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**AGGREGATE SHAREHOLDER VALUE, STOCK PRICES, AND
THE OPTIMAL DESIGN OF EXECUTIVE PAY**

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Abstract

This paper critically analyzes a fundamental feature of executive compensation arrangements: tying executives' pay to the future stock price. I show that tying pay to the future stock price, even the long-term stock price, distorts executives' incentives. In particular, it rewards them for engaging in share repurchases and equity issuances that reduce "aggregate shareholder value": the net cash flow to shareholders over time. I also put forward a new approach to equity-based pay that remedies these distortions.

Key words: executive compensation, executive pay, equity-based compensation, restricted shares, options, long-term, shares, stock, repurchases, buybacks, secondary offerings, seasoned equity offerings, agency costs; overvalued equity.

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I. INTRODUCTION

This paper critically analyzes a fundamental feature of executive pay arrangements: tying managers' payoffs to the future stock price. Executives receive most of their compensation in the form of stock, stock options, and other equity-like instruments whose payoffs depend on the future stock price. The higher is the future stock price, the larger is the payoff to executives.

Much attention has been paid to the problems associated with the long-standing practice of tying executive pay to the short-term stock price. As Lucian Bebchuk and I warned in our 2004 book, *Pay without Performance: The Unfulfilled Promise of Executive Compensation*, executive pay has been excessively tied to short-term stock prices, encouraging executives to focus on short-term results even when they came at the expense of long-term value.¹ The crisis of 2008-2009 has led to a widespread recognition that pay arrangements that reward executives for short-term results can indeed distort their incentives.²

Recognition of the problems associated with tying pay to the short-term stock price, in turn, has led to increasing interest in tying executives' equity pay to long-term value. For example, Treasury Secretary Timothy Geithner has urged corporate boards to "pay top executives in ways that are tightly aligned with the long-term value..."³ And the Finance Ministers and Central Bankers of the G-

¹ Lucian Bebchuk and Jesse Fried, *PAY WITHOUT PERFORMANCE: THE UNFULFILLED PROMISE OF EXECUTIVE COMPENSATION* (Harvard University Press, 2004), chapter 14 (analyzing problems resulting from the broad freedom of executives to unload equity incentives in the short-run).

² See, e.g., 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> (declaring "poorly designed compensation policies can create perverse incentives ... Management compensation policies should be aligned with the long-term prudential interests of the institution...")

³ See the statement by Treasury Secretary Tim Geithner on Compensation, June 10, 2009 (TG-163) (available at <http://www.ustreas.gov/press/releases/tg163.htm>).

20 recently called for global standards on pay structures “to ensure compensation practices are aligned with long-term value creation.”⁴

To better tie executive pay to long-term value, regulators and investors have sought to link executives’ payoffs to the long-term stock price. For example, academics and shareholder activists have urged firms to require executives to hold a large fraction of their equity incentives until after they retire.⁵ Several dozen firms, including Deere, Boeing, Exxon Mobil, and Citigroup have already adopted such measures.⁶ And regulators have required executives of TARP firms to receive a large portion of their compensation in stock that cannot be sold for several years.⁷

Certainly, it is far better to tie executives’ payoffs to the long-term stock price rather than to the short-term stock price.⁸ Stock prices are frequently “noisy” – deviating from the best possible estimate of their future value.⁹ And stock prices can sometimes be

⁴ See the G-20’s Declaration on Further Steps to Strengthen the Financial System, London, September 4-5, 2009.

⁵ Proposals to tie executive pay to the long-term stock price have come from, among others, longtime compensation reformer Jesse Brill, Professors Sanjai Bhagat and Roberta Romano, and AFSCME. See Jesse Brill, “*Hold Through Retirement*”: *Maximizing the Benefits of Equity Awards While Minimizing Inappropriate Risk Taking*, 22 THE CORPORATE EXECUTIVE 1 (November-December 2008), <http://www.thecorporatecounsel.net/Sub/TCE-sample.pdf> ; Sanjai Bhagat and Roberta Romano, *Reforming Executive Compensation: Simplicity, Transparency and Committing to the Long-Term* (working paper, 2009); AFSCME Press Release, *AFSCME Employees Pension Plan Announces 2009 Shareholder Proposals*, <http://www.afscme.org/press/24815.cfm>.

⁶ For example, Citigroup generally requires that directors and senior management hold 75% of the net shares granted to them under the firm’s equity programs until they step down.

⁷ See, e.g., Treasury Press Release TG-329, *The Special Master for TARP Executive Compensation Issues First Rulings* (October 22, 2009) available at <http://treas.gov/press/releases/tg329.htm> (“[TARP Special Master’s] rulings require that the majority of salaries be paid in stock that must be held for the long term . . .”).

⁸ See Bebchuk and Fried, *Pay without Performance*, supra note x, at ___; Bebchuk and Fried, *Paying for Long-Term Performance* (working paper, 2010), at ___.

⁹ See Jesse Fried, *Current-Shareholder Bias* (working paper, 2009), at ___.

manipulated by the firm's own executives.¹⁰ Thus, a firm's long-term stock price is likely to better reflect performance than the firm's short-term stock price.¹¹

However, this paper shows that tying the executives' payoffs to the stock price on a future date, whether in the short-term or the long-term, gives executives incentives to take steps that *reduce* aggregate shareholder value: the net cash flow to a firm's shareholders over time. Thus, tying executives' payoffs to the long-term stock price can make a firm's shareholders worse off.

I show that linking pay to the future stock price generates two types of distortions that reduce aggregate shareholder value. First, when the current stock price is low, executives may have an incentive to engage in repurchases that boost the future stock price but distribute cash that would generate more value for shareholders if the cash remained inside the firm. Second, when the current stock price is high, executives may have an incentive to issue equity to shareholders for value-reducing investments, what I call "cheap empire building." Thus both conventional equity arrangements that tie pay to the short-term stock price as well as new arrangements that tie pay to the long-term stock price suffer from a serious flaw.

The reason for these distortions is straightforward: tying executives' payoffs to the stock price on a future date aligns executives' economic interests with a particular group of shareholders: "non-trading shareholders," shareholders who neither reduce nor increase their stockholdings until that date. However, it fails to align executives' interests with "selling shareholders" who sell shares before that date. Nor does it align executives' interests with "buying shareholders" who buy shares before that date. Thus, tying executives' wealth to a future-date stock price can give executives an incentive to transfer value from selling and buying shareholders to non-trading shareholders, at the expense of aggregate shareholder value – the net cash flow from the firm to all shareholders.

I consider the possibility that the perverse incentives caused by tying executive pay to a future-date stock price are mitigated by other components of existing compensation arrangements. For

¹⁰ See Jesse Fried, Hands-Off Options, *Vand. L. Rev.* __ (2008).

¹¹ As Lucian Bebchuk and I have explained elsewhere, it is even better to tie executives' pay to the average stock price around some date in the long-term future than on to the stock price on a specific date. See Bebchuk and Fried, *Paying for Long-term Performance* (working paper, 2010).

example, executives receive salary and bonus, and can sell most of their vested equity in the present. These elements of the pay arrangement could, it might be argued, align executives' interests with selling and buying shareholders.

However, I show that these other components of pay arrangements do not mitigate the distortions caused by tying executives' pay to the future stock price, and in some cases may exacerbate them. Thus, the problematic incentives created by tying executive pay to the future stock price are likely to have substantial negative effects on aggregate shareholder value.

This paper also puts forward a new approach to tying executive pay to aggregate shareholder value that should be of interest to regulators, boards, and investors. Under this approach, executives would be required to sell some of their shares (or buy additional shares) whenever the firm repurchases its own stock (or issues new equity) so that the executives' proportional ownership in the firm remains constant as the firm transacts in its own stock.

I show that this "constant-share" approach would perfectly tie executives' wealth to aggregate shareholder value. It does so by linking executives' payoff to the net cash flow to *all* shareholders, not just the value flowing to non-trading shareholders, those who neither buy nor sell shares before a particular date. I explain how the constant-share approach could be effected at trivial cost, even in firms engaging in frequent repurchases and equity issuances.

Before proceeding, it is worth noting that there may well be obstacles to getting boards to implement the constant-share approach, most importantly resistance from executives. The constant-share approach will make it much more difficult for managers to profitably use inside information to indirectly buy stock at a low price from public shareholders through repurchases, as well as to indirectly sell stock to public shareholders at a high price. Thus, managers can be expected to resist adoption of this approach. The difficulty of overcoming managerial resistance may well mean that the constant-share approach will not be widely adopted absent regulatory intervention.

However, the question of whether (and if so, how) regulators should mandate a constant-share approach is beyond the scope of this paper. The two main purposes of this paper are to: (1) demonstrate a critical flaw in a fundamental feature of both conventional and emerging executive pay arrangements; and (2) put forward a new constant-share approach to equity-based pay that could, at little cost, remedy this deficiency.

The remainder of the paper is organized as follows. Part II first introduces the concept of aggregate shareholder value. It explains that, from an economic perspective, executives should not be encouraged to maximize the wealth of a particular subset of a firm's shareholders at the expense of other shareholders but rather aggregate shareholder value: the value flowing to all the firm's shareholders over time. It then examines the link between aggregate shareholder value and a future-date stock price in a simple firm: one that neither repurchases shares, nor issues new shares, before that future date. It shows that, in a simple firm, the future-date stock price perfectly captures aggregate shareholder value. Thus, tying executive pay to the future-date stock price in a simple firm incentivizes the executive to maximize aggregate shareholder value.

Part III considers equity-based pay arrangements in firms that may repurchase their own shares. It begins by explaining that most firms repurchase their own shares as a means of distributing cash to shareholders. It shows that repurchases transfer value from selling to non-selling shareholders if the stock is underpriced. It also shows that repurchases can increase aggregate shareholder value if the cash is better invested outside the firm, but will reduce aggregate shareholder value if the cash is better invested inside the firm. It then examines executives' incentive to repurchase shares when their payoff is tied to the future stock price. It shows that an executive seeking to maximize the future stock price may initiate a share repurchase that reduces aggregate shareholder value. In particular, if the firm's stock is underpriced, the executive may divert cash from value-creating activities so the firm can buy up its own shares at a bargain price. Such value-reducing repurchases can increase the future stock price if the "discount" on the stock exceeds the amount of value destroyed. Thus, unlike the simple-firm scenario, tying executive pay to the future stock price in a repurchasing firm can reward an executive for reducing aggregate shareholder value.

Part IV considers equity-based pay arrangements in firms that may issue shares. It explains that firms frequently issue share for a variety of purposes. analyzes the distortions that arise from tying executive pay to the future stock price in a firm that may issue additional shares. It shows that, in such a firm, tying executives' pay to the future stock price may cause the executive to engage in cheap empire building: selling overpriced equity to fund projects that destroy aggregate shareholder value. Such cheap empire building, I show, makes current shareholders of the firm better off if the value transferred from new shareholders exceeds the amount of value destroyed.

Part V introduces the constant-share approach to equity pay: requiring executives to maintain their proportional ownership as the firm transacts in its own stock. It shows that such an approach, by tying executives' wealth to the net cash flow to all of the firm's current and future shareholders, eliminates the incentive to engage in value-wasting share repurchases and cheap empire building. It explains how the constant-share repurchase can be implemented at low cost even in companies engaged in frequent stock issuances and repurchases. Part VI concludes.

II. AGGREGATE SHAREHOLDER VALUE AND STOCK PRICES IN A SIMPLE FIRM

This Part introduces the concept of aggregate shareholder value and discusses the link between aggregate shareholder value and the future stock price in a “simple firm:” one that neither repurchases nor issues additional shares before that date.

Section A explains why, from a social perspective, corporate governance and executive compensation arrangements should encourage executives to maximize aggregate shareholder value, rather than the value flowing to a particular group of a firm’s shareholders. It also explains how aggregate shareholder value can be measured.

Section B then examines the link between aggregate shareholder value and the stock price on a future date in a “simple firm.” It shows that, in a simple firm, the stock price on the future date reflects aggregate shareholder value through that date.

A. Aggregate Shareholder Value

Executive compensation (and corporate governance arrangements more generally) should encourage executives to maximize the value flowing to all the firm’s shareholders over time.¹² They should not encourage executives to maximize the payoff to particular shareholders at other shareholders’ expense. From an economic perspective, a dollar flowing to one shareholder is no less or no more valuable than a dollar flowing to another shareholder. Thus, executives should be encouraged to maximize what I have called “aggregate shareholder value”:¹³ the net cash flow to all of the firm’s shareholders over time – the cash received by all shareholders

¹² I assume, for purposes of this paper, that shareholders are the exclusive residual claimants of a firm’s cash flow. Thus, maximizing aggregate shareholder value is equivalent to maximizing the value of the firm itself. This assumption, made purely for expositional convenience, does not affect the paper’s analysis about the distortions caused by tying executives’ pay to the long-term stock price or the desirability of the constant-share proposal it puts forward.

¹³ See Jesse Fried, *Informed Trading and False Signaling with Open Market Repurchases*, 93 Cal. L. Rev. 1232, 1331 (2005).

from the firm less the cash paid by all shareholders to the firm for their shares.

Measuring aggregate shareholder value requires specifying a future measurement date. When the measurement date is the end of the firm's life, calculating aggregate shareholder value is straightforward. Aggregate shareholder value is simply the net amount of value that flows directly or indirectly from the firm to all of its current and future shareholders before all shareholders are cashed out. Direct payments from the firm include dividends and payments to repurchase shares, less amounts received from shareholders buying stock from the firm. Indirect payments are any cash paid by an acquirer of the firm to the firm's shareholders.

One can also *estimate* aggregate shareholder value through any measurement date before the firm is sold. Suppose we wished to determine the aggregate shareholder value as of a specific future date, which I will call "date D." It is the net amount of value that flows directly from the firm to shareholders before date D, plus the trading value of the firm's shares at date D, which approximates what the firm's shareholders would receive if the firm were sold on date D. The net amount of value directly flowing from the firm to shareholders would, again, include dividends and payments to repurchase shares, less amounts received from shareholders buying stock from the firm before date D. The accuracy of this estimate of aggregate shareholder value depends, of course, on the accuracy of the stock price at date D.

Importantly, aggregate shareholder value is not affected by "short-term" changes in the trading price of the stock, changes that occur before the measurement date. To see why this is the case, consider the shares of a firm trading at \$10 per share. Ten dollars is thus the price at which shares are sold by current shareholders to future shareholders. If the share price moves to \$11, each current shareholder selling a share makes \$1 more per share; however, each future shareholder buying a share spends \$1 more per share. Thus, aggregate shareholder value – the amount flowing to all shareholders – is not affected by the stock price moving to \$11 from \$10. Aggregate shareholder value depends solely on the amount of value flowing from the firm to shareholders over the relevant time period.¹⁴

¹⁴ To be sure, an increase in the trading price of the stock may be caused by expectations of larger future cash flows to shareholders from the firm – expectations that may or may not be realized. Thus, I am not claiming that there is no relationship between the trading price and long-term shareholder value. My claim, rather, is that a higher trading price itself does cause an increase in long-term shareholder value.

B. Stock Prices in a Simple Firm

I will now explain that the stock price on a future date reflects aggregate shareholder value in a simple firm: one that does not transact in its own stock before that date.

Consider a Corporation (ABC) that now has 2 shares outstanding. Assume that, at a future date D, ABC is liquidated and the parties then holding ABC's shares will receive \$20 pro rata if ABC does not buy or sell any of its own shares before date D. Assume further that, between now and date D, ABC does not repurchase any of its shares, or issue any new shares.¹⁵

ABC's aggregate shareholder value is easy to calculate. No cash flows from the firm to shareholders via stock repurchases, or from shareholders to the firm via equity issuances, until date D. Aggregate shareholder value until date D is thus simply the amount received by shareholders when ABC is sold at date D: \$20.¹⁶

Now consider ABC's stock price at date D. In a simple firm, as in any firm, the stock price on particular date is simply the firm's value at that date divided by the number of shares outstanding at that date. At date D, ABC's value is \$20 and it has 2 shares outstanding. Thus, ABC's stock price is simply \$10 (1/2 of ABC's \$20 value).

It should be easy to see that, in the case of the simple firm, a linear relationship exists between the stock price and aggregate shareholder value. For example, every 10% increase in aggregate shareholder value increases the stock price by 10%. If ABC's aggregate shareholder value were to increase from \$20 to \$22, ABC's stock price would increase from \$10 to \$11. In a simple firm, then, an executive paid on the basis of the stock price has powerful incentives to maximize aggregate shareholder value.

¹⁵ For simplicity, I will also assume that ABC also does not issue any dividends.

¹⁶ If dividends had been distributed, those payments would be counted toward aggregate shareholder value. However, I assume ABC does not issue dividends.

III. SHAREHOLDER VALUE AND STOCK PRICES IN REPURCHASING FIRMS

As we saw in Part II, aggregate shareholder value is captured by the future stock price in a simple firm: one that neither repurchases nor issues shares before the measurement date. However, most firms are not simple: they repurchase and/or issue shares on a frequent basis, distributing and receiving cash from shareholders. Indeed, the volume of repurchases and stock issuances in US public markets recently topped \$1 trillion each year, with over 90% of firms engaging in repurchases and stock issuances annually. For these firms, as we will see, the link between aggregate shareholder value and the future stock price will generally diverge, and tying an executive's pay to the future stock price can encourage the executive to make decisions that reduce aggregate shareholder value.

This Part examines the incentives created by tying an executive's pay to the future stock price in a firm that may repurchase its own stock. As we will see, this compensation structure may give the executive an incentive to conduct a repurchase that reduces net cash flow to shareholders over time.

Section A briefly discusses the motivations for and effects of share repurchases. It explains that repurchases can be used to distribute cash to their shareholders, and firms often undertake repurchases because the firm's stock price is low.

Section B shows that, in a repurchasing firm, the future stock price will increase when the firm buys back stock at a bargain price, even if aggregate shareholder value is unaffected by the repurchase. Share repurchases thus sever the tight connection between the future stock price and aggregate shareholder value.

Section C explains that repurchases can either increase or reduce aggregate shareholder value. They can increase aggregate shareholder value by distributing cash that can be better invested outside the firm; they reduce aggregate shareholder value when they distribute cash that is better invested inside the firm.

Section D shows that even a value-reducing repurchase can boost the future stock price. Thus, tying an executive's pay to the future stock price can distort repurchase decisions by rewarding executives for engaging in a repurchase that reduces aggregate shareholder value.

A. Use and Distributional Effects of Share Repurchases

Repurchases are frequently used to distribute cash to shareholders, and executives often decide to initiate share repurchases when the stock price is low in order to transfer value from selling shareholders to non-selling shareholders, including themselves.

1. The Frequent Use of Repurchases

Publicly traded U.S. firms annually generate hundreds of billions of dollars in earnings.¹⁷ Each year, executives must decide how much of their firms' retained earnings should be distributed to shareholders. They must also decide the form such distribution should take: dividends, repurchases, or a combination of both.

Share repurchases have become an increasingly common form of paying out cash. In 2007, U.S. corporations distributed almost \$2 trillion to their shareholders, over \$1 trillion through repurchases in 2007.¹⁸ Over 90% of publicly traded firms engage in repurchase activity, and more than 90% of repurchases take the form of open market repurchases, in which the firm buys its own stock on the market through a broker.¹⁹

2. Use of Repurchases to Buy Bargain-Price Stock

A share repurchase has substantial distributional effects. As I have shown elsewhere, a share repurchase is economically equivalent to a transaction in which: (1) first, non-selling shareholders directly purchase shares from sellers at the repurchase price; and (2) second,

¹⁷ See Gustavo Grullon & Roni Michaely, *Dividends, Share Repurchases, and the Substitution Hypothesis*, 57 J. FIN. 1649, 1655 (2002).

¹⁸ See Paul A. Griffin and Ning Zhu, *Accounting Rules? Stock Buybacks and Stock Options: Additional Evidence* (working paper, December 15, 2008), at 1.

¹⁹ See Grullon & Ikenberry, *supra* note X, at 33-34 (reporting that between 1980 and 1999, open-market programs comprised about 92% of the total share repurchase announcements and 91% of the total value of all repurchase announcements). The other form of repurchase is a repurchase tender offer (RTO), in which the firm offers to buy back its own stock directly from shareholders, usually at a premium over the market price. See Fried, *Insider Signaling*, at 428. For purposes of this paper, the mechanism by which firms repurchase stock – open-market repurchase or RTO – is irrelevant.

the firm issues a dividend equal to the dollar amount of the repurchase.²⁰ Thus, conducting a stock buyback when shares are underpriced transfers value from selling to non-selling shareholders.²¹

In fact, there is considerable evidence that executives use inside information to initiate and conduct repurchases when the stock is underpriced.²² For example, stock-price behavior is consistent with the use of repurchases to buy stock at a bargain. If executives use repurchases to buy stock at a low price, the stock prices of firms announcing repurchases should, on average, subsequently outperform those of firms not repurchasing. Indeed, stock prices of repurchasing firms increase faster than stock prices of similar firms not conducting repurchases. One study found that shares of firms announcing repurchases earn abnormal returns of 6.7% in the first year following the announcement and 23.6% over the subsequent four years.²³ These post-repurchase returns strongly suggest that, as a group, firms announcing OMRs are underpriced at the time repurchase programs are announced.²⁴

Executives themselves admit that they use repurchases to buy stock when it is cheap. According to the authors of a major 2004 survey of financial executives regarding their firms' payout policies, "the most popular response for all repurchase questions on the entire survey is that firms repurchase when their stock is a good value,

²⁰ See Fried, *Informed Trading*, supra note x, at 1344-46.

²¹ When a firm buys stock at a low price, the precise distributional effects depend on whether the shareholders from whom the firm buys stock would have sold their shares in any event at the repurchase price to new investors. If they would have sold their shares in any event at the same price, they do not "lose" any value as a result of the repurchase. Instead, those anonymous and unknown investors who would have purchased the selling shareholders' stock absent the repurchase are deprived of a gain. For simplicity, however, I will assume that it is the selling shareholders that lose money as the result of the value-wasting repurchase.

²² For a discussion of this evidence, see Fried, *Informed Trading*, supra note x, at 1347-49.

²³ See Konan Chan et al., *Economic Sources of Gains in Stock Repurchases*, 39 *J. Fin. Quant. Anal.* 461 (2004); see also Chan et al., supra note X, at 2 (examining 5,508 repurchase announcements between 1980 and 1996 and finding abnormal stock price performance of 5% the first year and 22% over four years among firms repurchasing shares, and a four-year abnormal return of 25% among value firms).

²⁴ For other evidence that executives uses repurchases to buy underpriced stock, see Fried, *Informed Trading*, supra note x, at 1349-51.

relative to its true value: 86.4% of all firms agree or strongly agree with this supposition.”²⁵ The survey’s organizers report: “executives tell us that they accelerate (or initiate) share repurchases when their stock price is low.”²⁶ There is also evidence that executives attempt to manipulate the stock price down around repurchases to increase the amount of value transferred to non-selling shareholders.²⁷

B. The Disconnect Between Aggregate Shareholder Value and Stock Price

In Part II, we saw that in a simple firm there is a tight link between aggregate shareholder value and the future stock price. The only way to increase the future stock price is to increase aggregate shareholder value. And any step that reduces aggregate shareholder value reduces the future stock price.

As we will now see, in a firm that repurchases its shares the link between aggregate shareholder value and the future stock price is severed. When executives use repurchases to buy back cheap stock, they can boost the future stock price even if the repurchase does not increase aggregate shareholder value.

Consider again ABC Corporation. As before, it has 2 shares outstanding and, if it does not transact in its equity, would distribute \$20 to its shareholders upon liquidation at date D.

Now assume that in the “short-term”, sometime between now and date D, ABC repurchases 1 share for a bargain price of \$8 per share. Assume further that no value is created or destroyed as a result

²⁵ Alon Brav, Campbell R. Harvey, John R. Graham, John R. & Roni Michaely, *Payout Policy in the 21st Century*, 77 J. FIN. ECON. 483, 514 (2005).

²⁶ *Id.* at 514. Earlier studies yielded similar responses. When asked in an anonymous 1988 survey what was the most important circumstance precipitating a repurchase, 66% of the surveyed executives responded “low stock price,” six times as many as the next most popular answer, “need for treasury stock.” George P. Tsetsekos et al., *A Survey of Stock Repurchase Motivations and Practices of Major U.S. Corporations*, 7 J. APPLIED BUS. RES. 15, 17-18, tbl.2 (1991).

²⁷ See Guojin Gong, Louis Henock, and Amy Sun, *Earnings Management and Firm Performance Following Open-Market Repurchases*, 63 J. Fin. 947 (2008)(reporting that firms adjust accruals to decrease their earnings before stock repurchases).

of the repurchase.²⁸ Thus, at date D when ABC is liquidated, the parties then holding ABC's 1 other share receive \$12 (\$20-\$8).

What is ABC's aggregate shareholder value? It is simply the amount that ABC distributes through the repurchase, \$8, plus the amount that is distributed when the firm is sold: \$12. ABC's aggregate shareholder value is thus \$20,²⁹ the same as when it was a simple firm.³⁰

But now consider ABC's stock price at date D. The stock price is simply ABC's value at date D (\$12) divided by the number of shares then outstanding (1). Thus, ABC's stock price at date D is not \$10, as it was when ABC was a simple firm, but rather \$12. In other words, ABC's stock price has increased because of an earlier repurchase at a bargain price.

It should be easy to see that, if ABC repurchases stock, the link between the stock price and aggregate shareholder value is broken. ABC's stock price at date D will not always reflect aggregate shareholder value. A 10% increase in aggregate shareholder value does not always lead to a 10% increase in the stock price. Conversely, ABC's managers can boost the stock price without increasing in aggregate shareholder value – simply by repurchasing stock at a bargain price.

C. Repurchases' Potential Adverse Effect on Value

Disconnecting stock price and aggregate shareholder value would not be problematic in a world where repurchases could not reduce aggregate shareholder value. However, repurchases can reduce aggregate shareholder value. And, as we will see in Section D, a repurchase can boost the stock price even if it is value-wasting.

²⁸ For simplicity, I continue to assume that ABC also does not issue any dividends.

²⁹ I ignore the time value of money (or alternatively, assume it is zero). This assumption, made purely for convenience, does not affect the analysis.

³⁰ The fact that aggregate shareholder value in the repurchasing firm is the same as in the simple firm should not be surprising. Since I assume the repurchase does not destroy or create any value, the fact that there is a repurchase should not affect aggregate shareholder value, only the way in which the value flows to shareholders. While before all the value flowed to shareholders when the firm was sold, now some of the value flows to shareholders through the repurchase before the firm is sold.

Recall that a share repurchase is economically equivalent to a transaction in which: (1) first, non-selling shareholders directly purchase shares from sellers at the repurchase price; and (2) second, the firm issues a dividend equal to the dollar amount of the repurchase.³¹ The first effect cannot affect aggregate shareholder value because it is purely distributional: it reallocates part of the pie but does not affect the size of the pie itself.

However, the second effect deprives the firm of cash that it can otherwise invest. It can reduce aggregate shareholder value if the firm could make better use of the cash than shareholders. Suppose, for example, that a dollar would generate a return of 15% in the firm and 10% outside the firm. Distributing the dollar makes shareholders as a group worse off by \$0.05 (\$0.15 - \$0.10).³²

Of course, the dividend-effect of repurchases could also increase aggregate shareholder value. Suppose, for example, that a dollar would generate 5% in the firm and 10% outside the firm. Then distributing the dollar makes shareholders as a group better off, not worse off.

Thus, I am thus not claiming that repurchases always reduce aggregate shareholder value. Rather, my point is that they can reduce aggregate shareholder value if the cash distributed would generate higher returns inside the firm than outside the firm.

One might wonder why executives would ever distribute cash that is better invested outside the firm than inside the firm. As we will see in the next Section, however, an executive whose payoff is tied to the future stock price will, when the stock is sufficiently underpriced, have this very incentive.

D. Executives' Distorted Repurchase Incentives

Having seen that executives can use repurchases to buy back cheap stock and that such repurchases might reduce aggregate shareholder value, I will now show that executives paid on the basis of the stock price may have an incentive to engage in value-wasting

³¹ See Fried, *Informed Trading*, supra note x, at 1344-46.

³² In a world of perfect capital markets, of course, there would be no need to sacrifice the 15% project to fund the repurchase. Corporations would obtain financing for any project with a positive net present value. Thus, a firm's ability to invest in desirable projects would not depend on having cash on hand. However, capital markets are not perfect. Neither firms nor shareholders can always obtain outside financing for projects with positive net present value.

repurchases. I will then explain that other components of executives' pay packages fail to mitigate this distortion.

1. Price-Boosting, Value-Wasting Repurchases

As we will now see, a value-wasting repurchase can increase the stock price if the stock is repurchased at a sufficient discount. Thus, executives whose pay is tied to the stock price may have an incentive to engage in bargain repurchases that reduce aggregate shareholder value.

Let us return to the example of ABC Corporation.³³ Recall that ABC has 2 shares outstanding. Suppose that, as before, ABC's sale value absent a repurchase is \$20. Thus, in the absence of a repurchase, aggregate shareholder value is \$20 and the sale-date stock price would be \$10.

Suppose that ABC's managers are considering repurchasing 1 share before the sale-date (in the "short-term") when ABC's shares are trading at \$8 per share, \$2 less than their actual value. Because ABC starts with 2 shares, this repurchase would leave 1 share outstanding. Finally, suppose that the repurchase would destroy \$1 of aggregate shareholder value by making it difficult for ABC to exploit valuable opportunities.

If there is a repurchase of 1 share in the short-term when the stock is trading for \$8 per share, \$8 will be distributed to shareholders in the repurchase. The distribution of \$8 of cash, plus the loss of \$1 value, will reduce ABC's value from \$20 to \$11. Thus, aggregate shareholder value in the event of a repurchase will be \$19 (\$8 distributed in the short-term during the repurchase plus \$11 distributed in the long-term). When ABC is liquidated after the repurchase, there will be 1 share outstanding. The sale-date stock price will thus be \$11 per share.

The effect of the repurchase on aggregate shareholder value and the stock price can be summarized in the following table:

	Aggregate Value	Stock Price
No Repurchase	\$20	\$10
Repurchase	\$19	\$11

³³ See Part II *supra*.

As one can see, the repurchase both boosts the stock price and reduces aggregate shareholder value. Thus, tying the executive's payoff to the stock price can induce her to repurchase shares even when the transaction destroys aggregate shareholder value.

The problem is that paying the executive based on the stock price aligns her interest with shareholders holding their shares but not with shareholders selling their stock back to the firm. Thus, the executive has an incentive to take steps that transfer value from selling shareholders to remaining shareholders even when those steps destroy aggregate shareholder value.³⁴

2. Do Other Pay Components Mitigate?

We just saw that an executive whose pay is tied to the future stock price may have an incentive to engage in repurchases that reduce aggregate shareholder value. In the real world, of course, equity would not be the executive's only form of compensation. The executive would also be paid a cash salary and, typically, stock that can be sold in the short-term. One might think that having stock that can be sold in the short-term would tie the executive's payout to that of short-term shareholders, including the shareholders selling stock back to the corporation when the firm conducts a repurchase.

However, the fact that executives *can* sell stock in the short term does not mean that they *will* sell stock in the short term. And when executives know that the stock is underpriced and conduct a repurchase in order to indirectly buy stock at a low price, they can be expected to hold onto their personal shares until the stock price rises. In fact, they buy more shares for their personal accounts before and during bargain repurchases.³⁵ Thus, other components of executives' compensation arrangements will not mitigate the incentives created by long-term stock holdings to engage in value-wasting repurchases.

³⁴ A more detailed numerical example can be found in Fried, *Informed Trading*, supra note x, at 1368-69. There is evidence consistent with at least some repurchases distributing cash that is better invested inside the firm. See Fried, *Informed Trading*, supra note x, at 1369. The use of repurchases to buy stock at a low price can lead to several other types of distortions that reduce aggregate shareholder. See Fried, *Informed Trading*, supra note x, at 1364-1370.

³⁵ See Elias Raad and H.K. Wu, *Insider Trading Effect on Stock Returns Around Open-Market Stock Repurchase Announcements: An Empirical Study*, 18 *J. Fin. Res.* 45, 57 (1995).

IV. SHAREHOLDER VALUE AND STOCK PRICES IN A STOCK-ISSUING FIRM

We saw in Part III that tying executives' pay to the future stock price may give executives an incentive, when the stock is underpriced, to conduct a repurchase even though the repurchase reduces aggregate shareholder value. We will now see that, when the stock is overpriced, an executive whose payoff is tied to the future stock price may have an incentive to sell equity to shareholders even though the investment enabled by the equity sale reduces aggregate shareholder value.

Section A discusses the purpose and effects of equity issuances by firms. It explains that firms often issue equity to finance expansion or fund operations. It also describes evidence that executives are more likely to have their firms sell equity when it is overpriced.

Section B explains that the sale of overpriced stock can increase the future stock price even if the investment facilitated by the sale does not increase aggregate shareholder value. Thus, as when the firm repurchases equity, the issuance of new equity severs the link between aggregate shareholder value and the future stock price.

Section C explains that the sale of equity can either increase or reduce aggregate shareholder value. It can increase aggregate shareholder value if the funds received from shareholders will generate higher returns inside the firm than outside the firm. It can reduce aggregate shareholder value if the funds received from shareholders will generate lower returns inside the firm than outside the firm.

Section D then shows how tying an executive's pay to the long-term stock price may induce the executive to sell equity to shareholders when the stock is overpriced even though the investment facilitated by the sale reduces aggregate shareholder value. It also shows that other components of the executive's pay package are unlikely to mitigate this distortion.

A. The Use and Distributional Effects of Equity Issuances

Publicly-traded firms sell hundreds of billions of shares to investors each year, and often do so when the stock is overpriced.

1. The Use of Equity Issuances

After undergoing an IPO, most publicly-traded firms continue to issue shares throughout their life.³⁶ These shares are issued to employees as part of stock-option compensation plans,³⁷ to raise capital for operations and strategic investments, and pursuant to acquisitions in which the acquirer stock is used as consideration for the target company's stock or assets. Although each type of equity issuance has its own purpose, all enable the firm to use less of its own cash.³⁸

While the magnitude of stock issuances is not as great as that of share repurchases, it is still substantial. Firms issue hundreds of billions of dollars of stock each year to new investors, including shareholders of target firms that are acquired via payment of acquirer stock.³⁹

2. Distributional Effects of Equity Issuances

As I explained in Part III, a share repurchase is economically equivalent to a two-part transaction in which: (1) first, continuing shareholders personally buy shares from selling shareholders at the repurchase price; and (2) second, the firm issues a dividend to the continuing shareholders.⁴⁰ The second part of the transaction (the pro

³⁶ See Eugene F. Fama and Kenneth R. French, Financing Decisions: Who Issues Stock?, *J. Fin. Econ.* (2005) (reporting that 86% of the firms in their sample issued stock between 1992-2003).

³⁷ Most publicly companies issue shares to give executives and lower level employees either restricted stock or stock options as part of their compensation packages. Among the largest 200 firms in 2007, the range of shares allocated to equity compensation plans ranged from .02% of outstanding shares to 62.6% of outstanding shares, with the median around 10.5%. Pearl Meyer's 2008 Equity Stake Study, p.2.

³⁸ For example, equity compensation in part substitutes for cash compensation: the more equity compensation an employee receives, the less the firm has to pay in cash. Thus, the greater the value of the restricted stock (or stock options) given to employees, the less the firm must pay in cash.

³⁹ In May 2009 alone, there was almost \$70 billion of stock issued by already-public companies. See Jeff Benjamin, Equity issues Hitting Market at Record Pace, *Investment News* (June 29, 2009) available at <http://www.investmentnews.com/article/20090628/REG/306289977>.

⁴⁰ See *supra* Part III.A.

rata dividend) has no distributional consequences. But the first one does: a share repurchase transfers value from selling shareholders to continuing shareholders when the stock is underpriced.

Similarly, an equity offering is economically equivalent to a two-part transaction in which: (1) first, continuing shareholders (long-term shareholders) personally sell shares to the new investors (future shareholders) at the offering price; and (2) second, all shareholders (current and future shareholders) buy stock from the firm pro rata at the offering price. The second part of the transaction, which is the reverse of a dividend, has no distributional consequences, but the first one does. An equity offering transfers value from future shareholders (new investors) to current shareholders when the offering price exceeds the value of the stock.⁴¹

Indeed, there is evidence that firms conduct equity offerings when the stock is overpriced, particularly for the purpose of buying other firms' assets at a discount.⁴² There is also evidence that executives manipulate the stock price up around equity offerings to increase the amount transferred from new investors,⁴³ especially when the stock is being used to acquire another company.⁴⁴

⁴¹ See Andrei Shleifer and Robert W. Vishny, *Stock Market Driven Acquisitions*, 70 *J. Fin. Econ.* 295 (2003) (proposing that overvalued firms engage in stock-financed acquisitions in order to obtain hard assets at a discount); Matthew Rhodes-Kropf and S. Viswanathan, *Market Valuation and Merger Waves*, 59 *J. Fin.* 2685 (2004) (similar).

⁴² See Pavel G. Savor & Qi Lu, *Do Stock Mergers Create Value for Acquirers?* (August 20, 2008) (working paper) available at <http://ssrn.com/abstract=881513>, at 3 (finding that a sample of stock-financed acquirers that complete their acquisition outperform a control sample of stock-finance acquirers that fail to complete their acquisition by 25-30% over a three year horizon). M. Dong, David Hirshleifer, and S.H. Teoh, *Do Overvalued Firms Raise More Capital* (working paper, 2007). Ming Dong, David Hirshleifer, and Siew Hong Teoh, *Stock Market Misvaluation and Corporate Investment* (working paper, 2007) (finding that misvaluation leads to increased investment in overvalued firms issuing equity). See also Daniel Bradley, Brandon Cline, and Qin Lian, *DO Insiders Practice What they Preach? Informed Option Exercises Around Acquisitions* (working paper, 2009) (finding that, around the announcement of stock-financed acquisitions, insiders of the acquiring firm exercise stock options and sell the underlying shares, which is consistent with the acquirer stock being over-priced).

⁴³ See S. Teoh, Ivo Welch, and T.J Wong, *Earnings Management and the Underperformance of Seasoned Equity Offerings*, 50 *J. Fin. Econ.* 1935 (1998).

⁴⁴ See Merle Erickson & Shiing-Wu Wang, *Earnings Management by Acquiring Firms in Stock for Stock Mergers*, 27 *J. ACCT. & ECON.* 149 (1999); Henock Louis, *Earnings Management and the Market Performance of Acquiring*

B. The Disconnect Between Aggregate Shareholder Value and Stock Price

In Part II, we saw that in a simple firm there is a tight link between aggregate shareholder value and the future stock price. The only way to increase the future stock price is to increase aggregate shareholder value. And any step that reduces aggregate shareholder value reduces the future stock price.

In Part III we saw that, in a firm that repurchases its shares the link between aggregate shareholder value and the future stock price is severed. When executives use repurchases to buy back cheap stock, they can boost the future stock price even if the repurchase does not increase aggregate shareholder value.

We will now see that the link between aggregate shareholder value and the future stock price is also severed in a firm that issues new stock. When executives sell overpriced stock, they can boost the future stock price even if the investment facilitated by the sale does not increase aggregate shareholder value.

Consider again ABC Corporation that now has 2 shares outstanding and, if there is no transactions in its equity, would distribute \$20 to its shareholders upon liquidation at date D. Assume that in the short-term, between now and a future date D, ABC sells 1 share for a price of \$13 per share and that no value is created or destroyed as a result of the sale.⁴⁵ Thus, at date D when ABC is liquidated, the parties then holding 3 ABC's shares receive a total of \$33.

What is ABC's aggregate shareholder value? It is simply the amount that ABC distributes at date D, \$33, less the amount received from shareholders in the short-term, \$13. ABC's aggregate shareholder value is thus again \$20.⁴⁶

Firms, 74 J. FIN. ECON. 121 (2004); Bok Baik, Jun-Koo Kang, and Richard Morton, *Earnings Management in Takeovers of Privately Held Targets* (2007) (working paper) available at <http://ssrn.com/abstract=1013639>; Antonia Botsari & Geoff Meeks, *Do Acquirers Manage Earnings Prior to Share for Share Bid?*, 35 J. BUS. FIN. & ACCT. 633 (2008); Guojin Gong, Henock Louis & Amy Sun, *Earnings Management, Lawsuits, and Stock-for-Stock Acquirer's Market Performance*, 46 J. ACCT. & ECON. 62 (2008).

⁴⁵ For simplicity, I continue to assume that ABC also does not issue any dividends.

⁴⁶ I ignore the time value of money (or alternatively, assume it is zero). This assumption, made purely for convenience, does not affect the analysis.

But now consider ABC's stock price at date D. At date D, the stock price is ABC's value (\$33) divided by the number of shares outstanding (3). Thus, ABC's stock price is \$11. Although aggregate shareholder value has not increased, ABC's stock price has gone up because equity was issued at a high price before date D.

It should be easy to see that, if ABC issues stock in the short-term, ABC's stock price at date D will not always reflect aggregate shareholder value. A 10% increase in aggregate shareholder value does not always lead to a 10% increase in the stock price. Conversely, ABC's managers can boost the stock price without increasing in aggregate shareholder value – simply by issuing stock at a high price.

C. Equity Issuances' Potential Adverse Effect on Value

Disconnecting stock price and aggregate shareholder value would not be problematic in a world where equity issuances could not reduce aggregate shareholder value. However, equity issuances, like share repurchases, can reduce aggregate shareholder value. And, as we will see in Section D, an equity issuance, like a share repurchase, can boost the stock price even if it is value-wasting.

Recall that an equity offering is economically equivalent to a two-part transaction in which: (1) first, current non-purchasing shareholders personally sell shares to the new investors at the offering price; and (2) second, all shareholders buy stock from the firm pro rata at the offering price. The second part of the transaction, which is the reverse of a dividend, transfers cash from shareholders to the firm. It can reduce aggregate shareholder value if the firm could make better use of the cash than shareholders. Suppose, for example, that a dollar would generate a return of 5% in the firm and 10% outside the firm. Transferring a dollar from shareholders to the firm makes shareholders as a group worse off by \$0.05 (\$0.15 - \$0.10).⁴⁷

Of course, equity issuances could also increase aggregate shareholder value. Suppose, for example, that a dollar would generate 15% in the firm and 10% outside the firm. Then moving the dollar

⁴⁷ In a world of perfect capital markets, of course, there would be no need to sacrifice the 15% project to fund the repurchase. Corporations would obtain financing for any project with a positive net present value. Thus, a firm's ability to invest in desirable projects would not depend on having cash on hand. However, capital markets are not perfect. Neither firms nor shareholders can always obtain outside financing for projects with positive net present value.

from shareholders to the firm makes shareholders as a group better off, not worse off.

Thus, I am thus not claiming that equity issuances always reduce aggregate shareholder value. Rather, my point is that they can reduce aggregate shareholder value if the cash taken from shareholders would generate higher returns outside the firm than inside the firm. And, as we will now see, an executive whose payoff is tied to the future stock price may, when the stock is sufficiently overpriced, have an incentive to engage in value-wasting equity issuances.

D. Executives' Distorted Equity-Issuance Decisions

Having seen that executives can have the firm sell overpriced stock, and that such sales of overpriced stock might not maximize long-term shareholder value, I will now show that executives paid on the basis of the long-term stock price may have an incentive to engage in value-wasting equity-financed expansion. I will then explain that other components of executives' pay packages do not mitigate this distortion.

1. Price-Boosting, Value-Wasting Expansion

Equity-financed expansion can increase the future stock price even if value is destroyed, as long as the equity is sold at a sufficiently high price. Thus, executives whose pay is tied to the future stock price may have an incentive to engage in an equity issuance that reduces aggregate shareholder value.

Return to our example involving ABC Corporation. Recall that ABC has 2 shares outstanding and, absent any transactions in its stock, has a sale value of \$20. Thus, in the absence of an equity offering, the sale-date stock price would be \$10.

Suppose that ABC's managers are considering selling another 1 share in the short-term, when the stock is trading at \$14 per share. The amount raised will be used to expand ABC. There would accordingly be 3 shares outstanding at the sale-date. Finally, suppose that the expansion financed by the stock issuance would destroy \$1 of aggregate shareholder value.

If ABC's executives expand the firm via an equity offering, \$14 will be raised from shareholders in the offering. When ABC is liquidated, its sale-date value will be the no-transaction value (\$20) increased by the proceeds of the equity issuance (\$14) and reduced by

the amount of value destroyed (\$1), or \$33. ABC's long-term stock price will be \$11 per share. ABC's aggregate shareholder value will be ABC's long-term value (\$33) less the amount raised from new shareholders in the short-term (\$14), or \$19.

The net effect of the equity sale on aggregate shareholder value and the stock price can be summarized in the following table:

	Aggregate Value	Stock Price
No Sale	\$20	\$10
Sale	\$19	\$11

As one can see, the equity sale boosts the stock price. Although the equity sale destroys \$1 of value, it also transfers \$4 of value to ABC, thus increasing ABC's value by a net \$3, or \$1 per share. Thus, tying the executive's payoff to the stock price can induce her to direct the firm to sell shares even when the transaction destroys aggregate shareholder value.

The problem is that paying the executive based on the future stock price aligns her interest with non-trading shareholders but not with shareholders who buy additional stock from the firm. Thus, the executive has an incentive to take steps that transfer value from buying shareholders to non-trading shareholders even when they would destroy aggregate shareholder value.

A well-known example of an overpriced equity offering that destroyed value is America Online's (AOL) stock-financed acquisition of Time Warner. Despite the fact that AOL paid a high premium for Time Warner (48% based on the announcement day closing price), and at this point there appear to have been no synergy gains, AOL's current shareholders are believed to have benefited because AOL's equity was so overpriced at the time.⁴⁸ Apparently, the "discount" for Time Warner exceeded the value destroyed by the transaction.

2 .Do Other Pay Components Mitigate?

⁴⁸ See Pavel G. Savor and Qi Lu, Do Stock Mergers Create Value for Acquirers? (working paper, ___), at 1. Combining AOL and Time Warner proved so unsuccessful that Time Warner eventually decided to spin off AOL. See Richard Perez-Pena, Time Warner Board Backs AOL Spinoff, New York Times (May 28, 2009), available at http://www.nytimes.com/2009/05/29/business/media/29warner.html?_r=1.

As we have seen, an executive paid on the basis of the future stock price will have an incentive to engage in value-wasting equity-financed expansion when the stock is overpriced. However, equity would not be the executive's only form of compensation. The executive would also be paid a cash salary and bonus and, typically, stock that can be sold now (and whose value may thus be a function of the current stock price). Thus one might think that these other forms of compensation might mitigate the adverse incentives created by tying some of the executives' pay to the future stock price.

But none of these other components of the executive's pay package would dilute the executive's incentive to engage in cheap empire building when the stock is overpriced. The executive's salary will not be reduced if the executive engages in such empire building. Indeed, given the well-known correlation between market capitalization and executive pay, the executive's salary and other forms of compensation may well be increased.⁴⁹ And to the extent the executive owns stock that can be sold in the short-term, when the stock price is high, the sale of additional equity by the firm will not prevent her from unloading her stock at a high price. Indeed, there is evidence that executives whose firms are selling overpriced stock simultaneously unload their own shares.⁵⁰ In short, the perverse incentives caused by tying executives' pay to the future stock price are not mitigated by other components of executives' pay packages.

⁴⁹ See Bebchuk and Grinstein (2005).

⁵⁰ See Daniel Bradley, Brandon Cline, and Qin Lian, *Do Insiders Practice What they Preach? Informed Option Exercises Around Acquisitions* (working paper, 2009) (finding that, around the announcement of stock-financed acquisitions, insiders of the acquiring firm exercise stock options and sell the underlying shares, which is consistent with the acquirer stock being over-priced).

V. CONSTANT-SHARE APPROACH TO EQUITY-BASED PAY

We saw in Parts III and IV that tying executives' pay to the future stock price can encourage executives to engage in stock repurchases and stock sales that transfer value from trading shareholders to non-trading shareholders in ways that destroy aggregate shareholder value: the net amount flowing to all shareholders over time.

In this Part, I put forward a new approach to equity-based pay that eliminates these distorted incentives. Under this approach, executives would be required to sell shares whenever the firm buys shares and buy shares whenever the firm sells shares. In particular, executives would be required to adjust their equity holdings as the firm repurchases and issues shares so as to maintain a constant share of the firm's outstanding equity through each transaction. I show that this "constant-share" approach in fact eliminates executives' incentives to engage in value-wasting repurchases and stock issuances and thereby better aligns executives' wealth with aggregate shareholder value.

Section A describes the mechanics of the constant-share approach. Section B shows how the constant-share approach would deter executives from engaging in value-wasting repurchases, but not discourage them from engaging in value-increasing repurchases. Section C explains how the constant-share approach would deter executives from engaging in cheap empire building but not discourage them from engaging in value-increasing equity-financed expansion. Section D explains that the constant-share approach could be easily implemented, even in firms that repurchase and issue stock on a frequent basis.

A. The Constant-Share Approach

We have seen that tying an executive's pay to the stock price, even the long-term stock price, does not actually link her compensation to aggregate shareholder value: the net amount flowing to the firm's shareholders over time. The reason is that while the stock price on a particular date reflects the firm value available to the shareholders on that date, it does not reflect the value that has already been distributed through repurchases or the amounts paid to the firm by shareholders buying stock from the firm before that date. Tying an executive's pay to aggregate shareholder value requires linking her payoff to the net payoffs of all the firm's shareholders.

The constant-share approach I put forward would tie executive pay to the payoffs for all the firm's shareholders. Under the constant-share approach, executives would be required to adjust their equity positions whenever the firm repurchases or issues shares so that executives' fractional ownership in the firm remains constant through the transaction.⁵¹ The executive would be required to transact on the same terms as the firm transacts with its own investors. Thus, the executive must sell some shares when the firm repurchases shares, at the repurchase price, and must buy shares when the firm sells shares, at the issuance price.⁵²

For example, suppose that an executive ("CEO") holds a certain fraction of the firm's equity at a particular point in time (say 2%). If the firm repurchases 1,000,000 shares, CEO would be required to sell to the firm, at the same price the firm was paying for the repurchased shares, 20,000 shares (2% of one million shares). Alternatively if the firm issues 1,000,000 new shares in a secondary offering, CEO would be required to buy, at the same prices the firm was receiving for the new stock, 20,000 of the 1 million shares. The effect of CEO's transactions would be to leave CEO with the same fraction of the firm's outstanding shares after the repurchase or share issuance: in this case, 2%.

Importantly, CEO's transactions could be effected without the purchase or sale of actual shares. For example, if CEO owns 2% of the firm's shares and the firm repurchases 1,000,000 shares, CEO could enter into an agreement with the firm to swap, at some point in the future, the then-current value of 20,000 of her shares to the firm for their value at the time of the repurchase price plus an amount accounting for the time value of the money (such as interest or the change in the value of an investment index). Similarly, if the firm issues 1,000,000 new shares, CEO could be required to swap, at some point in the future, the value of 20,000 shares at the issuance price plus interest (or something analogous) for the then-current value of the shares. However, for ease of exposition, I will describe the mechanism as one in which actual shares are purchased or sold by the executive.

As I will explain in more detail in Sections B and C, the intuition behind the constant-share approach is simple: by requiring

⁵¹ In calculating executives' pre-transaction ownership interest, one would need to include all of the executives' equity and equity-like incentives.

⁵² The proceeds of any sale of shares back to the firm should be held in an escrow account until the executive's equity is cashed out. Similarly, any equity purchased by the executive should be held, ideally for the long-term.

the executive to participate in repurchases as a selling shareholder and in equity issuances as a buying shareholder in the same proportion as she owns stock in the company, the executive does not financially benefit from repurchases and stock issuances when they only transfer wealth from one set of shareholders to another, without generating any value. As a result, the executive has an incentive to engage in such transactions – repurchases and equity issuances – only if they increase aggregate shareholder value: the value flowing to all shareholders of the firm over time.

B. Constant-Share Approach in a Repurchasing Firm

Let us consider in more detail how the constant-share approach would operate in the context of a repurchase. As we will see, the constant-share approach prevents an executive holding stock from profiting from bargain repurchases. This, in turn, eliminates the executive's incentive to engage in a repurchase merely because it transfers value from selling shareholders. However, as I will explain, it does not eliminate the executive's incentive to engage in any repurchase that actually increases aggregate shareholder value.

1. Eliminating the Distributional Incentive for Repurchases

The constant-share approach eliminates executives' distributional incentives to conduct share repurchases. To see why this is the case, suppose that an executive (CEO), at the time of a possible repurchase, owns 10% of the firm's stock. Suppose that the firm is considering purchasing 20% of the outstanding stock at the current trading price, which is less than the shares' value.

As I explained earlier, a share repurchase has the same distributional effects as a transaction in which non-selling shareholders directly purchase shares from selling shareholders at the repurchase price and then receive a dividend.⁵³ Absent the constant-share approach, the bargain repurchase would transfer value from selling shareholders to CEO. The executive, who owns 10% of the firm's stock before the repurchase, would own 12.5% after the repurchase.⁵⁴ Thus, the executive would capture 12.5% of the value

⁵³ See Part III.A.1 *supra*.

⁵⁴ Because the firm is repurchasing 20% of its stock, the proportional interest of each remaining shareholder, including the executive, will increase by 25%.

transferred from selling shareholders to non-selling shareholders as result of the bargain repurchase.

Under the constant-share approach, CEO would be required to participate in the 20% repurchase in an amount proportionate to her pre-transaction ownership interest of the firm (10%). Thus, shares sold by CEO to the firm would constitute 10% of the 20% block acquired by the firm (or 2% of the firm's outstanding stock). Another way to put it: because the firm is repurchasing 20% of all its shares, the executive would be required to sell to the firm 20% of her 10% interest during the repurchase. After the repurchase, CEO would continue to own 10% of the firm's equity.

The constant-share approach ensures that CEO does not profit from the repurchase of cheap stock. Because CEO would own 10% of the firm's equity after the repurchase, she will capture, through those shares, 10% of the value transferred from selling shareholders to nonselling shareholders. But, because CEO makes up 10% of the group of selling shareholders, she loses 10% of the value transferred from selling shareholders to non-selling shareholders. For the executive, it is a wash: her gain as a non-selling shareholder is precisely offset by her loss as a selling shareholder.⁵⁵

2. Incentivizing Desirable Repurchases

If an executive cannot benefit from a bargain repurchase, she will not have an incentive to conduct such a repurchase merely to transfer value from selling shareholders to long-term shareholders. More importantly, if the repurchase would destroy aggregate shareholder value, the constant-share approach will ensure that the executive loses money on the transaction: the executive's gain as a

⁵⁵ Suppose, for example, that ABC's equity is worth \$100 but is trading for \$60. ABC is contemplating a repurchase of 20% of the equity. Such a repurchase would transfer \$8 (20% x \$40) to remaining shareholders from selling shareholders. If CEO owns 10% of ABC's equity prior to the repurchase, CEO will own 12.5% of ABC's equity post-repurchase. CEO will thus capture \$1 (12.5% of \$8) of the value transferred to remaining shareholders from selling shareholders.

Now consider CEO's position under the constant-share approach. If CEO must sell 10% of her holdings in the repurchase (or 2% of ABC's outstanding shares), CEO will lose \$0.80 in the sale (2% x \$40) and be left with 10% of the ABC's post-repurchase equity. Holding 10% of ABC's post-repurchase equity will allow CEO to capture 10% of the \$8 transferred from selling shareholders to non-selling shareholders, or \$0.80, precisely the amount CEO loses on the sale. CEO thus does not personally benefit from the bargain repurchase. The model in the Appendix provides a more general illustration of this point.

nonselling shareholder will be less than her loss as a selling shareholder.⁵⁶

However, if the repurchase would *increase* aggregate shareholder value, the constant-share approach would not deter an executive from conducting the repurchase. The benefit to the executive as a long-term shareholder would exceed the cost to her as a selling shareholder. By eliminating inter-shareholder distributional effects on the executive from the decision to repurchase shares, the constant-share approach ensures that the executive will benefit from a repurchase if and only if it increases aggregate shareholder value.⁵⁷

3. Overpriced Repurchases?

The constant-share approach would immunize the executive from the effects of buying overpriced stock by allowing her to sell an offsetting amount of stock at the repurchase price. One might be concerned that the constant-share approach will lead an executive to repurchase overpriced stock when the repurchase would be value-increasing, hurting shareholders who hold their stock.

However, an executive of a firm with overpriced stock could simply choose to distribute cash via a dividend, which has no distributional effects on shareholders and is often a more efficient means of distributing cash than a share repurchase.⁵⁸ Thus, the

⁵⁶ Continuing with the example in the previous footnote, suppose that CEO owns 10% of ABC's equity, which is worth \$100, and thus has a value of \$10. The market currently values ABC's equity at \$60. ABC could repurchase 20% of its shares, but the repurchase would (everything else equal) destroy \$5 of ABC's value. Repurchase of 20% of ABC's shares would reduce ABC's value by another \$12 (20% x \$60), resulting in a post-repurchase value of \$83.

The repurchase transfers \$8 to ABC's non-selling shareholders, but destroys \$5 of value, generating a net benefit for non-selling shareholders of \$3. If CEO's payoff were tied to the stock price, she would benefit from the repurchase by \$0.375 (12.5% x \$3), even though the repurchase destroys aggregate shareholder value.

Under the constant-share approach, CEO would be required to sell 20% of her 10% interest, or 2% of ABC's outstanding equity. CEO would then hold stock worth \$8.30 and \$1.20 in cash. Because she starts with stock worth \$10 and ends with \$9.50, she loses \$0.50, which is her proportional share (10%) of the value destroyed by the transaction. Forcing CEO to internalize the destruction of value would deter her from engaging in any value-wasting repurchases. The model in the Appendix provides a more general illustration of this point.

⁵⁷ See Appendix for a model illustrating this point.

⁵⁸ See Fried, *Informed Trading*, *supra* note x, at 1369-1370.

constant-share approach is unlikely to make current shareholders worse off in any situation where the firm ends up distributing cash.

In any event, from an economic perspective, executives should engage in a value-increasing repurchase when the stock is overpriced if that is the only way to distribute the cash, even if some shareholders are made worse off. Currently, executives lack sufficient incentive to engage in repurchases that increase value when the stock is overpriced. Thus, there are too few of such value-increasing equity offerings when managers know the stock is cheap. To the extent the constant-share approach leads to more of these offers, it will induce executives to conduct transactions that make shareholders as a group better off

C. Constant-Share Approach in a Stock-Issuing Firm

Let us consider how the constant-share approach would operate in the context of a stock issuance. As we will see, the constant-share approach prevents an executive holding stock from profiting from the sale of overpriced equity. This, in turn, eliminates the executive's incentive to engage in cheap empire building via the sale of overpriced equity. However, the constant-share approach does not eliminate the executive's incentive to engage in value-increasing equity-financed expansion.

1. Eliminating Distributional Motives for Equity Issuances

Just as the constant-share approach eliminates executives' distributional incentives to conduct share repurchases, it eliminates their incentive to conduct equity issuances merely because the stock is overpriced. Suppose again that an executive (CEO), at the time of a possible equity issuance, owns 10% of the firm's stock. Suppose that the firm is considering issuing new equity equal to 25% of the firm's outstanding stock at the current trading price, which is more than the shares' long-term value.

As I explained earlier, an equity issuance has the same distributional effects as a transaction in which new investors (future shareholders) directly purchase shares from current shareholders at the issuance price.⁵⁹ Absent the constant-share approach, the sale of overpriced equity would transfer value from future shareholders to

⁵⁹ See *supra* Part III.B.1.

CEO. CEO, who owns 10% of the firm's stock before the equity issuance, would own 8% after the transaction⁶⁰ and therefore would capture 8% of the value transferred from future shareholders to current shareholders.

Under the constant-share approach, CEO would be required to buy 10% of the shares sold by the firm. Because the firm is selling an amount of shares equal to 25% of the amount of its pre-sale equity, CEO would be required to buy 2.5% of the pre-sale equity. Another way to put it is that CEO would be required to increase her 10% stock ownership by 25%, the proportion by which the equity offering increases the firm's shares. After the equity issuance, CEO would continue to own 10% of the firm's equity.

The constant-share approach would ensure that CEO does not profit from the sale of overpriced stock. Because CEO would own 10% of the firm's equity after the sale, she will capture, through those shares, 10% of the value transferred from future shareholders buying the stock at a high price. But, because CEO herself makes up 10% of the group of buying shareholders, she loses 10% of the value transferred from future shareholders to current shareholders. Again, it is a wash for CEO.⁶¹

2. Preserving Desirable Incentives for Equity Issuances

If an executive cannot benefit from the sale of equity merely because it is overpriced, she will not have an incentive to conduct such a sale merely to transfer value from new investors to current shareholders. More importantly, if the sale of overpriced equity would destroy aggregate shareholder value, the constant-share

⁶⁰ Because the firm is issuing an amount of equity equal to 25% of its pre-transaction outstanding shares, the proportional interest of each remaining shareholder, including the executive, will drop by 20%.

⁶¹ Suppose, for example, that ABC's equity is worth \$100 but is trading for \$200. ABC is contemplating a sale of stock equal to 25% of its outstanding equity for \$50. If ABC is currently worth \$100, it will be worth \$150 after the sale. The new investors will thus pay \$50 for an equity interest worth \$30 (20% of \$150). Current long-term shareholders will thus capture \$20 of value, of which CEO will capture 10%, or \$2. CEO's proportional ownership of ABC will drop from 10% to 8%.

Now consider CEO's position under the constant-share approach. She will still gain \$2 on her existing shares. But if CEO must buy 10% of the offering, she will lose \$2 on those shares (10% of \$20). CEO thus does not personally benefit from the sale of overpriced equity.

approach ensures that the executive loses money on the transaction: the executive will gain less as a current shareholder than she loses as a buying shareholder.⁶²

On the other hand, if the sale of overpriced equity would *increase* aggregate shareholder value, the constant-share approach would not deter an executive from conducting the equity offering. The benefit to the executive as a current shareholder would exceed the cost to her as a future shareholder. By eliminating inter-shareholder distributional effects on the executive from the decision to issue shares, the constant-share approach ensures that the executive will benefit from an equity offering if and only if it increases aggregate shareholder value.⁶³

3. The Sale of Underpriced Stock?

One might be concerned that, under the constant-share approach, an executive will try to conduct a value-increasing equity offering when the stock is *underpriced*, hurting current shareholders.

⁶² Continuing with the example in the previous footnote, suppose that CEO owns 10% of ABC's equity, which is worth \$100, but trading at a market valuation of \$200. CEO's equity is worth \$10 if there is no equity issuance and she holds her stock until the market valuation reflects ABC's actual value. ABC could issue an additional 25% of its shares for \$50 to finance an expansion, but the expansion would only increase ABC's (real) value by \$40 because it would destroy \$10 of value. Thus, current shareholders will end up with 80% of a firm worth \$140, or \$112, and be \$12 better off than if the firm does not conduct the sale. New investors will have paid \$50 for an interest in ABC worth \$28, and thus lose \$22. The difference between the gain to current shareholders and the loss to new investors is the value destroyed through the transaction.

If CEO's payoff is tied to the stock price, she will favor the equity-financed expansion. Without the expansion, ABC is worth \$100, and her 10% interest is thus worth \$10 if she cashes them in for their actual value. With the expansion, ABC will own 8% of a firm worth \$140, so her shares will be worth \$11.20. Thus CEO is \$1.20 better off as a result of the expansion.

Under the constant-share approach, CEO would be required to buy 10% of the \$50 issuance of 25% of ABC's equity. She would thus be required to pay \$5 for new stock. This new stock will constitute 2% of ABC's outstanding shares, and thus be worth \$2.80 (2% x \$140). CEO would thus suffer a loss equal to \$2.20 on the newly purchased stock. As we just saw, the gain on her existing shares will be \$1.20. The difference -- \$1.00 -- represents the executive's proportional share (10%) of the \$10 value wasted by the transaction. The constant-share approach would thus deter executives from engaging in any value-wasting equity issuance. The model in the Appendix provides a more general illustration of this point.

⁶³ See the Appendix for a model illustrating this point.

Ordinarily, executives do not have an incentive to issue shares when the stock is underpriced because such a transaction would reduce the value of their shares. But the constant-share approach ensures that, in a value-increasing equity offering, the executives' losses as a current shareholder would be less than the gains from her direct purchase of bargain-price stock. Thus, the executive's interests will diverge from that of current shareholders and might lead her to try to conduct a value-increasing equity offering that she would otherwise not pursue.

However, it is far from clear that, upon adoption of the constant-share approach, firms would engage in more offerings of underpriced equity. If current shareholders believe that the stock is underpriced and that they will suffer as a result of an equity offering, they could typically use their shareholder rights under the stock exchange rules or corporate law to block the transaction. For example, stock exchange rules require approval of any stock issuance that would increase the number of outstanding shares by more than 20%.⁶⁴ And if the transaction involves a merger of the firm, corporate law would separately require approval by a majority of a firm's shareholders.⁶⁵ Thus, offerings of underpriced equity would only proceed in situations where current shareholders believed they would benefit from the transactions. Knowing that shareholders might block the equity sale, executives are likely to turn first to retained earnings or the debt market to finance the expansion.

In any event, from an economic perspective, executives *should* engage in a value-increasing equity-financed expansion when the stock is underpriced if that is the only way to finance the expansion, even if current shareholders are made worse off. Currently, executives lack sufficient incentive to engage in equity-financed expansions that increase value when the stock is underpriced. Thus, there are too few of such value-increasing equity offerings when managers know the stock is cheap. To the extent the constant-share approach leads to more of these offers, it will induce executives to conduct transactions that make shareholders as a group better off.

D. Transaction Costs

⁶⁴ See NYSE Rule 312.03(c) and Nasdaq Rule 4350(i)(1)(D) (Requiring shareholder approval for issuance of 20% or more).

⁶⁵ See, e.g., Del. Gen. Corp. Law § 251(c).

This Section considers the transaction costs associated with the constant-share approach. Could such a scheme be put in place at low cost? The answer is “yes:” the constant-share approach can easily be implemented even if a firm conducts hundreds of transactions in its own equity each year.

The constant-share approach, if it were to be implemented in the way I have been describing it, would require that an executive sell shares every time the firm repurchases shares and buy shares every time the firm issues equity. Share repurchases and equity issuances are quite common. For example, a firm may enter a share repurchase program where it buys stock almost every week over a period of months or years.⁶⁶ Thus implementation of this approach every time the firm engages in a stock transaction would require the executive to frequently rebalance her holdings. This frequent rebalancing would, in turn, give rise to transaction costs.

Fortunately, there is a very simple method of implementing the constant-share approach. The firm could track its repurchases and equity offerings each year (which it should already be doing) and then, at the end of the year, require the executive to engage in a single transaction with the firm that rebalances her equity positions. For example, suppose a firm repurchases 3% of its stock at an average price of \$100 in January-July, and sells 1% of its stock for an average price of \$110 in August-December. On December 31st, the executive could be required to sell 3% of her stock to the firm for \$100, and then buy an amount of stock equal to 1% of her remaining stock from the firm at \$110 per share.⁶⁷ The purchases and sales could be netted so there is one transaction in which the executive buys (sells) a certain number of shares for a certain amount of money.⁶⁸

⁶⁶ See Fried, *Informed Trading*, *supra* note x, at 1335.

⁶⁷ Because the firm will end up repurchasing slightly more than 3% of its stock after the end-of-year adjustment, the actual amount of stock the executive must sell back to the firm for \$100 per share is slightly greater than 3%. In particular, if a firm repurchases 3% of its stock while an executive owns 2% of the stock, after the repurchase the executive would be required to sell 3/98 of her stock back to the company to maintain her 2% ownership. Similarly, the executive would be required to buy slightly more than 1% for \$110. See the Appendix for more details.

⁶⁸ If the firm required the executive to buy or sell actual shares, one might be concerned that such an end-of-year adjustment would cause the firm to distribute or take in more cash than it intended. But the CEO of a firm typically owns less than 2% of a firm’s stock, and the top-5 executives typically own less than 6% of a firm’s stock. Thus, depending on how widely the constant-share approach is applied, the incremental effect on the firm’s cash position is likely to be small.

One might argue that the constant-share approach is still too complicated, even if the adjustment in the executive's equity holdings need only be done once per year. However, executives' bonus arrangements, equity-vesting and payout schedules, and retirement plans have become increasingly complex over the years. Part of this complexity is, of course, driven by executives' and directors' interest in "camouflaging" the extent to which executive pay arrangements deviate from what is optimal for shareholders.⁶⁹ The constant-share approach is no more complicated (and in fact much less complicated) than many other features of existing executive compensation arrangements, some of which do not appear to serve any social purpose. It thus makes little sense to reject the constant-share approach, which actually aligns executives' interests with those of all the firm's shareholders, on the grounds that it is too complicated.

More importantly, the firm could easily anticipate the end-of-year adjustment when conducting its transactions. For example, if the firm wishes to distribute \$500 million during the year through a repurchase, and it knows the executives subject to the constant-share approach own 4% of the firm's stock, it can distribute \$480 million throughout the year and, after the repurchase is completed, buy \$20 million of stock from the executives at the average price paid to public shareholders for the repurchased stock. In any event, as I explained in Section A, the constant-share approach could always be implemented with the use of swap agreements that are settled when the executive is allowed to unwind her shares, rather than the purchase or sale of actual shares in the short-term.

⁶⁹ See Bebchuk and Fried, *Pay Without Performance*, supra note x, at 67-68, 105-07.

VI. Conclusion

There is now a widespread recognition that tying executive to the short-term stock price can distort executives' incentives and lead executives to take steps that destroy long-term value. This recognition, in turn, has led to increasing interest in tying executives' equity pay to the long-term stock price. For example, academics and shareholder activists have urged firms to require executives to hold a large fraction of their equity incentives until after they retire.

However, this paper has shown that tying executives' payoffs to the future stock price, even the long-term future, can cause executives to take steps that *reduce* aggregate shareholder value: the net amount flowing to all of the firm's shareholders over time. Thus tying an executive's pay to the long-term stock price can induce the executive to make shareholders as a group worse off.

The paper has described two types of distortions that can result from linking pay to the future stock price. First, if the current stock price is low, executives paid on the basis of the future stock price may have an incentive to engage in value-wasting repurchases. Second, when the current stock price is high, such executives may have an incentive to engage in excessive equity-financed expansion, or "cheap empire building."

The source of these distortions is simple. Tying executives' payoff to the stock price on a future date aligns executives' interests with those of only one group of shareholders: non-trading shareholders, shareholders who hold their stock until that date and who do not sell any of their stock or buy additional shares. It fails to align executives' interests with selling shareholders, shareholders who sell some of their shares to the firm before that date. It also fails to tie executives' interests to buying shareholders, those who buy shares from the firm before that date arrives. Thus, tying executives' wealth to the future stock price may give executives an incentive to take steps to transfer value to nontrading shareholders from selling and buying shareholders in ways that may reduce aggregate shareholder value – the value flowing to all shareholders of the firm over time.

This paper also has put forward a new approach to tying executive pay to aggregate shareholder value that should be of interest to regulators, boards, and investors. Under this approach, executives would be required to sell some of these shares (or buy additional shares) whenever the firm repurchases its own stock (or issues new equity) so that the executives' proportional ownership in

the firm remains constant as the firm transacts in its own stock. I have shown that this “constant-share” approach would perfectly tie executives’ wealth to aggregate shareholder value. I have also shown that this approach could easily be implemented.

I hope that the analysis I have offered will improve our understanding of the effects of tying executive pay to the stock price, and help regulators, directors, and shareholders improve executive compensation and corporate governance in public companies.

APPENDIX

The Appendix introduces an analytical framework for examining the relationship between stock price and aggregate shareholder value, the effect of tying executive pay to the stock price on executives' incentives to engage in repurchases and equity issuances, and the operation of the constant-share approach to executive pay.

A. Analytical Framework

Consider a Corporation (ABC) that initially has a single share outstanding and exists in three sequential periods: (a) Time $T=0$; (b) Time $T=1$, and (c) Time $T=2$.

At $T=0$, ABC has a single manager ("CEO") who is granted a fraction π of ABC's equity, which he must hold until $T=2$.

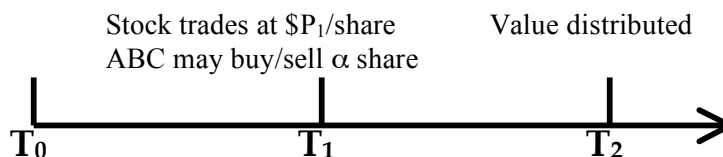
At $T=1$, ABC's share (or a fraction of it) can be traded for a price P_1 per share. At $T=1$, ABC may or may not repurchase or issue an additional amount of equity equal to a fraction α of its single share.

At $T=2$, ABC is liquidated and its value is distributed pro rata to its shareholders.

ABC's $T=2$ value will depend on whether there has been a transaction in ABC's stock at $T=1$. In the absence of any transactions in the firm's stock (such as a repurchase or sale of equity), ABC's $T=2$ value is V .

If there is a repurchase or sale of equity, ABC's $T=2$ value will be reduced (increased) by the amount paid (received) for any stock repurchased (sold) at $T=1$, plus an amount X representing the other effects of the transaction on ABC's value.

Figure 1. Sequence of Events for ABC Corporation



B. *Aggregate Shareholder Value and Final-Period Stock Price*

Aggregate shareholder value (ASV) is the net amount of value flowing from ABC to its shareholders between T=0 and T=2. Denote A_n as the ASV when ABC neither repurchases nor issues equity at T=1; A_r as the ASV when ABC repurchases equity at T=1, and A_i as the ASV when ABC issues equity at T=1.

It should be easy to see that

$$(1a) A_n = V$$

$$(1b) A_r = \alpha P_1 + (V - \alpha P_1 + X) = (V + X).$$

$$(1c) A_i = (V + \alpha P_1 + X) - \alpha P_1 = (V + X).$$

From the perspective of aggregate shareholder value, ABC should repurchase equity or issue equity iff $X > 0$.

The final-period stock price is: ABC's T=2 value, divided by the number of shares outstanding at T=2. Denote $\$P_{2N}$ as the final-period stock price if there is no repurchase or equity issuance, $\$P_{2R}$ as the final-period stock price if there is a repurchase, and $\$P_{2I}$ as the final period stock price if there is an equity issuance.

$$(2a) P_{2n} = \$V.$$

$$(2b) P_{2r} = (V - \alpha P_1 + X) / (1 - \alpha).$$

$$(2c) P_{2i} = (V + \alpha P_1 + X) / (1 + \alpha).$$

ASV and the final-period stock price for each scenario are summarized in the table below.

	Aggregate Value	Stock Price
--	-----------------	-------------

No transaction	$\$V$	$\$V$
Repurchase	$\$V+X$	$\$(V-\alpha P_1+X)/(1-\alpha)$
Equity issuance	$\$V+X$	$\$(V+\alpha P_1+X)/(1+\alpha)$

C. CEO's Incentive to Engage in Value-Wasting Repurchases

We now consider CEO's incentive to repurchase at T=1 when, as we have been assuming, his payoff is tied to the T=2 stock price.

Given CEO's incentive to maximize the T=2 stock price, it follows from (2a) and (2b) that CEO will repurchase at T=1 iff

$$(3) \$(V-\alpha P_1+X)/(1-\alpha) > \$V.$$

Simplifying (3) yields

$$(4) V-P_1 > -X/\alpha.$$

It follows from (4) that CEO has an incentive to engage in a value-wasting repurchase when:

$$(5) 0 > X > \alpha(P_1-V).$$

Remark. It should be easy to see from (5) that if $\$P_1 \geq \V (the stock is properly or overpriced at T=1), CEO does not have an incentive to conduct a value-wasting repurchase. However, if $\$P_1 < \V (the stock is underpriced at T=1), it will sometimes be in CEO's interest to conduct a value-wasting repurchase.

D. CEO's Incentive to Engage in Cheap Empire Building

We now consider CEO's incentive to issue equity at T=1 when, as we have been assuming, his payoff is tied to the T=2 stock price.

Given CEO's incentive to maximize the T=2 stock price, it follows from (2a) and (2c) that CEO will issue equity at T=1 iff

$$(6) \$(V+\alpha P_1+X)/(1+\alpha) > \$V.$$

Simplifying (6) yields

$$(7) P_1 - V > -X/\alpha.$$

It follows from (7) that CEO has an incentive to engage in a value-wasting equity issuance when:

$$(8) 0 > X > \alpha(V-P_1).$$

Remark. It should be easy to see from (8) that if $\$P_1 \leq \V (the stock is properly or underpriced in the short-term), CEO does not have an incentive to conduct a value-wasting issuance. However, if $\$P_1 > \V (the stock is overpriced in the short-term), it will sometimes be in CEO's interest to conduct a value-wasting issuance.

E. Constant-Share Approach

Under the constant-share approach, CEO must participate in a repurchase (issuance) by selling (buying) a fraction of the shares purchased (sold) by the company equal to his pre-transaction percentage interest in ABC, π . As we will see, this approach gives CEO an incentive to conduct a repurchase or equity issuance if and only if it increases aggregate shareholder value.

1. Aligning CEO's Payoff with Aggregate Shareholder Value

Denote the CEO's payoff if there is no repurchase as W_n and the CEO's payoff if there is a repurchase as W_r ; and CEO's payoff if there is a stock issuance as W_i .

If there is no repurchase or equity issuance, it should be easy to see from (2a) that

$$(9a) W_n = \pi V.$$

If there is a repurchase of α share at $T=1$ for price $\$P_1$, CEO will be required to sell $\pi\alpha$ share at price $\$P_1$ to ABC. CEO will

receive $\pi\alpha P_1$ at $T=1$ and be left with $\pi(1-\alpha)$ shares at $T=2$. It follows from this and (2a) that

$$(9b) W_r = \pi\alpha P_1 + \pi(1-\alpha)(V-\alpha P_1+X)/(1-\alpha) = \pi(V+X).$$

If there is an issuance of equity at $T=1$, CEO will pay $\pi\alpha P$ and be left with $\pi(1+\alpha)$ shares at $T=2$. It follows from this and (2c) that

$$(9c) W_i = -\pi\alpha P_1 + \pi(1+\alpha)(V+\alpha P_1+X)/(1+\alpha) = \pi(V+X).$$

The CEO's payoff under each scenario can be summarized in the following table.

	Aggregate Value	CEO Payoff
No transaction	$\$V$	$\$ \pi V$
Repurchase	$\$V+X$	$\$\pi(V+X)$
Equity issuance	$\$V+X$	$\$\pi(V+X)$

It should be easy to see that CEO will have an incentive to undertake a repurchase or equity issuance if and only if $X > 0$, the transaction increases aggregate shareholder value.

2. Ex Post Implementation

We assumed above that the CEO would participate pro-rata in any equity transaction at $T=1$. Thus, because CEO owns π of ABC's equity, he would sell or buy $\alpha\pi$ shares when ABC buys or sells α of its equity. Under this constant-share approach, CEO's payoff is tied to aggregate shareholder value.

However, CEO's payoff could be tied to aggregate shareholder value through the use of an ex post adjustment made to CEO's position *after* the equity transaction takes place. Denote as $\beta\pi$ the amount of shares CEO must sell/buy after ABC's repurchase or equity offering in order to tie CEO's payoff to aggregate shareholder value. The result of such an adjustment will be to further change the amount of equity outstanding as well as ABC's value.

Suppose ABC repurchases α share at $T=1$ for price P_1 , and then CEO sells $\beta\pi$ shares for price P_1 .

ABC's $T=2$ value will be $\$(V - [\alpha + \beta\pi]P_1 + X)$, and it will have $(1 - \alpha - \beta\pi)$ outstanding shares.

Denote CEO's payoff in a repurchase when there is an ex post adjustment as W_r' . It follows that

$$(10) \quad W_r' = \beta\pi P_1 + \pi(V - [\alpha + \beta\pi]P_1 + X) / (1 - \alpha - \beta\pi).$$

Aligning CEO's payoff with aggregate shareholder value requires that $W_r' = W_r$ which in turn implies that

$$(11) \quad W_r' = \pi(V + X).$$

From (10) and (11), it follows that

$$(12) \quad \beta = \alpha / (1 - \pi).$$

It can easily be shown that the post-transaction adjustment in the case of an equity issuance is the same. CEO must buy $\beta\pi$ shares at P_1 , where $\beta = \alpha / (1 - \pi)$.