

The False Promise of Risk-Reducing Incentive Pay: Evidence from Executive Pensions and Deferred Compensation

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I. INTRODUCTION

Incentive-based pay for corporate executives has been at the center of many recent controversies. Although “pay for performance” is supposed to help shareholders control managers by aligning the financial interests of the two sides, some blame it for the sky-

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rocketing total pay taken home by top executives.¹ In the wake of the 2008–2009 financial crisis, government regulators and legal scholars blame incentive compensation for causing, or at least not preventing, the climate of excessive risk taking that led to the meltdown.² As a result, scholars and regulators are working on designing optimal incentive compensation schemes that properly set executive incentives to maximize profits to the extent possible while also constraining excessive risk seeking.³

We disagree with these approaches, and in this Article, argue that packing compensation with yet more incentives is unlikely to solve the problems of incentive-based pay. The scholarly proposals have grown more complex as various baskets of securities and mixes of salary, bonuses, and pensions combine to form grand compensation schemes under which, it is hoped, rational managers will have almost no choice but to manage the firm with the optimal degree of risk. The corporate managers of the executive compensation literature are like machines whose incentives can be finely adjusted in a number of directions with measured changes to the sources of their compensation. We argue here that this cannot be so, and that there is a limit to the amount of information a corporate executive can process when making a decision on behalf of the firm.

In particular, we are skeptical of recent proposals favoring the use of “inside debt,” or corporate debt held by the debtor firm’s insiders,⁴ as a solution not only to the traditional agency problems between creditors and managers, but also to the dangers of unrestrained risk in the financial sector. Inside debt in the form of executive pensions or deferred cash has become an important part of the mix of mechanisms used to compensate corporate managers.⁵ Recent commentators argue that pensions align

1. For a description of the connection between incentive pay and shareholder interests, see Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 353 (1976); Michael C. Jensen & Kevin Murphy, *Performance Pay and Top Manager Incentives*, 98 J. POL. ECON. 225, 242–53 (1990). On the relationship between incentive pay and total compensation, see Kevin J. Murphy, *Explaining Executive Compensation: Managerial Power Versus the Perceived Cost of Stock Options*, 69 U. CHI. L. REV. 847, 847–48 (2002).

2. Sanjai Bhagat & Roberta Romano, *Reforming Executive Compensation: Focusing and Committing to the Long-Term*, 26 YALE J. ON REG. 359, 360 (2009); Frederick Tung, *Pay for Banker Performance: Structuring Executive Compensation for Risk Regulation*, 105 NW. U. L. REV. 1205, 1206 (2011); David I. Walker, *The Challenge of Improving the Long-Term Focus of Executive Pay*, 51 B.C. L. REV. 435, 435–36 (2010).

3. See, e.g., Lucian A. Bebchuk & Holger Spamann, *Regulating Bankers’ Pay*, 98 GEO. L.J. 247, 251 (2010) (proposing that managers of financial firms be paid with a mix of securities that represents the various interests making up the firm’s capital structure); Alex Edmans & Qi Liu, *Inside Debt*, 15 REV. FIN. 75, 77–79 (2011) (making the case that inside debt compensation is efficient and suggesting that managers of corporations be paid with inside debt in a manner that reflects the firm’s capital structure when the company’s debt-to-equity ratio is high); Tung, *supra* note 2 (suggesting that managers of financial firms should be paid with subordinated debt securities issued by the bank they manage); Jeffrey Gordon, *Executive Compensation and Corporate Governance in Financial Firms: The Case for Convertible Equity-Based Pay 2* (Columbia Law Sch., Working Paper No. 373, July 9, 2010), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1633906 (arguing that managers of financial firms should be paid with securities that convert from equity to debt if the firm reaches a defined level of financial distress).

4. Jensen & Meckling, *supra* note 1, at 352.

5. Lucian A. Bebchuk & Robert J. Jackson, *Executive Pensions*, 30 J. CORP. L. 823, 835–48 (2005); Edmans & Liu, *supra* note 3, at 76–77.

managerial self-interest with the interests of creditors, thereby encouraging conservative investment decisions and lowering the cost of debt.⁶ Similarly, because excessive risk taking by financial firms bears much of the responsibility for the recent financial crisis, some scholars suggest that the managers of financial firms be compensated with debt securities.⁷ The arguments supporting this compensation scheme derive from the same reasoning supporting the use of inside debt in other firms—that it will temper risk seeking and align managerial self-interest with the interests of those who bear the downside risk of firm failures.⁸

We argue, in contrast, that compensation with inside debt is often inefficient, and at times not even effective at influencing managerial behavior in the direction stakeholders prefer. We argue that inside debt unnecessarily complicates managers' incentive structures and can therefore have perverse incentive effects or none at all. We present evidence from the behavioral economics literature that individuals are incapable of constantly balancing financial consequences of their decisions, particularly as those financial outcomes become more complex and depend on more variables. Highly complex pay structures can lead managers to take mental “shortcuts” that reduce the quality of all their decisions.⁹

Complex compensation schemes also require constant recalibration, making them less effective and less reliable methods of incentivizing managers. Legacy costs and cross-monitoring costs contribute to this problem. The use of inside debt to pay executives imposes legacy costs because inside debt payments are difficult to reverse or terminate. Pension and deferred salary obligations can remain even after the firm's debt has been repaid or its financial position or capital structure changes.¹⁰ At that point, the executive's incentives would no longer align with any interested party and may be inefficiently misaligned with the interests of shareholders.

Paying with inside debt additionally presents cross-monitoring problems because different creditors have different risk preferences, monitoring abilities, and interests. The interests of creditors may also differ dramatically from the interests of shareholders when the firm is experiencing financial difficulty. The differing interests of those various investors and monitors make it difficult to choose what payment scheme to use in order to align managerial incentives, and it leads to uncertainty about which interests managers should consider paramount. A company may have to rebalance the compensation package in order to realign incentives as its financial circumstances or capital structure change. That increases the complexity of the compensation scheme and so, as we demonstrate, makes it less effective at influencing managerial decision making at all.

To test our hypothesis that inside debt is not strongly connected to any efficient

6. Edmans & Liu, *supra* note 3, at 77; Rangarajan K. Sundaram & David L. Yermack, *Pay Me Later: Inside Debt and Its Role in Managerial Compensation*, 62 J. FIN. 1551, 1554–55 (2007); see Yair Listokin, *Paying for Performance in Bankruptcy: Why CEOs Should Be Compensated with Debt*, 155 U. PA. L. REV. 777, 783–84 (2007) (making this point about debt-like compensation generally).

7. See generally Tung, *supra* note 2; Gordon, *supra* note 3, at 2.

8. Bebchuk & Spamann, *supra* note 3 (suggesting alignment of the interests of managers of financial firms with those of common shareholders, preferred shareholders, and bondholders); Gordon, *supra* note 3, at 1; Tung, *supra* note 2.

9. See *infra* Part IV (discussing behavioral consequences of complex pay structures).

10. We present evidence of this phenomenon *infra* text accompanying notes 240–42.

contracting goal, we collected original empirical evidence on the determinants of CEO pensions and deferred compensation plans. As proponents of inside debt have themselves argued, if inside debt were an effective tool for aligning managers with creditor interests, we should find a correlation between firm borrowing and the prevalence of inside debt payments.¹¹ We find, to the contrary, relatively little evidence for the efficient contracting story. We do, however, find considerable evidence that managerial power, legacy costs, and the makeup of the board of directors play a significant role in firms' decisions to use inside debt. For example, we find that as the portion of independent directors on a board increases, so too does the firm's use of inside debt, a result we explain as likely implying an important role for directors' personal risk preferences in the setting of executive pay. We argue that these findings suggest that actors in the best position to judge the efficacy of inside debt so far have not found it a useful tool for shaping managerial incentives.

Overall, we make several notable new contributions to the literature. Pensions, as this Article explains, are a key piece of evidence in the debate over whether executive pay is strictly optimal, or whether instead it is the result of "managerial power." Because our results cast doubt on the optimal contracting story for pensions, we offer substantial support for the managerial power theorists. We also contribute the first skeptical notes on proposals for using pay to constrain banker risk taking. And, more generally, we are the first to apply the insights of behavioral economics to the question of the efficacy of incentive-based pay.

Part II introduces the basic theory of incentive-based pay and reviews the recent literature calling for compensation with inside debt. Part III begins our critique of inside debt, arguing that even if all actors are fully rational, inside debt still needlessly creates costs that could be avoided simply by using other governance tools. Part IV relaxes the rationality assumption, applying the literatures on behavioral household finance and bounded rationality in firms to the workings of pay-for-performance mechanisms. Part V reviews existing research on the efficacy of inside debt, noting some significant holes in studies to date. Part VI presents the results of our original empirical investigation. The Article also includes a brief appendix describing our methodology.

II. EXECUTIVE COMPENSATION AND INSIDE DEBT

Executive compensation has become one of the primary tools of corporate governance.¹² It is also one of the most significant tools managers have at their disposal to extract value or "rents" from the firm.¹³ This tension between the two opposing uses of executive compensation permeates the academic debate and complicates attempts to decide what compensation schemes are most appropriate. Those who find compensation

11. Edmans & Liu, *supra* note 3, at 77.

12. See Daniel R. Fischel, *The "Race to the Bottom" Revisited: Reflections on Recent Developments in Delaware's Corporate Law*, 76 NW. U. L. REV. 913, 919 (1982) (discussing stock options as a way to incentivize managers to maximize shareholders' wealth).

13. David I. Walker, *The Law and Economics of Executive Compensation: Theory and Evidence*, in RESEARCH HANDBOOK ON THE ECONOMICS OF CORPORATE LAW 232 (Claire Hill & Brett McDonnell eds., 2011); Lucian Arye Bebchuk et al., *Managerial Power and Rent Extraction in the Design of Executive Compensation*, 69 U. CHI. L. REV. 751, 762 (2002).

effective in controlling agency costs argue that it is the product of “optimal contracting,” while those who see it as an opportunity for executives to extract rents explain compensation arrangements as the result of inappropriate “managerial power.”¹⁴ Part II.A briefly introduces the basic contours of this debate to readers who may be unfamiliar with it. Part II.B explains the possible role of debt in incentive-based pay and summarizes recent proposals on that front.

A. Traditional Incentive Compensation and Agency Costs

Because widely dispersed shareholders cannot exercise meaningful control over a public corporation, they elect directors to oversee the managers who run the day-to-day business of the firm.¹⁵ Thus, the owners of the business are not the managers, and the managers are controlling assets that do not belong to them. This separation of ownership from control in the public corporation was brought to light by Berle and Means 80 years ago, and the agency costs it creates remain the fundamental problem confronting corporate governance.¹⁶

One important way in which managers’ interests diverge from shareholders’ is that managers are more risk averse than shareholders.¹⁷ While shareholders can diversify away firm-specific risk, managers have sunk their reputation and a career’s worth of learning in the firm, all of which may be lost if it fails.¹⁸ To the extent they are paid with salary and pensions, managers are creditors of the firm and can only be paid if the firm remains solvent.¹⁹ The fixed nature of salary and pension claims means that they have a limited upside and will be lost entirely if the firm cannot repay its debts. Shareholders have a very different risk profile because they have only the money they paid for their shares at stake.²⁰ However, the shareholders’ upside is unlimited. So, when the firm is in trouble, shareholders have incentives to take big risks, especially if they are gambling with creditors’ money.²¹ This essential conflict between managerial risk aversion and shareholder risk preference imposes agency costs between shareholders and the managers

14. Versions of the optimal contracting argument include John E. Core et al., *Is U.S. CEO Compensation Inefficient Pay Without Performance?*, 103 MICH. L. REV. 1142, 1160–61 (2005); Alex Edmans & Xavier Gabaix, *Is CEO Pay Really Inefficient? A Survey of New Optimal Contracting Theories*, 15 EUR. FIN. MGMT. 486, 493 (2009); Bengt Holmstrom & Steven N. Kaplan, *The State of U.S. Corporate Governance: What’s Right and What’s Wrong?*, 16 J. APPLIED CORP. FIN. 8, 12 (2003). The managerial power side includes Bebchuk et al., *supra* note 13, at 753–55; William W. Bratton, *The Academic Tournament over Executive Compensation*, 93 CALIF. L. REV. 1557, 1561–78 (2005); Lawrence A. Cunningham, *A New Legal Theory to Test Executive Pay: Contractual Unconscionability*, 96 IOWA L. REV. 1177, 1190–97 (2011).

15. Eugene F. Fama & Michael C. Jensen, *Separation of Ownership and Control*, 26 J.L. & ECON. 301, 312–15 (1983).

16. ADOLF A. BERLE & GARDINER M. MEANS, *THE MODERN CORPORATION & PRIVATE PROPERTY* 1–7 (1932); William W. Bratton, *Berle and Means Reconsidered at the Century’s Turn*, 26 J. CORP. L. 737, 738 (2000).

17. Walker, *supra* note 13, at 236–37.

18. *Id.* at 5 n.11.

19. These elements of executive pay, with various forms of deferred compensation, constitute the “inside debt” compensation this Article criticizes.

20. Bebchuk & Spamann, *supra* note 3, at 256.

21. *Id.*

who are supposed to make the business decisions for the shareholders.²²

Equity compensation is designed to overcome the risk-aversion problem by giving managers financial incentives to take the risks shareholders would prefer.²³ Balancing the financial incentives provided by equity pay against the risk aversion created by full-time employment and payment with cash is supposed to make managers more risk preferring without giving them incentives to be reckless. Of course, if managers hold only the stock of their own firm, they will still not be as risk seeking as a diversified shareholder. Many firms, therefore, also use additional options to add to managers' incentives to take risk.²⁴

Stock and option compensation also help to bridge another major gap between investors and managers: effort.²⁵ Given a choice, most of us would rather enjoy leisure than work hard. Shareholders cannot easily monitor managerial effort.²⁶ Equity compensation, though, rewards managers for the market appraisal of their work and so ties their pay to their performance.²⁷

Whether executive compensation is effective in reducing these agency costs is the subject of debate. The "optimal contracting" approach holds that compensation mechanisms are designed to reduce the agency costs between executives and shareholders.²⁸ It explains executive compensation mechanisms as a product of arms-length bargaining designed to encourage managers to work toward the goal of shareholder wealth maximization.²⁹ On the other hand, the "managerial power" approach holds that executives have significant power to influence their own compensation and will use that power to extract rents from the corporation, thus deviating from the optimal contract shareholders would choose.³⁰ As executives work to hide this rent extraction from shareholders, they devise compensation schemes that might actually give them incentives at odds with shareholder wealth maximization.³¹

Even the optimal contracting framework recognizes that incentive-based pay is not always ideal. Incentive-based pay forces the manager to invest her wealth in the firm rather than a diversified portfolio. Risk-averse managers must be paid a premium to agree to that arrangement, and there is always some risk that the design of the incentive contract will be imprecise.³² If agency costs are low, the firm need not incur these extra

22. Walker, *supra* note 13, at 237.

23. *Id.* at 6.

24. Murphy, *supra* note 1, at 849. An option is simply the right to buy company stock at a given price. Usually this price is set such that the manager only profits if the price rises. If value declines, the option becomes worthless but does not otherwise affect the manager. This differential between the "upside" profit potential of the option and its limited "downside" risk of loss makes option holders more willing to take risks. William Gerard Sanders, *Behavioral Responses of CEOs to Stock Ownership and Stock Option Pay*, 44 ACAD. MGMT. J. 477, 478–79 (2001).

25. Jensen & Meckling, *supra* note 1, at 313.

26. Henry L. Tosi et al., *How Much Does Performance Matter? A Meta-Analysis of CEO Pay Studies*, 26 J. MGMT. 301, 304–05 (2000).

27. *Id.*

28. Core et al., *supra* note 14.

29. *Id.*

30. Bebchuk et al., *supra* note 13, at 753–54.

31. *Id.*

32. George P. Baker, *Incentive Contracts and Performance Measurement*, 100 J. POL. ECON. 598, 599–600, 606 (1992); Tosi et al., *supra* note 26.

costs, and so incentive-based pay is not optimal.³³ Additionally, sometimes the potential size of equity compensation makes managers risk preferring to a degree that might have collateral consequences for the market or society in general.³⁴ When a firm is in financial distress, the hope of realizing significant returns from equity compensation may encourage managers to take bigger risks, hoping that big returns will repay the creditors and make the firm solvent, and the managers wealthy, again. Conflicts such as these have been blamed for the excessive risk taking that led to the recent financial crisis.³⁵

B. Proposals to Pay with Inside Debt

Shareholders are not the only investors in a firm. In addition to selling stock, firms also raise money by borrowing.³⁶ As we have just explained, when a firm is solvent, the conventional wisdom supports paying managers with equity to align their interests and risk profiles with shareholders.³⁷ When a firm is highly leveraged or experiencing financial trouble, the same reasoning might support paying managers with debt of the firm to align their interests with those of dominant creditors.³⁸ Commentators call this form of compensation “inside debt” because it is held by firm insiders.³⁹ We first consider inside debt in the typical firm and then financial firms in particular.

1. Inside Debt Compensation in Non-Financial Firms

Proponents argue that inside debt is efficient because it aligns creditor and managerial interests.⁴⁰ When bankruptcy threatens, managers might be tempted to take big gambles. If they lose, the firm fails, as it would have anyway; but if they win, they preserve their investments in the firm.⁴¹ Other managers might simply abandon the firm entirely. Both actions would seriously threaten the interests of creditors, who typically prefer to avoid risks. Since they are collectively guaranteed repayment in full as long as firm assets are adequate to cover debt, creditors want to avoid any bets that might result in losses in excess of that threshold.⁴² Tying managers’ pay to debt, under this theory, is supposed to make them particularly sensitive to liquidation value; they must steer the

33. Tosi et al., *supra* note 26.

34. Bebchuk & Spamann, *supra* note 3, at 250.

35. *Id.*

36. Gary Gorton & Andrew Winton, *Financial Intermediation*, in 1 A HANDBOOK OF THE ECONOMICS OF FINANCE 431, 433 (George M. Constantinides et al. eds., 2003).

37. Walker, *supra* note 13, at 236–37.

38. Barry Adler’s “Chameleon Equity” work supported this intuition by suggesting the replacement of shareholders with the reigning residual claimant and using that rotating equity system to obviate the need for bankruptcy. Barry Adler, *Financial and Political Theories of American Corporate Bankruptcy*, 45 STAN. L. REV. 311, 323 (1993). Similar reasoning underlies the Jensen and Meckling supposition that it might make sense to provide compensation packages to managers that combine the use of debt and equity. Jensen & Meckling, *supra* note 1, at 352.

39. Edmans & Liu, *supra* note 3, at 75 n.1.

40. See Sundaram & Yermack, *supra* note 6, at 1559–64 (discussing the ability of pensions to align managerial interests with those of creditors).

41. Tung, *supra* note 2.

42. Charles K. Whitehead, *Creditors and Debt Governance*, in RESEARCH HANDBOOK ON THE ECONOMICS OF CORPORATE LAW 68, 73 (Claire Hill & Brett McDonnell eds., 2011).

firm carefully enough to preserve money to pay off those debts.⁴³

While we are unaware of any significant real-world examples of executives being paid with debt instruments of their firms, both pensions and deferred compensation can be quite similar to paying with bonds. Because of U.S. tax law, firms have strong incentives to ensure that promises of future payments to their CEOs be paid from general corporate funds rather than, say, a segregated account that might be protected from the corporation's creditors.⁴⁴ As a result, in the event of a bankruptcy, a CEO still waiting for promised cash must stand in line with other creditors. So, pensions and deferred compensation, like other forms of debt compensation, arguably align managers' incentives with that of creditors by putting both in a similar economic position.

Pensions and deferred compensation are widespread. Two studies completed by Sundaram and Yermack, and Bebchuk and Jackson find that payment with pensions is widespread among various companies with varying degrees of financial health in different industries.⁴⁵

Bebchuk and Jackson argue that pensions are evidence not of optimal contracting, but rather of managerial power.⁴⁶ Because, until recently, companies did not have to disclose the value of pension benefits, it was difficult for investors to discern how much of an executive's compensation was due after his tenure with the firm ended and to what extent he was being paid with inside debt.⁴⁷ Bebchuk and Jackson argue that their finding of substantial pension awards in a large number and variety of firms provides evidence that investors would be grossly misled about the value of executive compensation if they were not informed about the value of pensions.⁴⁸ The fact that these large payments of inside debt to managers were disguised from the market, they claim, supports scholars' claims that inside debt compensation in the form of pensions is a product of managerial power rather than optimal contracting.⁴⁹ Indeed, if pensions were an effective way to align managers' interests with shareholders, firms would have voluntarily disclosed their use in order to enjoy the higher stock prices such good news for equity would have

43. Edmans & Liu, *supra* note 3, at 77; see Jensen & Meckling, *supra* note 1, at 334–35 (explaining why managers would take riskier bets than creditors prefer).

44. Daniel I. Halperin, *Interest in Disguise: Taxing the "Time Value of Money"*, 95 YALE L.J. 506, 520–23 (1986); see I.R.C. § 409A (2011) (setting out rules for taxation of deferred compensation). If this condition is met, a CEO can defer paying tax on promised future payouts until the time they are received. Deferral is very valuable because it means that the CEO can earn interest on the amount she would have paid in tax for the entire time her tax bill is deferred. If future payments are protected from other creditors, then the CEO must pay tax on the present value of the payment at the time the promise is made, sacrificing the value of deferral. To be clear, we should distinguish the form of "nonqualified" pension discussed here from the standard pensions most readers have experienced first-hand, pensions that are "qualified" for particularly favorable tax treatment. Lucian Arye Bebchuk & Jesse M. Fried, *Stealth Compensation via Retirement Benefits*, 1 BERKELEY BUS. L.J. 291, 302–03 (2004).

45. Lucian A. Bebchuk & Robert J. Jackson, Jr., *Executive Pensions*, 30 J. CORP. L. 823, 838 (2005); Sundaram & Yermack, *supra* note 6, at 1570.

46. Bebchuk & Jackson, *supra* note 45, at 829–31; see also LUCIAN BEBCHUK & JESSE FRIED, PAY WITHOUT PERFORMANCE: THE UNFULFILLED PROMISE OF EXECUTIVE COMPENSATION 98–99 (2004).

47. Bebchuk & Jackson, *supra* note 45, at 824–26.

48. *Id.*

49. *Id.*; Bebchuk et al., *supra* note 13, at 789 ("A large extraction of rents will not cause the executives or directors harm if it can be dressed, packaged, or hidden—in short, camouflaged—so that it is not readily apparent as such.").

attracted.⁵⁰

Finance scholars have disputed the claim that inside debt compensation is a form of managerial rent extraction, arguing that, in some limited circumstances, inside debt compensation can properly be seen as an example of optimal contracting.⁵¹ Edmans and Liu conclude that the use of inside debt to compensate managers makes sense when a firm is in or approaching bankruptcy, or when its liquidation value is important and sensitive to managers' decision making.⁵² They claim inside debt compensation is useful in these situations because, unlike alternatives such as promises of bonuses or increased salary, it gives managers incentives to increase the firm's liquidation value and provides incentives for greater effort when the firm nears insolvency.⁵³ They emphasize that effective inside debt should have the same priority in bankruptcy as the firm's relevant creditors.⁵⁴ In firms with different kinds of debt, managers would have to be compensated with a mix of inside debt that approximates the firm's capital structure in order for the debt compensation to be "effective," that is, to encourage the effort necessary to enhance the firm's liquidation value.⁵⁵

Similarly, Yair Listokin (writing before Edmans and Liu) suggests paying CEOs of corporate debtors in possession (DIPs)⁵⁶ with unsecured debt.⁵⁷ Listokin proposes granting CEOs a "vertical strip" of debt, meaning that the CEO would hold percentages of each level of unsecured debt.⁵⁸ Using a vertical strip of debt instead of granting the CEO a portion of the junior-most claims would ensure that the idiosyncratic interests of one creditor are not preferred at the expense of the class.⁵⁹ Listokin's goal is to encourage managers to enhance the value of the bankrupt firm by giving them a share of the residual recovery.⁶⁰ It is a way for the CEO to realize upside potential again after her equity stake is rendered worthless.

Scholars who responded directly to Listokin's article argued, though, that the agency costs in a bankruptcy case are too low to justify the cost of incentive pay.⁶¹ The bankruptcy court, the U.S. Trustee's Office of the Department of Justice, the creditors'

50. Bebhuk & Jackson, *supra* note 45, at 824–26.

51. Edmans & Liu, *supra* note 3.

52. *Id.* at 92 (“[T]he manager’s debt-to-equity ratio is increasing in his effect on the liquidation value and the probability of bankruptcy, and decreasing in growth opportunities.”).

53. *Id.* at 77–78.

54. *Id.* at 76.

55. *Id.* at 78.

56. A debtor in possession is a bankruptcy debtor under a reorganization chapter of the Bankruptcy Code who remains in possession and control of its assets. A corporate debtor is considered “in possession” if it is operated by duly appointed officers and directors and not under the direction of a bankruptcy trustee. 7-110 COLLIER ON BANKRUPTCY 1100.01 (16th ed. 2010).

57. Listokin, *supra* note 6, at 783.

58. *Id.* at 783, 785.

59. *Id.* at 785.

60. *Id.* at 783.

61. Adam J. Levitin, *The Problematic Case for Incentive Compensation in Bankruptcy*, 156 U. PA. L. REV. PENNUMBRA 88, 94 (2007), <http://www.pennumbra.com/responses/response.php?rid=18>; Jonathan C. Lipson, *Where’s the Beef? A Few Words About Paying for Performance in Bankruptcy*, 156 U. PA. L. REV. PENNUMBRA 64, 65 (2007), <http://www.pennumbra.com/responses/response.php?rid=20>; Robert K. Rasmussen, *On the Scope of Managerial Discretion in Chapter 11*, 156 U. PA. L. REV. PENNUMBRA 77, 78 (2007), <http://www.pennumbra.com/responses/response.php?rid=19>.

committee, DIP lenders, and secured creditors all closely supervise the executives managing chapter 11 debtors in possession.⁶² Any of the parties with power over the debtor in possession can move for the appointment of a trustee if they think the debtor's management is incompetent or disloyal, that is, if they think the appointment of a trustee would be in the best interests of the estate's parties in interest.⁶³ That threat will have much more of an impact on executive decision making than the amount of compensation an executive might realize from debt holdings after the conclusion of the reorganization.⁶⁴ Stakeholders designed incentive compensation to constrain the agency costs of executive decision making in situations where shareholders, the putative principals, could exercise very little direct oversight.⁶⁵ Bankruptcy does not present the same problems, so these scholars argue that incentive compensation may not be the right solution.⁶⁶

Moving beyond the insolvency scenario, the finance scholarship hypothesizes that paying managers with inside debt lowers the cost of credit for the firm because it lowers the agency costs of debt.⁶⁷ That would potentially make payment with inside debt useful in healthy firms as well. If creditors can expect managers to be more sympathetic to creditors' interests, then creditors will be more willing to loan money to the firm and will charge lower interest rates. It is theoretically possible that those savings in interest would compensate the firm, and so shareholders, for any change in managerial incentives.⁶⁸ If that were the case, there should not be a decline in equity correlated to the revelation of inside debt compensation. One study found that firms with significant, disclosed inside debt holdings by managers enjoyed increased bond prices, but also realized decreased equity prices upon revelation of the payment scheme.⁶⁹ Other findings suggest that managers receiving inside debt in the form of pensions manage the firm more conservatively as measured by distance-to-default.⁷⁰

These findings therefore set up an important conflict between the managerial power and efficient contracting theories we have mentioned. While Bebchuk and his various co-authors, among others, see pensions as evidence that managers hide rents from shareholders, inside debt proponents suggest instead that pensions may actually serve shareholder interests, and hence do not constitute evidence in favor of the managerial power hypothesis. We argue in the ensuing Parts that the efficient contracting story is less persuasive than supporters claim—and, by implication, that pensions may be hallmarks of managerial power.

62. See Lipson, *supra* note 61, at 70 (noting that corporate debtors are in a “fishbowl”).

63. 11 U.S.C. §§ 1104(a)–(b) (2011).

64. See Rasmussen, *supra* note 61, at 84 (arguing that the “threat of replacement” of a manager of a troubled or bankrupt company “casts a long shadow”).

65. *Id.* at 78–79.

66. Levitin, *supra* note 61, at 94–96; Lipson, *supra* note 61, at 70; Rasmussen, *supra* note 61, at 77–78 (pointing to the significant degree of creditor control before and during bankruptcy).

67. Edmans & Liu, *supra* note 3, at 90; Sundaram & Yermack, *supra* note 6, at 1583.

68. See Jensen & Meckling, *supra* note 1, at 312–13, 338 (explaining that owners of firms bear total agency costs of the firms' contracts).

69. Edmans & Liu, *supra* note 3, at 90.

70. Sundaram & Yermack, *supra* note 6, at 1555.

2. Inside Debt Compensation in Financial Firms

Shareholders and creditors are not always the only parties affected by managerial risk preferences. Excessive risk taking in financial firms bears much of the responsibility for the financial crisis in 2008–2009 and the consensus seems to be that that risk taking was exacerbated, if not encouraged, by equity compensation designed to align managers' interests with those of shareholders.⁷¹ Bebchuk and Spamann argue that particular attributes of financial firms' capital structures and executive compensation make those managers more likely to take excessive risks than managers of non-financial firms.⁷² As we will explain, financial firms are very similar to financially distressed or highly leveraged non-financial firms in terms of capital structure and managerial incentives, so it is not surprising to see scholars using similar reasoning to explain the usefulness of inside debt compensation for "systemically important" financial firms.

Banks tend to be more highly leveraged than non-financial firms, in part because a significant part of their business is deposits, which they treat as loans made to the bank.⁷³ This enhanced leverage makes banks more like troubled companies in their risk profiles, so creditor and shareholder interests and risk preferences diverge more dramatically than in healthy non-financial firms.⁷⁴ Shareholders are willing to take big gambles with creditors' money in the hopes of realizing big returns.⁷⁵

Unlike financially distressed non-financial firms, however, banks are not as carefully monitored or controlled by their creditors. Bank creditors do not have the same strong incentives to monitor or to insist upon or enforce the same kinds of restrictive loan covenants that creditors of non-financial firms demand.⁷⁶ For instance, depositors are protected by FDIC insurance, so they need not worry about monitoring bank executives.⁷⁷ The bailouts of the financial firms in 2009 enhanced the moral hazard problem and extended it to other bank creditors such as bondholders.⁷⁸ Government regulation could, theoretically, fill that gap, but government regulation of banks has declined in recent decades so that regulation may not be as effective as typical creditor monitoring.⁷⁹ Therefore, with banks, we see the usual agency problems that confront non-financial firms when they near insolvency, but the banks' capital structures and corporate governance schemes do not provide the same protections provided by non-

71. Bebchuk & Spamann, *supra* note 3, at 249–52; John C. Coffee, Jr. & Hillary A. Sale, *Redesigning the SEC: Does the Treasury Have a Better Idea?*, 95 VA. L. REV. 707, 729–30 (2009); Jeff N. Gordon, "Say on Pay": Cautionary Notes on the U.K. Experience and the Case for Shareholder Opt-in, 46 HARV. J. ON LEGIS. 323, 363–64 (2009).

72. Bebchuk & Spamann, *supra* note 3, at 258–61 (detailing the capital structures of bank and bank holding companies and how that affects managerial incentives).

73. *Id.* at 251–52.

74. John C. Coffee, Jr., *Systemic Risk After Dodd–Frank: Contingent Capital and the Need for Regulatory Strategies Beyond Oversight*, 111 COLUM. L. REV. 795, 803–04 (2011) (explaining that financial firms lack the equity cushion that would enable them to absorb some losses); Tung, *supra* note 2, at 1206, 1210.

75. Tung, *supra* note 2, at 1211–12; Coffee & Sale, *supra* note 71, at 799. This point is made clearly by Chancellor Allen in *Credit Lyonnais Bank Nederland, N.V. v. Pathe Commc'ns Corp.*, Civ. A. No. 12150, 1991 WL 277613, at *34 n.55 (Del. Ch. Dec. 30, 1991).

76. Bebchuk & Spamann, *supra* note 3, at 266.

77. *Id.* at 256–57.

78. *Id.* at 266.

79. Tung, *supra* note 2, at 1215–16.

financial firms. Bebchuk and Spamann argue that the moral hazard problem and resulting lack of creditor control allow shareholders to be the dominant influence on managers.⁸⁰ Thus, they in effect claim that agency costs in financial firms remain high, unlike in bankruptcy.

Because shareholders of a financial firm, like shareholders of a highly leveraged non-financial firm, do not have much at stake, they have incentives to take significant risks. Shareholders have very little downside exposure in such a highly leveraged firm because they are able to borrow the money the bank will invest. Further, to the extent those shareholders are heavily invested in the financial firm and not diversified across the economy, they are shielded from the systemic risks financial firm behavior can cause.⁸¹ If financial firm managers are compensated with equity, they are similarly protected from the consequences of risk taking. Managers thus shielded from risk can impose significant societal costs. Societal cost is an important issue when considering the incentives of bank executives because taxpayers bear the cost of failing banks, either through the payment of FDIC insurance or, more drastically, through government bailouts.⁸² Taxpayers, like shareholders, are rationally ignorant of bank financing and do not monitor the bank or its regulator closely, again leaving agency costs high.⁸³

Because the problem with the governance of banks seems to be excessive risk taking and executive compensation, and the incentives of bank executives seem to be largely responsible for that problem, legal scholars have sensibly turned to those areas to suggest reforms. Particularly, those scholars have suggested that banks structure the compensation of their executives to align the executives' interests more closely with creditors in order to balance against the strong incentives executives have to take excessive risk.⁸⁴ In this regard, the scholars advocating inside debt compensation in financial firms appear to avoid the criticisms leveled against Listokin's proposal—agency costs in financial firms are indeed high. These scholars claim that compensating bank executives with debt securities would make them more risk averse by removing the possibility of large upside gains.⁸⁵

While the scholars considering executive compensation in financial firms agree about how to frame the problem, they have proposed different solutions. Bebchuk and Spamann suggest tying compensation to a basket of securities much broader than a bank or holding company's common stock.⁸⁶ They argue that compensation should reflect the value of preferred shares and bonds rather than just common stock.⁸⁷ Further, if executives receive bonuses based on particular accounting metrics, Bebchuk and Spamann argue that the banks should choose metrics that reflect the interests of preferred shareholders and bondholders.⁸⁸ Fred Tung suggests that banks pay their executives of

80. Bebchuk & Spamann, *supra* note 3, at 255–56.

81. Gordon, *supra* note 3, at 6.

82. Bebchuk & Spamann, *supra* note 3, at 255–57 (explaining the moral hazard problem in banks).

83. See Bernard Caillaud & Jean Tirole, *Parties as Political Intermediaries*, 117 Q.J. ECON. 1453, 1453 (2002) (describing rational ignorance theory).

84. Bebchuk & Spamann, *supra* note 3, at 269; Gordon, *supra* note 3, at 1; Tung, *supra* note 2, at 1216.

85. Bebchuk & Spamann, *supra* note 3, at 260; Tung, *supra* note 2, at 1207–08.

86. Bebchuk & Spamann, *supra* note 3, at 253.

87. *Id.* at 284.

88. *Id.*

financial firms with “their bank’s publicly traded subordinated debt securities.”⁸⁹ In a liquidation, this debt would be paid after depositors and other creditors are paid in full but before shareholders are paid.

In a way, Jeffrey Gordon’s proposal picks up where Tung’s leaves off. Gordon also advocates paying the executives of financial firms with subordinated debt, but rather than paying managers with a mix of securities that includes inside debt throughout the life of the firm, he suggests paying managers with convertible equity securities.⁹⁰ These equity securities would convert to subordinated debt upon the occurrence of particular indications of financial distress.⁹¹

Of course, there are important differences in detail between these proposals, but for our purposes, they share two common assumptions. First, all three presume that paying managers with debt would in fact shift managerial preferences for risk in the desired direction. Second, each implicitly assumes that the societal gains of those altered risk preferences will exceed any efficiency costs of inside debt. We argue in the ensuing Parts that neither of these assumptions is beyond doubt.

III. WHY COMPENSATION WITH INSIDE DEBT IS INEFFICIENT

Even accepting the premises of the scholars advocating the use of inside debt compensation, we think their arguments fall short for several reasons. First, inside debt compensation appears unnecessary in light of other options for protecting creditor interests. Second, unless perfectly calibrated, inside debt compensation will misalign managerial incentives and, even if it is perfectly calibrated, it may provide perverse incentives by giving managers downside protection they would not already have. Third, inside debt compensation imposes legacy costs as the corporation’s capital structure changes. To the extent inside debt compensation is inflexible, debt incentives may remain for managers after the corporation’s use of debt has declined or been eliminated. Further, adjusting the effects of inside debt compensation after the fact not only increases the complexity of the compensation scheme, but may significantly increase overall compensation and make it more difficult to calculate on an annual basis.

A. Inferior to Alternatives

Our first objection to inside debt is that, in most settings, it seems inferior to alternative tools for aligning managers’ interests with creditors. One of the most basic of these alternative tools is managers’ own risk aversion. As we have explained, a central concern of both ordinary creditors and guarantors of financial firms is that managers will take excess risk. However, there are already many factors that tend to keep management relatively risk averse: salary, reputation, undiversified human capital, and shareholder pressure for long term growth.⁹² Managers become risk seeking mostly because firms use equity and option compensation to reduce the agency costs for shareholders with short-

89. Tung, *supra* note 2, at 1207.

90. Gordon, *supra* note 3, at 8.

91. *Id.*

92. Brian J. Hall & Kevin J. Murphy, *Optimal Exercise Prices for Executive Stock Options*, 90 AM. ECON. REV. 209, 211 (2000) (discussing exercise-price policy for stock option compensation).

term profit goals.⁹³ In effect, inside debt is necessary principally to moderate risk preferences where the firm has already chosen to pay managers to be risk seeking.

If this diagnosis is accurate, it suggests that inside debt is a relatively wasteful route to risk aversion. Firms could obtain the same outcomes by moderating their equity-based compensation.⁹⁴ Both alternatives require a tradeoff between creditor and shareholder agency costs, but one involves reducing expenditures on pay while the other increases it. As a solution to the systemic risk problem, adding inside debt is likely to be politically popular with managers because it enriches them, but it is not clear that is a reason to favor it.⁹⁵

For non-financial firms, the agency costs of debt are low, even outside of bankruptcy, because of contractual protections creditors reserve in loan agreements. Covenants are one example. Some common covenants allow creditors to bar firms from transferring their assets, distributing them to shareholders, or taking on large debt with a superior priority to the existing loan—all events that would reduce the value of the credit instrument.⁹⁶ Institutional creditors, such as groups of banks, have strong covenants that give them significant control over corporate spending and decision making once the corporation reaches a particular level of financial distress.⁹⁷ Another example is secured credit. Secured creditors can protect themselves by foreclosing or threatening to foreclose on their collateral.⁹⁸ They may even be able to control the corporation's use of its income to the extent they have security interests in accounts receivable or other cash collateral.⁹⁹ Dispersed bondholders may also have a designated representative enforcing particular covenants and performing important monitoring on their behalf.¹⁰⁰

The low agency costs of credit imply that inside debt is likely not optimal. As explained earlier, incentive-based compensation is needlessly costly when direct monitoring is feasible.¹⁰¹ So, just as in bankruptcy itself, inside debt would be merely cumulative to existing contractual protections creditors wield. And the firm's likely need for future credit gives lenders power to extract change even absent covenants.¹⁰²

Edmans and Liu suggest, however, that covenants may be an imperfect way of lowering agency costs because managers may make decisions for the sole purpose of

93. Jensen & Meckling, *supra* note 1, at 352; Murphy, *supra* note 1, at 857–60.

94. Indeed, this point is already well-understood in the finance literature. *See generally* Teresa John & Kose John, *Top-Management Compensation and Capital Structure*, 48 J. FIN. 949 (1993) (discussing equity-based compensation).

95. For more extensive discussion of this tradeoff, see Brian Galle, *The Tragedy of the Carrots: Economics and Politics in the Choice of Price Instruments*, 64 STAN. L. REV. 797, 847–49 (2012).

96. Chenyang Wei, *Covenant Protection, Credit Spread Dynamics and Managerial Incentives* 2 (Nov. 29, 2005) (unpublished manuscript), available at http://pages.stern.nyu.edu/~cwei/JobMarket_CovenantsSpread_CEOIncentive_ChenyangWei.pdf.

97. Douglas G. Baird & Robert K. Rasmussen, *Private Debt and the Missing Lever of Corporate Governance*, 154 U. PA. L. REV. 1209, 1226–28 (2006).

98. Douglas G. Baird & M. Todd Henderson, *Other Peoples' Money*, 60 STAN. L. REV. 1309, 1333 (2008).

99. Robert E. Scott, *A Relational Theory of Secured Financing*, 86 COLUM. L. REV. 901, 926–27 (1986).

100. WILLIAM A. KLEIN & JOHN C. COFFEE, JR., *BUSINESS ORGANIZATION AND FINANCE: LEGAL AND ECONOMIC PRINCIPLES* 255 (9th ed. 2004).

101. *See supra* notes 32–34.

102. Whitehead, *supra* note 42, at 69.

avoiding a covenant violation and covenants may be irrevocably violated.¹⁰³ It is true that covenants themselves lack the flexibility that mechanisms like fiduciary duties or incentive compensation can provide, but much of their strength is in the ability creditors have to waive the enforcement of covenants if other concessions are made.¹⁰⁴ For instance, a creditor can choose not to declare a default if the corporation agrees to hire a reorganization officer. This bargaining in the shadow of the covenant offers more flexibility and more room for managerial input than Edmans and Liu appear to assume.

An additional way in which covenants are preferable to inside debt is their predictability.¹⁰⁵ Through covenants, creditors may dictate what powers they will have over corporate decision making, at what times, what corporate decisions they may veto, and what assets they have special rights to.¹⁰⁶ Covenants allow creditors to protect the negotiated-for relative priority of their claims, so that by comparing available assets to claims they can predict the consequences of insolvency and default.¹⁰⁷ Incentive pay is relatively more opaque because it depends on personal characteristics of the manager, many of which are states of the manager's mind or external factors that change over time.

Admittedly, the market's widespread use of covenants does raise questions about whether managerial risk aversion alone is an adequate protection for creditors and guarantors of financial firms, where covenants may be infeasible.¹⁰⁸ There is evidence, though, that covenants are substitutes for curtailing option pay—that is, that either route is effective at protecting creditors.¹⁰⁹ Covenants may be more popular than reducing incentive compensation where feasible because they allow shareholders to free ride on creditors who monitor credit terms.¹¹⁰ Or the combination of covenants and option pay may result from the influence of managers who would otherwise face lower total compensation.

Another disadvantage of inside debt relative to other options is that it imposes cross-monitoring costs if the inside debt is not perfectly calibrated. If, for instance, inside debt compensation aligns managerial interests with the most junior tranche of public debt, creditors who are senior to that level of debt will have to take the new managerial incentives into account in their agreements with the firm. If inside debt compensation is designed to incentivize managers to increase the firm's liquidation value, so as to engage in risks designed to enhance the value of the firm after insolvency, it might influence managers' decision making by encouraging decisions that are riskier than senior creditors would prefer. Rational senior creditors would adjust their rights and covenants in order to

103. Edmans & Liu, *supra* note 3, at 83.

104. Baird & Rasmussen, *supra* note 97.

105. On the costs of uncertainty in monitoring contracts, see Jensen & Meckling, *supra* note 1, at 325 n.27.

106. Baird & Rasmussen, *supra* note 97; Kelli A. Alces, *Strategic Governance*, 50 ARIZ. L. REV. 1053, 1074–75 (2008) (discussing particular loan covenants in a credit agreement between a consortium of banks and Visteon Corp.).

107. Baird & Henderson, *supra* note 98, at 1332–33.

108. Covenants are probably rare in the financial firm setting because the effective creditors are largely taxpayers and small depositors, who cannot easily negotiate, monitor, and enforce complex contracts with banks.

109. See Wei, *supra* note 96, at 3–4 (finding that increased covenant protection mitigates the credit cost of option compensation).

110. Whitehead, *supra* note 42, at 75.

counteract those incentives. Such adjustments are difficult because the effects of compensation incentives are less predictable than the direct mandates of covenants. This problem of cross-monitoring, where different creditor interests will have to work harder to monitor management as managerial incentives change and will have to adjust their powers and positions within the capital structure accordingly, introduces costs that may overwhelm whatever gains could be realized by lowering managers' risk profiles.

Listokin's suggestion that managers of bankrupt firms should be paid with a "vertical strip" of unsecured debt¹¹¹ could be expanded in a way that would allow inside debt compensation to overcome the cross-monitoring objection. If managers were paid with a "vertical strip" of the firm's debt, even outside of bankruptcy, managers would have a pay package that aligned their incentives proportionately with every level of debt. Indeed, managers could receive a package of incentive compensation that perfectly approximates the corporation's entire capital structure, thereby having incentives perfectly aligned with the corporation as a whole. A firm could realize the same effect by paying managers according to a bonus structure that approximates the firm's capital structure.

We argue that these alternatives would not be optimal forms of compensation. As argued in Part IV, managers are unlikely to figure out how each decision will affect their personal compensation package when there are so many variables in play.¹¹² Further, expanding incentive-based pay to cover yet more stakeholders is likely to further increase the premium paid to the manager for increasing firm-specific risk. And, in any event, Listokin's solution does not help defenders of inside debt justify its current practice. In reality, the only inside debt firms use are pensions and deferred compensation, both of which are unsecured and highly long-term obligations, leaving secured and short-term creditors unprotected.

B. Misaligns Incentives

Even if inside debt were not costlier than its alternatives, it would be less desirable because of its potential to shield managers excessively from the costs of their decisions. Of course, if inside debt compensation is too senior such that it is "received in all states of nature," then it will not encourage managers to protect creditors because the managers' pay is not meaningfully at risk.¹¹³ Any fixed payment that an executive will receive in bankruptcy ahead of other creditors, such as salary, will be too senior to be effective payment of inside debt.¹¹⁴ The main point here is more subtle, though. In many instances, inside debt may be guaranteed or manipulated, leaving managers in an effectively senior position, and therefore also leaving them with sub-optimal incentives to protect other stakeholder interests.

For example, the seniority problem implies that inside debt is unlikely to solve the problem of excessive risk in financial firms. If managers stand in the shoes of creditors,

111. Listokin, *supra* note 6, at 783.

112. See *infra* Part IV (examining the behavioral theory of complex pay packages and its possible effect decisions of executives).

113. Edmans & Liu, *supra* note 3, at 83.

114. See Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 209 (2008) (explaining moral hazard of bank regulation).

government guarantees create moral hazard for managers the same as for any other lender who expects a bailout.¹¹⁵ That is, if the government insures managers (together with other creditors) against downside risk but leaves them with some potential upside, managers will strongly prefer risk.¹¹⁶ On the other hand, if there is limited or no protection for those holding bank bonds, then inside debt compensation may indeed encourage risk aversion. If that were true, though bondholders, no longer guaranteed a payment, would have reason to monitor management. The argument that financial firms are fundamentally different from non-financial firms then falters.

A compromise between these two extremes could be to adopt a rule that *managers'* claims would not be insured or bailed out by the government. But this fails too, because then those claims would be too junior to align managers' interests perfectly with any class of creditors. If the inside debt used to pay managers is too junior, it will too closely resemble stock and will not have significantly different incentive effects than equity compensation. True, the upside of junior debt is limited in a way the upside potential of equity is not. But, if a firm is insolvent and not able to pay its junior-most creditors in full, giving managers claims below that level will give them incentives to take risks in order to receive something rather than nothing. Edmans and Liu point out that if a particular kind of compensation will not survive insolvency at all, such as solvency-dependent bonuses, that form of payment will not have the good incentive effects inside debt is supposed to have.¹¹⁷ In order to have the effects its proponents recommend, inside debt compensation cannot be either too senior or too junior; rather, it must be "just right."

It may be that the problem with financial firm governance is not risk taking per se, but instead that creditors do not have sufficient incentives to monitor because the government guarantees their claims. If so, then giving managers creditor claims would not solve the problem. Inside debt substitutes for direct creditor control,¹¹⁸ so use of inside debt reduces monitoring.

In similar fashion, if managers can control the seniority of their compensation then inside debt can actually lead to more risk taking than creditors would prefer. We argue that inside debt allows managers to hedge against their equity compensation and holdings by affording them downside protection. Without debt compensation, if a manager caused the firm to take an improvident risk, she might lose all of the equity value she held in the firm. With debt compensation, that manager is still paid at least the amount of her inside debt, allowing her to take more risks than she otherwise would.¹¹⁹

115. *Id.*

116. Gordon's proposal arguably mitigates this problem by converting manager equity to debt, reducing the possibility for upside gains. *See* Gordon, *supra* note 3 (proposing a new compensation mechanism in which managers' equity is connected to debt in order to help reduce risk). But managers can still collect bonuses for successful wagers. Perhaps a theoretically more appealing approach would be for the government explicitly to deny bailout protection for managers or creditors. However, that would put managers in a different risk position than other creditors, introducing new agency costs. It is unclear if it would be politically feasible in any event.

117. Edmans & Liu, *supra* note 3, at 77.

118. Cong Wang et al., Managerial Ownership of Debt and Bank Loan Contracting 4 (Nov. 29, 2010) (unpublished manuscript), available at <http://ssrn.com/abstract=1703473>. Admittedly, though, if monitoring is already very low, and inside debt improves managerial behavior in some other way, inside debt might be better than nothing.

119. *See* David M. Schizer, *Executives and Hedging: The Fragile Legal Foundation of Incentive Compatibility*, 100 COLUM. L. REV. 440, 453 (2000) (explaining that hedged compensation no longer serves a

Of course, the value of this hedge is much diminished if managers must stand in line with other creditors to state their claims, but it turns out that is not always the case. While Sundaram and Yermack point out that executive pensions are “unsecured, unfunded debt claims” that would “stand in line with other unsecured creditors,”¹²⁰ work by other scholars suggests that those pensions may actually trump the claims of other creditors in bankruptcy. Bebchuk and Jackson report that firms often allow executives to take a one-time cash payout of the actuarial value of their pensions, and that companies often assume executive pension obligations in full in bankruptcy even when other creditor claims are left unpaid.¹²¹ Because the manager is effectively senior to creditors, she is not actually aligned with their interests.

In essence, the downside protection story may be another instance of managerial power. The promise of a more balanced level of risk taking might lull shareholders and board members into a false sense that inside debt adequately constrains agency costs. In practice, inside debt appears at least as likely to protect managers from the full costs of their mistakes, risk taking, or poor judgment.

The secret seniority of inside debt may also allow managers to extract higher pay than they otherwise could. Managers cannot typically publicly hedge against their inside equity positions because of the negative signal that would send to the market, among other reasons.¹²² Compensation theorists argue that managers are paid a premium to offset this inability to diversify their firm-specific risk.¹²³ By concealing the extent of the true seniority of their pensions, managers can get the best of both worlds: they get paid a premium for taking on firm-specific risk, while in fact hedging away much of that risk. To be sure, perfectly rational boards negotiating with managers would likely anticipate hedging behavior. But rationally ignorant shareholders or other observers likely would not—thus, allowing boards captured by their CEO to use firm-specific risk as a rhetorical prop for higher pay.

Lastly, scholars supporting the use of subordinated debt securities to compensate the managers of financial firms claim to have discovered the “just right” balance between seniority and juniority of debt incentives. These scholars propose to give executives publicly traded debt securities at the right level of subordination to mitigate the strong risk preference caused by bank holding-company equity compensation.¹²⁴ Sensitivity to the market price of the inside debt security should act to influence managerial decision making even before the bond matures.¹²⁵ Gordon argues that cutting off the upside provided by equity compensation and replacing it with debt securities will give managers the right incentives to maximize corporate value in bankruptcy or through a period of insolvency without bankruptcy.¹²⁶

risk-altering function).

120. Sundaram & Yermack, *supra* note 6, at 1560.

121. Bebchuk & Jackson, *supra* note 45, at 831; *see also* Bebchuk & Fried, *supra* note 44, at 309 (describing firms that have used outside insurers to guarantee executive pensions in the event of looming insolvency).

122. Murphy, *supra* note 1, at 865; Schizer, *supra* note 119, at 474–94.

123. Murphy, *supra* note 1, at 865.

124. Gordon, *supra* note 3, at 11; Tung, *supra* note 2, at 1207–08.

125. Tung, *supra* note 2, at 1227–29.

126. Gordon, *supra* note 3, at 11.

Even if a compensation scheme cuts off the upside potential of equity compensation, as Gordon's does, giving managers shares of publicly traded debt or well-assured pension entitlements provides downside protection, a benefit shareholders do not enjoy. Because inside debt, whatever its level of seniority, increases the odds of a soft landing for executives, it will still likely misalign their incentives. An attempt to balance managers' risk preferences and incentives actually gives managers the best of both worlds and allows them to hedge against the risks of each position.

C. Inefficient Way to Adjust Incentives as Firm Changes

A final set of problems facing even fully rational actors relates to what we call the legacy costs of inside debt. Those who advocate the use of inside debt as a form of efficient contracting concede that it is only useful in certain circumstances.¹²⁷ A corporation's capital structure changes over time, moving through periods of relative financial health and distress. A firm might be highly leveraged at one point and then pay the debt off and have relatively few debt obligations at another point.

However, the forms of inside debt used and proposed, particularly pensions and debt securities, are not short-term, or even necessarily temporary forms of compensation. Pension obligations can last for the rest of an executive's life. If a firm grants a manager bonds with a maturity date of four years, that form of compensation continues for four years even if the firm's circumstances might change in the meantime. Even in perpetually highly leveraged firms or financial firms circumstances may change, the kinds of debt issued may differ, and debt covenants themselves may change as different investors enter the firm.¹²⁸

It appears that firms commonly deal with this problem by "re-balancing." In order to correct for the residual incentive effects of inside debt, firms add countervailing equity compensation.¹²⁹ For example, Jack Welch, the CEO of General Electric, received hundreds of millions in equity compensation as he neared retirement, apparently in order to offset the effects of massive gains in the expected value of his pension.¹³⁰ This is a puzzle. By simple math, it is cheaper to increase risk seeking by buying out the manager's existing inside debt than by adding equity.¹³¹ Perhaps this is another instance of managerial power. Or there may be other explanations, such as endowment effects or the framing of losses making buy-outs prohibitively expensive, tax timing effects, or

127. See *supra* Part II.B.

128. See John E. Core et al., *Executive Equity Compensation and Incentives: A Survey*, 9 ECON. POL'Y REV. 27, 34-35, 39 (2003) (observing that transaction costs may create slack between optimal and actual contracts and explaining the effect of changing CEO wealth on optimal incentive contracts).

129. Sundaram & Yermack, *supra* note 6, at 1553.

130. *Id.*

131. This is because buying out debt reduces the total outstanding value of securities in the denominator of the executive's personal debt to equity ratio. In contrast, adding more stock increases the denominator, further increasing the amount of stock that must be given. For instance, suppose the CEO has a debt-equity ratio of \$40 million debt to \$60 million equity and we want the ratio to be 30 to 70. If we buy out debt, we must repurchase \$14.3 million to get to 70% equity, or \$60 million out of \$85.7 million total (for those who remember ninth grade algebra, we set $60/x$ equal to $70/100$ and cross-multiply). If we add new equity, we would have to give our CEO more than twice as much, or \$33.33 million. The \$33.33 million is necessary to get to 70% equity: \$93.3 million out of \$133.33 million.

accounting. Whatever the reason, rebalancing adds to the costs of inside debt. Even buyouts, if firms actually pursued them, would add to the transaction costs of incentive pay. Another implication of rebalancing is that it leads to ever more complex pay structures. This piling of multiple layers of compensation has implications for the efficacy of any one incentive, as we detail in the next Part.

IV. A BEHAVIORAL THEORY OF COGNITIVELY COMPLEX PAY PACKAGES

Another major reason we are skeptical of the usefulness of paying managers with the firm's debt is that it is unclear whether such pay actually leads managers to protect the interests of creditors. Typically, a firm that uses some inside debt also pays the manager using a mix of salary, stock, options of varying values and exercise dates, and other perquisites and benefits.¹³² The manager also has her personal reputation at stake.¹³³ Taken together, the manager's net bundle of compensation represents a widely varying set of risks, rewards, and incentives.

The psychological literature suggests that complexity of such a degree is often overwhelming even to the most sophisticated economic actors. As the complexity of human decisions increases, our ability to make good decisions, or even to make decisions at all, comes increasingly under stress. Managers are not immune to this phenomenon, and may even be especially vulnerable to it. As a result, adding various forms of inside debt to a manager's pay portfolio may simply increase the randomness of her decisions.

To make a case for that view, we must first review what is known about how humans respond to complex incentives in general. We then return to executives and inside debt.

A. Bounded Rationality and Cognition

Humans have a limited ability to carry out complex mental tasks. That limitation, in turn, circumscribes our responsiveness to outside incentives. As Herbert Simon put it, we are "boundedly rational"—we can maximize our own self-interest, but only within the limits of our ability to understand what that self-interest entails.¹³⁴ One way of modeling these limits is to suppose that cognition is costly or time consuming, making it a scarce resource whose consumption must be balanced against other potential gains and losses.¹³⁵

If decision making is itself a scarce resource, then it follows that decision makers will economize on decisions. If the gains from a large investment in decision effort are small, it might be better not to decide.¹³⁶ Alternatively, as Simon suggests, the decider

132. See *infra* Part VIII (providing a statistical overview of CEO compensation of large publicly traded firms).

133. David Hirshleifer & Anjan V. Thakor, *Managerial Conservatism, Project Choice, and Debt*, 5 REV. FIN. STUD. 437, 437–70 (1992).

134. Herbert Simon, *Invariants of Human Behavior*, 41 ANN. REV. PSYCHOL. 1, 6 (1990).

135. JONATHAN BARON, THINKING AND DECIDING 54 (3d ed. 2000); Hans Gottinger, *Computational Costs and Bounded Rationality*, in STUDIES IN CONTEMPORARY ECONOMICS 223, 223–24 (Wolfgang Stegmüller et al. eds., 1982); John Conlisk, *Why Bounded Rationality?*, 34 J. ECON. LITERATURE 669, 671 (1996); Roy Radner, *Bounded Rationality, Indeterminacy, and the Theory of the Firm*, 106 ECON. J. 1360, 1363 (1996).

136. Eirik G. Furubotn, *The New Institutional Economics and the Theory of the Firm*, 45 J. ECON. BEHAV.

might “satisfice,” or make some decision that is cheaper than a full analysis but good enough to exclude the worst possible outcomes.¹³⁷

Though so far we have framed bounded rationality as itself the result of a fully rational cost-benefit analysis, there is also extensive evidence that humans engage in “satisficing” behavior unconsciously, as part of the brain’s effort to reconcile the demands of decisions with its own limited capacity.¹³⁸ Most readers are likely familiar with the concept of “heuristics,” or mental shortcuts, that humans use in order to reach acceptable decisions under a state of incomplete information.¹³⁹ For instance, we often assume that the status quo is right, that the information that is readily available to our conscious mind is the information we need to make a decision, and that the proper scope of the factors that influence a decision are the ones we can hold in our heads at one time.¹⁴⁰ The literature typically describes these effects as the status quo bias, the availability bias, and the framing effect, respectively.¹⁴¹ We are also highly attached to the first conclusion we reach, a phenomenon known as “anchoring.”¹⁴²

As the rational choice model suggests, the more demands we put on our brains, the larger a role satisficing and heuristics play in our decisions.¹⁴³ Many studies report that the brain is distracted by multi-tasking, and operates at lower efficiency for each additional task it is assigned.¹⁴⁴ When experimental subjects face complicated sets of incentives, they tend to rely only on the most important.¹⁴⁵ Time pressure increases subjects’ reliance on heuristics.¹⁴⁶ In some cases, as the demands of decision grow larger,

& ORG. 133, 137–38, 143 (2001); cf. George J. Stigler, *The Economics of Information*, 69 J. POL. ECON. 213, 213–25 (1961) (modeling optimal investment in search for information).

137. Herbert A. Simon, *A Behavioral Model of Rational Choice*, 69 Q.J. ECON. 99, 104 (1955); see Simon, *supra* note 134, at 9 (explaining heuristic search and describing satisficing as a “weak method,” which “[uses] experience to construct an expectation of how good a solution we might reasonably achieve, and halt[s] search as soon as a solution is reached that meets the expectation”).

138. Simon, *supra* note 134, at 9–10.

139. *Id.* at 9; Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 27 SCI. 1124, 1224–31 (1974). For Kahneman’s accessible summary, see Daniel Kahneman, *Maps of Bounded Rationality: Psychology for Behavioral Economics*, 93 AM. ECON. REV. 1449, 1449–70 (2003).

140. Kahneman, *supra* note 139, at 1458–59; David Laibson & Richard Zeckhauser, *Amos Tversky and the Ascent of Behavioral Economics*, 16 J. RISK & UNCERTAINTY 7, 9–14 (1998).

141. Kahneman, *supra* note 139, at 1449; Laibson & Zeckhauser, *supra* note 140, at 9–14.

142. BARON, *supra* note 135, at 375–76, 468; Laibson & Zeckhauser, *supra* note 140, at 23–24.

143. RICHARD THALER, *QUASI-RATIONAL ECONOMICS* 3–5 (1994); Stanley F. Biggs et al., *The Effects of Task Size and Similarity on the Decision Behavior of Bank Loan Officers*, 31 MGMT. SCI. 970, 974–76 (1985); Furubotn, *supra* note 136, at 143; Ellen C. Garbarino & Julie A. Edell, *Cognitive Effort, Affect, and Choice*, 24 J. CONSUMER RES. 147, 148 (1997); see Kahneman, *supra* note 139, at 1463, 1467 (reporting connection between time pressure or multiple tasks and mental errors); Hean Tat Keh et al., *Opportunity Evaluation Under Risky Conditions: The Cognitive Processes of Entrepreneurs*, ENTREPRENEURSHIP THEORY & PRAC., Winter 2002, at 125, 127 (tying entrepreneurial use of heuristics to lack of information and short period for decisions).

144. BARON, *supra* note 135, at 215–16; Daniel T. Gilbert & Randall E. Osborne, *Thinking Backward: Some Curable and Incurable Consequences of Cognitive Busyness*, 57 J. PERSONALITY & SOC. PSYCHOL. 940, 940 (1989).

145. Eldar Shafir et al., *Reason-Based Choice*, 49 COGNITION 11, 33 (1993); Paul Slovic, *Choice Between Equally Valued Alternatives*, 1 J. EXPERIMENTAL PSYCHOL.: HUMAN PERCEPTION & PERFORMANCE 280, 280–87 (1975); Amos Tversky et al., *Contingent Weighting in Judgment and Choice*, 95 PSYCHOL. REV. 371, 372–84 (1988).

146. BARON, *supra* note 135, at 215–16; Kahneman, *supra* note 139, at 1463, 1467.

we may abandon choice altogether.¹⁴⁷

B. Bounded Rationality and Investment Decisions

Although the literature we have just reviewed is extremely familiar to scholars of behavioral economics, it has so far never been applied directly to the question of the efficacy of incentive-based compensation. There is, though, a fairly near analogue: the behavior of individuals managing their own household portfolio.

Evidence from household finance and other consumer decisions suggests that the transaction costs of discerning one's own financial self-interest are very substantial, and that as a result, consumers sometimes avoid making important decisions.¹⁴⁸ Household investors are overwhelmed by complexity.¹⁴⁹ Planning for retirement is a very difficult task; the household has to decide how risk seeking it will be based on its projected needs, its current resources, the available set of current and future investments, inflation, and similar factors.¹⁵⁰ Not surprisingly, then, researchers find that the larger the set of options for retirement investments, the less likely an average worker is to choose any of them at all.¹⁵¹ Moving beyond investment products, many studies find that as the number of complex options increases, the less likely consumers are to choose any one of them.¹⁵²

147. Simona Botti & Sheena S. Iyengar, *The Dark Side of Choice: When Choice Impairs Social Welfare*, 25 J. PUB. POL'Y & MARKETING 24, 26–27 (2006).

148. Shlomo Benartzi & Richard Thaler, *Heuristics and Biases in Retirement Savings Behavior*, 21 J. ECON. PERSP. 81, 82–84 (2007); Hersh Shefrin, *Behavioralizing Finance*, 4 FOUND. & TRENDS FIN. 1, 25–26 (2009).

149. See Conlisk, *supra* note 135, at 672 (summarizing other studies on inability of households to plan their finances); Annamaria Lusardi & Olivia S. Mitchell, *How Ordinary Consumers Make Complex Economic Decisions: Financial Literacy and Retirement Readiness 1* (Nat'l Bureau of Econ. Research, Working Paper No. 15350, Sept. 2009), available at www.nber.org/papers/w15350.pdf?new_window=1 (reporting survey evidence that households are poorly prepared to make the complex financial decisions they regularly face). For an accessible overview, see Troy Paredes, *Blinded by the Light: Information Overload and Its Consequences for Securities Regulation*, 81 WASH. U. L.Q. 417, 439–44 (2003).

150. Lans Bovenberg et al., *Saving and Investing over the Life Cycle and the Role of Collective Pension Funds*, 155 DE ECONOMIST 347, 369 (2007); Lusardi & Mitchell, *supra* note 149, at 4.

151. Sheena S. Iyengar et al., *How Much Choice Is Too Much: Determinants of Individual Contributions in 401K Retirement Plans*, in PENSION DESIGN AND STRUCTURE: NEW LESSONS FROM BEHAVIORAL FINANCE 83, 83–97 (Olivia S. Mitchell & Steven Utkus eds., 2004). Similarly, researchers find a familiarity effect, in which workers are more likely to participate in a retirement plan if it offers an option to invest in “known” investments such as the company's stock. Gur Huberman et al., *Defined Contribution Pension Plans: Determinants of Participation and Contribution Rates*, 31 J. FIN. SERVICE RES. 1, 3 (2007).

152. John T. Gourville & Dilip Soman, *Overchoice and Assortment Type: When and Why Variety Backfires*, 24 MARKETING SCI. 382, 386–93 (2005) (using microwaves, cameras, and golf balls as test subjects); Sheena S. Iyengar & Mark R. Lepper, *When Choice Is Demotivating: Can One Desire Too Much of a Good Thing?*, 79 J. PERSONALITY & SOC. PSYCHOL. 995, 995–1004 (2000) (using jam). See generally Marianne Bertrand et al., *What's Psychology Worth? A Field Experiment in the Consumer Credit Market* (Nat'l Bureau of Econ. Research, Working Paper No. 11892, Dec. 2005), available at <http://www.nber.org/papers/w11892> (describing credit offers for consumers). The problem is not limited to consumers. See, e.g., Donald A. Redelmeier & Eldar Shafir, *Medical Decision Making in Situations That Offer Multiple Alternatives*, 273 J. AM. MED. ASS'N 302, 302–05 (1995) (finding that physicians were sometimes unable to make any treatment recommendation when irrelevant alternative choices were presented together with simpler decisions); Roger Simnett, *The Effect of Information Selection, Information Processing, and Task Complexity on Predictive Accuracy of Auditors*, 21 ACCT., ORG. & SOC'Y 699, 705–17 (1996) (testing subjects by providing financial

Complex decision settings also increase households' reliance on heuristics. The larger the menu of choices consumers face, the more likely they are to use a shortcut, such as focusing only on the most prominent of several important aspects of choice, or to rely on irrelevant information.¹⁵³ In studies of consumer purchases, for example, introducing more options made consumers more likely to shift their choice from extremes, such as the cheapest option, to "compromise" choices, such as the second cheapest. Rather than thinking about which was the best option, they just took a shortcut and split the difference, even if the new option was irrelevant to their choice.¹⁵⁴ Similarly, as retirement options proliferate, employees are more likely to stick with whatever the default "status quo" option their firm provides them, or with a very simple plan.¹⁵⁵ For complicated financial products, such as credit cards and mortgages, consumers tend to focus only on one or two of the most salient, or available features, such as the annual rate, and neglect many other important details such as hidden fees.¹⁵⁶

Procrastination can also explain many of the observed outcomes.¹⁵⁷ Given the high stakes in many of these decisions, a pure rational choice framework poorly explains why households are not expending more effort on their choices.¹⁵⁸ There is extensive evidence, though, that humans tend to excessively weigh costs and benefits in the present and very near future at the expense of those that are more distant.¹⁵⁹ Thus, the time and mental effort of choosing a retirement plan looms much larger than the budget crunch one

profiles for 30 companies to each of them); Doug Snowball, *Some Effects of Accounting Expertise and Information Load: An Empirical Study*, 5 ACCT., ORG. & SOC'Y 323, 329–35 (1980) (testing subjects with different accounting expertise).

153. Barbara E. Kahn & Jonathan Baron, *An Exploratory Study of Choice Rules Favored for High-Stakes Decisions*, 4 J. CONSUMER PSYCHOL. 305, 306–07, 314, 324–26 (1995); Shafir et al., *supra* note 145, at 21–26; Amos Tversky & Eldar Shafir, *Choice Under Conflict: The Dynamics of Deferred Decision*, 3 PSYCHOL. SCI. 358, 358–61 (1992).

154. Joel Huber & Christopher Puto, *Market Boundaries and Product Choice: Illustrating Attraction and Substitution Effects*, 10 J. CONSUMER RES. 31, 40 (1983); Shafir et al., *supra* note 145, at 25; Itamar Simonson, *The Effect of Product Assortment on Buyer Preferences*, 75 J. RETAILING 347, 348–70 (1999) (surveying the marketing literature).

155. Sheena S. Iyengar & Emir Kamenica, *Choice Proliferation, Simplicity Seeking, and Asset Allocation*, 94 J. PUB. ECON. 530, 532–39 (2010); Brigitte C. Madrian & Dennis F. Shea, *The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior*, 116 Q.J. ECON. 1149, 1178–79 (2001).

156. Lawrence M. Ausubel, *The Failure of Competition in the Credit Card Market*, 81 AM. ECON. REV. 50, 75–76 (1991); Paul S. Calem & Loretta J. Mester, *Consumer Behavior and the Stickiness of Credit Card Interest Rates*, 85 AM. ECON. REV. 1327, 1327 (1995); Stefano DellaVigna & Ulrike Malmendier, *Contract Design and Self-Control: Theory and Evidence*, 119 Q.J. ECON. 353, 377–79 (2004); David B. Gross & Nicholas S. Souleles, *Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data*, 117 Q.J. ECON. 149, 171 (2002).

157. Ted O'Donoghue & Matthew Rabin, *Procrastination in Preparing for Retirement*, in BEHAVIORAL DIMENSIONS OF RETIREMENT ECONOMICS 125, 125–26 (Henry J. Aaron ed., 1999); Yvonne McCarthy, *Behavioural Characteristics and Financial Distress* 33 (European Cent. Bank, Working Paper No. 1303, Feb. 2011), available at www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1303.pdf (finding evidence that "an individual's capacity for self-control, planning, and patience" helps determine which households get into financial difficulty). For an introduction to the theory of procrastination, see Brian Galle & Manuel Utset, *Is Cap-and-Trade Fair to the Poor? Short-sighted Households and the Timing of Consumption Taxes*, 79 GEO. WASH. L. REV. 33, 63–68 (2010).

158. Kahneman, *supra* note 139, at 1468.

159. For evidence in the financial decision context, see Madrian & Shea, *supra* note 155, at 1172–73.

will face at retirement from choosing the wrong plan.¹⁶⁰

Procrastination can actually be more acute for important decisions.¹⁶¹ A significant component of our incentive to procrastinate is our belief that our future self will carry out the task—in essence, we free ride on our future selves.¹⁶² When the stakes are large enough, it becomes more likely that our future self will do the burdensome task and therefore becomes more “rational” to free ride. At the same time, larger stakes increase the amount of effort it is rational to exert, increasing our desire to free ride.¹⁶³ But the future self, when the time comes, reaches the same conclusion and also procrastinates. Of course, our present self should anticipate this bad behavior by the future self and refuse to free ride. Unfortunately, evidence also suggests we are extremely bad at forecasting our own willpower; we tend to believe (often wrongly) we will be more resolute in the future when the “deadline” is closer.¹⁶⁴

“Bolstering” behavior offers another reason biases may persist even when stakes are high.¹⁶⁵ Psychologists suggest that we tend to hold on to or “anchor” on our first impressions. Indeed, psychologists attribute anchoring in large part to our unwillingness to admit to ourselves that we were wrong and to avoid the accompanying feelings of inner conflict and self-doubt.¹⁶⁶ Admitting we were wrong undermines our self-esteem and creates internal tension with our earlier decision.¹⁶⁷ The more that is at stake, the worse these conflicts feel, leading us to devote more effort to stamping out inconsistent or discomforting thoughts and doubts.¹⁶⁸

C. Bounded Rationality and Complex Pay

Executive decisions about complex pay strongly resemble these kinds of household finance decisions. Like a household planning for retirement, an executive receiving incentive-based pay must make a complex decision about how risk seeking she should be, given the makeup of her portfolio of investments, her tolerance for risk, and her expectations for the future.¹⁶⁹ Suppose an executive with a pay package that attempts to

160. John Beshears et al., *The Importance of Default Options for Retirement Savings Outcomes: Evidence from the United States*, in SOCIAL SECURITY POLICY IN A CHANGING ENVIRONMENT 167, 182–84 (Jeffrey Brown et al. eds., 2009); see Bovenberg et al., *supra* note 150, at 373 (“[P]eople lack the self-control [sic] that is required to implement a savings plan.”).

161. O’Donoghue & Rabin, *supra* note 157, at 128–29.

162. Conlisk, *supra* note 135, at 677; see O’Donoghue & Rabin, *supra* note 157, at 131 (explaining the future selves model).

163. O’Donoghue & Rabin, *supra* note 157, at 131.

164. Stefano DellaVigna, *Psychology and Economics: Evidence from the Field*, 47 J. ECON. LITERATURE 315, 320 (2009); Ted O’Donoghue & Matthew Rabin, *Choice and Procrastination*, 116 Q.J. ECON. 121, 150 (2001). Only a small mis-estimate is enough to cause significant procrastination. O’Donoghue & Rabin, *supra* note 157, at 140–42.

165. Kahneman, *supra* note 139, at 1469.

166. ELLIOT ARONSON, *THE SOCIAL ANIMAL* 154–56 (9th ed. 2004); BARON, *supra* note 135, at 208–11; George A. Akerlof & William T. Dickens, *The Economic Consequences of Cognitive Dissonance*, 72 AM. ECON. REV. 307, 307–09 (1982).

167. ROBERT D. CIALDINI, *INFLUENCE: SCIENCE AND PRACTICE* 53 (4th ed. 2001).

168. ARONSON, *supra* note 166, at 169; Kahneman, *supra* note 139, at 1469.

169. For resources describing the uncertain, complex, and conflicted environment for managerial decisions, see SYDNEY FINKELSTEIN ET AL., *STRATEGIC LEADERSHIP: THEORY AND RESEARCH ON*

align her incentives with (in rough order of decreasing risk preferences) shareholders, short-term unsecured creditors, long-term unsecured creditors, and long-term secured creditors.¹⁷⁰ She must choose projects for the firm that will maximize her expected return, given that each of those segments of her pay will have a different expected payoff depending on the amount of risk she chooses for the firm.

We are not aware of any direct studies of how executives manage pay complexity, but there is substantial indirect evidence to support our hypothesis. In experiments, executives show a tendency to balk at complex decisions, much as ordinary consumers do.¹⁷¹ Real-world evidence suggests that managers use a number of simplifying “rules of thumb” to economize on decision costs, such as setting arbitrary targets for firm leverage, using short time horizons to set various firm targets, and taking shortcuts on calculating present values of future results.¹⁷² Survey studies of CEOs find that many report relying on their gut to make important decisions, or use the framing or general reliability of the source of advice as a proxy for whether to follow the advice.¹⁷³ Additionally, a great number of studies find that CEOs are overconfident in their choices of projects.¹⁷⁴

EXECUTIVES, TOP MANAGEMENT TEAMS, AND BOARDS 43–44 (2009); Raphael Amit & Paul J.H. Schoemaker, *Strategic Assets and Organizational Rent*, 14 STRATEGIC MGMT. J. 33, 33, 40 (1993); Sucheta Nadkarni & Pamela S. Barr, *Environmental Context, Managerial Cognition, and Strategic Action: An Integrated View*, 29 STRATEGIC MGMT. J. 1395, 1397 (2008) (“Top managers are bombarded with a vast amount of strategic information that often exceeds their cognitive capacity.”); Amrit Tiwana et al., *The Bounded Rationality Bias in Managerial Valuation of Real Options: Theory and Evidence from IT Projects*, 38 DECISION SCI. 157, 158 (2007) (explaining difficulty of valuing corporate choices).

170. See Listokin, *supra* note 6, at 783 (proposing “vertical strip” of incentive compensation).

171. Kimberly M. Sawers, *Evidence of Choice Avoidance in Capital-Investment Judgments*, 22 CONTEMP. ACCT. RES. 1063, 1063–92 (2005). As one of our readers pointed out, though, Sawers’s result may depend on some contestable assumptions about the form of her regression analysis.

172. See Malcolm Baker et al., *Behavioral Corporate Finance: A Survey*, in HANDBOOK OF CORPORATE FINANCE: EMPIRICAL CORPORATE FINANCE 145, 171–76 (B. Espen Eckbo ed., 2007) (reporting other studies finding use of simplified financial assumptions and simplistic targets for borrowing and dividend payouts); Colin F. Camerer & Ulrike Malmendier, *Behavioral Economics of Organizations*, in BEHAVIORAL ECONOMICS AND ITS APPLICATIONS 235, 264 (Peter Diamond & Hannu Vartiainen eds., 2007) (finding equal investments in each division, regardless of size or return); John R. Graham & Campbell R. Harvey, *The Theory and Practice of Corporate Finance: Evidence from the Field*, 60 J. FIN. ECON. 187, 188–243 (2001) (describing use of rules of thumb for capital structure and investment hurdles); C.V. Helliard et al., *Managerial “Irrationality” in Financial Decision Making*, 31 MANAGERIAL FIN. 1, 1–11 (2005); Keh et al., *supra* note 143, at 136–38 (reporting illusion of control and belief in law of small numbers); Tiwana et al., *supra* note 169, at 161–62, 167, 171 (finding that managers rely on shortcuts such as net present value and do not consider other aspects of investment choices).

173. Peter Bryant, *Self-Regulation and Decision Heuristics in Entrepreneurial Opportunity Evaluation and Exploitation*, 45 MGMT. DECISION 732, 737–39 (2007) (discussing gut decisions and trust of other party); Sarah Kaplan, *Framing Contests: Strategy Making Under Uncertainty*, 19 ORG. SCI. 729, 729–30, 736–45 (2008) (explaining managerial use of framing); see Cynthia Devers et al., *The Effects of Endowment and Loss Aversion in Managerial Stock Option Valuation*, 50 ACAD. MGMT. J. 191, 203 (2007) (reporting laboratory study in which participating executives responded strongly to framing of gains and losses for stock options).

174. Colin Camerer & Dan Lovallo, *Overconfidence and Excess Entry: An Experimental Approach*, 89 AM. ECON. REV. 306, 306, 314–15 (1999); Ulrike Malmendier & Geoffrey Tate, *Who Makes Acquisitions? CEO Overconfidence and the Market’s Reaction*, 89 J. FIN. ECON. 20, 42 (2008); Edward J. Zajac & Max H. Bazerman, *Blind Spots in Industry and Competitor Analysis: Implications of Interfirm (Mis)perceptions for Strategic Decisions*, 16 ACAD. MGMT. REV. 37, 37–47 (1991); Jayanthi Sunder et al., *The Role of Managerial Overconfidence in the Design of Debt Covenants* 3 (Mar. 2010) (unpublished manuscript), available at

Overconfidence closely resembles the anchoring effect in that once an actor fixes on a decision, it becomes psychologically difficult to change.¹⁷⁵

There is also a management literature devoted to studying how cognitive limitations impact the way top managers run their firms.¹⁷⁶ These studies find that managers make decisions based on “subjective cognitive representations” of the firm’s situation.¹⁷⁷ Because it is not humanly possible to take in all the information that would be relevant to running a large firm, managers must choose a small subset of data to focus on.¹⁷⁸ Often, though, managerial focus seems to be driven by events and firm procedures, rather than being the product of deliberate choice: managers deal with what’s on their plate, and don’t have time to think about the next course.¹⁷⁹ Faster paced industries exaggerate this effect, shifting managerial attention away from long-range strategy.¹⁸⁰ While this literature does not generally deal directly with the question of incentive pay, it is highly suggestive for our project.¹⁸¹ The implication is that managers, like everyone else, can be confounded by too much information. Piling even more demands on their cognition can shift their decision making in ways that are not necessarily conducive to top firm performance.

If CEOs rely on heuristics and satisficing to make complex decisions, as the data suggest, then adding layers of incentive pay may have perverse effects. For example, as the CEO’s own self-interest becomes more and more difficult to calculate, she would be more likely to rely on mental shortcuts.¹⁸² Like the households and individual consumers in the studies we mentioned, when the menu of her portfolio becomes long enough, the present costs of assessing her own financial interest may become high enough that she procrastinates calculating it, and instead decides on the basis of her “gut” or her trusted

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1595007.

175. BARON, *supra* note 135, at 191; see Keh et al., *supra* note 143, at 128 (connecting overconfidence to the availability heuristic); Donald C. Langevoort, *Organized Illusions: A Behavioral Theory of Why Corporations Mislead Stock Market Investors (and Cause Other Social Harms)*, 146 U. PA. L. REV. 101, 142–43, 147 (1997) (describing the “optimism-commitment ‘whipsaw’”).

176. Orly Levy et al., *What We Talk About When We Talk About “Global Mindset”: Managerial Cognition in Multinational Corporations*, 38 J. INT’L BUS. STUD. 231, 232 (2007); Nadkarni & Barr, *supra* note 169, at 1395; see FINKELSTEIN ET AL., *supra* note 169, at 44 (explaining that the theoretical groundwork for this literature is known as “the Carnegie School” after the affiliation of some of its early expositors).

177. Nadkarni & Barr, *supra* note 169; see Vinay K. Garg et al., *Chief Executive Scanning Emphases, Environmental Dynamism, and Manufacturing Firm Performance*, 24 STRATEGIC MGMT. J. 725, 725–44 (2003) (examining effects of limited executive cognition).

178. Nadkarni & Barr, *supra* note 169, at 1397–98; see also Stephen Bainbridge, *Why a Board? Group Decisionmaking in Corporate Governance*, 55 VAND. L. REV. 1, 6–7 (2002) (connecting limited executive cognitive power to firms’ practice of limiting direct information flows to senior management).

179. Levy et al., *supra* note 176, at 245–58 (reviewing other studies); Nadkarni & Barr, *supra* note 169, at 1398, 1413–19; William Ocasio, *Towards an Attention-Based View of the Firm*, 19 STRATEGIC MGMT. J. 187, 195–205 (1997).

180. William C. Bogner & Pamela S. Barr, *Making Sense in Hypercompetitive Environments: A Cognitive Explanation for the Persistence of High Velocity Competition*, 11 ORG. SCI. 212, 213–25 (2000).

181. For a source that deals directly with incentive pay, see Sarah Kaplan & Rebecca Henderson, *Inertia and Incentives: Bridging Organizational Economics and Organizational Theory*, 16 ORG. SCI. 509, 511–19 (2005), which discusses the role of cognition and inter-personal relationships in the ways that firms can motivate line employees.

182. See Furubotn, *supra* note 136, at 136 (explaining that transaction costs constrain executive searches for best solution).

advisors. Heuristics can also lead managers to the wrong conclusions. Managers who fail to assess risks accurately might think they are responding to their incentives to take a certain amount of risk but actually greatly under- or overshoot.¹⁸³ Adding new pay instruments, then, can reduce the efficacy of all of the instruments.

Existing research on incentives also suggests that availability bias is another likely outcome of adding layers of incentive-based pay. In lab tests, subjects offered a financial incentive to maximize one aspect of their task are so focused on the reward that their performance on other mental tasks, especially tasks involving creativity and problem solving, declines significantly.¹⁸⁴ Explicit incentives have been found in many settings to “crowd out” intrinsic motivations—for instance, imposing a fine for picking children up late from daycare increased the amount of lateness.¹⁸⁵ As a result, it is possible that executives will be excessively sensitive to the largest or otherwise most salient component of their pay. Adding new incentives for the executive may not change her behavior at all, or may exacerbate her need to rely on heuristics.

Admittedly, scholars do not yet know the cut-off for a cognitively manageable level of pay complexity. The fact that increased pay complexity moves us closer to the threshold would not be as troubling if the threshold were far away. However, the evidence we have surveyed on ordinary households is to the contrary. Most individuals are overwhelmed by tasks and information rather simpler than those the executive must digest. The household need plan only for its own future, while the executive must determine not only her own personal degree of risk preference and needs for savings and current consumption, but also calculate the impact her decision will have on each of the components of her pay portfolio, and then how those impacts interact with her preferences and needs.¹⁸⁶ To be sure, the CEO is likely highly skilled at least at analyzing the firm’s performance. However, as discussed below, it is not clear that expertise is an advantage.

D. Some Objections Considered

There are several points that might be raised in response to our argument so far. For example, CEOs are obviously considerably more expert in financial matters than the

183. Baker et al., *supra* note 172, at 168–71; see Colin Camerer & Don Lovallo, *Overconfidence and Excess Entry: An Experimental Approach*, 89 AM. ECON. REV. 306, 315 (1999) (making this point about overconfidence).

184. John Condry & James Chambers, *Intrinsic Motivation and the Process of Learning*, in THE HIDDEN COSTS OF REWARDS: NEW PERSPECTIVES ON THE PSYCHOLOGY OF HUMAN MOTIVATION 61, 61–66 (Mark R. Lepper & David Green eds., 1978); see Stephanie J. Byram, *Cognitive and Motivational Factors Influencing Time Prediction*, 3 J. EXPERIMENTAL PSYCHOL.: APPLIED 216, 233 (1997) (reporting that financial incentives for speed of performance exacerbate biased performance).

185. Uri Gneezy & Aldo Rustichini, *A Fine Is a Price*, 29 J. LEGAL STUD. 1, 2–17 (2000); see also BARON, *supra* note 135, at 278–79 (describing other instances of crowding out). For overviews, see Camerer & Malmendier, *supra* note 172, at 243–44; Bruno S. Frey & Reto Jegen, *Motivation Crowding Theory*, 15 J. ECON. SURVS. 589, 599–600 (2001). Cf. James Y. Shah et al., *Forgetting All Else: On the Antecedents and Consequences of Goal Shielding*, 83 J. PERSONALITY & SOC. PSYCHOL. 1261, 1261–80 (2002) (reporting multiple experiments in which participants appeared to close off attention to goals other than the one previously committed to).

186. Tiwana et al., *supra* note 169, at 160–61; Radner, *supra* note 135, at 1361.

average household, and far more money rides on their decisions. It should therefore be rational for CEOs to devote more mental energy to their decisions, because they get a better return on their time. Similarly, CEOs have advisors and data to help them analyze their own financial interest. Even if some CEOs might be tempted to satisfice, market competition could spur them to try harder. While these are all possibilities, we think each of them unlikely.

First, theory and anecdotal evidence suggest that expertise and big stakes can increase, rather than decrease, the use of shortcuts. Advanced financial skills will lower the costs of assessing the tradeoffs of any pay portfolio.¹⁸⁷ However, procrastination and bolstering, as we have explained, are both more acute for important decisions, and there is little evidence that expertise mitigates either. Several leading economists, for instance, have reported their own and their colleagues' failures to plan for personal retirement.¹⁸⁸ And CEOs, as we also have noted already, are especially prone to believe in their own competence; they are, therefore, rather more likely to bolster their own prior beliefs or expect that their future self will carry out an important task.¹⁸⁹

Advice from others is unlikely to remedy the satisficing problem in this context.¹⁹⁰ Managers must make many important risky corporate decisions under substantial time pressure.¹⁹¹ Corporate culture rewards decisiveness and self-confidence, and we doubt that any corporate leader wants to project the impression that she has to evaluate her own self-interest before making decisions for the firm.¹⁹² Thus, an executive could not easily call her financial advisor to ask how a proposed deal will impact her pension or her option portfolio; she will have to decide, likely having to take shortcuts that diminish or distort the efficacy of the incentive pay.

In any event, as those who study firms have found, it is rare that advice from within the firm can move over-confident CEOs off of their own first impression.¹⁹³ Groupthink and herd behavior often mark firms in which the internal culture rewards consensus. Managers of such firms may assume dissenting views are wrong because they depart from the "wisdom of crowds," and going out on a limb with a different opinion sacrifices the opportunity to share blame with others if things go poorly.¹⁹⁴ All humans tend to

187. See Lusardi & Mitchell, *supra* note 149, at 16 (finding that sophisticated financial knowledge positively impacts the likelihood that any retirement planning a household does will be accurate).

188. Benartzi & Thaler, *supra* note 148, at 82, 84, 86; Laibson & Zeckhauser, *supra* note 140, at 23; O'Donoghue & Rabin, *supra* note 157, at 126; see also Bovenberg et al., *supra* note 150, at 372 (reporting evidence of widespread disinterest in pension planning, including among "more than 50% of a sample of highly educated wealthy individuals").

189. Cf. Donald C. Langevoort, *The Organizational Psychology of Hyper-Competition: Corporate Irresponsibility and the Lessons of Enron*, 70 GEO. WASH. L. REV. 968, 974 (2002) (noting that those with high self-esteem do not attribute bad outcomes to their own actions).

190. But see Bainbridge, *supra* note 178, at 20–27 (suggesting that board or other group decisions can improve quality of cognitively limited executive decisions).

191. Keh et al., *supra* note 143, at 127; see Nadkarni & Barr, *supra* note 169, at 1399 (describing settings in which managers do not have time to research decisions before making them).

192. Roland Benabou & Jean Tirole, *Self-Confidence and Personal Motivation*, 117 Q.J. ECON. 871, 878 (2002); Bryant, *supra* note 173, at 735; Troy A. Paredes, *Too Much Pay, Too Much Deference: Behavioral Corporate Finance, CEOs, and Corporate Governance*, 32 FLA. ST. U. L. REV. 673, 691, 699, 730 (2005).

193. Langevoort, *supra* note 175, at 136–37.

194. James D. Cox & Harvey Munsinger, *Bias in the Boardroom: Psychological Foundations and Legal*

selectively evaluate new information in a way that confirms our existing beliefs, and of course those of us who are over-confident do so even more than others.¹⁹⁵ That makes the CEO resistant to advice.¹⁹⁶ If not, advice from different counselors with varying personal goals and incentives may further muddy the waters and make it less likely the compensation scheme's incentives will dominate.

As for market discipline, it has not yet curtailed CEO overconfidence,¹⁹⁷ and it seems unlikely to affect satisficing either. As Langevoort argues, firms may actually prefer over-confident managers for their ability to avoid "informational paralysis."¹⁹⁸ This point could plausibly extend to managers who satisfice in other ways, as well.¹⁹⁹ We would add further to Langevoort's story by noting that promotion tournaments among executives select executives who are excessively attentive to the largest component of their rewards. Those, after all, are the mid-tier managers who chase the carrot of promotion most vigorously, perhaps at the expense of other goals such as a healthy work and family balance.²⁰⁰

Even if firms do not actively select for biases, there are a number of factors that blunt the impact of market pressures. Competition may squeeze satisficing managers only weakly because all firms satisfice.²⁰¹ If not, to the extent that market discipline, such as the threat of firing for poor performance, is just another incentive, it is hardly surprising that adding new incentives does not change the problem that the executive is insensitive to incentives.²⁰² Termination is rarely a serious worry for a CEO in any case.²⁰³ Board judgments to fire or discipline the manager rely on incomplete information doled by the manager, are subject to the board's own biases, and can be compromised by close ties to the CEO.²⁰⁴

Implications of Corporate Cohesion, 48 LAW & CONTEMP. PROBS. 83, 100–04 (1985); Langevoort, *supra* note 175, at 138; Paredes, *supra* note 192, at 686–87. Bainbridge acknowledges this and other similar counter-arguments to his views but suggests that advice on net still helps executives. Bainbridge, *supra* note 178, at 27–31.

195. BARON, *supra* note 135, at 195.

196. Langevoort, *supra* note 175, at 136; *see* BARON, *supra* note 135, at 211–12 (describing how individuals selectively expose themselves only to confirming advice).

197. Paredes, *supra* note 192, at 695; *cf.* Manuel A. Utset, *Towards a Bargaining Theory of the Firm*, 80 CORNELL L. REV. 540, 561–63 (1994) (identifying several reasons why firms may not "evolve" towards optimal contracting).

198. Donald C. Langevoort, *Resetting the Corporate Thermostat: Lessons from the Recent Financial Scandals About Self-Deception, Deceiving Others and the Design of Internal Controls*, 93 GEO. L.J. 285, 299–302 (2004); *see also* Camerer & Malmendier, *supra* note 172, at 259 (claiming confidence may be correlated with many kinds of managerial value).

199. For example, market selection for decisive managers is consistent with our procrastination story. In fact, procrastination may enable the manager to look *more* decisive because the manager puts off careful examination of the issues for later so she is able to act more quickly.

200. *Cf.* Camerer & Malmendier, *supra* note 172, at 271–72 (noting that overconfident managers are easier to motivate through tournament rewards). *But see* Stephen M. Bainbridge, *Executive Compensation: Who Decides?*, 83 TEX. L. REV. 1615, 1632–33 (2005) (claiming that managers succeed because they internalize firm norms).

201. Furubotn, *supra* note 136, at 144, 147; *cf.* Camerer & Malmendier, *supra* note 172, at 236 (claiming that there is no arbitrage market for betting against a biased CEO).

202. Baker et al., *supra* note 172, at 168.

203. Jensen & Murphy, *supra* note 1, at 238–42.

204. Baker et al., *supra* note 172, at 168; Jayne W. Barnard, *Narcissism, Over-Optimism, Fear, Anger, and*

Finally, it could be argued that though adding debt-like pay options will not perfectly align managers' actions with stakeholder interests, it surely must be an improvement over paying solely with equity. In fact, we think that is unclear. As we explained, mental shortcuts and satisficing usually increase when complexity and decision costs rise.²⁰⁵ Using debt instruments may reduce executive sensitivity to all forms of incentives. Further, a very large debt-like payment might lead executives to focus solely on maximizing that portion of their portfolios, crowding other incentives, while if debt is too small relative to stock options, managers may simply ignore it. As Edmans and Liu note, because of the complex tradeoffs involved, the optimality of using debt compensation is highly sensitive to a close match between managerial pay and the creditor's position.²⁰⁶ Rough approximations mean that debt compensation is less efficient than equity alone. We have argued, though, that rough approximations are likely the best case scenario.

V. EXISTING EVIDENCE OF DEBT COMPENSATION EFFICIENCY

So far, we have offered mostly theoretical predictions of how complex bundles would perform, or evidence that bears only indirectly on inside debt. In this Part, we survey evidence from the existing literature on inside debt itself to see whether our predictions are borne out. The study of debt-like instruments as tools of managerial control is new, so the data are fairly thin, which is one reason we add our own findings in Part VI. Overall, the data gathered by others generally support our view, though there are certainly several studies that claim to find that debt-like instruments are efficient. We think, though, that the studies finding efficient results are flawed, mostly because they are misspecified: they fail to fully consider alternative and important rival explanations, or otherwise look only at a piece of the relevant data.²⁰⁷

First, we should explain that evidence to date on debt compensation has focused mostly on pensions and deferred compensation. As we have mentioned, it is currently unheard of for U.S. firms to pay their executives with true debt. Again, theorists argue that pensions and deferred compensation can align managerial incentives with debt holders in much the same way as payments of stock align incentives with equity investors.²⁰⁸

There is some evidence at a minimum that pensions change CEO behavior. Sundaram and Yermack, using their formula for deriving pre-2007 pension balances, found lower risks of sliding towards bankruptcy among firms whose executives had

Depression: The Interior Lives of Corporate Leaders, 77 U. CIN. L. REV. 405, 426–27 (2008); Renee M. Jones, *Law, Norms, and the Breakdown of the Board: Promoting Accountability in Corporate Governance*, 92 IOWA L. REV. 105, 134–35 (2006); Langevoort, *supra* note 198, at 293.

205. See *supra* Parts IV.A–B.

206. Edmans & Liu, *supra* note 3, at 91; see also Walker, *supra* note 13, at 243 (“Optimal equity compensation design is quite sensitive to model specification . . .”).

207. See WILLIAM H. GREENE, *ECONOMETRIC ANALYSIS* 133–34 (6th ed. 2008) (explaining consequences of failure to include relevant variables in regression).

208. Edmans & Gabaix, *supra* note 14, at 492–93; Frederick Tung & Xue Wang, Bank CEOs, Inside Debt Compensation, and the Global Financial Crisis 2, 4 (Sept. 22, 2011) (unpublished manuscript), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1570161.

larger pension balances at risk.²⁰⁹ Tung and Wang report similarly that banks whose CEOs had large inside debt positions performed better during the financial crisis, suggesting that the firm had taken less risky positions before and during the crisis.²¹⁰

Endogeneity is a serious question for these studies, though.²¹¹ As Tung and Wang acknowledge, both the choice of compensation and the choice of firm risk could be caused by a risk-averse CEO, so that observing that the two happen together could be evidence of that shared causation and not evidence that one causes the other.²¹² Risk-averse executives might choose to be paid in debt-like instruments because they are more certain to pay out, and of course those CEOs would also pursue safer firm investments. We add that another possible common cause of pensions and low-risk outcomes is a firm's risk-averse institutional culture.²¹³

Tung and Wang's attempt to explain away this possible endogeneity story is not fully persuasive. They suggest that if risk aversion explains both outcomes, we should observe a correlation between risky bets and CEO debt prior to the crisis, and they find no such correlation.²¹⁴ That test is problematic, though, because as the duo report elsewhere in their manuscript, CEOs only appear to care about the security of their inside debt portfolios when a crisis is imminent.²¹⁵ If so, even a risk-averse CEO would not necessarily demand compensation comprised mostly of pension and cash when the firm is performing well. We then could not draw strong conclusions from the fact that we do not see a correlation between pay and the riskiness of a firm's bets pre-crisis.²¹⁶

Other studies attempt to analyze whether inside debt can benefit the firm by reducing the price of borrowing or the restrictions borrowers impose on the firm to protect their investment. Two recent papers report that firms with significant CEO pensions have lower borrowing costs or face fewer covenants.²¹⁷ Two other studies find

209. Sundaram & Yermack, *supra* note 6, at 1581–83.

210. Tung & Wang, *supra* note 208, at 3–4.

211. “Endogeneity” is a statistician's term for the possibility that the direction of causation assumed by the statistical model is incorrect; technically, it describes any situation in which the measured variable is correlated with the estimated errors. GREENE, *supra* note 207, at 11. This may be the result of the dependent variable—the outcome that is being predicted—in fact causing the factors we are using to analyze it. An example would be trying to predict why the sun rises, and concluding that it is caused in part by roosters crowing; there is a strong correlation, but our researcher has the causation story backwards. Another form of endogeneity can result from omitting a variable from the model that jointly causes both the dependent variable and the explanatory variable. An example could be a researcher observing a correlation between SAT scores and salary and concluding that employers pay high-scorers more; in fact, both are likely related to underlying intelligence or social capital.

212. Tung & Wang, *supra* note 208, at 26; *see also* John R. Graham et al., Managerial Attitudes and Corporate Actions 3 (May 2012) (unpublished manuscript), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1432641 (reporting their findings suggesting that CEOs choose firms whose compensation practices match their own risk preferences).

213. Cf. Graham et al., *supra* note 212, at 1 (noting managers may be selected for fit with firm culture). For a discussion of how firm culture develops and influences organizational decisions, *see* KARL E. WEICK, MAKING SENSE OF THE ORGANIZATION 284–307 (2001); Camerer & Malmendier, *supra* note 172, at 254–58.

214. Tung & Wang, *supra* note 208, at 26.

215. *Id.* at 24–25.

216. We suggest that, to refine this measure, future researchers might examine correlation between inside debt at firms close to bankruptcy and the riskiness of the firm's bets.

217. Feng Chen et al., Executive Inside Debt Holdings and Creditors' Demand for Pricing and Non-Pricing Protections 3 (Sept. 30, 2010) (unpublished manuscript), available at <http://www-2.rotman.utoronto.ca/>

that firms with higher amounts of debt tend also to have CEOs who receive a higher portion of their compensation via their pension, which is consistent with the idea that firms believe pensions facilitate borrowing.²¹⁸

A difficulty with these studies is that they do not clearly rule out an alternative story in which the use of pensions is the product of managerial power rather than efforts to design efficient debt contracts.²¹⁹ As we described earlier, the managerial power hypothesis suggests that influential managers will use pensions and deferred compensation as a way of hiding outsized pay and downside protection from their monitors. High debt, we believe, can contribute to managerial power. As we discussed previously, shareholders watch their managers less closely when creditor investment in the firm grows.²²⁰ Yet unlike the shareholders, the creditors nominally have equal or superior claims on the firm's residual assets as the managers.²²¹ A creditor therefore has little reason (unless bankruptcy is imminent and firm assets are limited) to care about the size of the manager's compensation, except to the extent that the raw amount of compensation affects managerial incentives.²²² So larger debt may result in lower monitoring of total CEO pay.

Our account explains not only the correlation between amount of debt and pensions but also the correlation between cost of debt and pensions. Greater creditor investment, we argue, gives a freer hand to managerial rent seeking in the form of excess compensation. Moreover, firms who can borrow more easily or more cheaply are likely to borrow more, so our theory also predicts a positive correlation between ease of borrowing and large CEO pension payouts.

There is some evidence already in favor of our managerial power story. Cen, though he uses only a single simple indicator of managerial power (whether the CEO is chairman

userfiles/departments/accounting/File/inside%20debt%20contracting%200930.pdf; Wang et al., *supra* note 118, at 1.

218. Joseph Gerakos, *CEO Pensions: Disclosure, Managerial Power, and Optimal Contracting* 4 (Pension Research Council, Working Paper No. 2007-5, Jan. 16, 2007), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=982180; Sundaram & Yermack, *supra* note 6, at 1574–75.

219. Sundaram & Yermack report using board size, percent of outside directors, CEO term in office, whether CEO belongs to the founding family, and percentage of institutional ownership as measures of managerial power. Sundaram & Yermack, *supra* note 6, at 1573. We identify several other important measures in the literature. See *infra* note 243 and accompanying text (identifying other explanatory variables, including the structure and gender profile of the board of directors).

220. See Whitehead, *supra* note 42, at 72 (explaining mechanisms that allow other investors to rely on creditor monitoring). This story may be less true to the extent that shareholder interests are contrary to those of creditors. For example, a large shareholder would not likely free ride on creditor efforts to control managerial risk taking.

221. See 11 U.S.C. § 507(a)(4) (2006) (granting unsecured priority to wages earned within 180 days prior to bankruptcy, but only to a maximum of roughly \$11 thousand).

222. Some might argue that shareholders, realizing the weak incentives of managers to monitor total compensation, will continue to watch over managerial compensation themselves. Shareholder free riding is still likely to increase, though, because compensation is only one aspect of managerial behavior. Managers must also have incentives to work hard, to serve investors and not their own ego, and so on. Because creditors provide monitoring along most of these other dimensions, equity investors need not. Many of these monitoring efforts—reading the annual report, for example—might also produce information about CEO compensation. Thus, at a minimum, free riding on creditors reduces the extent to which shareholders learn about compensation as incidental to their other monitoring efforts.

of the board), finds that this instrument has significant explanatory power for the portion of a CEO's compensation paid through pensions and deferred compensation.²²³ Kalyta and Magnan, and Goh and Li find correlations between pensions and managerial power in small samples from Canada and Great Britain, respectively.²²⁴ Gerakos also finds some evidence that instruments for managerial power correlate with pension size, but that the effects are small.²²⁵ We are somewhat skeptical of his results, however, because he examines the determinants of pension size rather than the portion of compensation paid as pension.²²⁶ Because he appears to neglect factors that tend to increase pay overall, such as firm size and complexity,²²⁷ he underestimates the relative contribution of managerial power to the choice of compensation form.²²⁸ Gerakos also uses a small one-year sample of 174 firms, which is a tiny enough slice of the market to leave room to doubt whether his findings would still be true of the market as a whole—a question we consider next in Part VI.

Additionally, though perhaps less significantly, the finance literature has misunderstood the role of tax in these decisions. A highly leveraged firm has stronger incentives to use deferred compensation. As tax law scholars have explained, deferred compensation is most likely to be on net tax-advantage when the firm's marginal tax rate is lower than the rate of the manager being paid.²²⁹ Interest payments are deductible, and so reduce the effective rate facing the firm.²³⁰ We therefore predict, purely as a tax matter, that higher debts as a portion of firm value would lead to higher inside debt. Whether cheaper debt would also inflate inside debt is ambiguous; the lower cost would reduce the tax savings from interest but also probably lead to more debt overall, and it is unclear which effect would dominate.

Sundaram and Yermack do try to control for a firm's tax status, but they do so

223. Wei Cen, *The Determinants of CEO Inside Debt and Its Components* 32 (Jan. 2011) (unpublished manuscript), available at papers.ssrn.com/5013/papers.cfm?abstract_id=1716306.

224. Paul Kalyta & Michel Magnan, *Executive Pensions, Disclosure Quality, and Rent Extraction*, 27 J. ACCT. & PUB. POL'Y 133, 135 (2008); Lisa Goh & Yong Li, *Executive Pensions and Excess Compensation* 6–7 (Sept. 2010) (unpublished manuscript), available at <https://research.mbs.ac.uk/accounting-finance/Portals/0/docs/2010/ExecutivePensionsandExcessCompensation.pdf>.

225. Gerakos, *supra* note 218, at 25–28.

226. *Id.* at 14–15.

227. For a review of research on the relationship between firm size and CEO pay, see Tosi et al., *supra* note 26, at 307–29 (finding that firm size explains 40% of variance in CEO pay).

228. Gerakos, *supra* note 218, at 16–19 (describing research design). For evidence on the determinants of the amount of executive compensation, see Kevin Murphy, *Executive Compensation*, in 3 HANDBOOK OF LABOR ECONOMICS 2485, 2485–563 (Orley Ashenfelter & David Card eds., 1999); Sydney Finkelstein & Donald C. Hambrick, *Chief Executive Compensation: A Study of the Intersection of Markets and Political Processes*, 10 STRATEGIC MGMT. J. 121, 121–34 (1989) (examining the effect of “managerial power, the role of the board of directors, firm complexity, and human capital” on CEO compensation).

229. Halperin, *supra* note 44; Gregg Polsky & Ethan Yale, *Reforming the Taxation of Deferred Compensation*, 85 N.C. L. REV. 571, 576–79 (2007); David I. Walker, *Is Equity Compensation Tax Advantaged?*, 84 B.U. L. REV. 695, 737–39 (2004). When measured on a risk-neutral basis, this advantage is smaller. Ethan Yale, *Investment Risk and the Tax Benefit of Deferred Compensation*, 62 TAX L. REV. 377, 382–94 (2009).

230. 26 U.S.C. § 163 (2006). To be clear, the greatest tax advantages accrue when the firm's *marginal* rate is lower than the employee's, so that interest deductions will only generate these benefits when they are large enough to drop the firm into a lower tax bracket.

inaccurately. Their study asks only whether a firm has carry-forward losses for the year—in other words, whether it has so many losses that it paid no tax at all, and so has a marginal rate of zero.²³¹ But pensions and deferred compensation contracts are written years before the corresponding benefits are actually paid. The proper control would be the firm's expectations of its future marginal rate at the time the contract is signed, not the marginal rate in the year of payment.²³²

Even if all these other questions could be answered satisfactorily, it would still be unclear whether existing studies have shown that inside debt is efficient. None of the papers even purport to measure any of the additional costs of complex compensation described here. Taking them at full face value, they show that inside debt can reduce the cost of borrowing. It remains possible that the total cost to the firm is greater than this savings. Indeed, as mentioned, the short-term market reaction to disclosures of inside debt was that the value of equity dropped by more than the increase in the value of firm debt.²³³ Admittedly, we should expect some drop in equity value even if inside debt is efficient.²³⁴ But the study finds that equity lost more value than creditors gained, implying that equity markets may view inside debt as destroying firm value over and above any simple transfer of value from shareholders to bond holders.²³⁵

Given these many open questions, there is room for additional investigation into the workings of inside debt. In Part VI, we examine some of our rival explanations for the relation between borrowing and inside debt, using a large database of publicly traded firms.

VI. ORIGINAL EMPIRICAL EVIDENCE ON PENSIONS AND DEFERRED COMPENSATION

This Part summarizes the results of our original empirical investigation into the reasons firms use inside debt as compensation. To briefly preview the result, we find little evidence that current borrowing needs explain firms' use of inside debt, but considerable evidence that inside debt is predicted by known markers of managerial power and by the risk preferences of the firm's directors. These findings tend to undermine the suggestions by others that firms have chosen to use inside debt because it is efficient.

It is difficult to directly test the efficiency of inside debt. As we have argued, studies examining the impact of executive pay structures on borrowing costs or borrowing terms do not tell the full picture.²³⁶ Market reactions to disclosure of those structures add more information, but outsiders may themselves have only an incomplete picture of how

231. Sundaram & Yermack, *supra* note 6, at 1573–74.

232. In addition, the Sundaram & Yermack controls fail to account for firms that may have a marginal rate between zero and the maximum individual rate. But because corporate rates are steeply progressive and then quickly plateau, *see* 26 U.S.C. § 11(b) (2006), that omission likely does not miss many firms.

233. Chayang Wei & David Yermack, *Investor Reactions to CEOs' Inside Debt Incentives*, FED. RESERVE BD. NO. 445, at 23, 31 (2011), *available at* papers.ssrn.com/sol3/papers.cfm?abstract_id=1604046.

234. Without inside debt, the efficiency argument goes, managers take too many risks, shifting value away from creditors with fixed claims on the firm to shareholders with a stake in the upside. Whitehead, *supra* note 42, at 73. Taking away this incentive for excessive risk should increase the expected value of a creditor position, but reduce expected value for the equity holders by an equal amount.

235. An alternative explanation, as we've mentioned, is that traders interpreted the disclosure as evidence of managerial power and adjusted expectations for the firm accordingly.

236. *See supra* Part V.

managers are responding to incentives.

Examining the firm's own decisions, then, may be the best window we have into the ultimate efficacy of inside debt. Directors of the firm, in particular, are responsible for direct supervision of its managers, interact with them repeatedly, and are at least in theory privy to all the firm's data.²³⁷ Rational representatives of the firm's owners would choose the most efficient method for reducing the agency costs of debt.²³⁸ Inside debt proponents claim that if directors choose to use inside debt in order to contain the agency costs of borrowing, that would be powerful evidence in favor of the efficient contracting theory.²³⁹ Directors' motive for using inside debt is also an important piece of evidence in the debate over managerial power, as we explained previously.²⁴⁰

Thus, to test the theories we have offered so far, we turn to examining the determinants of firms' use of inside debt compensation. We argued in the last Part that the existing evidence on the reasons firms choose to use inside debt is inconclusive. We claimed that studies so far have failed fully to consider whether firms might be using pensions and deferred compensation for reasons unrelated to current borrowing costs. In order to test our rival hypotheses, we assembled a data set of more than 1300 large publicly traded firms spanning a period of seven years. We then conducted a series of econometric analyses of our data. We explain the construction of the data set and our methods in detail in a methodological appendix.

First, we investigated the basic question whether firms that use pensions or deferred compensation also have current long-term debt obligations. We found that the average pension balance for the 102 firm-years in our sample with zero current long-term debt and an active CEO pension account was more than \$2.7 million.²⁴¹ CEOs observed during the 217 firm-years with deferred compensation plans but no long-term debt averaged \$1.1 million in total deferred compensation balances.²⁴² Even these simple outcomes, we suggest, are a challenging result for efficient contracting theories of inside debt. If the firm has no long-term debt of its own, why is it promising more than \$3 million in inside debt with a long time horizon?

We then attempted to identify with more precision the factors that tend to predict a firm's reliance on pension benefits and deferred compensation. We focused on the percentage of the CEO's annual compensation paid out in these two forms of inside debt as our main variable of interest. We collected a wide variety of data about each firm, its executive, and its board of directors. To test the efficient contracting hypothesis, we

237. Jensen & Murphy, *supra* note 1, at 251; Jonathan L. Johnson et al., *Boards of Directors: A Review and Research Agenda*, 22 J. MGMT. 409, 411 (1996). To be sure, many directors remain relatively uninformed about the details of their firm, Lisa Fairfax, *The Uneasy Case for the Inside Director*, 96 IOWA L. REV. 127, 164–66 (2010), and managers can control the flow of information to their directors. But directors at a minimum are better informed than any outside party.

238. Jensen & Meckling, *supra* note 1, at 338–39.

239. Edmans & Liu, *supra* note 3, at 77.

240. See *supra* Part II.A (stating managerial power prevents shareholder wealth maximization).

241. To be more precise, we found that there was a 95% chance that the average pension fell between \$1.857 million and \$3.623 million, given the observations in our sample. The average pension among all the 886 firm-years with no reported long-term debt (that is, the average including a zero balance at 700 or so firms) was \$315 thousand.

242. The 95% confidence interval here was \$956 thousand to \$1.35 million. The average across all zero-debt firms was \$282 thousand.

assembled data on the firm's current debts and its leverage ratio, or the amount of debt relative to outstanding equity.

In addition, to test our own competing hypotheses about the reasons firms use inside debt, we assembled a variety of other explanatory variables. One group of variables relates to the structure and demographics of the board of directors. Prior literature predicts that boards that are large, busy, conflicted, or closely tied to the CEO are less likely to challenge her authority.²⁴³ We put together information, such as the amount the firm pays its directors, that measures those factors. To examine whether directors' own preferences for risk taking might influence their decisions on CEO compensation, we computed the average equity and option stakes the board held in the firm, as well as looking at the gender profile of each board. At the same time, to test our theory about legacy costs of past borrowing, we also examined "lags," or prior years, of the firm's debt—that is, we examined whether past borrowing predicted current inside debt.

We also controlled for a variety of firm financial variables and CEO demographic characteristics that the literature predicts might influence the value of a CEO's inside debt. We added our own controls for tax considerations, utilizing both current and "lagged" tax characteristics of the firm. By including these controls in the regression, we isolated the individual impact of the variables we were more interested in. In effect, we could ask what impact factors such as firm debt and board compensation would have on inside debt, assuming all other things about each firm and CEO were identical.²⁴⁴

Our regression analysis took two forms, a fixed-effects panel and a set of three annual cross-sections. A fixed-effects panel looks at "within" variation, or the impact on the dependent variable of changes over time in the explanatory variables for each unit of measurement.²⁴⁵ In our case, that meant examining how changes in each firm's borrowing, etc., over the three years of our data impacted its use of inside debt. We also controlled for unobservable effects that might vary depending on the particular year of each observation—for example, whether there was a financial crisis happening that year.²⁴⁶ In addition to predicting the determinants of the percentage of a CEO's pay paid out in inside debt, we also looked at two other measures of inside debt common in the literature that precedes our study.²⁴⁷

For technical reasons explained in more detail in the appendix, we could not make use of the evolving differences *between* firms over time. Instead, for each year in our sample, we carried out a standard ordinary least-squares (OLS) regression, using the same variables as our panel regressions, across all firms. This allowed us to examine, within each year, what effect each firm's particular characteristics had on its use of inside

243. For evidence on board members who serve on several other boards, see Eliezer M. Fich & Anil Shivdasani, *Are Busy Boards Effective Monitors?*, 61 J. FIN. 689, 689–724 (2006). For evidence that directors with a significant financial stake in being on the board grant higher CEO pay, see Ivan E. Brick et al., *CEO Compensation, Director Compensation, and Firm Performance: Evidence of Cronyism?*, 12 J. CORP. FIN. 403, 412, 417 (2006). On board independence and CEO pay, see Vidhi Chhaochharia & Yaniv Grinstein, *CEO Compensation and Board Structure*, 64 J. FIN. 231, 232 (2009).

244. GREENE, *supra* note 207, at 29.

245. CHRISTOPHER F. BAUM, AN INTRODUCTION TO MODERN ECONOMETRICS USING STATA 220–21 (2006).

246. *Id.* at 224–25.

247. We explain why our own measure is more meaningful in Part VIII, the methodological appendix.

debt.

When we compare changes within firms over time, we argue the evidence most strongly supports the managerial power and perhaps directorial risk aversion stories over the others. These results are summarized in Table 1.²⁴⁸ Using our preferred variable (the leftmost column of numbers in Table 1), we find that a firm's debt has no significant effect on CEO pay. Consistent with the managerial power story, we find overall that both higher director pay and higher CEO pay have a significant positive impact on the portion of pay devoted to inside debt.²⁴⁹ We argue that higher CEO pay is an indicator of managerial power because it suggests that, as managers are paid more, they have a greater need to conceal their outsize rewards, and hence make more use of opaque pay forms such as inside debt.

248. Because board demographics and other firm governance variables do not vary much from year to year within firms in our sample, inferences from examining their variation are unreliable. *See* BAUM, *supra* note 245, at 223 ("The coefficients on variables with small within standard deviations are not well identified."). Therefore, we do not report them in Table 1, although we did include them in our regression analyses.

249. We include financial controls (not reported) to account for factors, such as firm size and success, that might independently explain correlations between board pay and CEO pay. In any event, there is no obvious story for why large or successful firms would be particularly likely to use inside debt.

Table 1: Effect of Changes Within Firms over Time

	Portion of Compensation Paid as Inside Debt	CEO Leverage	Total Inside Debt
Long-Term Debt	.00000175 (.0000013)	.00000328* (.00000186)	-.165 (.142)
First Lag of Long-Term Debt	.00000239 (.00000174)	.00000239 (.00000203)	-.486** (.216)
Second Lag of Long-Term Debt	.00000103 (.00000103)	.00000172 (.0000016)	.574** (.129)
Firm Leverage Ratio	.0344 (.0273)	.0552 (.0408)	1072.422 (1355.562)
Mean Director Compensation	.0000893** (.0000424)	-.0000216 (.0000364)	-.174 (1.400)
Mean Director Equity Compensation	-.000129** (.000055)	.00000146 (.0000487)	-1.157 (2.155)
Mean Director Option Compensation	-.0000439 (.0000465)	.0000761 (.0000489)	-5.605* (3.293)
% Firm Owned by Top Five Owners	-.00492 (.0343)	.010 (.050)	-1580.65 (2127.948)
CEO Age	.00246** (.000629)	.00336** (.00117)	371.231** (72.421)
Total CEO Compensation	.00000138** (.000000612)	.000000478 (.000000636)	.110** (.0412)
2008	.00272 (.00553)	.0147** (.00722)	-740.223** (286.031)
2009	.0177** (.00653)	.0799** (.0104)	-45.119 (354.070)

Two-way fixed effects regression; robust standard errors clustered by firm. Year effects relative to baseline of 2007. Coefficient reported together with (standard error).

*: statistically significant at 10% level in a two-way test against the null of no effect.

**: statistically significant at 5% level in a two-way test against the null of no effect.

The impact of director and CEO pay is not only statistically significant, but contrary to Gerakos' findings, it is also fairly meaningful in practical terms. Our coefficients look small because they include a lot of zeros, but the effect we report is the impact of an additional \$1 thousand of compensation. The mean director compensation in our sample is \$163 thousand, with a standard deviation of \$115 thousand, and mean CEO annual compensation is \$5.4 million with a standard deviation of \$6.4 million.²⁵⁰ Thus, our results imply that a one standard deviation increase in a board's compensation was responsible for a one percentage-point increase in the executive's portion of inside debt,

250. We report a complete set of descriptive statistics in the methodological appendix. See *infra* Part VIII.

while a similar increase in CEO salary accounts for another 0.88 points (e.g., from 1% to 2.88%). The average CEO received 5.6% of annual compensation in the form of inside debt. So a one-deviation increase in board compensation, all else equal, would explain more than one-sixth of all the average executive's inside debt, while CEO salary would explain another one-seventh.

Additionally, we find a significant and negative relation between directors' equity compensation and firm use of inside debt. Option compensation also has a negative sign, but not significantly so. Directors' risk preferences, then, appear to impact CEO pay, with directors holding a stake in the upside of the firm preferring to encourage CEOs to take risk.²⁵¹ The size of this effect is similar to the impact of CEO compensation—at our sample mean, it reduced inside debt by 0.8 of a percentage point, or about 14% of the average total.

It is possible, of course, that this is an efficient result for a firm that is in a position to take good risks, but we think our data suggest the opposite. Our financial variables attempted to control for factors that would correspond to risk-seeking firms, such as the firm's industry or whether the firm was in a financial position to make aggressive investments. Thus, our regression should treat all firms as having equal opportunities for good risk taking. Accordingly, if our controls were effective, the effect we measured for, the impact of director equity, could not be due to firm efforts to encourage directors to take efficient risks.

Admittedly, though, there may be other immeasurable factors, such as a firm-culture preference for risk, that influence both CEO inside debt holdings and directors' equity payouts. If so, it would be unclear whether director pay directly influences CEO inside debt. We do use firm "fixed effects," which help to control for such unobservable firm-specific factors, though.

Finally, on the panel studies, our results from regressions duplicating the dependent variables used in prior research (the middle and right-hand columns of Table 1) somewhat confirm the findings of those studies. We do find that firm debt is a significant predictor of cumulative measures of inside debt, such as CEO leverage and total inside debt held. We note, though, that once lags of firm debt are included, the contribution of current debt declines or becomes entirely insignificant, supporting our legacy costs story.

Our annual cross-sections confirm the panel results and add intriguing new details, as summarized in Table 2.

251. Because directors hold such a small portion of the firm's equity, each director is likely indifferent to the total costs to the firm of excessive risk taking. Brick et al., *supra* note 243, at 421.

Table 2: Effect of Change Across Firms on Portion of Annual Compensation Paid as Inside Debt, by Year

	2007	2008	2009
Long-Term Debt	.000000640 (.00000227)	.00000368 (.0000035)	.00000704** (.00000163)
First Lag of Long-Term Debt	-.0000000965 (.00000332)	.00000178 (.00000519)	-.00000315 (.0000028)
Second Lag of Long-Term Debt	-.000000932 (.00000311)	.00000368 (.000004)	-.000000311 (.00000375)
Firm Leverage Ratio	.000629 (.0182)	-.0137 (.0207)	-.00218 (.0264)
Mean Director Compensation	.0000161 (.0000344)	.0000881 (.0000617)	-.0000475 (.0000467)
Mean Director Equity Compensation	-.0000683 (.0000759)	-.000183** (.0000871)	-.0000967 (.0000716)
Mean Director Option Compensation	-.000148** (.0000488)	-.000238** (.0000681)	-.000177** (.0000686)
% Female Directors	.125** (.0436)	.114** (.0384)	.131** (.0409)
% Independent Directors	.104** (.0267)	.0808** (.033)	.109** (.032)
% Board < 75% Attendance	-.0663 (.0989)	-.0314 (.0864)	-.0489 (.0958)
% Board with Interlocking Position	-.352* (.191)	.119 (.0992)	-.0969 (.0817)
Board Size	.00124 (.00153)	.00295** (.00144)	.00455** (.002)
Mean Director Age	.00183* (.00105)	.00072 (.000836)	.00193** (.000934)
% Firm Owned by Top 5 Owners	-.0470 (.0352)	-.0471 (.0329)	-.0542 (.0376)
CEO Age	.00185** (.000422)	.00119** (.000427)	.00166** (.000505)
Total CEO Compensation	.00000128* (.000000682)	.00000108* (.000000648)	.00000449** (.0000014)

OLS regressions with robust standard errors. Coefficient reported together with (standard error).

*: statistically significant at 10% level in a two-way test against the null of no effect.

**: statistically significant at 5% level in a two-way test against the null of no effect.

In addition to largely confirming the panel results, our cross-sectional analyses provide further evidence of both the managerial power and risk aversion theories. Factors

that are predictors of directorial inattention, such as the age and size of the board, correlate with more extensive reliance on low-visibility inside debt.²⁵² And, again, higher pay is associated with more opaque pay. Concentrated ownership tends to reduce inside debt, although that result is close to, but not quite, statistically significant. We also find evidence that firm debt correlates with inside debt, albeit only in one of the three years studied.

Perhaps surprising are the large positive coefficients associated with female and independent boards. For example, a one standard deviation increase in the proportion of the board that is independent implies about a one percentage-point increase in the portion of inside debt compensation, which is roughly one-sixth of the average.²⁵³ We have no reason to believe that independent directors are more likely to turn a blind eye to managerial power.

Instead, we believe that independent directors are on average more risk averse than insiders.²⁵⁴ Board members with salary, legal liability, and reputational capital at stake in the success of a firm are in effect relatively undiversified investors in the firm, and so we should expect them to avoid risk unless paid in some form of equity.²⁵⁵ Risky endeavors by the firm also increase the need for time-consuming review of managerial decisions and expose the director to a greater likelihood of litigation. Inside directors face many of these incentives as well, of course, but they are more likely to hold an equity stake in the firm, and may be otherwise subject to control by more senior managers who do.²⁵⁶ Consistent with this story, Anderson et al., and Bhojraj and Sengupta found a negative correlation between board independence and the cost of debt—that is, independent boards correlate with lower borrowing costs.²⁵⁷

252. For prior evidence on these factors, see John E. Core et al., *Corporate Governance, Chief Executive Officer Compensation, and Firm Performance*, 51 J. FIN. ECON. 371, 371–73, 387–88 (1999). Large boards are predictive of inattention because of team production problems and general free riding. Older boards are thought to be inattentive because of the reduced importance of reputational considerations for the directors, more extensive social connections with managers, and perhaps diminished cognitive capacity.

253. There may be a similar risk aversion story for female directors. For evidence that women are more risk averse than men on average, see Catherine C. Eckel & Philip J. Grossman, *Men, Women, and Risk Aversion: Experimental Evidence*, in 1 HANDBOOK OF EXPERIMENTAL ECONOMIC RESULTS 1061, 1061–73 (Charles R. Plott & Vernon L. Smith eds., 2008); Rachel Croson & Uri Gneezy, *Gender Differences in Preferences*, 47 J. ECON. LITERATURE 448, 450–57 (2009). A variety of endogeneity checks suggested, however, that some unobserved variable, such as firm culture, contributes to firm preferences for both female directors and inside debt. For instance, we found that lags of inside debt predict female board membership.

254. For evidence of this proposition, see generally Yang Ni & Lynette D. Purda, *Does Monitoring by Independent Directors Reduce Firm Risk?* (Mar. 25, 2012) (unpublished manuscript), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1986289 (explaining that independent directors tend to make more conservative decisions).

255. See John C. Coffee, Jr., *Shareholders Versus Managers: The Strain in the Corporate Web*, 85 MICH. L. REV. 1, 26 (1986) (explaining differences in risk aversion levels between managers and shareholders); David Yermack, *Remuneration, Retention, and Reputation Incentives for Outside Directors*, 59 J. FIN. 2281, 2281–308 (2004) (studying the effects of different incentives on directors' performances). This could also explain, in part, our panel data findings that board compensation increases use of inside debt.

256. Our data do not include information on inside director own-firm equity holdings, except for equity paid to the inside director qua director.

257. Ronald C. Anderson et al., *Board Characteristics, Accounting Report Integrity, and the Cost of Debt*, 37 J. ACCT. & ECON. 315, 317 (2004); Sanjeev Bhojraj & Partha Sengupta, *Effect of Corporate Governance on Bond Ratings and Yields: The Role of Institutional Investors and Outside Directors*, 76 J. BUS. L. 455, 459

It is unclear whether our findings on independent boards imply inefficient contracting. It is possible that firms whose other stakeholders prefer less risk deliberately choose boards that they suspect will rein in CEO risk.²⁵⁸ Or, notwithstanding our efforts to control for industry and firm risk profile, it may be that firms that have high expected-value risky investment options choose boards that allow them to pursue these options. But it is also possible that the risk-reducing effects of certain board compositions would be a surprise to stakeholders and that they are an unintended consequence of other choices. If the risk effects of pensions are unintended, it is difficult to argue that stakeholders choose pension compensation for its efficiency.

Finally, we acknowledge that we find significant coefficients in the theoretically predicted direction for our financial controls. For example, firms with opportunities for aggressive investment make lesser use of inside debt. Firms that have performed well recently have CEOs with a smaller fraction of inside debt income and lower leverage, likely reflecting the increase in value in the CEOs' equity-based portions of their portfolios. We also found that the manufacturing and energy industry firms were more likely to use pensions, which is consistent with the general impression of experts that new industries are more reliant on risky pay.²⁵⁹

Overall, then, our data imply that existing studies have overstated the efficiency of inside debt. By neglecting to include variables we find to have a significant impact on firms' decisions to use inside debt, the existing literature has somewhat overstated the case for inside debt. For example, our finding on the importance of directorial risk preferences implies that the endogeneity concern highlighted in the Tung and Wang study might be a serious issue for the reliability of prior results.

VII. CONCLUSION

Inside debt is a key aspect of two areas of major public importance: corporate governance and financial firm regulation. We have argued that inside debt is unlikely to be a useful tool of corporate governance in most situations, and that many scholars, including those who cast a cold eye on pensions in the corporate governance context, have been insufficiently skeptical of inside debt in the banking context. Among other reasons, we suggested that inside debt is inefficient because agency costs of credit are already low in and out of bankruptcy, it facilitates managerial hedging and rent seeking, it lags a firm's borrowing needs, and it may be too complex or distracting for humans to respond to accurately.

Further, our own empirical findings offer only weak support for the optimal contracting theory of inside debt. Instead, our data suggest that inside debt is the result of factors consistent either with managerial power or with accidental distortions of board incentives. We cannot entirely rule out the possibility, however, that despite our best efforts, some unobservable factors that drive firm-wide risk preferences might be shaping

(2003). Anderson et al. attributed the relation between independence and borrowing costs to a reduction in "managerial opportunism." Anderson et al., *supra*, at 319. That is a possibility, but they do not rule out our story either.

258. See Graham et al., *supra* note 212 (suggesting that CEOs and managers may match up based on fit of "right personality traits for the particular company").

259. No other industry, including banks, had any significant effect on inside debt utilization.

both board and CEO compensation.

We should emphasize that our theory and findings here do not necessarily imply that all forms of incentive-based pay are inefficient. Much of our analysis turns on the low agency costs of credit and the perhaps uniquely high costs of inside debt. On the behavioral front, our discussion does raise some potential questions about the efficacy of complex stock and option packages. More work is needed to pinpoint managers' cognitive threshold for processing incentive pay. What we can say for now is that existing evidence suggests adding inside debt on top of an already intricate set of equity incentives is unlikely to improve managerial decisions.

VIII. METHODOLOGICAL APPENDIX

This Part explains for readers with more detailed interest in statistics the construction of the data set employed in Part VI and the econometric methods used to analyze it. Our data are composed primarily of firm financial information drawn from the online data service Execucomp, executive and director compensation information from Compustat, and blockholder information from Thomson-Reuter's database of 13F filings. Due to SEC filing rules, pension and deferred compensation information is available only from December 2006 forward, while the Compustat database contains data on director compensation, one of our key independent variables, only for 2007 through 2009. Execucomp tracks filings for firms currently or formerly in the S&P 1500, although data is missing for some firms in some years. Accordingly, most of our models utilize a panel of roughly 2000 firms over three years, with additional financial information (such as lagged firm debt) from prior years as well. Because of missing data, most of our regressions ultimately include about 3300 observations on 1300 firms over three years.

We constructed four different measures of firm reliance on inside debt. Following the literature, we additionally examined the raw total amount of the inside debt held by the CEO, utilizing total pension balance and total deferred compensation account balances from Compustat. As in the Cen study and others, we further computed the CEO's personal leverage ratio, consisting of inside debt held over inside debt plus total equity and in-the-money unexercised options.²⁶⁰ Also as in Cen, we computed the "match rate" of the firm—the ratio of executive over firm contributions to the deferred compensation fund—which Cen suggests captures the firm's effort to incentivize deferred compensation contributions.²⁶¹

In our view, however, the best indicator of a firm's preference for inside debt in a given year is the portion of annual compensation paid out in pension and deferred compensation.²⁶² Other measures in the literature are flawed. Firm need for risk taking can vary by year, but measures of total inside debt balance or personal leverage ratio

260. Cen, *supra* note 223, at 18; Sundaram & Yermack, *supra* note 6, at 1572; Tung & Wang, *supra* note 208, at 14. To reflect the fact that both firm and CEO decisions take place over a range of time within each year, we valued the executive's equity holdings by multiplying the number of shares held on the reporting date by the average value of shares during the calendar year.

261. Cen, *supra* note 223, at 20.

262. See Sundaram & Yermack, *supra* note 6, at 1567–69; Goh & Li, *supra* note 224, at 17 (using a version of percent inside debt as their dependent variable).

mingle together annual firm decisions with the results of prior years' decisions. And the deferred-compensation match ratio obviously omits any information about pension utilization. We calculated our alternative measure, which we call "percent inside debt," using Compustat data on annual changes in pension and defined contribution (DC) balances, divided by total compensation reported to the SEC.²⁶³

In all cases, we constructed measures both with salary included as inside debt (as in Tung and Wang) and without.²⁶⁴ Since we are interested primarily in long-term incentives, reported results do not include salary.

To test the competing hypotheses about the likely determinants of a firm's use of inside debt, we assembled a variety of explanatory variables. One group of variables relates to the structure and demographics of the board of directors. Using individual director data from Execucomp, we calculated the yearly percentage of each board that was independent, interlocking, former employees, financially expert, attended less than 75% of meetings, and female (excluding the CEO in all cases). We also determined the number of directors, as well as their mean age and number of other boards they occupied. Similarly, following literature on the effects of board compensation on CEO power²⁶⁵ and borrowing costs,²⁶⁶ we computed the average total compensation of the board and the average equity and option stakes the board held in the firm.²⁶⁷

In order to test the hypothesized relationship between a firm's borrowing needs and its use of inside debt, we collected total firm long-term debt and total firm debt in current liabilities. We also calculated the firm's leverage ratio, which was simply long-term debt over total assets. In addition, we collected lags of the firm's long-term debt extending back to 2003. Regression analyses with all lags included suggested that lags longer than two years had no statistically significant impact on the dependent variables, so we included only the first and second lags of debt in the reported results.

We similarly examined the delayed effects of tax on contractual design by including both current and multiple lags of tax status of each firm. Because the benefits of tax deferral can accrue to both debt and equity, and hence would appear in both the numerator and denominator of our main dependent variable, we expect no significant

263. Nonqualified executive pensions are typically "defined benefit" rather than "defined contribution" (DC). Sundaram & Yermack, *supra* note 6, at 1552. That is, unlike the pensions most readers have encountered, executive pensions are not typically subject to investment risk. Instead, executive pensions resemble an annuity guaranteeing the executive an annual payment determined according to a formula. Formulas usually depend on salary and bonuses in the years before retirement. *Id.* at 1561. Accordingly, annual changes in pension value can result both from affirmative decisions by the firm to change compensation as well as from "automatic" changes deriving from the underlying formula. A firm aiming to design an optimal compensation package, however, would adjust its pension formula annually to reflect the ideal degree of risk-seeking behavior for the executive. Similarly, firms can annually adjust their contribution to a DC fund to optimize incentives. Thus, we think it appropriate to use changes in annual pension and DC value as a test of whether firms employ pensions to optimally align executive incentives. However, as explained below, we also control for factors that affect the "automatic" adjustments in pension balance, such as firm success and CEO age.

264. Tung & Wang, *supra* note 208, at 13.

265. Brick et al., *supra* note 243, at 404.

266. Mine Ertugrul & Shantaram Hegde, *Board Compensation Practices and Agency Costs of Debt*, 14 J. CORP. FIN. 512, 513 (2008).

267. We also computed medians for all the figures for which we determined means. Our results were robust to the use of medians rather than means.

results. Our findings confirm this expectation.

Finally, we included a number of firm financial variables and CEO demographic characteristics commonly used as controls in the literature. For example, because pension formulae may depend on bonuses related to firm performance—but bonus data are very imperfectly collected—we computed firm performance, both as the ratio of net operating income to book assets, and as return on common equity. Because firms with more investment opportunities can be expected to be risk preferring, we control for that using the ratio of book-to-market value assets and property, plant, and equipment (PPE) assets over total assets.²⁶⁸ Firms with relatively concentrated ownership should be more closely monitored, perhaps resulting in less managerial power, and so we calculated the percentage of the firm held by its largest five shareholders using 13F filings.²⁶⁹

We also controlled for the general industry of each firm, using a series of dummies for each of the North American Industry Classification (NAIC) categories. We subdivided NAIC financial firms into banking, insurance, and other financial to make sure that we could observe if the banking industry's unmeasured leverage, in the form of depositors' claims, would influence outcomes.

Table A1: Descriptive Statistics for 2007–2009

Variable	Observed	Mean	Standard Deviation	Minimum	Maximum
% Board Attending < 75% of Board Meetings	4204	.0083	.0318	0	.3333
% Board Former Employee	4204	.0352	.0672	0	.6364
% Board with Financial Expertise	4204	.145	.1432	0	.8571
% Female Board	4204	.115	.0990	0	.625
% Independent Board	4204	.77252	.1157641	0	1
% Interlocking Board	4204	.0011	.0152	0	.333333
% of Firm Owned by 5 Largest Blockholders	7119	.296	.1111	.0001	.9409

268. *E.g.*, Walker, *supra* note 13, at 243. We do not employ the ratio of research and development (R&D) to sales used by Sundaram & Yermack, *supra* note 6, at 1573, because of extensive missing R&D data in our sample.

269. Prior studies connecting lower managerial pay to more concentrated ownership include Core et al., *supra* note 252, at 404; Marianne Bertrand & Sendhil Mullainathan, *Are CEOs Rewarded for Luck? The Ones Without Principals Are*, 116 Q.J. ECON. 901, 903 (2001).

% Related Board	4204	.0084	.0337	0	.4
Annual Change in Pension*	5433	425.563	1162.025	-1170.816	20671.74
CEO Age	5384	54.9577	7.21776	93	93
CEO's Leverage Ratio	.360	3.228	3.2277	170.618	170.6178
CEO Total Pension Balance*	5432	2585.56	6583.495	0	87302.01
CEO Total Compensation*	5426	5406.425	6426.267	0	112464.5
CEO Total Defined Balance*	5432	2195.611	8675.017	-71.312	245493
Common Equity*	7642	3062.371	10195.08	-96620	194236
Common S/h*	7138	26.0192	120.7305	.001	2612.674
DC Match Rate	1700	2.486	44.7758	-.232	1765.804
Debt in Current Liabilities*	7641	2430.947	26223.23	0	562857
Director Age, Mean	4204	61.5243	3.7634		75.8333
Director Age, Median	4204	61.8374	4.3015		78
Director Compensation, Mean	5399	162.989	115.3156	-1273.408	1795.866
Director Compensation, Median	5399	155.657	98.7040	-428.979	1797.116
Director Options, Mean	5392	31.70	65.9914	899.393	899.3932
Director Stock, Mean	5393	55.9958	68.8959	1467.36	1467.36
Ebitda*	7350	1104.66	4280.241	-76735	78669
Employees	7515	18.5198	64.2189	0	2100
Firm Performance	5428	.0661	4.5866	-136.4958	209.3245
Firm Leverage Ratio	7623	.1937	.3803	0	28.6111
Firm Total Assets*	7646	17439.11	103086.9	.005	2223299

Firm Total Long-Term Debt*	7623	3326.156	21398.8	0	466676
Investment Opportunities	6820	.4944	.4074	0	5.8763
Is CEO Male? (1=Yes)	.967	.9665	.1798	0	1
Number of Directors	6878	8.4612	2.7951	1	32
Other Boards/Director, Mean	4204	.8497	.5202	0	2.6
Other Boards/Director, Median	4204	.6013	.6392	0	3
Property, Plant, & Equipment (total, gross)*	6820	4023.618	14475.39	0	305906
Ratio of Change in Inside Debt to Total Compensation	5414	.0559	.1136	-.6123	.9924
Tax Loss Carry Forward*	4734	408.2209	1806.159	0	47300
Tax Paid*	7352	189.2618	908.4512	-1250	33941

*: in thousands

We separately regress each of the dependent variable measures utilizing a three-year unbalanced panel. For several of our explanatory variables of interest, such as the composition of the firm's board, there is relatively little variation within a firm from year to year. A Hausman test, however, indicated that a random effects approach would produce inconsistent results. Given the financial crisis, as well as potential year-specific abnormalities in executive pay,²⁷⁰ we expected significant year effects. Accordingly, we employed a two-way fixed-effects model.

To capture some of the information from the variation between firms, we also performed a cross-sectional analysis for each of the three years available. In addition to the cross-sections reported here, we also carried out a series of cross-section regressions using CEO leverage and total CEO inside debt as the dependent variables. With the exception of the tax controls, results were qualitatively similar to our reported results, suggesting that the correlations we found are robust to the choice of dependent variable. We found some significant results for current and lagged tax liability in the total inside debt regressions, but that is not surprising, because theory predicts that firms can use

270. See Graham et al., *supra* note 212, at 12 (discussing that components that factor into salary may vary by year).

either inside debt or stock options to capture the tax benefits of deferral.

Finally, we note that prior authors in the literature have at times used truncated or selection effect regressions, such as a Tobit model.²⁷¹ Our view is that these models are inappropriate. The theory behind use of the Tobit is that some firms do not use pensions, and so the outcome variable is truncated at zero.²⁷² That is not the case in our model, which allows for negative growth in pension balances. In any event, the sign and significance of our results do not change with the use of a Tobit model, although unsurprisingly most coefficients are somewhat larger in magnitude. We also do not believe that there is any selection effect in the sample: by hypothesis, firms can reset their inside debt amount to any level in any year, so that the decision to use zero inside debt is a point on the continuum of inside debt payouts. In other words, there are no decisions we do not observe in the sample. Indeed, tests of the inverse mills ratio generated from employing two-step Heckit regressions on the annual cross-sections could not reject the null hypothesis that no selection model was necessary.

271. Sundaram & Yermack, *supra* note 6, at 1573; Cen, *supra* note 223, at 27.

272. Sundaram & Yermack, *supra* note 6, at 1573.