. The 1958 Modigliani–Miller theorem suggests that risk management operations cannot increase corporate value. Indeed, as noted in the previous paper, risk management operations can be viewed in terms of leverage and so the Modigliani–Miller theorem on the irrelevance of capital structure, i.e., leverage, must apply. [2] Myers and Majluf (1984) eliminated the perfect information assumption implicit in the competitive financial markets that Modigliani and Miller used to derive the 1958 theorem; Myers and Majluf introduced asymmetric information and showed that internal finance can be less costly than external finance. Subsequently, as Adams notes, Froot et al. (1993) used the difference in the cost of internal versus external finance to demonstrate an optimal hedging result. If internal finance is less costly than external then risk management can add value. The risk management activity allows the firm to manage its cashflows so that the less costly internal finance is available on an as needed basis. While Froot, Scharfstein and Stein simply assume a cost differential between internal and external finance, Adams introduces an explicit bankruptcy cost to motivate and quantify the cost difference. Adams also extends the time horizon of the model so that some generic differences in risk management strategies can be motivated and addressed. If the firm needs internal funds at a future date then a convex or put option strategy can be used to reduce or eliminate the financial distress risk and ensure the appropriate cashflow. If the firm needs internal funds now then a concave or call option strategy will generate funds now while limiting financial

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[1] It is not clear that the repo example should give a leverage measure of L where

$$L = \frac{S + \sum_{i=1}^{n}(1-h)^i S}{S}.$$

If the haircut, equivalently margin is zero then this leverage measure becomes $n+1$ and has no upper limit. Leverage may be unbounded but asset value cannot as this example implies.

[2] Of course, risk was being amplified by leverage in the previous paper rather than transferred or hedged but the risk management notion must be flexible enough to allow for either the acquisition or disposal of risk.

distress then. Adams does provide a model that can endogenously generate the optimal set of risk management contracts and strategies and goes on to characterize the condition for convex versus concave strategies. [3]

The third paper, "Does Executive Portfolio Structure Affect Risk Management? CEO Risk-taking Incentives and Corporate Derivatives Usage," investigates the connection between management incentives and risk management. The literatures on capital structure and risk management both typically assume stock value maximization as the corporate objective function. If the CEO is motivated to act in the interests of shareholders then the assumed objective function is appropriate; otherwise the motives of management must be considered. Rodgers investigates the connection between the corporate manager's risk aversion and the consequent risk management choices. Stulz (1984) and Smith and Stulz (1985) note a connection between risk aversion and executive compensation. According to the story, the risk averse manager compensated with stock has the incentive to hedge corporate risks; equivalently, the concave utility combined with a linear compensation contract yields a concave objective function for the manger. Alternatively, the risk averse manager compensated with sufficient stock options has an incentive to act in the shareholders interests; equivalently, the convexity in the compensation contract counteracts the concavity of the utility function. This portion of the literature is flawed and so hypotheses constructed on it have to come into question. If the corporate manager can select a portfolio of securities on personal account as well as making decisions on corporate account then Rodgers makes an important point in this paper by pointing to the simultaneity between compensation decisions and risk management decisions. A model that allows the manager to make decisions on personal account as well as corporate account will typically yield a Fisher separation decision. [4] The Fisher separation is a generalization of the certainty result that shows that the firm's investment decision is independent of the manager's risk aversion. Indeed the generalized Fisher separation result provides an objective function that the manager uses in making all decisions on corporate account and so it may be referred to appropriately as a corporate objective function. While this view negates any relation between risk aversion and risk management for the publicly held and traded corporation, it also stresses a critical link between the manager's compensation contract and the consequent risk management decisions made by the manager. If the manager is paid with stock options then the objective function becomes the maximization of the stock options and so is generally inconsistent with hedging strategies. The result mentioned here is weakly consistent with Tufano's finding that hedging is

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[3] There is no need for a risk neutral assumption for the agents. While other features of the model are ingenious, this feature detracts from its generality.

[4] If the set of financial markets is incomplete then the separation will be constrained to the span of the market but should still hold.

negatively related to the number of stock options held by the manager. [5] The result mentioned here also seems consistent with Rodgers' results to the extent that a negative connection is made between stock options and risk management. I remain unconvinced that a connection has been established between risk aversion and risk management.

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[5] In fact, theory suggests that the relationship does not depend on the number of stock options; it does depend on the options being out of the money with some positive probability so that the structure of the compensation package is really convex.