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Stock-based incentive contracts and managerial performance: the case of Ralston Purina Company¹

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Abstract

Under Ralston Purina Company's 1986 incentive contract 14 managers would receive \$49.1 million in stock if within ten years the stock price closed above \$100 for ten consecutive days. While the contract required a 57.8% increase in stock price, it did not motivate managers to create value because the rate of return required to reach \$100 in ten years was substantially less than Ralston's cost of equity capital at the time of the contract's adoption. Barring any action by managers that would substantially change the market's expectations about the firm, reaching the \$100 hurdle price would be easy. In fact, managers collected the contract's payoffs within five years despite an industry-adjusted loss of \$2.1 billion in shareholder value. © 1999 Elsevier Science S.A. All rights reserved.

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1. Introduction

The separation of ownership from control in corporations leads to conflicts of interest between managers and shareholders (see, e.g., Berle and Means, 1932; Jensen and Meckling, 1976; Harris and Raviv, 1979; Fama, 1980). Tying managers' compensation to stock price is often cited as one way to align these interests (see, e.g., Smith and Watts, 1982). However, the effectiveness of stock-based incentive contracts depends on how well a contract's payoffs are tied to value creation. We examine this issue by studying a unique incentive contract adopted in March 1986 by the Ralston Purina Company (Ralston). The contract, adopted when Ralston's stock price was \$63.375, allocates 491,000 shares of restricted stock among 14 managers. However, the shares vest only if the stock closes at or above \$100 for *ten consecutive* trading days within *ten years* from the contract's adoption date. If the \$100 *ex-dividend* hurdle price is reached, the largest award goes to CEO William P. Stirtz, whose 160,000-share award would be worth \$16 million.

Ralston's stock closed above \$100 for the tenth consecutive day on February 22, 1991. The total change in shareholder value from the contract's adoption date until the \$100 hurdle price was reached is \$3.1 billion (adjusting for share repurchases and including cash dividends). Some feel the bonus is deserved: 'You're looking at a stock that went from \$10 (in 1981) to \$100 (in 1991) ...' (Reagan, 1991). Others say the \$100 hurdle price is too low: '... the plan did exactly what a good plan shouldn't: pay big for sub-par performance ...' (Colvin, 1992). Discussion of the contract in the financial press leads CEO Stirtz to state (at Ralston's 1991 shareholders' meeting) the board's rationale for adopting the contract:

... Between 1982 and 1985, the company implemented an aggressive plan of divestments, acquisitions and balance sheet management. As earnings and financial returns increased, the market value of the company grew ... *In order to extend this newfound positive momentum (emphasis added)* – and to retain the management team that created the transformation – the board in 1986 developed an incentive compensation program that was tied to further increases in shareholder value ...

On the surface, Ralston's contract appears to provide managers with incentives for value creation because it requires a stock price increase of 57.8% to earn the restricted shares. However, an analysis of the contract's features reveals that its payoffs do not require value creation by managers. With an adoption-day stock price of \$63.375, the implied annually compounded capital gain required to reach the \$100 *ex-dividend* hurdle price in exactly ten years is only 4.67%. Adjusting for Ralston's 1982–1986 average annual dividend yield of 3.1% leads to an annual return of only 7.77%. At the time of the contract's adoption, the risk-free rate (ten-year government bond yield) was 7.5%. More

importantly, using the capital asset pricing model with a market risk premium of 7.5% (the historical average), the risk-free rate of 7.5%, and Ralston's beta of 0.96 (estimated from daily data over the five-year period preceding the contract's adoption) yields an estimate of 14.7% for Ralston's annual cost of equity capital on the contract's adoption date. Adjusting for Ralston's 3.1% historical dividend yield results in a dividend-adjusted cost of equity capital of 11.6%. At this rate and using annual compounding, the expected stock price ten years from the contract's adoption date is \$189.92. Thus, if the hurdle price is met in exactly ten years, managers *could* actually destroy \$89.92 per share of shareholder value and still receive the contract's payoffs. This is an indication that the contract's payoffs are not tied to value creation and that Ralston's board ignored the firm's cost of equity capital when designing the contract.

Our ex-ante cost of equity capital analysis leads to several observations about the contract. Since its payoffs are not tied to value creation, the contract fails to align the interests of shareholders and managers even though it is based on stock price performance. Barring any major or prolonged economic downturn, or any action by managers that would substantially change the market's expectations about the firm, management could expect to reach the \$100 hurdle price easily. Using the 11.6% capital gains component for the cost of equity capital, the stock price should reach \$100 four years and three months after the contract's adoption date. The *actual* time it takes Ralston managers to achieve the \$100 stock price is four years and 11 months.

Other shortcomings of the contract are that it does not adjust for cash dividends and it is based on absolute, rather than relative, stock price performance.² The ex-dividend hurdle price creates an incentive for managers to alter dividend policy. Consistent with this feature, managers significantly reduced the firm's dividend yield and dividend payout ratios after the contract's adoption. From their perspective, cash dividends increase the risk of not achieving the \$100 ex-dividend hurdle price. The contract's failure to control for market- and/or industry-wide price movements means that its payoffs will occur regardless of the underlying cause of the stock's increase in price to \$100 (e.g., a bull market and/or strong industry-wide stock price performance). Over the period it takes the stock price to reach \$100, Ralston loses \$2.1 billion of shareholder value on an industry-adjusted basis. Thus, the contract rewarded managers even though the firm underperformed relative to its industry. Finally, adoption of the contract is not associated with any major changes in management's operating, financing, or investing decisions. This is consistent with the \$100 hurdle price

² The theory of relative performance evaluation (see, e.g., Holmstrom, 1979, 1982; Lazear and Rosen, 1981) identifies the conditions under which contract efficiency may be improved by incorporating additional information about an agent's performance, such as an index of industry- or market-wide performance.

being easy to achieve as long as managers do nothing to increase the risk of a bad outcome that might drive the stock price down.

Dial and Murphy (1995) find that a contract with features somewhat like Ralston's adopted in 1991 by General Dynamics Corporation (a defense contractor) is associated with management undertaking a value-creating strategic downsizing of the firm. However, the General Dynamics contract is a three-year contract that pays cash bonuses to executives for each \$10.00 increase in stock price that is maintained for ten consecutive trading days, while Ralston's contract calls for a one-time all-or-nothing restricted stock award if the stock price increases by 57.8% within a ten-year period. In addition to having a higher implied annual rate of return to reach the first hurdle price (11.87% versus 4.67%), the General Dynamics contract was adopted at a time when managers needed incentives to overhaul the firm's strategy due to declining opportunities in the defense industry. In contrast, Ralston's contract was adopted at a time when the firm was not facing a highly uncertain economic environment requiring major changes in strategy.

The paper is organized as follows. Section 2 outlines Ralston's history and describes its compensation policy and stock price performance over the 1981–1991 period. Section 3 examines the contract's impact on managerial decision-making by comparing the outcomes of management's operating, financing, and investment decisions before and after its adoption. Section 4 contains our conclusions.

2. Ralston Purina's history, compensation policy, and stock price performance

2.1. Ralston from 1894 to 1986

Ralston was founded in St. Louis, Missouri, in 1894 by William Danforth, William Andrews, and George Robinson. Danforth became the majority shareholder in 1896, and the Danforth family was actively involved in the day-to-day operations of the company until the early 1960s. During this period Ralston was primarily a farm animal feed and pet food (e.g., Purina Dog Chow) company. Diversification strategies in the 1960s and 1970s (e.g., Jack-in-the-Box fast food restaurants and retail house plants) proved unwise as evidenced by a 38.0% decline in the stock's value from December 31, 1976 to December 31, 1979. (During this period the CRSP value-weighted index had an average annual return of 13.05%.) In September 1979, *The Value Line Investment Survey* noted Ralston's poor performance:

Our advice: avoid Ralston shares. The stock has under-performed the market for years and we don't see this trend reversing soon... Ralston is losing market share in three of its core businesses... Ralston still has the biggest

share of the pet food business but is losing ground ... Finally, the retrenched Jack-in-the-Box isn't likely to fare well against the more established national fast food giants.

In light of Ralston's declining stock price, the company's board of directors paid three outside directors (none were affiliated with the firm's major shareholders) \$100,000 each (ten times their annual retainer) to identify a new CEO. They recommended Ralston vice president William P. Stirtz. He became CEO in July 1981 and chairman of the board in January 1982, and was the only Ralston manager to serve on the board over the 1981–1991 period. While Stirtz received various stock option and restricted stock awards, his stock ownership (including restricted shares and stock options) never exceeded 1% of Ralston's outstanding shares over the 1981–1991 period.

Stirtz described the mandate given to him by Ralston's Board in 1981 as follows:

... following ten years of mixed financial results and little growth in market value, Ralston Purina's Board of Directors challenged a new management team to revitalize all dimensions of the Company. Specifically, the Board directed management to transform the Company into a high return firm that focuses *single-mindedly on building shareholder value (emphasis added)*... Every aspect of the Company's operations were to be analyzed and, if necessary, changed to achieve maximum shareholder value (source: Speech by Stirtz at Ralston's 1991 shareholders' meeting).

In Ralston's 1982 annual report, Stirtz outlined his strategy for Ralston:

Our strategy is simple and concise ... Expand our core businesses by concentrating capital where funds will increase competitive advantage and productivity ... Methodically divest chronically under-performing assets ... Add to our strength by acquiring related businesses.

Over the July 1981 to March 1986 period, Stirtz divested numerous businesses, acquired others, increased financial leverage, and aggressively repurchased stock (Section 3 provides a detailed analysis). These decisions favorably affect the value of the stock, as shown in Fig. 1, which plots the value of an industry-adjusted return to a \$1.00 investment made in Ralston's stock on July 1, 1981 (selected managerial decisions are noted on the graph). We calculate Ralston's industry-adjusted stock performance each month using an industry index model in which the index is the mean return to an industry sample. The industry sample comprises the 13 firms that *The Value Line Investment Survey* classifies into the same industry as Ralston over the 1981–1991 period. These firms are American-Maize Products, Archer-Daniels-Midland, Borden, CPC International, Campbell Soup, Conagra, General Mills, H.J. Heinz, International Multifoods, Kellogg, Quaker Oats, Sara Lee, and Scope Industries. The model's

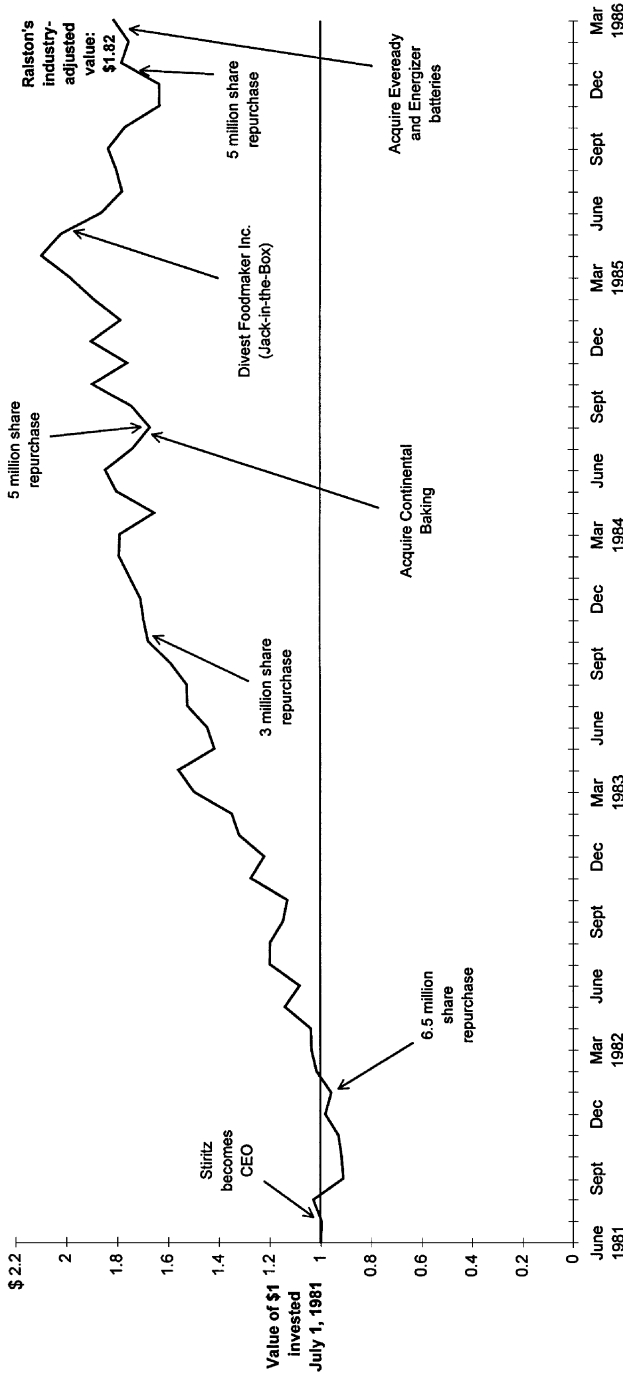


Fig. 1. Ralston's industry-adjusted stock price performance from July 1, 1981 to March 31, 1986.

The period covers the time from when William Stiritz took over as Ralston's CEO to the end of the month in which management's new incentive contract is adopted. This figure plots the industry-adjusted value of a \$1.00 investment made in Ralston's stock on July 1, 1981. Ralston's industry-adjusted stock return is measured each month using an industry index model in which the index of the model is the mean return of a 13-firm industry sample. We define the industry as the 13 firms classified into the same industry as Ralston over the 1981–1991 period by *The Value Line Investment Survey*. These firms are American-Matze Products Co., Archer-Daniels-Midland Co., Borden Inc., CPC International Inc., Campbell Soup Co., Congra Ind., General Mills Inc., H.J. Heinz Co., International Multifoods Corp., Kellogg Co., The Quaker Oats Co., Sara Lee Corp. and Scope Industries. The model's parameters are estimated via ordinary least squares and are updated each month using the 60 most recent months of data. In the absence of any industry-adjusted (abnormal) performance the expected value of this investment is \$1.00.

parameters are estimated through ordinary least squares and are updated monthly using the most recent 60 months of data. In the absence of any industry-adjusted (abnormal) performance, the expected value of this measure is \$1.00. By March 1986, the investment's value reaches \$1.82, evidence that prior to the new incentive contract's adoption, CEO Stiritz successfully created value for shareholders.

2.2. *Ralston's compensation policy and performance under the 1986 incentive contract*

To provide information about Ralston's compensation strategy, Table 1 summarizes various forms of remuneration (e.g., salary and bonuses, stock options, etc.) received by Ralston's CEO and the CEOs of firms in the industry sample. The compensation data are obtained from proxy statements. We value stock options on the date granted using the Black-Scholes option pricing model and restricted stock at its market value on the date granted. The Consumer Price Index is used to express all data in constant dollars as of the end of 1991. Results are reported separately for the 1982–1986 and 1987–1991 periods. The results are qualitatively similar if 1986 (the year of the contract's adoption) is excluded or if it is included in the second rather than the first period.

To organize our discussion of compensation policy, we adopt the approach taken by Baker et al. (1988) because their framework allows us to isolate key differences in the compensation policies of Ralston and other firms in the industry. Baker et al. (1988, p. 612) state that one dimension of compensation policy is the level of compensation, which 'is the expected total value of the pay package to the employee', and a second dimension is the functional form, which 'provides the definition of the relation between pay and performance and the definition of performance'. It is the functional form that 'provides the performance incentive for employees'. The data in Table 1 reveal fundamental differences in the level and functional form of the CEO compensation policy of Ralston and the industry. With regard to the level of total compensation, Ralston's CEO is awarded average annual total compensation of \$3,920,000 during 1982–1986 and \$6,943,000 during 1987–1991, compared to only \$1,689,000 and \$4,003,000, respectively, for CEOs of other firms in the industry. (While these differences are not statistically significant, Ralston's CEO's higher compensation may be due in part to the fact that Ralston is larger in terms of both sales and total assets when compared to the mean and median of the industry.)

Regarding functional form, Ralston's compensation policy stresses stock options and restricted stock awards far more than the industry. For example, 78.2% of Stiritz's average annual compensation over the 1982–1986 period is in the form of stock options and restricted stock, compared to only 49.3% for the industry. In the 1987–1991 period, 83.3% of Stiritz's average

Table 1

A comparison of Ralston's CEO compensation with a sample of 13 industry firms for the 1982–1986 and 1987–1991 periods. Stock options are valued on the date granted using the Black-Scholes option pricing model and restricted stock is valued at its market value on the date granted. The Consumer Price Index is used to express all data in constant dollars as of December 31, 1991. We define the industry as the 13 firms classified into the same industry as Ralston over the 1981–1991 period by *The Value Line Investment Survey*. These firms are American-Maize Products Co., Archer-Daniels-Midland Co., Borden Inc., CPC International Inc., Campbell Soup Co., Conagra Ind., General Mills Inc., H.J. Heinz Co., International Multifoods Corp., Kellogg Co., The Quaker Oats Co., Sara Lee Corp., and Scope Industries. The annual average for Ralston's CEO is the mean of the yearly values for the period. For the industry CEO value we first average across firms to obtain a single figure for each year and then calculate the average of these figures for the period. The results are qualitatively unchanged when the median rather than the mean is used.

Remuneration	Firm	Prior to incentive contract (1982–1986)		Subsequent to incentive contract (1987–1991)	
		Annual average compensation (\$000s)	Percent of total compensation	Annual average compensation (\$000s)	Percent of total compensation
Salary and bonus	Ralston	855	21.8	1162	16.7
	Industry	856	50.7	1481 ^a	37.0
Stock options	Ralston	1853	47.3	3359	48.4
	Industry	714	42.3	2268	56.7
Restricted stock	Ralston	1212	30.9	2422 ^b	34.9
	Industry	119	7.0	253 ^a	6.3
Total	Ralston	3920	100	6943	100
	Industry	1689	100	4003	100

^aRalston's and the industry sample's values are significantly different at the 1% level (two-tailed test) using a Wilcoxon two-sample test.

^bThis amount reported for Ralston is the grant value of the restricted shares awarded under the new incentive contract.

annual compensation is tied to stock price compared to 63.0% for the industry. The data in Table 1 clearly suggest that a basic tenet of Ralston's compensation policy is to make a large proportion of the CEO's compensation dependent on stock price. Indeed, not only is 83.3% of the CEO's compensation stock-based in the 1987–1991 period, but 34.9% of it is attributable to the restricted shares that vest if and only if the \$100 hurdle price is reached.

From 1982 to 1991, Ralston's major institutional investors are The Danforth Foundation, Washington University, Centerre Bancorporation, and Boatmen's Bancshares, Inc. Collectively, these institutions hold 15.49% of Ralston's shares

in 1982 and 27.03% in 1991, and all are located in St. Louis, where Ralston has its headquarters. The substantial stock ownership and board seats of these institutional investors give them the opportunity to influence the firm's compensation policy. Thus, one explanation for the adoption of Ralston's new incentive contract in 1986 is that the board wants to make the CEO's compensation even more highly dependent on stock price. Indeed, the large shareholdings of Ralston's institutional investors meant that they would capture a large portion of any increase in value resulting from improved managerial incentives to maximize the stock's value. The only board member affiliated with Ralston's major shareholders and serving on the compensation committee adopting the new incentive contract is William Danforth, M.D. (grandson of founder William H. Danforth, a trustee of The Danforth Foundation, and Chancellor of Washington University).

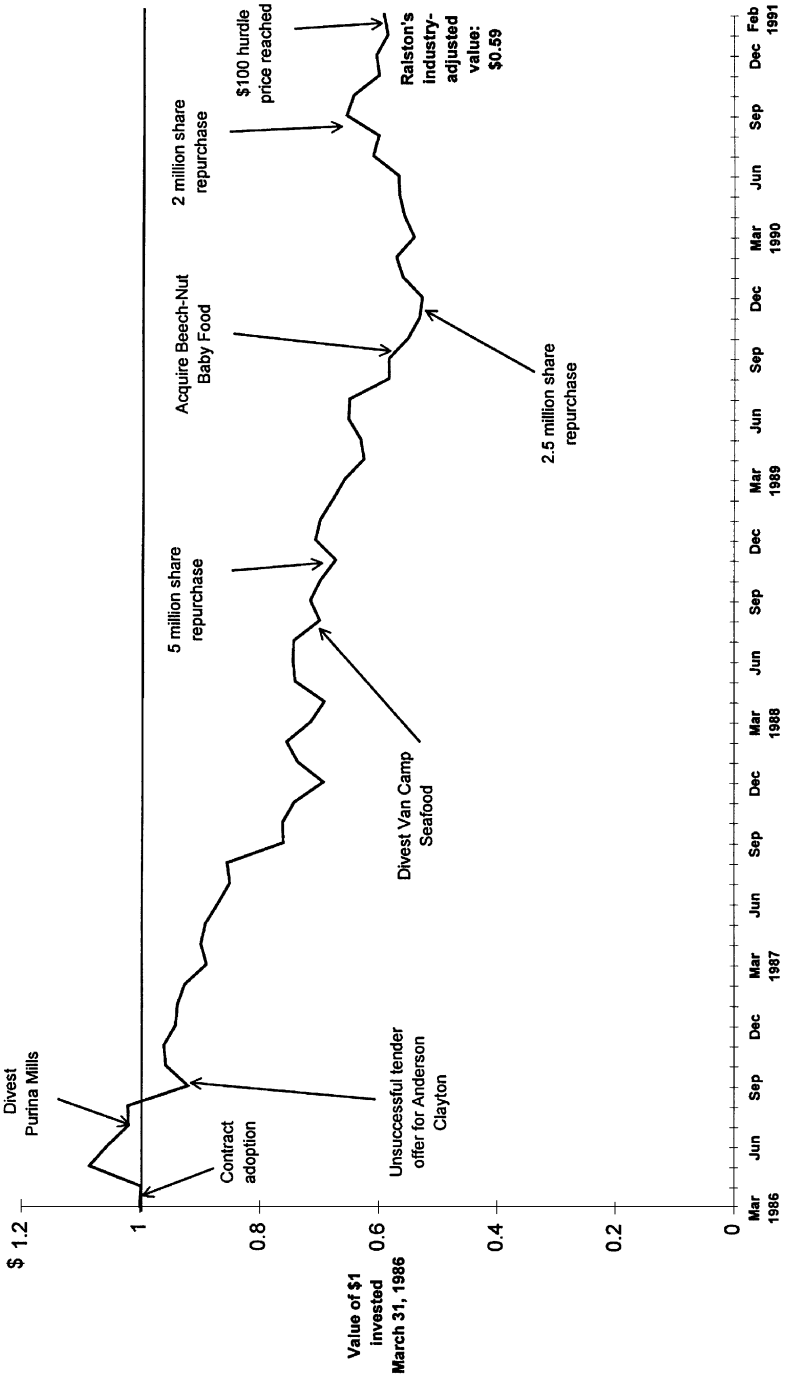
To provide evidence on the effect of the increase in stock-based compensation on the firm's stock price performance after the contract's adoption, Fig. 2 plots the industry-adjusted return to the value of a \$1.00 investment made in Ralston's stock on March 31, 1986 (the end of the month in which the new contract was adopted). When the \$100 hurdle price is reached in February 1991, the value of this investment has fallen to \$0.59. Thus, Ralston managers collect the contract's payoffs even though the firm underperforms relative to the industry. This is evidence that the contract did not achieve the board's objective of continuing the 'positive momentum in stock price performance' observed prior to its adoption.

Another way to assess Ralston's relative performance is to place each firm in the industry sample on a contract identical to Ralston's on the date Ralston's contract is adopted, and then determine how many achieve a similar performance requirement. We find that 11 of the 13 firms in the industry reach their ex-dividend hurdle price *before* Ralston. The average time it takes these 11 firms is two years and six months, compared to four years and 11 months for Ralston. Of the remaining two firms, one reaches its hurdle price two months after Ralston, and the other does not reach its hurdle price by the end of 1991. Firms in the industry reach their hurdle prices even though their average dividend yield is significantly higher than Ralston's (2.4% versus 1.8%, p -value = 0.01, two-tailed test).

3. Managerial policy decisions and shareholder wealth effects

3.1. Overall shareholder wealth changes

In this section we assess the contract's impact on managerial operating, financing, and investing decisions by measuring the change in shareholder wealth at the time these decisions are publicly disclosed, and by documenting



the change in certain financial ratios that reflect the outcome of these decisions. We obtain public disclosures of managerial decisions from *The Dow Jones News Service (DJNS)*. We report shareholder wealth measures for two separate periods: July 1, 1981 to March 19, 1986 (i.e., the date Stirtz became CEO until the day before the new contract is adopted) and March 20, 1986 to February 22, 1991 (i.e., the contract's adoption date until the date the \$100 hurdle price is maintained for the tenth day). Since the contract is adopted midway through Ralston's fiscal year, we cannot cleanly define a pre-contract and a post-contract adoption period for purposes of analyzing the financial ratios. We therefore use financial ratio data from 1982 to 1991 and form two periods with an equal number of years. The first five years (1982–1986) measure Ralston's performance before the contract's adoption and the last five years (1987–1991) measure performance after the contract's adoption. The first year (1982) is the first full year Stirtz serves as CEO, while the last year (1991) is the year in which the \$100 hurdle price is reached. (The results are qualitatively similar if 1986 is excluded or if it is included in the post-adoption period.)

Panel A of Table 2 reports Ralston's unadjusted and industry-adjusted wealth changes for news announcement days and non-news days. The shareholder wealth effect of each information release is measured using a two-day announcement period, defined as the day the news release appears on the *DJNS* and the following day. If the news release comes over the *DJNS* after the market closes, day zero is defined as the following day. Ralston's unadjusted wealth change on a given day is its stock return multiplied by the total market value of its outstanding common stock on the prior day. Ralston's industry-adjusted wealth change on a given day is its stock return less the equal-weighted return of the 13-firm industry sample, multiplied by the total market value of its outstanding common stock on the prior day. To determine the shareholder wealth effects of specific types of managerial decisions, Panel B of Table 2 reports total and



Fig. 2. Ralston's industry-adjusted stock price performance from March 31, 1986 to February 28, 1991.

The period covers the time from the end of the month in which management's new incentive contract is adopted to the month when the contract's \$100 hurdle price is met. This figure plots the industry-adjusted value of a \$1.00 investment made in Ralston's stock on March 31, 1986. Ralston's industry-adjusted stock return is measured each month using an industry index model in which the index is the mean return of a 13-firm industry sample. We define the industry as the 13 firms classified into the same industry as Ralston over the 1981–1991 period by *The Value Line Investment Survey*. These firms are American-Maize Products Co., Archer-Daniels-Midland Co., Borden Inc., CPC International Inc., Campbell Soup Co., Congra Ind., General Mills Inc., H.J. Heinz Co., International Multifoods Corp., Kellogg Co., The Quaker Oats Co., Sara Lee Corp and Scope Industries. The model's parameters are estimated via ordinary least squares and are updated each month using the most recent 60 months of data. In the absence of any industry-adjusted (abnormal) performance the expected value of this investment is \$1.00.

Table 2

Panel A

Ralston Purina Company's unadjusted (i.e., raw) and industry-adjusted wealth changes during news announcement periods and non-news periods. News announcement periods are constructed by using all information releases mentioning Ralston that appear on the *Dow Jones News Service (DJNS)* over the July 1, 1981 to February 22, 1991 period. News announcement periods are defined as the day each information release appears on the *DJNS* plus the following day. If the time stamp on the *DJNS* story is after the market closed, the news announcement period for the story is defined as the following two trading days. The total shareholder wealth effect of all information releases appearing under the heading 'All news announcement days' is measured by summing wealth changes across all unique event days. No event day's wealth change is counted more than once. The wealth changes reported under the heading 'All days' measure the total change in shareholder wealth for the period. The amounts reported under the heading 'Non-news days' correspond to that portion of the 'All days' change in wealth that occurs on days with no information releases. Results are separately reported for two periods. The first period, July 1, 1981 through March 19, 1986, begins on the date William P. Stiritz became Ralston's CEO and ends the day before the new incentive contract is adopted on March 20, 1986. The second period, March 20, 1986 through February 22, 1991, begins on the contract adoption date and ends on the day managers achieve the contract's \$100 hurdle price for the tenth consecutive day. Ralston's raw wealth change on a given day is its raw return times the market value of its common equity on the prior day. Ralston's industry-adjusted wealth change on a given day is its raw return less the industry portfolio's return times the market value of its common equity on the prior day. The return on the industry portfolio is the simple average of the individual firms' returns in the industry. We define the industry as the 13 firms classified into the same industry as Ralston over the 1981–1991 period by *The Value Line Investment Survey*. These firms are American-Maize Products Co., Archer-Daniels-Midland Co., Borden Inc., CPC International Inc., Campbell Soup Co., Conagra Inc., General Mills Inc., H.J. Heinz Co., International Multifoods Corp., Kellogg Co., The Quaker Oats Co., Sara Lee Corp., and Scope Industries.

	July 1, 1981 through March 19, 1986 (Pre-contract performance period)			March 20, 1986 through February 22, 1991 (Post-contract performance period)		
	Number of trading days	Unadjusted (raw) wealth change (millions of \$s)	Industry-adjusted wealth change (millions of \$s)	Number of trading days	Unadjusted (raw) wealth change (millions of \$s)	Industry adjusted wealth change (millions of \$s)
All news announcement days	281	2069	1235	240	519	640
Non-news days	912	2569	-104	1007	2592	-2712
All days	1193	4638	1131	1247	3111	-2072

Panel B

Total and mean two-day industry-adjusted wealth changes associated with public announcements of Ralston's investing, operating, financing, and shareholder distribution policies. Similar to Panel A, results are separately reported for the July 1, 1981 through March 19, 1986 and March 20, 1986 through February 22, 1991 periods. The operating performance category includes announcements of earnings, management earnings and sales forecasts, analysts' reports, new products, advertising policies and campaigns, and capital expenditures. The financing policy category includes announcements of shelf registrations, debt issuances, debt ratings, and Creditwatch reports by Moody's and Standard Poor's.

Announcement category	July 1, 1981 through March 19, 1986 (Pre-contract performance period)		March 20, 1986 through February 22, 1991 (Post-contract performance period)		Pre-contract mean versus post- contract mean (two-tailed <i>p</i> -value)
	Number of announcements	Industry-adjusted wealth change (millions of \$)	Number of announcements	Industry-adjusted wealth change (millions of \$)	
	Total	Mean	Total	Mean	
Acquisitions	8	324	13	376	0.74
Divestitures	32	426	10	389	0.41
Operating performance	35	256	42	336	0.98
Stock repurchases	11	559	7	647	0.23
Dividend policy	17	150	20	-462	0.17
Financing policy	16	-210	18	18	0.45

*Indicates significance at the 1% level using a two-tailed *t*-test.

**Indicates significance at the 5% level using a two-tailed *t*-test.

Table 3

Major acquisitions and divestitures by Ralston Purina Company over the July 1981 to February 1991 period. The pre-contract period is July 1, 1981 through March 19, 1986 and begins on the date William P. Stirtz became Ralston's CEO and ends the day before the new incentive contract is adopted on March 20, 1986. The post-contract period is March 20, 1986 through February 22, 1991 and begins on the contract adoption date and ends on the day managers achieve the contract's \$100 hurdle price for the tenth consecutive day. The date of each transaction is the initial date on which the particular acquisition or divestiture is announced. The total industry-adjusted wealth change for each acquisition or divestiture is measured by summing the two-day wealth changes across all announcements that pertain to the transaction. N.D. indicates that the purchase or sale price is not disclosed. The announcement to acquire Eveready Battery occurs within 18 days of the contract adoption date. We assume that negotiations (e.g., fairness opinion, due diligence, etc.) for the acquisition began prior to the contract's adoption and thus include the acquisition in the pre-contract period.

Divestitures			Acquisitions				
Date	Business	Total industry-adjusted wealth change (millions of \$)	Sale price (millions of \$)	Date	Business	Total industry-adjusted wealth change (millions of \$)	Purchase price (millions of \$)
<i>Pre-contract</i>				<i>Pre-contract</i>			
9/25/81	DECO House Plants	31.0	N.D.	8/30/84	Continental Baking (consumer baked goods)	15.3	475.0
11/2/81	Raltech Scientific Services	-38.2	4.2	4/7/86	Eveready Battery	247.5	1415.0
8/16/82	Mushroom processing operations	223.0	N.D.	—	Other acquisition announcements	61.2	—
10/4/82	European consumer products and pet foods	-11.7	22.5	<i>Pre-contract total</i>		\$324.0	\$1890.0
11/21/83	Continental Restaurant Systems	138.3	61.0	<i>Post-contract</i>			
10/18/84	Soybean processing operations	-199.1	N.D.	7/1/86	Drake Bakeries (consumer baked goods)	243.5	115.0
4/30/85	Foodmaker Inc. (fast food restaurants)	-23.1	500.0	12/1/88	Confinea (French battery manufacturer)	92.1	159.0

9/5/85	Foodservice divisions (frozen foods)	185.2	55.0	9/15/89	Beech-Nut Baby Food	56.7	55.0
—	Other diversifiture announcements	120.6	—	3/2/90	Eveready Battery (Mexico)	—	N.D.
	<i>Pre-contract total</i>	\$426.0	\$642.7	5/3/90	Keystone Ski Resorts	—	N.D.
	<i>Post-contract</i>				Other acquisition announcements	47.7	—
7/10/86	Purina Mills (farm animal feeds)	0.9	545.0		<i>Post-contract total</i>	\$376.0	\$329.6
7/13/87	Drake Bakeries (consumer baked goods)	101.2	176.0				
7/27/88	Van Camp Seafood	—	260.0				
7/13/89	Brenner Inc. (cookies and crackers)	188.9	N.D.				
—	Other diversifiture announcements	147.1	—				
	<i>Post-contract total</i>	\$389.0	\$981.0				

mean two-day industry-adjusted wealth changes for each of the following categories: investment policy (acquisitions and divestitures), operating performance, stock repurchases, dividend policy, and financing policy. These results are discussed in the following subsections.

As reported in Panel A of Table 2, Ralston's unadjusted change in shareholder wealth is \$4638 million for the period prior to the contract's adoption, 45% (\$2069 million) of which occurs during news announcement periods. On an industry-adjusted basis, the wealth change is \$1131 million. This superior performance does not extend into the period after the contract's adoption. While Ralston's unadjusted shareholder wealth increases \$3111 million during this period, the industry-adjusted wealth change is –\$2072 million. Furthermore, only 16.6% (\$519 million) of the \$3111 million unadjusted wealth change occurs during news announcement periods (compared to 45% in the earlier period). The remaining \$2592 million (83.4%) occurs during non-news periods and reflects the strong market- and industry-wide performance during this period. Thus, despite having more stock-based incentives in this period, the firm's increase in value is less than in the earlier period.

3.2. *Acquisitions and divestitures*

Table 3 summarizes Ralston's major divestitures and acquisitions over the 1981–1991 period. In the period prior to the contract's adoption, CEO Stirtz divests eight major divisions/lines-of-business, generating disclosed proceeds of \$642.7 million. The total industry-adjusted wealth change associated with these eight divestitures is \$305.4 million (excluding the \$120.6 million associated with 'Other divestiture announcements'). After the contract's adoption, four major divestitures are reported with disclosed proceeds of \$981.0 million and a total industry-adjusted wealth change of \$241.9 million (excluding the \$147.1 million associated with 'Other divestiture announcements'). With regard to acquisitions, there are two major acquisitions reported in the period prior to the contract's adoption with a disclosed cost of \$1890.0 million. (Because the announcement of the acquisition of Eveready Battery occurs only 18 days after the new contract's adoption, it seems likely that negotiations for the purchase began before the contract's adoption date; accordingly, we include this acquisition in the pre-contract period.) The total industry-adjusted wealth change associated with these two acquisitions is \$262.8 million (excluding the \$61.2 million associated with 'Other acquisition announcements'). After the new contract's adoption, five major acquisitions are made at a disclosed cost of \$329.6 million. The total industry-adjusted wealth change associated with these five acquisitions is \$328.3 million (excluding the \$47.7 million associated with 'Other divestiture announcements').

The effect of Ralston's acquisitions and divestitures during these two periods is to focus the firm on consumer products as illustrated by the line-of-business data in Table 4. From 1981 to 1986 the percentage of sales from human and pet

Table 4

Ralston Purina Company's lines of business and major products over the 1981–1991 time period. Figures under sales and operating profits are from Ralston Purina Company's annual reports.

Line of business	Major products	Sales %	Operating profits %
<i>1981</i>			
Agricultural	Animal & poultry feeds	47.8	33.6
Human and pet foods	Pet foods, sea foods & cereals	37.0	53.0
Restaurant	Fast-service & dinner houses	11.2	10.6
Diversified businesses	Soy proteins & misc.	4.0	2.8
<i>1986</i>			
Agricultural	Animal & poultry feeds	26.0	13.4
Human and pet foods	Pet foods, bakery products & cereals	67.0	78.8
Other consumer products	Batteries & soy proteins & misc.	7.0	7.8
<i>1991</i>			
Agricultural (international)	Animal feeds	12.5	5.0
Human and pet foods	Bakery products, pet foods & cereals	60.7	67.3
Other consumer products	Batteries & soy proteins & misc.	26.8	27.7

foods increases from 37.0% to 67.0%, while sales from the agricultural segment decline from 47.8% to 26.0%. The trend toward consumer products also shows in the changing pattern of operating profits, with human and pet foods increasing from 53.0% in 1981 to 78.8% in 1986 and agricultural products decreasing from 33.6% to 13.4%. By 1991, 87.5% of Ralston's sales and 95.0% of its operating profits are from human and pet foods and other consumer products.

The shareholder wealth measures reported in Panel B of Table 2 indicate that the acquisitions announced prior to the contract's adoption are associated with an insignificant mean industry-adjusted wealth increase of \$40.5 million (p -value = 0.22, two-tailed test). For divestitures, the mean industry-adjusted wealth increase of \$13.3 million is also insignificant (p -value = 0.25, two-tailed test). For the period after the contract's adoption, the corresponding mean industry-adjusted wealth changes are also insignificant. The mean industry-adjusted wealth change is \$28.9 million for acquisitions (p -value = 0.11, two-tailed test) and \$38.9 million for divestitures (p -value = 0.19, two-tailed test). A comparison of the mean wealth effects for acquisitions between the two periods indicates they are not significantly different (p -value = 0.74, two-tailed test). Similarly, the mean wealth effects of the divestitures do not differ between the two periods (p -value = 0.41, two-tailed test). Thus, there is no evidence that the contract's adoption is associated with any significant changes between the two periods in the value created by managers' acquisition and divestment decisions.

If the acquisitions and divestitures are combined into a single group, the pre-contract acquisitions and divestitures are associated with a marginally significant mean industry-adjusted wealth increase of \$18.8 million (p -value = 0.09, two-tailed test). For the post-contract period, the mean industry-adjusted wealth increase is \$33.3 million (p -value = 0.04, two-tailed test). However, a comparison of the mean wealth effects of the two periods indicates that they are not significantly different (p -value = 0.43, two-tailed test). This is further evidence that the contract's adoption is not associated with any significant change in the value created by managers' acquisition and divestment decisions.³

3.3. Operating performance

Ralston operates in highly competitive product markets. Thus, expenditures for new product development and advertising are important operating decisions. Consistent with this, one of the firm's stated operating policies is to 'develop products and services offering consumers added value' (source: 1982 annual report). To document any change in product development and advertising decisions after the contract's adoption, we calculate the ratio of research and development to sales (R&D) and the ratio of advertising to sales (ADV) for Ralston and the industry. The results are reported in Table 5. In the 1982–1986 period, Ralston spent marginally more on R&D than the industry (0.8% versus 0.7%, p -value = 0.07, two-tailed test), but spent significantly more than the industry in the 1987–1991 period (1.0% versus 0.6%, p -value = 0.009, two-tailed test). The increase in Ralston's annual average R&D ratio from 0.8% to 1.0% is also significant (p -value = 0.01, two-tailed test). Turning to advertising expenditures, Ralston's average ADV ratio significantly exceeds that of the industry in both the 1982–1986 and 1987–1991 periods (p -values = 0.01, two-tailed tests). Ralston's ADV ratio also increases significantly from 9.1% in the 1982–1986 period to 12.0% in the 1987–1991 period (p -value = 0.01, two-tailed test). These findings are consistent with the firm's change in focus toward consumer products documented in Table 4 and reflect the highly competitive nature of these markets.

To provide additional evidence on Ralston's operating performance, Table 5 reports the return on assets ratio (ROA) and the ratio of cash flow to sales (CF), where cash flow is income before depreciation minus the sum of income taxes, interest expense, and common and preferred dividends. Ralston's average annual ROA increases from 12.4% in the 1982–1986 period to 14.4% in the 1987–1991 period, although the change is insignificant. The CF results reveal that Ralston's 1982–1986 average of 5.8% is significantly greater than the

³ Baker (1992) provides a study of how acquisitions and divestitures can create (and destroy) value.

industry's average of 4.0% (p -value = 0.01, two-tailed test), but that the 1987–1991 period values are not significantly different (6.0% versus 5.0%, p -value = 0.14, two-tailed test). Furthermore, Ralston's 1982–1986 average of 5.8% is not significantly different from its 1987–1991 average of 6.0% (p -value = 0.14, two-tailed test).

The shareholder wealth measures reported in Panel B of Table 2 reveal that Ralston's operating performance announcements are associated with a mean industry-adjusted wealth change of \$7.3 million for the period prior to the contract and \$8.0 million for the period after the contract's adoption (both are insignificantly different from zero, and are not significantly different from each other). In conjunction with the insignificant changes in Ralston's ROA and cash flow ratios between the two periods, the mean industry-adjusted wealth measures suggest that managers did not make any significant changes in their operating decisions after their new incentive contract was adopted. On the contrary, the results suggest that managers maintained their policies since reaching the \$100 hurdle price was virtually guaranteed by doing so.

3.4. *Stock repurchases*

In Ralston's 1988 annual report, CEO Stirtz outlines his strategy for Ralston's cash flows:

Our ability to reinvest ... excess cash will ultimately decide the manner in which Ralston Purina survives. We are always alert to acquire businesses that we know and understand and where we believe our management skills can create value. The only other option is to return cash to shareholders principally through share repurchases and secondarily through dividends.

Consistent with this strategy, Ralston aggressively repurchases shares in the open market. In the 1982–1986 period, 40.3 million shares are acquired at a cost of \$1.1 billion, an amount constituting 74% of Ralston's cash flow during this period. In the 1987–1991 period, 22.3 million shares are repurchased at a cost of \$1.8 billion (90% of the firm's cash flow). From a strategic perspective, paying out cash as dividends makes reaching the \$100 ex-dividend hurdle price harder for managers. Thus, paying out cash via repurchases rather than as dividends allows managers to keep the ex-dividend stock price higher. Jensen (1986) discusses how agency costs can be reduced by paying out free cash flow.

As reported in Panel B of Table 2, the repurchase announcements made prior to the contract's adoption are associated with a mean industry-adjusted wealth change of \$50.8 million compared to \$92.5 million for the period after the contract's adoption (both are significantly positive). A comparison of these mean wealth change measures indicates they are not significantly different from each other (p -value = 0.23, two-tailed test). Given this, and because Ralston's managers are actively distributing excess cash before the contract's adoption, there is

no evidence to suggest that the contract is associated with a significant change in management's share repurchase strategy.

3.5. *Dividend policy*

Since Ralston's contract requires managers to achieve a \$100 ex-dividend stock price, it creates an incentive for managers to alter dividend policy (see Lambert et al., 1989). This incentive is, at least partially blunted by the contract's provision that cash dividends (plus interest) would accrue on the restricted shares. In the CEO's case, \$1,099,840 in dividends (excluding interest) accrue by the time the \$100 hurdle price is met in February 1991.

Table 5 shows that in the 1982–1986 period, Ralston and the industry have similar dividend yields, dividend payout ratios, and annual percentage increases in dividends per share. During the 1987–1991 period, Ralston increases annual dividends per share from \$0.98 to \$1.80, or a 14.1% annual rate of increase which is similar to the 13.3% for the industry (p -value = 0.99, two-tailed test). Ralston's increase in dividends per share does not keep pace with its stock price because its average annual dividend yield falls from 3.1% in the 1982–1986 period to 1.8% in the 1987–1991 period (p -value = 0.09, two-tailed test). The 1987–1991 average dividend yield is also significantly less than the industry average of 2.4% (p -value = 0.01, two-tailed test). Ralston's average annual dividend payout ratio (cash dividends paid to common shareholders divided by net income minus preferred dividends) also falls significantly from the 1982–1986 period (43.5% versus 27.1%, p -value = 0.05, two-tailed test). Thus, the contract's adoption is associated with a decline in Ralston's dividend yield and dividend payout ratio, and it appears that management substitutes share repurchases for increases in dividends in the 1987–1991 period. This strategy is beneficial to them because it keeps the ex-dividend stock price higher.

The shareholder wealth changes in Panel B of Table 2 reveal that Ralston's dividend announcements are associated with a mean industry-adjusted wealth change of \$8.8 million in the period prior to the contract's adoption and – \$23.1 million in the period following adoption (both insignificantly different from zero, and not significantly different from each other; p -value = 0.17, two-tailed test). We conjecture that the – \$23.1 million industry-adjusted mean wealth change reflects Ralston's falling dividend payout ratio and dividend yield during this period, which the market may have interpreted as confirmation that the firm is underperforming relative to the industry (see Fig. 2).

3.6. *Financial policy*

Adoption of Ralston's 1986 incentive contract is not associated with any significant changes in the firm's financial policy. As reported in Table 5, Ralston's leverage, measured as the ratio of the book value of long-term debt to

Table 5

Financial ratios reflecting the investing, operating, financing, and dividend policies of Ralston Purina Company and a sample of 13 firms in the industry. We define the industry as the 13 firms classified into the same industry as Ralston over the 1981–1991 period by *The Value Line Investment Survey*. These firms are American-Maize Products Co., Archer-Daniels-Midland Co., Borden Inc., CPC International Inc., Campbell Soup Co., Conagra Ind., General Mills Inc., H.J. Heinz Co., International Multifoods Corp., Kellogg Co., The Quaker Oats Co., Sara Lee Corp., and Scope Industries. The sample period is 1982 through 1991. The value reported for Ralston is the mean of the yearly values for the period. The value reported for the industry is the mean of the yearly values after averaging across the 13 firms in the industry each year. Ratios are measured annually and use data from COMPUSTAT. Return on assets is the ratio of net income plus interest expense less preferred dividends divided by average total assets. Cash flow is measured as income before depreciation minus the sum of total income taxes, total interest expense, and preferred and common dividends. Dividend yield is the ratio of cash dividends per share to year-end share price. Dividend payout is the ratio of cash dividends to common divided by net income less preferred dividends. Reported *p*-values (two-tailed) are from Wilcoxon two-sample tests.

Ratio	Fiscal years 1982–1986 (Pre-contract adoption performance period)			Fiscal years 1987–1991 (Post-contract adoption performance period)			Ralston's fiscal years 1982–1986 vs. 1987–1991 (<i>p</i> -value)
	Ralston (mean) %	Industry (mean) %	Ralston vs. industry (<i>p</i> -value)	Ralston (mean) %	Industry (mean) %	Ralston vs. industry (<i>p</i> -value)	
Research and development expenditures/sales	0.8	0.7	0.07	1.0	0.6	0.009	0.01
Advertising expenditures/sales	9.1	5.2	0.01	12.0	6.5	0.01	0.01
Return on assets	12.4	10.5	0.14	14.4	9.7	0.01	0.68
Cash flow/sales	5.8	4.0	0.01	6.0	5.0	0.14	0.14
Percent change in common dividends per share	9.0	9.3	0.54	14.1	13.3	0.99	0.01
Dividend yield	3.1	3.3	0.53	1.8	2.4	0.01	0.09
Dividend payout ratio	43.5	37.3	0.46	27.1	103.7	0.01	0.05
Book value of long term debt/market value of common equity	46.4	62.5	0.10	53.3	55.6	0.68	0.40

the market value of common equity, is not significantly different between the two periods (46.4% versus 53.3%, p -value = 0.40, two-tailed test). The mean industry-adjusted wealth change measures of the firm's financing announcements in Panel B of Table 2 reveal that the mean wealth changes for both periods (–\$13.1 and \$1.0 million, respectively) are not significantly different from zero. The insignificant shareholder wealth effects of the firm's financial policy announcements and its stable financial leverage ratio between the two time periods suggest that managers made no major changes in financial policy after the contract's adoption.

4. Conclusion

Our analysis documents that Ralston outperforms its industry prior to the adoption of its new incentive contract in 1986, but underperforms its industry after the contract's adoption. There are also no major changes in management's operating, financing, or investing policies after the contract's adoption. These findings raise two questions. Why did Ralston underperform an industry of firms with a lower percentage of stock-based compensation and why did Ralston's new incentive contract not lead to significant changes in managerial decisions? Our analysis suggests several answers to these questions.

First, the rate of return required to reach the \$100 hurdle price by the end of the ten-year contract period is substantially less than Ralston's cost of equity capital at the time of the contract's adoption. Thus, reaching the \$100 price is virtually guaranteed as long as managers maintain their operating, financing, and investing decisions. This is basically what Ralston's managers do.

Second, Lambert and Larcker (1986) and Lambert et al. (1991) show that a manager who expects a stock option to finish 'in the money' may act to reduce the variability of the stock price in an attempt to 'bank' the value of the award. Since Ralston's restricted stock award has option-like features, and since the \$100 hurdle price would be easy for managers to achieve, another reason for managers to maintain the status quo on operating, financing, and investing decisions is that they want to bank the value of their restricted stock awards. Indeed, we find that Ralston's unsystematic (firm-specific) risk fell from a mean of 1.5% in the 19 quarters preceding the contract's adoption to a mean of 1.0% in the 19 quarters following the contract's adoption (p -value = 0.0001, two-tailed test). (We measure Ralston's unsystematic risk in each of the 19 quarters preceding and following the contract's adoption as the standard deviation of the residuals from a market model regression using the daily returns for each quarter.)

Finally, stock-based incentives are typically used to reduce management's tendency to be risk averse regarding the firm's operating and investment decisions. However, since a large portion of a manager's human and financial

capital is tied to firm value, it is possible to exacerbate a manager's risk aversion by weighting compensation too heavily toward stock-based rewards. Smith and Watts (1982, p. 356) note that 'if managers were compensated only with restricted stock, as long as their claims were a large fraction of their wealth, their risk aversion would still provide incentives to take volatility-reducing projects'. This is a reasonable characterization of the Ralston contract because the grant value of the CEO's restricted stock award constitutes 34.9% of his total remuneration over the five-year period after the contract's adoption and, more importantly, this compensation would be realized if and only if the \$100 hurdle price is reached.

In summary, our analysis of Ralston's contract suggests that the use of stock-based incentive contracts does not guarantee that managers' and shareholders' interests will be better aligned. The effectiveness of such contracts depends critically on how tightly the contract's payoffs are linked to value creation on the part of managers.

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