Corporate Finance, Corporate Law and Finance Theory

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Twenty-five years ago, only a few U.S. law schools offered a course in corporate finance, and those that did offered a specialized, practical course. Today, most U.S. law schools offer a theoretical corporate finance course. The shift from a highly specialized elective to a mainstay of the curriculum and from nuts and bolts to principles underscores the legal profession's recognition that finance theory is critical for understanding corporate law issues.[1]

The typical contemporary law school corporate finance class consists of two parts. The first part focuses on valuation (the finance part of corporate finance);[2] the second part usually covers capital structure (the corporate part of corporate finance). The distinction is sometimes

1. Ronald Gilson and Bernard Black chose 1972, the year Victor Brudney and Marvin Chirelstein published the first edition of their casebook, *Cases and Materials on Corporate Finance*, to mark the beginning of the legal profession's recognition that corporate lawyers should have a grounding in finance theory. RONALD J. GILSON & BERNARD S. BLACK, (SOME OF) THE ESSENTIALS OF FINANCE AND INVESTMENT 1 (1993).

2. Finance has been described as the economics of time and risk. *See* Stephen A. Ross, *Finance*, *in* 2 THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS 322, 326–29 (John Eatwell et al. eds., 1987); Lawrence Summers, *On Economics and Finance*, 40 J. FIN. 633, 634 (1985) (providing an amusing account of the relationship between economics and finance).

described as one between the left-hand and right-hand sides of the corporate balance sheet. Thus, valuation focuses on what assets the firm should hold and capital structure on how it should finance those assets.

The central and unifying theme behind the first part of the course—valuation—is the net present value (NPV) rule. NPV is the discounted present value of the cash flow from a given project. The NPV rule states that among independent projects the investor should accept all positive NPV projects and reject all negative ones; among mutually exclusive projects, the investor should choose the project with the highest (positive) NPV.[3] Although understanding how to use the NPV rule is not the same as being able to figure out what investments to make, the rule provides a framework to decide whether to accept or reject any given project.[4]

A comprehensive corporate finance course describes the NPV rule, underscores the assumptions upon which it is based,[5] illustrates alternative rules and shows how these alternatives can lead investors astray,[6] and makes clear the demanding informational requirements of the rule.[7] Most law school corporate finance teachers also call upon their students to apply what they have learned, drawing applications from court cases and other legal settings.[8]

In contrast with the first part of the course, where most professors cover roughly the same material, there is wide variance in coverage in the second part. The topics covered often include at least some of the

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3.   RICHARD A. BREALEY & STEWART C. MYERS, PRINCIPLES OF CORPORATE FINANCE 24 (6th ed. 2000); STEPHEN A. ROSS, RANDOLPH W. WESTERFIELD & JEFFREY JAFFE, CORPORATE FINANCE 57–60, 189 (5th ed. 1999).

4.   The NPV rule provides the correct answer because undertaking a positive-NPV project increases consumption possibilities and undertaking a negative NPV reduces them. ROSS ET AL., *supra* note 3, at 50–57.

5.   The most crucial assumption is that borrowing and lending rates are equal.

6.   The most popular alternative rules are the payback, average accounting return and internal rate of return rules.

7.   Following the standard business school corporate finance texts, these materials are taught first under the assumption that the cash flows are certain (the so-called "risk free world"). The discussion then turns to modern portfolio theory, which relates risk to expected return. The first part usually concludes with a discussion of market efficiency and possibly option theory. *See* GILSON & BLACK, *supra* note 1, at 231–51; Peter H. Huang, *Teaching Corporate Law from an Options Perspective*, 34 U. GA. L. REV. 571, 575–92 (2000) (describing how corporate law can be taught from an options perspective); Merton H. Miller & Keith Sharfman, *The Economic Expert Witness*, 3 GREEN BAG 2d 297, 307 (2000) (discussing the ubiquitous nature of options in legal decisionmaking).

8.   The preference for legal materials serves several goals. First, it shows students that finance questions arise in many legal contexts and that a basic understanding of finance is important to many lawyers, not just business lawyers. Second, it drives home the point that there is a large variance in financial sophistication within the bar and on the bench and, thus, the potential for a high return on their investment in studying.

following: debt, equity and other securities (such as preferred stock, convertible bonds, and warrants), dividends, conflicts between investors (and perhaps other stakeholders as well), the use of securities other than debt and equity, mergers and acquisitions, bankruptcy, utility rate regulation, derivatives, leasing, and financial innovation.

Given the wide divergence in choice of topics, it is perhaps not surprising that many corporate finance professors teach these materials as a collection of loosely related topics. In this essay, we describe a theme that we have used for several years to tie these materials together. The theme we propose should be useful regardless of the topics. It will also help legal scholars who seek to understand business developments, how businesses react to laws, and how they should be regulated. In addition, lawyers who understand and apply the theme will be better able to advise their clients.

I. THE MODIGLIANI-MILLER THEOREM OF CAPITAL STRUCTURE IRRELEVANCY (THE M&M THEOREM)

First published more than forty years ago,[9] the M&M Theorem has been called the foundation of modern finance.[10] The M&M Theorem states that under certain idealized assumptions the cost of capital to the firm and the total value of the firm are independent of the firm's capital structure.[11] Succinctly (if somewhat colloquially) stated, corporate capital structure is irrelevant. The assumptions upon which the M&M Theorem rest can be categorized as follows:[12]

(1) No income taxes: There are no income taxes in the economy, either at the firm level or the individual level.

(2) Equal borrowing cost: Individuals can borrow at the same interest rate as corporations.

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9. Franco Modigliani & Merton Miller, *The Cost of Capital, Corporate Finance, and the Theory of Investment*, 49 AM. ECON. REV. 655 (1959).

10. ROSS ET AL., *supra* note 3, at 390; Joseph E. Stiglitz, *Why Financial Structure Matters*, J. ECON. PERSP., Fall 1998, at 121, 121; *Unlocking Corporate Finance*, ECONOMIST, Dec. 8, 1990, at 81. Modigliani and Miller's method of proof—arbitrage will ensure that financial substitutes will sell for the same price—is the foundation for many central ideas in finance including both the capital asset pricing model and the Black-Scholes formula for option prices. Stephen A. Ross, *Comment on the Modigliani-Miller Propositions*, J. ECON. PERSP., Fall 1998, at 127, 128–29; Hal Varian, *The Arbitrage Principle in Financial Economics*, J. ECON. PERSP., Fall 1997, at 55, 56.

11. The value of the firm is the present value of the corporation's cash flow discounted at the firm's cost of capital. Thus, maximizing the value of the firm is equivalent to minimizing the cost of capital.

12. *See, e.g.*, ZVI BODIE & ROBERT C. MERTON, FINANCE 404 (1998).

(3) Efficient market hypothesis: Information regarding securities, corporations, and markets is freely available and commonly understood by all market participants. This implies that insiders do not have better information than other investors and that all investors share homogeneous expectations about the future prices of securities.

(4) Perfect markets: There are no bankruptcy, transaction, contracting, or agency costs. This assumption implies that the firm's investment policy is fixed and its cash flows are given.

The M&M Theorem is often described as the principle of the conservation of value.[13] The idea is that regardless of how the interests in a business enterprise are divided, the total value of the enterprise is unchanged.[14] The Theorem therefore also implies that the chief financial officer (CFO) who frets over the corporation's balance sheet and the financial economist who studies the CFO's decisions are both wasting their time.

When it first appeared, commentators vigorously debated the Theorem's significance.[15] The debate was not whether the theorem was a completely accurate picture of reality (after all, even its staunchest defenders acknowledged that our economy had taxes), but whether it captured the essential features well enough so that its conclusion was roughly correct. Over time, the consensus has developed that the theorem does not accurately capture reality and so its conclusion is incorrect.[16] Surprisingly, it is precisely the inaccuracy of the M&M Theorem's assumptions that makes it the foundation of modern corporate finance.

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    13.   Modigliani and Miller prove their theorem by demonstrating that given their four assumptions any corporate capital structure (debt-equity ratio) can be costlessly replicated by investors. *See* Modigliani & Miller, *supra* note 9, at 268. Thus, no investor would pay a premium for any capital structure because he can produce that same structure himself at no cost on his own account by increasing or decreasing leverage through borrowing or lending.

    14.   See ROSS ET AL., *supra* note 3, at 379 (providing an account of Professor Miller's difficulty in explaining the M&M Theorem to reporters when Professor Modigliani won the Noble Prize in economics; he finally succeeded when he used the analogy that a pizza is no larger if you cut it into more slices).

    15.   Merton H. Miller, *The Modigliani-Miller Propositions After Thirty Years*, J. ECON. PERSP., Fall 1998, at 99, 99–100.

    16.   *See* Ross, *supra* note 2, at 332, 335; Clifford W. Smith, Jr., *The Theory of Corporate Finance: A Historical Overview*, *in* THE MODERN THEORY OF CORPORATE FINANCE 3, 4 (Clifford W. Smith ed., 2d ed. 1990).

II. THE REVERSE M&M THEOREM

The explanatory power of the M&M Theorem comes from turning it upside down: If capital structure can affect the value of the firm, it must work through one or more of the four M&M assumptions.[17] That is to say, the only ways that capital structure can increase value are by lowering taxes, providing access to cheaper borrowing, releasing valuable information, or improving cash flow. We call this idea the Reverse M&M Theorem.

The crucial insight provided by the M&M Theorem is that it tells us where to look to understand capital structure.[18] If we want to understand how firms raise capital, we need to look at taxes, borrowing costs, information, and cash flows. Any explanation why some firms tend to use or avoid particular capital structures must, therefore, focus on exploiting the failures to satisfy the M&M assumptions. In this way, the Reverse M&M Theorem is an important organizing principle for modern corporate finance because it tells us what types of arguments can explain capital structure policies.[19] At a very general level, the most commonly invoked explanations for capital structures are as follows:

Taxes: Relaxing the assumption of no taxes implies that capital structure can create value by reducing taxes. This opens the way for explanations based on tax asymmetries.[20]

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17.   Logically, the theorem can be written in the form "if p, then q." In this form, p is the four assumptions and q is the conclusion that capital structure is irrelevant. The validity of the theorem as a form of economic reasoning, in the sense that if the assumptions are true the conclusion follows, is generally accepted. As a matter of logic, if a statement is true, so is the contrapositive. The contrapositive of the statement "if p, then q" is the statement "if not q, then not p." The contrapositive of the M&M Theorem is that if capital structure matters, then the four assumptions do not all hold. Economic intuition adds content to that logic by recognizing that any explanation must work through at least one of the assumptions.

18.   ROSS ET AL., *supra* note 3, at 395; Smith, *supra* note 16.

19.   ROSS ET AL., *supra* note 3, at 395; James A. Brickley & John J. McConnell, *Dividend Policy*, *in* 1 THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS, *supra* note 2, at 896; Claire Hill, *Securitization: A Low-Cost Sweetener for Lemons*, 74 WASH. U. L.Q. 1061, 1084–1106 (1996); Michael Knoll, *Taxing Prometheus: How the Corporate Interest Deduction Discourages Innovation and Risk Taking*, 38 VILL. L. REV. 1461, 1467 n.24 (1993); Kimberly D. Krawiec, *Derivatives, Corporate Hedging, and Shareholder Wealth: Modigliani-Miller Forty Years Later*, 1998 U. ILL. L. REV. 1039, 1058–78; Ross, *supra* note 2, at 322; Smith, *supra* note 16; Clifford Smith, Charles Smithson & D. Sykes Wilford, *Financial Engineering: Why Hedge?*, *in* HANDBOOK OF FINANCIAL ENGINEERING 126, 128 (Clifford Smith & Charles Smithson eds., 1990).

20.   *See, e.g.*, Harry D. DeAngelo & Ronald Masulis, *Optimal Capital Structure Under Corporate and Personal Taxation*, 8 J. FIN. ECON. 44 (1980).

Inefficient markets:[21] Relaxing the efficiency assumption implies that individuals can have different information and different opinions as to how much a security is worth. This has led to explanations based upon signaling[22] and heterogeneous expectations.[23]

Imperfect markets:[24] Relaxing the assumption of perfect capital markets means that capital structure can create value by changing investment policy. This has led to explanations based on agency costs.[25]

III. APPLICATIONS

Capital structure is more than simply the firm's selection of its debt-to-equity ratio. Generally speaking, it is the decision of how to raise the funds to pay for the corporation's assets. It addresses the following questions: What securities should the firm issue? How much of each security should the firm issue? To whom should such securities be issued? And what rights should different classes of securityholders have? The rest of this section will describe several important capital structure

21. Modigliani and Miller implicitly assume that investors are rational. A large amount of recent research is in the field of behavioral finance, which assumes that investors are systematically irrational. *See generally* MAX BAZERMAN, SMART MONEY DECISIONS: WHY YOU DO WHAT YOU DO WITH MONEY (AND HOW TO CHANGE IT FOR THE BETTER) (1999); GARY BELSKY & TOM GILOVICH, WHY SMART PEOPLE MAKE BIG MONEY MISTAKES AND HOW TO CORRECT THEM: LESSONS FROM THE NEW SCIENCE OF BEHAVIORAL ECONOMICS (1999); HERSH SHEFRIN, BEYOND GREED AND FEAR: UNDERSTANDING BEHAVIORAL FINANCE AND THE PSYCHOLOGY OF INVESTING (2000). Thus, behavioral finance has implications for corporate finance. SHEFRIN, *supra*, 225–70; ANDREI SHLEIFER, INEFFICIENT MARKETS: AN INTRODUCTION TO BEHAVIORAL FINANCE 184–85 (2000).

22. *E.g.*, Peter H. Huang, *Structural Stability of Financial and Accounting Signaling Equilibria*, 9 RES. FIN. 37 (1991) (demonstrating the robustness of financial and accounting signaling models); Stephen A. Ross, *The Determination of Financial Structure: The Incentive Signaling Approach*, 8 BELL J. ECON & MGMT. SCI. 23 (1977).

23. *E.g.*, ROBERT A. HAUGEN, THE NEW FINANCE: THE CASE AGAINST EFFICIENT MARKETS 120–38 (2d ed. 1999) (arguing that many long-accepted principles of corporate finance require revision because corporations face inefficient, over-reactive capital markets); SHEFRIN, *supra* note 21, at 227–37 (discussing cognitive biases in takeovers); Lynn Stout, *Are Takeover Premiums Really Premiums? Market Price, Fair Value, and Corporate Law*, 99 YALE L.J. 1235 (1990) (arguing that takeover premiums do not measure the gains created by mergers because inframarginal investors value the target's securities above their market price).

24. The assumption that individuals can borrow at the same rate as corporations is not as unrealistic as it might first seem because of the possibility of borrowing on margin. *See* WILLIAM A. KLEIN & JOHN C. COFFEE, JR., BUSINESS ORGANIZATION AND FINANCE: LEGAL AND ECONOMIC PRINCIPLES 343–44 (7th ed. 2000). In any event, the relaxation of this assumption has not generated much literature.

25. *E.g.*, Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305 (1976).

developments and offer explanations for those structures using the Reverse M&M Theorem.[26]

A. CONVERTIBLE BONDS

In addition to debt and equity, many firms also issue convertible bonds. A convertible bond is a bond that is convertible at the option of the holder into another security, usually the issuer's equity.[27] A convertible bond is a hybrid security, combining elements of both debt and equity.[28] Because the issuer, by combining elements of both securities, discourages the clienteles for each security from buying its hybrid, some commentators have wondered why firms issue convertible bonds.[29]

A frequently offered explanation begins with the observation that convertible bonds pay interest at a lower rate than otherwise comparable straight bonds. That observation has led some observers and market participants to argue that convertible bonds are cheaper than straight bonds by the difference in interest rates.[30] That explanation, however, ignores the cost to the firm of the option to convert: Because the expected value of the conversion privilege to the holder is also the cost to the firm's equityholders of having sold that right, the value of the option should equal the interest saved.[31]

The Reverse M&M Theorem suggests several more persuasive reasons for using convertible bonds. Convertible bonds help to control agency problems, especially the tendency for highly leveraged firms to pursue high-variability projects with a negative NPV because the equityholders enjoy the entire upside of their decisions, but their downside is truncated by limited liability.[32] Convertible debt can counter this tendency because the conversion privilege gives the debtholders the ability

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26.   Our list is incomplete; we could have included additional topics and additional explanations for the topics included if we had the space.

27.   For example, Compaq might issue for $1000 a convertible bond that can be converted into twenty shares of common stock. The conversion ratio is then said to be 20 and the implied conversion price $50 a share.

28.   It pays interest and has priority in bankruptcy, both debt characteristics, but it participates in the issuer's upside, an equity characteristic. William A. Klein, *The Convertible Bond: A Peculiar Package*, 123 U. PA. L. REV. 547, 553 (1975).

29.   *E.g.*, *id.* at 555–60.

30.   See William M. Bratton, *The Economics and Jurisprudence of Convertible Bonds*, 1984 WIS. L. REV. 667, 673 n.20 (citing surveys of convertible bond issuers).

31.   Klein, *supra* note 28, at 555–60 (describing the cheaper financing rationale for convertible bonds).

32.   Jensen & Meckling, *supra* note 25, at 334–37. In the finance literature, this phenomenon is called asset substitution.

to capture some of the upside by converting. Under certain circumstances, this will reduce the benefit to the equityholders by enough to prevent them from pursuing a bad project.[33]

Another reason for issuing convertible bonds is to mitigate problems caused by asymmetric information. For a firm with a given expected value, the equity will be worth more and the debt will be worth less the more volatile the firm's value.[34] If outside investors cannot accurately evaluate the firm's risk and if they believe that the firm's insiders can more accurately assess that risk, they will discount whatever security the firm offers. If the firm sells debt, they will assume the firm is risky. Alternatively, if the firm sells equity, they will assume the firm has little risk.[35] For such opaque firms, the possibility of offering a security with both debt and equity characteristics allows the firm to offer a "vertical slice" of the company.[36] This slice is more cost-effective because any discount is smaller since there is less opportunity for the insiders to exploit their informational advantage.[37]

B. PROJECT FINANCE

In a project financing, the sponsoring entity sets up a project as a distinct legal entity and raises funds through the project, which issues securities.[38] The investors, thus, look to the project's cash flow for their return. Many large and high-profile projects have been built using project

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33.   AMIR BARNEA, ROBERT A. HAUGEN & LEMMA W. SENBET, AGENCY PROBLEMS AND FINANCIAL CONTRACTING 80–105 (1985); ROSS ET AL., *supra* note 3, at 614–15; Kjell Nyborg, *Rationale for Convertible Bonds*, *in* THE COMPLETE FINANCE COMPANION 241, 244–45 (Tim Dickson & George Bickerstaffe eds., 1998).

34.   Equity represents a call on the firm's assets at the face amount of the debt, and debt represents ownership of the firm's assets subject to equity's call. Because the value of the call option is an increasing function of the volatility of the underlying asset, the equity will be worth more and the debt will be worth less the more volatile is the firm's value. BARNEA ET AL., *supra* note 33, at 80–105; ROSS ET AL., *supra* note 3, at 614–15.

35.   Thus, the insider's superior information actually financially disadvantages the insiders. Because outside investors know that they are at a disadvantage, they will assume the worst and pay less for whichever security—debt or equity—the firm issues.

36.   This assumes that the firm already has debt outstanding and thus cannot issue equity that offers a vertical slice of the company.

37.   Michael Brennan & Eduardo Schwartz, *The Case for Convertibles*, CHASE FIN. Q., Spring 1982, at 27, 28, *reprinted in* J. APPLIED CORP. FIN., Summer 1998, at 55, 56.

38.   The use of a separate legal entity removes the assets from the originator's estate in the event the originator goes bankrupt.

finance, including the Trans-Alaska Pipeline and the English Channel Tunnel.[39]

Project financing is a capital structure decision because the firm could fund the project using its own credit. A common explanation for project finance is that firms with weak credit ratings can finance a project more cheaply with project finance than on their own account. That explanation, however, is wrong because it violates the Reverse M&M Theorem: It assumes that capital structure can create value without implicating any of the M&M assumptions.[40]

There are, however, several more plausible explanations. Project finance can overcome the underinvestment problem—the possibility that the firm will not invest in positive-NPV projects that require an outside contribution of capital because a portion of the capital investment might go to pay the claims of existing debtholders.[41] Because the project is funded as a separate entity, none of the project's cash flow can be siphoned off to pay the firm's general creditors. Thus, any positive-NPV project can be funded with project finance.[42]

Project finance can also discipline management. Unlike corporations that have an indefinite life, most projects have a finite life. Thus, if the investors are to be repaid and earn a profit, they must receive these amounts over the project's life. Accordingly, most project financings call for the periodic payment to the equityholders of all cash flows above those necessary to pay the project's creditors and to continue maintaining the project's assets. In contrast, if the project were financed internally, the management would only have to pay the debtholders. The rest of the cash flow generated by the project (the project's free cash flow) would be in the

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39. For a history of project finance, see Harold Rose, *Building on the Benefits of Project Financing*, *in* THE COMPLETE FINANCE COMPANION, *supra* note 33, at 80, 80–85. Very similar to project financing is securitization. The difference between a project financing and a securitization is the assets held by the separate legal entity backing the securities. In a project financing, the entity holds real assets, such as a power plant, factory or mine; in a securitization, the entity holds receivables, such as home mortgages, automobile loans, or credit card receipts. Beginning with mortgage-backed securities in 1975, securitizations have grown rapidly, reaching $2.5 trillion in 1996. Harold Rose, *Securitization: Unbundling for Value*, *in* THE COMPLETE FINANCE COMPANION, *supra* note 33, at 252, 256.

40. *Cf.* ROSS ET AL., *supra* note 3, at 372–74 (debt is not cheaper than equity even though debt pays a lower return because issuing debt increases the equity's risk and thus its expected return).

41. Stewart C. Myers, *Determinants of Corporate Borrowing*, 5 J. FIN. ECON. 147 (1977) (describing the underinvestment problem).

42. *See* Teresa A. John & Kose John, *Optimality of Project Financing: Theory and Empirical Implications in Finance and Accounting*, 1 REV. QUANTITATIVE FIN. & ACCT. 51 (1991) (describing how project finance can be used to overcome the underinvestment problem).

control of the managers. Such free cash flow can be a source of agency costs within the firm, because the managers might invest that cash in negative-NPV projects.[43] Project finance, by forcing the managers to pay the otherwise free cash flow to outside investors, allows the investors, not the managers, to decide where the free cash flow will be invested.[44] If the managers want to make new investments, they must raise the capital from outside investors.

Project finance can also create value when there are informational asymmetries. A firm's managers often have more information about a business than do outside investors. Keeping nonpublic information from competitors can be very valuable. On the other hand, keeping information from investors is costly because investors, suspicious that the secrecy conceals bad news, will discount the issuer's securities.[45] Project financings can reduce, in two ways, these discounts without revealing sensitive information to competitors. First, if it is difficult to ascertain the project's value without this information, the firm can use project finance and disclose the information only to those who finance the project.[46] Second, even if the project itself is transparent, the firm might have other projects that rely on sensitive information. The latter projects are good candidates for internal financing. Project finance is an attractive means of raising outside capital for transparent projects, so internal funding can be used for opaque ones.[47]

C. FINANCIAL ENGINEERING WITH DERIVATIVES

A derivative is a security the value of which is derived from another security.[48] Thus, call options,[49] put options,[50] and forward contracts[51] are

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43.   *See* Michael C. Jensen, *Agency Costs of Free Cash Flow, Corporate Finance and Takeovers*, 76 AM. ECON. REV. 323 (1986) (describing the agency costs of free cash flow).

44.   JOHN D. FINNERTY, PROJECT FINANCING: ASSET-BASED FINANCIAL ENGINEERING 20 (1996) (describing how project finance can reduce the agency costs of free cash flow).

45.   *See* Stewart C. Myers & Nicholas S. Majluf, *Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have*, 13 J. FIN. ECON. 187 (1984) (providing an asymmetric information-based justification for a pecking order theory of capital structure).

46.   For example, the funds for a mining operation can be raised this way without publicly disclosing the find and tipping off competitors and land owners. Salmon Shah & Anjan V. Thakor, *Optimal Capital Structure and Project Financing*, 42 J. ECON. THEORY 209 (1987).

47.   FINNERTY, *supra* note 44, at 21–22, 352; (discussing Andrew H. Chen, John W. Kensinger & John D. Martin, Project Financing as a Means of Preserving Financial Flexibility (1989) (unpublished working paper)).

48.   Peter H. Huang, *A Normative Analysis of New Financially Engineered Derivatives*, 73 S. CAL. L. REV. 471, 483 (2000).

49.   The holder of a call option has the right, but not the obligation, to purchase the underlying asset at the strike price before the option expires.

all derivatives because the value of these securities all depend upon the price of the underlying securities upon which they are based.[52] Nonfinancial corporations use derivatives to control risk, such as the risk that the price of a raw material will rise or that exchange rates will move against them.[53] This practice is called financial engineering[54] or hedging.[55] And it has exploded,[56] from a nearly standing start in the early 1970s to over $100 trillion at the end of 1999 (as measured by their notional value or principal amount).[57]

One of the major lessons of modern portfolio theory is that risk-averse investors should diversify in order to eliminate their exposure to unique risk.[58] Although firms could manage their risk directly by using derivatives, corporations can avoid the attendant effort and expense by allowing the unique risk to flow through to shareholders. Because individuals can diversify, corporations should not use derivatives simply to reduce the unique risk they pass through to shareholders.[59] Accordingly, if corporations can create value for their investors with financial engineering, that value must come from somewhere other than a reduction in unique risk. The Reverse M&M Theorem suggests at least two possible sources of that value.

First, hedging can create value for shareholders by reducing taxes. Although the corporate tax structure is fairly flat,[60] there is an important

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50. The holder of a put option has the right, but not the obligation, to sell the underlying asset at the strike price before the option expires.

51. The holder of a forward contract is obligated to purchase the underlying asset at the strike price when the contract matures.

52. For example, the value of a call option on 100 shares of Microsoft with a strike price of $100 that expires on February 1, 2001 is a function of the price of the common stock of Microsoft on or before that date. In general, the higher the price of the underlying asset goes, the greater the value of a call option on that asset.

53. DONALD R. CHAMBERS & NELSON J. LACEY, MODERN CORPORATE FINANCE 576 (2d ed. 1999).

54. *Id.*

55. ROSS ET AL., *supra* note 3, at 645.

56. *See* Richard Marston, Gregory S. Hayt, and Gordon M. Bodnar, *Derivatives as a Way of Reducing Risk*, *in* THE COMPLETE FINANCE COMPANION *supra* note 33 at 345, 345–52 (describing a survey of nonfinancial U.S. businesses that found widespread use of derivatives to manage risk).

57. Huang, *supra* note 48, at 485–86; Press Release, Bank for International Settlements, The Global OTC Derivatives Market at End-December 1999 (May 18, 2000), http://www.bis.org/press/index.htm.

58. Unique risk is that portion of the risk of securities that can be diversified, and so does not pay a higher expected return.

59. CHAMBERS & LACEY, *supra* note 53, at 594; Smith et al., *supra* note 19, at 127–28.

60. The corporate income tax rate is 15% on the first $50,000 of income, 25% on the next $25,000, 34% on the next $9,925,000, and 35% thereafter. I.R.C. § 11 (1994).

asymmetry. Firms with positive taxable income in any year pay taxes, but firms with a loss do not get refunds. Instead, these firms have no tax liability.[61] Because of this asymmetry, a firm with highly volatile earnings will have a higher expected tax liability than a firm with steady earnings.[62] This creates an incentive for firms to hedge in order to reduce their taxes. By making their income more stable, such firms can reduce their expected taxes. Since the government takes less, more is left for shareholders.[63]

Second, hedging can create value by reducing the costs of financial distress and bankruptcy. The managers and shareholders of a firm in financial distress have incentives to make decisions that do not maximize the value of the enterprise. For example, they have the incentive not to contribute capital to undertake new investments if a portion of that capital might be siphoned off by debtholders. They also have the incentive to pursue risky projects that have a negative NPV because their downside is truncated by limited liability. In addition, managers will demand higher compensation for the risk that they will be blamed for a failure that was beyond their control. The possibility of reducing these agency costs by making the firm's earnings more stable is another way in which financial engineering can create value.[64]

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61.   The tax system also contains a complicated provision for carrying losses back two years and forward twenty years. I.R.C. § 172(b)(1)(A) (2000). However, because these losses do not carry interest, a loss carried forward is less valuable than an immediate refund. Thus, the carry-over provision does not eliminate the asymmetry, but merely reduces it. Since the asymmetry remains, the effect persists.

62.   In effect, the government's tax claim is similar to a call option on a portion (equal to the tax rate) of the firm's income, and the call option is worth more the more volatile is the underlying asset (here, the firm's income).

63.   CHAMBERS & LACEY, *supra* note 53, at 594; Smith et al., *supra* note 19, at 129–32. *But see* Krawiec, *supra* note 19, at 1077–78 (observing that tax-based explanations of hedging do not apply to most large U.S. corporations that hedge); Roberta Romano, *Derivative Securities Regulation*, *in* 1 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 590, 596 (Peter Newman ed., 1998) (same).

64.   CHAMBERS & LACEY, *supra* note 53, at 594; Smith et al., *supra* note 19, at 132-34, 136-37. Knoll has taught the Smith, Smithson & Wilford article since he began teaching corporate finance almost ten years ago. That article explains how the M&M Theorem can be turned upside down and used to explain how derivatives can create value for corporations. In his experience, the article works well both to illustrate what we have been calling the Reverse M&M Theorem and to illustrate how that theorem can be used to understand how publicly traded corporations use derivatives to create value.

D. TRACKING STOCK

Last April, AT&T raised $10.6 billion when it issued tracking stock in its wireless operations.[65] Tracking stock does not represent an interest in the entire company, but only in one part of the company.

Tracking stock first appeared in the mid-80s when General Motors (GM) issued tracking stock in its Electronic Data Systems (EDS) and Hughes Electronics subsidiaries. By July 1999, fifteen other companies had issued 37 tracking stocks with most of these offerings occurring since 1996. Besides GM and AT&T, other recent high-profile issues (and their parent companies) include Go.Com (Disney), CarMax (Circuit City), Sprint PCS (Sprint), and ZDNet (Ziff-Davis).[66] Other companies that are considering issuing tracking stock include Cendant, Dow Jones, DuPont, JC Penny, Microsoft, NBC, the New York Times, and Staples.[67]

The issuance of tracking stock is obviously a capital structure decision. It is also a new phenomenon upon which scholarly attention is only now being focused.[68] The Reverse M&M Theorem tells us that if tracking stock creates value for the issuing firm's shareholders, that value must come through the failure to meet one or more of the M&M assumptions.

Underwriters sometimes speak of firms issuing tracking stock in order to unlock value buried in the corporate issuer.[69] In order to make sense of

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65.   Suzanne McGee, *Deals & Deal Makers: AT&T Wireless Sets IPO at $29.50 a Share As Traders Brace for Largest U.S. Debut*, WALL ST. J., Apr. 27, 2000, at C21 (reporting that AT&T raised $10.6 billion from the sale of its tracking stock).

66.   Susan Scherreik, *Tread Carefully When You Buy Tracking Stocks*, BUS. WK., Mar. 6, 2000, at 182.

67.   *Id.*; Robert McGough, *Tracking Stocks Fail to Justify Their Buzz, a Study Finds*, WALL ST. J., Apr. 25, 2000, at C1.

68.   Several finance studies document positive excess returns for firms announcing the issuance of tracking stocks. *See, e.g.*, Matthew T. Billet & David C. Mauer, *Diversification and the Value of Internal Capital Markets: The Case of Tracking Stock*, J. BANKING & FIN. (forthcoming 2000); Julia D'Souza & John Jacob, *Why Firms Issue Targeted Stock*, 56 J. FIN. ECON. 459 (2000); Dennis E. Logue, James K. Seward & James P. Walsh, *Rearranging Residual Claims: A Case for Targeted Stock*, FIN. MGMT., Spring 1996, at 43. But a recent study finds significantly negative excess returns from buying and holding tracking stocks for a three-year period following their issuance. Matthew T. Billet & Anand M. Vijh, Long-Term Returns from Tracking Stocks (May, 2000), *available at* http://papers.ssrn.com/paper.taf?ABSTRACT_ID=229549.

69.   Kenneth N. Gilpin, *Shares That Track Assets Add Value at a Cost*, N.Y. TIMES, July 18, 1999, § 3 (Money and Business), at 7; Adam Lashingsky, *Will The Boom in Tracking Stocks Derail Investors?*, FORTUNE, Jan. 10, 2000, at 210; Arthur M. Louis, *Tracking Stock Can Unleash a Unit's Value*, S.F. CHRON., May 11, 1999, at C1; *Making Tracks*, ECONOMIST, Nov. 13, 1999, at 79; Steven Syre & Charles Stein, *Genzyme Tracking Stocks Are Off Track on Returns*, BOSTON GLOBE, June 24, 1999, at D1; Maria Vickers, *Are Two Stocks Better Than One?*, BUS. WK., June 28, 1999, at 98;

this suggestion, consider a conglomerate with two or more lines of business. Assume further that it is difficult for investors to value the underlying businesses. In such a case, there might be a substantial difference in opinion among investors on the value of each business. In that case, some investors who place very high values on one or more of the firm's parts might not hold its common stock if they place a sufficiently low value on the other parts such that they value the whole package below its market price. Tracking stock, thus, has the potential to increase the firm's market value when investors hold heterogeneous expectations because it allows those investors who place the highest value on each unit to invest only in that unit. In effect, tracking stock allows the issuer to unbundle the business for the purpose of selling its parts without having to separate the operations.

Another situation which lends itself to the use of tracking stock involves a firm that has different investment projects available, only some of which are difficult for investors to value.[70] Investors are likely to discount the hard-to-value projects significantly because of the problems caused by asymmetric information. If the firm needs to raise new capital to finance these projects, but cannot issue debt, it will have to issue equity at a discount. This discount will come at the expense of existing equityholders. If, however, the firm can issue tracking stock in the units that are easier for investors to value, then any discount will be smaller or perhaps nonexistent. Thus, it might be cheaper for the firm to raise capital by issuing tracking stock in a transparent unit than to issue equity in the whole firm, which is more opaque.

A third possible explanation for tracking stock is that it is a currency that can be used to provide management with stock-based incentives that are tied to specific units.[71] Such stock is said to align more closely managers' and shareholders' interests because most managers have a bigger impact on their division than they do on their firm as a whole. Thus, tracking stocks might create value by reducing agency costs.[72]

Deborah Adamson, *The Truth About Tracking Stocks*, CBS MARKETWATCH (Jan. 5, 2000), *at* http://cbs.marketwatch.com/archive/20000105/news/current/clueless.htx?source=&dist=.

    70.   These projects might simply be difficult for investors to value or the firm might have proprietary information that it cannot release to investors without also releasing it to its competitors.

    71.   *See* PAUL MILGROM & JOHN ROBERTS, ECONOMICS, ORGANIZATION & MANAGEMENT 574–76 (1992) (describing GM's issuance of tracking stock as motivated in part by a desire to maintain employee incentives within EDS); J. FRED WESTON, KWANG S. CHUNG & JUAN A. SIU, TAKEOVERS, RESTRUCTURING, AND CORPORATE GOVERNANCE 254–55 (2d ed. 1998) (same).

    72.   For tracking stock to create value, its benefits must outweigh its costs. The Reverse M&M Theorem implies that capital structures can destroy value as well as create value. Firms can throw away

E. CORPORATE, SECURITIES, AND BUSINESS LAW

Corporate, securities, bankruptcy, and commercial law all regulate dealings among investors. By prescribing various rights, these laws partition investors' interests in firms. Accordingly, if the M&M assumptions were accurate, none of these laws would have any effect on firm value.[73] However, because the M&M assumptions are not accurate, the laws regulating investor relations can affect the firm values through taxes, and information and agency costs.

Consider corporate law, which in the United States is state law. Although each state has its own corporate law, more than half of the Fortune 500 and more than forty percent of the companies listed on the New York Stock Exchange are incorporated in Delaware.[74] If the law had no effect on value, it would be surprising to find so many firms incorporated in such a small state where many of them had no other operations. Although commentators have debated whether Delaware law increases or decreases total value,[75] the Reverse M&M Theorem tells us where to look.

If complete contracts could be written and enforced at no cost, there would be no agency costs from potential conflicts between investors. It is because such contracts are impossible that agency costs occur. To protect themselves from later being exploited, those who do not exercise control pay less for their securities; and those in control take advantage of their

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value by paying excessive legal, accounting, and investment banking fees and by paying for otherwise unnecessary shareholder proxies to amend corporate charters. *See* Russ Banham, *Track Stars*, J. ACCT., July 1999, at 45, 48. Moreover, tracking stock imposes agency costs by creating conflicts of interest over cost allocations, liquidation rights and internal transfer payments. Jeffrey J. Hass, *Directorial Fiduciary Duties in a Tracking Stock Equity Structure: The Need for a Duty of Fairness*, 94 MICH. L. REV. 2089, 2091–93 (1996) (arguing that such conflicts arise when managers have disproportionate interest in different divisions and proposing a new duty of fairness to deal with such conflicts).

73.   If investors could not contract around these rules, security prices would adjust to reflect the value of the rights they conveyed, but the aggregate value of the firm would remain unchanged.

74.   Leo Herzel & Laura D. Richman, *Delaware's Preeminence by Design*, *Foreword* to R. FRANKLIN BALOTTI & JESSE A. FINKELSTEIN, DELAWARE LAW OF CORPORATIONS AND BUSINESS ORGANIZATIONS, AT F-1 (3d ed. 1997 & Supp. 1999).

75.   *Compare* William L. Cary, *Federalism and Corporate Law: Reflections Upon Delaware*, 83 YALE L.J. 663 (1974) (arguing that state competition for corporate charters constitutes a race to the bottom), *with* Ralph K. Winter, Jr., *State Law, Shareholder Protection, and the Theory of the Corporation*, 6 J. LEGAL STUD. 251 (1977) (arguing that such competition constitutes a race to the top). *See also* Ehud Kamar, *A Regulatory Competition Theory of Indeterminacy in Corporate Law*, 98 COLUM. L. REV. 1908 (1998) (arguing that indeterminacy created by judicial predominance permits Delaware to retain its preeminent position).

position. The net effect is a reduction in value.[76] To the extent that corporate law can efficiently restrain such actions, it reduces waste and increases value. Normatively, then, the law should try to minimize total agency costs (and other costs that result from the deviations from the M&M assumptions). That is complicated because restrictions that reduce waste also restrict the flexibility to make valuable investments. It is further complicated by the need to take into account the efficiency of private contracting solutions.

Consider U.S. federal securities laws. If a particular asset is deemed to be a security, the Securities and Exchange Commission (SEC) regulates it. The SEC also regulates options on securities and security indices.[77] The Commodity Futures Trading Commission (CFTC) has jurisdiction over all futures contracts, commodities and options on futures contracts. The SEC regulates options on foreign currencies traded on a U.S. national securities exchange, while the CFTC regulates them otherwise. Derivatives that are not traded on an exchange, known as Over-the-Counter (OTC) derivatives, are not regulated by the SEC or CFTC, but are governed by standard contract law.[78] This messy jurisdictional hodge-podge, whereby financially equivalent instruments are governed by different or no regulatory agencies depending on legal classifications, is the result of numerous political battles and compromises. It means that corporations can engage in regulatory arbitrage by issuing legally distinct, but financially equivalent instruments.[79]

If the M&M assumptions were correct, regulatory arbitrage is both valueless and harmless. The Reverse M&M Theorem, thus, can help us to understand such arbitrage. For example, by opting out of U.S. securities laws, a corporation can avoid the cost of mandatory disclosure requirements. If markets were efficient and perfect, such actions would increase firm values. Conversely, to the extent that securities markets are inefficient and imperfect, a firm might increase its value by complying with

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76. For example, managers exploit shareholders to the detriment of both through excessive expenditures on perks that the managers value at less than their cost.

77. EDWARD F. GREENE, ALAN L. BELLER, GEORGE M. COHEN, MANLEY O. HUDSON, JR. & EDWARD J. ROSEN, 2 U.S. REGULATION OF THE INTERNATIONAL SECURITIES AND DERIVATIVES MARKETS §13.04[3][c] (4th ed. 1998).

78. OTC derivatives may also be governed by federal anti-fraud provisions, state common law (including not only contract law, but also tort law for fraud, negligent misrepresentation, and breach of fiduciary duty), and potentially state statutory law, including anti-gambling statutes.

79. Frank Partnoy, *Financial Derivatives and the Costs of Regulatory Arbitrage*, 22 J. CORP. L. 211, 231–35 (1997) (discussing how regulatory arbitrage can achieve different accounting treatments, avoid investment restrictions, and qualify for government subsidies).

a regime of mandatory disclosure with strict penalties.[80] Such disclosure could increase value by mitigating moral hazard and associated agency costs.[81]

The Reverse M&M Theorem also suggests how to evaluate the tax law's treatment of capital structure, such as its relative treatments of debt and equity. If the other M&M assumptions were true, the tax advantage provided by debt would have no social welfare cost. Firms would use more debt, but this would simply be equivalent to a reduction in corporate taxes. It is because the other assumptions are not true that the tax-advantaged treatment of debt has real economic costs. Because bankruptcy and financial distress costs are positive,[82] the tax-favored treatment of debt encourages more debt, increasing these costs.[83] Moreover, because not all activities and assets have the same financial distress costs, some activities can support more debt than others.[84] Accordingly, the tax system mis-allocates investment by encouraging investment in projects that can be heavily debt-financed and discouraging it in projects that cannot.[85]

IV. CONCLUSION

If the M&M assumptions were accurate, capital structure would have no effect on firm value. If that were true, chief financial officers, investment bankers, and corporate lawyers would have all but disappeared, taking with them corporate finance as an area of scholarship and teaching. But the assumptions are not accurate, work is booming, and the discipline is flourishing. All this is possible because capital structure can create value by reducing taxes, by providing information, and by lowering agency costs. A lawyer who understands how capital structure can create value is better able to advise her clients on how to structure their transactions to take

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80. *See* EDWARD B. ROCK, SECURITIES REGULATION AS LOBSTER TRAP: A CREDIBLE COMMITMENT THEORY OF MANDATORY DISCLOSURE (Inst. for Law and Econ., Univ. of Penn. Law Sch., Working Paper No. 269, 1999).

81. As is often quoted, "[s]unlight is said to be the best of disinfectants; electric light the most efficient policeman." LOUIS BRANDEIS, OTHER PEOPLE'S MONEY 62 (Torchbook ed. 1967) (1914).

82. *See* Edward Altman, *A Further Empirical Investigation of the Bankruptcy Cost Question*, 39 J. FIN. 1067, 1076–83 (1984) (estimating the total costs of financial distress as 12.1% of corporate value five years prior to filing for bankruptcy and 16.7% at the time of filing).

83. Roger Gordon & Burton Malkiel, *Corporation Finance*, *in* HOW TAXES AFFECT ECONOMIC BEHAVIOR 131, 172 (Henry J. Aaron & Joseph A. Pechman eds., 1981) (estimating the welfare loss from encouraging debt over equity was $3.2 billion in 1975).

84. According to the trade-off theory of capital structure, low-volatility, low-growth firms that use few intangible assets can support more debt than high-volatility, high-growth firms that make extensive use of intangible assets. Myers, *supra* note 41, at 170.

85. Knoll, *supra* note 19, at 1491–97.

maximum advantage of those opportunities without violating the law.[86] Such a lawyer is also better able to evaluate the law and suggest beneficial reforms.

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86.   *See generally* Ronald J. Gilson, *Value Creation by Business Lawyers: Legal Skills and Asset Pricing*, 94 YALE L.J. 239 (1984) (developing a planning approach for understanding what business lawyers do); Miller & Sharfman, *supra* note 7, at 305 (answering question of whether it is important for law students to study corporate finance emphatically in the affirmative).