

Asset Securitization and Asymmetric Information

Edward M. Iacobucci and Ralph A. Winter

ABSTRACT

We analyze the incentives for asset securitization that flow from informational asymmetries within a corporation. Within the framework of “hidden-action” asymmetries, securitization of those cash flows that are relatively insensitive to managerial effort leaves critical incentive devices more high powered and more focused on cash flows that matter. In addition, asset securitization exchanges a stream of future cash inflows for a lump-sum cash inflow, which enhances monitoring and control of management expenditures. Within the “hidden-information” framework, asset securitization can be explained by asymmetric information (1) between insiders and outside investors about the value of nonsecuritized assets or (2) between insiders and outsider investors about the value of securitized assets. In both hidden-information theories, asset securitization is driven by the propensity of the market to allocate assets to investors who are best informed about asset values.

1. INTRODUCTION

Asset securitization is the partial or complete segregation of a specific set of cash flows from a corporation’s other assets and the issuance of

EDWARD M. IACOBUCCI is Associate Professor in the Faculty of Law, University of Toronto. RALPH A. WINTER is Professor of Strategy and Business Economics in the Sauder School of Business, University of British Columbia. We are grateful for comments from Kevin Davis, Victor Goldberg, Andrew Iacobucci, Bob Scott, Sheryl Strother, Michael Trebilcock, George Triantis, and workshop participants at Columbia Law School, University of Toronto Faculty of Law, University of Virginia Law School, University of Michigan Law School, Northwestern University Law School, University of Chicago Law School, and the American Law and Economics Association. We gratefully acknowledge financial support from the Social Sciences and Humanities Research Council of Canada.

[*Journal of Legal Studies*, vol. 34 (January 2005)]

© 2005 by The University of Chicago. All rights reserved. 0047-2530/2005/3401-0006\$01.50

securities based on these cash flows.¹ The types of financial assets involved in asset securitization transactions are often receivables (Schwarcz 1994). The practice of securitization originated with the sale of securities backed by residential mortgages (Schwarcz 1993, p. 3), but a wide variety of assets have been securitized, including lease, auto loan, and credit card receivables (Dvorak 2001, p. 546), commercial mortgages (Dolan 1998a), equipment leases, franchise fees (Schwarcz 1993), state lottery winnings (Dolan 1998b), and litigation settlement payments (Dolan 1998b). Recently, even more unconventional assets have been the subject of securitization. For example, David Bowie securitized royalties from his music catalog (Kerr 2000). Revenues from particular natural resource stocks, such as oil and gas reserves, have also been securitized (Harrel, Rice, and Shearer 1997).

This paper analyzes the economic incentives for a firm to engage in asset securitization.² The paper is motivated by four observations. First, the use of asset securitization as a financial tool has increased dramatically over the last 20 years. There are now over \$2.5 trillion worth of such securities outstanding (Lupica 2001, p. 292). The Securities and Exchange Commission stated in 1992 that asset securitization is “becoming one of the dominant means of capital formation in the United States” (Investment Company Act Release No. 19,105, [1992 Transfer Binder] Federal Securities Law Reporter [CCH], secs. 85,062, 83,500 [November 19, 1992]); since then, the global market for securitization issues has more than tripled (Adelson 1999, p. 166).³ At the same time, the scope of asset securitization has broadened from its original base of mortgages and receivables to other more variable cash flows such as those mentioned above. The title of a 1997 article in the business press makes the point succinctly: “On the Frontier of Creative Finance: How Wall Street Can Securitize Anything” (Clark 1997, p. 49).

Second, the discussion of asset securitization among practitioners is plagued by fallacies. For example, some commentators suggest that asset securitization is attractive because it allows a medium- or low-quality firm to offer a high-quality security or because it allows a firm to offer securities at a lower cost of capital than the firm’s general debt or equity.

1. For a foundational discussion of the role of organizational law in facilitating asset partitioning, including mention of securitization, see Hansmann and Kraakman (2002).

2. That is, we do not address securitization by an individual, such as David Bowie, nor securitization by organizations other than profit-maximizing firms, such as political bodies.

3. The 1999 figure is estimated.

The theory of finance shows these explanations to be wrong, as we shall discuss.

Third, the academic literature on asset securitization is sparse, and some of the theories offered are problematic. For example, asset securitization has been described as a useful judgment-proofing tool (LoPucki 1996). But exchanging one asset (future cash flows) for another (current cash) does not in itself judgment proof the firm (Schwarcz 1999b), although it may assist in a judgment-proofing strategy. And as an empirical matter, many firms that engage in asset securitization do not appear to be sufficiently endangered by insolvency risk for judgment proofing to justify the transaction costs of asset securitization.

Fourth, many of the existing theories that have theoretical validity depend on factors external to the firm, such as regulation or involuntary creditors, to explain securitization. If regulation avoidance or judgment proofing were the explanation of securitization, it would be appropriate to doubt its social usefulness (assuming that the regulation in question makes sense). The set of incentives for asset securitization that we explore involves forces purely internal to the contractual parties within the corporate form of organization. While ours is a positive analysis, it has normative implications in countering the claim by some commentators that securitization is a socially harmful means of avoiding obligations to third parties.

Asset securitization represents a change in the organization of a firm, and it is natural to base an analysis of the strategy on informational asymmetries, which provide the foundation of the theory of the firm. We categorize theories of asset securitization according to two classes of underlying informational asymmetries.⁴ One class is the set of informational differences among investors that exists at the time that securities are issued (“hidden information,” in the modern parlance of economic theory). The other class is the set of informational asymmetries between managers and investors about managerial actions and uncertain factors that affect security payoffs and that are realized during the period between security issue and the date of security maturity (“hidden action” or “agency” problems) (see Mas-Colell, Whinston, and Green 1995, chap. 14).⁵

Following an overview in Section 2 of the mechanics of asset secur-

4. This structure parallels Triantis (1992).

5. The distinction between hidden-action and hidden-information problems has replaced the older classification of informational problems into problems of moral hazard and adverse selection.

itization and the scope and extent of securitization, we develop the agency or hidden-action perspective on asset securitization in Section 3, which develops the theme that segregating cash flows from the rest of the firm can facilitate monitoring of managers. Section 4 shows that asset securitization can also be useful in controlling agency problems by limiting managerial discretion over cash flows. Section 5 develops the hidden-information perspective on asset securitization, showing that where investors are differently informed about the values of different classes of assets within the firm, market forces compel a segregation of ownership of the asset classes. This is precisely what securitization accomplishes. Section 6 distinguishes asset securitization from secured debt, which we argue is often insufficient to achieve the benefits of securitization outlined here. Section 7 offers some empirical evidence consistent with the hypothesis that asset securitization is used to reduce agency costs. The concluding section summarizes the paper.

2. AN OVERVIEW OF ASSET SECURITIZATION

2.1. The Structure of Securitization Transactions

Although the specific details of asset securitization transactions vary enormously, the typical transaction involves the sale by a corporation (the originator) of assets to a special-purpose vehicle (SPV), which is a corporation, trust, or other entity. The SPV finances its purchase of these assets by issuing debt securities or “equity securities with debtlike characteristics” (Investment Company Act Release No. 19,105, [1992 Transfer Binder] Federal Securities Law Reporter [CCH], secs. 85,062, 83,500 [November 19, 1992]). The description of equity as “debtlike” refers to the fact that the securities sold by the SPV derive their value from, and often only from, the specific financial assets the originator sells to the SPV. Since the assets in question, such as receivables from past transactions, will often have a limited maximum value, the residual claim is capped, and thus even equity claims on SPV assets may resemble debt.

It is common for the securities to be sold in tranches that vary in seniority. If the securities are to be sold to the public, each tranche is rated by a specialized rating agency, such as Moody’s. Senior tranches are often rated as investment grade, but lower tranches may attract low ratings. In the event of a private placement, ratings are not always necessary since sophisticated investors themselves can evaluate the securities (Schwarcz 1994, pp. 138–39).

The originator will often offer some kind of credit support for the securities.⁶ One form of support arises where the originator retains ownership of the most junior tranche of securities, thus “overcollateralizing” more senior securities. Alternatively, credit support can arise from selling the subordinated tranche to a third party (Schwarcz 1993, p. 13) or from bank letters of credit, insurance, or irrevocable credit lines (Schwarcz 1993).

Asset securitization is distinguished from a secured loan by the partitioning of the cash flows away from the rest of the firm in a “true sale” for bankruptcy purposes. Any explanation of asset securitization must account for this key feature. If an issuance of securities based on a subset of cash flows does not involve a true sale, then it is a secured loan, and the SPV would have a security interest but not ownership of the cash flows (Schwarcz 1993, p. 29).⁷ This distinction is critical. For example, in the event of the originator’s bankruptcy, section 362 of the U.S. Bankruptcy Code would impose a stay of all actions by the SPV seeking to obtain access to the receivables if the transaction were a secured loan; if, on the other hand, the transaction were a true sale, the stay would not apply even in the event of the originator’s bankruptcy since the receivables in question do not form part of the debtor’s estate. For the securitization transaction to be just that, rather than a secured loan, it is important that the sale of assets to the SPV be a true sale.⁸

6. But, as we will discuss, support coming from the originator itself, as opposed to third parties, must be limited if the sale of assets to the SPV is to be characterized as a true sale.

7. Unlike title holders, secured lenders have only a contingent property interest in the collateral that grants them rights in the event of the borrower’s failure to make payments on its debt. Note that Article 9 applies to outright sales of accounts, which form the basis of many securitization transactions (Uniform Commercial Code [U.C.C.], sec. 9-102[1][b]). The application of Article 9 to such a transaction, however, does not imply that a purported sale of accounts is as a matter of law a secured transaction. Comment 2 to section 9-102 states that no provision of Article 9 is intended to prevent the sale of accounts and that the “use of the terminology such as ‘collateral’ to include accounts or chattel paper that have been sold is intended solely as a drafting technique . . . and is not relevant to the sale or secured transaction determination.” See Schwarcz (1999a, p. 951–52), who notes that commentary responded to the (erroneous) view expressed in *Octagon Gas Sys., Inc. v. Rimmer* (995 F.2d 948 [10 Cir. 1993]) that the sale of accounts was precluded by Article 9. Article 9 also provides that a “debtor that has sold an account, chattel paper, payment intangible, or promissory note does not retain a legal or equitable interest in the collateral sold” (U.C.C., sec. 9-318[a]). Note, however, that a securitization transaction that involves revolving assets, such as past and future receivables, may be subject to the section 362 stay, because future receivables do form part of the debtor’s estate for an instant.

8. In a recent controversial case, *In re LTV Steel Co., Inc. et al.* (274 B.R. 278 [N.D. Ohio 2001]), the court refused to grant emergency relief from an earlier interim order that

Each of our theories of securitization depend on securitization transactions transferring meaningful risk to the SPV and its security holders. We show that partitioning risk in this manner facilitates monitoring and valuation. It is helpful, therefore, to note briefly here that in practice securitizations must effect a transfer of some economic risk to satisfy the traditional true-sale requirement. The greater the recourse against the originator for unpaid or untimely repayments of the receivables that the SPV (and its security holders) has, the less likely will the transaction meet the true-sale requirements (see Schwarcz 1993, p. 31).⁹ Similarly, the greater the access that the originator has to the surplus from the receivables, the less likely the transaction will be a true sale.¹⁰ In addition, the true-sale character of a securitization transaction may be jeopardized by a pricing mechanism that fluctuates depending on interest rates or on actual rather than expected collections of receivables (Schwarcz 1993, pp. 32–33). We discuss asset partitioning and the true-sale requirements in greater detail, including recent proposals for reform, in comparing securitization and secured debt in Section 6, but we emphasize here that securitization entails some partitioning of risk because of the traditional approach to true sales. Indeed, the securities issued in a securitization transaction can be quite risky. Clearly the tranche with lowest priority,

permitted a debtor claim to cash assets that had been allegedly sold in securitization transactions to SPVs. The court determined that the cash collateral was “necessary to enable Debtor to keep its doors open” (p. 286) and that investors in the asset-backed securities were adequately protected; a full evidentiary hearing would be necessary to determine whether there was a true sale. The case eventually settled. While this was simply a case for interim relief, rather than a final determination, concerns over situations like those in *LTV Steel* led to significant support from the securitization industry for proposals to reform the bankruptcy code to accommodate securitizations explicitly. Proposed section 912 of the Bankruptcy Reform Act of 2001 (Senate File 220, 107 Cong., 1st Sess., sec. 912 [2001]) would have explicitly set out that assets subject to true sales in securitization transactions do not form a part of the bankrupt’s estate. In part because of the use of securitizations in Enron, however, the provision lost political support (see Lipson 2002). We discuss this reform initiative, along with state reforms to Article 9, in more detail later.

9. Ngo (2002 p. 156): “The nature of the rights of recourse that a transferee has against a transferor is arguably the most significant factor in determining whether a transaction is a true sale or a secured loan. The existence of some recourse rights will not automatically disqualify a transaction as a sale. However, the greater the extent of the transferee’s recourse rights, the closer the transaction appears to be a secured loan instead of a sale.”

10. Schwarcz (1993, p. 32): “The right of the transferee of the receivables to retain all collections of transferred receivables for its own account, even after the transferee has collected its investment plus yield, would therefore be a factor in favor of characterization of the receivables transaction as a true sale.” Ngo (2002, pp. 157–58): “[C]ourts have ruled that a sales agreement granting the originator rights to excess proceeds will count against the characterization of the transaction as a true sale.”

sometimes referred to as “toxic waste” (*Economist* 2001) faces a considerable risk of nonpayment. But tranches of higher priority are exposed to risk as well. The *Economist* (2001) reports that American Express Financial Advisors took an \$830 million charge on its portfolio of \$3.5 billion of “collateralized debt obligations,” or a portfolio of asset-backed securities.¹¹ And as the scope of securitization expands to include particularly volatile assets, such as the rights to payments associated with timber stocks or oil and gas reserves, the risk associated with these securities will increase further.

Aside from transferring risk, another factor in the true-sale analysis is the method by which the accounts are collected. If the SPV has authority to collect the accounts, this favors true-sale status. Such authority could include ownership by the SPV of all books and records relating to the receivables and the right of the SPV to appoint a collection agency (*Economist* 2001, p. 33). In practice, the originator often collects the receivables subject to the SPV’s discretion.¹² To better ensure true-sale status, the originator will often segregate collected funds from its own funds pending remittance to the SPV (Schwarcz 1993, p. 34).

It is also important that the SPV not be susceptible to bankruptcy itself, thus avoiding stays on the collection of receivables by the SPV’s security holders. One method of avoiding the voluntary bankruptcy of the SPV is to ensure that it is neither owned nor controlled by the originator, thus preventing the originator from causing the SPV to file a voluntary bankruptcy petition under section 301 of the Bankruptcy Code (Schwarcz 1993, p. 16). Equity in the SPV could be owned by a third party, such as a charitable institution, that would have no incentive to petition for bankruptcy voluntarily even after the originator’s bankruptcy as long as collections continue. Where the SPV is owned or controlled by the originator, steps will often be taken to limit the ability of the SPV to file voluntarily for bankruptcy protection. For example, the SPV’s charter may prohibit the voluntary filing for bankruptcy unless a certain number of independent directors (that is, independent of the originator) agree to such an action (Schwarcz 1993, p. 17). Steps will also be taken to ensure that the SPV will not be petitioned involuntarily into bankruptcy by creditors that have not been paid. This can be ac-

11. Some of these losses were from American Express’s losses on junior tranches that it had retained from its own deals, but the *Economist* (2001) describes also the “deteriorating quality” of more senior tranches in the market generally.

12. This undermines the possibility that asset securitization might be motivated by expertise in collecting receivables.

complished by limiting the SPV's access to trade credit in its charter, perhaps by limiting the business in which the SPV can engage (Schwarcz 1993, p. 24).

Commentary suggests that asset securitization gives rise to higher transaction costs than other means of financing. Schwarcz notes that the securitization deal will be attractive only if the savings in financing costs resulting from securitization are greater than the difference in transaction costs relative to other financing devices (Schwarcz 1994, p. 138). Commentary has observed that the high fixed transaction costs of securitization imply that it will be worthwhile only if it is of a certain size. Schwarcz reports that public offerings of securitized assets are rarely cost effective for transactions of less than \$50 million and are more common for transactions worth \$100 million or more (1994, p. 139). Up-front costs include legal fees, asset review costs, and rating agency fees, while "ongoing" costs include credit enhancement costs, administrative fees, trustee fees, and issuing and paying agent fees (Aidun and Farley 1995, p. 30). Many of these costs are idiosyncratic to asset securitization,¹³ underscoring the puzzle of why asset securitization is so popular.

2.2. Existing Explanations of Asset Securitization

A common but suspect explanation of asset securitization is that since the rate of return that must be offered by the originator in securitizing assets is less than the cost of raising funds in other ways—less than the cost of debt capital, for example—securitizing assets is a cost-efficient financing device. Schwarcz (1993, p. 2) writes, "The separation of the selling company . . . from the receivables themselves can enable the originator to raise funds at less expense, through securities issued by the SPV, than if it raised funds through securities it issued directly. (For example, the securities issued by the SPV, depending on the structure of the transaction, may have a higher investment rating than securities issued directly by the originator and, therefore, would bear a lower

13. Additional costs may arise in seeking an exemption under the Investment Company Act of 1940 (15 U.S.C., secs. 80-a-1 to -64). Since an SPV serves only as a vehicle for selling securities, the securitization transaction must comply with this act. Hill (1996, p. 1082) reports that "virtually all securitization transactions are structured to meet one of the exemptions; this endeavor also is costly."

interest rate than the originator might be able to obtain on its own securities, bank lines of credit or secured borrowings.)”¹⁴

This explanation is an example of the most common fallacy in corporate finance: that issuing securities with the lowest required rates of return minimizes the cost of capital simply because these securities have the lowest rates of return. The Modigliani-Miller theorem reveals the fallacy (Modigliani and Miller 1958).¹⁵ In perfect capital markets, dividing streams of income among different financial claimants, be they creditors or shareholders, does not affect the value of the firm.¹⁶ Any gain from selling high-quality securities through a securitization transaction is offset exactly in perfect capital markets by losses in the quality of other securities. For example, removing relatively safe securitized assets from the firm will increase the cost of equity as investors demand a greater expected return to compensate for the increased risk of equity.

The Modigliani-Miller theorem depends on perfect capital markets, but the value of the theorem is not in its predictions per se but as a benchmark against which to evaluate practical explanations of financing strategies. Since financing choices can matter only where the assumptions underlying the theorem do not hold, one must identify clearly which assumptions are not met when asserting the practical value of a particular financing strategy, such as asset securitization.

Commentators have suggested that asset securitization results from externalities between the firm and involuntary creditors, such as tort

14. In a later paper, however, Schwarcz (1994, p. 148, n. 53) briefly discusses the Modigliani-Miller theorem (Modigliani and Miller 1958) and notes that although in perfect capital markets, asset securitization may not save funds, it is nevertheless cost-efficient because whereas “[i]n a perfect universe [referring to Modigliani-Miller], every savings achieved by changing one part of a company’s capital structure will result in off-setting costs to other parts of the capital structure. . . . Securitization achieves a net cost savings because the universe is imperfect.” This later statement is, of course, consistent with this paper. The challenge is to identify the particular market imperfections that make securitization attractive. Schwarcz (1994, p. 151) offers as a specific explanation of asset securitization its role as a means of economizing on monitoring costs. We discuss Schwarcz’s explanation in Sections 3 and 5.

15. A large body of literature within the theory of corporate finance consists of analyzing the impact on optimal capital structure of changes to the assumption of perfect capital markets.

16. Perfect capital markets are complete, that is, available and in operation for any conceivable security, and free of transaction costs, taxes, and informational asymmetries across investors about security returns.

claimants.¹⁷ Securitization removes the assets in question from the originator's bankruptcy estate. LoPucki (1996) suggests that securitizing allows firms to "judgment-proof" themselves. Asset securitization offers the "virtual elimination of the risk that the courts will disregard the entity that holds the assets" (LoPucki 1996, p. 24), and thus "asset securitization may be the silver bullet that kills liability" (p. 30).

The problem with this approach is that, as Schwarcz points out, selling assets in a securitization transaction does not itself diminish the capital in the firm that is available to creditors (Schwarcz 1999b). In such a deal, assets of one kind are simply exchanged for assets of another kind: in an arm's-length transaction, the originator will receive proceeds equal in value to the assets sold, thus not diminishing the value of the originator's estate. Only if the originator disposes of the proceeds is there judgment proofing; securitization in and of itself is not a judgment-proofing technique. One response to Schwarcz's argument is that securitization, while not itself sufficient to judgment proof a firm, is a useful component of a judgment-proofing technique: first securitize, then distribute the proceeds to claimants.¹⁸ LoPucki (1999, p. 59) notes that "[f]or most firms whose asset transactions have been reported in the press, th[e] plan was to pay creditors or shareholders."

LoPucki may therefore be justified in characterizing asset securitization as potentially a judgment-proofing device in some circumstances. But White (1998) provides empirical evidence that is not generally supportive of LoPucki's theory. For example, along with the growth of securitization, there has been no downward trend in corporate asset-to-liability ratios or in the amount of liability insurance being purchased by corporations. While we cannot dismiss the possible use of asset securitization as a judgment-proofing technique in some cases, the explanation is not very robust.

Another bankruptcy-related explanation of asset securitization is that it allows firms to avoid costs from the reorganization process if bank-

17. There is a similar explanation concerning the relationship between the firm and "nonadjusting creditors" such as small trade creditors. Asset securitization could transfer wealth from these creditors by helping to reduce the assets available to them. See Lupica (1998).

18. LoPucki (1999, p. 56) responds effectively to Schwarcz with an analogy: "To see the fallacy, consider by analogy the invention of a new tool that makes burglary easier. Neither the fact that the new tool has uses other than burglary nor the fact that burglaries could be accomplished without it would prove that the new tool was not a dangerous new threat to the security of homes. Asset securitization is under attack because it appears to be the most efficient, effective judgment-proofing tool currently available."

ruptcy arises (see Frost 1997). Since the firm has fewer assets with which to reorganize following asset securitization, the firm avoids inefficiencies brought about by the reorganization process, such as excessive delay resulting from managers protecting their own interests. If the bankruptcy process is indeed inefficient, allowing creditors to opt out through asset securitization may be value enhancing. But Schwarcz's objection to LoPucki's judgment-proofing analysis also applies to the bankruptcy opt-out theory: asset securitization does not necessarily reduce the value of assets within the firm—it depends on how the proceeds from securitization are spent. Given LoPucki's observation that the proceeds are often paid out to investors, Frost's bankruptcy opt-out explanation may have some plausible grounding in a subset of cases. But it seems unlikely to apply to a wide range of cases in which expected bankruptcy costs are not large.

Relatively few explanations in the literature describe the benefits of asset securitization within the firm; instead the explanations rely on external factors such as regulation or involuntary or other nonadjusting creditors.¹⁹ We will show that the incentives for asset securitization are more fundamental. Instead of being the result of external pressures, asset securitization can add value even in a bankruptcy-free, regulation-free context because of matters internal to the firm and its investors. Our positive theories of securitization respond to normative criticism of the practice by those who see it simply as a means of responding to external factors, such as the possibility of involuntary creditors.

3. ASSET SECURITIZATION AND HIDDEN ACTION

At the heart of our hidden-action explanations of asset securitization are two conditions that are satisfied in many such transactions. First, our explanations assume that the cash flows that are securitized are relatively insensitive to managerial effort. This condition appears to be satisfied in many deals in which the cash flows in question are already-earned receivables of all kinds. Managers have limited scope to change the value of these receivables, once realized, relative to their ability to affect the value of firm assets in general. Managers may have some influence over the value of past receivables through collection efforts

19. Hill (1996) provides an exception to this observation. We will discuss Hill's theory of the information problems across investors in the firm that could give rise to securitization in Section 5.

(although the SPV typically retains the right to appoint a collection agent) and through ongoing conduct—for example, if the firm approaches insolvency, receivables may become more difficult to collect. But as a general matter, it is reasonable to posit that in the representative case, the link between managerial effort and value is weaker for past receivables than for other assets.

The second important condition is that the securitized assets be uncertain.²⁰ The explanations developed in this section apply with most force to deals involving the greatest transfer of risk. For example, revenues from harvesting timber vary with exogenous fluctuations in the price of timber. Securitizing timber proceeds limits the exogenous price risk the originator faces. Interest rate risk and the risk that receivables will not be collected in a timely manner are other sources of uncertainty in the return on securitized assets.

Having established the two important conditions for the hidden-action theories of asset securitization, we turn now to elaborating our theories. Agency costs refer first to the loss in firm value that results from individuals within the firm following their own interests rather than the collective interest, the costs of monitoring individuals to minimize the distortions that result, and the costs of any other mechanisms to control the distortions (Jensen and Meckling 1976). We show that asset securitization can enhance each of the five main mechanisms that are used to limit agency costs.²¹

3.1. Securitization and Direct Monitoring

The efficiency of monitoring by residual claimants²² can be enhanced by asset securitization. Monitoring refers to the observation of inputs of the manager in combination with inferences about managerial inputs drawn by shareholders (more realistically, by their representatives on

20. This condition is necessary for the four hidden-action theories outlined in this section, but not for the free cash flow argument (another hidden-action theory) discussed in Section 4.

21. Four of the mechanisms—monitoring, managerial reputation, takeovers, and explicit incentive pay mechanisms—are discussed in this section. The role of asset securitization in enhancing the fifth mechanism, limitations on managerial free cash flow, is different and particularly important. This role is discussed in Section 4.

22. See Alchian and Demsetz (1972), who proposed that allocating a residual claim to owners of a firm provides owners with incentives to monitor agents.

the board of directors) from the output performance of the corporation.²³ Monitoring involves the interaction of signals about output and observation of inputs. Asset securitization can enhance monitoring efficiency by reducing the noise in the relationship between firm performance and managerial performance. Consider a corporation whose assets generate two separate cash flows, A and B. Suppose that there is a difference in the extent to which managerial effort affects the two cash flows; for simplicity, cash flow A is sensitive to managerial effort and cash flow B is unaffected by changes in effort. Asset securitization of the cash flows B that involves a complete transfer of those cash flows would leave within the firm only the cash flows that are sensitive to managerial effort.²⁴ The observation by monitors of the information provided by total cash flows, and by the capital market values of the total cash flows, would then provide a more informative, or more focused, signal of managerial effort.

If monitoring by residual claimants were dependent solely on accounting data, and if the values of the two cash flows could be completely disentangled in accounting data, then asset securitization would not enhance the value of the information available to monitors. But an important mechanism that existing shareholders and their representatives on the board of directors rely on in assessing managerial performance is the valuation of firm assets by the capital market (Easterbrook 1984). Accounting data on cash flows cannot in themselves provide information about changes in the present value of future cash flows, and the impact of managerial decisions on this present value are more important to shareholders than the impact on current cash flows. In an efficient capital market, market valuation of managerial performance is not just a signal but an end in itself for residual claimants (compare Fama 1970). A more focused, less noisy link between managerial effort and capital market valuation not only provides higher-quality information to monitors but

23. Alchian and Demsetz (1972, p. 173) elaborate: "We use the term monitor to connote several activities in addition to its disciplinary connotation. It connotes measuring output performance, apportioning rewards, observing the input behavior of inputs as a means of detecting or estimating their marginal productivity and giving assignments or instructions in what to do and how to do it. (It also includes . . . authority to terminate or revise contracts.)"

24. The cash generated by the sale of the assets to the SPV, if not distributed to shareholders, may be invested to generate new cash flows if there are investment opportunities with positive net present value. Investments with positive net present value would generally be financed with external capital were it not for securitization, so the effect of securitization under the assumptions of our example is to eliminate noise from the relationship between managerial input and firm profits.

also enhances the incentives to monitor. This further improves managerial incentives and reduces agency costs.

3.2. Securitization and Managerial Reputation as a Disciplining Device

Fama (1980) emphasized as the main source of discipline on management the impact of corporate performance on managers' reputation in the managerial labor market. Holmström (1982a, 1982b), in what has become the standard reference on the incentive impact of career concerns, formalized the reputational mechanism in a dynamic model. In Holmström's model, a firm's output in each period depends on the manager's inherent talent, the manager's effort, and other random factors. Incompleteness in contracting is taken to the extreme in this model. Because effort, talent, and random factors cannot be observed, these variables cannot enter a labor contract; the manager works in each period for a wage, which a competitive labor market determines at the beginning of each period.

If workers' inherent talents were observable but effort remained unobservable, then there would be no rational basis for a manager to establish a reputation as hard working, and career concerns would not mitigate agency costs.²⁵ Holmström's model captures a key, but subtle, incentive to establish a reputation in labor markets. Both the manager's effort and talent affect firm profit, but the two effects cannot be disentangled in observation by future labor demanders. A manager takes additional effort not to gain a reputation as one who works hard but to affect future labor market perception of his or her likely inherent quality. The incentive to work harder in this model arises because greater output in the current period will increase the future labor market's perception of the manager's inherent talent—and therefore increase the wage rate offered the manager.²⁶

Two factors in Holmström's model limit the ability of reputation to resolve agency problems. First, the manager is rewarded by the market

25. With a finite career, managers would not have the incentive to work hard in the last year of their careers. Knowing that the market knows this, and therefore realizing that they will not be rewarded for extra effort in the penultimate year of their careers through a higher ultimate wage, managers will not work hard in the penultimate year of their careers either, and so on. Any supposed incentive for reputation would "unravel" from the last period in this way, no matter how long the career.

26. We have categorized Holmström's model as a hidden-action model, but it involves a mixture of hidden action and hidden information. Indeed, hidden information about talent (hidden characteristics) mitigates the hidden-action problem in the model.

in the future for additional effort undertaken today, so the reward is discounted compared to a hypothetical complete labor contract in which the reward is immediate. Second, as the manager works harder, producing more profit, he or she realizes that the future labor market will, with increasing likelihood, attribute the history of high profits to a lucky draw on random factors. The gain from marginal effort is less than fully appreciated by the future labor market because of the noise of random factors (Holmström 1982a, 1982b).²⁷ Noise is responsible for this limitation on career concerns as a resolution of agency problems because it is the presence of noise that leads future labor markets to attribute higher output to a lucky draw. The greater the noise, the greater the limitation.

As in our discussion of monitoring, securitization of assets that are uncertain but insensitive to managerial input reduces noise in the relationship between profit and managerial input decisions such as effort. The prediction is that this should strengthen the disciplining force of reputation on managerial effort.²⁸

Consider the application of the agency problem to the securitization

27. Underlying this effect are assumptions on the distributions of the random variables in the model. For most conventional distributions, noise does diminish incentives. Dewatripont, Jewitt, and Tirole (1999) examine the robustness of Holmström's analysis in an important paper.

28. This footnote outlines a formalization of this argument, based on a two-period version of the Holmström (1982a, 1982b) model. See also Dewatripont, Jewitt, and Tirole (1999). In each of the two periods, the profits (y) earned by a manager on behalf of shareholders depend on the sum of talent (θ), current effort (a), and noise (ε): $y_t = \theta_t + a_t + \varepsilon_t$ ($t = 1, 2$). The terms ε_t are independent between periods and normally distributed with mean zero and variance σ^2 ; the distribution of talent is normally distributed with mean θ_T and variance σ_T^2 . The manager faces a competitive market in each period for his or her input and discounts the second-period wage at a rate δ . Talent is unknown to everybody, and effort is known only to the manager. The cost of effort, $c(a)$, is convex. Profits are observed by everyone at the end of a period but are not describable *ex ante*. As a result, the manager is paid a wage w_1 in the first period. The manager has no incentive to exert any effort in the second period; hence a_2 is zero. The wage in the second period, w_2 , is therefore the market's expectation of the manager's talent, conditional on the history of output, y_1 . An equilibrium effort level in the first period is a level a^* such that if the market anticipates a^* from the manager, then it is in fact in the manager's interest to exert a^* . Given that the market rationally anticipates $a_2 = 0$ in the second period, the second-period wage will be the manager's expected talent level conditional on a^* and y_1 : $E(\theta|y_1, a^*)$. The manager chooses a to maximize $E[E(\theta|y_1, a^*)] - c(a)$, where the inner expectation is with respect to talent and the outer expectation is with respect to performance. The first-order condition characterizing the equilibrium effort level is $c'(a^*) = \delta\sigma_T^2/(\sigma_T^2 + \sigma^2)$ (Dewatripont, Jewitt, and Tirole 1999). Comparative statics on this equation show that a^* is decreasing in σ^2 . Thus, a reduction in noise, for example through securitizing an asset with a return that is uncertain but insensitive to effort, will improve effort.

decision itself. Do managers, to the extent that they have superior information on the efficiency benefits of securitization (in reducing agency costs), have efficient incentives to undertake securitization? Must they be masochistic to enhance discipline of themselves?²⁹ In the monitoring theory, one might argue that managers would undertake a less-than-optimal degree of securitization because once their contracts are set, they benefit from a reduction in monitoring. Under the reputation model, however, the incentives for eliminating noise are in the right direction. The reputation forces rely on a carrot—the greater reward in future markets for additional effort today—rather than the stick of direct monitoring and interference by residual claimants. The manager will volunteer to accept carrots but discourage the addition of sticks to the incentive environment. An additional managerial incentive for securitization, to anticipate the theory developed in Section 5, flows from the hidden-information (hidden-characteristics) aspect of Holmstrom's model. Higher-quality managers will want to be more accurately monitored in the first period of the model because of the greater likelihood that these managers will be highly rewarded by accurate monitoring. Knowing this, investors will attach higher value to firms with a greater degree of securitization because the degree of securitization will signal to them that management is of higher quality and therefore that the assets of the firm have higher value.

3.3. Securitization and the Market for Corporate Control

The theory that asset securitization enhances firm value by reducing noise about managerial performance in the contexts of monitoring and reputation extends to a third source of discipline on managers: the market for corporate control (Manne 1965; Marris 1964). More accurate determination of the quality of existing management is possible the greater the correlation between the firm's value and managerial effort. Noise limits the discipline that the market for corporate control imposes on agency problems for the same reason that it limits the discipline imposed

29. A stark example illustrates the point that agents may invite discipline. John McManus (1975) cites Steven Cheung for the following anecdote: on the Yangtze River in China, there was a stretch of fast water over which boats were pulled upstream by workers prodded by an overseer using a whip. On observing this brutality, an American woman objected vigorously, but was told: "Those men own the right to draw boats over this stretch of water and they have hired the overseer and given him his duties." Personal trainers provide a more modern example, although even the most dedicated trainees rarely supply the whip.

by reputational concerns: the more noise there is, the more poor performance by a bad manager is likely to be (mistakenly) attributed by potential acquirers to poor asset quality or a bad temporary shock. Noise therefore dampens the incentive on the part of a manager to increase effort so as to reduce the probability of being taken over. Again, securitization of assets that are insensitive to managerial effort or discretion leaves this agency cost control mechanism more focused on the assets that matter.

3.4. Securitization and Explicit Incentive Pay

Finally, Jensen and Meckling (1976) and the more formal principal-agent literature emphasize the role that managerial incentive payment schemes play in providing incentives by allocating managers a share of residual claim.³⁰ If a manager/agent could be allocated the entire residual claim (purchasing the firm from its owner), the manager would capture the entire marginal benefits and costs of any decision, and the incentive problem would be solved, even absent the three incentive devices canvassed above. One of the main reasons why such residual claimancy contracts are not observed is risk aversion on the part of the agent. While allocating the full residual claim to the agent has desirable incentive properties, the principal may better be able to bear the risk associated with the residual claim (Shavell 1979; Holmström 1979).³¹ Optimal incentive contracts, expressed as sharing rules over profit in the formal literature, are in practice implemented with packages of equity and stock options. The implementation of incentive schemes via market-value-based securities is critical because the market value is not only the best summary of the value of managerial decisions: it is the bottom line for owners.

Consider explicit incentive payment schemes in the case of the risk-averse agent. Consider, as in our earlier discussions, a corporation with assets that generate cash flow streams A and B, in which only the first cash flow, A, is sensitive to managerial decision making. Cash flow B is

30. Prominent papers in the formal principal-agent literature include Ross (1973), Shavell (1979), Holmström (1979), and Sappington (1983). Sappington (1991) provides an excellent overview of the vast principal-agent literature.

31. In addition to agent risk aversion, the principal-agent literature develops three other reasons why the agent may not realize the full residual claim: (1) wealth constraints (Sappington 1983), (2) team production with many agents (Holmstrom 1982a, 1982b; Demski and Sappington 1984), and (3) the fact that residual profits themselves may be unobservable and therefore noncontractable (Holmström and Milgrom 1991).

uncertain but is independent of managerial decisions. Under these circumstances, an efficient incentive payment scheme would, if possible, allow the residual claim of the agent to be focused on cash flow A. Each percent of the residual claim of returns to asset B allocated to the manager allocates risk to the manager—instead of leaving it with shareholders where it is more easily diversified—with no benefits in greater incentives for the manager. Because managerial incentive contracts are implemented through market securities, securitization of the asset B, and its removal from the assets on which security holders have a claim, allows precisely the required focus. To the extent that the returns on asset B are uncertain, securitization narrows the manager's claim to cash flows that matter. The optimal contract becomes more high powered when it can be narrowly focused, thus enhancing incentives.³²

In sum, the securitization of assets whose values are uncertain but relatively insensitive to managerial effort or discretion can reduce agency costs by eliminating noise in the relationship between managerial effort and firm performance in the capital market. While the theories in this section depend on securitization to focus the value of the firm better on managerial performance by reducing exogenous risks, we show in Section 4 that securitization of even riskless cash flows can reduce agency costs.

4. ASSET SECURITIZATION AND FREE CASH FLOW

The agency costs of free cash flow (Jensen 1986) help to explain asset securitization.³³ Prior to an asset securitization transaction, the would-be collateral for the securities to be issued by the SPV consists of a cash inflow over time.³⁴ Management's use of the cash will be costly to monitor given that it will arrive in a series of relatively small amounts. By

32. This proposition is formalized most easily using a one-task version of the quadratic-normal principal-agent model of Holmström and Milgrom (1991). In that model, the cost of effort is assumed to be a quadratic function, the agent exhibits constant absolute risk aversion, and the profits are linear in effort and a noise term. The optimal contract takes the form of offering the agent a share of profits $\alpha = 1/(1 + r\sigma^2c)$, where r is the measure of the agent's absolute risk aversion, σ^2 is the variance of noise, and c is the (constant) second derivative of the cost of effort. Thus, a decrease in noise results in higher α , that is, a more high powered contract, and it raises the joint payoff to the principal and agent.

33. Free cash flow refers to the liquid assets belonging to a firm that exceed the requirements of the firm for investment in positive-net-present-value projects.

34. The cash flow explanation of asset securitization is more persuasive the longer the term of the receivables.

securitizing the assets, the firm sells the future cash flows to a third party, the SPV (which has already committed to pay the cash to investors), thus ensuring that the cash is not wasted by management.³⁵ Committing the future cash intake to investors in this way reduces the agency costs of free cash flow.

Limiting future agency costs through such a commitment, however, is only half the story. Asset securitization protects future cash flows from mismanagement but also gives rise to a relatively large cash infusion for the originator. For asset securitization to control the agency costs of free cash, there must be some assurance that the proceeds from the securitization are not misspent. As background, consider this issue in the context of conventional straight-debt issuance. Here three controls limit managerial discretion over the cash infusion: lenders investigate the proposed use of the funds; the funds realized from selling debt may be part of a transaction, such as a leveraged buyout, that commits the firm to disgorge cash to investors; and large infusions of cash are easier to monitor than small inflows over time because of economies of scale in monitoring.

The first of these controls on the use of the proceeds from an ordinary sale of debt relies on external investors investigating the firm before lending to it. There is no direct analog in the case of asset securitization since investors in the SPV's securities have little incentive to analyze how the proceeds from the deal are spent. Indeed, "securitization provides benefits to originators by divorcing the receivables from the originator" (Ngo 2002, p. 155). The SPV's investors will not examine the originator to ensure that the proceeds from the deal are to be used wisely.

The other two mechanisms by which debt limits agency costs, however, apply to asset securitization. Securitizing assets results in the exchange of small, difficult-to-monitor inflows of cash over time for a large, one-shot, and relatively easy to monitor cash infusion. Monitors, instead of having to examine the plans for cash collected each year, can learn of managerial intentions for the cash in one annual capital budget. Monitoring of the use of this single cash infusion will be more effective

35. Indeed, to better ensure the characterization of the transaction as involving a true sale, the SPV will often have the authority to collect the receivables in question. Even if the originator collects them, this is subject to the SPV's discretion, and the originator will often take steps to partition the collected funds from the corporation's cash. Thus, the future cash inflows are not subject to managerial control but instead are committed to investors in the SPV's securities, just as future cash flows in a leveraged buyout are earmarked for lenders.

and less costly than that of future inflows. The substitution of future cash flows for a one-time cash payment thus adds value to the firm by facilitating monitoring and limiting the agency costs associated with that cash. In Section 3 we discussed the role of asset securitization in focusing or concentrating the residual claim allocated to managers on cash flows over which the manager has relatively significant influence. The economies of scale inherent in monitoring provide an explanation of asset securitization as allowing a focus or concentration in terms of cash flows that are vulnerable to the agency costs associated with free cash flow.

Even if there are no positive-net-present-value investments for the firm, asset securitization may be useful. Managers—again, as a result of monitoring—may wish to commit to disgorge future cash flows, and thus commit not to waste free cash flow, by securitizing assets and promising to pay out the proceeds to investors.³⁶ Adding empirical support to this possibility, LoPucki (1999) reports that it is common for firms to commit to distributing the cash realized from asset securitization to security holders. Firms in securitizations frequently use the funds to refinance. Given the significant transaction costs associated with securitization, it is a puzzle why firms would sell future claims to pay out cash now to investors. Particularly where the proceeds are used to pay dividends to equity, which otherwise would not carry an obligation to make cash payments in the future, the agency costs of free cash flow help to solve this puzzle.³⁷

5. HIDDEN-INFORMATION EXPLANATIONS OF SECURITIZATION

5.1. Asymmetric Information on General Assets between Insiders and Outsiders

As Hill (1996) has suggested, asset securitization may be a means of avoiding a lemons market premium on general security issues. Securitized assets are often cash flows such as receivables with risk that is more easily assessed than the risk of the general assets of the firm, such as

36. Managers may face pressure to make this commitment because of monitors such as large shareholders or boards of directors, incentive pay, or the market for corporate control.

37. An explanation of the use of asset securitization to pay debt holders, as Steven Schwarcz pointed out to us, is that many indentures prohibit the prepayment of covered debt from lower-cost debt. Securitization proceeds often can be used for this purpose because securitization is not debt.

physical assets or intangibles such as good will or growth opportunities within a market. Informational asymmetries may therefore arise regarding the returns on the general assets of the firm when investors are equally informed about the prospective returns on assets such as receivables. This means that issuing claims on the receivables avoids the lemons problem that would be associated with an issue of claims on general assets (Akerlof 1970; Myers and Majluf 1984).

To elaborate, we continue to describe the receivables as B assets and the rest of the firm's assets as A assets. Assume that the value of B is known across investors, or assume that the stamp of approval provided by a bond-rating agency can address asymmetric information about B, while the value of A is known only by insiders. When a firm issues equity or any other risky security on a firm comprising A and B, it is offering to share its residual returns in A with outside investors. Outside investors may rationally take the willingness of insiders to share in returns in A as an indication that these returns are likely to be low: given market prices, issuing risky securities in A and B jointly is worthwhile only for those firms with lower-quality assets since the cost of sharing in future returns is lower for these firms (Myers and Majluf 1984). Accordingly, investors discount the issued security in response to the issue of a risky security by a firm. The undervaluation of new securities that a firm faces when it reveals its willingness to share in its future profit can be referred to as a lemons market premium. This premium is avoided through securitization of assets, B assets in our example, that are not subject to asymmetric information.

A second benefit of securitizing the B assets, in addition to the avoidance of the lemons market premium on the capital raised by issuing general claims to A and B, is a positive impact on the price of all outstanding shares of the corporation. The essence of securitization under the informational assumptions of this theory is its use by insiders as a means of retaining ownership of a larger share of the A assets about which they are privately informed. Outside investors recognize that the insiders of high-quality firms are more willing than insiders of low-quality firms to incur the relatively high transactions costs of securitization in exchange for the benefit of retaining ownership of the A assets. Outside investors therefore rationally attach a higher value to the shares of firms that have engaged in asset securitization than those who do not. We refer to this as a "signaling benefit," as distinct from the lemons market avoidance benefit. In the Appendix, we provide a formal model of the benefits of securitization under asymmetric information about

general asset values. In this model, the lemons market avoidance benefit and the signaling benefit appear as separate terms in an expression for the overall benefits of securitization.

Some commentators describe asset securitization as an instrument for accessing capital markets by small firms or risky firms that would otherwise have no access to a wide set of capital suppliers. This is not in itself an economic explanation of asset securitization because it leaves unanswered the question of why firms would have access to capital markets through securitization but not generally. The lemons market avoidance and signaling theories provide an answer.

5.2. Asymmetric Information on Securitized Assets between Insiders and Outsiders

A second hidden-information explanation for securitized assets is the possibility of informational asymmetries that differ from those just considered in two respects: the asymmetry is not just between managers or insiders and outside investors but among different classes of outside investors, and the asymmetry is not about the returns on general assets of the firm but about the securitized assets. Virtually all investors specialize to some degree in information about specific securities.³⁸ Structured finance is sometimes associated with specialization by financial intermediaries in the valuation of the particular cash flows being offered by the originator. This is a phenomenon more often associated with factoring, which is closely related to asset securitization³⁹ but has explanatory power for asset securitization as well: asset securitization in some instances involves the private placement of the SPV securities to investors who are sufficiently well informed about the value of the securities that the services of rating agencies are not purchased (Schwarcz 1994, pp. 138–39).⁴⁰

38. This is evidenced by the well-documented “home bias” in portfolio choice, even regionally within a country.

39. As a general matter, our asymmetric-information explanations of why firms seek to sell their receivables in a securitization transaction could also explain why firms seek to sell receivables in a factoring transaction. The choice between securitization and factoring is likely dictated by supply-side considerations, such as the ability of the acquirer of the receivables to diversify the risk of the purchase. See Schwarcz (1994, pp. 144–46) for a further discussion of the distinction between securitization and factoring.

40. Also see Schwarcz (2002, pp. 2–17): “In these structures, sophisticated investors provide the equivalent of ‘credit enhancement’ to the SPV by purchasing subordinated securities. The originator thereby allocates certain repayment risks to these investors, who are in the business of assessing and accepting such risks and who consequently are willing to accept a higher level of risk than the average investor.”

Similar in its effect to the sale of assets to specialized investors is the sale of assets to the general public after their quality has been certified by specialists. Even if most outside investors cannot value accurately the securitized assets, rating agencies may be able to act as intermediaries that rate asset-backed securities and thus mitigate the informational asymmetries between insiders and outsiders. Bond-rating agencies may not provide the most accurate classification—that is, the classification may not be based on the full set of information held by insiders—but such classification does help convey information to outside investors.

We offer a formal model in the Appendix that establishes the following. When firms have the opportunity to sell assets to specialized investors or, through securitization, to have the assets certified by rating agencies prior to a sale to the public, then the general market will take any decision not to securitize as a signal that the assets are of relatively low quality. At a given price in the general equity market, for assets of given observable characteristics, only the higher-quality firms will incur the relatively high transaction costs of securitization to realize a sale at the asset's true price. Investors in the general market are aware of these incentives and therefore take the decision not to securitize as a signal of the poor quality of assets.⁴¹ Like any signaling explanation, this hinges on a negative relationship between the underlying, unobservable quality of the agents doing the signaling and the net cost of signaling.⁴² To understand the nature of this pivotal relationship in our explanation of securitization as a signal, consider (in the context of this theory) the assets over which informational asymmetries exist among outsider investors as “securitizable assets.” Higher-quality firms have higher-quality securitizable assets. Assume that these assets are all correlated in quality and that when a firm chooses to securitize, outsiders can observe the proportion of securitizable assets that is securitized but cannot observe

41. The impact on equity holders of an undervaluation by the market of the current equity price has two components, analogous to the previous model in Section 5.1: (1) the additional shares that must be offered to raise a given amount of financing and (2) the negative effect on shareholders' wealth that is manifest in the event of liquidity trading in the future. Note that the second benefit, such as the signaling benefit in the model of Section 5.1, is realized even for securitization transactions that involve a pure reallocation of ownership of equity (transactions in which the cash raised is simply distributed to shareholders or used to retire debt), rather than financing of investment.

42. In Michael Spence's (1973) original signaling model, education is a signal of workers' ability because a higher-quality worker incurs a lower cost of attaining a higher level of education. In the asymmetric-information literature, the critical relationship is termed the “single-crossing property.”

the terms on which the securitization occurred.⁴³ In the signaling equilibrium, each firm trades off at the margin the higher transactions cost of securitization with two benefits of additional securitization: (1) the valuation of the additional securitized assets at their true value rather than at the average value attached by general investors to assets that are securitizable but nonsecuritized and (2) the more favorable expectations of general investors about the value of the firm's remaining securitizable assets. The first of these benefits is always higher for higher-quality firms. This explains the negative relationship between the quality of firms and the net cost of signaling that is pivotal in this theory of why securitization can be a signal of quality.

5.3. The Structure of Hidden-Information Theories of Asset Securitization

The hidden-information explanations of asset securitization vary in their assumptions about which assets are characterized by informational asymmetries and which investors are differently informed about the asset returns, but they all are driven by the same economic force: the tendency of security markets to allocate claims to returns to those investors who are best informed about the returns. Where the asymmetry in information differs between two classes of assets owned in common by a corporation, as it does in our hidden-information theories, then the market forces that match claims to assets with best-informed investors require that the ownership of the two classes of assets be split.⁴⁴ Separate ownership, which can be achieved by securitization, is necessary for markets to achieve different patterns of the allocation between the two sets of claims to asset returns. In short, asset securitization is explained within a hidden-information framework by the asymmetry across assets of the nature and extent of informational asymmetries—the asymmetry in asymmetries.

The hidden-information structure provides a more general theory of asset securitization, or the structure of asset ownership across investors,

43. If outsiders could observe the terms of the sale of the securitizable assets to expert investors (for example, the price per dollar of receivables), and if securitized assets were perfectly correlated with one another, inexpert general investors would be able to infer directly the securitizable assets' quality from a sale of any proportion of securitizable assets. Asset securitization of any subset of securitizable assets in such a case would serve as a certification of the quality of the securitizable assets; no signal would be necessary.

44. This is true in other markets as well. In Akerlof's (1970) analysis of the unraveling of the used car market, for example, the asset, the car, is allocated to the party with the best information about its value, its current owner.

than the examples offered here. The nature of informational asymmetries may vary across assets in ways that we have not considered. For example, if a firm or entrepreneur wishes to sell a bundle of assets that are all subject to asymmetric information (unlike the assumptions of our three models) but the better-informed investors are different for each asset, then the entrepreneur can achieve a higher expected price for the assets by splitting them and selling each separately.⁴⁵ Any asymmetry across assets in the nature of informational asymmetry on the asset returns leads to an incentive to split the ownership of the assets, which can be achieved via asset securitization.

6. THE RELATIONSHIP BETWEEN SECURED DEBT AND ASSET SECURITIZATION

There are obvious similarities between secured debt and asset securitization. Fundamentally, both involve the sale of debt that is backed by collateral. But there are also important differences in the two financing techniques. Most fundamentally, securitization involves a true sale of the collateral, while secured debt does not. In this section, we will contrast asset securitization with secured debt. This exercise not only situates our analysis within the broader literature concerning the use of secured debt (for a general review of the secured financing literature, see Scott [1997]) but further illuminates our explanations of asset securitization. It shows that our theories are about asset securitization, not secured debt.

6.1. The True-Sale Requirement and Asset Partitioning

In a securitization transaction, the originator transfers its assets in a true sale, while in a secured loan deal, the borrower simply offers assets as collateral. The distinction between a sale and a loan, while critical to our theories, is far from crystal clear in practice. In particular, courts have taken different positions about the extent to which the risks of loss and gain associated with a financial asset must be transferred to the putative buyer for a sale to take place (Pantaleo et al. 1996). Some cases have determined whether the transaction was a sale by asking if the buyer (lender) has any recourse against the seller (borrower) if the asset does not pay off. (See the discussion of, for example, *In re Executive Growth Investments, Inc.* [40 B.R. 417 (Bankr. C.D. Cal. 1984)] in

45. This can be proved by representing the market mechanism as a (common-value) auction with privately informed purchasers.

Pantaleo et al. [1996, pp. 175–77].) The mainstream position, however, would allow some recourse from buyer to seller to make up shortfalls, and some access to a surplus for the seller, within a true-sale transaction. In *Major's Furniture Mart, Inc. v. Castle Credit Corp.* (602 F.2d 538 [3d Cir. 1979]), for example, the court stated that “[t]he question for the court then is whether the Nature of the recourse, and the true nature of the transaction, are such that the legal rights and economic consequences of the agreement bear a greater similarity to a financing transaction or to a sale” (p. 544).

In part because of the uncertainty about courts' interpretations of what a true sale will be⁴⁶ and the importance of this question for securitization deals, the industry lobbied for a section in the Bankruptcy Act that would have clarified that assets subject to a securitization transaction are not part of the debtor's estate regardless of the extent of recourse (see, for example, Lipson 2002). This reform to bankruptcy law was not adopted, but several states have abandoned the substance-over-form approach of cases such as *Major's Furniture Mart* to true sales and instead take a form-over-substance approach. For example, Texas adopted a nonuniform version of section 9-109 of revised Article 9 that essentially provides that a true sale of financial assets arises as a matter of law where the parties themselves characterize the transaction as a true sale (Carbino and Schorling 2003, p. 383, n. 59). To similar effect is the Delaware Asset-Backed Securities Facilitation Act, which provides that assets subject to a securitization transaction are no longer the property of the originator (Delaware Code Annotated, title 6, chap. 27A [Supp. 2002]; see Carbino and Schorling 2003). These reforms would allow parties to allocate risks in whatever manner they choose while assuring themselves of a true-sale characterization under state law.

It is not yet clear, however, how effective these state statutes will be in influencing bankruptcy proceedings. A key question is the extent to which federal bankruptcy proceedings will turn on state law definitions. While there is authority supporting the notion that federal bankruptcy proceedings should respect state law sales definitions that affect third parties (Pantaleo et al. 1996; Plank 1996), courts may conclude that federal bankruptcy law preempts these state law reforms (see Carbino and Schorling [2003, pp. 384–85], who discuss whether bankruptcy law

46. Particularly the fallout from *LTV Steel*, in which the court granted a debtor access to the assets subject to a securitization deal until a full evidentiary hearing could determine the true-sale characterization question.

preempts state law). A recent Fifth Circuit case entirely ignored the Texas approach to true sales found in Article 9; instead it looked to the substance of a transfer of receivables (not a securitization) to conclude that it was a loan, not a sale, for the purposes of a federal statute.⁴⁷

Our theories of securitization depend, to a greater or lesser extent, on originators truly transferring some risk to the SPV and its security holders. Given that federal bankruptcy reform has stalled, that most states have not adopted Texas-like reforms, and that the status of these reforms in bankruptcy is not clear, parties are likely to continue to take a prudent approach that limits the retention of risk by originators in securitization deals. We note, however, that while our theories of securitization depend on at least some partitioning of risk, we do not offer a normative analysis of reforms of true-sale standards to accommodate deals that do not transfer much or any risk. The central normative implication of our theories is minimal and uncontroversial: the law should not prevent the parties from transferring risk to security holders in a securitization deal. This does not imply that the law should compel the parties to transfer risk. We also do not view the evident push for reform by the industry as a strong challenge to our positive description of the motivations for securitization, even though the reforms would permit securitization deals that do not transfer risk, while our theories require some transference of risk. Because of the cost of uncertainty that exists under current law, which manifests itself in a number of ways, including significant legal fees for true-sale opinions, private-sector support for reform is not necessarily evidence of a desire of the parties in all, or even most, securitization transactions to leave significant risk with the originator. Rather, the impetus for reform could originate with parties simply seeking an easily applicable rule that would encompass the present practice of originators retaining some limited risk. Proposed reforms would not prevent parties from allocating risks to both buyer and seller but would add value by removing costly doubt about the true-sale character of the deal.

We turn now to a fuller explanation of how the true, although possibly partial, partitioning of risk associated with securitizations but not secured loans affects our analysis. As we discuss, complete partitioning

47. *Reaves Brokerage Co. Inc. v. Sunbelt Fruit and Vegetable Co. Inc.* (336 F.3d 410 [5th Cir. 2003]), where the transfer of accounts receivable was found to be a loan, not a true sale, for the purposes of the Perishable Agricultural Commodities Act, notwithstanding parties' description of deal as a sale. See the discussion in Warren and Westbrook (2004).

of risk in a securitization deal is not necessary for our theories to hold, although some degree of partitioning is.

6.2. Focus and the Principal-Agent Problem

Asset securitization, as discussed, can strengthen the relationship between firm value and managerial performance. Such increased focus improves the efficacy of direct monitoring of managers, managerial labor markets, the market for corporate control, and incentive contracting. This explanation does not apply to secured debt generally.⁴⁸ The key difference is that asset securitization insulates the originator's equity from fluctuations in the value of the "collateral" (either the secured asset in a secured loan or the receivables in a securitization transaction) to a greater extent than secured debt. As we have discussed, to meet the standard true-sale requirement, parties must ensure that the originator retains much of the risk associated with the assets being securitized. While there is scope for the originator to retain some risk under the traditional true-sale standard, and there would be even greater scope under some recent proposed and actual reforms, originators in general transfer at least some of the risk of the asset in a securitization transaction. This helps to insulate the originator's equity from shocks due to risky receivables. Generally speaking, the SPV's securities are much more sensitive to fluctuations in the value of receivables than are the originator's securities. More specifically, if the receivables fall in value, then the originator will typically not be called on to make up a significant portion of the shortfall (Schwarcz 1994, p. 149, n. 55). In some transactions, to be sure, the originator may hold a subordinated tranche of securities or may offer limited guarantees and thus commit to make up some of the shortfall. But even in these cases, the risk to the originator is lower following the securitization. In addition, often the subordinated tranche will be sold to the public. And in many instances, third parties such as insurers commit to making up any shortfall in the receivables.

48. However, the focus explanation could apply to other choices about the structure of the firm's securities. Tightening the link between managerial performance and the value of equity has been cited as motivation for the decision to spin off assets as separate corporations (see, for example, Schipper and Smith 1986). Indeed, it is possible that the rise of securitization could be linked to corporate tax reforms that presented obstacles to spin-offs (see Stephan 1990). "Tracking stock," or "targeted stock," which gives its owner an interest in the earnings of one division of a diversified firm, has also been explained as enhancing the incentives of managers because of greater focus of stock value on their performance. See, for example, D'Souza and Jacob (2000).

Thus, the originator is insulated from some downside risk to which retaining the receivables would expose it.

On the other hand, if the receivables increase in value, then the SPV will be able to meet its debt obligations while earning a surplus. In some cases, the originator will have access to these earnings, perhaps through a two-tiered structure involving the sale of the assets first to the originator's subsidiary and then to an SPV (Schwarcz 1993, p. 21). Alternatively, the surplus may accrue to a subordinated tranche of securities owned by the originator. Having access to the surplus exposes the originator to some risk. But a securitization transaction can be structured such that the originator does not have recourse to a surplus, such as when the riskiest (lowest-priority) tranche is sold to a third party. This would insulate the manager of the originator from upside risk as well.

Thus, asset securitization can limit upside and downside risk from the receivables for the originator. The same considerations do not arise with secured debt. Suppose receivables have an expected value of \$10 and a firm issues debt secured by these receivables. If the receivables turn out to be worth less than \$10, the firm nevertheless continues to owe \$10.⁴⁹ The value of equity will fall with the value of the receivables (see Schwarcz [2004], who noted that secured creditors have priority over the full amount of debt even if the subject of security interest is of insufficient value to repay the debt). Downside risk to equity from secured debt is limited only when bankruptcy arises, since creditors will seize the receivables and will bear any losses from a loss in their value. Similarly, if the receivables appreciate in value, this will accrue to equity. The debt of \$10 can be paid, and the surplus will increase share value. The manager is thus exposed to upside, firm-specific risk. Securing debt does not serve to partition off risk in the same way as asset securitization. While there is scope for variation in the degree of risk that the originator assumes in a securitization deal, it is clear that asset securitization can, and generally does, partition risk in a way that secured debt does not. Asset securitization is thus superior to secured debt in increasing focus to address the principal-agent problem within the firm.⁵⁰

49. Unless there is nonrecourse secured debt. Our explanations of asset securitization may also have some force for nonrecourse secured debt.

50. Several commentators have suggested that secured debt addresses potential inefficiencies in the monitoring of debtors by creditors. For example, Levmore (1982) and Triantis (1992, p. 245) each outline how asset-specific monitoring is encouraged by granting a security interest: the secured lender now has an incentive to monitor the use of that asset that others do not, which resolves the problems of free riding and competitive monitor-

6.3. Free Cash Flow, Secured Debt, and Asset Securitization

We outlined in Section 4 the role that asset securitization plays in limiting management's access to cash, which in turn may limit managerial misbehavior with respect to that cash. Secured debt may also play a cash management role, but again asset securitization has distinct advantages. Triantis (1994) identifies two key sources of the power of security interests to limit waste arising from managerial access to cash. First, secured lenders have a contingent property right in the secured asset. This makes it difficult for borrowers to convert an asset into cash. Second, secured lenders have priority over other lenders. Such priority makes it difficult for borrowers to continue to borrow to have access to cash. Both the property and priority aspects of secured debt limit the agency costs of free cash flow.

A contingent property interest in cash-based collateral held by ordinary secured lenders would not give rise to the same commitment to manage cash properly as securitization of that collateral. Security in receivables, for example, generally does not limit managerial access to cash realized from those receivables. Only when the firm defaults on its debt does the creditor have the right to seize the proceeds from receivables; until then, the cash is freely available to managers, and lenders' contingent property interest is insufficient to intervene. Managers may misuse the cash in the interim. Securitizing the cash-based assets, on the other hand, removes the cash from managerial discretion and thus is a stronger form of commitment against agency costs via cash management. It is true that some securitization deals grant the originator access to surplus from the receivables, so it is possible that the originator will receive some cash in the future; again, the partitioning of assets in a securitization deal is not airtight. But the surplus will generally be a small fraction of the value of the receivables.

Asset securitization is also more effective in addressing the agency costs of free cash in which a contingent property interest in noncash collateral, which interest would hinder the transformation of the collateral into cash, would be impractical. Security interests will not restrict

ing. The secured lender will monitor the collateral, while other creditors will monitor the firm's other assets. Conversely, Jackson and Kronman (1979) suggest that where a secured lender is overcollateralized, the secured creditor will not monitor so that other creditors will not attempt to free ride on its efforts. Scott (1986) points out that specialization by creditors in monitoring particular types of assets will also provide efficiencies. These explanations of secured debt are distinct from our focus explanations of asset securitization, which rely on the partitioning of risk off from the firm.

the sale of collateral where the debtor's business turns on the periodic sale of the collateral. As Triantis (1994, p. 2160) states, "Although the sale of inventory collateral for cash raises the same concern about managerial discretion over cash proceeds, this sale is fundamentally necessary to enable the debtor to pay the principal and interest owed to its creditors. Therefore, the sale of inventory may proceed without impediment." This implies that some assets may be freely converted to cash notwithstanding security interests. Some asset securitization transactions seem to address the impracticality of restricting the sale of collateral and thus the failure of secured debt alone to prevent the conversion of assets into cash. Securitization has become an important financing tool for resource companies, such as owners of timber and oil and gas assets (Harrell, Rice, and Shearer 1997). Instead of relying on a security interest in timber or other resources, which would not restrict the conversion of these assets into cash because of the nature of the business, asset securitization commits the originator to use the cash inflows from the resources in a particular, nonproblematic way, that is, to disgorge it to buyers of the SPV's securities.

With regard the priority question, and a disadvantage of securitizing relative to secured debt, there are no exceptions to the priority of the security holders in a securitization transaction over the collateral.⁵¹ By engaging in a true sale through asset securitization, property rights in the future cash flows in question belong to the SPV, subject to a security interest held by its creditors, not the originator. Asset securitization thus irrevocably commits the firm to convert future cash into current cash. This brings potential disadvantages. For example, it may be that after securitization, the firm discovers a valuable investment opportunity for which the securitized cash flows (perhaps because of information problems among outside investors) would have provided a relatively inexpensive form of finance.⁵² Given the likely difficulty in renegotiating terms of such debt (see Laux 2001; Amihud, Garbade, and Kahan 1999), the SPV's creditors will in practice not exercise any discretion over whether to allow the originator to raise cash by ceding priority over the

51. For example, as a legal matter, there are some exceptions to "first-in-time" priority that allow the secured borrower to raise cash. A purchase money security interest, for instance, allows later-in-time priority over collateral acquired with the additional funds. U.C.C. secs. 9-107, 9-312(3), (4). See discussion in Scott (1997, p. 1445).

52. Triantis (2000) argues that many rules in Article 9 are designed to strike a compromise between the concerns over agency costs and that of access to relatively cheap internal capital.

cash flows to a subsequent creditor. Future investment using the securitized assets will be forgone. Asset securitization leaves no room for a nuanced approach to priority that commentators have suggested that the laws of secured transactions creates (see Triantis 2000; Scott 1997; Kanda and Levmore 1994). This could result in the failure of the firm to make valuable investments. The firm will weigh these various cash management advantages and disadvantages of secured debt and asset securitization.

6.4. Valuation

Asset securitization also offers advantages over secured debt when it comes to having the collateral valued by experts (for discussions of secured debt and valuation, see Buckley [1986]; Triantis [1992]; Scott [1997]; Schwartz [1981]). First, asset securitization is a more precise tool than secured debt for segregating the particular secured assets from the originator's other assets (Hansmann and Kraakman 2002, pp. 420–21). While the true-sale requirement does not create an impermeable partition between the firm and the SPV's security holders, securitization does, as discussed, transfer the risk associated with the assets to SPV security holders more than secured debt does. The sale of the collateral to the SPV before claims are issued implies that the security holders realize the bulk of their value from the collateral and the collateral alone. The problems that may occur on a reorganization in valuing the secured creditor's claim do not arise.⁵³ This in turn implies that securitizing undervalued assets brings valuation advantages that securing a loan using the assets as collateral does not.

Moreover, there are strong incentives for the originator to have the value of the securities sold by the SPV match the value of the collateral in question. To meet traditional true-sale requirements, the originator in a securitization transaction must have limited responsibility for shortfalls, and limited direct access to surpluses, from the assets. This implies that it is important for the firm to realize an accurate price for the collateral in the transaction: the originator will not want to sell assets for less than they are worth if it cannot realize much of a surplus, while the buyer of the SPV's securities will not pay for the securities if they are worth less than the collateral if the originator does not make up

53. See, for example, Schwartz (1981, pp. 25–26), who notes that in a reorganization, the value the secured lender receives in lieu of collateral is subject to the court's valuation decisions and may be difficult to predict.

much of a shortfall.⁵⁴ With secured debt, in contrast, the borrower will directly realize any surplus that the asset generates beyond the value of the debt. In addition, the borrower will generally be responsible for making up any shortcoming in the value of the asset relative to the outstanding debt. There is therefore less incentive to have the value of the secured loan precisely match the value of the collateral: surpluses or shortfalls remain the responsibility of the debtor. For these reasons, the specialized-valuation explanation of asset securitization is more powerful than the analogous explanation of secured debt.

7. EMPIRICAL EVIDENCE

We offer in this section empirical evidence about the observed pattern of choices among corporations to securitize assets that is consistent with the theory that the practice is used to mitigate agency costs. An ideal test of this hypothesis would investigate whether those firms most vulnerable to agency costs are also those most likely to securitize assets. The lack of good measures of vulnerability to agency costs, however, leads us to adopt a proxy for this variable: the power of the incentive contract for the chief executive officer (CEO) of the corporation, that is, the nonwage component of the compensation. Our assumption is that those firms with higher potential agency costs will on average adopt higher-powered incentive contracts. We thus investigate whether firms with higher-powered CEO incentive contracts are more likely to adopt the strategy of asset securitization.

This approach requires some elaboration, however, since both asset securitization and executive compensation are endogenous. We estimate only a correlation (more precisely, an affiliation) of the two variables, not a causal relationship. If our theory is correct, then both asset securitization and the power of the incentive contract are strategies to mitigate agency costs. If the main source of variation in the optimal use of each instrument across firms is in the cost of using either instrument, then under our theory, a negative correlation would be observed. Where incentive contracts were very costly to impose because of high managerial risk aversion, for example, the marginal value of asset securiti-

54. If a third party agrees to make up the shortfall, which occasionally occurs, the originator must effectively pay for this ex ante by compensating the third party for acting as an “insurer.” There is no gain to the originator from an inaccurate valuation of the collateral.

zation would be high, and we would observe both low-powered contracts and a high likelihood of asset securitization. Where incentive contracts were less costly, we would observe the opposite combination. The uses of the two substitute instruments would vary inversely across firms.

We submit, however, that the costs of adoption of the instruments—costs such as the risk aversion of managers or the transactions costs of asset securitization—are less likely to vary substantially across firms than is the basic vulnerability of firms to agency costs. In some firms, the actions of managers are more likely to be hidden and the firm value likely to be vulnerable to agency problems than in others; the variation in the magnitude of the agency problem across firms is more likely to explain a correlation between the two instruments that is a variation in the costs of either of the instruments.

In this case, the use of both instruments will vary together. In short, we regard a positive correlation between the power of executive compensation and the likelihood of asset securitization as a testable implication of the joint hypothesis that both instruments are responses to problems and that the variation in vulnerability to agency costs drives the variability across firms in the use of the two instruments. The prediction that the two instruments should be correlated is strengthened in our theory by the proposition that asset securitization can be a complementary instrument to higher-powered executive compensation contracts in the sense that asset securitization can reduce the variability of corporate returns, leading to a higher-powered optimal incentive contract in a model in which an optimal compensation contract trades off the alignment of managerial incentives against managerial risk aversion (as developed in Section 3).

We investigate this hypothesis by examining 1997 executive compensation data on 1,166 firms from the ExecuComp database.⁵⁵ The percentage of variable pay at these firms is given by the difference between total pay and salary as a fraction of total pay. We identified firms that were engaged in asset securitization by examining data from the Moody's database in December 2002.⁵⁶ In particular, we identified all originators from 2,000 ratings and research reports found in the U.S.

55. Standard & Poor's ExecuComp (online).

56. Moody's database is available online at <http://www.moody.com>.

asset-backed securities section of the database.⁵⁷ We found data on 61 CEO compensation packages at firms that were in both the ExecuComp database and the Moody's database. This allows a comparison of executive compensation at firms that we know engage in securitization and other firms. Because some of the other firms may also engage in securitization but are not in the Moody's database, our comparisons are biased against finding statistically significant differences between compensation at our sample of firms that securitize and other firms, yet we do find such differences.

The average "power," or variable proportion of executive compensation, is 66 percent in our sample. The prediction of our model is borne out by the data. For example, of firms with power exceeding 80 percent, 9.7 percent were found in the Moody's database as having undertaken asset securitization recently; in firms with power of 50 percent or less, only 2 percent were found in the database.⁵⁸

We subject this simple finding to one check to counter the possibility that the positive relationship is due simply to the correlation of both variables, asset securitization and power, with company size.⁵⁹ We estimate a logit equation with the probability of adoption of asset securitization as the dependent variable, controlling for the size of the firm, as measured by total assets. The logit relationship is represented by the equations below. In these equations, y_i^* can be interpreted as the unobservable (or latent) net benefits of adopting asset securitization for firm i and y_i as the (observable) decision about whether to adopt asset securitization. Size is measured by total assets, and the power of the executive compensation package is measured as the proportion of total

57. In particular, the section of the database was found by entering "ratings," then "structured finance," then "all asset-backed securities," then "USA." Many of the reports concerned securities issued around 1997, so the use of 1997 executive compensation as a measure of variable pay is appropriate. In any event, our prediction would be that variable pay should be higher both at firms with asset-backed securities outstanding and those contemplating securitization.

58. The impact of power in predicting the probability of asset securitization is statistically significant at the 1 percent level.

59. Securitization and company size may be correlated, for example, because of scale economies that lower the unit costs of a securitization transaction. There may be a correlation between size and higher-powered compensation because of a correlation between size and compensation levels and because of tax treatment of fixed compensation: under section 162(m) of the Internal Revenue Code, compensation over \$1 million cannot be expensed by the corporation for tax purposes unless it is performance related.

Table 1. Logit Regression of the Probability of Adopting Asset Securitization

Variable	Coefficient	S.E.	z	P > z	95% Confidence Interval	
					Low	High
Power	2.238	.8437	2.65	.008	.5840	3.8913
Size	.0000173	3.08E-06	5.63	.000	.0000113	.0000234
Constant	-4.839	6,413	-7.49	.000	-6.105	-3.572

Note. Number of observations = 1,166; likelihood ratio $\chi^2 = 72.27$; prob > $\chi^2 = .0000$; pseudo $R^2 = .1510$. S.E. = standard error.

compensation to the CEO that is not in the form of a wage. The error term u_i represents the impact of variables other than size or power:⁶⁰

$$y_i^* = \alpha_i + \beta_1 \text{power}_i + \beta_2 \text{size}_i + u_i$$

and

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0, \\ 0 & \text{otherwise.} \end{cases}$$

Table 1 provides the estimates of the parameters of the logit regression. The regression estimates indicate that greater adoption of asset securitization is associated with higher levels of agency costs, consistent with the theories developed here: the coefficient on power in the regression is positive, and the hypothesis that it is zero can be rejected at a significant level of greater than 99 percent.⁶¹

This evidence is clearly only one step toward the full estimation of a model of the impact on asset securitization of differences in the vulnerability to agency costs. But the evidence is consistent with the theory that asset securitization is a response to problems of asymmetric information.

60. In logit regressions, the error term is assumed to have a Weibull distribution, which is close to a normal distribution.

61. To understand the economic significance of the coefficient, note that the coefficient on power, 2.238, is the log of the impact of power on the odds ratio (the probability of using asset securitization divided by the probability of not using asset securitization). This impact is therefore 9.37. Roughly, the estimate is that an increase in power from, say, .3 to .9 leads to an increase in the probability of asset securitization by a factor of 5.6; this is about the same as suggested by the estimation of the simple, binary relationship.

8. CONCLUSION

The essence of asset securitization is the substantial, if not always complete, partitioning of future cash flows from the rest of the firm. Any explanation of asset securitization must account for this fundamental feature. The theories that we offer all satisfy this requirement, although the reason for the partitioning varies. The hidden-action explanations of asset securitization depend on the separation of cash flows that are risky but relatively insensitive to managerial effort from other cash flows. Partitioning in this case helps control agency problems by reducing the risk to the firm from factors beyond managers' control. The cash flow theory of asset securitization also depends on the separation of cash flows from the rest of the firm to reduce agency costs, but for different reasons. Partitioning off these flows in an asset securitization transaction exchanges a series of small, difficult-to-monitor cash flows for a single, relatively easy to monitor cash infusion, thus reducing the agency costs of free cash flow. Where there is uncertainty about the value of the nonsecuritized assets, the partitioning of the collateral in a securitization transaction from the rest of the firm allows the sale of securities that are not subject to a lemons problem. This allows the firm to avoid a lemons discount and helps it to signal the high quality of its remaining general equity; only higher-quality firms would incur the relatively high transaction costs of securitization to avoid the lemons discount. On the other hand, where there is uncertainty about the collateral, securitization allows expert investors or rating agencies to value the collateral independent of the rest of the firm. Partitioning is crucial to this theory also.

Asset securitization can, depending on the circumstances, address the problems of hidden action and hidden information. Moreover, there are important differences between asset securitization and secured debt that make the former important as a distinct financing device. Securing debt does not insulate the firm from risky collateral to the same extent as securitizing does, so the focus explanations do not apply as well to secured debt. Secured transactions cannot limit managerial access to cash as directly as securitization does, particularly where the collateral in question is cash or where restrictions on the sale of the collateral are impractical. Finally, secured debt transactions entail less incentive to value the collateral precisely, given that shortfalls and excess returns will generally be covered or realized in full by the borrower itself.

In sum, the uniqueness of asset securitization and its effectiveness in addressing information problems help explain its recent explosion in

popularity. Considerations external to the firm, such as regulation or judgment proofing, are not necessary to provide a coherent positive account of securitization.

APPENDIX: MODELS OF ASSET SECURITIZATION UNDER HIDDEN INFORMATION

A1. Asset Securitization and Asymmetric Information about General Asset Values

This model formalizes the arguments in Section 5.1. It establishes the incentives for securitizing assets of known value, that is, value over which all investors are symmetrically informed, when the alternative is to issue claims on general assets that are subject to asymmetric information. Insiders (managers) are informed about the value of general assets; outside investors are not. The securitization of assets in this model is assumed to involve administrative costs greater than those of issuing general securities.

Consider a firm that needs to raise an amount of capital I to invest in a project that will yield a net present value of v . The firm's total assets consist of some assets over which insiders, including managers who act on behalf of insiders, have superior information and some assets over which all investors have full information about future returns. We suppose that the class of assets of known returns is large enough that some of these could be securitized to finance the project cost, I , and compare the value of the firm under two financing strategies: securitizing assets of known value and issuing general equity claims. Initially, we assume that after financing the project through either strategy, the insiders keep their equity for the life of the firm (that is, until the realization of returns on all assets).⁶²

The Securitization Strategy. Suppose that the firm raises funds by securitizing some of the assets of known value. The securitized assets we will label B, and the remaining assets we will label A. Assets A have an uncertain return: with probability θ these assets return a value of \$1 in the future, and with probability $1 - \theta$ these assets return a value of \$0.⁶³ The quality θ of the assets is known only to insiders; outside investors form expectations about the quality based only on the financing strategy of the firm. The distribution of possible qualities from the perspective of outsiders is denoted F .

If the firm finances through securitization, an administrative cost k is incurred. The expected payoff to insiders who choose securitization consists of the

62. All assets' returns are assumed to be realized at some date after which the firm is liquidated. Subsequently, we introduce "liquidity trading" of equity after the financing of the new investment.

63. The normalization of possible return values to zero and one has no impact on the results but simplifies notation.

expected payoff of assets A plus the net value of the project v minus an administrative cost of securitization, k :

$$\theta + v - k. \quad (\text{A1})$$

The Equity Issuance Strategy. In the event that the firm issues sufficient general equity to finance the project, let p_0 represent the market valuation (price) of the assets A and let λ represent the share of the equity that the firm must sell to finance the project. The variables λ and p_0 must satisfy the financing constraint:

$$\lambda(p_0 + I + v) = I, \quad (\text{A2})$$

where the left-hand side of this constraint represents λ times the market valuation of the existing assets A, assets B (valued at I), and the net present value of the new project. The set of firms deciding to issue general equity can be shown to be a set $[0, \hat{\theta}]$. The price p_0 must satisfy rational expectations:

$$p_0 = E(\theta | \theta \leq \hat{\theta}) = \int_0^{\hat{\theta}} t dF(t) / F(\hat{\theta}). \quad (\text{A3})$$

This equation and the financing constraint (A2) can be solved to give the share of equity that must be offered to the market to finance the project:

$$\lambda = I / [E(\theta | \theta \leq \hat{\theta}) + I + v],$$

and the payoff to a firm of quality θ that chooses to finance the project with the necessary issue of general equity is therefore

$$\left[1 - \frac{I}{E(\theta | \theta \leq \hat{\theta}) + I + v} \right] (\theta + I + v). \quad (\text{A4})$$

Finally, equating the payoffs (A1) and (A4) determines the marginal type $\hat{\theta}$.

For a firm of type $\theta > \hat{\theta}$, the gain from securitization equals (A1) minus (A4), which can be written as

$$\text{gain} = \left[\frac{\theta + I + v}{E(\theta | \theta \leq \hat{\theta}) + I + v} \right] I - k.$$

The first term of this equation we could call the “lemons premium avoidance benefit”: the decrease in the cost of raising I when assets A are valued at their correct quality instead of at the average quality of those firms choosing the strategy of general equity issuance. The gain is then net of the administrative cost of securitization, k .

Extension to Liquidity Trading. In the simple model outlined above, the price of the firm’s equity after a decision to securitize assets is irrelevant. The existing equity holders retain ownership of the equity until the final payoff of

assets; there is no trading of equity after the securitization decision and no scope in the model for identifying a beneficial impact of securitization on the price of equity. (Moreover, a postinvestment opportunity for equity holders to sell shares in and of itself would not provide this scope, since a market for equity in which current owners have superior information about the value of their shares would generate no trade because of the lemons problem.) It is unrealistic, however, to suppose that in reality the future price of postinvestment price of equity is irrelevant, and certainly the prediction of no trade is unrealistic. We build postinvestment trade into the model by incorporating exogenous liquidity trading. Liquidity trading is a common component of financial economic models.

Suppose, then, that after the investment decision has been made, an exogenous proportion, g , of equity will be sold by inside equity holders after the investment has been undertaken.⁶⁴ We now let p_1 represent the market valuation of assets A after a decision to securitize has been taken; p_0 continues to represent the market valuation of these assets after a decision to raise general equity. This revision to the model alters the payoffs from each method of financing, to incorporate the gains to insiders from selling the fraction g of equity at the market prices (p_0 or p_1) rather than retaining ownership of equity until the realization of returns. It is straightforward to show that in this extended model, the gains to securitization can be expressed as follows:

$$\begin{aligned} \text{gain} &= \left[\frac{\theta + I + v}{E(\theta|\theta \leq \hat{\theta}) + I + v} \right] I + g(p_1 - p_0) - k \\ &= \left[\frac{\theta + I + v}{E(\theta|\theta \leq \hat{\theta}) + I + v} \right] I + g[E(\theta|\theta > \hat{\theta}) - E(\theta|\theta \leq \hat{\theta})] - k. \end{aligned}$$

The first term in this equation again represents the lemons premium avoidance benefit. The second term represents an additional gain from securitization, a signaling benefit, which captures the increase in value of shares sold that reflects the value of being associated with the high-quality group of firms choosing to securitize rather than the lower-quality group choosing to issue general equity.

A2. Asset Securitization and Asymmetric Information about Securitized Asset Values

This model formalizes the analysis in Section 5.2. We investigate the incentives for asset securitization when the capital market participants include a group of investors with specific knowledge of the quality of securitized assets, reflecting specialization in the valuation of these assets. This group of specialized investors is large enough to represent a competitive source of capital but has limited funds and is therefore not in the market for general assets.

64. It would be more realistic, but less succinct algebraically, to assume that an exogenous amount of funds must be raised for liquidity purposes.

Consider a firm with two assets, A and B, as in the previous model. Asset A (which will again represent general, nonsecuritized assets in the equilibrium of the model) is known by all outside investors to have value A, and it is now asset B that is subject to asymmetric information. The payoff from asset B is one with probability θ and zero with probability $1 - \theta$. Specialized investors are aware of θ ; general investors are not.

We consider an entrepreneur who owns both sets of assets in a single firm. The entrepreneur wishes to sell the entire firm rather than wait for the realization of payoffs to the assets. The entrepreneur can sell some proportion s of the claims on asset B to specialized investors, which we interpret as asset securitization, and sells the remaining proportion of assets, $1 - s$, to the general equity market. While general investors are unaware of the quality θ of the asset B, these investors can observe s and condition their expectations on this variable.

Consider first the case in which administrative costs to securitization are entirely fixed. In this case, it is straightforward to show that in any equilibrium, the values of s are zero or one, depending on θ .⁶⁵ That is, if it is worthwhile securitizing some of asset B, it is worthwhile securitizing all of asset B. As in our first hidden-information model, the decision to securitize assets involves a trade-off between the transactions cost of doing so and the benefits of being identified by investors as having a higher-quality set of assets. General investors know that those firms choosing not to securitize asset B with specialized investors have lower-quality assets and price the equity of these firms accordingly. In equilibrium, all firms with quality greater than some marginal type, $\hat{\theta}$, securitize asset B.

It is most plausible that the transactions costs associated with securitization are not entirely fixed, however, but instead increase with the size of the securitization transaction. In this case, the market outcome will not be of the variety just described, in which many different quality types choose the same action, but will instead be a separating equilibrium in which each quality type chooses to securitize a different proportion of asset B. To illustrate this, suppose that the costs of securitization are entirely variable: if a proportion s of the (divisible) asset B is securitized, then the entrepreneur incurs an administrative cost, ks .

A separating equilibrium consists of (i) a mapping ϕ from observed s to expected quality on the part of general investors; $\phi(s)$ is the quality that investors expect from a firm that has securitized an amount s ; and (ii) a function $S(\theta)$ giving the decision $s = S(\theta)$ on the part of the firm of quality θ , such that, (1) given the entire function $\phi(s)$, the firm of each quality θ maximizes its payoff by choosing $s = S(\theta)$ and (2) for all θ , $\phi(S(\theta)) = \theta$; that is, $\phi = S^{-1}$. The first

65. Suppose that there were an equilibrium in which a set H of some types chose $s < 1$. Then either the top quality θ^* in H is pooled with other types in H in its choice of s or is identified in equilibrium as θ^* . In the former case, the type θ^* does better by choosing $s = 1$ (where its payoff is the same as if it is fully identified); in the latter case, any type in H would profit by mimicking θ^* . This contradicts the supposition.

condition is that each firm be rational. This condition recognizes that each firm in changing its decision s will affect investors' expectations about its quality. The second condition is that investors' expectations are, in equilibrium, correct.

The payoff to an entrepreneur of quality θ from choosing s , facing market expectations $\phi(s)$, is

$$A + s\theta + (1 - s)\phi(s) - ks,$$

which describes the payoff from selling asset A, selling the fraction s of asset B to specialized investors at its true value, θ , and selling the remaining fraction of B, $(1 - s)$, to investors whose perception of the value, $\phi(s)$, depends on the choice of s . The entrepreneur's first-order condition for maximizing this payoff (equilibrium condition [1]) is

$$\theta + (1 - s)\frac{\partial\phi}{\partial s} - \phi(s) - k = 0. \quad (\text{A5})$$

From the rational expectations condition $\phi = S^{-1}$, we have $\partial\phi/\partial s = [1/(\partial S/\partial\theta)]$. Substituting this into equation (A5), evaluating equation (A5) at $s = S(\theta)$, and then substituting the equilibrium condition $\phi(S(\theta)) = \theta$ yields

$$1 - S(\theta) - k\frac{\partial S}{\partial\theta} = 0. \quad (\text{A6})$$

A boundary condition is provided by $S(0) = 0$ (the lowest-quality firm is identified as such in equilibrium and gains nothing from securitization). Equation (A6) is a linear differential equation with a solution

$$S(\theta) = 1 - e^{-\theta/k}.$$

The equilibrium pattern of asset securitization thus starts with zero and increases monotonically in quality. Each firm trades off at the margin the benefits of securitization that flow from being identified as a higher-quality firm against higher transactions costs. Thus, when investors vary with respect to their knowledge of the quality of a class of assets, the securitization and sale of these assets to a specialized (informed) class of investors emerges in a signaling equilibrium.

REFERENCES

- Adelson, Mark H. 1999. Trends in Securitization: Commentary from a Rating Agency Perspective. *Practicing Law Institute/Commercial* 797:149–255.
- Aidun, Christopher K., and George P. Farley. 1995. Capital for Middle-Market Companies. *Business Credit* (September 1995), p. 29.
- Akerlof, George A. 1970. The Market for "Lemons": Qualitative Uncertainty and the Market Mechanism. *Quarterly Journal of Economics* 84:488–500.

- Alchian, Armen A., and Harold Demsetz. 1972. Production, Information Costs, and Economic Organization. *American Economic Review* 62:777–95.
- Amihud, Y., K. Garbade, and M. Kahan. 1999. A New Governance Structure for Corporate Bonds. *Stanford Law Review* 51:447–92.
- Buckley, Francis H. 1986. The Bankruptcy Priority Puzzle. *Virginia Law Review* 72:1393–1470.
- Carbino, Jeffrey M., and William H. Schorling. 2003. Delaware’s Asset-Backed Securities Facilitation Act: Will the Act Prevent the Recharacterization of a Sale of Receivables in a Seller’s Bankruptcy? *Delaware Law Review* 6: 367–400.
- Clark, Kim. 1997. On the Frontier of Creative Finance: How Wall Street Can Securitize Anything. *Fortune*. April 28.
- Demski, J., and D. Sappington. 1984. Optimal Incentive Contracts with Multiple Agents. *Journal of Economic Theory* 33:152–71.
- Dewatripont, Mathias, Ian Jewitt, and Jean Tirole. 1999. The Economics of Career Concerns, Part I: Comparing Information Structures. *Review of Economic Studies* 66:183–98.
- Dolan, Patrick D. 1998a. Lender’s Guide to the Securitization of Commercial Mortgage Loans. *Banking Law Journal* 115:597–603.
- . 1998b. Lender’s Guide to the Securitization of State Lottery Winnings and Litigation Settlement Payments. *Banking Law Journal* 115:710–18.
- D’Souza, Julia, and John Jacob. 2000. Why Firms Issue Targeted Stock. *Journal of Financial Economics* 56:459–83.
- Dvorak, Vuliya A. 2001. Transplanting Asset Securitization: Is the Grass Green Enough on the Other Side?. *Houston Law Review* 38:541–75.
- Easterbrook, Frank H. 1984. Two Agency-Cost Explanations of Dividends. *American Economic Review* 74:650–59.
- Economist*. 2001. CDO—Not Cash on Delivery. July 28.
- Fama, Eugene F. 1970. Efficient Capital Markets: A Review of Theory and Empirical Work. *Journal of Finance* 25:383–417.
- . 1980. Agency Problems and the Theory of the Firm. *Journal of Political Economy* 88:288–307.
- Frost, Christopher. 1997. Asset Securitization and Corporate Risk Allocation. *Tulane Law Review* 72:101–57.
- Hansmann, Henry, and Reinier Kraakman. 2002. The Essential Role of Organizational Law. *Yale Law Journal* 110:387–440.
- Harrell, Charles E., James L. Rice III, and W. Robert Shearer. 1997. Securitization of Oil, Gas, and Other Natural Resource Assets: Emerging Financing Techniques. *Business Law* 52:885–946.
- Hill, Claire A. 1996. Securitization: A Low-Cost Sweetener for Lemons. *Washington University Law Quarterly* 74:1061–1126.
- Holmström, Bengt. 1979. Moral Hazard and Observability. *Bell Journal of Economics* 13:74–91.

- . 1982a. Managerial Incentive Problems: A Dynamic Perspective. In *Essays in Economics and Management in Honor of Lars Wahlbeck*. Helsinki: Swedish School of Economics. Reprinted in *Review of Economic Studies* 66 (1999): 169–82.
- . 1982b. Moral Hazard in Teams. *Bell Journal of Economics* 13:324–40.
- Holmström, Bengt, and Paul Milgrom. 1991. Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design. *Journal of Law, Economics, and Organization* 7:24–52.
- Jackson, T., and A. Kronman. 1979. Secured Financing and Priorities among Creditors. *Yale Law Journal* 88:1143–82.
- Jensen, Michael C. 1986. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review* 76:323–29.
- Jensen, Michael C., and William H. Meckling. 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership. *Journal of Financial Economics* 3:305–60.
- Kanda, Heideki, and Saul Levmore. 1994. Explaining Creditor Priorities. *Virginia Law Review* 80:2103–54.
- Kerr, Teresa N. 2000. Bowie Bonding in the Music Biz: Will Music Royalty Securitization Be the Key to the Gold for Music Industry Participants? *UCLA Entertainment Law Review* 7:367–97.
- Laux, Christian. 2001. Project Specific External Financing and Headquarters Monitoring Incentives. *Journal of Law, Economics and Organization* 17: 397–412.
- Levmore, Saul. 1982. Monitors and Freeriders in Commercial and Corporate Settings. *Yale Law Journal* 92:49–83.
- Lipson, Jonathan C. 2002. Enron, Asset Securitization and Bankruptcy Reform: Dead or Dormant? *Journal of Bankruptcy Law and Practice* 11:101–19.
- LoPucki, Lynn M. 1996. The Death of Liability. *Yale Law Journal* 106:1–92.
- . 1999. The Irrefutable Logic of Judgment Proofing: A Reply to Professor Schwarcz. *Stanford Law Review* 52:55–71.
- Lupica, Lois R. 1998. Asset Securitization: The Unsecured Creditor's Perspective. *Texas Law Review* 76:595–660.
- . 2001. Revised Article 9, Securitization Transactions and the Bankruptcy Dynamic. *American Bankruptcy Institute Law Review* 9:287–322.
- Manne, Henry G. 1965. Mergers and the Market for Corporate Control. *Journal of Political Economy* 73:110–20.
- Marris, Robin. 1964. *The Economic Theory of "Managerial" Capitalism*. London: Macmillan.
- Mas-Colell, Andreu, Michael D. Whinston, and Jerry R. Green. 1995. *Microeconomic Theory*. New York: Oxford University Press.
- McManus, John C. 1975. The Costs of Alternative Economics Organization. *Canadian Journal of Economics* 8:334–50.
- Modigliani, Franco, and Merton H. Miller. 1958. The Cost of Capital, Cor-

- poration Finance and the Theory of Investment. *American Economic Review* 48:261–97.
- Myers, Stewart, and Nicholas S. Majluf. 1984. Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. *Journal of Finance Economics* 13:187–221.
- Ngo, Minh Van. 2002. Getting the Question Right on Floating Liens and Securitized Assets. *Yale Journal on Regulation* 19:85–169.
- Pantaleo, Peter V., et al. 1996. Rethinking the Role of Recourse in the Sale of Financial Assets. *Business Lawyer* 52:159–98.
- Plank, Thomas E. 1996. The Constitutional Limits of Bankruptcy. *Tennessee Law Review* 63:487–584.
- Ross, Stephen. 1973. The Economic Theory of Agency: The Principal's Problem. *American Economic Review* 63:134–39.
- Sappington, David. 1983. Limited Liability Contracts between Principal and Agent. *Journal of Economic Theory* 29:1–21.
- . 1991. Incentives in Principal-Agent Relationships. *Journal of Economic Perspectives* 5:45–66.
- Schipper, Katherine, and Abbie Smith. 1986. A Comparison of Equity Carve-Outs and Seasoned Equity Offerings: Share Price Effects and Corporate Restructuring. *Journal of Financial Economics* 15:153–86.
- Schwarcz, Steven L. 1993. *Structured Finance: A Guide to the Principles of Asset Securitization*. 2d ed. New York: Practising Law Institute.
- . 1994. The Alchemy of Asset Securitization. *Stanford Journal of Law, Business and Finance* 1:133–54.
- . 1999a. The Impact on Securitization of Revised UCC Article 9. *Chicago Kent Law Review* 74:947–61.
- . 1999b. The Inherent Irrationality of Judgment Proofing. *Stanford Law Review* 52:1–53.
- . 2002. *Structured Finance: A Guide to the Principles of Asset Securitization*. 3d ed. New York: Practising Law Institute.
- . 2004. Securitization Post-Enron. *Cardozo Law Review* 25:1539–75.
- Schwartz, Alan. 1981. Security Interests and Bankruptcy Priorities: A Review of Current Theories. *Journal of Legal Studies* 10:1–37.
- Scott, Robert E. 1986. A Relational Theory of Secured Lending. *Columbia Law Review* 86:901–77.
- . 1997. The Truth about Secured Financing. *Cornell Law Review* 82:1436–65.
- Shavell, Steven. 1979. Risk Sharing and Incentives in the Principal and Agent Relationship. *Bell Journal of Economics* 10:55–73.
- Spence, Michael. 1973. Job Market Signaling. *Quarterly Journal of Economics* 87:355–74.
- Stephan, Paul B. III. 1990. Disaggregation and Subchapter C: Rethinking Corporate Tax Reform. *Virginia Law Review* 76:655–711.

- Triantis, George. 1992. Secured Debt under Conditions of Imperfect Information. *Journal of Legal Studies* 21:225–58.
- . 1994. A Free-Cash-Flow Theory of Secured Debt and Creditor Priorities. *Virginia Law Review* 80:2155–65.
- . 2000. Financial Slack Policy and the Laws of Secured Transactions. *Journal of Legal Studies* 29:35–69.
- Warren, Elizabeth, and Jay Westbrook. 2004. A Little Peripheral Vision. *American Bankruptcy Institute Journal*. February 26.
- White, James J. 1998. Corporate Judgment Proofing: A Response to Lynn LoPucki's *The Death of Liability*. *Yale Law Journal* 106:1363–1412.