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## REGULATING BANKERS' PAY

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## REGULATING BANKERS' PAY

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## Abstract

This paper contributes to understanding the role of executive compensation as a possible cause of the current financial crisis, to assessing current legislative and regulatory attempts to discourage bank executives from taking excessive risks, and to identifying how bankers' pay should be reformed and regulated going forward.

Although there is now wide recognition that bank executives' decisions might have been distorted by the short-term focus of pay packages, we identify a separate and critical distortion that has received little attention. Because bank executives have been paid with shares in bank holding companies or options on such shares, and both banks and bank holding companies issued much debt to bondholders, executives' payoffs have been tied to highly levered bets on the value of the capital that banks have. These highly levered structures gave executives powerful incentives to take excessive risks.

We show that current legislative and regulatory attempts to discourage bank executives from taking excessive risks fail to address this identified distortion. In particular, adopted and proposed measures aimed at aligning the interests of executives tightly with those of the common shareholders of bank holding companies – through emphasizing awards of restricted common shares in these companies and introducing “say on pay” votes by these shareholders – do not eliminate the divergence between executives' interests and the aggregate interests of all those with a stake in the bank. The common shareholders of bank holding companies, especially now that the value of their investment has decreased considerably, would favor different strategies than that would be in the interest of the government as preferred shareholder and guarantor of some of the bank's obligations.

Finally, having identified the problems with current legislative and regulatory attempts, we analyze how best to implement recent legislative mandates that require banks receiving TARP funding to eliminate incentives to take excessive risks. Beyond banks receiving governmental support, we argue that monitoring and regulating bankers' pay should be an important element of banking regulation in general, and we analyze how banking regulators should assess and regulate bankers' pay.

**Keywords:** Executive compensation, banks, financial firms, financial crisis, TARP, restricted shares, options, moral hazard, risk-taking.

**JEL Classification:** G28, K23

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## I. INTRODUCTION

Excessive risk in the banking sector seems to be the cause of what is now the deepest economic crisis since the Great Depression. There is widespread concern that executive compensation arrangements are partly to blame, and that fixing these arrangements will be extremely important in resolving the current crisis and preventing similar events in the future. But what exactly has been wrong with bank executives' pay and how should it be fixed going forward? These are the questions on which we focus in this paper.

We explain how banks' financing structures and incentive pay arrangements incentivized executives to take excessive risks, how these incentives were amplified by the crisis, and why understanding this problem is important for effective reform. In essence, the problem is that bank executives' payoffs have been tied to highly levered bets on the value of banks' assets. We show that the measures thus far adopted or proposed by Congress and the administration do not address the critical problem that we identify, and we suggest how compensation should be structured going forward to deal with the problem. Beyond the current crisis, we argue for employing the lever of executive compensation as an important element of banking regulation. Regulating executive pay in banks can nicely complement, and may partially substitute for, prudential regulation of banks' capital and risk.

Much attention is now focused on the fact that pay arrangements have provided executives with incentives to focus on short-term results.<sup>1</sup> They have enabled executives to take money off the table before it turned out that gains to earnings and stock prices were in fact illusory. This problem was first highlighted several years ago in a book and accompanying

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<sup>1</sup> See, e.g., the statement by the chairman of the Federal Reserve System, Ben S. Bernanke, *The Financial Crisis and Community Banking*, speech given at the Independent Community Bankers of America's National Convention and Techworld, Phoenix, Arizona (03/20/2009), available at <http://www.federalreserve.gov/newsevents/speech/bernanke20090320a.htm#fn3> (accessed 03/23/2009) (declaring "poorly designed compensation policies can create perverse incentives that can ultimately jeopardize the health of the banking organization. Management compensation policies should be aligned with the long-term prudential interests of the institution, be tied to the risks being borne by the organization, provide appropriate incentives for safe and sound behavior, and avoid short-term payments for transactions with long-term horizons.") and the statement by the CEO of Goldman Sachs, Lloyd Blankfein, *Do not destroy the essential catalyst of risk*, FINANCIAL TIMES 02/09/2009, p. 7 (arguing that "An individual's performance should be evaluated over time so as to avoid excessive risk-taking. To ensure this, all equity awards need to be subject to future delivery and/or deferred exercise. Senior executive officers should be required to retain most of the equity they receive at least until they retire, while equity delivery schedules should continue to apply after the individual has left the firm.")

articles co-authored by one of us,<sup>2</sup> and has recently become widely recognized.<sup>3</sup> There is no question that short-termism could have contributed to excessive risk-taking, and a contemporaneous paper co-authored by one of us with Jesse Fried shows how compensation arrangements can be best designed to eliminate the potential distortions from such short-termism.<sup>4</sup> But we identify in this paper some other key features of current and past pay arrangements that would lead to excessive risk-taking even in a world with one period in which there are naturally no problems related to the length of executives' horizon.

Both the Emergency Economic Stabilization Act of 2008 (also known as the TARP bill) and the American Recovery and Reinvestment Act of 2009 (the so-called stimulus bill) require the elimination of incentives to take “unnecessary and excessive risks” in firms receiving TARP funds.<sup>5</sup> The Treasury’s recent statements on financial sector reform reaffirm the importance of this mandate.<sup>6</sup> To operationalize this mandate, however, a clear understanding of the factors that provided such harmful incentives is necessary. As commentators have noted, such an understanding has so far been lacking.<sup>7</sup> Our analysis elucidates the source of excessive risk-taking incentives in pay arrangements and thereby contributes to implementing the existing legislative mandate.

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<sup>2</sup> Lucian A. Bebchuk & Jesse Fried, *PAY WITHOUT PERFORMANCE* (2004), Lucian A. Bebchuk, Jesse Fried, & David Walker, *Managerial Power and Rent Extraction in the Design of Executive Compensation*, 69 *UNIVERSITY OF CHICAGO LAW REVIEW* 751-846 (2002); Lucian A. Bebchuk & Jesse Fried, *Executive Compensation as an Agency Problem*, 17 *JOURNAL OF ECONOMIC PERSPECTIVES* 71-92 (2003); Lucian A. Bebchuk & Jesse Fried, *Pay without Performance: Overview of the Issues*, *JOURNAL OF APPLIED CORPORATE FINANCE* 8-22 (2005).

<sup>3</sup> *Cf.*, e.g., the shareholder proposals submitted by AFSCME during the 2009 proxy season suggesting that executives be required to hold their shares in the company until two years past retirement, *see* AFSCME press release of 01/27/2009 available at <http://www.afscme.org/press/24815.cfm>, accessed 03/29/2009. For a recent review of the literature, *see* Sanjai Bhagat & Roberta Romano, *Reforming Executive Compensation: Focusing and Committing to the Long-Term*, *YALE LAW & ECONOMICS RESEARCH PAPER NO. 374* (February 2009).

<sup>4</sup> *See* Lucian A. Bebchuk & Jesse Fried, *Paying for Long-Term Performance*, unpublished manuscript, forthcoming as *HARVARD LAW & ECONOMICS DISCUSSION PAPER No. \_\_\_\_* (2009).

<sup>5</sup> *See infra* notes 49 and 50 and accompanying text.

<sup>6</sup> *Cf.* Treasury Secretary Timothy F. Geithner, Written Testimony House Financial Services Committee Hearing, March 26, 2009, available at <http://www.treas.gov/press/releases/tg71.htm>, accessed 03/31/2009 (arguing that “regulators must issue standards for executive compensation practices across all financial firms ... [that] encourage prudent risk-taking ... and should not otherwise create incentives that overwhelm risk management frameworks.”).

<sup>7</sup> *See infra* note 51.

In addition to the general mandate, Congress and the Treasury have adopted a number of concrete provisions addressing executive compensation in firms receiving TARP funds. We show, however, that these provisions do not address the incentives to take excessive risks that we identify and may in fact make them worse. In particular, Congress and the administration have focused on requiring TARP recipients to pay incentive compensation only in the form of restricted stock and to submit pay arrangements to a non-binding shareholder vote (“say-on-pay”). These measures serve to align the incentives of executives with those of shareholders. But the interests of the shareholders of TARP recipients considerably differ from those of the government as a preferred shareholder and as a formal or implicit guarantor of obligations. These shareholders could well benefit from taking excessive risks at the expense of preferred shareholders and debt-holders.<sup>8</sup> We suggest that Congress should attempt to decouple bank managers’ incentives from those of shareholders, rather than aligning them.

Our analysis of bankers’ incentives and the role of executive compensation has implications far beyond the current crisis and compensation in banks receiving TARP funds. We argue for regulating the pay of bank executives as an important element of banking regulation. Our approach would structure executive compensation for banks to incentivize top bankers to take into account the effects of their decisions not on a thin slice of equity (or even just an option on the value of this equity) but rather on the value of all of the bank’s assets – or at least on all the contributors to the bank’s capital, including preferred shareholders and debt-holders. At the minimum, banking regulators should monitor executive pay in banks and take into account the existence of the problems we identify in carrying out their bank oversight functions.

Part II begins our analysis by describing the incentives of banks’ top executives in the run-up to the current crisis. The analysis of banks’ financing structure and compensation arrangements shows that bank managers’ incentives arose from an extremely levered bet on banks’ assets. Because top bank executives were paid with shares of a bank holding company or options on such shares, and both banks and bank holding companies obtained capital from debt-

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<sup>8</sup> Some may wonder why the banks appear not to be lending at the moment if, as we argue, they have an incentive to take risks. But we do not argue that banks will take *any* gamble. If the perceived odds are too unfavorable, even risk-loving banks will hold back lending. One of us has argued elsewhere that banks might rationally withhold lending for reasons of coordination failure, *see* Lucian A. Bebchuk & Itay Goldstein, *Self-Fulfilling Credit Market Freezes*, HARVARD LAW & ECONOMICS DISCUSSION PAPER No. 623 (December 2008); and for a proposal how to solve that problem, Lucian A. Bebchuk, *Unfreezing Credit Markets*, HARVARD LAW & ECONOMICS DISCUSSION PAPER No. 622 (December 2008).

holders, executives faced asymmetric payoffs, expecting to benefit more from large gains than to lose from large losses of a similar magnitude. Transforming deposits into loans, banks are inherently levered institutions. But the standard structure of large banks – which are generally owned by bank holding companies and pay their executives partly with stock options – have added two additional layers of leverage. We illustrate the common capital and incentive structures of modern banks with numbers from Citigroup and Bank of America.

Our basic argument can be seen in a simple example. A bank has \$100 of assets financed by \$90 of deposits and \$10 of capital, of which \$4 are debt and \$6 are equity; the bank's equity is in turn held by a bank holding company, which is financed by \$2 of debt and \$4 of equity and has no other assets; and the bank manager is compensated with some shares in the bank holding company. On the downside, limited liability protects the manager from the consequences of any losses beyond \$4. By contrast, the benefits to the manager from gains on the upside are unlimited. If the manager does not own stock in the holding company but rather options on its stock, the incentives are even more skewed. For example, if the exercise price of the option is equal to the current stock price, and the manager makes a negative-expected-value bet, the manager may have a great deal to gain if the bet turns out well and little to lose if the bet turns out poorly.

In Part III, we show that the crisis has not alleviated the problem that executive compensation currently provides managers with incentives to enhance the value of common shares of bank holding companies or of options on the value of such shares even when such enhancement does not serve the interests of bondholders, depositors, and the government as guarantor of deposits. Indeed, for some banks, the crisis might have exacerbated the divergence between the interests of executives and the aggregate interests of those with a stake in the bank by reducing the value of executives' shares, and options to buy shares, in the banks' holding companies. Such reductions make executives' payoffs all the more asymmetric. In the current circumstances, such divergence might lead the executives to avoid raising additional capital even when doing so is desirable to strengthen the cushion available to bondholders and depositors and to take advantage of lending opportunities.

In Part IV, we assess against this background the measures adopted by Congress and proposed by the Treasury to regulate executive pay in banks receiving TARP funds. The main measures – the use of restricted stock in incentive pay and say-on-pay advisory shareholder votes



on compensation – attempt to tighten the alignment of executives’ and shareholders’ interests. Our analysis of the divergence of interest between shareholders and contributors of capital to the bank that are senior to the shareholders indicates that this strategy could well be counterproductive. For the shareholders’ interests could well be served by taking risks that would be detrimental to the government’s interests as preferred shareholder and guarantor of some or all of the banks’ debt. The government has injected large amounts of money into the banks and in return has received preferred stock and other positions that are senior to equity. Moreover, the government guarantees deposits de jure up to \$250,000 and might de facto have, or elect to shoulder, responsibility for deposits beyond this limit and other bank obligations. These interests of the government would not be well served by strengthening the link between executives’ interests and those of the shareholders of bank holding companies.

In Part V, we explain better ways to regulate executive compensation in banks receiving TARP funds. More generally, we suggest that executive pay can be an important lever for banking regulation beyond both TARP recipients and the current crisis.

Moral hazard is inherent to banking, at least in the presence of deposit insurance. In principle, banking regulators are keenly aware of the problem and attempt to mitigate it by directly regulating banks’ activities. But given the complexities of modern finance and the limited information and resources of regulators, such regulation is necessarily imperfect. Moreover, as long as management’s incentives are tied to those of shareholders, management might have an incentive to increase risks beyond what is intended or assumed by the regulators, who might often be one step behind banks’ executives. Regulators should attempt to make management incentives work for, rather than against, the goals of banking regulation.

In addition to regulating banks’ behavior directly, the government could regulate the pay packages that shape how bank executives choose from the menu of actions allowed by this direct regulation. Such regulation of pay should focus on the structure of compensation – not the amount – with the aim of discouraging the taking of excessive risks. In terms of substance, to the extent that executive pay is tied to the value of specified securities, it should be based on a broader basket of securities and not only common shares. Rather than tying executive pay to a specified percentage of the value of the common shares of the bank holding company, it could be tied to a specified percentage of the aggregate value of the common shares, the preferred shares, and the bonds issued by either the bank holding company or the bank. Similarly, to the extent

that executives receive bonus compensation based on accounting measures, such bonuses should not be based on metrics that reflect the interests of common shareholders, such as earnings per share, but rather on broader metrics that reflects also the interests of preferred shareholders, bondholders, and the government as guarantor of deposits. Such changes in compensation structures would induce executives to take into account the effects of their decisions on preferred shareholders, bondholders, and depositors and thereby would curtail incentives to take excessive risks.

The proposed regulation of bankers' pay could nicely supplement and reinforce the traditional, direct regulation of banks' activities. Indeed, if pay arrangements are designed to discourage excessive risk-taking, direct regulation of activities could be less tight than it should otherwise be. Conversely, as long as banks' executive pay arrangements are unconstrained, regulators should be more strict in their monitoring and direct regulation of banks' activities. At the minimum, bank regulators should closely monitor the structure of banks' pay arrangements and take the incentives they generate into account when assessing the risks posed by any given bank and deciding how strictly to monitor and directly regulate the bank's activities.

As is the case with any analysis of incentives, our own cannot show whether and to what extent any given executives were in fact driven by the incentives given to them. Individuals do not always act in ways that fully maximize their (monetary) payoffs. But, like other work by policy analysts and financial economists, we assume that incentives matter. This is why executives are in the first place given packages that seek to provide them with payoffs connected to performance. To the extent that the incentives generated by pay arrangements matter, our analysis seeks to identify the arrangements that produce perverse incentives and those that produce desirable ones.

Our analysis also complements others that focus on different aspects of the current crisis, and how to solve it. One set of pressing issues concerns the restoration of banks' ability to carry out their important normal role in the economy, by cleaning up banks' balance sheets, shoring up banks' capital positions, or other means.<sup>9</sup> While our paper does not directly address these issues,

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<sup>9</sup> See, e.g., Lucian A. Bebchuk, *Buying Troubled Assets*, YALE JOURNAL OF REGULATION (forthcoming); John C. Coates IV & David S. Scharfstein, *Lowering the Cost of Bank Recapitalization*, YALE JOURNAL OF REGULATION (forthcoming); John Geanakoplos, *Solving the Present Crisis and Managing the Leverage Cycle*, available at <http://cowles.econ.yale.edu/~gean/crisis/solving-present-crisis.pdf> (accessed 03/26/2009).

it shows that bankers' pay arrangements do not currently provide them with incentives to make optimal decisions, and how these arrangements should be adjusted to do so. There are also proposals for improving the traditional prudential regulation of banks' capital and activities.<sup>10</sup> We put forward an additional lever, executive compensation, that could usefully complement and perhaps partly substitute for the traditional prudential regulation.

Throughout, we focus on the compensation of the banks' top executives. Compensation structures at lower levels of the banks' hierarchy were certainly important for encouraging risk-taking at those levels, and for this reason they have been intensively discussed in the media. But lower-level compensation schedules are set by higher levels of management. Hence setting appropriate incentives for the highest level of management will have ripple effects throughout the entire banking organization without replacing decentralized private decision-making with government regulation. Top management's incentives are central to the behavior of banks as a whole. Our new approach to banking regulation proposes to use this key.

## II. INTO THE CRISIS: THE TRIPLE LEVERAGING OF EXECUTIVES' INCENTIVES

Here we describe in more detail the financial structure of modern banking organizations and the compensation structures in such organizations that provided bank executives with incentives for excessive risk taking in the build-up to the present crisis. By taking excessive risks, we refer to taking actions that may either increase or decrease the value of the bank assets but whose expected effect on bank value is negative. The taking of such negative-expected-value "bets" may nevertheless be attractive from the perspective of a private actor if the actor expects to capture a share of possible gains but to bear a smaller share of possible losses. We suggest that this was the case for bank managers in the build-up to the present crisis, since compensation arrangements shielded these executives from a large fraction of possible losses. To be sure, the asymmetric payoffs that we analyze did not provide managers with incentives to take actions that

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<sup>10</sup> See, e.g., Gerard Caprio Jr., Asli Demirgüç-Kunt & Edward J. Kane, *The 2007 Meltdown in Structured Securitization*, WORLD BANK POLICY RESEARCH WORKING PAPER 4756 (October 2008); Michael Solender, *How the Obama Administration should Regulate the Financial Sector*, YALE LAW & ECONOMICS RESEARCH PAPER No. 376 (February 2009), available at <http://ssrn.com/abstract=1350005>; Group of 30, FINANCIAL REFORM – A FRAMEWORK FOR FINANCIAL STABILITY (Washington DC, 2008); Calomiris, *supra* note 13.

would produce a loss with absolute certainty within the relevant period. Rather, we argue that they had incentives to take risks that had both an upside and a downside, and that were socially excessive yet privately optimal.

We begin in section A by briefly laying out the well-known problem of moral hazard in banks. Bank shareholders have an incentive to increase the volatility of bank assets, which government-protected bank creditors have no incentive to prevent. In section B, we describe features of the financial structure of modern banking organizations and their compensation structures that tie the interests of bank executives to highly levered bets on the value of bank assets. In section C, we explain how the use of options in executive pay arrangements added an additional layer of leverage, further exacerbating the moral hazard problem. In section D, we illustrate the analysis of this part with the financial incentives of the CEOs of Citibank and Bank of America.

Section E comments on why bondholders of banks and bank holding companies cannot be relied on to prevent pay arrangements that provide incentives for excessive risk-taking. Finally, Section F explains why our analysis of managers' private incentives to take excessive risks is fully consistent with the observation that some bank managers lost substantial amounts of private wealth in the current crisis.

#### *A. Moral hazard in Banks*

There is a fundamental and now well understood moral hazard problem in banks.<sup>11</sup> Those who provide (equity) capital have an excessive incentive to take risk. They will capture

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<sup>11</sup> Moral hazard in banks is a special, particularly severe case of moral hazard of equity in general. On the general problem of moral hazard, see Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure*, 3 JOURNAL OF FINANCIAL ECONOMICS 305 (1976), at 334-337. As we discuss at the end of this Subsection II.A, moral hazard is particularly severe in banks because by their very function banks have extraordinarily dispersed creditors, namely small depositors, who have neither the incentive nor the competence to evaluate banks' risk-taking behavior, or more generally their solvency, see Mathias Dewatripont & Jean Tirole, *THE PRUDENTIAL REGULATION OF BANKS* (1994), at 6. Depositors certainly have no incentive to protect themselves when they are protected by deposit insurance. See generally Gary Gorton & Andrew Winton, *Financial Intermediation*, in Constantinides, Harris & Stulz, this note, 431, at 520-529 with references to the abundant literature, including empirical literature documenting the incidence of moral hazard at the bank level in the presence of deposit insurance. Cross-country evidence also supports the importance of deposit insurance for moral hazard, see Aslı Demirgüç-Kunt & Harry Huizinga, *Market discipline and deposit*

the full upside, but some of the downside will be borne by the government as insurer of deposits if the bank goes bankrupt.

It will be helpful to use in this, and the subsequent section, a stylized example. In our analysis of the basic example and all subsequent modifications, we will assume for simplicity that there are only two periods – the present, when managers make decisions, and, the future, when gains or losses are realized and the manager gets paid. With multiple periods, the analysis would become more complex but our general conclusions would not change.

Consider a bank that has \$100 in assets, funded by capital of \$10 and \$90 of deposits, which are senior to capital. In this case, the shareholders will have an excessive incentive to take risk. To see this, consider a strategy that would produce a fifty-fifty chance of increasing or decreasing the value of the bank's assets. In particular, suppose that the bank has to decide whether to pursue a risky strategy with a 50 percent chance of reducing the value of the assets by \$20 and a 50 percent chance of increasing it by  $X$ . If  $X$  is less than \$20, the risky strategy will have a negative expected value. However, taking the risky strategy would be in the interest of the shareholders for some values of  $X$  below \$20.

The reason is that, in the event the risky strategy would produce a loss of \$20, the shareholders will not bear this loss fully. Rather, they will lose only \$10, their capital invested in the bank, with the remainder of \$10 borne by depositors and/or the government as guarantor of depositors. In contrast, in the event that the risky strategy is successful, the shareholders will capture the full benefit of the increase  $X$  in the value of the assets. As a result, taking the risky strategy will have a positive expected value for the shareholders as long as  $X$  is more than \$10. Thus, there is a range of values that  $X$  might take – between \$10 and \$20 – within which the risky strategy will have a negative expected value but will still be in the economic interest of the shareholders.

Another way of seeing the problem is by noting that, from the perspective of the shareholders' economic interests, there is no difference between a decline in the value of assets

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*insurance*, 51 JOURNAL OF MONETARY ECONOMICS 375 (2004) (finding in a sample of 30 countries that deposit insurance leads to greater risk-taking); James R. Barth, Gerard Caprio, Jr. & Ross Levine, RETHINKING BANK REGULATION – TILL ANGELS GOVERN (2006), at 213-223 (finding in a sample of over 150 countries that deposit insurance increases the likelihood of banking crises); Asli Demirgüç-Kunt & Enrica Detragiache, *Does deposit insurance increase banking system stability? An empirical investigation*, 49 JOURNAL OF MONETARY ECONOMICS 1373 (2002) (same, for 61 countries).

of 10 and *any* larger decline that wipes out all or most of the value of the assets; in both cases, the shareholders will lose their capital. As a result, shareholders will have an incentive to underweight the lower tail of the distribution of losses.

To see this, consider a bank that can keep things as they are or choose either one of two risky strategies A and B. Suppose that A will produce a gain of \$2 with a 90 percent chance and a loss of \$10 with a 10 percent chance, while B will produce a gain of \$3 with a 90 percent chance and a loss of \$50M with a 10 percent chance. In this case, taking A has a positive expected value and taking B has a negative expected value. But the economic interest of the shareholders will favor B over A, as the shareholders will lose the same amount if either A or B fails, and they will make more if B succeeds than if A succeeds.

It is widely acknowledged that taking excessive risks cannot be deterred by the prospect that depositors will avoid banks that do so. To begin, depositors whose deposits are guaranteed by the government have no incentives to investigate the banks' strategy before depositing their funds, or to withdraw these funds when they learn that the bank has embarked, or is about to embark, on a risky project, because they are protected by the government. And even if they were not protected by insurance, the vast majority of small depositors would have neither the incentives nor the resources to monitor the bank's behavior.

Given that depositors cannot be expected to prevent excessive risk-taking by banks, and that such risk-taking might lead to bank failure that would have an adverse effect on the government as insurer of deposits and on the economy, governments regulate and monitor banks' capital and activities.<sup>12</sup> It is widely recognized, however, that, given the limits to regulators' information, such prudential regulation can constrain but cannot be counted on to eliminate all excessive risk-taking by banks.<sup>13</sup> We discuss the reasons for this in Part V.B.

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<sup>12</sup> See Dewatripont & Tirole, previous note, at 29-45; Dirk Heremans, *Regulation of Banking and Financial Institutions*, in Boudewijn Bouckaert & Gerrit de Geest (eds.), 3 *ENCYCLOPEDIA OF LAW AND ECONOMICS* 950 (2000), at 954-956; Tommaso Padoa-Schioppa, *REGULATING FINANCE – BALANCING FREEDOM AND RISK* (2004), at 7. On other possible reasons for capital regulation, see Richard Herring & Robert E. Litan, *FINANCIAL REGULATION IN THE GLOBAL ECONOMY* (1995), at 49-63; Robert C. Clark, *The Soundness of Financial Intermediaries*, 86 *YALE LAW JOURNAL* 1 (1976), at 10-26 (emphasizing the protection of small depositors as the main motivation for prudential regulation).

<sup>13</sup> Many have observed that financial regulators have difficulty detecting all the risks taken by financial institutions, and perhaps difficulties acting based on vague notions of risk. See, e.g., Henry T.C. Hu, *Swaps, the Modern Process of Financial Innovation and the Vulnerability of a Regulatory Paradigm*, 138 *U. PENN. L.R.* 333 (1989), especially at 392-412 (noting that financial innovation perpetually crosses

## *B. Capital and Compensation Structures*

So far we have discussed the generic moral hazard problem inherent to all banks, especially when operating under a regime of deposit insurance. We now turn to modern U.S. banking organizations and to their executives. In such organizations, decisions are made not by those who collectively contribute the bank capital on which depositors rely but rather by executives, and the analysis should focus on the incentives of these executives.

In particular, we discuss below several special features of modern banking organizations that tend to aggravate the basic moral hazard problem discussed in the preceding section: (1) the capital of the bank is partly financed by debt instruments; and (2) the common equity of modern banks is held by bank holding companies that have an additional layer of debt financing; and (3) the interests of the executives who make decisions are tied to the value of common shares in the bank holding company. We also discuss why those providing debt financing at the bank or bank holding company level have only muted incentives to restrain the taking of excessive risks.

### *1. Debt at the Operating Bank Level*

Banks have long been allowed to raise some of their required capital in forms other than common shares. Under both the original (Basel I) and the revised (Basel II) capital standards agreed upon by the Basel Committee on Banking Supervision, up to one-third of the required

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existing regulatory classifications, and that such innovation are hard to understand for regulators who have less resources than the private sector and are inevitably one step behind since they are reacting to private innovation); *id.*, *Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism*, 102 *YALE LAW JOURNAL* 1457 (1993), at 1463 (“Observers agree that regulators know less than the bankers, and that they know too little.”); James R. Barth, Gerard Caprio, Jr. & Ross Levine, *Reassessing the Rationale and Practice of Bank Regulation and Supervision after Basel II*, in International Monetary Fund, *CURRENT DEVELOPMENTS IN MONETARY AND FINANCIAL LAW* vol. 5, 225 (2008), at 227 (noting that “most supervisory agencies will never have sufficient human capital or budgets to implement Basel II successfully”); Richard J. Herring, *The Known, The Unknown, and the Unknowable in Financial Policy: An Application to the Subprime Crisis*, paper presented at the Weil, Gotshal and Manges Roundtable on the Future of Financial Regulation at Yale Law School on February 13, 2009, at 3-5; Charles W. Calomiris, *Financial Innovation, Regulation, and Reform*, *CATO JOURNAL* (forthcoming), manuscript at 1, 9-10 (noting that banks could keep risks off balance sheet, and game regulatory risk regulation by, *inter alia*, encouraging inflated debt ratings by credit rating agencies). Also *cf.* Philip A. Wellons, *Enforcement of Risk-Based Capital Rules*, in Hal S. Scott (ed.), *CAPITAL ADEQUACY BEYOND BASEL* 284 (2005) (reporting “very low levels of enforcement of capital requirements in the United States between 1993 and 2001, particularly for larger firms,” but noting that “this may result from the fact that such firms are adequately capitalized.”).

capital can consist of subordinated long-term debt.<sup>14</sup> In 2006, the largest U.S. bank holding companies maintained around 20 percent of their capital in the form of such debt: 18 percent at Citigroup, 20 percent at Bank of America, and 23 percent at J.P. Morgan.<sup>15</sup>

Suppose that the \$10 of capital of the bank in our example is financed in the following way: \$2 comes from note holders as debt, and \$8M comes from common shareholders. The executives in charge hold common shares. In this case, the executives are insulated from the effects of any increase in the level of losses beyond \$8M. Any loss beyond \$8M will wipe out the value of common shares in the bank, and increases in the loss beyond that level would not affect the value of the common shares. In contrast, any gain in assets value will be fully captured by the common shares of the bank.

Another way to see the problem is to notice that the standard structures we observe in banks have exacerbated the problem of under-weighting of losses. In our example, executives will have an incentive not only to under-weight losses to assets that exceed \$10, as was the case in the discussion of the preceding section, but also losses that are in the \$8M to \$10 range.

## *2. Debt at the Bank Holding Company Level*

An additional distortion arises from the presence of an additional layer of debt financing at the level of the bank holding company. The biggest banks in the United States (as well as in some other major countries) are not stand-alone entities but subsidiaries of financial conglomerates, which in the United States are known as bank holding companies. Citibank, for example, is a subsidiary of Citigroup, which combines traditional consumer and commercial banking with investment banking, wealth management, and alternative investments such as private equity, hedge funds, and structured products.<sup>16</sup> Major strategic decisions are taken at the

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<sup>14</sup> See Basel Committee on Banking Supervision, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS (Bank for International Settlements, 2006), para. 49(xii) and Annex 1a (Tier 2(e)). On these capital standards generally, see, e.g., Michael P. Malloy, PRINCIPLES OF BANK REGULATION (2003), at 261-276.

<sup>15</sup> See Citigroup Annual Report 2006, Financial Information appendix, at 86; Bank of America Annual Report 2006, at 61; JPMorgan Chase & Co. Annual Report 2006, at 130.

<sup>16</sup> See Citigroup Annual Report 2006, previous note, at 2. In 2006, Citigroup earned 34 percent of its gross revenue from sources other than interest on loans, or 56 percent of net revenues (i.e., revenues net of interest expense). Ibid at 104.



holding company level, and the incentive pay of the top executives is tied to the share price of the holding company.

This structure is important for understanding incentives for risk-taking because bank holding companies also issue debt. To be sure, because capital adequacy requirements extend to bank holding companies on a consolidated (group) basis, they place limits on how much debt can be issued at the bank holding company level.<sup>17</sup> If they did not, there would be no limit on how much the common shareholders of the bank holding company could lever up their capital.<sup>18</sup> Still, the existence of debt and risky assets at the holding level alongside the holding's investment in the bank will alter the holding's incentives to manage the bank.

By definition, the bank holding company holds assets that are not in traditional banking, such as the hedge fund and investment banking subsidiaries of Citigroup mentioned above. Even though these assets may be subsidiaries, substantial amounts of debt financing are located at the holding level.<sup>19</sup> If the non-bank assets of the holding produce a loss, the value of equity in the

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<sup>17</sup> See for US law Pauline B. Heller & Melanie Fein, FEDERAL BANK HOLDING COMPANY LAW (looseleaf), XXX; and for the Basel rules and beyond Howell E. Jackson, *Consolidated Capital Regulation for Financial Conglomerates*, in Scott, *supra* note 13, 123. Prior to Basel II, some countries pursued a different approach to the regulation of holding companies, see Howell E. Jackson, *Regulation of Financial Holding Companies*, in Peter Newman (ed.), 3 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 232 (1998), at 234.

<sup>18</sup> See Jackson, in Newman (ed.), previous note, at 233-234 (noting that this would not matter if the solvency regulation of the bank itself worked perfectly). In our numerical example, suppose that the 8 percent equity in the bank were held by a holding company, which was in turn financed by 50 percent equity and 50 percent debt (and, for simplicity, has no further assets). In this case, the first \$4 paid by the bank to the holding company would accrue to the creditors of the holding company. If the assets of the bank fell below \$96, the shareholders of the holding company would be wiped out, and further losses would be of no concern to them. Shareholders, in other words, would underweight any losses that exceed \$4. To prevent this, banking regulation prohibits such additional leveraging at the holding level. This being said, bank holding companies were allowed to lever up more than banks because up to 15 percent (for "internationally active banking organizations") of their tier 1 capital could be contributed through "qualifying trust preferred securities," which, from the bank's point of view, is essentially long term debt (default only occurs if the bank misses interest payments for at least five years), see 12 CFR 225 Appendix A.II.A.1.b (Regulation Y).

<sup>19</sup> Cf. Citigroup Annual Report 2006, *supra* note 15, at 139-140 (reporting \$116bn of long term loans at the holding company, exclusive of \$10bn of junior subordinated notes relating to trust preferred securities, as well as at least \$42bn of short term debt through Citigroup Funding Inc. [which is guaranteed by the holding company, see p. 12]); Bank of America Annual Report 2006, *supra* note 15, at 148 (reporting \$148bn of debt at the holding level).

holding company will be reduced, in effect leveraging the holding and hence increasing the incentives for risk-taking.<sup>20</sup>

To see this, consider again our numerical example of a bank with \$100 in assets, \$90 in deposits, \$2 in other debt, and hence \$8 in equity. Now suppose that the equity is owned by a holding company, and that the holding company also owns another business with \$100 in assets. Thus, altogether, the holding company has \$108 in assets. Further suppose that the holding company is financed with \$92 in debt and \$16 of equity. Let us call the additional business a fund, and suppose that the fund is moderately risky – with equal probability, the fund will either lose or gain \$10.

What happens when the fund produces the loss of \$10? The fund's assets will then be reduced to \$90. But the holding company still has the bank shares (worth \$8) to satisfy the holding creditors. Creditors will be paid in full from proceeds of the shares (dividends or sale), and the common shareholders of the bank holding company will receive \$6. If the fund produces a gain instead of a loss, the shareholders will receive \$26. On average, they will receive \$16.

The shareholders and the executives holding shares in the bank holding company will do better, however, if the bank itself adopts a risky strategy. Suppose, for example, that the bank could adopt a value-neutral strategy that produces an \$8 loss or gain with equal probability, and suppose that the success of this bank strategy is independent of the success of the fund. Then half of the time that the fund turns a loss, so will the bank, in which case the book value of the bank's equity will be zero, the bank shares will be worthless, and the creditors of the holding company will be left empty-handed. Since the bank strategy was value-neutral, the question is where did the money go? It accrues (probabilistically) to the shareholders when both the bank and the fund are successful. On average, they will receive \$16.50.

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<sup>20</sup> See Jackson, previous note, at 234-235. Empirically, Howell E. Jackson, *The Superior Performance of Savings and Loan Associations With Substantial Holding Companies*, 22 JOURNAL OF LEGAL STUDIES 405 (1993) finds in a sample of 175 thrifts in Arizona, California, and Nevada between 1986 and 1991 that those owned by holding companies were less likely to fail and, when they did, imposed less cost on the deposit insurer (at 416-419). But he also finds that the stand-alone thrifts were considerably smaller and younger than the integrated thrifts (at 415). In any event, if there were beneficial effects of thrift holding companies present in Jackson's sample in the 1980s, they may not be present with the bank holding companies we are concerned with here because they are larger and hence themselves subject to "too large to fail" moral hazard.

The flipside of this is that executives seeking to maximize the value of common shares in the bank holding company would accept a risky strategy for the bank even if the possible gain were less than \$8. In the example, they would accept the risky strategy for a possible upside of at least \$7. This is what is important from the point of view of bank creditors, because it means that of available risky strategies, more will be attractive to shareholders than if the bank were a stand-alone business (as before, shareholders will not bear any losses beyond \$8 at the bank level).

There are several interesting aspects to this example. The capital ratio of the overall structure on a consolidated basis – \$200 in assets, and \$16 of equity – is equivalent to the capital ratio of the bank, namely 8 percent. The bank's assets are separate from those of the fund and hence protected from any losses that the fund might incur.<sup>21</sup> And yet, the existence of the fund is not irrelevant for the bank's creditors.

The severity of the problem depends on the riskiness of the fund, and the correlation of possible risky bank strategies with returns at the fund. Consider the following example which may be an admittedly extreme stylized version of what happened when big financial conglomerates got into the hedge fund business. Assume that the possible fund losses or gains are \$16, a still rather modest 16 percent of fund assets. Also assume that the bank has access to a strategy that is perfectly positively correlated with fund returns – if the fund loses \$16, the bank loses Y; if the fund gains \$16, the bank gains X. One might think of bank and fund strategies that are strongly correlated with market returns. Since a loss of \$16 by the fund wipes out the initial equity, shareholders are indifferent about Y – from their financial point of view, once the fund has lost \$16, it makes no difference whether the bank loses nothing or \$100. On the other hand, the common shareholders of the bank holding company will receive any additional gain X when the fund has turned a profit. In this case, executives seeking to maximize the value of the bank holding company's common shares will be willing to accept any gain X in the good state for any loss Y in the bad state. In other words, they will be willing to literally bet the bank for a penny.<sup>22</sup>

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<sup>21</sup> Even if the fund lost all its assets, creditors of the holding company could not touch any of the assets of the bank before the bank's own creditors, most importantly the depositors, were paid in full. On this essential role of corporate law for the partitioning of assets, *see* Henry Hansmann & Reinier Kraakman, *The Essential Role of Organizational Law*, 110 YALE LAW JOURNAL 387 (2000).

<sup>22</sup> An interesting corollary is that executives seeking to maximize the value of the bank holding company's common shares have an incentive *not* to diversify the sources of income the company derives from its bank subsidiaries on the one hand, and its other financial subsidiaries on the other.

To conclude this section, we acknowledge that banking regulators impose limits on the non-bank activities of bank holding companies, and on the risks they can take.<sup>23</sup> As with the regulation of the bank themselves, however, this regulation is inevitably imperfect, and as a factual matter, non-bank activities of bank holding companies are riskier than their banking activities.<sup>24</sup> This observation is consistent with the factor pushing toward risk-taking identified in this section. Determining how important this factor was in the buildup to the current crisis will require further empirical work.<sup>25</sup>

### *C. The Use of Stock Options*

We have seen that the organization and compensation structures of modern banking organizations have increased the incentives of executives whose interests are tied to the value of common shares of bank holding companies to take excessive risks – that is, to take gambles that have a negative present value but that, due to the insulation of common shareholders from downside risks, carried a positive expected value to these shareholders. The problem resulted from the fact that these capital structures insulated shareholders from the effect of declines in the

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<sup>23</sup> See, e.g., Heller & Fein, *supra* note 17, at \_ (reviewing such regulations in the US).

<sup>24</sup> Empirically, non-interest (i.e., fee based) income of financial holding companies is much more volatile than income from interest, see Robert DeYoung & Karin P. Roland, *Product Mix and Earnings Volatility at Commercial Banks: Evidence from a Degree of Total Leverage Model*, 10 JOURNAL OF FINANCIAL INTERMEDIATION 54 (2001), at 68-70 (finding in data for 472 US commercial banks from 1988 to 1995 that diversifying from deposits and loans into non-interest revenue activities, particularly trading, strongly increase revenue volatility); and cf. Kevin J. Stroh & Adrienne Rumble, *The dark side of diversification: The case of US financial holding companies*, 30 JOURNAL OF BANKING & FINANCE 2131 (2006) (finding in data of over 1,800 financial holding companies in the US from 1997 to 2002 that any gains from diversification into non-interest revenue generation are more than offset by the costs of increased exposure to volatile activities).

<sup>25</sup> Researchers affiliated with the FDIC and the Federal Reserve have argued that bank holding companies are a source of strength for their banks because the FDIC has authority to force bank holding companies to cross-guarantee the bank's obligations, see Adam B. Ashcraft, *Are Bank Holding Companies a Source of Strength to Their Banking Subsidiaries?*, 40 JOURNAL OF MONEY, CREDIT AND BANKING 273 (2008); Christine M. Bradley & Kenneth D. Jones, *Loss Sharing Rules for Bank Holding Companies: An Assessment of the Federal Reserve's Source-of-Strength Policy and the FDIC's Cross Guarantee Authority*, 17 FINANCIAL MARKETS, INSTITUTIONS & INSTRUMENTS 249 (2008). This argument only operates, however, as long as the bank holding companies themselves are solvent. Our argument relates to the opposite situation when they are not, and the *ex ante* incentives set by this possibility. The current crisis may correspond to our scenario.

value of bank assets on the capital that comes from bondholders at either the bank level or the bank holding company level.

It might be suggested that bank executives holding common shares in the bank holding company would have an incentive to be more conservative than would be in the interest of other common shareholders. To begin, to the extent that the ownership of common shares in the bank holding company represents a substantial fraction of an executive's wealth, such a large stake might lead the executive to be more risk-averse than shareholders who are more diversified. In addition, a failure of the bank might impose significant personal costs on the bank's managers that would not be borne by other common shareholders.<sup>26</sup> Empirical studies have documented that CEOs who are insulated from shareholder pressure and do not receive high-powered pay are less prone to engage in risk-taking.<sup>27</sup>

To counter CEO incentives for a more "quiet life,"<sup>28</sup> however, incentive pay in the form of stock and options has steadily increased over the last two decades.<sup>29</sup> With options, executives

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<sup>26</sup> Among other things, executives will bear costs to the extent that they have firm-specific human capital and that their professional standing would be adversely affected by such failure. In addition, banks may have deferred compensation programs and supplemental retirement accounts for their executives, and executives' rights under these programs might be adversely affected by a bank failure. For evidence on the extensive use of such programs and accounts, see Lucian Bebchuk and Robert Jackson, *Executive Pensions*, 30 JOURNAL OF CORPORATION LAW 823 (2009); Rangarajan Sundaram and David Yermack, *Pay me Later: Inside Debt and its Role in Managerial Compensation*, 62 JOURNAL OF FINANCE 1551 (2007). As Bebchuk and Jackson explain, however, arrangements and practices indicate that executives' benefits under these arrangements may not suffer even in the event of bank failure.

<sup>27</sup> See Shams Pathan, *Strong Boards, CEO power and bank risk-taking*, JOURNAL OF BANKING & FINANCE (forthcoming 2009); and generally Gorton & Winton, *supra* note 11 (reviewing other studies with similar findings).

<sup>28</sup> See, e.g., Marianne Bertrand & Sendhil Mullainathan, *Enjoying the Quiet Life? Corporate Governance and Managerial Preferences*, 111 JOURNAL OF POLITICAL ECONOMY 1043 (2003) (documenting the behavior of managers protected from takeovers in the 1980s, when incentive pay was much less common).

<sup>29</sup> Cf. Elijah Brewer III, William Curt Hunter & William Jackson III, *Deregulation and the Relationship between Bank CEO Compensation and Risk-Taking*, FEDERAL RESERVE BANK OF CHICAGO WORKING PAPER 2003-32 (2003) (documenting the increase of equity-based compensation in the banking sector after deregulation in the 1990s, and an associated increase in risk-taking). The trend towards more incentive compensation also affected banks' directors during that same time, see David A. Brecher, Terry L. Campbell II & Melissa B. Frye, *Incentive Compensation for Bank Directors: The Impact of Deregulation*, 78 JOURNAL OF BUSINESS 1753 (2005). On the rapid growth of executive compensation's performance sensitivity from the 1980s to the present in general, see Carola Frydman & Raven E. Saks, *Executive Compensation: A New View from a Long-Term Perspective, 1936-2005*, working paper,

can have *even more* incentives for risk-taking than the common shareholders of bank holding companies. When executives are paid with options, they are also to some extent insulated from losses suffered by these common shareholders due to asset value decline, which can further exacerbate the moral hazard problem and the incentive to take excessive risks. The executive's calculus will not be the same as that of the common shareholders of the bank holding company, because he or she will fully capture gains in stock price but will not fully bear the losses, as common shareholders would.

Consider again the bank in our example. Suppose that the executive did not get restricted shares in the bank holding company but rather options on such shares. And examine again the choice whether to take a risky strategy that would create a 50 percent chance of a \$20 decline in assets value and a 50 percent chance of an increase in asset value of  $X$ . And let us examine how the use of options will affect the value of  $X$  above which the executive's interest will favor choosing the risky strategy.

Let us consider two scenarios. In one, the market does not recognize the possibility that the executive will take the risky strategy and the potential loss from asset declines is not yet factored into the stock price of the common shares. In this case, the distortion in favor of excessive risk taking is especially excessive. For in this case, taking the risky strategy will have a positive expected value effect on the executive's payoffs for any positive value of  $X$ . The executive's options will gain in value if the risky strategy produces an increase and will retain a zero value, which not taking the risky strategy will do as well, if the executive does not take the risky strategy.

In the scenario considered above, the executive cannot gain from not taking the risky strategy, because doing so would never increase the stock price as it has not yet factored in the possible decline in value due to the risky strategy. If the market takes into account the possibility that the executive will take a negative-expected-value risky strategy, the analysis becomes more complicated—for in that case, not taking the risky strategy might produce some increase in the value of common shares. But it can be shown that the use of options still exacerbates the distortion in favor of risk taking relative to the situation in which the executive has common shares in the bank holding company. For as long as the common shares have positive value when

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Massachusetts Institute of Technology (August 2008), available at [http://web.mit.edu/frydman/www/trends\\_frydmansaks\\_0808.pdf](http://web.mit.edu/frydman/www/trends_frydmansaks_0808.pdf), accessed 03/31/2009.

options are granted, the structure of the option holder's payoffs will be different from that of the common shareholders – the option holder will be insulated from some of the effect on common shareholders that an asset value decline could bring. In fact, it can be shown that the option holder will always choose the risky option as long as  $X$  is greater than \$1.34, even if this is fully anticipated by the market.<sup>30</sup> (For values of  $X$  below \$1.34, the manager will sometimes choose the safe strategy and other times the risky strategy.<sup>31</sup>)

Essentially, the problem can be viewed as follows. When the executive has options on the shares of the bank holding company, the executive's position is equivalent to holding shares with a nonrecourse loan on those shares equal to the current price of the shares.<sup>32</sup> This makes the executive's position with respect to the bank's capital even more leveraged. This is an additional layer of leverage added on top of the deposits and loans. And each layer of leverage strengthens the incentive to take risks.

#### *D. Citigroup and Bank of America*

It is useful to illustrate the claims made in the analysis above by looking at the two biggest banks in the United States in terms of assets and examining the incentives of their top

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<sup>30</sup> If the market anticipates that the executive will choose the risky option with certainty, the value of common stock will be  $\frac{1}{2} \cdot 0 + \frac{1}{2} \cdot (\$4+X) = \$2+X/2$ . If the executive unexpectedly chooses the safe option, the value of common stock will increase to \$4, a certain gain of  $\$2-X/2$ . If the executive chooses the risky option, the value of the common stock will either fall to zero or, if the gamble succeeds, increase to  $\$4+X$ , a gain of  $\$2+X/2$ . Hence the expected gain from the risky strategy is  $\frac{1}{2} \cdot 0 + \frac{1}{2} \cdot (\$2+X/2) = \$1+X/4$ . This is greater than the certain gain from the safe strategy as long as  $X$  is greater than  $\$(4/3)$ . Consequently, for  $X$  greater than \$1.34, the executive can be expected to choose the risky option, and the market's expectation will be borne out. We have already discussed in the main text that the executive's incentive to gamble is even higher if the market does not anticipate it. So we conclude that for  $X$  greater than \$1.34, the only equilibrium is for the executive to always gamble, and the market to fully anticipate this.

<sup>31</sup> Since the executive will always gamble if the market does not anticipate gambling, it cannot be an equilibrium for the executive not to gamble if  $X$  is less than \$1.34. On the other hand, if the market anticipated that the executive will gamble for sure, the share price would be sufficiently depressed to make it profitable for the executive to raise the share price by following the safe strategy, rather than gambling – in other words, the expectation of the market would not be borne out in equilibrium. It follows that for values of  $X$  between 0 and \$1.34, the only equilibrium is a mixed one in which the manager gambles with some probability, which the market anticipates.

<sup>32</sup> The analysis of stocks as options (or the other way around) using arbitrage arguments is due to Fischer Black & Myron Scholes, *The Pricing of Options and Corporate Liabilities*, 81 JOURNAL OF POLITICAL ECONOMY 637 (1973).

executives to see how the executives were affected by risk taking. For simplicity we will look at their situations at the end of 2006.

At that time, Citigroup and Bank of America were both heavily leveraged, although not exceptionally so. Both met the Federal Reserve Board's requirements for "well-capitalized institutions": a ratio of total capital to risk-weighted of at least 10 percent, and a ratio of tier 1 capital to assets of at least 6 percent.<sup>33</sup> Their leverage ratios – the ratio of tier 1 capital (mainly equity) to adjusted average assets<sup>34</sup> – were high, although not higher than that of the next biggest US bank, J.P. Morgan. Citigroup's leverage ratio in 2006 was 5.2 percent, Bank of America's 6.4 percent, and J.P. Morgan's 6.2 percent.<sup>35</sup>

At the end of 2006, Citigroup's CEO Chuck Prince held 1.6m Citigroup shares, and over 1.1m options at exercise prices between \$32 and \$54 (all but 225,000 options had an exercise price of at least \$42).<sup>36</sup> The closing price of Citigroup's stock on December 29, 2006, was \$55.70.<sup>37</sup> Bank of America's CEO Ken Lewis held 2.9m shares in his company as well as 1.925m options at exercise prices between \$40 and \$47.<sup>38</sup> The closing price of Bank of America's stock on December 29, 2006, was \$53.39.<sup>39</sup>

Both executives were heavily invested in their companies' stock but, presumably, not in their companies' bonds. As explained above, this alone created powerful incentives to underweight the possible downside of a strategy relative to its upside.

Their options, however, encouraged even more risk-taking. Most of them had exercise prices at around 20 percent below the current stock price. This means that any loss to the company's equity beyond 20 percent would not have had any impact on the value of the options,

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<sup>33</sup> Cf. 12 C.F.R. 225.2(r) (defining "well capitalized").

<sup>34</sup> "Adjusted average assets" is total assets net of certain deductions for intangible capital and other assets, see 12 C.F.R. 225 Annex D.II.b.

<sup>35</sup> See Citigroup Annual Report 2006, Financial Information appendix, at 86; Bank of America Annual Report 2006, at 93; JPMorgan Chase & Co. Annual Report 2006, at 130.

<sup>36</sup> See Citigroup's 2007 Proxy Statement, at 16 (reporting stock ownership as of 02/28/2007) and 51 (reporting outstanding options and their exercise prices).

<sup>37</sup> See "Historical Price Lookup" on Citigroup's investor relations website (<http://www.citigroup.com/citi/fin/index.htm>), accessed 03/23/2009.

<sup>38</sup> See Bank of America's 2007 Proxy Statement, at 17-18 (reporting stock ownership, including 1m shares corresponding to possible option exercises) and 35 (reporting outstanding options).

<sup>39</sup> See "Historical Price Lookup" on Bank of America's investor relations website (<http://phx.corporate-ir.net/phoenix.zhtml?c=71595&p=irol-stocklookup>), accessed 03/24/2009.



which would then be zero.<sup>40</sup> By contrast, any increase in the value of equity would have been fully reflected in the value of the options.

Overall, the above discussion indicates that the payoffs facing the CEOs of Citigroup and Bank of America at the end of 2006 were quite asymmetric. Their monetary gain from a given large increase in the value of their firm's assets was greater than their monetary loss from an equally large decline in the value of these assets. In these circumstances, there was a wide range of negative-expected-value bets that would have had a positive expected value effect on the CEOs' monetary position. In short, the equity-based compensation given to these executives provided them with strong incentives to take excessive risks.

#### *E. Why Bondholders Cannot be Relied on to Regulate Pay*

The foregoing analysis of bank executives' incentives to take excessive risks raises the question of why bondholders of banks and bank holding companies do not prevent banks from using executive pay arrangements that produce such incentives. In theory, bondholders could insist on covenants that would preclude such pay arrangements or, in the absence of such covenants and the presence of such pay arrangements, they could insist on an interest rate premium so large that it would deter banks from using such pay arrangements. Unlike depositors, many bondholders have incentives, and can be expected, to monitor banks to which they lend.

However, bondholders cannot be relied upon to prevent pay arrangements that induce excessive risk-taking because they do not bear fully the costs of such arrangements. In the event that excessive risk-taking will produce a bank failure, a substantial part of the costs will be borne by the government as guarantor of deposits. The bondholders would not bear this major cost of excessive risk-taking, and, conversely, would not capture the benefits that limiting excessive risk-taking would confer on depositors and the government.

Furthermore, the expected costs to bondholders from excessive risk-taking, and their incentives to limit it, are further reduced by the prospect that, in the event of bank failure, bondholders may benefit directly or indirectly from a government bailout event though they are

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<sup>40</sup> We remain in the framework of our one-period model, so that a drop in equity value is final. In a more fully specified model, stock prices might recover, and hence options would retain some positive value if their exercise price is above the current stock price. One can think of the one-period model as a simple way to describe the stock price development until the expiration date of the options.

not formally insured by the government. As financial institutions have grown larger over the last two decades, partly as a result of deregulation, it has become even more difficult for the government to commit not to bail them out.<sup>41</sup> For example, in the recent crisis, the government has injected substantial capital into many banks in the form of preferred shares that are junior to the claims of bondholders, insured some banks against a decline in the value of some of their toxic assets, and initiated a program to provide government subsidies to funds that will purchase toxic assets from banks – all actions that benefitted bondholders and provided them with partial protection against the consequences of the banks’ losses. Of course, the prospect of such government interventions dampens the incentives of bondholders to seek, and offer interest rate concessions in return for, limits on executive pay arrangements that induce excessive risk-taking. The effect of “too big to fail” interventions is similar to the moral hazard engendered by deposit insurance discussed in the previous section.<sup>42</sup> When bondholders are insulated from some of the effects of bank losses by such interventions, they cannot be relied upon to curb excessive risk-taking.

#### *F. Consistency of Our Analysis with the Wiping out of Some Executives’ Wealth*

In the preceding four sections, we have explained how excessive risk-taking was in the rational self-interest of bank managers given the structure of their monetary incentives. Some may wonder if this analysis is consistent with the fact that some CEOs at the helm of major US banks lost much of their personal wealth in the present crisis. If this is the outcome, one might ask, how could the strategy have been in the managers’ self-interest?

The answer is that ex ante the losses that later occurred were only one of a number of possibilities. Bank managers could recognize the possibility of such losses, yet rationally decide that they were outweighed by the possibility of continued profitability of the risky lines of

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<sup>41</sup> On the consolidation of the banking industry through the 1990s, see Gary A. Dymski, *THE BANK MERGER WAVE* (1999). On the reinforcement of “too big to fail” moral hazard by this development, see Stern & Feldman, previous note, at 2 and 60-66.

<sup>42</sup> See Gary H. Stern & Ron J. Feldman, *TOO BIG TO FAIL: THE HAZARD OF BANK BAILOUTS* (2004), at 9-85 (discussing the theory and empirical evidence of moral hazard engendered by “too big to fail”); Gorton & Winton, *supra* note 11, at 487 and 524 (discussing the empirical evidence on the risk-taking incentives engendered by “too big to fail”); David G. Mayes, *An Overview of the Issues*, in David G. Mayes & Aarno Liuksila (eds.), *WHO PAYS FOR BANK INSOLVENCY? 27* (2004), at 29.

business and an opportunity to exit them later but before a possible collapse. The possibility of losses is a normal feature of rational business decisions, and our discussion above has acknowledged such possibilities throughout. The mere fact that a risky strategy turned out to produce losses ex post does not mean that it was not rational to follow the strategy ex ante.

Let us illustrate the point with a purposefully extreme example. Imagine an individual who is given the opportunity to bet all her wealth on one or more spins of a roulette wheel. A rational, risk-averse individual who does not obtain any utility from the act of gambling itself would decline this opportunity: any chance of winning would be counterbalanced by an equally large or even slightly larger chance of losing, and a risk-averse individual would shun such a gamble. Now imagine a fictitious roulette game with asymmetric payoffs. In particular, imagine that bets on black yield four times the betted amount if successful. *This* bet on black could be attractive even to a rational and (moderately) risk-averse individual. We do not need to resolve here what number of rounds we should expect the individual to play as long as the individual keeps winning. But we would not be surprised to see the individual play one or more rounds. If the individual happened to lose all of her wealth playing this game, we would expect the individual to regret ex post having made the bet. But we would hardly conclude from this ex post loss of the individual's personal wealth that this rules out, or is in any way inconsistent with, her choosing rationally to make the bet and her being drawn to it by the asymmetric pay-offs.

It should be clear therefore that the observation of ex post losses does not imply that those choosing the ultimately unsuccessful strategy did not understand the environment they were operating in. What with the benefit of hindsight appears to be a losing strategy may have been a winning if risky strategy ex ante. In the present context, bank managers may have anticipated the possibility of a crisis, and may even have considered some degree of turmoil inevitable. Yet as long as the precise timing and dimension of the crisis were not foreseeable, bank managers could rationally pursue risky strategies in the hope of pocketing profits before the crisis hits, and exiting in time. The mere fact that the crisis hit the banks at a moment when they were still invested in "toxic securities" and other risky investments does not mean that such investments were not in the ex ante rational self-interest of the bank managers.

In fact, it is in the nature of the moral hazard problem of banks that it becomes visible mainly in situations in which, ex post, the strategy chosen turned out badly for all parties involved, including the parties responsible for the taking of excessive risks. Moral hazard during

the savings and loan crisis of the 1980s came to light when the thrifts involved became insolvent, and hence its shareholders were wiped out. Ex post, the risky strategies chosen did not pay off for the shareholders of these thrifts. Ex ante, however, they were privately optimal for shareholders (yet harmful from a social point of view).

### III. THE CURRENT SITUATION: THE EFFECTS OF THE CRISIS ON INCENTIVES

Before proceeding, we would like to comment on the effects of the current financial circumstances in which banks operate on executives' incentives. The financial and economic crisis of 2008-2009 has eroded the value of banks' assets and hence the capital of banks, with a disproportionate effect on the value of shares in the bank holding companies. For example, the shares of Citigroup lost 94 percent of their value in the two years ending March 20, 2009.<sup>43</sup> In that same period, the shares of Bank of America lost 82 percent of their value.<sup>44</sup> The value of the bank's assets and of the bonds issued by both banks declined to a much lesser extent.<sup>45</sup> Because executives hold common shares in the bank holding company and options on such shares, the reduction in the value of these common shares increased the divergence between the interests of executives and the interests of bondholders, depositors, and the government as a guarantor of deposits. The increased divergence can lead to substantial distortions in decision-making.

The following two sections describe two ways in which this problem may manifest itself. At some point down the road, bank executives may resume excessive risk-taking. The reduction in the value of common shares makes executives' payoffs from taking risks all the more asymmetric. A reduction in the value of common shares (and of options on common shares) reduces how much bank executives have to lose from a bet that turns out poorly; as a result, there

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<sup>43</sup> The closing share price of Citigroup on March 20 was \$50.64 in 2007, \$22.50 in 2008, and \$2.62 in 2009. See "Historical Price Lookup" on Citigroup's investor relations website (<http://www.citigroup.com/citi/fin/index.htm>), accessed 03/21/2009.

<sup>44</sup> The closing share price of Bank of America on March 20 was \$50.76 in 2007, \$41.86 in 2008, and \$6.19 in 2009. See "Historical Price Lookup" on Bank of America's investor relations website (<http://phx.corporate-ir.net/phoenix.zhtml?c=71595&p=irol-stocklookup>), accessed 03/21/2009.

<sup>45</sup> Cf. Dena Aubin, *Bailout hopes so far limit Citigroup bonds' downside*, Reuters News 01/14/2009 (reporting that Citigroup's bonds lost only 3 to 5 percent in value on 01/14/2009 when Citigroup's share lost 22 percent, and that market participants assumed the debt to be paid, if only because of a government bailout). As of 03/24/2009, Citigroup's bonds were trading at discounts of at most 10 percent on their face value (source: Bloomberg bond quotes).

will be more negative expected value strategies for which the possible private gains to the managers and other common shareholders will outweigh the private possible losses to them. We explain this point in more detail in section A.

In the current circumstances, the divergence between executives' interests and the interests of the bank as a whole may manifest itself in executives' reluctance to make additional loans that would have a positive expected value but require them to raise additional equity capital. Making such loans would be efficient from the perspective of the aggregate interests of those who have a stake in the bank. Given regulatory capital requirements, however, making such loans might require the bank to raise additional equity capital. In the current circumstances, it might be in the interests of the common shareholders (and holders of options on common shares) to avoid this: if the economy performs poorly, the benefits of the new equity capital will accrue to bondholders and depositors; and if the economy performs well, the investors contributing new equity capital will dilute the existing common shareholders' claim on profits.

The two distortions we discuss in this part are manifestations of the same underlying problem. Both arise because managers compensated with common shares and options of the bank holding company will seek to maximize the value to current common shareholders, rather than the value of the bank assets as a whole. With the erosion of the value of common shares in the bank holding company brought about by the financial crisis, this problem is as acute as ever.

#### *A. Excessive Risk-Taking*

Let us first consider how the erosion of banks' equity capital will affect down the road the problem of excessive risk incentives. Consider the bank in our running example. Suppose that the value of the assets decreases from \$100 to \$97. This decrease reduces the book value of the common shares of the bank holding company from \$4 million to \$1. This reduction in turn decreases the maximum amount the holding company's common shareholders can lose from taking a risky strategy relative to the situation analyzed earlier. Whereas before the common shareholders would bear the first \$4 of losses, the changes mean that they will now bear losses only up to \$1. This will of course increase their incentive to take excessive risks. They simply have less to lose from making bets.

Indeed, some of the banks might now be in a situation in which the common shares of the bank holding company have a negative book value. The value that the common shares have

might be simply due to their being an out of the money option, based on the possibility that the book value of the bank's assets will increase and become positive in the future.

Suppose that the assets of the bank in our example went down to \$85. In this case, the bank has \$5 less in assets than in obligations to depositors. In this situation, the common shares might still trade at a positive price even though they have a negative book value. This is because the shares will have a value of zero if the book value does not improve but might have a positive value if the assets' value appreciates, say, back to \$100.

Although a decline in the book value of a bank to a low, razor-thin but still positive value increases the incentive to take excessive risks, a decline into negative territory makes things even worse. Consider our example in which the value of assets went down to \$85. And suppose that the executives have a choice of taking a risky negative-expected-value strategy.

In this case, if the risky strategy is taken, the downside to the common shareholders of the bank holding company and the executives is no longer limited – it is non-existent. With negative book value for the bank and for the bank holding company, common shareholders and the executives with equity-based incentives tied to the bank holding company shares have nothing to lose from further erosion of book value. In contrast, if they gamble and the book value goes up sufficiently, they might end up with something.

In fact, in the case of negative book value, executives' incentives will be distorted not only in under-weighting downside risks but also in underweighting low positive returns relative to large positive returns. A limited increase in book value that will not bring the book value of the equity of the bank holding company into positive territory will not give the common shareholders and executives of the bank holding company anything. Hence executives seeking to maximize the value of common shares will attach little value to such limited increases in the cost-benefit calculus. In the example under consideration, such executives will favor a strategy that would increase the value of the assets by \$15 with a 10 percent chance and fail to increase it with a 90 percent chance over a strategy that would increase the value of the assets of the bank by \$5 for sure. Even though the effect of the latter strategy on the value of the banks' assets will have a higher expected value, the executives will favor the former strategy because a \$5 increase in the value of the assets would be insufficient to bring the value of the common shares of the bank holding company back into positive territory.

Finally, even when the common shares of the bank holding company retain a positive book value, a similar effect to their having a negative book value can arise when executives have options that are out of the money because they were given with strike prices equal to the then current stock price at times when stock prices were much higher than now. For example, the stock options that Bank of America granted its top executives in the years before the crisis have exercise prices between \$42.70 and \$53.85.<sup>46</sup> As we mentioned above, however, the stock price of Bank of America has dropped dramatically over the last two years, and is now only \$11.21 (as of June 1, 2009).<sup>47</sup> Hence these options are now deeply out-of-the-money, and will pay off for their holders only if the stock price increases by a factor of 4 or more. The presence of these options gives executives an incentive to favor strategies with large improbable gains over strategies with small probable gains, for small gains would not be able to pull up the stock price above the exercise price of the stock options they have.

### *B. Excessive Reluctance to Raising and Deploying Capital*

We now turn to discuss another way in which, in the current circumstances, the divergence between executives' interests and the aggregate interests of those with a stake in the bank may manifest itself. Executives' incentives may lead them to refrain from engaging in some new lending transactions that have positive expected value. The reason is that unlike cash holdings, new lending may need to be backed by additional regulatory capital. Due to their losses in the current crisis, many banks may not have the necessary capital cushion for new lending now, or may put themselves in danger of falling below the required capital in the near future if they lend out available funds now but incur some additional losses shortly thereafter. In principle, banks could raise additional equity capital to overcome this problem. However, executives' compensation arrangements provide them with excessive incentives to avoid the raising of additional equity capital in the current circumstances. As a result, bank executives may excessively resist raising new equity capital and may pass on positive-expected-value lending

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<sup>46</sup> See Bank of America's Proxy Statement for 2009 available at its investor relations website ([http://media.corporate-ir.net/media\\_files/irol/71/71595/reports/2009\\_Proxy.pdf](http://media.corporate-ir.net/media_files/irol/71/71595/reports/2009_Proxy.pdf)) accessed 03/21/2009, at p. 27 (reporting exercise prices of options granted between February 2005 and February 2008).

<sup>47</sup> See "Historical Price Lookup" on Bank of America's investor relations website (<http://phx.corporate-ir.net/phoenix.zhtml?c=71595&p=irol-stocklookup>), accessed 06/03/2009.

opportunities. The presence of such incentives may thus inefficiently reduce the availability of credit.

The common shareholders of bank holding companies, and executives aligned with their interests, currently have excessive incentives to avoid raising capital due to what is known in the financial literature as the debt overhang problem.<sup>48</sup> In the current situation where the exhaustion of the existing equity is a relevant scenario, the benefits of infusing new common equity would partly flow to a bank's bondholders and depositors (as well as the government as guarantor of depositors) by providing them with extra cushion should the bank perform poorly and the existing equity be wiped out. At the same time, the costs of infusing new equity will be borne fully by the existing common shareholders through a dilution of their stake. In other words, raising new common equity capital would confer a positive externality on bondholders and depositors at the expense of current common shareholders.

For this reason, bank executives will have excessive incentives to avoid raising new equity capital. Moreover, to avoid getting into a situation in which the regulator forces the bank to raise new equity capital, executives may avoid deploying even available cash reserves so as not to risk falling short of the regulatory capital thresholds in the near future as a result of losses they may be forced to recognize. In this scenario, even though they technically have sufficient capital to lend, banks might turn down positive expected value lending opportunities in order to protect current common shareholders from dilution in the future.

If the divergence between executives' interests and the aggregate interests of those with a stake in the bank manifests itself in reluctance to lend, it might appear to some as a reluctance to take risks and thus might seem to be in tension with the argument that executives' pay structures have provided them with excessive incentives to take risks. In the current circumstances, however, the reluctance to lend might be due to a reluctance to raise additional equity capital – and a desire to reduce the likelihood of being forced to raise such equity capital. And a desire to avoid raising additional capital even when the bank is just marginally (or even inadequately) capitalized is fully consistent with our earlier arguments.

Indeed, the reluctance to raise additional equity capital reflects the asymmetry between upside and downside payoffs on which we have been focusing throughout. As we have

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<sup>48</sup> The idea was first clearly articulated by Stewart C. Myers, *Determinants of Corporate Borrowing*, 5 JOURNAL OF FINANCIAL ECONOMICS 147 (1977).



explained, the common shareholders (and executives aligned with their interests) can expect to capture fully upside gains but to be limited in their exposure to large downside losses. These common shareholders (and executives aligned with them) have an excessive incentive to avoid raising equity capital because (i) the common shareholders will bear the costs of the new equity's capturing its share of the upside, and (ii) due to the common shareholders' insulation from large losses, the common shareholders will not internalize the full value of the new equity's contribution to absorbing such losses.

#### IV. CURRENT ATTEMPTS TO IMPROVE INCENTIVES

There is now widespread recognition that executive compensation is important and that compensation packages may have contributed to the excessive risk taking that has occurred. For this reason, the TARP legislation directed the Treasury Secretary to require TARP recipients not to have pay packages that provide incentives to take excessive risks.<sup>49</sup> The executive compensation provisions in the recent stimulus bill imposed additional restrictions on compensation in TARP recipients and adopted again the principle of avoiding incentives to take

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<sup>49</sup> See Sections 111 and 302 of the Emergency Economic Stabilization Act of 2008 (EESA), P.L. 110-343 (Division A), codified as 12 U.S.C. 5221, and the explanation of these provisions by Joseph Bachelder, *EESA Limits on Executive Pay at Affected Institutions*, NEW YORK LAW JOURNAL (11/14/2008); and Davis Polk & Wardwell, EXECUTIVE COMPENSATION RULES UNDER THE EMERGENCY ECONOMIC STABILIZATION ACT OF 2008 (October 23, 2008), available at <http://www.dpw.com/1485409/10.23.08.epg.tarp.memo.pdf>, accessed 03/21/2009. In particular, Section 111(b)(2)(A) EESA required the Treasury Secretary to ensure that financial institutions selling troubled assets to the Treasury outside of a competitive bidding process in exchange for a financial stake in the institution had to have "limits on compensation that exclude incentives for senior executive officers of a financial institution to take unnecessary and excessive risks that threaten the value of the financial institution during the period that the Secretary holds an equity or debt position in the financial institution." The Treasury promulgated such guidelines on 02/04/2009, which impose, in particular, that executive base pay be limited to \$500,000 and any incentive pay be granted in the form of restricted stock, although these rules can be waived by shareholders of all TARP recipients except those receiving "exception financial recovery assistance." See US Department of the Treasury, press release of 02/04/2009 available at <http://www.ustreas.gov/press/releases/tg15.htm>, accessed 03/29/2009. On the Treasury's guidelines, see Davis Polk & Wardwell, NEW EXECUTIVE COMPENSATION RESTRICTIONS UNDER THE EMERGENCY ECONOMIC STABILIZATION ACT OF 2008 (February 6, 2009), available at <http://www.dpw.com/1485409/clientmemos/2009/02.05.09.ec.pdf>, accessed 03/21/2009.

excessive risks.<sup>50</sup> Various observers have pointed out that what this means is fairly vague,<sup>51</sup> and to our knowledge there has thus far been little effort to operationalize this principle. Furthermore, as we explain below, the main measures that have been thus far adopted or proposed by Congress or the administration – limiting incentive pay to restricted stock, introducing say-on-pay votes, and constraining the amount of incentive pay – do not, or only very imperfectly, address the major harmful incentives we identified above. Below, we discuss in turn each of these three measures.

#### *A. Mandating the use of restricted stock?*

Restrictions proposed by the administration sought to encourage TARP recipients to use restricted stock. For companies getting special assistance, this use was mandated for any compensation above \$500K.<sup>52</sup> For other companies getting TARP financing, this use was mandated if the company did not opt out.<sup>53</sup> The stimulus bill tightened this rule by eliminating the opt-out possibility. Incentive compensation for top officers and employees of TARP recipients must be exclusively in long-term restricted stock.<sup>54</sup>

Is the use of restricted stock a good way of providing executives with good incentives to deal with risks? Not at all.

To be sure, restricted stock does not involve the extra problems resulting from the use of options discussed above. And to the extent that the unloading of shares is restricted, this might address the problems discussed by other work, concerning distortions arising from the freedom to unload incentives.<sup>55</sup> But the analysis in this paper has shown that, even assuming there is only

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<sup>50</sup> See Title VII of the American Recovery and Reinvestment Act of 2009, 111 H.R. 1, amending Sections 109(a) and 111 of the EESA (previous note), and the explanations in Davis Polk & Wardwell, COMPENSATION PROVISIONS IN THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (February 17, 2009) available at <http://www.dpw.com/1485409/clientmemos/02.17.09.stimulus.bill.memo.pdf> (accessed 03/21/2009).

<sup>51</sup> See, e.g., Davis Polk & Wardwell, previous note, at 10.

<sup>52</sup> See the Treasury guidelines issued on 02/04/2009, *supra* note 49, and the explanations in Davis Polk & Wardwell, NEW EXECUTIVE COMPENSATION RESTRICTIONS, *supra* note 49.

<sup>53</sup> *Ibid.*

<sup>54</sup> See section 111(b)(3)(D) of EESA as amended by the American Recovery and Reinvestment Act of 2009, *supra* note 49.

<sup>55</sup> The statute requires that the long-term restricted stock not fully vest during the time that the company owes TARP money to the government, see section 111(b)(3)(D)(I) of EESA as amended (previous note).

one period at the end of which results are realized, the use of restricted stock in bank holding companies provides incentives to take excessive risks, and this is especially the case in the current circumstances.

Even when the market capitalization of the bank holding companies was substantial, tying executive payoffs to the value of the shares of the holding companies linked the payoffs of executives to a limited part of the capital invested in the operating banks. In the example considered above, the executives were tied to a position in the bank's assets levered by 96 percent when putting together the claims of depositors and debt-holders at the levels of the bank and the bank holding company. Now that the value of bank assets has declined, so that the book value of the common shares in the bank holding company is substantially reduced – and might be negative – restricted stock will tie executive payoffs to an extremely levered bet on the value of the assets of the bank and thus give executives highly distorted incentives.

One way of seeing the flaw in using restricted common shares in bank holding companies as the exclusive instrument of executives' incentive pay is by noting the divergence of interests between common shares in bank holding companies and the preferred shares owned by the government in some banks that have received TARP funding. Because the common shareholders have claims that are junior to those of preferred shareholders, the common shareholders would benefit from taking more risks than would be in the interest of preferred shareholders. Thus, a government mandate to use restricted common shares will induce executives to deviate from the course of action that would best protect the interests of the government as preferred shareholder.

### *B. Say on Pay?*

Another approach pursued by the administration and Congress is to subject compensation in TARP recipients to advisory “say on pay” votes. The Treasury's proposed guidelines for recipients of exceptional TARP assistance required that “[t]he senior executive compensation structure and the rationale for how compensation is tied to sound risk management must be submitted to a non-binding shareholder resolution.”<sup>56</sup> More generally, the Treasury proposed

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Similarly, the Treasury guidelines, *supra* note 49, require that restricted stock awards to senior executives of companies receiving “exceptional recovery assistance” vest only after the government has been paid back in full with interest.

<sup>56</sup> See Treasury guidelines of 02/04/2009, *supra* note 49.

that in the future, “[e]ven beyond companies receiving financial recovery assistance, owners of financial institutions – the shareholders – should have a non-binding resolution on both the levels of executive compensation as well as how the structure of compensation incentives help promote risk management and long-term value creation for the firm and the economy as a whole.”<sup>57</sup> The stimulus bill extended the advisory say-on-pay requirement to all TARP recipients.<sup>58</sup>

There is a lot that can be said in favor of say on pay in companies in general, and one of us testified in Congress in favor of say on pay proposals.<sup>59</sup> But say on pay proposals are intended to contribute to aligning the interests of executives with those of shareholders, which is desirable in companies in general. In the case of banks receiving TARP financing, however, tightening the link between the interests of executives and common shareholders is not the objective the government should pursue. Quite the contrary, such alignment might push executives in a direction that considerably diverges from the interests of the government as investor in the banks and as de jure and de facto guarantor of some of their obligations.

As an investor, the government has put a lot of money into preferred shares that are senior in the capital structure to the common shares. In addition, the government guarantees deposits up to \$250,000 de jure (\$100,000 from 01/01/2010), and possibly beyond that de facto. Making executive pay more responsive to the preferences of common shareholders cannot be expected to produce incentives to take into account the interests of preferred shareholders, bondholders, and depositors.

To the contrary, as we have seen, the common shareholders of the bank holding companies, especially under current circumstances, will benefit from taking excessive risks and have an interest in encouraging executives to take such risks. Empirical studies have documented that bank executives take more risks when their incentives are more aligned with shareholders’.<sup>60</sup> Thus, the fact that shareholders of bank holding companies voted in favor of a pay structure, and

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<sup>57</sup> *Ibid.*

<sup>58</sup> *See* section 111(e) of EESA as amended by the American Recovery and Reinvestment Act of 2009, *supra* note 50. For explanations of this provision, *see* Davis Polk & Wardwell, “SAY ON PAY” NOW A REALITY FOR TARP PARTICIPANTS (February 25, 2009), available at <http://www.dpw.com/1485409/clientmemos/2009/02.25.09.say.on.pay.pdf>, accessed 03/25/2009.

<sup>59</sup> *See* Lucian A. Bebchuk, Written Testimony Before the Committee on Financial Services – United States House of Representatives – Hearing on Empowering Shareholders on Executive Compensation – March 8, 2007, available at [http://www.law.harvard.edu/faculty/bebchuk/pdfs/2007\\_HFSC.pdf](http://www.law.harvard.edu/faculty/bebchuk/pdfs/2007_HFSC.pdf) (accessed 03/25/2009).

<sup>60</sup> *See* Brewer, Hunter & Jackson, *supra* note 29; Gorton & Winton, *supra* note 11, at 526-529.

the fact that pay structures might be set with the prospect of such a vote, hardly indicate that pay structures will avoid incentives that encourage excessive risk taking. Thus, introducing say-on-pay votes cannot be expected to contribute to eliminating incentives to take excessive risks.

### *C. Limits on incentive pay?*

The Stimulus Bill limited the fraction of executive pay in TARP recipients that can take the form of incentive pay. The Bill stipulated that, under rules to be promulgated by the Treasury Secretary, senior executive officers and the highest-paid employees of major TARP recipients will not be allowed to receive “any bonus, retention award, or incentive compensation ... except ... long-term restricted stock ... in an amount ... not greater than 1/3 of the total amount of compensation of the employee receiving the stock,” subject to certain further restrictions.<sup>61</sup> While some of these terms raise difficult issues of interpretation<sup>62</sup>, we will assume that these provisions effectively limit any incentive pay to one-third of the total annual salary of the executive or employee in question.

In principle, well-designed incentive pay can improve the management of firms.<sup>63</sup> We share the view that incentives matter, and we will explain below how appropriately designed incentive pay can help to stabilize our banks in the current crisis and beyond.

That being said, our analysis above identified major problems with the current incentive structure for bank executives. From this perspective, scaling down financial incentives may be a good thing. *No* financial incentives may be better than *bad* ones. Thus, if incentive compensation remains structured in ways that provide perverse incentives, limits on incentive pay can actually improve matters. Rather than discussing this question, however, we move on to what is an

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<sup>61</sup> See section 111(b)(D)(i) of EESA as amended by the American Recovery and Reinvestment Act of 2009, *supra* note 50. The provision covers the senior executive officers of companies receiving at least \$250m in TARP financing, as well various numbers of highest paid employees depending on the amount of TARP funds received, *ibid* section 111(b)(D)(ii). The provision is not directly applicable but requires the Treasury Secretary to adopt rules implementing the limitations; the Treasury Secretary can impose further terms and conditions, *ibid* section 111(b)(D)(i)(III).

<sup>62</sup> See Davis Polk & Wardwell, *supra* note 50, at 4-7.

<sup>63</sup> Focusing on this aspect, most commentary from the academic and business world was very critical of the incentive pay cap. See, e.g., Wachtell, Lipton, Rosen & Katz, FINANCIAL INSTITUTIONS DEVELOPMENT – CONGRESSIONAL LEADERS AGREE TO ELIMINATE INCENTIVE COMPENSATION AND IMPOSE OTHER COMPENSATION RESTRICTIONS FOR TARP PARTICIPANTS (February 13, 2009), available at <http://blogs.law.harvard.edu/corpgov/files/2009/02/wlrk-16493-09.pdf> (accessed 03/26/2009).

unambiguously superior alternative to both bad incentives and no incentives: well-designed incentives.

## V. THE WAY FORWARD – GETTING INCENTIVES RIGHT

In the preceding parts II through IV, we laid out the problems inherent in current executive pay arrangements in banks. Deposit insurance and “too big to fail” policies for banks create the standard moral hazard problem – an incentive for bank shareholders to gamble with the bank’s assets at the expense of the government. The structure of banks and of bankers’ pay provides incentives to engage in excessive risk-taking even beyond what is suggested by the standard moral hazard problem. The depletion of banks’ assets in the current crisis has further levered bank shareholders’ positions, exacerbating the identified problem. And none of the current legislative and regulatory proposals deals effectively with this problem.

In this part V, we argue for including a regulation of bankers’ pay as part of banking regulation. In section A, we consider the traditional approach to banking regulation, which attempts to address the moral hazard problem by restricting the menu of choices available to banks. We highlight the limitations of this approach, and show that it can be usefully complemented with regulation of the incentives of those making the choices from the menu. In section B, we discuss in more detail the forms that such regulation of incentives should take. At a minimum, bank regulators should monitor the incentives of the banks’ top management team. In addition, we argue that it might be desirable for regulators to encourage or even require certain arrangements, as well as to prohibit or at least discourage certain other arrangements. Finally, in section C, we emphasize the complementary nature of regulation of bankers’ pay and the traditional approach. Optimal regulation should combine both approaches.

### *A. Supplementing the Traditional Approach*

There is a substantial body of regulation – both in the U.S. and in other countries around the world – that attempts to deal with the moral hazard problem of banks.<sup>64</sup> This large body of

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<sup>64</sup> On the international level, the current relevant regulation is contained in the revised Basel accord (Basel II), *see* Basel Committee on Banking Supervision, *supra* note 14; and for an historical overview, explanations of the main features, and possible extensions *see* Malloy, *supra* note 14; and Laurent

regulation addresses bank behavior directly. It prevents banks from taking certain actions, such as making certain investments or loans that are deemed too risky given the banks' capital and portfolio, and it requires them to take certain other actions, such as maintaining certain amounts of capital. Banking regulators monitor banks' activities and capital situations to enforce these criteria. In other words, this body of regulations attempts to limit the choices available to banks in order to preclude socially inefficient choices. The sweeping "Framework for Regulatory Reform" recently announced by the Treasury remains firmly within that paradigm.<sup>65</sup>

The traditional approach of limiting banks' choices is fraught with well-known difficulties. The regulation needs to rule out socially inefficient choices, but should not restrain socially efficient ones.<sup>66</sup> Discriminating between the two is hard. In particular, determining the riskiness of a bank's asset pool and the corresponding appropriate level of capital requires not only an extremely sophisticated understanding of risk modeling but also intimate knowledge of the positions that the bank is taking. As outsiders, regulators are bound to be at an information disadvantage vis-à-vis bank executives.<sup>67</sup> In practice, regulators will also often lag behind the banks in their capacity to process the information that they receive.<sup>68</sup> These difficulties have increased with the growth of financial institutions.<sup>69</sup> Most importantly, the incentives are such that banks can be expected to seek ways to get around regulations and take risks beyond the level sought by regulators.<sup>70</sup>

In principle, regulatory agencies and commentators understand the nature of this "game" between banks and their regulators and the resulting imperfections of traditional regulation very

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Balthazar, FROM BASEL 1 TO BASEL 3: THE INTEGRATION OF STATE-OF-THE-ART RISK MODELING IN BANKING REGULATION (2006). In the United States, the relevant regulation for bank holding companies is contained in regulation Y of the Federal Reserve (12 C.F.R. 225).

<sup>65</sup> Cf. U.S. Department of the Treasury, Press Release of March 26, 2009, "Treasury Outlines Framework for Regulatory Reform," available at <http://www.treasury.gov/press/releases/tg72.htm>, accessed 03/31/2009, and Treasury Secretary Geithner's congressional testimony of the same date, *supra* note 6 (mentioning the four components addressing systemic risk, protecting consumers and investors, eliminating gaps in the regulatory structure, and fostering international coordination, but not executive compensation as a crucial lever of regulatory reform).

<sup>66</sup> See, e.g., Padoa-Schioppa, *supra* note 12, at 2-3.

<sup>67</sup> See, e.g., Hu, *Misunderstood Derivatives*, *supra* note 13; and Calomiris, *supra* note 13.

<sup>68</sup> See, e.g., Barth, Caprio & Levine, *supra* note 13; and Hu, *Swaps*, *supra* note 13, at 395-396.

<sup>69</sup> See, e.g., Board of Governors of the Federal Reserve System, Staff Study 172 – Using Subordinated Debt as an Instrument of Market Discipline (December 1999), at 1.

<sup>70</sup> See, e.g., Calomiris, *supra* note 13.

well. But they have paid insufficient attention to the crucial role of executive compensation in this game. Executive compensation shapes the incentives of those actually making the decisions on behalf of banks, namely their managers. Executive compensation that provides executives with powerful incentives to take risks, as current executive pay arrangements do, incentivizes managers to work against the goals of prudential regulation. At a minimum, banking regulators should monitor the strength of these incentives as part of their overall risk monitoring. Moreover, regulators should consider regulating executive compensation in banks to eliminate incentives to take risks that are inconsistent with the goals of prudential regulation. In this way, banking regulation might be able to harness bank managers' information and expertise, rather than fight against them.

We discuss how regulators should monitor and restrict bankers' pay in some detail in the following section. Here we want to emphasize how regulating bankers' pay conceptually differs from the traditional forms of banking regulation. While traditional banking regulation regulates and monitors the menu of choices available to bank executives, regulators may in addition elect to regulate and monitor the incentives shaping how bank executives make choices from this menu. As will be discussed further in section C below, both approaches can complement each other and work together to reduce the incidence of excessive risk-taking.

Even though the traditional focus of bank regulators and banking scholars has been on the moral hazard problem between shareholders and the government, the crucial decision makers in many banks are executives whose incentives are substantially influenced by pay arrangements. The importance of executives' incentives is confirmed by the evidence that banks whose managers have weaker incentives to serve shareholder interests take less risk.<sup>71</sup> Given the importance of these incentives, monitoring and regulating them can provide regulators with an additional and important instrument.

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<sup>71</sup> See Gorton & Winton, *supra* note 11, at 526-529 (reviewing the empirical literature up to 2003); Brewer, Hunter & Jackson, *supra* note 29 (documenting the increase in equity-based compensation and an associated increase in risk-taking). More generally, much of corporate governance research is concerned with the problem that managers will *not* implement shareholders' wishes, a problem first clearly articulated in Jensen & Meckling, *supra* note 11, at 312-330 (calling this the "agency cost of outside equity").



In 2006, the Basel Committee on Banking Regulation issued a report on the importance of enhancing corporate governance in banking organizations.<sup>72</sup> The report stresses the importance of banks' internal governance processes, including adequate board involvement in determining the pay of senior executives.<sup>73</sup> While the report appears to recognize that executive pay decisions are important, it fails to recognize that boards selected by shareholders cannot be generally counted on to eliminate risks for excessive risk taking – in the same way that they cannot be fully counted on to avoid excessive risks in deciding how much capital to maintain and how to invest the banks' assets. Banking regulators, therefore, should not limit themselves to confirming that boards are adequately involved in making executive pay decisions. Regulators do monitor and regulate banks' capital and investment decisions even when bank boards are adequately involved in such decisions. Similarly, we argue, banking regulators should monitor and possibly regulate banks' executive pay decisions, regardless of whether boards are adequately involved.

More recently, in April 2009, the Financial Stability Forum, which includes representatives of financial authorities from the advanced economies, issued a report, "FSF Principles for Sound Compensation Practices."<sup>74</sup> The report still appears to believe that involvement by shareholders and directors can bring about desirable compensation structures and seeks to facilitate disclosure to shareholders and engagement by them, and thus does not recognize the divergence between the pay arrangements that would be preferable by shareholders and those that would be optimal. But the report suggests that regulators should be willing to intervene when they observe deviations from sound practice. We view this as a very welcome development.

### *B. Monitoring and Regulating Bankers' Pay*

We now discuss in more detail how banking regulators should take into account executive pay arrangements. At a minimum, banking regulators should monitor existing pay arrangements to identify constellations that would reward executives for excessive risk-taking.

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<sup>72</sup> See Basel Committee on Banking Supervision, ENHANCING CORPORATE GOVERNANCE FOR BANKING ORGANISATIONS (Bank for International Settlements, 2006).

<sup>73</sup> Ibid., paragraphs 44-47.

<sup>74</sup> See Financial Stability Forum, FSF Principles for Sound Compensation Practices, available at [http://www.financialstabilityboard.org/publications/r\\_0904b.pdf](http://www.financialstabilityboard.org/publications/r_0904b.pdf).

We discuss this strategy in subsection 1. We discuss the possibility of regulating pay arrangements directly in subsection 2.

### *1. Monitoring Executives' Incentives*

To begin, in the same way that regulators already monitor the balance sheets of banks and the positions that they take, regulators should also monitor and assess executives' pay packages, including option and stock holdings from years past. Such monitoring and assessment is important for assessing the risks posed by the bank. We have seen that pay arrangements can provide powerful incentives for excessive risk taking. Hence regulators need to understand these arrangements, and ring the alarm bell when these arrangements favor excessive risks, particularly when they give executives incentives to maximize the value of a thin junior slice of the bank's capital. We surmise that if banking regulators had seen the incentive structures in banks as we see them now, they would have been alarmed early on. In the future, monitoring executives' incentive structures should be a part of regulators' standard procedure.

Which aspects of executives' pay to monitor follows naturally from our analysis of the leveraged moral hazard problem above. We have seen that the problem results from executives' insulation from downside risk, which depends on the amount of debt at various levels of the banking organization, the amount of shares and options held by or promised to the executive, and the strike price of options, if any. Regulators already possess information on the level of debt, and can easily obtain information on shares and options held by executives. From this information, regulators can calculate the sensitivity of executive pay to value increases and decreases of the bank's assets, possibly conditional on value increases or decreases at the holding level.

If the executive's pay sensitivity is too asymmetric, i.e., if the executive is too protected from downside risk, regulators should adjust upwards their assessment of the risks posed by the bank. Such upward adjustment of risks may lead regulators to take the steps that they would take when making such an upward adjustment for other reasons (e.g., an increase in the perceived risk of a bank's loans pool). Regulators could, for example, demand additional reassurance from the bank, be it in the form of additional capital or otherwise. Regulators already wield significant powers to intervene when they detect a danger to the safety and soundness of a banking

institution. Regulators should also look to executive pay arrangements in determining whether and to what extent such a danger exists.

## *2. Regulating Executives' Incentives*

We now turn to the possibility of directly regulating executive pay arrangements, or at least encouraging or discouraging certain arrangements. Such regulation should seek to limit the extent to which bank executives face asymmetric payoffs when considering options that have both an upside and a downside. Putting forward a comprehensive and detailed blueprint for such regulation is beyond the scope of this paper. What we would like to do, however, is to outline directions that such regulation should take and thereby provide a basis for subsequent discussions of the subject.

It is most straightforward to describe the direction we suggest when executives' payoffs are linked to the value of specified securities. At present, executives' payoffs are linked only to equity, or even a levered bet on equity to the extent they are granted options rather than straight equity. To encourage more prudent decision-making, we suggest that bank executives' equity-based compensation be replaced with compensation based on the value of a broader basket of securities representing a larger part of the corporate pie. To begin, now that the government has become a major investor in many banks in which it holds preferred stock, it naturally has an interest in having executives' payoffs linked also to the value of preferred stock. For example, instead of tying executives' compensation to the value of a specified percentage of the common shares, executives' compensation could be tied to the value of a specified percentage of the value of the common shares and the preferred shares.

More generally, executives' payoffs could be tied to an even broader basket of securities than common shares and preferred shares. In particular, executives' payoffs could be tied to a set percentage of the aggregate value of common shares, preferred shares, and all outstanding bonds. Because such compensation structure would expose executives to a broader fraction of the negative consequences of risks taken, it will reduce their incentives to take excessive risks.

Indeed, even the above structure would not lead bank executives to fully internalize and take into account the adverse consequences that the taking of risks might have for the interests of the government as guarantor of deposits. To do so, it would be necessary to broaden further the set of positions to whose aggregate value executive payoffs are tied, and it would be worth

considering how this can be best done. One could consider, for example, schemes in which executive payoffs are tied not to (a given percentage of) the aggregate value of the bank's common shares, preferred shares, and bonds but to this aggregate value minus any payments made by the government to the bank's depositors (as well as other payments made by the government in support of the bank) during a period ending one year after the executive's departure from the bank. Alternatively, one could consider tying executive payoffs to the aggregate value of the bank's common shares, preferred shares, and bonds minus the estimated increase (if any) in the expected value of government payments as proxied by the product of (i) the increase in the implied probability of default inferred from the price of credit default swaps, and (ii) the value of the bank's deposits. Until an effective way for doing so is identified, however, tying executive pay to the aggregate value of common shares, preferred shares, and bonds will already produce a significant improvement in incentives compared with existing arrangements.

Similarly, to the extent that executives receive bonus compensation that is tied to specified accounting measures, it also should be tied to broader measures. For example, the bonus compensation of some bank executives has been based on accounting measures such as return on equity or earning per common share that are of substantial interest to common shareholders. Our approach suggests that it would be worthwhile to consider basing bonus compensation on broader measures such as earnings before any payments made to bondholders.

One might wonder how our argument relates to the widespread view, which we share, that, in general, executive pay arrangements should be designed with a focus on aligning the interests of executives with those of shareholders.<sup>75</sup> In our view, banks present a special case because, given the systemic costs of bank failure and the government's guarantee of bank deposits, a body of regulation is in place to limit stockholders from making business decisions that would serve their interests but produce excessive risks and impose an externality. Because regulating executive pay can improve the effectiveness of banking regulation in achieving its widely accepted goals, it could be appropriate to constrain banks' freedom to set pay structures while not imposing such constraints outside the banking sector.<sup>76</sup>

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<sup>75</sup> One of us has written extensively on how executive compensation should be best designed to align executives' and shareholders' interests. *See* the sources cited *supra* in notes 2 and 4.

<sup>76</sup> While shareholders of firms outside the banking sector (or directors elected by such shareholders) should not be constrained by regulators in setting the structure of executive pay arrangements, firms

We expect that any regulation of executive pay would be viewed by some as excessive interference. Optimal setting of executive pay arrangements requires substantial information, it might be argued, and such decisions should therefore be left to private decisions by the banks themselves. In regulated banks, however, interference in business decisions is already commonplace under existing regulation anyway, and is viewed as justified by the fundamental moral hazard problem between shareholders and the government. Banking regulators already regulate decisions with respect to banks' capital and investments that are probably as (or even more) information-sensitive as decisions concerning executive pay. Furthermore, regulation of executive pay in banks could well take the form of setting some limits and principles while still allowing significant discretion to the banks. In addition, regulating bankers' pay might allow regulators to be less tough in other areas of banking regulation. Hence we do not believe that regulating bankers' pay would lead to more intrusive regulation overall.

Finally, we are aware that shareholders have other means of influencing management than explicit pay packages. Thus, even when executive pay in banks is regulated, shareholders vote on the election of directors who appoint and fire bank executives, and this voting power may by itself lead executives to give some weight to shareholders' preferences. But the fact that executives may have other incentives to take excessive risks to benefit common shareholders hardly implies that it would not be desirable to limit the extent to which pay arrangements provide them with such incentives. Doing so would at least move us in the right direction.

### *C. Combining Old and New Tools*

In section A, we briefly reviewed the traditional approach to banking regulation, which monitors and restricts the menu of choices available to banks. In section B, we argued for supplementing it with a new approach, which monitors and possibly restricts the incentives provided to bank managers who choose from this menu. Here we offer additional comments on the complementary relationship between the two approaches.

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seeking to reduce their borrowing costs should be free, of course, to agree to covenants that require them to tie executive pay also to the value of the firm's debt securities. For theoretical analyses of whether and when such covenants could be efficient, see David Hirshleifer and Anjan Thakor, *Managerial Conservatism, Project Choice, and Debt*, 5 REVIEW OF FINANCIAL STUDIES 437 (1992), Teresa John and Kose John, *Top-Management Compensation and Capital Structure*, 48 JOURNAL OF FINANCE 949 (1993), and, most recently, Alex Edmans, *Inside Debt*, Working Paper, Wharton School, December 2008.

As we have seen, both approaches are imperfect. The traditional approach provides banks with incentives to find ways to circumvent the regulations without breaking them, while regulators struggle to understand what exactly the banks are doing, and how to evaluate the ensuing risks. And we recognize that the proposed incentive-based approach can be expected to be imperfect as well.

It might therefore be often optimal to utilize and combine elements of both approaches. Regulators could focus both on the menu of choices available, and on the incentives influencing the choices from that menu. The two approaches may reinforce each other and work together to protect the safety and soundness of banks. At the same time, adding regulation of pay to the traditional approach does not necessarily mean that banking regulation should or will become overall more stringent. Adding a new tool allows less frequent or less constraining use of others.

Especially when bankers' pay is not directly regulated, monitoring executive pay should play an important role in determining the appropriate capital and other regulatory requirements specific to each institution, as explained in section 2.1 above. This does not mean that capital or other traditional regulation should become tougher across the board; rather, information about executive pay arrangements should be used to produce a better fit between regulatory requirements and individual banks' risk profiles.

Conversely, when bank regulators ensure or at least verify that executives do not have strong incentives to take risks, they can afford to give them more discretion to make choices. We do not believe that regulating executives' incentives alone would be sufficient to ensure the soundness of financial institutions, and hence we are not advocating a repeal of existing banking regulation. But we do believe that, with experience, banking regulators may sometimes be able to reduce traditional regulation of the menu of actions when bank executives' incentives are more in line with the regulation's goals. More importantly, combining traditional direct regulation of banks' actions and activities with the proposed regulation of bank executives' pay may well improve the overall effectiveness of banking regulation and thus contribute to securing the safety and soundness of the banking sector.

## VI. CONCLUSION

This paper has identified some key factors that have encouraged bank executives to take excessive risks. It has also shown that these factors are still present and that current attempts to

regulate bankers' compensation fail to address them. Furthermore, it has identified the compensation arrangements necessary to eliminate the identified incentives to take excessive risks both in banks receiving TARP support and in banks in general. .

Looking beyond the current crisis, executive compensation can serve as a powerful lever that can harness executives' information and expertise to the regulators' advantage. Going forward, monitoring and regulation of bank executives' compensation – along the lines we have put forward – can constitute a valuable component of banking regulation and complement nicely the monitoring and regulation of banks' investment and lending decisions. We hope that our analysis will contribute to an objective whose importance has been made clear by the financial crisis – ensuring that bank executives not have incentives to take excessive risks.