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Applying economic psychology to the problem of executive compensation

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Applying economic psychology to the problem of executive compensation

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Abstract

The conventional design of executive compensation plans is based on an outdated model of executive agency. Empirical work described in this article has provided a better understanding of the relationship between executives' pay and their motivation by undertaking a detailed examination of the psychology of executive incentives. Four key points emerge. First, executives are much more risk averse than financial theory predicts. Secondly, executives are very high time discounters, thus reducing the perceived value of deferred rewards. Thirdly, intrinsic motivation is much more important than admitted by traditional economic theory. Fourthly, executives are more concerned about the perceived fairness of their awards relative to peers than in absolute amounts. Our research suggests that companies would be better off paying generous salaries, and using annual cash bonuses to incentivize desired actions and behaviors. Executives should be required to invest their bonuses in company shares until they have sufficient "skin in the game" to align their interests with shareholders. As far as possible the use of equity plans, especially complex, high-powered, performance-based plans should be kept to a minimum.

Keywords: economic psychology, executive compensation, motivation theory

The conventional design of executive compensation plans, involving high salaries, generous bonuses and highly-leveraged stock programs, is based on an outdated model of executive agency. The general principal-agent model focuses on bilateral arrangements where a principal (conventionally “her”) hires an agent (conventionally “him”) to carry out some activity on her behalf (Eisenhardt, 1989). In its more specific application to companies, agency theory postulates, among other things, that in order to motivate managers (agents) to carry-out actions and select effort levels that are in the best interests of shareholders (principals), boards of directors, acting on behalf of shareholders, must design high-powered performance-based incentive contracts which make an agent’s compensation contingent on measurable performance outcomes (Jensen & Meckling, 1976). Critically, agency theory makes the assumptions that executives are rational, self- interested, utility-maximizers, motivated only by money.

It has been apparent for some time that agency theory has major shortcomings. Research conducted by economists over the past 35 years has found little evidence of a statistically significant link between executive pay and performance¹. The data indicate that executive compensation is correlated with firm size, not company profits. Conventional wisdom today is that CEO pay increases as a power function of company size (Edmans & Gabaix, 2016).

My research, carried out in conjunction with Julie Gore of University of Bath in the UK and Tom Gosling of PwC, has provided a better understanding of the relationship between executives’ pay and their motivation by undertaking a detailed examination of the psychology of executive incentives. We asked the question: “how can compensation plans be designed in order to maximize executive motivation?” Four key points have emerged from our research. First, executives are much more risk averse than financial theory predicts, preferring fixed outcomes to risky, yet potentially more rewarding, alternatives. They also attach a heavy discount to

ambiguous and complex incentives. Secondly, executives are very high time discounters, typically marking-down the value of complex long-term incentives at a rate in excess of 30% per year, reducing the perceived value of a three-year deferred incentive by around 70%. Thirdly, intrinsic motivation is much more important than admitted by traditional economic theory, to the point where many executives would give up over 28% of their income to work in more personally satisfying roles.(Pepper & Gore, 2014). Finally, fairness matters. Executives are more concerned about the perceived fairness of their awards relative to peers than in absolute amounts (Pepper, Gosling, & Gore, 2015) .

These factors suggest that conventional methods of compensating executives are contributing to the rapid inflation in executive pay, rather than incentivizing executives to maximize their performance. Long-term incentive plans are actually increasing agency costs rather than providing a way of reducing them. Companies have to offer the possibility of ever-larger pay-offs to counter the reduced subjective values that executives attach to their awards.

The Research

Whereas agency theory focuses on how incentive contracts can be best designed to align the interests of shareholders (principals) and executives (agents), our research, drawing on ideas from economic psychology and behavioral economics, focuses on agent motivation. The theory of work motivation most commonly used by psychologists when investigating the motivational impact of monetary incentives is expectancy theory, originally advanced in the 1960s by the American psychologist Victor Vroom (1964). We used a version of expectancy theory known as “temporal motivation theory”, devised by management scholars Piers Steel and Cornelius König. (2006). This incorporates George Ainslie’s theory about hyperbolic time discounting and Daniel

Kahneman and Amos Tversky's prospect theory (Ainslie, 1991; Kahneman & Tversky, 1979). Temporal motivation theory postulates that the a person's motivation to carry out a particular act is the product of his or her expectancy that the act will lead, directly or indirectly, to a particular outcome, and the value which he or she attaches to that outcome, discounted for risk, and for any time delay between the occurrence of the final outcome and the initial act.

Our empirical work based on these theories was carried out between 2008 and 2015, first in the UK, and subsequently in over 40 other countries. An initial study ("study 1") involved interviewing a range of senior executives about pay and motivation and then performing a detailed textual analysis of the transcripts of their answers (Pepper, Gore, & Crossman, 2013). The themes that emerged were used to develop a questionnaire, which was tested on another group of executives ("study 2"). After refinement, the questionnaire was used by an international research firm to gather data from its global panel of senior executives, with titles such as chairman, CEO, president, managing director, senior vice president, and so on ("study 3"). Participants were categorized into three earnings bands: \$350,000 and under (n = 506), between \$350,000 and \$725,000 (n = 178), and \$725,000 or more (n = 72). The resulting sample of 756 participants from across the world was also representative of all major industry categories. A wide range of senior roles, industries, company types and company sizes were represented in the sample. Subjects included 619 males and 137 females. Ages ranged from under 39 years (194), 40-49 years (285), 50-59 years (195) and over 60 years (82). The geographical spread of participants is shown graphically in Figure 1. After collection, the data was carefully analyzed using statistical software (IBM SPSS Statistics, version 19) before drawing conclusions.

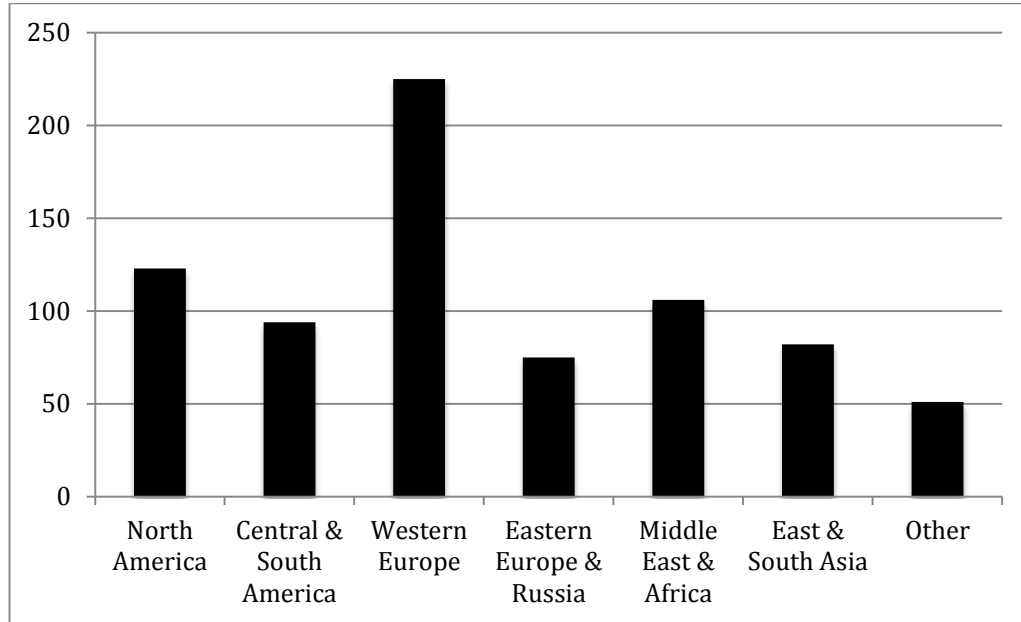


Figure 1. Country Distribution of Participants in the Main Study

The three studies focused in particular on whether long-term incentive plans are an efficient and effective way of motivating senior executives. The conclusion was that long-term incentives are a very expensive way of trying to motivate executives.

Executives Are More Risk Averse than Financial Theory Predicts

In one question in study 3 participants were asked if they would rather have (A) a 50% chance of receiving a bonus of \$90,000; otherwise nothing; or (B) \$41,250 for certain? The expected value of (A) is \$45,000, suggesting that a risk neutral executive should prefer (A) over (B). Yet in our research 63% of executives chose (B), representing a risk premium of around 9%. By repeating the question with different values it was possible to demonstrate that executives require a risk premium of up to 17% before selecting the risky option. To put this in context, rational choice risk premiums have been estimated at between 6% and 11% for executives with up to 50% of

their wealth tied up in firm equity (Canyon, Core, & Guay, 2011). The risk premiums implied by the questions in the questionnaire are therefore at or above the upper end of this range.

Executives also attach a heavy discount to ambiguous and complex incentives: for example, a guaranteed bonus of \$45,000 payable in three years' time is preferred to a guaranteed bonus of 10,000 shares deliverable in three years' time when the share price, currently \$4.50, has fluctuated between \$2.25 and \$6.75 in the last 12 months. One CEO put it rather elegantly as follows:

Deferred share schemes are basically somewhat poorly understood, and pretty arbitrary. In the old days share options were easily understood, but pretty arbitrary. These new schemes are extraordinarily complex... and still pretty arbitrary. That's the issue.

Another executive said of performance-based stock programs: "because of complexity, direct motivation is often not there on a day-to-day basis". A cognitive psychologist would confirm that you cannot be extrinsically motivated by something you do not understand (Deci & Ryan, 1985).

Time Discount Rates Exceed 30%

According to standard finance theory, individuals should discount future receipts at rates that are consistent with the return on comparably risky future cash flows, adjusted for inflation (Brealey, Myers, & Allen, 2014). Time discount rates should, therefore, have been close to the risk-free rate of around 1% per annum, subject to local inflation, which in 2013 when study 3 was carried out varied between under 1% (Switzerland) to over 9% (Argentina). Evidence from the study indicated that executives discount for time at much higher rates of between 15%-69%, depending on location, with a median rate of 33%. This is consistent with the thesis that

psychologically we discount for the future hyperbolically rather than exponentially, as finance theory would predict. Figure 2 shows both hyperbolic (perceived value) and exponential (economic value) utility functions, along with the gap between the economic value and perceived value of long-term incentives, which only closes when the final pay-out occurs. As various participants in study 1 put it: “it is inevitable that people attach a lower discount to near-term systems”; “long-term incentives are an amount of money with a very high discount attached to it”; and “companies are paying people in a currency they don’t value”.

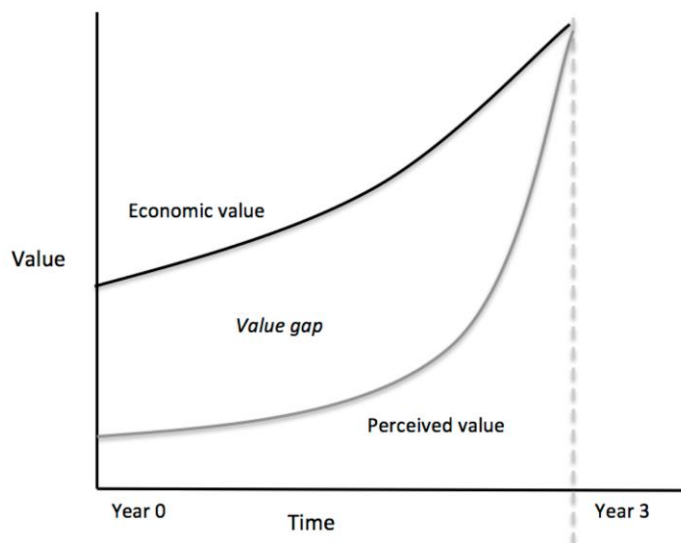


Figure 2. Exponential and Hyperbolic Discounting

Money Isn't Everything

Questions about the relationship between intrinsic and extrinsic motivation provoked a range of responses from participants in the research. The prevailing view was that, for senior executives, certain intrinsic factors, especially an orientation towards achievement, are important primary sources of behaviour. Power-status and intimacy-teamwork were also mentioned as significant

factors affecting the way people behave. In general, however, intrinsic needs or drives were not seen as substitutes for extrinsic rewards: a substantial minimum level of remuneration must be provided. One CEO put it like this:

Once you are at a threshold level on the financial structures, a level which is felt to be fair and appropriate to the market, then [intrinsic factors] become really important...but if you are at a significant discount on the monetary part then the other things will not make up for it.

A number of participants commented that very large awards should not be necessary to engage and motivate executives. A company chairman, commenting specifically on the US executive labor market, said: “I do not believe, nor have I ever observed, that \$100 million motivates people more than \$10 million, indeed more than \$1 million”. In practice, the relationship between intrinsic and extrinsic motivation is complex and hard to unravel. As well as providing material benefits, extrinsic rewards are also important sources of information for executives. They give signals which executives can use to measure their value relative to their peers, how highly they are valued by their company boards, and even in some cases their self-worth. As another executive put it: “the principal role of money is...as a way of keeping the score.”

Some scholars argue that intrinsic and extrinsic motivation are neither independent nor additive, proposing instead that contingent monetary rewards might actually cause a reduction in intrinsic motivation. Jeffrey Pfeffer, an American business theorist, contends that large external rewards can actually undermine intrinsic motivation (Pfeffer, 1998). Similarly, Bruno Frey, a Swiss behavioural economist, postulates that extrinsic rewards may “crowd-out” intrinsic motivation: people become distracted by monetary rewards, particularly if incentives are badly designed (Frey, 1997; Frey & Jegen, 2001). As one of the executives in study 1 put it: “if the

amounts are large enough they can make one lose sight of the intrinsic.” Answers to another question in the survey showed that on average executives would be prepared to sacrifice round 28% of their earnings if they worked in a more ideal job.

Fairness Matters

Scholarly work in a number of academic traditions has demonstrated that fairness is a key factor in determining whether employees are satisfied with their pay, especially when comparisons are made with the compensation of other team members (Adams, 1976; Festinger, 1954; Varian, 1975). Yet fairness among senior executives, especially top-management teams, has not generally featured in theoretical accounts of executive incentives. Equity considerations play no part in agency theory. One important way in which rewards are evaluated is by drawing comparisons with salient others. In study 1, executives commented as follows: “internal relativity is a big issue”; “the only way I really think about compensation is ‘do I feel fairly compensated relative to my peers?’” and “corporate executives appear to be very sensitive to differentials with perceived peers.”

Another question in the survey used in study 3 asked participants whether they thought that Jean, a hypothetical executive earning \$187,500 who later discovers that her immediate company peers are earning \$180,000, would be more or less highly motivated than Jacques, an executive working in the same industry with comparably expertise and experience to Jean, who earns \$195,000 but who subsequently discovers that his peers are earning \$202,500. The standard economic model would predict that an agent should choose a higher absolute amount over a lower absolute amount. Yet in study 3, Jean, the executive receiving the lower absolute but higher relative amount was chosen by 46% of participants. Jacques, the executive receiving the

higher absolute sum was chosen by only 31%, with other participants expressing the view that Jean and Jacques would be equally motivated (Pepper et al., 2015).

Behavioral Agency Theory

Figure 3 graphs the relationship between pay and motivation according to behavioral agency theory, a variation on standard principal-agent theory, developed in response to the findings of this research programme by integrating temporal motivation theory into the principal-agent model (Pepper & Gore, 2015).

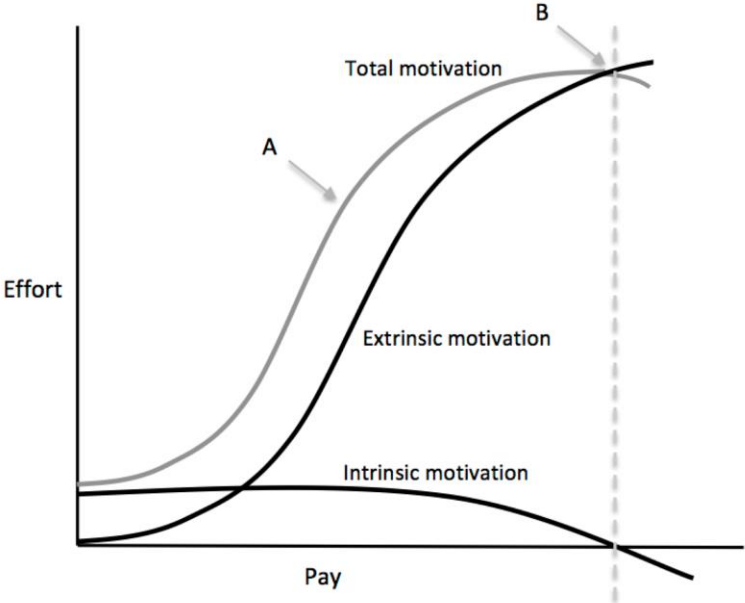


Figure 2. Exponential and Hyperbolic Discounting

Behavioral agency theory builds on the four key behavioral concepts that have been identified by behavioral economists and supported by the present study. These are the four key points noted at

the beginning of this article: very conservative preferences when it comes to risky, ambiguous and uncertain outcomes, heavy time discounting, a recognised trade-off between intrinsic and extrinsic motivation, and inequity aversion along with a strong preference for fairness. The graph illustrates how total motivation is the sum of the intrinsic and extrinsic motivation curves. It shows the incentive ‘sweet spot’ (A), where the motivational benefit of an additional dollar of pay is maximized, as well as point (B) when ‘crowding out’ sets in, after which intrinsic motivation is undermined by each additional dollar of incentive pay, and total motivation therefore declines.

New Design Principles for Executive Compensation

Agency theory has focused much attention on the use of high-powered incentives as a mechanism for overcoming agency costs in public corporations. In so doing, economists and finance scholars have dramatically underplayed the role of psychology in determining organizational behaviour. Considerable time has been spent devising highly elaborate incentive plans, which the philosopher Joseph Heath, in an article entitled “The uses and abuses of agency theory”, describes as being of “baroque complexity” (Heath, 2014), while neglecting risk perceptions, time discounting and intrinsic motivation. Inflation in executive pay over the last 30 years is almost entirely related to pay-outs from stock options and other long-term incentive plans: senior executives’ salaries have been remarkably stable for many years. Our research suggests, somewhat perversely, that companies would be better paying *larger* salaries, and using annual cash bonuses to incentivize desired actions and behaviors³. Executives should be required to invest their bonuses in company shares until they have sufficient “skin in the game” to align their interests with shareholders. For greater tax efficiency, annual bonuses might be

provided in the form of restricted stock, with time constraints on vesting but without financial performance metrics, until holding requirements had been met. In other respects, as far as possible use of equity plans should be minimized.

An example of how a compensation package designed according to these new principles might compare with a traditional package is set out in Table 1. This is an “ideal type”, in the sense in which this phrase was used by the German sociologist Max Weber - the example describes the common elements and characteristics of a paradigmatic plan, rather than implying perfection. In practice many variations can be expected. In particular, tax issues have not been taken into account. For the purposes of illustration, imagine that the CEO in a large company currently receives a salary of \$1,000,000, an annual bonus opportunity of 200% of salary, and an annual long-term incentive plan award of 400% of salary. Pensions and benefits are ignored for the purposes of simplicity. The face value of the compensation package is therefore \$7,000,000. Assume that the CEO has a subjective discount rate for risk of 16% and for time of 33%. After these discounts have been applied the subjective value of the bonus is reduced to \$1,125,000. The perceived value of the long-term incentive, discounted over three years at a rate of 33% per annum, as well as for risk, is reduced to \$1,000,000. Thus the total subjective value of the CEO’s current compensation package amounts to around \$3,125,000. The accounting cost to the company, assuming the bonus and long-term incentive both pay-out at a rate of 75% and that the fair value of the long-term incentive at the date of grant is broadly the same as the amount which is eventually disbursed, around \$5,500,000.

Table 1
Comparison of Traditional and New Design Compensation Packages

	Traditional Compensation Package			New Design Compensation Package		
	Maximum Value \$'000	Perceived Value ^a \$'000	Actual Payout \$'000	Maximum Value \$'000	Perceived Value ^a \$'000	Actual Payout \$'000
Salary	1,000	1,000	1,000	2,000	2,000	2,000
Bonus	2,000	1,125	1,500	2,000	1,125	1,500
Bonus % of Salary	200%	112.5%	150%	100%	56.25%	75%
LTIP	4,000	1,000	3,000	-	-	-
LTIP % of Salary	400%	100%	300%	-	-	-
Total	\$7,000	\$3,125	\$5,500	\$4,000	\$3,125	\$3,500
Free Cash ^b			\$900			\$1,500
Alignment Holding:			\$'000			\$'000
Shares			2,000			6,000
LTIP			4,000			-
Total			\$6,000			\$6,000
	Time to meet share-holding requirement ^c		3 years			5 years

^a Calculation of the perceived value assumes discount rates for risk of 16% pa and for time of 33% pa.

^b Free cash flow assumes the executive has an annual cash requirement of \$600,000 and a tax rate of 40%.

^c The time to meet the shareholding requirement is an estimate and assumes that salary accumulates pro-rata during the financial year and bonuses are paid in the second quarter of the following year.

By redesigning the compensation pack according to the new design principles, the same subjective value of \$3,125,000 can be delivered to the executive at a lower total cost to the company and with a lower headline rate of executive pay. The redesigned package comprises a base salary of \$2,000,000, twice the amount payable under the traditional arrangements, and an annual bonus opportunity of 100% of salary. By the time the value of the bonus has been discounted for risk by 16% and for time by 33%, its perceived value is reduced to around \$1,125,000. Assuming that the actual bonus pays out at a rate of 75%, the cost to the company and headline rate of executive compensation is reduced to \$3,500,000.

One of the main objectives of incentive contracts under agency theory is to align the interests of shareholders and managers in order to reduce agency costs. In the present case,

alignment of the CEO's interests with those of the corporation's shareholders is obtained by requiring the CEO to invest his available after tax cash in company shares until a meaningful shareholding has been obtained, combined with participation in the long-term incentive plan. In the example, under the traditional compensation package, on the basis that the executive is required to buy shares with a value at the date of acquisition equivalent to 200% of salary, and assuming a tax rate of 40%, represents around 3 years of free cash flow. This shareholding, combined with exposure under the long-term incentive plan, means that at any one time the CEO will have an interest in around \$6,000,000 worth of shares in the company. Under the new design, a similar level of exposure to own company shares can be obtained by investing after-tax free cash flow over a period of around 5 years.

Setting a precedent?

There is at least one company whose executive reward strategy is consistent with many of the design principles described in this article. In some of his famous letters to shareholders, Warren Buffett has explained how Berkshire Hathaway, the investment company which he runs with his partner, Charlie Munger, has adopted an incentive compensation system which rewards key managers with generous salaries and cash bonuses, but eschews equity plans (Buffett, 2014). At Berkshire, salaries are calibrated according to the size of the executive's job and cash bonuses are paid annually for meeting targets within the executive's own business unit. Performance is defined in different ways depending on the economics of the underlying business, but Buffett says he tries to keep things "simple and fair". Business unit performance is rewarded whether Berkshire stock rises, falls or stays the same. Managers are encouraged to buy Berkshire stock with their bonuses, and Buffett notes that many have done so, thus benefitting from the strong

sustained share price performance of Berkshire Hathaway over many years. By buying stock with their own money, managers accept the risks and carrying costs of ownership as well as benefitting from dividends and opportunities for capital growth. In this way their interests are much more closely aligned with those of other shareholders than would be the case if they were beneficiaries of stock option awards or other types of equity incentive

Conclusion

Executive compensation has become a major political issue and many commentators believe that reform is vital to restore faith in capitalism. Businesses are waking up to the fact that long-term incentive plans don't work as intended. How many non-executives on board compensation committees really understand the formula they are approving and the size of the awards that may crystalize in future as a result? According to Philip Hampton, Chairman of GlaxoSmithKline plc: "we've probably been going in the wrong direction for 20 years or more"². Change is evidently necessary. By incorporating the design principles set out in this article into their thinking about executive compensation, companies might be encouraged to move towards what would in aggregate be smaller, but more balanced, more effective compensation plans, benefitting business and society as a whole, yet without fundamentally undermining the motivation of our top executives. One major institutional investor has recently recognized this. In April 2017, Norges Bank Investment Management, which manages the world's largest sovereign wealth fund on behalf of the state of Norway, published guidelines for the remuneration of CEOs of the companies in which it invests which are consistent with, and in part based upon, the research described in this article⁴.

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Notes

- ¹ In 1990, in an article entitled: “Performance pay and top-management incentives,” published in the *Journal of Political Economy*, Michael Jensen and Kevin Murphy were unable to find a statistically significant connection between CEO pay and performance. Ten years later Henry Tosi, Steven Werner, Jeffrey Katz and Luis Gomez-Mejia, in “How much does performance matter? A meta-analysis of CEO pay studies,” in the *Journal of Management*, concluded that incentive alignment as an explanatory agency construct for CEO pay was at best weakly supported by the evidence based on their meta-analysis of over 100 empirical studies. In 2010 a literature review by Carola Frydman and Dirk Jenter entitled “CEO compensation,” in the *Annual Review of Financial Economics*, concluded that neither agency theory nor the alternative “managerial power hypothesis” proposed by Lucien Bebchuk, Jesse Fried and David Walker (2002) was fully consistent with the available evidence.
- ² Philip Hampton was quoted in the Financial Times on May 9, 2016 by Financial Editor Patrick Jenkins.
- ³ In the US companies would have to take account of section 162(m) of the US Internal Revenue Code which provides that compensation paid to the CEO and the next four highest paid executives in a firm in excess of \$1m are not tax deductible unless certain conditions are satisfied. These conditions are that the payments in excess of \$1m must be made under a performance-based plan and that the plan must have been approved in advance by shareholders. In practice, many companies simply get round these rules by paying larger cash bonuses (Rose & Wolfram, 2000).
- ⁴ Norges Bank Investment Management, Asset Manager Perspective 01| 2017, “Remuneration of the CEO”, published April 7, 2017.