

Return on Reward

-Generating higher performance by increasing incentives-

Master Thesis

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ABSTRACT

Return on reward, i.e. the average economic performance per employee, which a company generates based on its average total labor expenses is a topic that seems to have received surprisingly little attention in the past. While companies manage their (often fictive) financial indicators (e.g. capital structures and stock prices) in an attempt to create value for their shareholders, the sense that each individual employee is (or at least, should) actually be contributing a certain measurable economic value, is often overlooked. Moreover, in the world of Human Resource Management, the intense debate between economists and psychologists/sociological economists on whether higher incentives actually lead to higher performance, is still largely unsettled. By using a model which measures economic value per employee as a function of productivity and cost per employee, while at the same time looking for trends which indicate a relation between these two, this paper answers the question whether higher average wage bills generate higher productivity. The relationship between the cost of labor and various performance metrics over an 18-year timespan was empirically examined. The results from this assessment indicated that a positive correlation can be found between the average total labor expenses and average employee productivity, as measured by various different performance metrics. Thus, while current literature is locked in debate on the effects of incentives on motivation and performance, these results provide a strong argument for the fact that incentives positively impact performance. Moreover, from the subsequent findings it can be concluded that providing higher incentives leads to a productivity increase which outweighs the initial cost of the increase. This leads to the conclusion that the economic returns benefit from an increase in average rewards provided to an organization's workforce. Hence, the results from this study conclude that it does indeed pay off to pay more.

PREFACE

'All men by nature desire knowledge' – Aristotle

The master thesis lying before you is the result of an academic endeavor in the field of Business Economics. An inspiring educational journey which allowed me to accumulate knowledge from the areas of i.a. Corporate Finance, Private Equity and Management Accounting. The aggregate result of all that I have gathered, together with my experiences as a Business Analyst at Hay Group, led to this study on generating higher performance levels by increasing average individual incentives.

There are many people I would like to thank for their support and input. First of all, I would like to thank my thesis supervisor, Prof. Dr. E.A. de Groot, for his valuable comments and guidance in this personal and professional learning experience. Second, I would like to thank Pieter Bukala for all his support and for intellectually challenging me during the data analysis process.

Finally, I would like to thank my friends and family for their patience and limitless support during this fascinating but time consuming process. To: papa, mama, Thomas & Marlies; my sincerest gratitude go out to all of you for providing me with the platform from which I am able to excel.

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1.0 Introduction

In today's business environment, organizational effectiveness (generally referred to as business performance) is a fundamental concept to both management practitioners and researchers alike (Venkatraman & Ramanujam, 1987). In order to survive in this highly competitive business environment, organizations all across the globe strive to maximize their firm value¹ and achieve what Porter (1985) identified as a *Sustainable Competitive Advantage*². Aware of this ongoing struggle for excellence, academic researchers attempt to assist in this by developing the knowledge and the tools for these organizations to excel. In addition, numerous academic scholars have tried to develop the ultimate measurement system to assess organizational performance so that organizations can effectively grasp their current status. To this day, however, academic literature has not been able to generate a stand-alone performance measure which encompasses the total sum of the various drivers for success (e.g. Chakravarthy, 1986; Bacidore, Boquist, Milbourn & Thakor, 1997; Zhu, 1998; Ferguson & Leistikow, 1998; Richard, Devinney, Yip, Johnson, 2009).

This lack of consensus among scholars becomes even more peculiar in discovering the fact that although Chakravarthy (1986) acknowledges that various studies on performance measures for strategic management have identified no less than 14 distinct quantitative measures³, a measure for the *return on human capital employed* strikingly was not one of them. Moreover, his attempt to reconcile the issue of the '*single measure which most significantly determines performance*' (Chakravarthy, 1986) by proposing a multi-factor model that incorporates various different financial ratios, still neglects to take a measure for the return on capital invested in human assets into account. The absence of such a measure in modern academic literature seems particularly negligent considering the fact that scholars from an earlier era did identify the significance of human capital as a driver for business success. Schultz (1961) e.g. identified that; '*(the growth of) human capital is (one of) the most distinctive feature(s) of our economic system.*' Moreover, Schultz (1961) argues that the individual knowledge and skills of employees are a significant form of capital which, as this particular form of capital has grown in Western societies at a much faster rate than conventional (nonhuman) capital, should be nurtured by making it a substantial part of deliberate investments. Especially since, when measuring what labor contributes to output, the productive capacity of human beings is vastly larger than all other forms of wealth taken together (Schultz, 1961). Considering these arguments, it becomes clear that the effect of human capital performance (or essentially; employee performance) on business success is to be taken more than serious. Especially considering the fact that compensation is the largest single source cost for an average organization (Gerhart, Rynes and Fulmer, 2009) and that labor cost generally account for 60% to 95% of the average total cost of an organization (Larking, Pierce & Gino, 2012)⁴.

¹ Firm value is identified by Bacidore, Boquist, Milbourn & Thakor (1997) as the sum of two separately measurable components being: (1) An organization's physical assets in place (plant, equipment, working capital, etc.) and (2) The NPV of the organization's current and future investment opportunities.

² Porter (1985) argues that any organizational entity is ultimately striving for a situation in which it has acquired or developed a (combination of) attribute(s) that allows it to outperform its competitors for a continuing period of time. The effective manipulation of resources under (in)direct control of the firm allows an organization to outgrow its competition and become a dominant force on the market in which it operates.

³ These 14 measures included, i.a.; Return on investment (ROI), Return on Sales (ROS), Growth in Revenues, Cash Flow/Investment, Market share, Market Share gain, Variations and percentage point changes in ROI, Product quality, etc.

⁴ This excludes the firm's physical cost of goods sold.

Despite the lack of attention given to human capital as a driver for business performance, the topic *did* receive quite some attention by scholars who wished to shed light on the social and psychological dynamics behind human resource management. The degree to which wage policies and incentive schemes affect the behavior of individuals and have a subsequent impact on their effort and effectiveness to deliver on a firm's objectives, is a topic that numerous scholars have devoted their energy to. Gerhart & Milkovich (1992), e.g., make the argument that one of the strongest determinants of employee attitudes, motivation and behaviors is compensation. Going even beyond the scope of a professional setting, the concept of compensation, or more specifically; monetary incentives, has been widely recognized as an item that influences human behavior. This might be due to the broad usefulness of money which, according to Rynes, Gerhart & Minette (2004), make it an item that can assist in obtaining virtually any level on Maslow's motivational hierarchy, including social esteem and self-actualization. Driven by the fact that a wide range of scholars agrees on the argument that *'Money is the crucial incentive in assessing instrumental value, none of the other incentives or motivational techniques even come close'* (Locke et al., 1980) and *'no other incentive or motivational technique even comes close to money with respect to its instrumental value'* (Judge, et al, 2010), the magnitude of the existing body of literature on this topic has grown to massive proportions over the past few decades.

But while many scholars like e.g. Zajac & Westphal (1994) have investigated the importance of *pay mix* the analysis of the effect of *pay levels* has either been neglected or not yet conclusively studied (Judge, et al, 2010). Gardner, Dyne & Pierce (2004) also identified this shortcoming in current literature as they state that; *'the assumption that high pay levels will maintain and enhance future performance has been largely untested.'* Again, this indicates a peculiar lack of knowledge in the academic literature, as a potential causal relationship between pay levels and performance would have a strong impact on the way in which human capital in organizations is perceived. Especially since such a causal relationship does not seem to be very farfetched as this concept was already discussed in 1958 by Kelvin Lancaster, who reversed the possible causality of productivity and pay by identifying the argument that; *'the problem of inflation can be solved by national wage policy, in which wage increases are assessed and granted on the basis of increases in "productivity", i.e., average labour productivity'* (Lancaster, 1958). *'Given the simple wage-cost price determination, then it cannot be doubted that, if productivity increases by a uniform proportion throughout the economy, and wages are everywhere raised by that same proportion, then wage cost per unit of product are unchanged, all prices are unchanged and any index of prices is unchanged'* (Lancaster, 1958). Taken this argument from a macro-economic perspective, it comes as no surprise that it was what Lancaster called *'the seed from which a whole complex of assertions which can be classified as "productivity-gear wage policies" grew.'* Additionally, in later years, various scholars (e.g. Gardner, Dyne & Pierce, 2004; Larkin, Pierce & Gino, 2012) have argued that even the equity theory as put forth by Adams (1963) would suggest that high pay levels represent high outcomes which in turn should motivate employees to adjust their performance upward.

Considering the current situation of academic literature as described above, there seems to be a unique niche for this thesis to provide new insights on. On the one hand, as can be read from e.g. Kanter (1987), although there has been much attention for the effects of the *pay mix*, the question whether *pay level* affects employee performance still remains. As such, discovering whether there is indeed such a relationship between pay levels and performance levels from an 'on average', company-wide perspective could provide new insights in the effectiveness of current HR-practices. On the other hand, this study could bring new perspectives on the discussion surrounding performance measurement systems. From current literature it is evident that; '*optimal financial performance is the ultimate strategic goal of most organizations*' Shaw, Gupta & Delery (2002). Subsequently, in order to assess this, '*a good financial performance measure should ask how well the firm has generated operating profits, given the amount of invested to produce those profits*' (Bacidore, Boquist, Milbourn & Thakor, 1997). Hence, should such a causal relationship between incentives and performance indeed exist, this study will complement the current theories on both performance measurement systems as well as the importance of human capital to firm performance by assessing the necessity of including a ratio for *return on human capital employed* in today's performance management systems.

Combining these two distinct but related bodies of knowledge, leads to the aforementioned niche where this study can bring its added value. By investigating the relationship between average total labor expenses and performance, as well as, assessing the impact of higher levels of incentives on the average productivity, a clear picture on the proposition that increased benefits outweigh the increased cost can be derived. Ultimately, this study provides an answer to the following research question:

Do organizations with higher total labor expenses per employee generate higher economic performance per employee?

In the following section, a review of the existing body of academic literature on the topic of monetary incentives will be provided. This theoretical framework will identify the different perspectives on the incentive-performance relationship, which will provide a validation for the study at hand. Subsequently, building on these current theories, several hypotheses will be developed which will ultimately provide an answer on the underlying question of this study. Additionally, in sections 3 and 4 the method of research and proposed datasets are discussed. The final sections of this thesis consist of a thorough analysis of the data and enlighten us on the degree to which the proposed hypotheses hold. Based on this analysis, several conclusions are drawn and implications for future research are provided in section 8.

2.0 Literature Review

As we can read from Heyman & Ariely (2004); *'The standard model of labor is one in which individuals trade their time and energy in return for monetary rewards'*. And although, as discussed in the previous section of this study, the effectiveness of this model is to be questioned, it provides a starting point for the review of the existing body of literature. For decades, a wide variety of scholars has been investing massive amounts of time and energy to research the effects of pay on performance and all concepts that are associated with this effect.

In order to provide a thorough framework for analyzing the opposing views on the relationship between productivity and reward, first; the classic economic theory that is at the foundation of the relationship between pay and performance shall be elaborated on and the relating concepts that influence this relationship shall be discussed. Once this classic view has been properly elucidated, the sociological and psychological economic theories that currently oppose the classic view will be described. Subsequently, the theories that attempt to bridge the gap and reconcile the differences between these two opposing views, as well as those that add any additional valuable insight to one of the explored theories and thus complement the theoretical framework, will be discussed. In the subsequent sections 2.1 to 2.4 the described analysis of the existing literature will provide a proper foundation for this study.

2.0.1 Literature Overview

In order to ensure a thorough understanding of the theories discussed in the following sections and properly validate the later findings of this study within the current body of academic knowledge, Tables 1 to 9 present a summary of the academic articles that provided insight for this research. These tables can be found at the end of each subsection where they present a summary of the articles which provided insight for the preceding subsection⁵. Once a specific article summary has been presented, it is excluded from subsequent tables. The aforementioned additional assessment and validation of the results of this study in relation to the current body of academic knowledge is presented in section 7.

Table 1: Literature Summary section 1; Introduction

The table below summarizes the academic articles that provided insight for section 1

Author	Date	Title	Research question	Variables	Time period	Outcomes
Bacidore, J.M., Boquist, J.A., Milbourn, T.T. & Thakor, A.V.	1997	The Search for the Best Financial Performance Measure.	Assesses the ability of EVA to predict abnormal return and the contemporaneous correlation between EVA and abnormal return offset against a refinement of EVA; REVA	Type of firm financing (cost of equity vs. Cost of debt), capital charge, WACC, NOPAT, net income, total shareholder return, market value of equity, market value of interest-bearing-debt, book value of preferred stock,	<1992, 1992-1999	Refined Economic Value Added (REVA) provides an analytical framework for evaluating operating performance measures in the context of shareholder value creation. Statistically, REVA outperforms EVA (. Economic Value Added) with regard to its ability to predict shareholder value creation. Moreover, REVA is a theoretically superior measure for assessing whether a firm's operating performance is adequate from the standpoint of compensating the firm's financiers for the risk to their capital.

⁵ With the exception of tables 1 and 9 which summarize the theories which provided insight for section 1; Introduction and section 3; Hypotheses & Methodology, respectively. Table 1 is presented above in section 2.0.1; table 9 is presented at the end of section 3.2.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Chakravarthy, B.S.	1986	Measuring Strategic Performance.	Which type of traditional measure for evaluating strategic performance is the best?	ROI, ROS, growth in revenues, cash flow/investment, market share, market share gain, product quality relative to competitors, new product activities relative to competitors, direct cost relative to competitors, product R&D, Process R&D, variations in ROI, percentage point change in ROI, percentage point change in cash flow/investment, return on total capital, return on book equity, market to book ratio,	< 1992	Traditional measures for evaluating strategic firm performance are inadequate. No single profitability measure seems capable of discriminating excellence. Strategic performance needs a futuristic measure
Ferguson, R. & Leistikow, D.	1998	Search for the Best Financial Performance Measure: Basics Are Better.	Is REVA a better performance measure than EVA?	Develops a model using variables, i.a.; market value of the firm's total debt, market value of the firm's total equity, pretax cost of debt, the firm's marginal tax rate, cost of equity.	1992-1999	EVA is theoretically superior to REVA. As REVA is inconsistent with the definition of abnormal earnings and dividend discount models, it is inconsistent with finance theory. As such, REVA is an inappropriate measure for financial performance while EVA is.
Heyman, J & Ariely, D.	2004	Effort for Payment: A Tale of Two Markets.	In which way does the relationship between compensation and effort hinge on the distinction between monetary markets and social markets?	Experimental study which included; (Level of) reciprocity, level of knowledge on the type of reciprocity, performance.	2000-2003	When payments are given in the form of gifts, or when payments are not mentioned, effort seems to stem from altruistic motives and is largely insensitive to the magnitude of the payment. In case of cash payments, effort stems from reciprocation motives and is thus largely sensitive to the magnitude of the payment. The distinction in two types of markets is thus vital, as it directly influences the appropriate method of pay.
Lancaster, K.	1958	Productivity-Geared Wage Policies.	What makes for 'successful' possible wage policies under varying conditions of commodity demand and labour supply?	Prices, wages, productivity, supply/demand of labor, elasticity of labor mobility, wage increases.	< 1992	When accepting a wage cost inflation model as a macroeconomic framework, it is possible to determine a wage policy in which wages are geared to productivity changes to preserve a constant price level and a balance in the labor markets of the sectors of the economy.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Schultz, T.W.	1961	Investment in Human Capital.	Investment in human capital accounts for most of the impressive rise in the real earnings per worker.	Macroeconomic review of capital-income and investment ratios. Measuring national economic growth from the perspective of human capital focusing on 5 categories; 1. health facilities, 2. on-the-job training, 3. organized education, 4. study programs for adults, 5. migration of individuals to adjust to changing job opportunities.	< 1992	The most distinctive feature of the economic system is the growth in human capital. Measured by what labor contributes to output, the productive capacity of human beings is now vastly larger than all other forms of wealth taken together. When it is idle, human capital deteriorates as it impairs skills that individuals have acquired.
Venkatraman, N. & Ramanujam V.	1987	Measurement of Business Economic Performance: An Examination of Method Convergence.	Seeking to: 1. Develop a scheme for classifying alternative approaches to measuring BEP, and, 2. Examine the degree of convergence of two different measurement schemes using two different data-analytical frameworks (MTMM & CFA).	Sales growth, net income, ROI	< 1992	The study indicates that treating one particular method of measuring BEP as superior is questionable, as the approaches yielded different insights. However, the advantages of CFA over MTMM is demonstrated.
Zajac, E.J. & Westphal, J.D.	1994	The costs and benefits of managerial incentives and monitoring in large U.S. corporations: When is more not better?	Proposes that; there may be considerable diminishing 'behavioral returns' to increases in monitoring and incentives, such that the contingent relationships may be more logarithmic than linear.	Stock risk, debt-to-equity ratio, accounting risk, compensation contingency, wealth change, CEO ownership, diversification, outsider ratio, outside director ownership, non-director blockholder, CEO/chairman split, log of sales, CEO age, ROA.	< 1992	Firms that are more risky face greater costs when using incentive compensation contracts for top managers, thus reducing the expected level of incentive compensation use for such firms. Firms facing this problem of low incentive compensation use can realize greater benefits from higher levels of board monitoring, and thus are likely to rely more on board monitoring. Firms with more complex corporate strategies face higher costs in using board monitoring and are thus likely to rely less on board monitoring as a source of controlling top management behavior. Within this contingency perspective there may be diminishing 'behavioral returns' to increases in monitoring incentives. All in all, maximum levels of incentives and monitoring are not necessarily optimal and a firm's strategy may not only have significant product/market implications, but also corporate governance implications.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Zhu, J.	2000	Multi-factor performance measure model with an application to Fortune 500 companies.	Is DEA an appropriate way to evaluate business performance from a multi-factor perspective?	Develops a model using various variables including, i.a.; employees, assets, shareholders' equity, revenues, profits, market value, total return to investors, earnings per share, adjustments for size, EPS.	1992-1999	Top-ranked companies by revenue do not necessarily have top-ranked performance viewed as being multidimensional. Decreasing returns to scale (DRS) are uncovered among the relatively large (revenue-top-ranked) companies. Reduction in current levels of employees, assets and equity may actually increase revenue and profit levels. Within the context of performance measures; multifactor analysis seems to be the most appropriate way to objectively measure strategic performance.

2.1 Economic Theory - The 'Classic' view

Basic economic theory dictates: an increase in in the financial incentives provided for an activity will improve performance (Gneezy & Rustichini, 2000). This advocate stems from the assumption that individuals are rational and extrinsically motivated actors (the *homo oeconomicus* (Frey, 1999)) whose reactions to external incentives are predictable and follow the archetypal stimulus-response theory (Weibel, Rost & Osterloh, 2009). The general hypothesis which lies at the foundation of this theory is, according to Bonner & Sprinkle (2002) that; *'incentives lead to greater effort than would have been the case in their absence.'* Although seemingly similar, these two relating theories propose the first and foremost important concept to clarify; can *'effort'* and *'performance'* actually be identified as two sides of the same coin?

As can be read from Bonner & Sprinkle (2002); *'Theoretically, monetary incentives work by increasing effort which, in turn, leads to increases in performance.'* Consequently, a causal relationship is to be assumed between effort and performance, which means that the two concepts are indeed strongly related. In order then to comprehend the initial source of performance, it is of vital importance to touch upon the notion of the *effort construct*. And while going in-depth in the *effort construct* lies beyond the scope of this research a short introduction to the concept is essential for the validation of any findings regarding this topic.

The aforementioned effort construct can, according to Bonner & Sprinkle (2002), be decomposed in 'Direction', 'Duration', 'Intensity' and 'Strategy Development'. According to their research; *'Increases in effort, or 'greater effort' refers to effort either directed toward current performance of the task, which is thought to lead to immediate performance increases, or effort directed toward learning, which is thought to lead to delayed performance increases'* (Bonner & Sprinkle, 2002)⁶. Due to this distinction, the four separate classifications of effort as mentioned above of can be made where; effort direction, effort duration and effort intensity contribute to the changes in current performance and strategy development contributes to changes in learning and hence delayed increased performance (Bettman, Johnson & payne, 1990; Kanfer, 1987; Locke & Latham, 1990). Drawing from these theoretical concepts, Bonner & Sprinkle (2002) propose that various cognitive mechanisms are affected by monetary incentives and consequently influence one or more of the

⁶ Similarly to the *effort construct* itself, the mediators and drivers of the effort-performance relationship fall outside the scope of this study. As such the previously identified causal relationship is henceforth assumed to have a direct and invariable relationship which consequentially allows that, for the remainder of this paper, the terms *'effort'* and *'performance'* will be used interchangeably.

dimensions of effort. The earlier mentioned causal relationship between effort and performance would thus be similarly affected by the cognitive mechanisms that influence these effort dimensions.

In the broad discussion on the aforementioned mechanisms, four predominant theories prescribe how these mechanisms are exactly affected and lead to increased effort; agency theory (expected utility theory), expectancy theory, goal-setting theory and social cognitive (self-efficacy) theory. In order to comprehend the 'Economic View' on performance and pay, these four predominant theories must be further elaborated, with particular focus on the paramount of the four; agency theory, which has emerged in recent years as the principal theory guiding organizational research on the pay-performance relationship (e.g., Gerhart & Milkovich, 1992; Roth & O'Donnell, 1996; Stroh, Brett, Bauman & Reilly, 1996).

Table 2: Literature summary Section 2.1; Economic Theory – the 'Classic' view

The table below summarizes the academic articles that provided insight for section 2.1

Author	Date	Title	Research question	Variables	Time period	Outcomes
Bettman, J.R., Johnson, E.J. & Payne, J.W.	1990	A componential analysis of cognitive effort in choice.	Develops a model for measuring the effort required to execute a decision strategy which suggests that effort is a weighted sum of elementary information processes.	Development of the model included various elementary information processes; Read (reading an alternative value), compare (compare two alternatives), difference (calculate the size of the difference of two alternatives), add (add the values of an attribute), product (weight one value by another), eliminate (remove an alternative attribute from consideration), move (go to the next element), choose (announce a preferred alternative and stop the process).	< 1992	The concept of effort plays a major role in attempts to understand the contingent use of processing strategies. The componential model proposed to approach strategy effort yields strong empirical support and thus provides a good fit for response time and self-reports of effort. The EIP model is thus superior to a behavioral model for assessing strategy effort. However, within the model, the individual EIPs receive significantly different levels of effort.
Bonner, S.E. & Sprinkle, G.B.	2002	The effects of monetary incentives on effort and task performance: theories, evidence and a framework for research.	Provides a conceptual framework for understanding the effects of monetary incentives on individual effort and performance as well as mediators of the incentive-effort relation.	Elaborate review of academic studies conducted by a variety of scholars regarding the effects of (performance-contingent) monetary incentives. Discusses the effort construct, various theories which explain the effects of incentives, variables which affect this relationship (personal, task, environmental, incentive scheme).	2000-2003	Various findings with respect to the manner in which the variables; person, task, environmental and incentive scheme affect the effort construct. Explicit performance targets seem to have additive positive effects on effort and performance over monetary incentives. Overall, monetary incentives do affect effort, which affects the output of a given task but this relationship is mediated by cognitive mechanisms and person specific variables.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Gneezy, U. & Rustichini, A.	2000	Pay enough or don't pay at all.	Which claim regarding monetary incentive holds; that made by economists who argue that monetary incentives improve performance, or that of the psychologists who claim that the opposite may happen?	Various (laboratory) experiments in which participants took part in an IQ test for which they received either nothing or a certain monetary reward.	1992-1999	The effect of monetary compensation on performance is not monotonic. If money is offered, a larger amount yields higher performance, however, offering money does not always produce an improvement. Individuals who are offered monetary incentives performed more poorly than those who were offered no compensation. Contracts, social or private, are usually incomplete and regulate an interaction in a situation of incomplete information. The behavior produced by the contract is a response to the combination of a payoff structure and information on this structure. Given the outcomes of the study, the rule that 'a small payment is better than nothing' might not hold.
Roth, K. & O'Donnell, S.	1996	Foreign subsidiary compensation strategy: An agency theory perspective.	Which type of compensation strategies is most appropriate for supporting managers of foreign subsidiaries within a global industry context?	Senior management pay mix, market positioning, subsidiary pay mix, salary adjustment criteria.	1992-1999	Compensation strategy is influenced by the agency problem, defined by the subsidiary's cultural distance from its headquarters market, lateral centralization, and senior management's commitment to the parent. Incentive structures aligned to the agency state were positively related to subsidiary effectiveness. Compensation strategy was found to have a strong impact on perceived subsidiary effectiveness which suggests that reconfiguring the compensation strategy of a multinational corporation can be effective.
Stroh, L.K., Brett, J.M., Bauman, J.P. & Reilly, A.H.	1996	Agency theory and variable compensation strategies.	Investigates the effects of organization-level agency-theory-based variables on the proportion of variable compensation that managers receive.	Organizational performance, organizational size, experience, organizational tenure, job tenure, education, level, chemical, financial, pharmaceutical, retail, hotel, communications, consumer products, task programmability, turbulence, expected length of agency relationship.	< 1992	Level of task programmability is associated with an increased use of variable pay, and long-term relationships between an agent and principal are associated with decreased use. Results supported the classical organization-theory prediction that under higher risk, organizations use higher proportions of variable pay; but results question agency theory's ability to predict compensation strategy for middle-level managers in the high-risk situation.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Weibel, A., Rost, K. & Osterloh, M.	2009	Pay for performance in the public sector-benefits and (hidden) cost.	To which conditions is the impact of pay for performance on performance bound in either a negative or positive way, if at all?	Meta-analytic review of past experimental studies including measures, i.a.; Additional performance, locus of control, performance-contingent pay, intrinsic motivation, extrinsic motivation, realistic vignettes, gender, year of birth, length of employment, complexity of knowledge in current work.	<1992, 1992-1999, 2000-2003, 2004-2008	Pay for performance has a strong positive effect on performance in the case of noninteresting tasks. Pay for performance, however, tends to have a negative effect on performance in the case of interesting tasks and thus negatively affects personal efforts. This method of pay causes a cognitive shift, that is, it strengthens extrinsic motivation for behavior and at the same time weakens intrinsic motivation for behavior (crowding-out effect). Depending on the strength of these two opposing effects, pay for performance either hurts or promotes personal efforts. Motivation is likely to be a key influence on the effect of performance-related pay on performance. Pay for performance is generally more costly as it appears because it almost always produces hidden cost of rewards.

2.1.1 Agency theory

Ross (1973), already identified that; *'the relationship of agency is one of the oldest and most common codified models of social interaction.'* Fundamentally, agency theory describes the situation in which a relationship exists between two (or more) parties where one, the *agent*, acts (as a representative) for, or on behalf of the other, the *principle*, in a particular domain of decision problems (Ross, 1973). This particular domain of decision problems creates the responsibilities of the agent within the principal-agent contract, which, in standard agency theory is measured in terms of maximizing *principal's* outcomes (Bergen, Dutta & Walker, 1992).

Various scholars that studied the agency relationship have identified three fundamental behavioral assumptions underlying agency theory: that both parties are (1) rational and (2) self-interested, and that the agent is (3) both effort- and risk averse. (e.g., Baiman, 1990; Jensen & Meckling, 1976; Levinthal, 1988). Bonner & Sprinkle (2002) add to these assumptions that the individuals involved have well-defined preferences, confirming to the axioms of expected utility theory. As such, it comes quite natural to economists that agents generally choose activities yielding the highest private returns (Acemoglu, 1995). Moreover, as we can read from Bloom & Milkovich (1998); *'The agent's rational self-interest and effort aversion create the potential for moral hazard.'* This 'moral hazard' stems from the conflict between the self-interested, effort-averse agent and the principle whose fundamental goal is to maximize organizational performance. This situation is commonly referred to as the agency problem, on which Bloom & Milkovich (1998) argue; *'In the employment relationship, the basic agency problem is characterized in terms of structuring monitoring and compensation systems so that they will induce self-interested, utility-maximizing, risk-and-effort-averse agents to act on the behalf of principles who want to increase the value and performance of their firms.'* The monitoring systems involved to reconcile the agency problem essentially focus on the principal's ability to observe or constrain the agents'

actions, whereas the compensation systems attempt to affect the behavior of the agent in order to align the interest of the agent with those of the principle (Jensen & Meckling, 1976).

In assessing the agency problem, particularly the assumptions of self-interest and risk-averseness of the agents deserves proper attention. Bonner & Sprinkle (2002) identify that self-interest means that agents will not exert any effort on a task unless it somehow contributes to their own economic well-being and that increases in effort require an equal increase in perceived attractiveness of the agents' economic well-being. Moreover, as Deckop, Mangel & Cirka (1999) argue; *'Agency theory starts with the assumption that employee and employer interests naturally diverge'*. Combining these two views, it seems that agency theory (and by extend the generally used economic control frameworks (Deckop, Mangel & Cirka, 1999)), implicitly assumes that an agent's actions will have a negative effect on the principle while the actions *desired* by the principle will ultimately have a negative effect on the agent. It is in this peculiar spectrum that monetary incentives seem to find their essential place to reconcile the differences between agent and principle and the reason for scholars to offer this theory in support of financial incentives representing the economic approach to human behavior (Young, Beckman & Baker, 2012).

The basic concept of the risk-averseness assumption is that agents will exert less effort when they perceive some type of variability (risk) in their compensation. This concept is heavily related with both performance-pay schemes and the (partial) transition of business risk from the principal to the agent (two concepts which are intertwined). The transition of business risk is primarily encountered in principal-agent relationships where the principal attempts to align the objectives and measurements of success of both parties and to align the actions of the agents with the desired organizational outcomes. One way of doing so is by offering some form of incentive pay, as much of the recent agency-based compensation research has found (Baker, Jensen & Murphy, 1988; Baker, 1992; Jensen & Murphy, 1990; Tosi, Katz & Gomez-Mejia, 1997, Mason & Watts, 2012). Incentive pay is particularly used to align agents' interests when low task programmability and information asymmetries make it more difficult to monitor agents' effort (Jensen & Murphy, 1990; Kren & Kerr, 1993). However, the same agency-based compensation research that proposes these systems has been overlooking the considerations of risk and has almost exclusively focused on effort-aversion and investigating the efficacy of incentive pay for aligning agents' behavior with that of the required output for the principal (Bloom & Milkovich, 1998). This indicates a peculiar blind spot in current academic research as the potential negative effect of various types of risk (such as decreased employment security) is not explicitly considered in the general interpretations of agency theory, yet it may exert a strong influence on agents' behavior (Bloom & Milkovich, 1998). Especially since higher business risk may reduce or negate an agent's incentives, even though the agent is working to achieve the principal's objectives. Similarly, when business risk is higher, greater use of incentive pay may become dysfunctional for directing managers' behaviors; as it imposes a continuous growth in risk (Bloom & Milkovich, 1998).

One way to mitigate this potential diminish in performance is by providing some kind of insurance that helps to protect their interests which, according to classic agency theory, will allow agents to accept greater risk (Conlon & Parks, 1990; Holmstrom, 1987). In practice, this required insurance is provided by a higher base-pay-rate (Baiman, 1990), which increase an agent's wealth. Moreover, this adheres to the internal labor

markets theory of Osterman (1992) that higher pay levels in exchange for reduced stability in an individual's employment and future income should be provided. Such increase in base pay levels are considered a *risk-premium*, which must be paid due to the agent's risk-averse nature when monetary incentives are based on imperfect surrogates of behavior (Bonner & Sprinkle, 2002).

Summarizing the discussion above is the general quest in classic definitions of agency theory (by e.g., Eisenhardt, 1998; Jensen, 1983; Levinthal, 1988) that the optimal compensation systems seek to balance the agent's effort and risk aversion. A balance which is generally achieved by finding the optimal equilibrium between base pay and incentive pay, that is necessary to induce the agent to act in the principal's best interest while at the same time accounting for the performance diminishing aversion to risk (Baiman, 1990).

Table 3: Literature summary Section 2.1.1; Agency Theory

The table below summarizes the academic articles that provided insight for section 2.1.1

Author	Date	Title	Research question	Variables	Time period	Outcomes
Acemoglu, D.	1995	Reward structures and the allocation of talent.	How do reward structures assist in the proper allocation of talent between productive and unproductive activities?	Agents, investment cost, revenues, productivity, type of activity (unproductive/productive).	1992-1999	Returns on productive activities depend on the amount of unproductive activities in the economy and hence, the reward structure that determines the allocation of talent is also endogenous. Unproductive activities reduce the marginal productivity of investment and the relative return of entrepreneurship, which creates the possibility for a multiplicity of equilibria where the unproductive activities themselves make these activities more attractive.
Baiman, S.	1990	Agency research in managerial accounting: A second look.	What implications does recent agency literature have for managerial accounting research?	Literature study reviewing three distinct branches; principle-agent model, transaction cost economics model, Rochester model.	< 1992	In all agency models, individuals are assumed to be motivated by self-interest and all three branches provide similar frameworks for analyzing the interaction of self-interested individuals within an economic context. Emphasizing different sources of divergence between self-interested and cooperative behavior, as well as emphasizing different aspects of a common research agenda, is what makes each branch unique in dealing with the agency problem.
Baker, G. P.	1992	Incentive Contracts and Performance Management.	Under what circumstances do incentive contracts provide efficient outcomes and what are the characteristics of an optimal contract based on alternative performance measures?	Develops a model containing several factors, including e.g.; agent's payoff, risk attitude, utility, total firm value, effort, revenue.	< 1992	Contracts based on performance measures that do not adhere to the principle's objective will not provide the first-best incentives, even when the agent is risk neutral. The form of the optimal contract and the efficiency of this contract depend on the relationship between the performance measure used and the principle's objective. Incentive contracts based on the total value of the organization, such as partnerships and stock ownership, will dominate when information asymmetries are great and no good performance measure exist.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Baker, G.P., Jensen, M.C. & Murphy, K.J.	1988	Compensation and incentives: Practice versus theory.	What are the discrepancies between current economic theory and practice and how can this disassociation be explained?	Literature study reviewing several issues on compensation including; objective vs. subjective performance measures, promotion-based incentive systems, tournament vs. tenure and up-or-out systems, profit sharing plans, etc.	< 1992	Economic models might not fully capture some aspects of human behavior that is understood by psychologists, behaviorists, human resource consultants and personnel executives or the practitioners are simply adopting policies that sacrifice organizational efficiency for egalitarian pay systems. Both the intellectual profits as well as the organizational efficiencies to be gained from focusing on the compensation puzzle will make future research worthwhile.
Bergen, M., Dutta, S. & Walker, O.C., Jr.	1992	Agency relationships in marketing: A review of the implications and applications of agency theory and related theories.	Analysis of the basic content of agency theory and critical review of its past and potential future applications for marketing.	Variables used in the literature under analysis included; risk aversion, environmental uncertainty, types of salespeople, task programmability, opportunity cost of a salesperson's time, behavior-control systems, salary vs. commission, compensation, motivation preference, profits, resale prices, trademark value, advertising volume, information asymmetry.	< 1992	Agency theory contributes much to the understanding of a wide range of marketing issues. The general principle that underlies all suggestions made is that agency theory proves most useful for examining situations characterized by factors that make contracting and controlling the performance of the agents especially difficult. Agency theory provides significant guidance to assess situations involving; 1. substantial goal conflict, 2. sufficient environmental uncertainty to trigger the risk-sharing implications of the theory, 3. substantial information asymmetries, 4. difficulty in evaluating performance.
Bloom, M. & Milkovich, G.T.	1998	Relationships among Risk, Incentive Pay and Organizational Performance .	Does risk influences the use of base and incentive pay and does it moderate the relationship between incentive pay and firm performance?	Business risk (both systematic and unsystematic) measured as price variation on ROA/stock returns, Compensation, TSR (Total Shareholder Return), Ownership (based on SEC-filings), total assets, net sales, common equity, number of employees	1992-1999	Organizations facing higher risk do not place greater emphasis on short-term incentives. Higher-risk firms that relied on incentive pay exhibited poorer performance than higher-risk firms that did not emphasize incentive pay. As such, the employment contract is more complex than it has been depicted and considering risk is considerably more important. Higher base pay is positively related to firm performance.
Conlon, E.J. & Parks, J.M.	1990	Effects of monitoring and tradition on compensation agreements: An experiment on principal-agent dyads.	How do the main and interactive effects of monitoring and tradition change over time?	Tradition, Monitoring, Contingent pay, Earnings, Negotiations, Information	1992-1999	The ability of a principal to monitor an agent decreased the use of performance-contingent pay. The existence of a pay tradition can inhibit the economically rational thinking agency theory assumes. These effects of tradition are relatively powerful and unlikely to diminish over time.
Deckop, J.R., Mangel, R. & Cirka, C.C.	1999	Getting more than you pay for: Organizational Citizenship Behavior and Pay-for-Performance Plans.	Does value alignment moderate the impact of pay for performance on extra role behaviors?	Organizational Citizenship Behavior (measured by a 9-item questionnaire), Pay-performance link (measured by a subjective survey), procedural justice, gender, age, education, unionization.	1992-1999	Employees, who are low in value commitment, appear to perceive pay-for-performance as a disincentive to engage in OCB. Value-committed employees are encouraged by pay-for-performance to engage in OCB.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Eisenhardt, K.M.	1989	Agency theory: As assessment and review.	What is agency theory and what does it contribute to organizational theory?	Variables used in the literature under analysis included, i.a.; manager vs. owner controlled, management's equity options, decentralization, information systems, cost of outcome measures, length of selling cycle, SG&A, employee stock options.	< 1992	Agency theory offers a unique insight into information systems, outcome uncertainty, incentives and risk. Moreover, it is an empirically valid perspective, particularly when coupled with complementary perspectives.
Jensen, M.C.	1983	Organization theory and methodology .	Why do organizations take the form they do and behave as they do?	Discusses i.a.; choice of definitions, tautologies, analytical techniques, types of evidence	<1992	Accounting is an integral part of the structure of every organization. A fundamental understanding of why accounting practices evolve as they do and how to improve them requires a deeper understanding about organizations than now exists in the social sciences.
Jensen, M.C. & Meckling, W.	1976	Theory of the firm: Managerial behavior, agency cost and ownership structure.	How does the theory of the firm and concepts such as; separation of ownership and control, 'corporate objective functions', optimal capital structures and the completeness of markets problem relate?	Development of the model included, i.a.; optimal scale, monitoring and bonding activities, agency cost, expenditures, capital structures, cost of debt.	< 1992	The level of agency costs depends among other things on statutory and common law and human ingenuity in devising contracts. Both the law and the sophistication of contracts relevant to the modern corporation are the products of a historical process in which there were strong incentives of individuals to minimize agency costs.
Jensen, M.C. & Murphy, K.J.	1990	Performance pay and top-management incentives.	Do public and private political forces impose constraints that reduce the pay performance sensitivity?	Change in shareholder wealth, pay-performance sensitivity, CEO fractional ownership, market return	<1992	The relation between CEO wealth and shareholder wealth is small and has fallen by an order of magnitude in the last 50 years.
Kren, L. & Kerr, J.L.	1993	The effect of behavior monitoring and uncertainty on the use of performance-contingent compensation.	Examines the effects of control system characteristics and perceived environmental uncertainty on the relative use of performance-contingent compensation.	Specific action controls, decision controls, personnel controls, information system controls, proportion of performance-contingent compensation, monitoring, uncertainty, information systems	<1992	Monitoring ability is negatively associated with the use of performance-contingent compensation. Monitoring is found to moderate the relationship between uncertainty and compensation system design. Whereas in non-monitoring firms, higher levels of uncertainty are associated with increased use of performance-contingent compensation, in monitoring firms, higher levels of uncertainty are associated with decreased use of performance contingent-compensation.
Levinthal, D.	1977	A survey of agency models of organizations.	Characterization and criticism of the agency model research.	Mathematical approach to agency theory, incorporating i.a.; time, expected revenue, required wage, monitoring, effort vs. outcome.	< 1992	Agency models constitute the response of conventional microeconomic theorists to the gaps left by the conventional neoclassical theory of the firm. The major weakness of the current body of work remains to be its reliance on the agent's disutility of effort as the source of incentive problems.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Mason, W., Watts, D.J.	2012	Financial Incentives and the 'performance of crowds'.	How can financial incentives be used to motivate workplace performance in a crowd-source setting?	Gender, geographical region, income level, time, accuracy.	2009-2012	Increased financial incentives increase the quantity but not the quality of the work performed. This difference seems to be due to the 'anchoring' effect: workers who are paid more also perceive the value of their work to be greater and thus are no more motivated than workers who are paid less. Details of the compensation scheme do matter, specifically a 'quota' system which results in better work for less pay than an equivalent 'piece rate' system.
Ross, S.A.	1973	The Economic Theory of Agency: The Principal's Problem.	How to embed agency theory in a general equilibrium market context?	Utility functions, uncertainty, Pareto efficiency theory, and risk.	< 1992	For various utility functions as well as a broad range of payoff structures, the need to motivate agents does not conflict with the attainment of Pareto efficiency. However, as most agent-principle relationships interact with asymmetric information, the optimal solution cannot be derived in this way.
Tosi, H.L., Katz, J.P & Gomez-Mejia, L.R.	1997	Disaggregating the Agency Contract: The Effects of Monitoring, Incentive Alignment and, Term in Office on Agent Decision Making.	Do differential effects of incentive alignment and monitoring on agent decisions occur?	Profit-maximizing strategy, monitoring (high/low), incentive alignment (high/low), term in office (long/short), escalation of previous decision.	1992-1999	Incentive alignment is a more powerful mechanism than monitoring for ensuring that agents act in the best interest of the owners. An interaction of monitoring, incentive alignment and term in office revealed that these effects are relatively complicated and deserve further study. Incentive alignment has a beneficial effect for the principal for long-term CEOs even though the tendency to escalate (negative effect for principals) was greatest for those agents.
Young, G.J., Beckman, H. & Baker, E.	2012	Financial incentives, professional values and performance : A study of pay-for-performance in a professional organization.	What is the effect of financial incentives on performance in a professional organization, taking into account the conflicting theories of agency and professional control?	Performance (various years), work autonomy, goal importance, practice size, specialty, financial incentive,	1999, 2000-2003, 2004	Performance improves following the introduction of an incentive. Simultaneously, psychologically based attitudes towards the incentive program regarding its impact on an individual's own work autonomy and the importance of the performance goals moderated the effect of the incentive on performance. Agency theory and professional control are complementary theoretical perspectives for understanding how professionals will respond to the imposition of performance-related incentives. In terms of practice, PFP programs aimed at professional organizations should be designed to take into account the values and goals of an organization's professionals to maximize the effect of financial incentives on performance.

2.1.2 Expectancy theory

Vroom (1964) was one founding fathers of expectancy theory, which proposes that individuals strive to maximize the expected satisfaction that the outcomes of a certain effort yield. The theory basically hypothesizes that an individual's motivation to exert effort in a particular situation or task, is a direct function of two separate factors; First the expectancy about the relationship between effort and a particular outcome of this effort (the effort-outcome expectancy⁷), and second, the attractiveness of this outcome (Vroom, 1964). Solving the equation of these two factors, it leads to the overall concept that individuals are motivated to choose a certain level of effort depending on their belief that it will lead to a desired outcome.

The generally used measurable outcome; monetary incentives, generate an effect which Bonner & Sprinkle (2002) argue to be twofold. First, the outcome of interest is a financial reward which generally has a higher valence than receiving no financial incentive. As such, expectancy theory adheres to the classic economic view. Second, the expectancies themselves are higher under monetary incentives due to the stronger links among effort, performance and pay. Looking at these two effects, expectancy theory suggests that an individual's motivation and the subsequent degree of effort are presumably higher when compensation is based directly on performance⁸. This effect is, due to both the increased attractiveness of the outcome as well as the increased expectancy about the effort-outcome relationship.

One particular issue that Bonner & Sprinkle (2002) identify, however, is that since economic theory suggests that most individuals have diminishing marginal utility for wealth, increasing rewards may decrease motivation and performance over time, as further increases in wealth have less value. If this particular concept holds, it provides validation (albeit a weak one) for the social theories that oppose the economic view.

Table 4: Literature summary Section 2.1.2; Expectancy Theory

The table below summarizes the academic articles that provided insight for section 2.1.2

Author	Date	Title	Research question	Variables	Time period	Outcomes
Bailey, C.D., Brown, L.D. & Cocco, A.F.	1998	The Effects of Monetary Incentives on Worker Learning and Performance in an Assembly Task.	What are the effects of common incentive schemes vs. Fixed pay on the components of performance during the learning phase of a production run?	Overall performance (=units assembled/hours), fixed pay, piece-rate, goal-contingent, number of direct labor hours to produce Xth unit, number of direct labor hours to produce the first unit, learning index (slope)	1992-1999	Incentives that do not reward improvement directly may not enhance learning. Findings suggest that monetary incentives can influence 'operator performance' by increasing concentration at the start, resulting in better initial performance. Moreover, both overall and initial performance are higher in the incentive-pay groups.

⁷ A deeper analysis of this factor leads to a separation between *effort-performance expectancy*, *performance-evaluation expectancy* and *evaluation-outcome expectancy* as was studied by Naylor, Pritchard & Ilgen (1980). This particular separation, however, falls outside the scope of this research but should be noted when studying workplace processes that deal with performance evaluation.

⁸ A notion which has also come to be known as path-goal theory which assumes that when individuals perceives some positive connection between their job behavior and a certain reward they value, their behavior will be motivated and their effort will be expended (Schneider & Olson, 1970). Based on the work of earlier scientists (e.g. Lawler & Porter, 1967; Galbraith, 1968), this connection has come to be known as the 'perceived effort-reward probability'.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Goerg, S.J. & Kube, S.	2012	Goals (th)at work; Goals, monetary incentives and workers' performance.	How do differently set goals, monetary incentives and work performance relate?	Time, accuracy, exogenous goals, personal goals, piece rates, attained goals, age, gender, ability.	2009-2012	The use of personal work goals leads to a significant output increase. The positive effect of goals not only prevails if these goals are self-chosen by workers, but also if goals are set exogenously by the principal. However, in this latter case, the exact size of the goals plays a crucial role. The positive effect of self-chosen goals persists even if the goals are not backed up by monetary incentives. Goals are also more optimistic in the absence of monetary consequences. Higher goals cause individuals to work faster, decreasing the average time spend on a task and hence, increasing the output. This positive effect decreases when goals become more unattainable.
Schneider, B. & Olson, L.K.	1970	Effort as a correlate of organizational reward system and individual values.	An examination of the relationship between satisfaction and effort, based on the degree to which pay satisfaction leads to greater effort.	Effort & performance (supervisory survey), rewards (both intrinsic and extrinsic), tenure.	< 1992	Findings from the study support the effort-reward model of behavior. Differences in actual reward policies between organizations result in differential effort. Effort is highest in organizations where it is rewarded with pay, moreover, individuals who most highly value pay are those that work hardest allowver. Those individuals who most highly value intrinsic rewards, satisfaction with pay for high effort allows for self-reinforcement.

2.1.3 Goal-setting theory

Bonner & Sprinkle (2002) argue that; *'While neither expectancy theory nor agency theory provides much information about the cognitive mechanisms whereby motivation created by monetary incentives leads to changes in effort, Goal-setting theory and social-cognitive theory add further richness to these fundamental ideas.'* As such, the work of Locke & Latham (1990) on Goal-setting theory provides additional insight into the way in which individuals alter their behavior upon being confronted with monetary incentives.

In essence, Goal-setting theory (e.g. Locke & Latham, 1990; Goerg & Kube, 2012) proposes that personal goals are the primary determinant of effort and using personal goals in a professional setting lead to significant output increases. The distinct difference between expectancy theory and goal-setting theory is that, where expectancy theory focuses on the expected outcome of a certain action by an individual, goal-setting theory proposes that effort is exerted based on the goal itself. As such, contrary to expectancy theory, the expectancy of achieving the goal and the associated valued outcome does not play a role in goal-setting theory. And while the argument is made that challenging goals will lead to greater effort exerted than those that are easily obtained (Locke & Latham, 1990), even when these goals are not enforced by monetary incentives (Goerg & Kube, 2012), the theory also recognizes that these personal goals may differ from those set by the organization with which the individual interacts. As such, in Goals-setting theory the classic agency-problem as

previously discussed can be identified. Moreover, it proposes that goals in general can only be stimulant to the incentive-induced effort increases as both personal and organizational goals can be effectively aligned⁹.

In order to overcome this issue, Goal-setting theory proposes several possible ways in which monetary incentive affect an individual's effort (Locke & Latham, 1990). First, monetary incentives put forth by an organization may entice people to set goals when they otherwise would not. Second, the goals set might be more challenging than those set without monetary incentive and finally, monetary incentives might generate stronger goal commitment. The latter can, according to Bailey, Brown & Cocco (1998) also be reinforced by not only thriving on individual preferences, but also by the power of authority and assigning the according incentive scheme. And while it might still be unclear which of the above generates the strongest effect, it is obvious that Goal-setting theory provides a description of the effect of incentives on effort that goes beyond their effects on expectancies and outcomes (Bonner & Sprinkle, 2002).

2.1.4 Social-cognitive theory

Building upon many of the concepts previously introduced, social-cognitive theory (Bandura, 1991) proposes self-regulatory cognitive mechanisms that relate to effort. Expanding on both expectancy theory and goal-setting theory; social-cognitive theory introduces the concept of self-efficacy, or, the individual's belief about whether he or she can execute the actions needed to attain a specific level of performance (e.g. Elias, Barney & Bishop, 2013). Self-efficacy, which is assumed to help individuals regulate their effort towards a certain task, can thus be seen as an additional and supporting concept in the theories previously described as it can affect all four dimensions of effort (direction, duration, intensity and strategy-development; Bonner & Sprinkle, 2002). Moreover, an indirect effect on effort can be observed as self-efficacy is believed to impact goal levels and commitment. Due to these widely varying effects, social-cognitive theory argues numerous factors to influence the incentive-effort relationship, making it a more complicated theory than those described above. In an attempt to clarify the relationship between incentives and effort according to social-cognitive theory, Bandura (1991) proposes the following cause and effect relationship; Incentives lead to increased task interest and, consequently, to increased effort. In turn, increased effort generally leads to improved performance, greater skill on the task and increased self-efficacy. This increase in self-efficacy can subsequently flow back to effort, increasing the performance of the individuals under assessment. One important thing to note here is that Bandura (1991) explains us that the motivation that stems from self-efficacy is only achieved in situations where there are multiple reactions between individual and organization. In cases with one-time interactions, expectancy theory must be used as a proxy for social-cognitive theory as the individual receives no additional information on the degree to which it is achieving the desired outcome.

⁹ Controversially, results from behavioral economics suggest that monetary incentives can lead to a crowding-out effect (a concept which will be explained in a later section of this paper) when the agents are mission-oriented (i.e. their primary concern is achieving the organizational goals), rather than self-interested (Bengtsson & Engström, 2012). While these findings support the need for personal-organizational goal alignment, the proposed crowding-effect seems to be the exact opposite of the effect found by Goal-setting theory.

Table 5: Literature summary Section 2.1.4; Social-Cognitive Theory

The table below summarizes the academic articles that provided insight for section 2.1.4

Author	Date	Title	Research question	Variables	Time period	Outcomes
Bandura, A.	1991	Social cognitive theory of self-regulation.	Analysis of the structure and mechanisms of self-regulation.	Broad discussion on the characteristics of self-regulation, including; structure, sub functions, mechanisms, impact.	< 1992	Self-regulatory mechanisms play a paramount role in human motivation and action across diverse realms of functioning. Self-regulation is a multifaceted phenomenon operating through a number of subsidiary cognitive processes including self-monitoring, standard setting, evaluative judgment, self-appraisal, and affective self-reaction. Cognitive regulation of motivation and action relies extensively on an anticipatory proactive system rather than simply on a reactive negative feedback system. The human capacity for forethought, reflective self-appraisal, and self-reaction gives prominence to cognitively based motivators in the exercise of personal agency.
Elias, S.M., Barney, C.E. & Bishop, J.W.	2013	The treatment of self-efficacy among psychology and management scholars.	Do work self-efficacy beliefs fully mediate the relationship between generalized self-efficacy beliefs and the work-related outcomes under investigation?	Generalized self-efficacy, work efficacy, LMX, learning.	2009-2012	The relationships between generalized self-efficacy and LMX and learning are each fully mediated by work self-efficacy beliefs. As such, it should be thought of as a distal variable that affects work-related outcomes through its influence on work self-efficacy beliefs.

2.1.5 Concurring theories

While the theories described above are perhaps the most prominent, they are certainly not the only theories that attempt to explain the effort-incentive relationship. Expanding on the idea that increased pay levels have a positive effect on an individual's performance, Social exchange theory (e.g. Molm, Takahashi & Peterson, 2003; Cropanzano & Greenberg, 1997; Gardner, Dyne & Pierce, 2004) attempts to clarify the underlying social constructs that drive this behavior. Molm, Takahashi & Peterson (2003) argue there is a certain *exchange relationship* between actors in any given relationship (in case of a business environment; agents and principles) which thrives on three distinct assumptions; (1) actors provide more to each other through exchange, (2) actors are motivated to obtain more of the outcomes that they value and others control, and (3) exchanges between actors recur over time. Cropanzano & Greenberg (1997), who assumed the existence of similar factors in the *exchange relationship*, reason that social exchange theory thus predicts a reciprocal response (increased performance) of an actor given that the other actor decided to increase the level of benefits (increased monetary incentives) as this would constitute a relationship which is deemed *fair* by both parties. Gardner, Dyne & Pierce (2004), expand on this idea by indicating that the sole assumptions of social exchange theory alone are not enough to constitute a sustainable positive effect between incentives and performance. An additional construct that intervenes in this relationship, Gardner, Dyne & Pierce (2004) argue, is organization-based-self-esteem (henceforth OBSE) which is an individual's perceived value as a member of a specific organization. The concept reflects a subjective assessment of personal adequacy and worthiness as an

organizational member and is directly related to an individual's experiences within a specific organization Gardner, Dyne & Pierce (2004). Supporting the earlier findings of Korman (1976) and Judge & Bono (2001), Gardner Dyne & Pierce (2004) found that OBSE has significant positive effects on employee performance and thus mediates effectively mediates the effects of pay level on employee performance. As such, it seems obvious that increasing the perceived level of OBSE of an individual (the agent) should be a primary concern for organizations (principle). Milkovich & Milkovich (1992) as well as Thierry (2001) found that pay levels are a strong driver behind OBSE by being a 'message' from the principle that the agent has a certain *value* to the organization. Since an important part of an individual's perceived value is created by such external indications, pay levels (in delivering this message) affect one's perception of individual value which then has a positive effect on one's self-esteem. Concluding, Gardner, Dyne & Pierce (2004) argue that; *'Pay level is one key indicator of employee value to the organization and thus it strengthens employee organization-based self-esteem that then affects future job performance.'*

Drawn from the initial concept of the classic economic view and adhering to the fundamental assumption that monetary incentives improve overall performance (Bailey, Brown & Cocco, 1998) as well as the assumption that one of the strongest determinants of employee attitudes, motivation and behaviors is compensation (Gerhart & Milkovich, 1992), various scholars have developed theories on optimizing this incentive-performance relationship. Studies covering *pay dispersion, pay distribution, Pay-for-Performance plans, etc.* have received a fair amount of attention over the past decades (e.g. Gerhart & Milkovich, 1992; Shaw, Gupta & Delery, 2002; Weibel, Rost & Osterloh, 2009; Mason & Watts, 2012; Trevor, Reilly & Gerhart, 2012; Jordan, 2010; Lambert, Larcker, Wiegelt, 1993; Wallace, 1997; Booth & Frank, 1999; Zedelius, et al., 2012), heavily leaning on the idea that the compensation system of any organization is one of the most significant human resource management systems for ensuring an effective strategy implementation (Montemayor, 1996). As many of these theories implicitly assume that the classic economic view holds, it is vital for the sake of completeness on this particular body of literature to discuss the most prominent of these theories.

Lazear (2000) who is one of the frontrunners of the economic view, as made clear by his statement that; *'Claims by sociologists (Deci, 1971; Lepper et al., 1973) and others that monetizing incentives may actually reduce output are unambiguously refuted by the data'*, provides us with a perspective on one of the more dominant theories concerning the pay-performance relationship. His work on the effectiveness of various pay-schemes, more specifically; the difference in worker effort between a piece-rate scheme and an hourly wage schedule, provides great insight for organizations that wish to optimize their pay-schemes to best fit their needs. Concluding that; *'Because a piece rate allows the more able to work harder and receive more from the job, and because hourly wage does not, more able workers prefer piece rates'*, Lazear (2000) makes clear that companies should decide for themselves to which category their workers belong and hence, which pay-scheme would optimize their effort. This might also explain why Gomez-Mejia & Balking (1989) found *'considerable evidence that merit pay programs generally fail to produce the motivation effect expected of them'*, a similar argument made by Lawler (1987). An important final conclusion that Lazear's (2000) research drew, however,

is that the theories put forth imply that average worker ability and the average output per worker should increase when an organization opts for the piece-rate scheme as compared to the hourly wage rates (Lazear, 2000). The view put forth by Lazear (2000) adheres to the significant body of literature which supports the common assumption that performance-contingent monetary incentives increase individual performance (e.g. Locke et al. 1980; Weibel, Rost & Osterloh, 2009; Mason & Watts, 2012). Moreover, while it has been argued by e.g. Young & Lewis (1995) that there is no definitive guidance for choosing the proper compensation scheme as there is no consensus yet on the 'best' one and evidence from comparing the effects of various incentive structures on overall performance is mixed¹⁰, it is generally assumed that incentive pay schemes *are* positively related to economic return (Bloom & Milkovich, 1998). Since these systems propose that individuals who generate more output receive higher rewards, it flows naturally from the initially proposed incentive-performance relationship that these individuals have the possibility to obtain increased monetary incentives. As such, these theories as well effectively support the classic economic view.

Table 6: Literature summary Section 2.1.5; Concurring Theories

The table below summarizes the academic articles that provided insight for section 2.1.5

Author	Date	Title	Research question	Variables	Time period	Outcomes
Booth, A.L. & Frank, J.	1999	Earnings, Productivity and Performance-related pay.	What is the effect of PRP on productivity in relation to the cost for the average and marginal firm of using PRP?	Performance-related-pay, Individual characteristics (including; gender, age, race, etc.), educational degree, firm size, unionization	1992-1999	Jobs with performance-related-pay attract workers of higher ability and induce workers to provide greater effort. The earnings differential equals the average productivity gains from PRP, net of monitoring cost at the marginal firm using PRP but not of the disutility of effort. The marginal firm using PRP has higher monitoring cost than the average firm using PRP.
Gardner, D.G., van Dyne, L. & Pierce, J.L.	2004	The effects of pay level on organization-based self-esteem and performance: A field study.	Is there a relationship between pay level and subsequent employee performance? Is there a relationship between pay level and organization-based self-esteem? Does organization-based self-esteem link pay level with performance?	Total compensation, employee evaluations on personal adequacy and worthiness, supervisory performance reviews, tenure.		Pay level affects employee self-esteem, which in turn, affects employee performance. The study found no relationship between change in pay and subsequent performance.

¹⁰ Various discussions on this topic are currently ongoing; Shaw, Gupta & Delery (2002) emphasize the theoretical disagreement between scholars on the most effective manner to distribute monetary incentives and find no concrete answer to the question whether it is more strategically valuable to disperse or compress compensation systems. Konrad & Pfeffer (1990) found in their study on performance related pay-schemes that while most of these reward systems increase a workers expected utility (and hence performance) the strength of this relationship is diminished quite vividly in the presence of uncertainty whereas Gerhart & Milkovich (1992) argue that merit pay and bonuses contribute to higher performance.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Gomez-Mejia, L.R. & Balkin, D.B.	1989	Effectiveness of Individual and Aggregate Compensation Strategies.	To which extent do individual differences in reward strategies mediate the perceived effectiveness of incentive systems?	Number of employees, sales revenue, average ratio of profits to sales, average ratio of R&D expenditures to sales, industry group, compensation policy, pay effectiveness & pay satisfaction (both based on withdrawal rates) risk preference.	< 1992	Individual-based rewards are perceived as less effective than aggregate incentive strategies. All things considered, the most effective rewards were considered to be team-based bonuses. Employees with a low willingness to take risks are more likely to experience withdrawal cognition if they work for a firm that relies on variable compensation
Jordan, J.M.	2010	Salary and decision making: relationship between pay and focus on financial profitability and prosociality in an organizational context.	Do higher pay levels lead to decision making that is more focused on financial profitability and less focused on prosociality?	Gender, age, education, salary, years with employer, years in profession.	2009-2012	Salary level predicts an increased focus on the dimension related to financial profitability and decreases focus on dimensions of prosociality and legal concerns. When pay is linked to financial profitability objectives in an organization, one may expect a decreased focus on prosocial-related issues and an increased focus on financial-profitability-related issues.
Judge, T.A. & Bono, J.E.	2001	Relationship of core self-evaluation traits –self-esteem, generalized self-efficacy, locus of control and emotional stability- with job satisfaction and job performance: A meta-analysis.	Quantitative review of the literature that examines the relationship of the four core self-evaluation traits with job satisfaction and job performance.	Literature review that incorporates four distinct variables; Self-esteem, generalized self-efficacy, internal locus of control, emotional stability.	<1999	Self-esteem, locus of control, neuroticism and generalized self-efficacy are significant predictors of both job satisfaction and job performance.
Korman, A.	1976	Hypothesis of work behavior revisited and an extension.	All other things being equal, will individuals engage in and find satisfying those behavioral roles which maximize their sense of cognitive balance or consistency?	Reevaluation of the initially proposed theory by extending the previous findings with thirty-three studies that test the initial model.	< 1992	The hypotheses and research question received considerable support, particularly in field studies. The possible ambiguity in the expectancy-value theory stems from the situation when a person has low expectancies for all possible outcomes.
Lambert, R.A., Larcker, D.F. & Weigelt, K.	1993	The structure of Organizational Incentives.	Which theoretical model provides the best directives for designing organizational incentives?	Salary, annual bonus, number of employees, sales, total compensation, stock prices, risk preferences, managerial power, organizational scope size, ROA	< 1992	Organizational incentives are most appropriately characterized by a combination of models (tournament, managerial power, agency theory) rather than being completely described by a single theoretical description.
Lazear, E.P.	2000	Performance Pay and Productivity.	How sensitive is worker behavior to incentives and what specific changes in behaviors are elicited?	Utility (under both systems), average worker productivity (units-per-worker-per-day), base pay, regular hours, overtime hours, pay, pay-per-day, cost-per-unit.	1992-1999	A switch from hourly wages to piece rates brings about an increase in average levels of output as well as in the variance. This benefit is a productivity gain, which does not mean that the firm's profits rise as well. Moreover, tenure effects on productivity are found to be large, which is reflected in learning on the job as well as in the induction that the least productive workers leave the company first.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Lazear, E.P.	2000	Economic Imperialism.	Is economics imperialistic and has this imperialism been successful?	Examining social studies from an economic perspective, including concepts as; utility, maximization, rational behavior, demand, theory of the firm.		Economics has been successful as a science which emphasizes rational behavior, maximization, trade-offs, and substitution. The discipline insists that these models result in equilibrium which pushes the economists to further inquiry as they understand the concepts of efficiency.
Molm, L.D., Takahashi, N. & Peterson, G.	2003	In the eye of the beholder: Procedural justice in social exchange.	How does the form of social exchange, affects perceptions of fairness?	Perceptions of fairness, form of exchange, inequality, treatment, trustworthiness	2000-2003	Actors perceive negotiated exchange partners as less fair and they are less willing to engage in unequal exchanges with them.
Montemayor, E.F.	1996	Congruence between pay policy and competitive strategy in high-performance firms.	Which pay policies have a positive relationship with firm performance for different business strategies?	Effort performance, market performance, financial performance, strategy-cost, strategy-differentiation, strategy-innovation, philosophy-labor cost, philosophy-attract/retain, philosophy-motivation, pay level policy, inventive-to-base, merit-average raise, merit-range of raises, merit-nonexempt employees, administration-open, administration-participative.	< 1992	Inferior firm performance is associated with the lack of fit between pay policy and business strategy, thus supporting the need for a contingency approach in the design of pay policy. There exists a systematic difference in pay policies between high-performing organizations whose strategy is dominated by cost leadership, differentiation or innovation tactics. Cost leaders emphasize labor cost objectives more than differentiators. Innovators assign more importance on attraction/retention than differentiators. The importance of motivation objectives is greater for differentiators than for innovators. Innovators are highly aggressive in their pay policy. Differentiators offer more variable pay than Innovators. Innovators use a wider range of merit raises and extend merit pay to a larger portion of nonexempt employees. Innovators are more open with respect to pay information than Differentiators.
Shaw, J.D., Gupta, N. & Delery, J.E.	2002	Pay dispersion and workforce performance: Moderating effects of incentives and interdependence.	Which effects moderate the relationship between pay dispersion and workforce performance?	Independent variables; results from a questionnaire filled out by various organizations and contained, e.g., pay dispersion, individual incentives, accident frequency ratios, out of service percentages, total turnover rate, perceptual performance. Control variables included; organizational size, unionization, age, tenure, benefit levels, pay system communication, seniority-based pay.	1992-1999, 2000-2003	Dispersion is more effective when it exists in conjunction with individual incentives. A complex pattern of interrelationships among pay dispersion, individual incentives, work interdependence and organizational effectiveness exists. Horizontal pay dispersion has the most broad-ranging effects on organizational performance.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Trevor, O.C., Reilly, G. & Gerhart, B.	2012	Reconsidering pay dispersion's effect on the performance of the interdependent work: reconciling sorting and pay inequality.	Are pay dispersion and team performance positively related when pay dispersion is explained by the sorting of employee inputs?	Productivity relevant reasons for pay dispersion, overall pay dispersion, pay variance, dispersion in explained pay, predicted DEP, dispersion in unexplained pay, residual DUP, pay strategies, pay level, PfP,	1992-1999, 2000-2003, 2004	When work is interdependent, pay dispersion explained by productivity-relevant employee inputs provides sorting advantages that lead to a positive relationship with team performance but pay dispersion net of these inputs does not.
Wallace, J.S.	1997	Adopting residual income-based compensation plans: Do you get what you pay for?	Does adopting residual income-based compensation plans alter manager's behavior?	Total assets, ROA, leverage, new investments, dispositions, repurchases per share, dividends per share, asset turnover, residual income, stock ownership, dividend pay-out ratio, NPV of projects, shareholder wealth.	1992-1999	Compensation plans based on residual income change manager's behavior. Firms that adopt a residual income performance measure; 1. increase their dispositions of assets and decrease their new investments, 2. increase their payouts to shareholders through share repurchases, 3. use their assets more intensively.
Zedelius, C.M., Veling, H., Bijleveld, E. & Aarts, H.	2012	Promising High Monetary Rewards for Future Task Performance Increases Intermediate Task Performance.	Does the promise of monetary rewards for future performance increase the performance of unrewarded intermediate tasks?	Response time, accuracy, (financial) incentives.	2009-2012	High rewards sped up both rewarded and intermediate, unrewarded responses. This effect is independent of the duration of the reward presentation. Long presentation of the future rewards seems to lead to a speed-accuracy trade-off for both rewarded and unrewarded activities whereas short presentation speeds up responses to rewarded and unrewarded activities without this trade-off. As such, high rewards for future performance boost intermediate performance due to enhanced task preparation.

2.2 Social Theory – The ‘Modern’ view

Contrary to the theories discussed in section 2.1 which adhere to classic economic view that offering monetary incentives is a well-established and clearly effective motivational technique for improving overall performance (Bailey, Brown & Cocco, 1998), several theories from the field of sociology and psychological economics¹¹ have been developed in recent years which oppose this idea. Research from Kohn (1993) and Pfeffer (1998) for example draws the classic economic view into question by stating that; *‘incentive plans simply cannot work’* and that the concept of pay-for-performance as an effective motivator of effort is basically a ‘myth’. Steel & MacDonell (2012) go even further by discussing; *‘5 ways in which external rewards destroy performance’*, and Herzberg (1987) answered the question; *‘How do you motivate employees?’* essentially by stating; *‘not by offering incentives, as they are in fact a demotivator.’* The latter is also acknowledged in theories proposed by various other scholars. Deci, Ryan & Koestner (1999) for example suggest that monetary incentives emphasize

¹¹ Weibel, Rost & Osterloh (2009) make the argument that the combination of economics and psychology, which is commonly referred to as behavioral economics, should be more adequately grasped by the term ‘psychological economics’. While the psychological definition of ‘behaviorist’ encompasses the stimulus-response relationships which are already studied by standard economics and behavioral theory, the term ‘psychological economics’ allows including theories that model cognitive and emotional processes. (Weibel, Rost & Osterloh, 2009)

the external reward for a particular task to the extent that it decreases the intrinsic motivation of the individual performing the task. Since particularly this cognitive evaluation theory (Deci et al., 1982; Deci, Ryan & Koestner, 1999) assumes a direct relationship between intrinsic motivation and effort, a decrease in motivation would thus lead to a subsequent decrease in effort. Or, as Gneezy & Rustichini (2000) formulate it; *'if the reward directly affects the utility of an individual in a negative way (because it reduces the intrinsic motivation) then performance may decline with the increase in monetary incentive.'* In addition, so-called arousal theory (e.g. Eysenck, 1982), hypothesizes an inverted-U relationship between arousal and effort and, consequently, between effort and performance. The latter theory thus posits that when arousal increases (which generally tends to happen when incentives are introduced), effort eventually decreases.

Moreover, the effort construct which is used in classic economic theory as the key intervening variable between monetary incentives and performance arguably neglects to account for various other variables which, according to social scholars, affect the pay-performance relationship. Such variables (including e.g. affect and stress) are not only likely to be important factors in explaining the mediating principles in the incentives-effort relation, but they too propose an effect which contradicts economic theory. Stone & Ziebart (1995) for example, propose an increase in negative affect when monetary incentives are introduced, leading to a subsequent decrease in performance and Shield, Deng & Kato (2000) argue that stress (similar to arousal) negatively affects an individual's effort and thus negatively mediates the incentives-effort relation.

One of the most valuable contributions on this topic has been brought by Frey & Jegen (2001) who developed the concept commonly known as the *'crowding-out'* effect. Disputing the fundamental idea that incentives lead to increase in performance, Frey & Jegen (2001) argue that: *'The crowding-out effect, is one of the most important anomalies in economics, as it suggests the opposite of the most fundamental economic 'law', that raising monetary incentives increases supply.'* And while, as can be read from the previous sections, there are numerous scholars that adhere to the 'law' of economic theory, the mere possibility of a crowding-out effect even existing changes the fundamentals of the incentive-effort relationship. The magnitude of this anomaly is due to the fact that it predicts the reverse reaction to the one expected according to the relative price effect on which, according to Frey & Jegen (2001), much of the successes of the 'economic approach to human behavior' (as can be read also from Becker, 1968; Frey, 1997) and of the 'economic imperialism' (developed by e.g. Stigler, 1984; Hirshleifer, 1985 and Lazear, 2000) are based.

This Motivation Crowding Theory, similar to Self-Determination Theory¹², finds its foundations in the distinction between *intrinsic* and *extrinsic* motivation. Whereas the classic economic view neglects to differentiate between these diverse sources of motivation, the neoclassic sociological and psychological economic scholars do recognize a distinct difference between *intrinsic* and *extrinsic* motivation; where extrinsic motivation focuses on incentives from outside the individual in question, i.e. thus adhering to the relative price effect stemming from economic theory. In contrast, intrinsic motivation is identified as the motivation coming from within the individual and, following Deci (1971), is generated when an individual performs an activity which yields no apparent reward except the activity itself. This type of motivation which, according to Huck

¹² Self-determination theory advocates that extrinsic rewards (monetary incentives) will ultimately demotivate and dissatisfy individuals. By undermining an individual's perceived autonomy, external rewards will have a negative impact on intrinsic interest for the task or job towards which the incentive is directed (e.g. Judge, et al., 2010; Gagne & Forest, 2011).

Kübler & Weibull (2012) is; *based in the innate, organismic needs and occurs in its purest form when a person does an activity in the absence of a reward contingency or control*, is thus nurtured through different processes than external motivation.

In an attempt to mediate between the standard economic model and the studies that found opposing results claiming that; *'monetary rewards merely replace task-related (intrinsic) motivation by reward-induced external pressure (extrinsic motivation)* (Kunz & Linder, 2012), Motivation Crowding Theory specifies a systematic interaction between intrinsic and extrinsic motivation (Frey & Jegen, 2001). This interaction and the associated possible negative effect on performance have been termed the 'hidden cost of reward' by Frey (1997) and have been generalized for the sake of simplicity in two distinct respects:

- a. *All interventions originating from outside the person under consideration, i.e. both positive monetary rewards and regulations accompanied by negative sanctions may affect intrinsic motivation.*
- b. *These external interventions may crowd-out or crowd-in intrinsic motivation (or leave it unaffected).*

(Frey & Jegen, 2001)

In their elaborate study, Frey & Jegen (2001) found that it can be argued that three varying situations in the classic principal-agent relationship may be distinguished;

1. The classic economic theories hold and the external intervention (providing a monetary incentive) increases effort. This is the relative price effect of external intervention which is generally referred to as the *crowding-in* effect and is the social/psychological explanation for the economic theory to act is commonly suggested.
2. The external intervention (monetary incentive) negatively affects the agent's marginal benefit from performing and thus decreases effort as the intrinsic motivation of the agent is taunted by the external intervention. This effect is referred to as *crowding-out* and reflects the economic anomaly which was addressed at the start of this section. This especially tends to occur when external interventions are perceived to be controlling, leading to impaired self-determination and impaired self-esteem.
3. Both effects occur, leading to a situation in which the size of either one of the effects decides whether there is *crowding-in* or *crowding-out*¹³.

From this separation above it becomes clear that Motivation Crowding Theory does not provide another rigid point of view on the question whether or not incentives have a positive effect on performance. It does, however, contests the general economic idea and provides food for thought on the concept of incentives as it suggests that, raising monetary incentives reduces rather than increases supply, should the crowding effect hold. Moreover, as Gibbons (1998) clearly states, one of the key takeaways of this theory is that *'management practices based on economic models may dampen (or even destroy) non-economic realities such as intrinsic motivation and social relations.'*

¹³ These concepts will be properly elucidated in section 2.3

Table 7: Literature summary Section 2.2; Social Theory – The ‘Modern’ view

The table below summarizes the academic articles that provided insight for section 2.2

Author	Date	Title	Research question	Variables	Time period	Outcomes
Deci, E.L., Ryan, R.M. & Koestner, R.	1999	A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation	Discussion on the three general categories of explanations on the undermining effect.	Review of 20 dissertations and 128 studies that looked into the undermining effect. The studies were assessed based on their findings in the area of; engagement, free choice, feedback, contingency.	1992-1999	Engagement-contingent, completion-contingent and performance-contingent rewards significantly undermined free-choice intrinsic motivation, as did all rewards, all tangible rewards and all expected rewards. Engagement-contingent and completion-contingent rewards also significantly undermined self-reported interest, as did all tangible and all expected rewards. Positive feedback enhances both free-choice behavior and self-reported interest. Tangible rewards tend to be more detrimental for children than college students, and verbal rewards tend to be less enhancing for children than college students.
Deci, E.L., Betley, G., Kahle, J. Abrams, L & Porac, J.	1981	When trying to win: competition and intrinsic motivation.	Does competition decrease intrinsic motivation?	Gender, time, (no) competition, personal perception of the task (survey).	< 1992	Competition decreases intrinsic motivation as it alters an individual perception and operates similar to an extrinsic incentive. The activity under review becomes a means to an end instead of the end itself which is mastery-oriented. Under certain circumstances it tends to be perceived as controlling and thus tends to decrease intrinsic motivation.
Frey, B.S. & Jegen, R.	2001	Motivation Crowding Theory.	Does empirical evidence to support the theoretical concept Motivation Crowding Theory exist and is this evidence empirically valid?	Elaborate review of academic studies conducted by assessing circumstantial evidence, laboratory studies by both economists and psychologists and field research by a wide variety of scholars.	2000-2003	Significant empirical evidence suggests that Motivation Crowding Theory does exist and that external intervention via monetary incentives may indeed undermine intrinsic motivation. Crowding effects are an empirically relevant phenomenon, which can, in specific cases, even dominate the traditional relative price effect.
Frey, B.S.	1997	A constitution for knaves crowds out civic virtues.	Does a constitution designed for knaves, or purely self-interested individuals, crowd out civic virtues?	I.a.; the part of income not declared, probability of detection, penalty tax rate, mean of marginal tax rate, income deduction possibilities, natural log of per capita income, non-wage income, old-age taxpayers' share.	< 1992	A successful way to maintain and enhance civic virtue is extensive constitutional rights of direct citizen participation via popular referenda and initiatives. Such a constitution does, however, runs greater risk of knaves free riding and exploiting other citizens. Hence, a constitution must be strict enough to effectively deter exploitative behavior, but at the same time, the system of laws should fundamentally trust citizens.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Gagne, M. & Forest, J.	2011	The study of compensation systems through the lens of self-determination theory: Reconciling 35 years of debate.	How do compensation system characteristics influence the satisfaction of the needs for autonomy, competence and relatedness of individuals?	Develops a theoretical framework which incorporates i.a. the following variables; amount of pay, distributive justice, need satisfaction, autonomous motivation, procedural justice, objective vs. subjective assessment, variable vs. fixed pay ratio.	<1992, 1992-1999, 2000-2003, 2004-2008, 2009-2012	High base pay will foster greater need satisfaction, partly because of desirable social comparisons and improved perceptions of distributive justice. High proportions of performance-contingent pay are related to a larger decrement of intrinsic motivation, which in turn, negatively affects performance. The way performance appraisals are conducted influences the impact of compensation systems on motivation.
Gibbons, R.	1998	Incentives in Organizations.	Summary of four strands in agency theory; classic model, static model, repeated-game model, incentive contracts.	Discusses i.a.; objective and subjective performance assessment, incentive contracts, assurance, locus of control	1992-1999	It is useful to impose job restrictions to reduce an agent's distractions. Complementary instruments should be used in incentive contracting.
Hirschleifer, J.	1985	The expanding domain of economics.	Is it ultimately possible to carve of a distinct territory for economics?	Examining social studies from an economic perspective, including concepts as; scarcity, cost, preferences, opportunities.	< 1992	Economics penetrates all social disciplines and is reciprocally penetrated by them. The analytical categories (scarcity, cost, preferences, opportunities, etc.) are truly universally applicable, giving economics its imperialist invasive power.
Huck, S., Kübler, D. & Weibull, J.	2012	Social norms and economic incentives in firms.	How can social norms be modeled from the perspective that agents' desire for, or peer pressure towards, social efficiency?	Develops a model using variables, i.a.; social ideal, team spirit, team pay, bonus rate, effort level, total utility.	2009-2012	One and the same social norm may be output enhancing, neutral, or decreasing depending on the type of contract chosen by the firm's owner. As such, one can manage social norms by choosing the appropriate contract type to determine the way social norms will impact behavior. This is due to the fact that social norms are rooted in externalities. Social norms make the optimal design of economic incentives tricky as there can be multiplicity of equilibria, jumps and crowding out.
Judge, T.A., Piccolo, R.F., Podsakoff, N.P., Shaw, J.C. & Rich, B.L.	2010	The relationship between pay and job satisfaction: A meta-analysis of the literature.	Is the level of pay related to pay satisfaction and/or job satisfaction?	Meta-analytic review of past experimental studies including measures, i.a.; job satisfaction, pay satisfaction, pay level, job type.	<1992, 1992-1999, 2000-2003, 2004-2008	Pay level is only marginally related to satisfaction. Individuals who make more money are little more satisfied than those who make considerably less.
Kohn, A.	1993	Why incentive plans cannot work.	Do rewards work?	Literature review that incorporates articles by Frederick Herzberg, Joni L. Pearce and Edwin A. Locke.	< 1992	Offering rewards to motivate employees is ineffective. Rewards buy temporary compliance but do not reinforce positive behavior over the long term. Pay is not a motivator as rewards punish, rupture relationships, ignore reasons, discourage risk-taking and undermine interest.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Konrad, A.M. & Pfeffer, J.	1990	Do you get what you deserve? Factors affecting the relationship between productivity and pay.	Do factors that reduce uncertainty or ambiguity in the evaluation and salary-determination processes increase the effect of productivity on pay?	Race, gender, academic rank, number of years employed, number of job changes, receipt of outside research funding, outside job offers, number of different jobs, salary, research productivity, department size, departmental attitude towards research, research collaboration, organizational size, organizational wealth, organizational quality, job market condition, paradigm development,	< 1992	Productivity has a larger effect on pay in departments that 1. have stronger norms emphasizing research, 2. are located in private and higher quality institutions, 3. are institutions that are governed by collective bargaining agreements, 4. are characterized by more research collaboration and more social contact, 5. are in fields with more highly developed scientific paradigms, 6. has a chair-person with shorter, fixed-length terms. In context in which productivity could be readily assessed and in which merit was emphasized, the effect of performance on pay was comparatively small.
Kunz, J. & Linder, S.	2012	Organizational Control and Work Effort – Another Look at the Interplay of Rewards and Motivation.	What is the impact of monetary and affiliative rewards on the willingness to exert work effort?	I.a.; Work autonomy, employee participation, promotion policies, climate of work, trustworthiness of reward promises, willingness to exert effort, motivation, gender, age, affiliative rewards, monetary rewards, norm-based motivation, work experience, extrinsic motivation.	2009-2012	Monetary and affiliative rewards have different effects; affiliative rewards clearly have beneficial effects by positively interacting with enjoyment-based motivation, whereas the picture for monetary rewards is more nuanced than typically assumed in literature. This is due to the fact that monetary rewards contribute to a higher willingness to exert effort; they show both a beneficial direct effect and a positive moderation effect on the relationship between extrinsic motivation and effort. However, they also exhibit a detrimental moderating effect on the relation between norm-based motivation and willingness to exert work effort. While the total effect is still positive, the legend 'crowding-out' effect of intrinsic motivation likewise receives strong support. Monetary rewards seem to crowd-out norm-based motivation while leaving the impact of enjoyment-based motivation unaffected.
Shields, M.D., Deng, F.J. & Kato, Y.	2000	The design and effects of control systems: test of direct- and indirect-effects models.	Development and testing of two distinct (direct & indirect) control-system models	Participative standard setting, standard tightness, standard-based incentives, job-related stress, job performance.	1992-1999	The indirect model had better overall fit to the data according to the two fit indices, the indirect model provided a better fit to the data than did the direct model in the models-comparison test, tests of the hypotheses in the indirect model provided support for all of them as opposed to two out of five in the direct model. Test results indicate that standard-based incentives and standard tightness are influenced by the degree of subordinate participation in standard setting, and that the effects of these three control-system components are indirect on job performance through job-related stress as the intervening variable.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Steel, P & MacDonell, R.	2012	When rewards go wrong: A tale of five motivational misdirects.	Why can rewards go wrong?	Review of compensation literature focusing on five distinct topics; Intrinsic motivation, autonomy & locus of control, communication of rewards, affective forecasting.	2009-2012	Being paid for what we love can make us love it less; extrinsic incentives can destroy intrinsic motivation. How can be as important as what; fairness and autonomy play a crucial role in effective reward schemes. Rewards tell us how rewarding the task really is; the framing from a certain reward indicates how appreciated individuals are for performing the task at hand. Focusing on winning instead of how to win; the desirability of the outcome can severely damage the degree to which individuals are likely to obtain these outcomes.
Stone, D.N. & Ziebart, D.A.	1995	A model of financial incentive effects in decision making.	Do performance-contingent incentives impact both cognitions and emotions, and do cognitive and affective changes mediate the relationship between incentives and decision quality?	Amount of processing decision time, number of boxes opened, number of boxes reopened, percentage of information examined, time per box opened, sequence for processing, variability of processing, percentage of time on specific level of attributes (most important, middle importance, least important).	1992-1999	Participants offered performance-contingent incentives took longer to choose, examined more information, had higher levels of negative affect and used decision strategies that led to more accurate choices than participants offered randomly distributed incentives. Path analyses using structural equations modeling indicated that the changes in information processing behavior induced by financial incentives increased decision quality, while the increased levels of negative affect associated with incentives decreased decision quality.

2.3 Reconciliation

As mentioned in the introduction of this literature review, there are more than two sides of the debate on the incentive-performance relationship. Whereas the recently developed sociological and psychological economics studies oppose the classic economic view, there are quite some scholars that attempt to reconcile these opposing views by imposing several constraints on e.g. the situations under review. These scholars offer a ‘constraint-based solution’ in assessing the theories on incentives and effort instead of focusing on the relationship itself. The theories that stem from this particular body of literature leave enough room for both views to be considered valid. Evidently, it is vital to discuss these theories in order to provide a complete understanding on the currently existing body of knowledge on the incentive-performance relationship.

One such theory is derived by e.g. Rynes, Gerhart & Minette (2004) who grant insight into the criteria that have to be met in order for the classic view to hold. As they quote that; ‘*most managers believe that importance of pay depends on a number of variables, both situational and individual*’, it becomes clear that even those who uphold believe in the classic economic view, acknowledge such criteria to exist. Where scholars like Harrison, Virick & Williams (1996) and Trank, Rynes & Bretz (2002) provide us with understanding on the individual preferences¹⁴ that play their part in the effectiveness of the pay-performance relationship¹⁵,

¹⁴ A full analysis of these individual preferences falls outside the scope of this study, however, it includes the following; Extroverts value pay higher than introverts, high-performers value pay-for-performance schemes higher than low-performers, men value pay higher than woman, etc. An additional summary of the existing body of literature can be found in Rynes, Gerhart & Minette (2004)

various other studies (e.g. Rynes et al. 1983; Greenberg, 1990; Delery et al., 2000; Datta, Guthrie & Wright, 2005; Samuels & Whitecotton, 2012), expand on the principles that guide the situational drivers for an effective relationship between pay and performance. Rynes, Gerhart & Minette (2004) have summarized most of this literature and argue that four¹⁶ general principles explain the situational drivers which either make or break monetary incentives as a motivator; First of all there has to be variability in pay options, which means that it allows for distinguishing between high and low performers. Second, the incentive has to be fair in relative terms. This notion has also been touched upon by Adams (1963) whose *Equity Theory* suggests individuals measure the fairness of their received incentives based on their own input-output ratio as compared to a referent source¹⁷ (e.g. pay and efforts of coworkers). From this comparison, employees will evaluate whether they have been fairly rewarded for their effort in the social exchange relationship with the organization. Evidently, a compensation level which is deemed 'unfair' during the evaluation process, will hence not increase motivation and might even decrease performance once employees decide to balance the perceived injustice by exerting less effort. The third principle states that the motivational effect of money is nonlinear across pay levels. This principle reflects the declining marginal utility which was earlier mentioned as a critical issue in *expectancy theory* and also introduces the concept of *reservation wage*, which according to Rynes, Gerhart & Minette (2004) impedes companies that fall considerably below market in terms of starting salaries in attracting applicants. The fourth and final principle is that different objectives of monetary incentives (attraction, retention, or on-the-job performance) are dissimilar in the perceived importance of these incentives. E.g. While salaries tend to play an important role in retention, their importance seems to be even higher in the attraction phase. Concluding from the research of Rynes, Gerhart & Minette (2004) it becomes evident that while monetary incentives might prove to have strong motivational potential, its effectiveness depends on various individual and situational factors.

Aside from the influence of situational characteristics, the earlier discussed Motivation Crowding Theory by Frey & Jegen (2001), also provides an explanation of the differing effects of incentives. As described before, Frey & Jegen (2001) argue that three varying situations could occur when an individual is offered an incentive. Various scholars (e.g. Huck Kübler & Weibull; 2012, Larkin, Pierce & Gino, 2012; Weibel Rost & Osterloh, 2009, Fang & Gerhart, 2012; Fiorillo, 2011) have argued that these effects are subject to a trade-off between the positive effect of the incentive on an individual's external motivation and the negative effect on the internal motivation. Hence, '*the overall effect is thus dependent on the relative strength of the two observable contradicting effects*' (Weibel, Rost & Osterloh, 2009). This perspective suggests thus suggests that both a price effect and a crowding effect simultaneously effect a person's overall motivation where; '*the crowding effect is effectively subtracted from the relative price effect*' (Larking, Pierce & Gino, 2012). The reconciliation from this perspective thus stems from the fact that; '*the net effect of reward on intrinsic interest*

¹⁵ One set of individual characteristics to consider follows from the effort-reward model: value of rewards. Reward value is assumed to act in interaction with the reward system to determine effort. In the effort-reward model, two classes of rewards, extrinsic (pay, promotion) and intrinsic (autonomy, security, social, esteem, self-realization) are specified. (Schneider & Olson, 1970)

¹⁶ Rynes, Gerhart & Minette (2004) seem to neglect to mention the 'fifth general principle' which has received much attention in literature on the agency-problem or effort-incentive relationship. Discussed quite thoroughly in Bloom & Milkovich (1998) the concept of *Risk* (and the combination with the type of pay-scheme) is a factor which largely determines the effectiveness of monetary incentives. Organizations that experience higher risk, generally increase (a specific part of) their monetary incentives, commonly leading to decreased performance.

¹⁷ This concept lies at the heart of the more recent *Distributive Justice Theory* (Schreurs, et al., 2013) which attempts to explain pay satisfaction from a social exchange theory perspective.

depends on which effect dominates: the potential negative effect on perceived control or the potential positive effect on perceived competence.' (Fang & Gerhart, 2012)

The final important framework that assists in reconciling the two opposing views is provided by Heyman & Ariely (2004). Drawing from the initial 'Relational Theory' of Fiske (1992), Heyman & Ariely (2004) propose that the effort-incentive relationship is determined by the type of exchange between the parties involved (a concept which divides these exchanges in money- vs. social-markets). Where individuals in money-markets relationships will exert their effort based on reciprocity, the effort exerted in social-market relationships is shaped by altruism. Consequentially, the amount of compensation in money-markets relationships directly influences individuals' level of effort, whereas the amount of compensation is perceived as irrelevant in social-market relationships where individuals work as hard as they can regardless of payment (Heyman & Ariely, 2004). Starting from this initial proposition, Heyman & Ariely (2004) make a clear distinction in the effect that monetary incentives have on an individual's effort and provide an insight into the possible reason for *both* the classic view *and* the socialist view to be correct in explaining the effect of incentives on performance. Contrary to the general sociological perspective which dictates that the crowding effect is generated by the way in which the external incentive is perceived (controlling vs. rewarding (Fang & Gerhart, 2012)), Heyman & Ariely (2004) found that the effect can be decomposed one step further as it proposes that not the (perception on the) *incentive*, but the (perception on the) underlying *task* is the main driver of the crowding effect. The way in which the *task* to which an individual exerts effort is cognitively framed (money- vs. social-markets) impacts the way in which an individual perceives the justification of a possible incentive. This perception on the incentive will in turn lead to a certain crowding effect (either *-out* or *-in*). A notion also put forth by Deckop, Mangel & Cirka (1999) who identified that a similar effect can be identified when *values* are under review, as opposed to *tasks*. According to their study; the employment exchange becomes social rather than economic (money- vs. social-markets) when the values of individuals are more tightly aligned with those of the organization. Both theories thus provide us with a possible reconciliation as it leaves not only room for both a crowding-out *and* a crowding-in effect to exist in the agent-principle relationship, but it also explains how both perspectives (the 'classic' economic view *and* the 'modern' social view) issue on the incentive-performance relationship can merge together.

Table 8: Literature summary Section 2.3; Reconciliation

The table below summarizes the academic articles that provided insight for section 2.3

Author	Date	Title	Research question	Variables	Time period	Outcomes
Brase, G.L.	2009	How different types of participant payments alter task performance.	Do different types of payments alter task performance?	Type of payment, normalized percentages, natural frequencies.	2004-2008	Successful task completion is more frequent with performance-based incentives than with either of the other incentive types. Performance on moderately difficult tasks is most sensitive to incentives. These results can be understood in economic terms as participants maximizing an objective function, given their available cognitive capital and the particular production function of the experiment.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Datta, D.K., Guthrie, J.P. & Wright, P.M.	2005	Human Resource Management and Labor Productivity: Does Industry Matter?	How do industry characteristics affect the relative importance and value of high-performance work systems?	Total output/labor input, labor cost, market demand, product price, ROI, industry capital intensity, industry growth, industry product differentiation, firm size, firm sales growth, firm capital intensity, unionization.	2000-2003	The impact of human resource systems on productivity is influenced by industry capital intensity, growth, and differentiation. Firm competitiveness can be enhanced by high-performance work systems.
Delery, J., Gupta, N., Shaw, J., Jenkins, G.D. & Ganster, D.	2000	Unionization, compensation, and voice effects on quits and retention.	What are the relationships among unionization, compensation practices, and employee attachment?	Unionization, tenure, employee attachment, pay & benefits, paid days off, participation in decision making, carrier type, organization's age, organizational size.	1992-1999	Higher wages and benefits in unionized trucking settings account for a substantial portion of unionization effects on employee attachment. Partly due to bargaining power as well as higher employee skill levels. In unionized settings, turnover is lower and tenure is higher, as it is more difficult for employees to leave. The allover conclusion of this study is that unions have a strong influence on all aspects of employment practices.
Fang, M. & Gerhart, B.	2012	Does pay for performance diminish intrinsic interest?	Does pay for performance diminish intrinsic interest?	Educational level, gender, age, personality, pay scheme, CET variables i.a.; enjoyment, satisfaction, challenge.	2009-2012	No evidence of a detrimental effect of PFIP plans on intrinsic interest was found. Intrinsic interest seems to be higher under PFIP conditions. Organizations placing greater emphasis on PFIP plans tend to have employees with motivation orientations matching their PFIP plans, which may reduce the profitability of a detrimental effect of PFIP.
Fiorillo, D.	2011	Do monetary rewards crowd out the intrinsic motivation of volunteers? Some empirical evidence for Italian volunteers.	Do monetary rewards crowd out the intrinsic motivation of volunteers?	Hours per week, monetary rewards, intrinsic motivation, gender, marital status, educational level, occupational status, age, volunteer activities, type of organization.	1992-1999	Monetary payments, as well as intrinsic motivation have roles in the real-life decision to supply volunteer work, but monetary rewards do not crowd out intrinsic motivation. Since increasing monetary rewards has the opposite sign on voluntary work of individuals with low and high intrinsic motivation, on average, the positive effect offsets the negative, and there are no observations that intrinsically motivated individuals who get a monetary reward work less.
Fiske, A.P.	1992	The Four Elementary Forms of Sociality: Framework for a Unified Theory of Social Relations.	Are all the domains and aspects of social relations organized by combinations of four elementary models; communal sharing, authority ranking, equality matching, market pricing?	Elaborate study which encompasses the results of ethnographic field work and 19 experimental studies using 7 different methods testing 6 different cognitive predictions on a wide range of subjects from 5 different cultures.	< 1992	The motivation, planning, production, comprehension, coordination, and evaluation of human social life is based largely on combinations of 4 psychological models; CS (people treat all members of a category as equivalent), AR (people attend to their positions in a linear ordering), EM (people keep track of the imbalances among them), MP (people orient to ratio values).

Author	Date	Title	Research question	Variables	Time period	Outcomes
Greenberg, J.	1990	Employee theft as a reaction to underpayment inequity: The hidden cost of pay cuts.	Are perceptions of inequity linked to theft rates and could these rates be reduced when explanations on this inequity are presented?	Theft rates, pay rates (decreases), perceived pay rates.	< 1992	Workers that experience underpayment inequity would attempt to redress that inequity by raising their inputs (stealing). As such, a 15% pay reduction leads to a spike in theft rates of about twice as much as normal. Carefully explained pay-cuts seemed to have significantly less negative impact on theft rates. Generalizing this concept leads to the conclusion that adequately explaining inequitable conditions may be an effective means of reducing potentially costly reactions to feelings of underpayment inequity.
Harrison, D.A., Virick, M. & Williams, S.	1996	Working without a net: Time, performance, and turnover under maximally contingent rewards.	Comparison of performance-turnover relationships under moderately and maximally contingent rewards.	Variables included, i.a.; Performance, turnover, commission, time.	1992-1999	The performance-turnover relationship is stronger under maximally contingent rewards. Current (time-dependent) performance affords a better prediction of turnover than average (time-stationary) performance. Performance velocity (slope over time) has a unique effect on turnover risk.
Larkin, I., Pierkin, L. & Gino, F.	2012	The psychological cost of pay-for-performance: Implications for the strategic compensation of employees.	Which psychological cost reduces the efficacy of strategic individual performance-based compensation of non-executive employees?	Develops a theoretical framework including various factors i.a.; team performance-based incentives, individual performance-based incentives, strategic compensation, employee effort, employee ability, pay of others, overconfidence, social comparison.	2009-2012	Employees work harder when their pay is based on performance. Firms are more likely to use performance-based pay (vs. flat pay) when they have less information about actual employee effort. Firms are more likely to use performance-based pay (vs. flat pay) when they have less information about employee skill level, and/or as employee skill level is more heterogeneous. Firms are more likely to use team-based performance pay vs. individual-based pay when coordination across workers is important, when free riding is less likely, or when monitoring cost are low. Perceived inequity through wage comparison reduces the effort benefits of individual pay-for-performance systems. Perceived inequity arising through random shocks in pay introduces additional costs from effort, sabotage, and attrition in individual pay-for-performance systems. Overconfidence bias reduces the sorting benefits of individual pay-for-performance compensation.
Rynes, S.L., Gerhart, B. & Minette, K.A.	2004	The importance of pay in employee motivation: discrepancies between what people say and what they do.	Do employee surveys regarding the importance of various factors in motivation generally produce results that are consistent with studies of actual employee behavior?	Literature review on three key issues; Gaps between what people say and do with respect to pay, Contingency factors, General principles from compensation research.	<1992, 1992-1999, 2000-2003	Money is not the only motivator and it is not the primary motivator for everyone. However, there is evidence that money is an important motivator for most people which is generally not accurately reflected in people's own perception on motivation.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Rynes, S.L., Schwab, D.P. & Heneman, H.G.	1983	The role of pay and market pay variability in job application decisions.	Is it possible to use non-compensatory, reservation wage strategies in decisions concerning job applications?	I.a.; Salary level, starting salary, geographical location, promotional opportunities, type of work.	< 1992	Non-compensatory strategies are most commonly used to evaluate pay in making application decisions. The study suggests that both the importance of pay and the nature of its role in decision strategies are likely to vary in accordance with the market pay distribution. Previous job choice theorizing and research suggest that attribute importance and the extent of non-compensatory model usage are likely to vary as a function of job seeker and non-pecuniary market characteristics. Hence, there is a need for caution in making generalizations about the role of pay in decisions involving employment.
Samuels, J.A. & Whitecotton, S.M.	2011	An effort based analysis of the paradoxical effects of incentives on decision-aided performance.	What is the effect of incentives on decision-aided performance?	Accuracy, time, (ir)relevant information condition, analyst opinion (negative, neutral, positive).	2009-2012	Incentives do not necessarily decrease performance in the presence of decision aids. The effect of incentives on decision-aided performance depends on other contextual factors such as the absence or presence of additional contextual information. Incentives have a negative effect on performance when decision makers are limited to the same information as the decision aid. Financial incentives increase the amount of time (effort duration) that individuals devote to a task. However, whether the increased effort translates into performance is contingent on whether decision makers have access to additional information beyond the decision aid. As such, effort duration mediates the relationship between financial incentives and performance, and the effect of effort duration on performance is moderated by the information environment.
Schreurs, B., Hannes, G., Schumacher, D., van Emmerik, H. & Notelaers, G.	2013	Pay-level satisfaction and employee outcomes: the moderating effect of employee-involvement climate.	What is the moderating effect of employee-involvement climate on the relationship between pay-level satisfaction and employee outcomes?	Gender, age, management position, pay-level satisfaction, IS, PDM, job satisfaction, affective commitment, turnover intention, information-sharing climate, decision-making climate.	2009-2012	A decision-making climate buffers the negative effects of low pay-level satisfaction. Next to that, information-sharing climate seems to exacerbate the negative effects of low pay-level satisfaction.
Trank, C.Q., Rynes, S.L. & Bretz, R.D.	2002	Attracting applicants in the war for talent: Differences in work preferences among high achievers.	How are indicators of achievement associated with individual differences in preferences for job and organizational attributes?	Cognitive ability, GPA, Extracurriculars, Offices, Full-time, Part-time, Year in school, Work itself, Job flexibility, Broad career path, Training opportunities, Individual pay, Contingent pay, Promotion opportunity, Fast track, Pay level, Coworker selectivity, Praise and recognition, Commitment, Entrepreneurial.	2000-2003	Students with cognitive ability and all types of high achievement place greater importance on interesting and challenging work than do other students. Students with high cognitive ability and high <i>academic</i> achievement seemed to have different preference patterns from those with high <i>social</i> achievement when it comes to work attributes such as job flexibility, pay practices, fast-track promotion systems, etc.

2.4 Concluding Remarks

As becomes clear from the theories discussed in this section, the incentive-performance relationship is not one that can be easily be categorized nor have decades of academic research provided a straight-forward solution to overcome the challenges faced by organizations that seek the appropriate way to motivate their employees to exert the full extent of their effort. There is currently an immense body of academic literature which discusses a multitude of the concepts elucidated in this literature review all relating to effort, performance, pay, or any other concept that might play a part in the relationship between them. Moreover, as this body of literature is still growing, ensuring to discuss every relevant theory on these topics is next to impossible. Hence, the literature review above attempts to provide a concise overview of the current perspectives in classical economics and sociology/psychological economics on the incentive-effort relationship.

A final interesting issue that this review of current literature reveals is that the dispute between scholars on the incentive-performance relationship seems to be unaffected by one of the most fundamental laws in macro-economics. Based on the cyclicity of economic trends, macro-economics dictates that organizations are subject to the upward and downward fluctuations in economic business cycles. While an analysis of this particular body of theory lies far beyond the scope of this paper, it seems peculiar that the up- and downward trends in recent history¹⁸ do not seem to affect the outcomes of the studies conducted during the various stages of the economic cycles in the past 20 years. Evidence on this unexpected indifference to this cyclical pattern presents itself not only in the work of various scholars who found indications of the general debate on the effectiveness on incentives within multiple parts of the economic cycle (e.g. Kunz & Linder, 2012; Brase, 2009), but also by comparing the overview of the theories provided in this literature review with the up- and downward macro-economic trends over the past two decades.

Taking this final caveat into account, it becomes clear that the theoretical framework provided in this paper identifies the need for additional quantitative research on the incentive-performance relationship. Moreover, by setting the boundaries within which the current scholars have conducted their studies, the theories provide a proper starting point from which this additional analysis should commence. Hence, in the following section, the hypotheses (3.1) belonging to this study as well as the method of research (3.2) shall be described.

¹⁸ See appendix 2 for an overview of the up- and downward economic trends in recent history.

3.0 Hypotheses & Methodology

As the review of current academic literature in section 2 pointed out, there seems to be the need for additional quantitative research to assist in deriving a conclusive answer to the debate between scholars supporting the various views on the incentive-performance relationship. By using the *Human Capital Effectiveness model* (Bontis & Fitz-en, 2002)¹⁹ which, similar to e.g. *Human Resource Accounting* (Bontis, Dragonetti, Jacobsen & Roos, 1999), seeks to quantify the economic value of people in an organization, this study will provide new insights to the current debate. In the section 3.1, the hypotheses which were tested are discussed as well as an in-depth explanation of the model by which the data was analyzed.

3.1 Hypotheses

The previous sections of this paper explicated that while the effects of pay mix and incentive schemes on effort and performance have been widely researched by academic scholars, the degree to which pay level (more specifically, the 'total amount' of pay received by an employee) affects these concepts is largely untested. A peculiar shortcoming in academic research, as it is precisely this effect which could shed new light on the current debate between economists and sociologists on whether monetary incentives actually crowd-out or crowd-in motivation and, subsequently, effort and performance. The research question which was outlined in earlier sections of this thesis can be decomposed into several testable hypotheses which logically follow each other into providing a conclusive answer to the research question under review.

The first hypothesis (and a prerequisite for accepting the overall research question) is that organizations with a higher wage bill are more productive²⁰ than those with a lower wage bill. However, as can be read from various scholars in the field of performance research (e.g. Chakravarthy, 1986; Bacidore, Boquist, Milbourn & Thakor, 1997; Zhu, 1998; Richard, Devinney, Yip, Johnson, 2009) 'Productivity' can be measured in a wide variety of metrics. The debate on which of the available metrics is the most appropriate, is unfortunately still unsettled. While a generally accepted rule of thumb indicates that; *'a good financial performance measure should ask how well the firm has generated operating profits given the amount of capital invested to produce those profits'* (Bacidore, Boquist, Milbourn & Thakor, 1997), measuring performance *'requires more than a single criterion'*, as; *'business performance is a complex phenomenon'* (Zhu, 1998). A thorough analysis of all possible measures of performance falls outside the scope of this research²¹, however, it follows from Richard, Devinney, Yip & Johnson (2009) that *'financial market and accounting measures (e.g. Earnings Per Share, EVA, EBIT) are generally recognized as the most appropriate measure of overall organizational performance'*. As such, it is evident that a metric from this category should be included in the analysis. Conversely, Bontis & Fitz-enz (2002), indicate that the so-called; *'the revenue factor metric'*²² is *'a basic measure of human capital effectiveness'*. Furthermore, both the *'Human Capital Value added* and *Human Capital Return on Investment* metrics, are vital measures for the performance of organizations. As the incentive-performance debate is rooted in the performance of human capital, these are appropriate measure

¹⁹ The foundation of this model stems from the earlier work of Bontis (1998; 2001) which explored and reviewed the various models used to measure intellectual capital.

²⁰ Productivity is used here as a proxy for performance, thus being able to indicate a possible incentive-effort performance.

²¹ See appendix 1 for a thorough overview of the various performance metrics in current academic literature (Richard, Devinney, Yip & Johnson, 2009)

²² One of the metrics used to analyze the dataset, this concept will be explained later in this section

to use in the assessment of the performance of organizations. Moreover, by evaluating these uncommon metrics against the generally accepted financial market and accounting measures of performance, it allows for their validation and endorsement.

This leads to the following testable hypotheses;

H1a: Organizations with higher total labor cost per employee generate higher total revenues per employee.

H1b: Organizations with higher total labor cost per employee generate a higher EPS.

H1c: Organizations with higher total labor cost per employee generate a higher 'Human Capital Value Added'²³.

H1d: Organizations with higher total labor cost per employee generate a higher Human Capital ROI²⁴.

To test these hypotheses a standard regression model was used in combination with the earlier mentioned *Human Capital Effectiveness* model. An in-depth explanation of these two distinct models is provided in section 3.2.

After a viable result for H1a-d has been derived, a subsequent analysis should provide insight into the effectiveness of the hypothesized productivity increase. In order to do so the following statement will be tested;

H2: The additional generated value²⁵ in organizations for which hypothesis H1a-d holds, offsets the additional total labor cost per employee, i.e. these organizations experience a net increase in performance.

Hypothesis H2 logically follows H1 and should be able to provide a conclusive answer to the question whether companies are rewarded for offering higher monetary incentives to their workforce. As an affirmation of this proposition would instigate new perspectives on the concept of incentives, it could fundamentally alter the perspectives in the existing body of knowledge. A concise example of this would be the fact that the concept of *Relative Worth* which has come to be known as the proper basis for determining pay levels in the contemporary views of pay distribution (Bloom, 1999), would be fundamentally wrong. The argument made by Bloom (1999) that; '*since an organization has limited compensation resources, the distribution of pay within is inherently a zero-sum matter: each employee's pay necessarily limits every other employee's pay*', should then be thoroughly revised. As overall pay increases would increase overall profit, hence, it would be beneficial to reconcile the currently accepted '*limited*' characteristic of compensation resources. The method for testing this hypothesis will be explained in the latter part of section 3.2.

²³ One of the metrics used to analyze the dataset, this concept will be explained later in this section

²⁴ One of the metrics used to analyze the dataset, this concept will be explained later in this section

²⁵ Based on one of the aforementioned performance metrics (i.e. Revenue, EPS, HCVA, HCROI)

3.2 Model

Following Bontis (1998; 2001) and Bontis & Fitz-enz (2002), the Human Capital Effectiveness model²⁶ was used in the analysis and testing of the hypotheses described above. This Human Capital Effectiveness model (henceforth HCE) comprises of four distinct metrics which together provide a thorough perspective on the effectiveness²⁷ of an organization's workforce. These four metrics included in the HCE-model are; *revenue factor*, *expense factor*, *income factor* and *human capital ROI*. While the data in this study will be assessed on merely two²⁸ of these four metrics, an explanation of all four metrics in the model is essential to properly comprehend the framework it provides for measuring the economic value created by an organization's workforce. As such, these metrics are further elucidated below²⁹;

Revenue Factor

According to Bontis & Fitz-enz (2002); *the revenue factor metric is a basic measure of human capital effectiveness and is the aggregate result of all the drivers of human capital management that influence employee behavior.'*

The following equation is used to assess this metric:

$$\frac{\text{Total Revenue}}{\text{FTE}}$$

Expense Factor

Measuring the total operating expenses of an organization on a 'per employee' basis, the calculation used to assess this metric is:

$$\frac{\text{Total Operating Expenses}}{\text{FTE}}$$

Income Factor

This metric assesses the total operating income per employee and thus provides an insight into the contribution of each employee on the total operating income:

$$\frac{\text{Total Operating Income}}{\text{FTE}}$$

²⁶ The Human Capital Effectiveness model is part of the Intellectual Capital ROI model (Bontis & Fitz-enz, 2002) which also includes various other quantitative and qualitative metrics in order to measure the total (positive) impact of HR practices and human capital management on effectiveness of an organization's workforce. As such, it contains many metrics which fall outside the scope of this particular study which will thus not be used.

²⁷ In terms of financial in- and output on average per employee

²⁸ For this particular study, the *expense factor* and *income factor* do not prove to be essential

²⁹ In the original HCE-model, Bontis & Fitz-enz (2002) intended to measure FTE (Full Time Equivalent) values, however, due to a lack of respondents the study was completed by using 'headcounts' of employees working in the sampled companies. By using the proposed dataset, however, this study *will* be able to effectively use the initially suggested metric of 'Average FTE' as the proper denominator in the calculations and is therefore used.

Human Capital ROI

Embodying the most important metric of the four, the Human Capital ROI is an ‘*equivalent to calculating the value added of investing in the organization’s human assets*’ (Bontis & Fitz-enz, 2002). The results from this metric show a value of output for each unit of input, or more concretely, how much return is generated per € spent on employees. By reinforcing this connection, Gardner, Dyne & Pierce (2004) argue that; ‘*Organizations can increase the ROI of their compensation dollars*’. This connection is measured as:

$$\frac{\text{Revenue} - (\text{Total Operating Expenses} - \text{Total Labor Expenses})}{\text{Total Labor Expenses}}$$

Complementing the HCE-model, the *Human Capital Valuation* model (henceforth HCV) provides five additional metrics which act as a mediating construct in predicting human capital effectiveness. These five metrics use compensation figures as proxies for the value of human capital in organizations and consist of; *compensation revenue factor*, *compensation expense factor*, *compensations factor*, *executive compensation factor* and *supervisory compensation factor*. While all five metrics provide valuable insight into an organization’s sustainability, the *compensation factor* is the only metric which provides particular benefit for the current study.

Compensation factor

Describes the average compensation paid to each employee in the organization;

$$\frac{\text{Total Labor Expenses}}{\text{FTE}}$$

In addition to these distinct models, the *Human Capital Value Added* factor should be measured. The outcome of this metric values the positive impact human capital management has on effectiveness, which is used as a proxy for productivity by measuring total profit per employee;

$$\frac{\text{Revenue} - (\text{Total Operating Expenses} - \text{Total Labor Expenses})}{\text{FTE}}$$

As indicated in section 3.1, hypotheses 1a-d will be tested by using the performance metrics from the *Human Capital Effectiveness* and *Human Capital Valuation* models described above in combination with a standard regression model. This standard regression will be used to assess the correlations between the various performance metrics and the underlying cost of labor. The regression model takes the following form:

$$a_{P_1, P_2, P_3, P_4, t} = \beta_0 + \beta_1 C_{l, t} + \beta_2 E_{gr, t} + \beta_3 I + \varepsilon_{p, t}$$

Where; $a_{P_x, t}$, is the performance metric under review at time t and $C_{l, t}$, is the cost of labor at time t calculated as; $\frac{\text{Labor Cost}_t}{\text{FTE}_t}$,

where (as will be clarified in section 4) FTE is averaged for 2 years. $E_{gr, t}$ = the average economic growth rate³⁰ at time t . $\beta_3 I$ = the coefficient for the respective industry a company operates in and β_0 represents the standard intersect.

The aforementioned performance measures ($a_{P_x, t}$) represent the 4 distinct metrics used in hypotheses 1a-d and constitute the following; P_1 = The Revenue Factor; P_2 = the Human Capital Value Added (HCVA); P_3 = the *Earnings per Share*; and P_4 = the Human Capital Return on Investment

³⁰ Source and composition will be explicated in section 4 of this paper

Once the existence of such a correlation has been established and validated, hypothesis 2 will identify the actual benefit of such a correlation to the organizations under examination. In order to do so, the results of the higher performance should be measured against the higher cost necessary to achieve this increase. Essential to note here is that, following Gardner, Dyne & Pierce (2004) the measure used in this analysis is **pay level** (an employee's total direct compensation) as opposed to **pay increases** (an employee's pay raise or change in pay level at some given point in time). The reason for this is that **pay level** provides a relatively stable construct that represents the result of cumulative changes in pay across time while **pay increases** constitute of a single change in pay at a given moment. As such, the measure for hypothesis 2 is not the actual change in pay but the new level of performance offset against the various levels of pay. Moreover, contrary to hypothesis 1, the regression for testing hypothesis 2 will not include all four distinct performance measures. As stated earlier, testing hypothesis 1 validates the various metrics of Bontis & Fitz-enz (2002) against the generally accepted financial market and accounting measures. As such, it can be assumed that a validation of hypothesis 2 based on the most prominent measure in the model; HCVA would be appropriate. Particularly since this metric is ultimately the metric of interest for this thesis.

When taking all these arguments into consideration, the regression model for the validation of hypothesis 2 takes the following form:

$$a_{P_1,t} = \beta_0 + \beta_1 C_{l,t} + \beta_2 E_{gr,t} + \beta_3 I + \varepsilon_{P,t}$$

Where; $a_{P_1,t}$ is the HCVA at time t calculated as; $\frac{Revenue\ Adjusted_t - (Total\ Operating\ Expenses - Total\ Labor\ Expenses^{31})_t}{FTE_t}$.

In this new metric $Revenue\ Adjusted_t = Revenue_t - \Delta TLE_t$, where $\Delta TLE_t = TLE_t - TLE_{t-1}$. Similar to calculations used for the regression model used to test H1a-d, $C_{l,t}$, is the cost of labor at time t calculated as; $\frac{Labor\ Cost_t}{FTE_t}$, where FTE is averaged for 2 years.

$E_{gr,t}$ = the average economic growth rate at time t . $\beta_3 I$ = the coefficient for the respective industry a company operates in and β_0 again represents the standard intercept.

In the following section of this paper (4), a thorough overview of the dataset will be given using descriptive statistics and additional analytics in order to ensure full comprehension of the sample under review. Once the data has been properly elucidated, section 5 will provide the results of the regression models discussed above and the statistical significance of the hypotheses under review will be provided.

³¹ Henceforth TLE

Table 9: Literature summary Section 3; Hypotheses & Methodology

The table below summarizes the articles that provided insight for section 3

Author	Date	Title	Research question	Variables	Time period	Outcomes
Bloom, M.	1999	The Performance Effects of Pay Dispersion on Individuals and Organizations.	What is the relationship between pay dispersion and performance?	Variables for individual performance: adjusted batting runs, singles&doubles, home runs, bases on balls, number of times hit as batsman, fielding runs, put-outs&strikeouts, innings played, pay-scheme. Variables for organizational performance; wins/games played, total home attendance/stadium capacity*home games, gate receipts, media income, total income, franchise value, total compensation, total labor cost.	1992-1999	More compressed pay dispersions are positively related to multiple measures of individual and organizational performance. Greater dispersion is associated with lower individual and group performance in areas where work interdependencies are important.
Bontis, N.	1998	Intellectual capital: an exploratory study that develops measures and models.	How to conceptualize the elusive intangible 'IC' in order to channel it into an essential source for competitive advantage.	Develops a model containing three distinct conceptualizations; Human capital, structural capital, customer capital. This model is further measured by e.g.; profit, profit growth, sales growth, after-tax return on assets, increase revenue per employee, customer loyalty, etc.	1992-1999	The management of IC lies at the heart of value in the current 'knowledge era' of business. A true formula for measuring IC may never exist, however, longitudinal examination of metrics as well as benchmarking against industry norms can assist in examining an organization's IC. All business leaders should be appreciative of the power knowledge management can have on business performance and measuring and strategically managing knowledge may make the difference between mediocrity and excellence.
Bontis, N.	2001	Assessing knowledge assets: a review of the models used to measure intellectual capital.	A summary of the current body of knowledge regarding assessing knowledge assets through trends and features of current IC measurement models.	Literature review pertaining to the assessment of knowledge assets. The models discussed include; Skandia Navigator, IC index, Technology Broker, Intangible asset monitor, MVA and EVA.	1992-1999	Intangible assets have a substantial implication for financing a knowledge organization's vision. The efforts to create human resources costing and accounting systems have not considered the full range of intangible assets that can exist nor have they been particularly useful as MIS monitoring the daily progress of business. In the long term, it could become essential for organizations to disclose their IC in explaining business performance.

Author	Date	Title	Research question	Variables	Time period	Outcomes
Bontis, N. & Fitz-enz, J.	2002	Intellectual Capital ROI: A causal map of human capital antecedents and consequents.	Integrating constructs from the fields of intellectual capital, knowledge management, human resources, organizational behavior, and information technology and accounting to uncover a more holistic perspective of organizational performance and reconcile the use of both economic and perceptual measures of human capital management.	Develops a model containing several quantitative and qualitative factors including; human capital effectiveness, human capital valuation, human capital investment, human capital depletion, employee satisfaction, knowledge integration, relational capital, knowledge sharing, etc.	1992-1999	Measuring and modeling of human capital are critical, a view which is attributed to the growing strategic importance of intellectual capital management and the need for HR managers to establish their credibility. This study yielded a holistic causal map that integrated constructs from the fields of intellectual capital, knowledge management, human resources, organizational behavior, information technology and accounting. The integration of both qualitative and quantitative measures in an overall conceptual model resulted in a structural equation which allows participating organizations to gauge the effectiveness of its human capital capabilities.
Bontis, N., Dragonetti, N.C., Jacobsen, K. & Roos, G.	1999	The Knowledge Toolbox: A review of the tools available to measure and manage intangible resources.	What is the best tool to measure intangible resources?	Critical review of various intangible resource measurement systems including; Human Resource Accounting, EVA, Balanced Scorecard, IC.	1992-1999	No universally best tool exists for measuring intangible resources. Each of the tools assessed have success stories they can rightfully take credit for but they are all more or less appropriate to a specific situation and/or company.
O'Hanlon, J. & Peasnell, K.	1998	Wall street's contribution to management accounting: the Stern Stewart EVA financial management system.	Review of EVA as the proper measure to promote value-maximizing behavior in corporate managers	Residual income, NPV & DCF, changes in book value, profit, total market value, ROA.	1992-1999	EVA provides the basis for judging entrepreneurial performance in practice. However, a sole focus on EVA might lead a division with good growth prospects to under-invest because of the dent to the EVAs early years caused by the capital charge being at its maximum when revenues are lowest. Relationship between economic value, book value and future EVAs provides a basis for many of the claims that are made in support of EVA.
Richard, P.J., Devinney, T.M., Yip, G.S. & Johnson, G.	2009	Measuring Organizational Performance: Towards Methodological Best Practice.	Discussion on the meaning and measurement of organizational performance with particular emphasis on financial measures and the use of performance as a dependent variable.	Discusses various measures of organizational performance including, i.a.; accounting measures (ROI, EBIT, market share, net operating profits, NOPAT, ROA, ROE), financial market measures (EPS, stock price, P/E ratio), mixed accounting/financial measures (cash flow per share, DCF, EVA, REVA, MVA, NPV, SVA, WACC).	<1992, 1992-1999, 2000-2003, 2004-2008	Understanding how discipline-specific measures load onto the dimensions of organizational performance and the interrelationships between specialist measures is essential to understanding the relationships between multiple organizational actions. Claims to address organizational performance must include strong theory that addresses two key issues; the dimensionality of performance, the selection and combination of performance measures. To be strong, the theoretical rationale for an approach to performance measure must be both comprehensive in its assessment and rigorous in its validation. This means that the measure must be rooted deeply in theory and validated by empirical evidence.

4.0 Data Analysis

To investigate the relationship between labor cost and performance, a specific data set is required which contains information on various performance indicators as well as comprehensive information on the magnitude of the organizational workforce and the cost that is associated with this workforce. Moreover information on economic cyclical patterns is required to investigate its potential for being an independent variable in the incentive-effort relationship. The data used in this study was obtained through ThomsonOne³² and was comprised of public archival data from companies listed on the Amsterdam Exchange Index (henceforth AEX) and Amsterdam Midkap Index (henceforth AMX) complemented with publicly listed companies from the United States. After careful consideration of the various data streams offered by ThomsonOne, the complete set was acquired from WorldScope which provided the most consistently complete dataset and thus proved to be the appropriate source from which to extract the entire set. An important implication of using archival data is that it does not incorporate any factors that might influence individual performance which is not reflected in the averaged total (e.g. individual bonus policies). Moreover, this data does not reflect any individual (i.e. organization-based) characteristics³³, hence the proxies for performance, etc. are assumed to be *ceteris paribus* with regard to the aforementioned internal characteristics of the organizations under analysis. This assumption protects the analysis from interference from company specific policies and supports the relative stability of the items under investigation.

An intensive period of assessing the various alternatives and the actual process of collecting the data resulted in a total data set consisting of 1167 companies³⁴ from 9 different industries; *Raw materials, Consumer goods, Consumer services, Financials, Health care, Industrials, Technology, Telecommunications, Utilities*, and spans over a 20 year period, starting in 1993³⁵. During this data collection process, careful consideration was placed on the eligibility of the individual organizations in light of the specific set of variables required for being able to be measured by the *Human Capital Effectiveness* model of Bontis & Fitz-enz (2002). Due to these specific characteristics, companies that did not meet these initial criteria were excluded altogether. For the remaining 1167 organizations, the following variables³⁶ were extracted from the database; *Revenues*³⁶, *Net Operating Income*³⁷, *Total Operating Expenses*³⁸, *Salaries and Benefit Expenses*³⁹, *Employees*⁴⁰, *Earnings per Share*⁴¹, *EBIT*⁴² and *EVA*⁴³. These variables were retrieved as non-scaled values and directly converted to amounts in EUR, using the standardized proxy rates provided by WorldScope⁴⁴.

³² ThomsonOne (T1), the new interface of the former Thomson ONE Banker, offers a widely used, searchable database archive, and online access to financial data from (listed) corporations world wide. The data streams in this archive are provided by various sources, including i.a.; WorldScope, SDC, Thomson Financial, Company.info, Orbis, CompuStat Global, DataStream and Thomson Research. For more information see www.thomsonone.com

³³ Such as e.g. the spread of pay, which might influence performance (Shaw, Gupta & Delery, 2002), social comparison leading to perceived inequity of pay level between peers (Larking, Pierce & Gino, 2012) or the use of various incentive-schemes within a certain organization performance (e.g. Locke et al. 1980; Weibel, Rost & Osterloh, 2009; Mason & Watts, 2012).

³⁴ Of this 1167 companies, 156 are listed on the AEX and AMX, the additional 1011 are listed companies from the United States

³⁵ This particular data range was chosen as ThomsonOne indicates that the average corporate data history in its databases begins in 1993. Moreover, by covering a timespan of approximately 20 years, the dataset provides enough validity for the statistically significant results to be accepted.

³⁶ Identified by WorldScope as; gross sales and other operating revenue less discounts, returns and allowances

³⁷ Identified by WorldScope as; income before extraordinary items

³⁸ Identified by WorldScope as; the sum of all expenses related to operations

³⁹ Identified by WorldScope as; wages paid to employees and officers of the company

⁴⁰ Identified by WorldScope as; the number of both full and part time employees of the company at year's end

⁴¹ Identified by WorldScope as; the earnings for the 12 months ending the fiscal year of the company

⁴² Identified by WorldScope as; the earnings of a company before interest expense and income taxes

The aforementioned information on cyclicity (i.e. annual Real GDP Growth Rate) was obtained through The World Bank⁴⁵ and represents the annual percentage growth rate of GDP at market prices based on constant local currency. This source calculates GDP as the sum of gross value added by all resident producers in the economy and corrected for product taxes (added) as well as any subsidies not included in the value of the products (subtracted). Furthermore, The World Bank calculates GDP without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. The complete cyclical pattern for both the United States and the Netherlands⁴⁶ was confirmed with various additional sources for supplementary validation. These sources included both national governmental data sources (Centraal Bureau voor de Statistiek, the Central Intelligence Agency's 'World Fact book') as well as several independent international sources (e.g. Index Mundi and Trading Economics)⁴⁷.

4.1 Data Quality Analysis

In order to avoid errors and failure in the later stages of the main analysis, the acquired data set was evaluated for missing values, outliers and overall quality. As previously stated, during the data collection process a careful assessment was made on whether specific organizations should be included. However, an in-depth analysis of the 1167 organizations was made upon completion of the data collection in order to ensure the consistency of the dataset. The results of this thorough analysis will henceforth be discussed.

4.1.1 Outliers

The assessment of outliers in terms of minimum and maximum values generated several cases that reported unrealistic values in terms of Sales, Labor Cost and Total Cost. These unrealistic cases (i.e. negative values) were excluded from the study. After this initial exclusion, the assessment which can be found in tables 11 and 12 concluded that no other unrealistic outliers were apparent in the data set. An additional assessment for normality and homoscedasticity of the data did not generate any significant complications and no cases had to be excluded.

4.1.2 Manipulation

Prior to an additional assessment for absent data, the manipulations necessary for the accurate application of the HCE model and subsequent regressions had to be completed. In order to create a stable construct for measuring the total workforce on a yearly basis, the data acquired for FTE had to be reconstructed. Since the data represents the total amount of employees (i.e. FTE) at year's end, the initial value does not incorporate any changes to the workforce during the year. In order to accurately approximate the actual value of employees during the year, the total values were averaged for two years (i.e. the FTE value for subsequent calculations will be the average of FTE_t and FTE_{t-1}). Unfortunately, the data range does not include data for 1992, which implies that the FTE value for 1993 could not be averaged. As such, all data from 1993 was excluded from further analysis.

⁴³ Identified by WorldScope as; (Operating income after depreciation-income taxes)-cost of capital

⁴⁴ This conversion was used on both the United States listings, as well as the AEX/AMX listings prior 2001

⁴⁵ The World Bank provides information on a wide variety of global issues and trends including World Development Indicators comprised of information from the World Bank national accounts data and OECD national accounts data. For more information see; data.worldbank.org

⁴⁶ Provided in appendix 2

⁴⁷ See statline.cbs.nl, www.cia.gov, www.indexmundi.com and www.tradeeconomics.com for more information

After this initial manipulation was done, the metrics as described in section 3.2 could be calculated and incorporated in the subsequent analyses.

4.1.3 Missing Data

Upon completion of the data collection process, a total of 1123 companies were included in the complete data set. An assessment of the uniqueness of the entity keys showed that several of these organizations were reported more than once, which would be due to their listing on both the AEX/AMX as well as a listing on an United States exchange. These organizations were excluded from further analysis. Moreover, the remaining 1117 companies were assessed on the completeness of the distinct line items necessary for later analysis (i.e. *all* necessary line items being present for a specific year). Based on the findings in this assessment, a total of 581 companies had to be excluded from the study due to the fact that one or more variables were absent which would lead to inconclusive calculations when using the model. Thereafter, the remaining 536 companies were evaluated on the completeness of line items for the entire timespan of the collected data set (i.e. *all* line items being present for *all* 20 years). This evaluation indicated that 430 companies delivered incomplete information (i.e. of one or more years, one or more variables were missing). Hence, a total of 106 companies, remain for additional analysis and hypothesis testing. However, the excluded companies were incorporated in an additional assessment to evaluate any underlying patterns in the missing data. This analysis was conducted to test the hypothesis that both groups are equal and results obtained from the COMPLETE sample can thus be generalized for both groups. In order to do so, descriptive statistics for both groups in terms of means and variances were calculated and compared. In addition, an independent-samples t-test as conducted to compare the mean scores for Sales, FTE Average, Labor Cost and Total Cost. These two analyses investigate the similarities between both groups, which, in case any of the groups would consist out of extreme data, would present a significant difference in the variances found between the groups. The results of this analysis can be found in table 10, which shows that despite the relatively large standard deviations in both groups, this is generally not the case. No significant differences in the scores between INCOMPLETE and COMPLETE for the variables under review were found, with the exception of the scores for Labor Cost, which were slightly higher in the COMPLETE set.

One important factor to note here is that based on the distribution of these remaining 106 companies in terms of industries⁴⁸, the findings reported in section 5 are predominantly generalizable to organizations in the *financial* industry as these represent the vast majority of the organizations in the sample. Moreover, this provides a reasonable explanation for the significant difference between the two groups in terms of Labor Cost as indicated before. While the *financial* industry is certainly not the only industry in which individuals are rewarded quite significantly for their efforts, the predominant presence of this industry in the sample could instigate a relatively higher mean, in terms of Labor Cost, than a more mixed sample would experience.

⁴⁸ The distribution in terms of industry of the remaining 106 companies is as follows; 94 *Financials*, 6 *Industrials*, 1 *Consumer Services*, 3 *Consumer Goods*, 1 *Basic Materials*.

Table 10: Missing data; sales, FTE average, Labor Cost and Total Cost comparison

INCOMPLETE, indicates the organizations for which no complete data could be obtained on one or more variables in one or more years. COMPLETE represents the dataset for which all variables were obtained for the entire time span of 20 years. Sales indicates the total revenues per year. FTE Average indicates, as explained earlier, the average of number of employees (in Fulltime Equivalent Units) of 2 subsequent years. Labor Cost represents the total value of expenses on labor per year, whereas Total Cost presents the value of the total operating expenses per year.

Dataset	Variable	N	Mean	Std. Deviation	Sig. (2-tailed)
INCOMPLETE	Sales	14848	1757972643	9154946691	.430
	FTE Average	13960	7236,346067	32540	.450
	Labor Cost	12574	318966514	1596818997	.035
	Total Cost	14457	1594045233	8486758869	.962
COMPLETE	Sales	1995	1902775274	7471158778	.430
	FTE Average	1995	7773,888471	29228	.450
	Labor Cost	1995	399112731	1576726759	.35
	Total Cost	1995	1586757478	6226075947	.962

4.2 Descriptive Statistics

Tables 11 and 12 show summary statistics for both the filtered (COMPLETE) and unfiltered (INCOMPLETE) dataset used in the remainder of this paper. The unfiltered set represents the total dataset consisting of 1117 companies, while the filtered dataset represents the final dataset which will be used to validate the hypotheses from section 3.1. All four performance metrics seem to have an average positive result despite the fact that both HCROI and HCVA have a negative minimum value. Similar to the pattern reflected in appendix 2, the annual GDP growth rate shows a clear negative minimum, yet the overall mean indicates a positive growth over the 20 year total.

Table 11: Summary Statistics filtered (n=105)

Sales indicates the total revenues per year. FTE Average indicates, as explained earlier, the average of number of employees (in Fulltime Equivalent Units) of 2 subsequent years. EPS represents the reported earnings per share. HCROI (=Human Capital Return on Investment), HCVA (Human Capital Value Added) and Rev_Factor (Revenue Factor) provide the output of the performance metrics discussed in section 3.2. Comp_Factor provides the output of the dependent variable measured by coefficient β_1 , further details of the calculation can be found in section 3.2. All these variables are generated on a 'per company' basis. AGR_GDP is the Annual Growth Rate of GDP as discussed in the introduction of section 4. Country represents a dummy variable for country listing which equals 0 for United States and 1 for the Netherlands.

Variable	Mean	Std. Deviation	Minimum	Maximum
Sales	1902775274	7471158778	4652386,982	86077270580
FTE Average	7773,888	29228,21847	39	307000
Labor Cost	399112730,8	1576726759	1210616,876	23197816546
Total Cost	1586757478	6226075947	3745394,045	70704846356
EPS	1,138	1,571	0,003	27,431
HCROI	2,045	0,825	-8,478	9,037
HCVA	84580,807	41258,282	-383764,772	359592,679
Rev_Factor	195137,607	91576,478	1117,507	883727,633
Comp_Factor	42103,672	15077,968	17070,392	155573,118
AGR_GDP	2,497	1,867	-3,7	4,9
Country	0,67	0,249	0	1

Table 12: Summary Statistics unfiltered (n=1117)

Sales indicates the total revenues per year. FTE Average indicates, as explained earlier, the average of number of employees (in Fulltime Equivalent Units) of 2 subsequent years. HCROI (=Human Capital Return on Investment), HCVA (Human Capital Value Added) and Rev_Factor (Revenue Factor) provide the output of the performance metrics discussed in section 3.2. Comp_Factor provides the output of the dependent variable measured by coefficient β_1 , further details of the calculation can be found in section 3.2. AGR_GDP is the Annual Growth Rate of GDP as discussed in the introduction of section 4. Country and Complete_20yrs represent dummy variables for country listing and COMPLETE vs. INCOMPLETE data sets. These variables equal 0 for United States or INCOMPLETE respectively and 1 for respectively the Netherlands or COMPLETE.

Variable	Mean	Std. Deviation	Minimum	Maximum
Sales	1,775E+09	8971946709	0	1,82401E+11
FTE Average	7303,559	32143,966	0	608260
Labor Cost	329941303	1594267043	0	28475362972
Total Cost	1,593E+09	8245555359	0	1,74335E+11
HCROI	194,061	11103,260	-443631,12	522702,916
HCVA	163795,59	4036998,487	-5741771,2	453995142,9
Rev_Factor	410813,86	4500829,445	-983082,23	455271428,6
Comp_Factor	52766,102	201631,0489	0	18571637,68
AGR_GDP	2,4664279	1,883	-3,7	4,9
Country	0,14	0,346	0	1
Complete_20yrs	0,09	0,292	0	1

5.0 Results

Building on the data described in detail in section 4 and the models clarified in section 3.2, this chapter will provide the results and findings of this study. By presenting the results from the various analyses and theorizing the possible generalizations that can be drawn from these findings, this section provides an understanding of the relationship between Labor Cost and Performance, as found in this study. More specifically, section 5.1 will elaborate on the findings from the analyses used for testing hypothesis 1 and presents the results of the relationship between Total Average Cost of Labor and the various performance metrics under investigation. As identified earlier, this is an important analysis in the sense that it validates the first step in the answer to the research question of this paper. Section 5.2 explains the results of the analysis of several additional metrics which were tested in the process in order to validate the subsequent analysis for hypothesis 2. In section 5.3, the results from the subsequent analysis on the actual benefit of a correlation between Total Average Cost of Labor and performance are presented. From these results can be concluded whether possible relationship between Labor Cost and performance is actually profitable for organizations.

5.1 Relationship between Labor Cost and Performance (1)

The following section shows the results from the analysis of the relationship between the Total Average Cost of Labor (i.e. the compensation factor as suggested by Bontis & Fitz-enz (2002)) and the various performance metrics as described in section 3.2. Table 13 shows the correlation results from the regression of Compensation Factor, Industry and Annual GDP Growth Rate characteristics on the Revenue Factor, Earnings per Share, Human Capital Value Added and Human Capital Return on Investment. Section 5.1.1 to 5.1.4 discusses the results for the relationship between these independent variables and the distinct performance measures separately.

Table 13: Regression results of Labor Cost, Industry and Annual GDP Growth on Performance.

The dependent variables are the Revenue Factor, Earnings per Share, Human Capital Value Added and Human Capital Return on Investment. The independent variables are the Compensation Factor, Industry and Annual GDP Growth Rate. The definitions for these variables is identical to those discussed in table 2; summary statistics filtered. This table also reflects the dataset which was used to obtain these results. The reported Beta Coefficient is exclusively the Beta for the highest correlating variable.

Independent Variable	Dependent Variable			
	Rev_Factor	EPS	HCVA	HCROI
Comp_Factor	.526** (0.000)	.195** (0.000)	.605** (0.000)	-.146** (0.000)
Industry	.006 (0.978)	.027 (0.233)	.223** (0.000)	.319** (0.000)
AGR_GDP	-.034 (0.156)	-.118** (0.000)	-.19 (0.394)	.156** (0.000)
<i>Standardized Beta</i>	.538	.18	.615	.315
<i>Adjusted R-square</i>	.28	.045	.417	.136
<i>No. of observations</i>	1995	1995	1995	1995

** Correlation is significant at the 0.01 level (2-tailed)

5.1.1 Revenue Factor

The relationship between the compensation factor and the revenue factor appears to be significantly positive. Both the correlation indicators as well as the adjusted R-square indicate a positive relation between the two variables. Despite the relatively low adjusted R-square the logical conclusion from this regression

would have to be a statistically significant impact of compensation on performance. With respect to the other independent variables, one has to conclude that the correlation between them and the revenue factor is too weak for a statistically significant relationship to exist. Moreover, an additional assessment for collinearity reveals no complications due to multicollinearity for which the results should be adjusted as both the Tolerance and Variance Inflation Factor are within reasonable ranges. Hence, it can be concluded that H1a; 'organizations with higher total labor cost per employee generate higher total revenues per employee', should be accepted.

5.1.2 EPS

Despite the fact that the adjusted R-square is arguably too low for seriously considering the explanatory power of the Compensation Factor on the Earnings per Share, a statistically significant relationship between these variables can be found. The considerably weak R-square might be caused by the fact that the characteristics of the financial market measures in general (or possibly EPS in particular) entail that the metric is subject to market conditions and turbulent forces outside the circle influence of the organization itself. Hence, regardless of the direct performances of the organization, changes in e.g., the company's capital structure or macro-economic influences could severely alter the value of the metric and provide more explanatory power than the Compensation Factor. Furthermore, it could be argued that, based on the generally accepted value of .3 and above for validating noteworthy correlations, the relationship found here is still to be neglected.

Taking this into account, it stems as no surprise that the Annual GDP Growth Rate appears to have a correlation with the metric which is nearly as high as that of the compensation factor. This indicates that the relationship with this particular variable, which was nearly non-existent when evaluating the revenue factor, seems to be significantly stronger when looking at EPS.

However, based on the statistical significance provided by this regression, it has to be concluded that H1b: 'organizations with higher total labor cost per employee generate a higher EPS', can be accepted.

5.1.3 HCVA

Considerably higher than all other correlations, the relationship between the Human Capital Value Added and the compensation factor shows a statistically significant correlation. Moreover, by indicating a correlation factor of .605, this correlation can be considered particularly strong. This designation is especially deserved when compared to the other performance metrics.

Moreover, contrary to the aforementioned performance metrics, the variable for industry seems to play a role in the relationship. This correlation is notably weaker than the main driver in this relationship, which is undisputedly the cost of labor, however, it is statistically significant. Similar to the findings of the assessment of the revenue factor, an additional assessment for collinearity reveals that both the Tolerance and Variance Inflation Factor are within reasonable ranges. As the relationship found in this analysis indicates strong evidence that; 'organizations with higher total labor cost per employee generate a higher 'Human Capital Value Added', H1c can be accepted.

5.1.4 HCROI

Contrary to the aforementioned results of the regression, the analysis of the relationship between HCROI and its underlying drivers indicates various interesting relationships. While the other performance metrics correlate significantly with only one or two of the underlying variables, this particular metric has statistically significant relationships with all three independent variables. From this assessment, however, it has to be noted that the variable for *Industry* is the main driver in this relationship which thus wields the largest part of the already weak explanatory power of this relationship. This weak relationship, which is reflected by the relatively small adjusted R-square, is peculiar considering the predominant presence of merely one particular industry in the distribution. It is, however, evident that a relationship between these variables exists. Despite this fact H1d: ‘organizations with higher total labor cost per employee generate a higher Human Capital ROI’, can be accepted the weak correlation factor between the Compensation Factor and the HCROI is still statistically significant.

In summary, the results from the analyses of the relationship between Labor Cost and Performance provide interesting insights. Whereas the performance measures which include a certain variable for FTE within the metric itself seem to indicate a strong and statistically significant relationship with the Total Average Cost of Labor, both the EPS and HCROI measures of performance reflect fairly weak correlation factors. Despite the statistical significance, their explanatory power seems to be close to non-existent and the other independent variables present values which are nearly as high. One possible explanation of this result could be the underlying drivers of the performance measures as identified in section 5.1.2. Alterations in the organization’s capital structure, cost structure, market value or other financial issues could drastically change the output of these measures. Moreover, the fundamental element in both the Revenue Factor and HCVA metrics is the workforce itself, as both metrics include a denominator which consists of FTE. The evident relationship thus leads to a stronger correlation factor and more direct acceptance of the hypotheses which supports the notion that high rewards impose higher returns.

Despite the acceptance of H1a-d based on their statistical significance, a thorough validation of the HCE metrics (in particular the HCVA) is an essential criterion for the evaluation of H2. The weak correlation factors for both EPS and HCROI could pose a threat to the subsequent analysis, as it is of vital importance that the aforementioned validation is undisputed. Statisticians who make the argument that the correlation factor and adjusted R-square are to be used as indicators of significance, could thus dispute the acceptance of H1b and H1c. In order to overcome this threat, additional tests have been constructed. These additional assessments will be explained further in section 5.2.

Assessing the other independent variables, it could in general be argued that the variable for industry does not play a significant role in the correlations. As earlier mentioned, this is not surprising considering the predominant distribution of *financials* within the dataset. However, the HCROI measure was affected by this controlling variable. A possible explanation could be the fact that this metric is denominated by ‘Total Labor Cost’, which table 10 in section 4.1.3 found to be particularly high in this industry. As such, similar to the way in

which the denominator of the Compensation Factor affects HCVA and the Revenue factor, this might influence the relationship experienced by the HCROI.

Lastly, contrary to rational economic expectations, the Annual GDP Growth Rate proved to be of less than significant importance on nearly all relationships. Although this would adhere to the lack of significance of this controlling variable found by the literature overview as discussed in the final part of section 2, it is quite a peculiar finding. Especially since an additional regression in which this controlling variable has been removed does not seem to provide a significantly different output.

5.2 Relationship between Labor Cost and Performance (2)

The results presented in section 5.1.2 and 5.1.4 suggested weak correlation factors and relatively small R-square values which jeopardizes the direct relationship between the Total Average Cost of Labor and the performance measures Earnings per Share and HCROI. These findings suggest that EPS and HCROI are only marginally affected by the Total Average Cost of Labor and thus endanger the justification of providing higher rewards to an organization's workforce. Contrary to these findings are the results reported in 5.1.1 and 5.1.3 which clearly indicates a positive correlation and thus a relationship between pay level and performance level when measured by the HCVA and Revenue Factor metrics. The observed difference between these four metrics, particularly between EPS and the two positively correlating metrics, leads to the logical conclusion that a strong relationship between pay and performance can only be found by using the metrics from the HCE model.

However, in order for any subsequent findings to be properly validated, it is essential to find a common ground between the metrics (i.e. HCVA) from the HCE model of Bontiz & Fitz-enz (2002) and the generally accepted financial market and accounting measures of performance⁴⁹. In order to attempt to find this common ground, an additional set of regressions has been conducted in which three more generally accepted financial market and accounting measures have been analyzed. The results of these additional regressions⁵⁰ can be found in table 14. Subsequent section 5.2.1 to 5.2.3 will discuss the results for each of these measures in more detail.

Table 14: Regression results of Labor Cost and Annual GDP Growth on Performance (2).

The dependent variables are the Earnings Before Interest and Taxes, Net Income and Economic Value Added. The definitions for these variables can be found in the footnote on page 31 in section 4. The independent variables are the Compensation Factor and Annual GDP Growth Rate. The definitions for these independent variables is identical to those discussed in table 2; summary statistics filtered. This table also reflects and adjusted dataset from which all industries other than *Financials* were excluded. The reported Beta Coefficient is exclusively the Beta for the highest correlating variable.

Independent Variable	Dependent Variable		
	EBIT	Net_Income	EVA
Comp_Factor	0,404** (0.000)	0,396** (0.000)	-0,096** (0.000)
AGR_GDP	-0,024 (0.313)	-0,17 (0.475)	0,036 (0.163)
<i>Standardized Beta</i>	0,411	0,404	-0,093
<i>Adjusted R-square</i>	0,164	0,158	0,009
<i>No. of observations</i>	1804	1804	1804

** Correlation is significant at the 0.01 level (2-tailed)

⁴⁹ The reason for this necessity is explained in-depth in section 3.2

⁵⁰ Which were conducted by using the 94 companies of the *Financial* industry

5.2.1 EBIT

Similar to both HCVA and the Revenue Factor, there seems to be quite a strong positive relationship between the Compensation Factor and EBIT. Despite the relatively low adjusted R-square, it is evident that the positive correlation can be explained by this independent variable, which proves to be statistically significant. Similar to the results of prior regressions, the control variable for Annual GDP Growth does not indicate any additional significance for this assessment. Additional validation for this result stems from the standardized coefficients and sig. values which all indicate a distinct explanatory power for this particular measure.

5.2.2 Net Income

Albeit slightly lower than the regression for EBIT, the assessment on the correlation between the Compensation Factor and Net Income also provides a statistically significant positive result. Similar to the relationship between EBIT and the Compensation Factor, the model experiences a fairly low adjusted R-square which indicates that a substantial part of the variance is not explained by the current model. Hence, the explanatory power of this particular variable is lower than one would prefer. However, despite this issue, the regression provides enough statistical validation of the positive relationship between the Compensation Factor and Net Income.

5.2.3 EVA

Resulting in even lower correlation values than the regression for EPS did, the findings from the assessment of EVA and its relationship with the Compensation Factor indicate a weak yet significant negative relationship. Albeit, less than satisfying, the results in table 14 clearly indicate the particularly low value for the Compensation Factor does constitute a significant relationship and can thus be explained by this model. The particularly weak (and negative) correlation, however, suggests that this performance metric is not the appropriate validation for the HCE model.

In summary, from the results of these additional regressions it becomes evident that there is a distinct difference in the manner in which financial market measures and accounting measures relate to the Compensation Factor. While widely accepted accounting measures of performance (i.e. EBIT and Net Income) indicate a strong positive relationship with the suggested independent variable, both of the financial market measures (i.e. EPS and EVA) seem to provide only very weak correlations. As indicated in section 5.1, this might be caused by the underlying drivers of the various metrics or perhaps by the fact that the financial market measures reflect different types of performance to a different type of audience. While the possible causes of this difference will be further discussed in section 6, it suffices to state here that this initial difference existed and was not resolved by testing EVA as an additional measure for this type of performance.

However, as regressions for both EBIT and Net Income yield satisfying positive results, the metrics from the HCE model can be validated and the HCVA can thus be used in section 5.3 to test hypothesis 2.

5.3 The benefit of a relationship between Labor Cost and Performance

Following the results from section 5.1 and 5.2 the regressions conducted on the effect of the Compensation Factor on the various performance metrics provided a clear image of the relationships between them. Due to the positive validation of the HCE model and its metrics in relation to the generally accepted accounting measures of performance, it is possible to take the final step in obtaining an answer to the research question of this thesis. In order to do so, the possible excess in performance as a result of a certain level of labor cost needs to be tested. An in-depth explanation of the model to test this final hypothesis was provided in section 3.2. Once the proper calculations for an adjusted value of HCVA were made, these values were tested in a standard regression against the independent variables used in the prior regressions. Table 15 shows the result of this regression.

Table 15: Regression results of increased Labor Cost on the new Performance level.

The dependent variable Human Capital Value Added_Adjusted is the metric as explained in detail in section 3.2. The independent variables are the Compensation Factor, Industry and Annual GDP Growth Rate. The definitions for these variables is identical to those discussed in table 2; summary statistics filtered. This table also reflects the dataset which was used to obtain these results.

Independent Variable	Dependent Variable HCVA_Adjusted
Comp_Factor	.592** (0.000)
Industry	.222** (0.000)
AGR_GDP	-.043 (0.056)
<i>Standardized Beta</i>	.598
<i>Adjusted R-square</i>	.398
<i>No. of observations</i>	1995

** . Correlation is significant at the 0.01 level (2-tailed)

As the results in table 15 indicate, a positive and statistically significant correlation exists between the Compensation Factor and the adjusted HCVA. With a quite respectable result of the adjusted R-Square (.398) and an equally respectable correlation factor, it becomes evident that the movements of the adjusted HCVA can definitely be explained by the underlying changes in the Compensation Factor. Taking these results into account, the question whether ‘the additional value generated from higher performance, offsets the additional total labor cost per employee and, hence, these organizations experience a net increase in performance’ can be affirmatively answered. Hence, H2 can be accepted.

5.4 Hypotheses Evaluation

The previous sections 5.1 to 5.3 thoroughly discussed the regression results and the implications from these findings. The various performance metrics and the incentive-performance relationship were discussed in detail and conclusions on the testable hypotheses from section 3.1 were drawn. In order to provide a comprehensive overview of this discussion, table 16 indicates a final evaluation of the testable hypotheses.

Table 16: Hypothesis evaluation

Indicates the conclusive assessment of the hypothesis and indicates whether each hypothesis should be accepted or rejected. Remarks, indicates concise additional information on the reasoning for accepting or rejecting.

Hypothesis		Accept / Reject	Remarks
1	a <i>Organizations with higher total labor cost per employee generate higher total revenues per employee</i>	Accept	Strong correlation factor, appropriate R-square and statistical significance.
	b <i>Organizations with higher total labor cost per employee generate a higher EPS</i>	Accept	Statistical significance despite the considerably low correlation factor and adjusted R-square. Less than satisfactory result yet, confirms the hypothesis.
	c <i>Organizations with higher total labor cost per employee generate a higher 'Human Capital Value Added'</i>	Accept	Strong correlation factor, appropriate R-square and statistical significance.
	d <i>Organizations with higher total labor cost per employee generate a higher Human Capital ROI</i>	Accept	Statistical significance despite the considerably low correlation factor and adjusted R-square. Less than satisfactory result yet, confirms the hypothesis.
2	<i>The additional generated value in organizations for which hypothesis H1a-d holds, offsets the additional total labor cost per employee</i>	Accept	Strong correlation factor, appropriate R-square and statistical significance.

6.0 Additional Analysis – Economic Cycles

The results discussed in section 5 clearly indicate a positive relationship between incentives and performance. Since the data spans over a period of approximately 20 years, the general conclusions can be drawn that, despite the potentially crude fluctuations in the macro-economic environment, the positive incentive-performance relationship holds under average circumstances. While this conclusion provides sufficient evidence for the hypotheses discussed in section 3.1 to be accepted and to distill an answer to the research question of this study, it would be interesting to assess the robustness of this relationship by evaluating it during specific periods of severe economic downturn. The underlying assumption for this is that, while the results of the regressions have indicated a positive relationship over the entire time period, the relationship might be significantly different during the aforementioned downturns. Since these specific periods are merely a fraction of the total dataset, the effect on the overall relationship might not be significant enough to adjust the overall positive results. However, when this specific period is extrapolated from the dataset and subjected to an additional assessment, the potentially different effects might become visible.

In order to provide this additional assessment and verify the robustness of the relationship against periods of severe economic decline, the United States listings from the *Financial* industry between 2006 and 2009 are reevaluated. As can be seen from Figure 1 below, this particular dataset reflects a period of significant and uninterrupted economic decline and thus provides the proper data for additional assessment. Moreover, by limiting the country of origin, the findings will not be diluted by slight differences between the national economic trends.

Figure 1: Annual GDP Growth Rate in the United States

The particular period which will be assessed; 2006-2009 has been highlighted.



Source: www.tradeeconomics.com and data.worldbank.org

6.1 Additional Analysis - Results

The following section shows the results from the additional analysis discussed in section 6.0. In this analysis, all testable performance measures used to evaluate hypotheses 1a-d including the additional measures from section 5.2 are included. Hence the relationship between the Total Average Cost and all of these various performance metrics for the time period between 2006 and 2009 was assessed. The statistical results are provided in table 17 and thoroughly discussed below.

Table 17: Regression results of Labor Cost and Annual GDP Growth on Performance in economic downturn

The dependent variables are the Revenue Factor, Earnings per Share, Human Capital Value Added and Human Capital Return on Investment, Earnings Before Interest and Taxes, Net Income and Economic Value Added. The definitions for these variables can be found in the footnote on page 31 in section 4. The independent variables are the Compensation Factor and Annual GDP Growth Rate. The definitions for these independent variables is identical to those discussed in table 2; summary statistics filtered. The reported Beta Coefficient is exclusively the Beta for the highest correlating variable.

Independent Variable	Dependent Variable						
	Rev_Factor	EPS	HCVA	HCROI	EBIT	Net_Income	EVA
Comp_Factor	.498** (0.000)	.105* (0.040)	.681** (0.000)	-.135** (0.008)	.461** (0.000)	.460** (0.000)	-.156** (0.004)
AGR_GDP	.056 (0.015)	.083 (0.106)	.178** (0.000)	.243** (0.000)	.056 (0.276)	.070 (0.171)	-.026 (0.626)
<i>Standardized Beta</i>	.500	.107	.684	-.241	.462	.461	-.156
<i>Adjusted R-square</i>	.246	.031	.497	.071	.210	.214	.019
<i>No. of observations</i>	381	381	381	381	381	381	381

** . Correlation is significant at the 0.01 level (2-tailed)

* . Correlation is significant at the 0.05 level (2-tailed)

From the regression results provided in table 17 it becomes clear that despite the initial assumption; the positive incentive-effort relationship seems to hold during a time of economic decline. While not all measures indicate a significance level of 0.01 (the correlation between the Compensation Factor and EPS is significant at merely the 0.05 level) and the adjusted R-square is particularly low for both EPS and HCROI, each of the measures assessed seems to indicate a significant relationship with the Compensation Factor. These results are consistent with the results from the regressions which were discussed in section 5. The similarity in the findings from both the regressions of the entire dataset as well as those from the regressions of the extrapolated dataset discussed in section 6.0 leads to the conclusion that the relationship holds under any circumstance.

Moreover, the correlation between the Annual GDP Growth Rate and the HCVA and HCROI indicators also shows a significant relationship. Similar to the other findings, this is again consistent with the results discussed in section 5, which were obtained by testing the entire dataset. Especially the result on HCROI deserves attention, as this seems to be the sole relationship on which Annual GDP Growth Rate provides the strongest independent variable. These findings indicate that for both of these performance measures, the economic trends have a significant impact on the overall level of performance as could be expected in periods of severe economic decline. In order for this to be valid, however, the underlying data should thus reflect a consistent decline for all performance metrics, as well as, a decline for the Compensation Factor over multiple years.

In order to validate this argument, an additional evaluation of the underlying data was conducted, which showed a consistent decline of all factors measured in the regression. This decline adheres the assumption that the negative trend in macro-economic externality dictates the pattern, despite the relatively low significance of the relationship with median performance measure. Thus, while the negative trend which is reflected by the declining Annual GDP Growth Rate might not be the direct cause of the decline in the performance metrics, it constitutes as a clear proxy for the overall pattern which affects the entire dataset. Moreover, while this consistent decline logically leads to the findings discussed above, it generates additional questions on the incentive-performance relationship as it is unclear in what way the drivers of the Compensation Factor are initially affected by this decline. Since the drivers of the Compensation Factor (total workforce and total labor expenses) both experience a decline, the values of the Compensation Factor decrease. However, since the dataset does not indicate whether downsizing the workforce precedes the decrease in labor expenses, the actual effect on motivation (i.e. performance) cannot be completely grasped. I.e. employee performance might not be affected solely by the decrease in compensation but also by the fear of being the victim of a subsequent downsize.

In summary, however, it needs to be concluded that the robustness check on the incentive-performance relationship does not alter the relationships found in section 5.

7.0 Literature Evaluation

While sections 3, 4 & 5 have provided valuable insight into the incentive-performance relationship, these insights should be positioned properly in the existing body of academic knowledge. Especially since the literature review provided in section 2 clearly shows that the debate between economic scholars and sociological / psychological economic scholars is still vivid. By identifying to which general group of theories the results from this study adhere, these findings are can actively provide their contribution to academic science and shed new light on ongoing academic debates. As such, the relevance of this study can be accurately validated and the paper can take its rightful place amongst the broad spectrum of academic knowledge.

7.1 Comparison of Findings

This section provides an overview and comparison of the conclusions drawn in relevant academic literature against the findings of the current study. Based on the results obtained in section 5, a distinction is made between the various findings in the academic articles that have provided insight for this study. The evaluation is based on the degree to which the current results concur with the findings in a specific article. While many articles defend a singular perspective, several of the articles discussed in table 18 present outcomes which the findings in this study both confirm and dispute. Moreover, various articles which provided insight for this reached a conclusion that was unrelated to the current study, or, reached a related conclusion which was not actively pursued. Hence, the following evaluation contains four distinct labels which are assigned to accordingly to each individual article. Subsequently, section 7.2 provides an additional assessment of the possible explanatory factors for the various categories.

Table 18: Comparison of findings in current academic literature vs. findings in research

Confirm and Contradict indicate whether the findings in the current study respectively support or dispute the findings in the specified article. Unrelated indicates that the findings in the current study have no relation to the findings in the specified article. Unrelated yet not answered indicate that while the findings in this study relate to the specified article, the study does not provide any ground to either confirm or contradict these findings.

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Acemoglu, D.	1995	Reward structures and the allocation of talent.	Returns on productive activities depend on the amount of unproductive activities in the economy and hence, the reward structure that determines the allocation of talent is also endogenous. Unproductive activities reduce the marginal productivity of investment and the relative return of entrepreneurship, which creates the possibility for a multiplicity of equilibria where the unproductive activities themselves make these activities more attractive.	Unrelated
Bacidore, J.M., Boquist, J.A., Milbourn, T.T. & Thakor, A.V.	1997	The Search for the Best Financial Performance Measure.	Refined Economic Value Added (REVA) provides an analytical framework for evaluating operating performance measures in the context of shareholder value creation. Statistically, REVA outperforms EVA. (Economic Value Added) with regard to its ability to predict shareholder value creation. Moreover, REVA is a theoretically superior measure for assessing whether a firm's operating performance is adequate form the standpoint of compensating the firm's financiers for the risk to their capital.	Unrelated

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Bailey, C.D., Brown, L.D. & Cocco, A.F.	1998	The Effects of Monetary Incentives on Worker Learning and Performance in an Assembly Task.	Incentives that do not reward improvement directly may not enhance learning. Findings suggest that monetary incentives can influence 'operator performance' by increasing concentration at the start, resulting in better initial performance. Moreover, both overall and initial performance are higher in the incentive-pay groups.	Unrelated
Baiman, S.	1990	Agency research in managerial accounting: A second look.	In all agency models, individuals are assumed to be motivated by self-interest and all three branches provide similar frameworks for analyzing the interaction of self-interested individuals within an economic context. Emphasizing different sources of divergence between self-interested and cooperative behavior, as well as emphasizing different aspects of a common research agenda, is what makes each branch unique in dealing with the agency problem.	Unrelated
Baker, G. P.	1992	Incentive Contracts and Performance Management.	Contracts based on performance measures that do not adhere to the principle's objective will not provide the first-best incentives, even when the agent is risk neutral. The form of the optimal contract and the efficiency of this contract depend on the relationship between the performance measure used and the principle's objective. Incentive contracts based on the total value of the organization, such as partnerships and stock ownership, will dominate when information asymmetries are great and no good performance measure exist.	Related yet not answered
Baker, G.P., Jensen, M.C. & Murphy, K.J.	1988	Compensation and incentives: Practice versus theory.	Economic models might not fully capture some aspects of human behavior that is understood by psychologists, behaviorists, human resource consultants and personnel executives or the practitioners are simply adopting policies that sacrifice organizational efficiency for egalitarian pay systems. Both the intellectual profits as well as the organizational efficiencies to be gained from focusing on the compensation puzzle will make future research worthwhile.	Confirm
Bandura, A.	1991	Social cognitive theory of self-regulation.	Self-regulatory mechanisms play a paramount role in human motivation and action across diverse realms of functioning. Self-regulation is a multifaceted phenomenon operating through a number of subsidiary cognitive processes including self-monitoring, standard setting, evaluative judgment, self-appraisal, and affective self-reaction. Cognitive regulation of motivation and action relies extensively on an anticipatory proactive system rather than simply on a reactive negative feedback system. The human capacity for forethought, reflective self-appraisal, and self-reaction gives prominence to cognitively based motivators in the exercise of personal agency.	Unrelated
Bengtsson, N & Engström, P.	2012	Replacing trust with control: a field test of motivation crowd out theory.	The study finds no evidence of motivational crowding out. In fact, the subjects experiencing a controlling atmosphere seemed to achieve more which indicates a positive effect on productivity.	Confirm
Bergen, M., Dutta, S. & Walker, O.C., Jr.	1992	Agency relationships in marketing: A review of the implications and applications of agency theory and related theories.	Agency theory contributes much to the understanding of a wide range of marketing issues. The general principle that underlies all suggestions made is that agency theory proves most useful for examining situations characterized by factors that make contracting and controlling the performance of the agents especially difficult. Agency theory provides significant guidance to assess situations involving; 1. substantial goal conflict, 2. sufficient environmental uncertainty to trigger the risk-sharing implications of the theory, 3. substantial information asymmetries, 4. difficulty in evaluating performance.	Confirm

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Bettman, J.R., Johnson, E.J. & Payne, J.W.	1990	A componential analysis of cognitive effort in choice.	The concept of effort plays a major role in attempts to understand the contingent use of processing strategies. The componential model proposed to approach strategy effort yields strong empirical support and thus provides a good fit for response time and self-reports of effort. The EIP model is thus superior to a behavioral model for assessing strategy effort. However, within the model, the individual EIPs receive significantly different levels of effort.	Unrelated
Bloom, M.	1999	The Performance Effects of Pay Dispersion on Individuals and Organizations.	More compressed pay dispersions are positively related to multiple measures of individual and organizational performance. Greater dispersion is associated with lower individual and group performance in areas where work interdependencies are important.	Related yet not answered
Bloom, M. & Milkovich, G.T.	1998	Relationships among Risk, Incentive Pay and Organizational Performance.	Organizations facing higher risk do not place greater emphasis on short-term incentives. Higher-risk firms that relied on incentive pay exhibited poorer performance than higher-risk firms that did not emphasize incentive pay. As such, the employment contract is more complex than it has been depicted and considering risk is considerably more important. Higher base pay is positively related to firm performance.	Confirm
Bonner, S.E. & Sprinkle, G.B.	2002	The effects of monetary incentives on effort and task performance: theories, evidence and a framework for research.	Various findings with respect to the manner in which the variables; person, task, environmental and incentive scheme affect the effort construct. Explicit performance targets seem to have additive positive effects on effort and performance over monetary incentives. Overall, monetary incentives do affect effort, which affects the output of a given task but this relationship is mediated by cognitive mechanisms and person specific variables.	Confirm
Bontis, N.	1998	Intellectual capital: an exploratory study that develops measures and models.	The management of IC lies at the heart of value in the current 'knowledge era' of business. A true formula for measuring IC may never exist, however, longitudinal examination of metrics as well as benchmarking against industry norms can assist in examining an organization's IC. All business leaders should be appreciative of the power knowledge management can have on business performance and measuring and strategically managing knowledge may make the difference between mediocrity and excellence.	Confirm
Bontis, N.	2001	Assessing knowledge assets: a review of the models used to measure intellectual capital.	Intangible assets have a substantial implication for financing a knowledge organization's vision. The efforts to create human resources costing and accounting systems have not considered the full range of intangible assets that can exist nor have they been particularly useful as MIS monitoring the daily progress of business. In the long term, it could become essential for organizations to disclose their IC in explaining business performance.	Confirm
Bontis, N., Dragonetti, N.C., Jacobsen, K. & Roos, G.	1999	The Knowledge Toolbox: A review of the tools available to measure and manage intangible resources.	No universally best tool exists for measuring intangible resources. Each of the tools assessed have success stories they can rightfully take credit for but they are all more or less appropriate to a specific situation and/or company.	Confirm
Bontis, N. & Fitz-enz, J.	2002	Intellectual Capital ROI: A causal map of human capital antecedents and consequents.	Measuring and modeling of human capital are critical, a view which is attributed to the growing strategic importance of intellectual capital management and the need for HR managers to establish their credibility. This study yielded a holistic causal map that integrated constructs from the fields of intellectual capital, knowledge management, human resources, organizational behavior, information technology and accounting. The integration of both qualitative and quantitative measures in an overall conceptual model resulted in a structural equation which allows participating organizations to gauge the effectiveness of its human capital capabilities.	Confirm

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Booth, A.L. & Frank, J.	1999	Earnings, Productivity and Performance-related pay.	Jobs with performance-related-pay attract workers of higher ability and induce workers to provide greater effort. The earnings differential equals the average productivity gains from PRP, net of monitoring cost at the marginal firm using PRP but not of the disutility of effort. The marginal firm using PRP has higher monitoring cost than the average firm using PRP.	Related yet not answered
Brase, G.L.	2009	How different types of participant payments alter task performance.	Successful task completion is more frequent with performance-based incentives than with either of the other incentive types. Performance on moderately difficult tasks is most sensitive to incentives. These results can be understood in economic terms as participants maximizing an objective function, given their available cognitive capital and the particular production function of the experiment.	Related yet not answered
Chakravarthy, B.S.	1986	Measuring Strategic Performance.	Traditional measures for evaluating strategic firm performance are inadequate. No single profitability measure seems capable of discriminating excellence. Strategic performance needs a futuristic measure	Confirm
Conlon, E.J. & Parks, J.M.	1990	Effects of monitoring and tradition on compensation agreements: An experiment on principal-agent dyads.	The ability of a principal to monitor an agent decreased the use of performance-contingent pay. The existence of a pay tradition can inhibit the economically rational thinking agency theory assumes. These effects of tradition are relatively powerful and unlikely to diminish over time.	Unrelated
Datta, D.K., Guthrie, J.P. & Wright, P.M.	2005	Human Resource Management and Labor Productivity: Does Industry Matter?	The impact of human resource systems on productivity is influenced by industry capital intensity, growth, and differentiation. Firm competitiveness can be enhanced by high-performance work systems.	Unrelated
Deci, E.L., Betley, G., Kahle, J. Abrams, L & Porac, J.	1981	When trying to win: competition and intrinsic motivation.	Competition decreases intrinsic motivation as it alters an individual perception and operates similar to an extrinsic incentive. The activity under review becomes a means to an end instead of the end itself which is mastery-oriented. Under certain circumstances it tends to be perceived as controlling and thus tends to decrease intrinsic motivation.	Unrelated
Deci, E.L., Ryan, R.M. & Koestner, R.	1999	A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation	Engagement-contingent, completion-contingent and performance-contingent rewards significantly undermined free-choice intrinsic motivation, as did all rewards, all tangible rewards and all expected rewards. Engagement-contingent and completion-contingent rewards also significantly undermined self-reported interest, as did all tangible and all expected rewards. Positive feedback enhances both free-choice behavior and self-reported interest. Tangible rewards tend to be more detrimental for children than college students, and verbal rewards tend to be less enhancing for children than college students.	Contradict
Deckop, J.R., Mangel, R. & Cirka, C.C.	1999	Getting more than you pay for: Organizational Citizenship Behavior and Pay-for-Performance Plans.	Employees, who are low in value commitment, appear to perceive pay-for-performance as a disincentive to engage in OCB. Value-committed employees are encouraged by pay-for-performance to engage in OCB.	Related yet not answered
Delery, J., Gupta, N., Shaw, J., Jenkins, G.D. & Ganster, D.	2000	Unionization, compensation, and voice effects on quits and retention.	Higher wages and benefits in unionized trucking settings account for a substantial portion of unionization effects on employee attachment. Partly due to bargaining power as well as higher employee skill levels. In unionized settings, turnover is lower and tenure is higher, as it is more difficult for employees to leave. The all-over conclusion of this study is that unions have a strong influence on all aspects of employment practices.	Unrelated

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Eisenhardt, K.M.	1989	Agency theory: As assessment and review.	Agency theory offers a unique insight into information systems, outcome uncertainty, incentives and risk. Moreover, it is an empirically valid perspective, particularly when coupled with complementary perspectives.	Unrelated
Elias, S.M., Barney, C.E. & Bishop, J.W.	2013	The treatment of self-efficacy among psychology and management scholars.	The relationships between generalized self-efficacy and LMX and learning are each fully mediated by work self-efficacy beliefs. As such, it should be thought of as a distal variable that affects work-related outcomes through its influence on work self-efficacy beliefs.	Unrelated
Fang, M. & Gerhart, B.	2012	Does pay for performance diminish intrinsic interest?	No evidence of a detrimental effect of PFIP plans on intrinsic interest was found. Intrinsic interest seems to be higher under PFIP conditions. Organizations placing greater emphasis on PFIP plans tend to have employees with motivation orientations matching their PFIP plans, which may reduce the profitability of a detrimental effect of PFIP.	Related yet not answered
Ferguson, R. & Leistikow, D.	1998	Search for the Best Financial Performance Measure: Basics Are Better.	EVA is theoretically superior to REVA. As REVA is inconsistent with the definition of abnormal earnings and dividend discount models, it is inconsistent with finance theory. As such, REVA is an inappropriate measure for financial performance while EVA is.	Unrelated
Fiorillo, D.	2011	Do monetary rewards crowd out the intrinsic motivation of volunteers? Some empirical evidence for Italian volunteers.	Monetary payments, as well as intrinsic motivation have roles in the real-life decision to supply volunteer work, but monetary rewards do not crowd out intrinsic motivation. Since increasing monetary rewards has the opposite sign on voluntary work of individuals with low and high intrinsic motivation, on average, the positive effect offsets the negative, and there are no observations that intrinsically motivated individuals who get a monetary reward work less.	Confirm
Fiske, A.P.	1992	The Four Elementary Forms of Sociality: Framework for a Unified Theory of Social Relations.	The motivation, planning, production, comprehension, coordination, and evaluation of human social life is based largely on combinations of 4 psychological models; CS (people treat all members of a category as equivalent), AR (people attend to their positions in a linear ordering), EM (people keep track of the imbalances among them), MP (people orient to ratio values).	Unrelated
Frey, B.S.	1997	A constitution for knaves crowds out civic virtues.	A successful way to maintain and enhance civic virtue is extensive constitutional rights of direct citizen participation via popular referenda and initiatives. Such a constitution does, however, runs greater risk of knaves free riding and exploiting other citizens. Hence, a constitution must be strict enough to effectively deter exploitative behavior, but at the same time, the system of laws should fundamentally trust citizens.	Unrelated
Frey, B.S. & Jegen, R.	2001	Motivation Crowding Theory.	Significant empirical evidence suggests that Motivation Crowding Theory does exist and that external intervention via monetary incentives may indeed undermine intrinsic motivation. Crowding effects are an empirically relevant phenomenon, which can, in specific cases, even dominate the traditional relative price effect.	Contradict

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Gagne, M. & Forest, J.	2011	The study of compensation systems through the lens of self-determination theory: Reconciling 35 years of debate.	High base pay will foster greater need satisfaction, partly because of desirable social comparisons and improved perceptions of distributive justice. High proportions of performance-contingent pay are related to a larger decrement of intrinsic motivation, which in turn, negatively affects performance. The way performance appraisals are conducted influences the impact of compensation systems on motivation.	Confirm
Gardner, D.G., van Dyne, L. & Pierce, J.L.	2004	The effects of pay level on organization-based self-esteem and performance: A field study.	Pay level affects employee self-esteem, which in turn, affects employee performance. The study found no relationship between change in pay and subsequent performance.	Confirm
Gibbons, R.	1998	Incentives in Organizations.	It is useful to impose job restrictions to reduce an agent's distractions. Complementary instruments should be used in incentive contracting.	Unrelated
Gneezy, U. & Rustichini, A.	2000	Pay enough or don't pay at all.	The effect of monetary compensation on performance is not monotonic. If money is offered, a larger amount yields higher performance, however, offering money does not always produce an improvement. Individuals who are offered monetary incentives performed more poorly than those who were offered no compensation. Contracts, social or private, are usually incomplete and regulate an interaction in a situation of incomplete information. The behavior produced by the contract is a response to the combination of a payoff structure and information on this structure. Given the outcomes of the study, the rule that 'a small payment is better than nothing' might not hold.	Contradict
Goerg, S.J. & Kube, S.	2012	Goals (th)at work; Goals, monetary incentives and workers' performance.	The use of personal work goals leads to a significant output increase. The positive effect of goals not only prevails if these goals are self-chosen by workers, but also if goals are set exogenously by the principal. However, in this latter case, the exact size of the goals plays a crucial role. The positive effect of self-chosen goals persists even if the goals are not backed up by monetary incentives. Goals are also more optimistic in the absence of monetary consequences. Higher goals cause individuals to work faster, decreasing the average time spend on a task and hence, increasing the output. This positive effect decreases when goals become more unattainable.	Contradict
Gomez-Mejia, L.R. & Balkin, D.B.	1989	Effectiveness of Individual and Aggregate Compensation Strategies.	Individual-based rewards are perceived as less effective than aggregate incentive strategies. All things considered, the most effective rewards were considered to be team-based bonuses. Employees with a low willingness to take risks are more likely to experience withdrawal cognition if they work for a firm that relies on variable compensation	Related yet not answered
Greenberg, J.	1990	Employee theft as a reaction to underpayment inequity: The hidden cost of pay cuts.	Workers that experience underpayment inequity would attempt to redress that inequity by raising their inputs (stealing). As such, a 15% pay reduction leads to a spike in theft rates of about twice as much as normal. Carefully explained pay-cuts seemed to have significantly less negative impact on theft rates. Generalizing this concept leads to the conclusion that adequately explaining inequitable conditions may be an effective means of reducing potentially costly reactions to feelings of underpayment inequity.	Unrelated

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Harrison, D.A., Virick, M. & Williams, S.	1996	Working without a net: Time, performance, and turnover under maximally contingent rewards.	The performance-turnover relationship is stronger under maximally contingent rewards. Current (time-dependent) performance affords a better prediction of turnover than average (time-stationary) performance. Performance velocity (slope over time) has a unique effect on turnover risk.	Related yet not answered
Heyman, J & Ariely, D.	2004	Effort for Payment: A Tale of Two Markets.	When payments are given in the form of gifts, or when payments are not mentioned, effort seems to stem from altruistic motives and is largely insensitive to the magnitude of the payment. In case of cash payments, effort stems from reciprocation motives and is thus largely sensitive to the magnitude of the payment. The distinction in two types of markets is thus vital, as it directly influences the appropriate method of pay.	Confirm / Contradict
Hirschleifer, J.	1985	The expanding domain of economics.	Economics penetrates all social disciplines and is reciprocally penetrated by them. The analytical categories (scarcity, cost, preferences, opportunities, etc.) are truly universally applicable, giving economics its imperialist invasive power.	Unrelated
Huck, S., Kübler, D. & Weibull, J.	2012	Social norms and economic incentives in firms.	One and the same social norm may be output enhancing, neutral, or decreasing depending on the type of contract chosen by the firm's owner. As such, one can manage social norms by choosing the appropriate contract type to determine the way social norms will impact behavior. This is due to the fact that social norms are rooted in externalities. Social norms make the optimal design of economic incentives tricky as there can be multiplicity of equilibria, jumps and crowding out.	Unrelated / Contradict
Jensen, M.C.	1983	Organization theory and methodology.	Accounting is an integral part of the structure of every organization. A fundamental understanding of why accounting practices evolve as they do and how to improve them requires a deeper understanding about organizations than now exists in the social sciences.	Unrelated
Jensen, M.C. & Meckling, W.	1976	Theory of the firm: Managerial behavior, agency cost and ownership structure.	The level of agency costs depends among other things on statutory and common law and human ingenuity in devising contracts. Both the law and the sophistication of contracts relevant to the modern corporation are the products of a historical process in which there were strong incentives of individuals to minimize agency costs.	Unrelated
Jensen, M.C. & Murphy, K.J.	1990	Performance pay and top-management incentives.	The relation between CEO wealth and shareholder wealth is small and has fallen by an order of magnitude in the last 50 years.	Unrelated
Jordan, J.M.	2010	Salary and decision making: relationship between pay and focus on financial profitability and prosociality in an organizational context.	Salary level predicts an increased focus on the dimension related to financial profitability and decreases focus on dimensions of prosociality and legal concerns. When pay is linked to financial profitability objectives in an organization, one may expect a decreased focus on prosocial-related issues and an increased focus on financial-profitability-related issues.	Related yet not answered

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Judge, T.A. & Bono, J.E.	2001	Relationship of core self-evaluation traits –self-esteem, generalized self-efficacy, locus of control and emotional stability- with job satisfaction and job performance: A meta-analysis.	Self-esteem, locus of control, neuroticism and generalized self-efficacy are significant predictors of both job satisfaction and job performance.	Unrelated
Judge, T.A., Piccolo, R.F., Podsakoff, N.P., Shaw, J.C. & Rich, B.L.	2010	The relationship between pay and job satisfaction: A meta-analysis of the literature.	Pay level is only marginally related to satisfaction. Individuals who make more money are little more satisfied than those who make considerably less.	Unrelated
Kohn, A.	1993	Why incentive plans cannot work.	Offering rewards to motivate employees is ineffective. Rewards buy temporary compliance but do not reinforce positive behavior over the long term. Pay is not a motivator as rewards punish, rupture relationships, ignore reasons, discourage risk-taking and undermine interest.	Contradict
Konrad, A.M. & Pfeffer, J.	1990	Do you get what you deserve? Factors affecting the relationship between productivity and pay.	Productivity has a larger effect on pay in departments that 1. have stronger norms emphasizing research, 2. are located in private and higher quality institutions, 3. are institutions that are governed by collective bargaining agreements, 4. are characterized by more research collaboration and more social contact, 5. are in fields with more highly developed scientific paradigms, 6. has a chair-person with shorter, fixed-length terms. In context in which productivity could be readily assessed and in which merit was emphasized, the effect of performance on pay was comparatively small.	Related yet not answered
Korman, A.	1976	Hypothesis of work behavior revisited and an extension.	The hypotheses and research question received considerable support, particularly in field studies. The possible ambiguity in the expectancy-value theory stems from the situation when a person has low expectancies for all possible outcomes.	Unrelated
Kren, L. & Kerr, J.L.	1993	The effect of behavior monitoring and uncertainty on the use of performance-contingent compensation.	Monitoring ability is negatively associated with the use of performance-contingent compensation. Monitoring is found to moderate the relationship between uncertainty and compensation system design. Whereas in non-monitoring firms, higher levels of uncertainty are associated with increased use of performance-contingent compensation, in monitoring firms, higher levels of uncertainty are associated with decreased use of performance-contingent-compensation.	Unrelated

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Kunz, J. & Linder, S.	2012	Organizational Control and Work Effort – Another Look at the Interplay of Rewards and Motivation.	Monetary and affiliative rewards have different effects; affiliative rewards clearly have beneficial effects by positively interacting with enjoyment-based motivation, whereas the picture for monetary rewards is more nuanced than typically assumed in literature. This is due to the fact that monetary rewards contribute to a higher willingness to exert effort; they show both a beneficial direct effect and a positive moderation effect on the relationship between extrinsic motivation and effort. However, they also exhibit a detrimental moderating effect on the relation between norm-based motivation and willingness to exert work effort. While the total effect is still positive, the legend 'crowding-out' effect of intrinsic motivation likewise receives strong support. Monetary rewards seem to crowd-out norm-based motivation while leaving the impact of enjoyment-based motivation unaffected.	Confirm / Contradict
Lambert, R.A., Larcker, D.F. & Weigelt, K.	1993	The structure of Organizational Incentives.	Organizational incentives are most appropriately characterized by a combination of models (tournament, managerial power, agency theory) rather than being completely described by a single theoretical description.	Unrelated
Lancaster, K.	1958	Productivity-Geared Wage Policies.	When accepting a wage cost inflation model as a macroeconomic framework, it is possible to determine a wage policy in which wages are geared to productivity changes to preserve a constant price level and a balance in the labor markets of the sectors of the economy.	Related yet not answered
Larkin, I., Pierce, L. & Gino, F.	2012	The psychological cost of pay-for-performance: Implications for the strategic compensation of employees.	Employees work harder when their pay is based on performance. Firms are more likely to use performance-based pay (vs. flat pay) when they have less information about actual employee effort. Firms are more likely to use performance-based pay (vs. flat pay) when they have less information about employee skill level, and/or as employee skill level is more heterogeneous. Firms are more likely to use team-based performance pay vs. individual-based pay when coordination across workers is important, when free riding is less likely, or when monitoring cost are low. Perceived inequity through wage comparison reduces the effort benefits of individual pay-for-performance systems. Perceived inequity arising through random shocks in pay introduces additional costs from effort, sabotage, and attrition in individual pay-for-performance systems. Overconfidence bias reduces the sorting benefits of individual pay-for-performance compensation.	Related yet not answered
Lazear, E.P.	2000	Performance Pay and Productivity.	A switch from hourly wages to piece rates brings about an increase in average levels of output as well as in the variance. This benefit is a productivity gain, which does not mean that the firm's profits rise as well. Moreover, tenure effects on productivity are found to be large, which is reflected in learning on the job as well as in the induction that the least productive workers leave the company first.	Related yet not answered
Lazear, E.P.	2000	Economic Imperialism.	Economics has been successful as a science which emphasizes rational behavior, maximization, trade-offs, and substitution. The discipline insists that these models result in equilibrium which pushes the economists to further inquiry as they understand the concepts of efficiency.	Unrelated
Levinthal, D.	1977	A survey of agency models of organizations.	Agency models constitute the response of conventional microeconomic theorists to the gaps left by the conventional neoclassical theory of the firm. The major weakness of the current body of work remains to be its reliance on the agent's disutility of effort as the source of incentive problems.	Unrelated
Mason, W., Watts, D.J.	2012	Financial Incentives and the 'performance of crowds'.	Increased financial incentives increase the quantity but not the quality of the work performed. This difference seems to be due to the 'anchoring' effect: workers who are paid more also perceive the value of their work to be greater and thus are no more motivated than workers who are paid less. Details of the compensation scheme do matter, specifically a 'quota' system which results in better work for less pay than an equivalent 'piece rate' system.	Confirm / Related yet not answered

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Molm, L.D., Takahashi, N. & Peterson, G.	2003	In the eye of the beholder: Procedural justice in social exchange.	Actors perceive negotiated exchange partners as less fair and they are less willing to engage in unequal exchanges with them.	Unrelated
Montemayor, E.F.	1996	Congruence between pay policy and competitive strategy in high-performance firms.	Inferior firm performance is associated with the lack of fit between pay policy and business strategy, thus supporting the need for a contingency approach in the design of pay policy. There exists a systematic difference in pay policies between high-performing organizations whose strategy is dominated by cost leadership, differentiation or innovation tactics. Cost leaders emphasize labor cost objectives more than differentiators. Innovators assign more importance on attraction/retention than differentiators. The importance of motivation objectives is greater for differentiators than for innovators. Innovators are highly aggressive in their pay policy. Differentiators offer more variable pay than Innovators. Innovators use a wider range of merit raises and extend merit pay to a larger portion of nonexempt employees. Innovators are more open with respect to pay information than Differentiators.	Unrelated
O'Hanlon, J. & Peasnell, K.	1998	Wall street's contribution to management accounting: the Stern Stewart EVA financial management system.	EVA provides the basis for judging entrepreneurial performance in practice. However, a sole focus on EVA might lead a division with good growth prospects to under-invest because of the dent to the EVAs early years caused by the capital charge being at its maximum when revenues are lowest. Relationship between economic value, book value and future EVAs provides a basis for many of the claims that are made in support of EVA.	Unrelated
Richard, P.J., Devinney, T.M., Yip, G.S. & Johnson, G.	2009	Measuring Organizational Performance: Towards Methodological Best Practice.	Understanding how discipline-specific measures load onto the dimensions of organizational performance and the interrelationships between specialist measures is essential to understanding the relationships between multiple organizational actions. Claims to address organizational performance must include strong theory that addresses two key issues; the dimensionality of performance, the selection and combination of performance measures. To be strong, the theoretical rationale for an approach to performance measure must be both comprehensive in its assessment and rigorous in its validation. This means that the measure must be rooted deeply in theory and validated by empirical evidence.	Unrelated
Ross, S.A.	1973	The Economic Theory of Agency: The Principal's Problem.	For various utility functions as well as a broad range of payoff structures, the need to motivate agents does not conflict with the attainment of Pareto efficiency. However, as most agent-principle relationships interact with asymmetric information, the optimal solution cannot be derived in this way.	Unrelated
Roth, K. & O'Donnell, S.	1996	Foreign subsidiary compensation strategy: An agency theory perspective.	Compensation strategy is influenced by the agency problem, defined by the subsidiary's cultural distance from its headquarters market, lateral centralization, and senior management's commitment to the parent. Incentive structures aligned to the agency state were positively related to subsidiary effectiveness. Compensation strategy was found to have a strong impact on perceived subsidiary effectiveness which suggests that reconfiguring the compensation strategy of a multinational corporation can be effective.	Confirm / Related yet not answered
Rynes, S.L., Gerhart, B. & Minette, K.A.	2004	The importance of pay in employee motivation: discrepancies between what people say and what they do.	Money is not the only motivator and it is not the primary motivator for everyone. However, there is evidence that money is an important motivator for most people which is generally not accurately reflected in people's own perception on motivation.	Confirm

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Rynes, S.L., Schwab, D.P. & Heneman, H.G.	1983	The role of pay and market pay variability in job application decisions.	Non-compensatory strategies are most commonly used to evaluate pay in making application decisions. The study suggests that both the importance of pay and the nature of its role in decision strategies are likely to vary in accordance with the market pay distribution. Previous job choice theorizing and research suggest that attribute importance and the extent of non-compensatory model usage are likely to vary as a function of job seeker and non-pecuniary market characteristics. Hence, there is a need for caution in making generalizations about the role of pay in decisions involving employment.	Unrelated
Samuels, J.A. & Whitecotton, S.M.	2011	An effort based analysis of the paradoxical effects of incentives on decision-aided performance.	Incentives do not necessarily decrease performance in the presence of decision aids. The effect of incentives on decision-aided performance depends on other contextual factors such as the absence or presence of additional contextual information. Incentives have a negative effect on performance when decision makers are limited to the same information as the decision aid. Financial incentives increase the amount of time (effort duration) that individuals devote to a task. However, whether the increased effort translates into performance is contingent on whether decision makers have access to additional information beyond the decision aid. As such, effort duration mediates the relationship between financial incentives and performance, and the effect of effort duration on performance is moderated by the information environment.	Confirm / Contradict
Schneider, B. & Olson, L.K.	1970	Effort as a correlate of organizational reward system and individual values.	Findings from the study support the effort-reward model of behavior. Differences in actual reward policies between organizations result in differential effort. Effort is highest in organizations where it is rewarded with pay, moreover, individuals who most highly value pay are those that work hardest allover. Those individuals who most highly value intrinsic rewards, satisfaction with pay for high effort allows for self-reinforcement.	Confirm
Schreurs, B., Hannes, G., Schumacher, D., van Emmerik, H. & Notelaers, G.	2013	Pay-level satisfaction and employee outcomes: the moderating effect of employee-involvement climate.	A decision-making climate buffers the negative effects of low pay-level satisfaction. Next to that, information-sharing climate seems to exacerbate the negative effects of low pay-level satisfaction.	Unrelated
Schultz, T.W.	1961	Investment in Human Capital.	The most distinctive feature of the economic system is the growth in human capital. Measured by what labor contributes to output, the productive capacity of human beings is now vastly larger than all other forms of wealth taken together. When it is idle, human capital deteriorates as it impairs skills that individuals have acquired.	Related yet not answered
Shaw, J.D., Gupta, N. & Delery, J.E.	2002	Pay dispersion and workforce performance: Moderating effects of incentives and interdependence.	Dispersion is more effective when it exists in conjunction with individual incentives. A complex pattern of interrelationships among pay dispersion, individual incentives, work interdependence and organizational effectiveness exists. Horizontal pay dispersion has the most broad-ranging effects on organizational performance.	Related yet not answered
Shaw, J.D., Park, T.Y. & Kim, E.	2013	A resource-based perspective on human capital losses, HRM investments, and organizational performance.	Human capital losses (voluntary turnover rates) - workforce performance relationship takes the form of an attenuated negative relationship when HRM investments are high. Stronger curvilinear effects of voluntary turnover rates on financial performance via workforce productivity under these conditions can be observed.	Unrelated

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Shields, M.D., Deng, F.J. & Kato, Y.	2000	The design and effects of control systems: test of direct- and indirect-effects models.	The indirect model had better overall fit to the data according to the two fit indices, the indirect model provided a better fit to the data than did the direct model in the models-comparison test, tests of the hypotheses in the indirect model provided support for all of them as opposed to two out of five in the direct model. Test results indicate that standard-based incentives and standard tightness are influenced by the degree of subordinate participation in standard setting, and that the effects of these three control-system components are indirect on job performance through job-related stress as the intervening variable.	Unrelated
Steel, P & MacDonell, R.	2012	When rewards go wrong: A tale of five motivational misdirects.	Being paid for what we love can make us love it less; extrinsic incentives can destroy intrinsic motivation. How can be as important as what; fairness and autonomy play a crucial role in effective reward schemes. Rewards tell us how rewarding the task really is; the framing from a certain reward indicates how appreciated individuals are for performing the task at hand. Focusing on winning instead of how to win; the desirability of the outcome can severely damage the degree to which individuals are likely to obtain these outcomes.	Contradict
Stone, D.N. & Ziebart, D.A.	1995	A model of financial incentive effects in decision making.	Participants offered performance-contingent incentives took longer to choose, examined more information, had higher levels of negative affect and used decision strategies that led to more accurate choices than participants offered randomly distributed incentives. Path analyses using structural equations modeling indicated that the changes in information processing behavior induced by financial incentives increased decision quality, while the increased levels of negative affect associated with incentives decreased decision quality.	Related yet not answered
Stroh, L.K., Brett, J.M., Bauman, J.P. & Reilly, A.H.	1996	Agency theory and variable compensation strategies.	Level of task programmability is associated with an increased use of variable pay, and long-term relationships between an agent and principal are associated with decreased use. Results supported the classical organization-theory prediction that under higher risk, organizations use higher proportions of variable pay; but results question agency theory's ability to predict compensation strategy for middle-level managers in the high-risk situation.	Unrelated
Tosi, H.L., Katz, J.P & Gomez-Mejia, L.R.	1997	Disaggregating the Agency Contract: The Effects of Monitoring, Incentive Alignment and, Term in Office on Agent Decision Making.	Incentive alignment is a more powerful mechanism than monitoring for ensuring that agents act in the best interest of the owners. An interaction of monitoring, incentive alignment and term in office revealed that these effects are relatively complicated and deserve further study. Incentive alignment has a beneficial effect for the principal for long-term CEOs even though the tendency to escalate (negative effect for principals) was greatest for those agents.	Unrelated
Trank, C.Q., Rynes, S.L. & Bretz, R.D.	2002	Attracting applicants in the war for talent: Differences in work preferences among high achievers.	Students with cognitive ability and all types of high achievement place greater importance on interesting and challenging work than do other students. Students with high cognitive ability and high <i>academic</i> achievement seemed to have different preference patterns from those with high <i>social</i> achievement when it comes to work attributes such as job flexibility, pay practices, fast-track promotion systems, etc.	Unrelated
Trevor, O.C., Reilly, G. & Gerhart, B.	2012	Reconsidering pay dispersion's effect on the performance of the interdependent work: reconciling sorting and pay inequality.	When work is interdependent, pay dispersion explained by productivity-relevant employee inputs provides sorting advantages that lead to a positive relationship with team performance but pay dispersion net of these inputs does not.	Unrelated

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Venkatraman, N. & Ramanujam V.	1987	Measurement of Business Economic Performance: An Examination of Method Convergence.	The study indicates that treating one particular method of measuring BEP as superior is questionable, as the approaches yielded different insights. However, the advantages of CFA over MTMM is demonstrated.	Unrelated
Wallace, J.S.	1997	Adopting residual income-based compensation plans: Do you get what you pay for?	Compensation plans based on residual income change manager's behavior. Firms that adopt a residual income performance measure; 1. increase their dispositions of assets and decrease their new investments, 2. increase their payouts to shareholders through share repurchases, 3. use their assets more intensively.	Related yet not answered
Weibel, A., Rost, K. & Osterloh, M.	2009	Pay for performance in the public sector-benefits and (hidden) cost.	Pay for performance has a strong positive effect on performance in the case of noninteresting tasks. Pay for performance, however, tends to have a negative effect on performance in the case of interesting tasks and thus negatively affects personal efforts. This method of pay causes a cognitive shift, that is, it strengthens extrinsic motivation for behavior and at the same time weakens intrinsic motivation for behavior (crowding-out effect). Depending on the strength of these two opposing effects, pay for performance either hurts or promotes personal efforts. Motivation is likely to be a key influence on the effect of performance-related pay on performance. Pay for performance is generally more costly as it appears because it almost always produces hidden cost of rewards.	Related yet not answered
Young, G.J., Beckman, H. & Baker, E.	2012	Financial incentives, professional values and performance: A study of pay-for-performance in a professional organization.	Performance improves following the introduction of an incentive. Simultaneously, psychologically based attitudes towards the incentive program regarding its impact on an individual's own work autonomy and the importance of the performance goals moderated the effect of the incentive on performance. Agency theory and professional control are complementary theoretical perspectives for understanding how professionals will respond to the imposition of performance-related incentives. In terms of practice, PFP programs aimed at professional organizations should be designed to take into account the values and goals of an organization's professionals to maximize the effect of financial incentives on performance.	Confirm
Zajac, E.J. & Westphal, J.D.	1994	The costs and benefits of managerial incentives and monitoring in large U.S. corporations: When is more not better?	Firms that are more risky face greater costs when using incentive compensation contracts for top managers, thus reducing the expected level of incentive compensation use for such firms. Firms facing this problem of low incentive compensation use can realize greater benefits from higher levels of board monitoring, and thus are likely to rely more on board monitoring. Firms with more complex corporate strategies face higher costs in using board monitoring and are thus likely to rely less on board monitoring as a source of controlling top management behavior. Within this contingency perspective there may be diminishing 'behavioral returns' to increases in monitoring incentives. All in all, maximum levels of incentives and monitoring are not necessarily optimal and a firm's strategy may not only have significant product/market implications, but also corporate governance implications.	Unrelated
Zedelius, C.M., Veling, H., Bijleveld, E. & Aarts, H.	2012	Promising High Monetary Rewards for Future Task Performance Increases Intermediate Task Performance.	High rewards sped up both rewarded and intermediate, unrewarded responses. This effect is independent of the duration of the reward presentation. Long presentation of the future rewards seems to lead to a speed-accuracy trade-off for both rewarded and unrewarded activities whereas short presentation speeds up responses to rewarded and unrewarded activities without this trade-off. As such, high rewards for future performance boost intermediate performance due to enhanced task preparation.	Confirm

Literature Findings				Research Findings
Author	Date	Title	Outcomes	Confirm / Contradict / Unrelated / Related yet not answered
Zhu, J.	2000	Multi-factor performance measure model with an application to Fortune 500 companies.	Top-ranked companies by revenue do not necessarily have top-ranked performance viewed as being multidimensional. Decreasing returns to scale (DRS) are uncovered among the relatively large (revenue-top-ranked) companies. Reduction in current levels of employees, assets and equity may actually increase revenue and profit levels. Within the context of performance measures; multifactor analysis seems to be the most appropriate way to objectively measure strategic performance.	Unrelated

7.2 Assessment

While the previous section indicates to which theories this particular study adheres, the following section provides an assessment of these categories and possible explanations on the most common reasons for confirming or contradicting with the articles evaluated in section 7.1. This additional assessment should create a concrete understanding of why this study belongs to a specific branch of academic research.

Table 19: Assessment of explanatory factors for Confirming / Contradicting existing literature

The definitions of the evaluation labels are identical to those described for table 18, section 7.1. The Explanatory factors include a group indicator and an explanation for receiving this particular evaluation.

Evaluation	Explanatory factor	
Confirm	Model	Various articles were used in the development of the methodology and directly provided several distinct elements for the final model. These specific articles argued in favor of the distinct performance metrics used in obtaining the results and concluded that these measures are the proper ones to evaluate human performance. Since this study reaches similar conclusions, the outcomes from these articles are confirmed.
	Effect of incentives on performance	A variety of articles found similar results with respect to the effects of incentives on performance. The consistent results found in section 5, indicate a clear and distinct positive relationship between incentives and performance, which was identical to the articles that adhere to the 'classic' economic view. Since the findings of this study thus clearly confirm with this particular body of theory, the articles that share these outcomes are confirmed.
Contradict	Crowd-out	A significant amount of articles indicated the existence of the 'crowding-out' effect, as described in section 2.2. Based on the findings in this study, however, no such effect can be distinguished. As discussed in section 5, while not all correlations were directly significant, none of the regressions showed a possible negative relationship. Hence, this particular body of knowledge is disputed, however, an interesting phenomenon is the fact that these articles found a crowding-effect at all. This might be caused by the set-up of this particular quantitative study, as opposed to the common practice in sociology and psychology of using laboratory experiments.
	Importance of monetary incentives	Several articles argue that while monetary incentives contribute to performance, other incentives provide stronger effects. Despite the fact that the data used in this study does not allow for any in-depth analysis on pay-structures or non-financial incentives, the results suggest that monetary incentives are particularly powerful motivators. As such, the specific set of variables used in this study leads to the conclusion that monetary incentives are adequate instigators of enhanced performance and thus contradicts these articles.
	Non-monotonic effects	While the current study provides consistent positive relationships between incentives and performance, various articles found non-monotonic effects of incentives on performance. Despite the fact that these particular articles identify a similar positive relationship as this current study found, they also report neutral and/or negative effects of incentives on performance. Due to the consistent nature of the results of this study, it has to be concluded that these conclusions are thus not confirmed. A possible explanation could, again, be found in the set-up of the study and/or the specific type of data used. Another explanation could be the differing time periods that were studied, although these non-monotonic effects are concluded by scholars from various time periods. Lastly, there are different ways in which performance can be measured. Possibly, the explanation can be found in the fact that the metrics used by this study interact differently with the underlying assessment of incentives.

Evaluation	Explanatory factor	
Unrelated	Performance measures	Several of the articles marked 'unrelated' were used in the development of the methodology and provided important understanding on the magnitude of possible performance indicators. These articles generally concluded that a certain specific performance metric was to be preferred; however, no such conclusion was drawn in the current study.
	Decision making	Several of the articles which provided insight for the theoretical framework, focused on the degree to which decision making impact performance. Whether decisions are made quicker and better when related to incentives or whether the actual concept of decision making itself would enhance performance. These concepts, while interesting were unrelated to the current study.
	Risk	A distinct amount of articles which provided insight for the theoretical framework, focused on the various factors concerning agency theory. A particular research direction for these articles was the implication of various levels and sources of risk on performance. Again, these concepts are interesting yet unrelated to the current study.
	Other factors	Similar to the factors described above, a significant amount of additional articles were used that did not directly research the same concepts as the current study. As such, the outcomes from these papers, while interesting, does not relate to the results from this study.
Related yet not answered	Pay-structures	As indicated in earlier sections of this paper, there is a wide array of scholars that is engaged in studying the concept of pay-mix and incentive schemes. A proper pay-mix should lead to increased performance and linking incentives to specific targets (Pay for Performance Plans) have received much attention in recent academic history. While these articles and their findings are definitely related to the topic of this study, the results cannot be directly validated, as the data used in this study does not take organizational characteristics (such as pay-structures) into account. As such, although there are many corresponding variables, these findings cannot be directly confirmed by the results from this study.
	Pay dispersement	Similar to the topic of pay-structures, the possible dispersement of pay is a topic that is researched in several of the papers that provided insight for this study. The degree to which pay is dispersed within a firm can alter productivity and can largely influence the performance of individuals throughout an organization. While this, again, is a related and interesting topic, the outcomes of the articles cannot be confirmed, nor contradicted by the results from this study. Similar to the pay-structures discussed above, a different set of data (which includes individual organizational variables) could solve this.
	Variety in underlying factors	A last category of articles which are related but could not be validated are those that discuss the underlying factors of the incentive-performance relationship instead of the end-result of the relationship. The degree to which effort drives performance and the different drivers of effort, as well as the degree to which performance can be subdivided into increased quality, increased quantity, etc. are issues that are extensively researched in many articles. Again, while relating directly to the findings in this study, the results could not assist in validating or contradicting the findings in the literature. An additional qualitative study which includes surveys for a specific set of companies might generate the results to solve this.

8.0 Conclusions, Implications & Limitations

The review of current academic literature in section 2 indicated that the debate on the incentive-performance relationship is still largely unsettled and scientists continue to be in disagreement on the subject of motivational crowding theory. While this thesis will not be able to settle decades of debate, the results from section 5 clearly provide interesting new insights on the incentive-performance relationship which allows them to be able to contribute to the existing body of knowledge. While the initial models as discussed in section 3.2 needed to be complemented during the course of the analysis, the final objective of providing additional quantitative research has been achieved. The following chapter will discuss the findings from section 5, 6 and 7 in more detail and will draw several conclusions and practical implications from these results. Moreover, the possible limitations of this study will be discussed and recommendations for future research are provided.

Building on the hypotheses in section 3.1 the regression models provided conclusive evidence of a relationship between the Compensation Factor and the evaluated performance metrics as discussed in section 3.2. With a strong relationship for both the Revenue Factor and HCVA metrics and a significantly weaker one for the HCROI and EPS metrics, these apparent relationships suggests that when measuring performance in terms of Human Capital, it can indeed be argued that increasing the level of incentives an individual receives for his/her efforts, increases his/her performance. Additionally, the results that were found in these regressions seem to hold despite the macro-economic trends which generally impact the external environment and thus have implications for performance. The additional analysis from section 6, which assessed the relationship during a singular period of severe economic decline, provided similar results as the initial assessment made in section 5. This high level of consistency over all the performance metrics as well as distinct time periods makes the findings largely generalizable. Especially due to the assumption that in the dataset under research, the individual / organizational characteristics were all equal and thus unaffected by any internal differences; a generalization can effectively be made. Moreover, the increased performance provides a level of additional value which offsets against the higher level of labor expenses. In essence, these companies experience a net benefit of providing their workforce with increasing levels of incentives.

When looking at performance metrics which are not directly rooted in the world of Human Capital, but are generally accepted as indicative measures of performance (i.e. EBIT and Net Income), a similar effect seems to apply. Since these metrics measure firm performance in a different way, the existence of a positive relationship between the Compensation Factor and these measures of performance validates not only the HCE-model metrics, but also the findings discussed above. Hence, similar to the results derived from the Revenue Factor and HCVA models, the results from the analysis of the measures for EBIT and Net Income suggest that increased incentives lead to increased performance. This leads to a very practical implication for organizations in the sense that a revision of its current wage policy (i.e. the level of incentives) could very well lead to performance increases and additional value generation.

As section 5.1.2 and 5.2.3 indicate, a different situation occurs with respect to the financial market measures. While both the HCE-metrics and the accounting measures indicate strong positive relationships with a high degree of explanatory power between incentives and performance, the financial market measures do not. While these relationships are statistically significant, the weak correlation factors and explanatory power

makes suggests that other factors which were not included in the model have far more effect on performance when measured by a financial market metric. More specifically, this could suggest that the measures on which organizations are frequently evaluated are not directly affected by changes in labor expenses, or, by changes in individual performance. Following the reasoning provided in section 5, the cause of this weak relationship could potentially be the underlying drivers of these financial market measures, as they are supposed to reflect different types of performance to a different type of audience. While the (generally internally focused) accounting measures are commonly used by C-suite managers and executives, the financial market measures are typically tailored towards an outside audience of shareholders and investors. For this particular audience, a measure which reflects a company's macro-economic potential and value creating capacities for those who invest, is more valuable than a measure that reflects merely one type of value driver. Despite this reasonable explanation, however, the implications that follow from this reasoning are quite disappointing as it would suggest that this particular audience is more interested in the way in which an organization is able to sustain itself externally instead of the potential to increase internal value creation. As such, a practical implication of the findings in this study would be to adjust the typical set of performance measures to incorporate some of the measures from the HCE model (i.e. HCVA). Since the currently used metrics (EVA, EPS) do not sufficiently reflect a correlation between incentives and performance, the fact that it is worthwhile to increase the average total labor expenses will not be concurred by the average shareholder.

In addition to the practical implications discussed above, the findings from this study also have reasonable consequences for the ongoing academic debate which was discussed in section 2. From the findings discussed in section 5, it can be concluded that; despite the varying levels of significant correlation among the performance measures, none of the regressions indicated a statistically significant *negative* relationship. As such, these results imply that an *increase* in Total Labor Expenses under no circumstance leads to a *decrease* in performance. Hence, the 'motivation crowding effect' as described in section 2.2 does not seem to occur anywhere in the analysis, regardless of the performance measure used to evaluate this potential effect. In light of the currently unsettled discussion between sociological / psychological economics and the classic economic view, this study thus contributes to the discussion by showing that the results from an extensive quantitative⁵¹ analysis do not indicate any evidence of a potential crowding-out effect. Since the only relationship that can be identified is a positive one, this study therefore still adheres to the classic economic view. This is also reflected by the Literature Evaluation in section 7 which provides an assessment of the body of academic literature and the appropriate position for the current study within this spectrum. From this analysis, it becomes clear that the findings in this paper belong to the branch of articles that posit the 'classic' view of economics, which defines its construct in terms of e.g. principle-agent relationship⁵² and various other constructs which explain why people will exert more effort when they are incentivized to do so. Sharing the findings and beliefs of renowned scholars like, e.g. Lazear, Bonner, Sprinkle, Young, Beckman, Baker, Rynes Gerhart, Minette, Bergen, Dutta, Walker, Bloom and Milkovich, this study can claim its rightful place alongside these advocates of the 'classic' Economic theory.

⁵¹ As opposed to the typically conducted laboratory studies and in-company surveys within a controlled environment.

⁵² Discussed in detail in section 2.1.1

While the results of this paper provide a wide variety of interesting insights and pose both academic and practical implications there are, unfortunately, various limitations which future research should attempt to reconcile. First and foremost, the data that was used in this study poses a limited insight into the companies included in the analysis. While this issue was resolved by assuming all internal company characteristics to be *ceteris paribus*, this is quite obviously not a definitive solution to the problem. Especially considering the growing attention for pay policies, incentive-schemes and bonus packages in recent years, the differing company policies could have a reasonable impact on the findings.

A second but related issue is that, with this particular set of data, it is impossible to differ between the various layers of employees (i.e. responsibilities) within a given company. Thus, the benefit created by the evaluation of all organizations on an 'average, company-wide level' is simultaneously a limitation of the model, as it does not allow any nuances to be made in this respect. Whether or not executives behave in the same way as their lower-level counterparts, or even the employees working the assembly line, is untestable with the current dataset. Since these findings could provide new information on the argument made by, (e.g. Samuel & Whitecotton, 2011 and Weibel, Rost & Osterloh, 2009) that that the relationship between incentives and performance is weaker for complex tasks which require a high degree of both skill and effort as opposed to those tasks which do not, it would be fairly beneficial for future research to attempt to shed a light on this. Future research could thus largely contribute to this study by complementing the archival data analysis with a firm body of in-company data.

Lastly, due to the rigorous exclusion of incomplete cases, the distribution of industries within the remaining dataset consisted predominantly of organizations from the *Financial* industry. Although the Data Quality Analysis in section 4 provided sufficient validity for the new sample to be tested and its results to be generalized for the entire set, one could argue that the findings in this study are mainly generalizable to organizations in the *Financial* sector. As this would severely limit the magnitude of the implications drawn from this study, an indisputable generalizability is to be aspired. As such, a possible implication for future research would be to attempt to complement the current data set so that less incomplete cases are found in the set which would limit the exclusion.

In summary, while there is still much to be discovered in the area of effort, performance and incentives, this thesis has provided valuable new insights on the current academic debate. The aggregate results of this study not only provide additional quantitative evidence that a causal relationship between incentives and performance indeed exists, they show the actual net benefit of higher wage levels. Since companies ultimately strive for optimal financial performance and increasing incentive levels can contribute to this optimum, it logically follows that organizations should nurture their human capital in order to excel. Once this understanding has taken the appropriate hold on the decision makers in today's business environment, the quest for the most appropriate measure of *return on human capital employed* is imminent. When that day arrives, this thesis will again provide valuable additional understanding.

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Appendices

Appendix 1 – Overview of current performance metrics

Source: Richard P.J., Devinney, T.M., Yip, G.S. & Johnson, G (2009)

Accounting measures	
Cash flow from operations	This accounting measure is used to examine whether cash flow differs significantly from earnings. It is defined as net operating profit plus noncash expenses minus noncash sales.
Earnings before interest and taxes (EBIT)	This basic measure is often recorded on accounting statements as operating profit. This is the firm's profit, which is defined as revenues minus costs of goods sold and administrative and selling costs associated with the firm's operations. Interest and taxes the firm must pay are not deducted in the calculation of EBIT.
Earnings before interest, taxes, depreciation, and amortization (EBITDA)	Like EBIT, EBITDA is defined as the firm's operating profit and does not make any allowance for interest and taxes that must be paid. It is also adjusted to remove the effects of noncash expenses such as depreciation and amortization (these are deducted from the cost component).
Market share	Firm's sales revenue in the product market divided by the total sales revenue available in that market. Although it can be defined as unit sales volume divided by the total volume of units sold in that product market, this is very rare in management research.
Net operating profits (also known as earnings)	This is equal to the firm's revenue minus the cost of goods sold and selling, general and administrative expenses. Taxes and interest are removed to reach this net figure.
Net operating profit less adjusted taxes (NOPLAT) (also known as net operating profit after tax [NOPAT])	This measure is similar to net operating profit but is adjusted to remove several accounting distortions. It provides a cash-based measure of net operating profit. Typically, this requires subtracting taxes after making adjustments for the effect of tax deferrals and taxes on interest and nonoperating income, adding back lease expenses and unwinding the amortization of goodwill. Some consultants make up to 160 adjustments. Interest costs are not subtracted; this is important as this measure is often used in EVA calculations that take interest costs into account by allowing for the cost of capital separately.
Profit margin	This is the ratio of net operating profit to sales.
Return on assets (ROA)	This is a very popular accounting measure of performance. It is defined as the ratio of net operating profit to the firm's start-of-year assets recorded on its balance sheet.
Return on book-valued assets	This is return on assets but using the end-of-year book value of assets.
Return on capital employed (ROCE) (often called return on capital [ROC])	ROCE is a measure of how well a firm is using capital to generate revenue. It is defined as EBIT divided by employed capital. Employed capital includes long-term debt and is equal to total assets less current liabilities and the value of intangible assets.
Return on equity (ROE)	A measure of how much the firm generates for its owners. ROE is equal to net profit divided by the book value of shareholder's equity. Shareholder's equity usually includes the value of reserves as these could be paid out to shareholders.

(continued)

Table 2 (continued)

Return on investment (ROI)	This is a leading traditional measure. ROI is usually defined as the ratio of net operating profit to the net book value of assets. The net book value of assets is equal to the firm's assets less the value of intangibles and total liabilities. In recent times, an increasing number of publications use NOPLAT and other adjusted profit measures as the numerator.
Return on invested capital (ROIC)	This increasingly popular measure is defined as the ratio of NOPLAT to the firm's invested capital. Invested capital is defined as total assets less excess cash and the value of noninterest-bearing current liabilities. These two adjustments to total assets are intended to remove the effects of assets that do not need to be supported by capital.
Return on net assets (RONA)	This measure focuses on the assets the firm needs to generate its profit. It is calculated as the ratio of NOPLAT to net assets. Net assets is defined as fixed assets plus cash plus required working capital. This measure is closely related to EVA, as it is sometimes defined as $EVA = (RONA - WACC) \times Invested\ Capital$.
Return on sales (ROS)	This is the ratio of net operating profit to the sales made by the firm in the period.
Return on total assets	This is the ratio of earnings available to common stockholders to the firm's assets. This is virtually identical to return on assets, the use of <i>total</i> in the name signals that net profit (earnings) is adjusted to remove dividends for preference shares and other nonresidual claims (although most versions of ROA also do this anyway).
Risk-adjusted return on capital (RAROC) (also known as return on risk-adjusted capital [RORAC])	This measure is used primarily by financial institutions. It is defined as the ratio of risk-adjusted earnings to economic capital employed. Here, the capital employed is evaluated relative to the market, credit, and operational risk involved. The results of a RAROC model are then generally used in calculating EVA or another measurement that accounts for risk.
Sales	This is the firm's revenue from goods sold.
Sales growth	This is the change in sales over the period, expressed as the difference between sales last period and those this period as a percentage of the sales last period.
Variance in accounting profitability	A common accounting measure of risk is to use the variance in accounting profitability. This is often based on the volatility of one of the returns, such as ROA or ROI.

Financial market measures

Beta coefficient	The β -coefficient from the capital asset pricing model (CAPM). This is a measure of the level of systematic risk associated with the individual firm relative to the market portfolio.
Earnings-per-share (EPS)	This is a traditional measure of firm value. It is equal to net operating profit minus dividends paid to preference shares divided by the number of common stocks issued.
Jensen's alpha	This is the α -coefficient from the CAPM. Jensen's alpha is a measure of a firm's excess return over that associated with the systematic risk of its operations. That is, this captures unique exceptional positive or negative performance.
Market value (or market capitalization)	This is the total value of a firm's common stock (which represents the residual value of the firm's resources). It is equal to the number of shares outstanding multiplied by their current stock price.
Price-to-earnings ratio (P/E ratio)	The P/E ratio is a common method of comparing firm valuations. It is defined as the ratio of the current stock price to the annual earnings per share the firm pays out.
Return on market-valued assets	Return on market-valued assets is the annual operating income divided by the beginning-of-year market value of equity plus the book value of long-term debt.
Stock price	This is the price of the firm's listed common stock.
Total shareholder return (TSR)	Captures the gain (loss) made by shareholders during the period (generally each year). TSR is the sum of the change in stock price during the year plus any dividends paid out, expressed as a percentage of the opening value of the stock.
Tracking stocks	Securities issued that pay dividends based on the performance of some subset of the firm's divisions (usually those from a single business unit). These provide a more pure reflection of the performance of a firm's divisions (and are especially useful for multi-industry firms).

Mixed accounting/financial market measures

Balanced scorecard	The balanced scorecard is a framework that draws together multiple measures aimed at financial performance, internal business processes, customer perspectives, and innovation and learning. The aim is to enable firms to build a comprehensive performance measurement system. There is a similar concept in French accounting called the <i>Tableau de Bord</i> .
Cash flow per share	This is defined as the cash flow from operations minus preferred stock dividends divided by the number of common shares outstanding. This is a measure of the cash flow associated with each share.
Cash flow return on investment (CFROI)	This is an inflation-adjusted approximation of the internal rate of return earned by a company over all its operating assets. Normally, this is done by discounting cash flow projections that are calculated based on ROI.
Cash value added (CVA)	The CVA is the difference between a firm's operating cash flow (OCF) and the operating cash flow demand (OCFD) that it must pay shareholders. The OCF is the firm's EBITDA (which includes only cash effects) less any working capital changes and nonstrategic investments made during the period. The OCFD is defined as the investors' opportunity cost of the investment in cash terms. This provides a dollar value estimate of the net performance of the firm.
Discounted cash flows (DCF)	This is the present value of future cash flows. These are discounted for the time-value of money, usually at the firm's WACC. DCF models then compare future free cash flows to the debt and other cash investments required to support them.
Economic value added (EVA) (the generic name for this is economic profit)	This highly popular measure adjusts accounting earnings for the cost of capital. It is normally defined as $\text{NOPLAT} - (\text{WACC} \times \text{Invested Capital})$. The WACC is usually calculated through a rule of thumb, such as it being the risk free rate plus 6% multiplied by the firm's beta (Chen & Dodd, 1997).
Free cash flows	Free cash flows are the cash remaining for shareholders after all other claimants are paid. In each period, they are defined as the firm's net operating profit less taxes, operating investment required to sustain the firm, and any additional working capital requirements. These are a key component of DCF calculations, which discount them back to present values.
Internal rate of return (IRR)	The IRR is the discount rate that results in the NPV of a series of future cash flows flowing from an investment being zero.
Market-to-book value	The ratio of an organization's market value to the book value of assets.
Market value added (MVA)	Defined as the market value of the firm less the book value of debt and equity. Therefore, it represents the excess value of the firm over the capital used to support it.
Net present value (NPV)	NPV is the difference between the present value (PV) of discounted future cash flows and the investment required to earn them.
Shareholder value analysis (SVA)	This measurement approach assesses shareholder value as the residual value of the firm. Generally, it is defined as shareholder value equal to corporate value minus debt. Corporate value is calculated by discounting future earnings at the cost of capital (or weighted average of the cost of debt and equity) and adding a residual value to capture the present value of cash flows outside the discounted period plus the current value of any liquid assets (such as cash or marketable securities) (Rappaport, 1986).
Tobin's <i>q</i>	This measure is defined as the ratio of the market value of the firm's assets to their replacement cost. The market-to-book value is often used as a proxy as the replacement cost of the firm's assets is difficult to estimate.
Total business return (TBR)	TBR is closely associated with CFROI. It adopts an approach similar to TSR but is based on cash flows. TBR is defined as the terminal value of business less cash investments made during the period plus cash flow received during the period

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Warranted equity value (WEV)	WEV is a modification of EVA used by financial institutions. Here, the cost of capital is calculated based on capital-at-risk (due to the prudential requirements applying to banks).
Weighted average cost of capital (WACC)	This is a measure of the cost the firm must pay for the capital it employs. It is the weighted average of the cost of debt and the cost of equity. The cost of debt is usually adjusted to reflect the tax deductibility of interest expenses.
Z-score	Developed by Altman (1968), the Z-score provides an indication of the likelihood of a firm going bankrupt. It is based on a linear model of five common financial ratios: working capital/total assets, retained earnings/total assets, EBIT/total assets, market value of equity/book value of total liabilities, and sales/total assets.

Appendix 2 – Annual GDP Growth Rate

The tables below present the Annual Growth Rate of GDP in respectively the United States and the Netherlands for the period between 1993 and 2013. While the patterns for the entire timespan are clearly similar, the annual GDP growth rate for the United States seems to be slightly less crude than the one for the Netherlands.

Source: www.tradeeconomics.com and data.worldbank.org

