

The relation of incentive pay to affective and cognitive workers' well-being: An empirical examination

Master of Science thesis

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Preface

In front of you lies my master thesis, the final part of the master Economics of Management and Organisation at the Erasmus University Rotterdam. This thesis gives an overview of my research done in the field of incentives, resulting in an empirical examination on the relation of incentive pay to workers' well-being. As I am interested in the economics of incentives, and especially in relation to people's behaviour, this topic was a perfect fit. In this master thesis I combined knowledge I gained during my study, making it a fitted end to my master study.

In this preface I would like to thank a number of people who helped me complete my study and this master thesis. First of all, I would like to thank my supervisor Robert Dur for his time, effort, and helpful advices and ideas during this thesis. His enthusiasm made that I wanted to do my best even harder and that I enjoyed writing this thesis. I would also like to thank Robin Zoutenbier for his support in running the regressions and giving me advice about the right methods. His availability for questions made that my research could be improved several times.

For the bigger picture, I am thankful to my family and friends who made it possible for me to follow the Economics and Business study. In particular, I would like to thank my mom and dad for their constant support, trust, and endlessly listening during this study. I would also like to thank Joey for his love, support, and the power to let me relax by having a great time together.

I hope this thesis fully covers my work done throughout the duration of this master thesis and adds value to the literature on incentive pay.

Kirsten van der Beek

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Abstract

In this thesis incentive pay is examined in relation to workers' well-being. I separately study the relation of incentive pay to affective and cognitive workers' well-being to determine if a difference exists between affective and cognitive workers' well-being. Further, incentive pay is divided into bonuses and future income increases to study differences in the relation of the two types of incentive pay. The role of gender and risk attitude is examined as an explanation for the relation of incentive pay to affective and cognitive workers' well-being.

I use cross-sectional and panel data of the German Socio-Economic Panel (GSOEP) to empirically test the relation of bonuses and future income increases to affective and cognitive workers' well-being. I find that bonuses and future income increases are not associated with affective workers' well-being. I further show that bonuses do not affect cognitive workers' well-being, but future income increases do increase cognitive workers' well-being. This relation of future income increases to cognitive workers' well-being cannot be explained by gender and risk attitude.

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1. Introduction

1.1 Background

Incentive pay is designed among other things to solve the problem of moral hazard. Moral hazard is related to the principal-agent problem, where the interests of the firm and the worker are misaligned. Incentive pay can be used to solve moral hazard when monitoring the effort of a worker is costly. Western economies are increasingly making use of incentive pay (Murphy, 1999). The increased use has made that the concept of incentive pay is examined in different studies. It has been shown that incentive pay increases productivity and earnings in return for additional effort (Paarsch & Shearer, 2000; Lazear, 2000; Parent, 1999). Incentive pay also affects job satisfaction. Higher earnings through incentive pay lead to higher job satisfaction while additional effort through incentive pay decreases job satisfaction. In empirical research Heywood and Wei (2006) and Green and Heywood (2008) found a positive effect of incentive pay on job satisfaction.

1.2 Research motivation and relevance

Job satisfaction is about satisfaction at work and is part of workers' well-being. Cornelissen et al. (2011) showed by controlling for earnings in their analysis that the positive effect of incentive pay on job satisfaction is mostly determined by earnings. They also showed that risk tolerance can lead to higher job satisfaction through incentive pay. Because job satisfaction is a part of workers' well-being, there could be a relation of incentive pay to workers' well-being. It is expected that the influence of higher earnings as a result of incentive pay also affects workers' well-being. It is possible that also other influences of incentive pay lead to a relation to workers' well-being, such as optimism about future employment.

In the literature on well-being is a distinction made between two components of workers' well-being, which are affective and cognitive well-being. Affective well-being is about the emotional components of happiness while cognitive well-being concerns overall life satisfaction. Knabe et al (2010) showed with research on unemployment a difference between affective and cognitive well-being. They found that unemployment leads to lower cognitive well-being, while affective well-being stays unchanged. Due to this difference I expect different relations of incentive pay to affective and cognitive well-being. I expect that the use of incentive pay leads to lower affective well-being and higher cognitive well-being. Affective well-being may decrease through feelings of fear, anxiety and sadness, which arise

from reaching for a higher goal during the process of incentive pay. Cognitive well-being may increase because eventually workers achieve a goal during the process of incentive pay which raises their overall satisfaction.

As the relation of incentive pay to affective and cognitive workers' well-being is important and not yet examined, I explore this in my thesis. I contribute to the literature on incentive pay by separately examining incentive pay in relation to affective and cognitive workers' well-being. These relations should be explored because well-being can have influence on productivity, social behaviour and the work environment. The relation of incentive pay to workers' well-being may also determine the long term success of incentive pay.

In this thesis I make a distinction between two different types of individual incentive pay, which are bonuses and future income increases. Previous research has shown that not all types of incentive pay have the same influence. Especially bonuses seem to have an influence on job satisfaction (Pouliakas & Theodossiou, 2009). Therefore I expect that especially bonuses increase workers' well-being and I separately test the relation of these different types of incentive pay to affective and cognitive workers' well-being.

It is possible that other variables confound the relation. Heywood and Wei (2006) and Artz (2008) found that the effect of incentive pay on job satisfaction differs for men and women. When receiving incentive pay, men have a higher job satisfaction than women. Men also respond more strongly to incentives than women because they rather interact in a competitive environment (Croson & Gneezy, 2009). Therefore I examine the role of gender as an explanation for the relation of incentive pay to workers' well-being. I expect that men who receive incentive pay have a higher workers' well-being than women who receive incentive pay. Besides gender differences, I also expect risk attitude differences. It has been shown that workers with lower risk aversion are significantly more likely to choose jobs with incentive pay (Grund & Sliwka, 2006). Cornelissen et al. (2011) found that higher risk tolerance of workers in incentive pay schemes leads to higher job satisfaction. From this I expect that with bonuses and future income increases less risk averse workers have a higher well-being than more risk averse workers. Risk averse workers dislike uncertainty and fluctuations in their income. These uncertainty and fluctuations are more common in future income increases than in bonuses, because bonuses are likely to be smaller and more in the present than future income increases. From that aspect I expect for workers with the same level of risk aversion

that workers who receive future income increases have a higher workers well-being than workers who receive bonuses.

1.3 Research questions

Summarizing, the purpose of this thesis is to examine the two different types of incentive pay in relation to affective and cognitive workers' well-being. The research question for my thesis is:

'Do different types of individual incentive pay, in which individual incentive pay is measured by bonuses and future income increases, increase affective and cognitive workers' well-being?'

In order to answer the main question, the following sub questions are answered:

1. 'How are the different types of incentive pay defined and measured?'
2. 'How are affective and cognitive workers' well-being defined and measured?'
3. 'Which methods are used to obtain the results of incentive pay on workers' well-being?'
4. 'Which control variables are included to get accurate estimates?'
5. 'Do bonuses increase affective and cognitive workers' well-being?'
6. 'Do future income increases increase affective and cognitive workers' well-being?'
7. 'Do gender differences exist between the relation of different types of incentive pay to affective and cognitive workers' well-being?'
8. 'Do risk attitude differences exist between the relation of different types of incentive pay to affective and cognitive workers' well-being?'

1.4 Methods

The relation of bonuses and future income increases to affective and cognitive workers' well-being is empirically tested using data of the German Socio-Economic Panel (GSOEP), which contains information on both incentive pay and workers' well-being. First I use cross-sectional data and run ordinary least squares (OLS) regressions. Next I run linear fixed-effects panel regressions with panel data to take into account unobservable time-invariant heterogeneity. The variables gender and risk attitude are added as interactions to examine if they are of influence on incentive pay in relation to workers' well-being.

1.5 Main findings

Using the OLS and fixed-effects panel regressions it is possible to present my main research findings. It is shown that bonuses and future income increases are not associated with affective workers' well-being, which means that affective workers' well-being is the same for workers with and without incentive pay. Cognitive workers' well-being is also not affected by bonuses and is the same for workers with and without bonuses. Future income increases do positively influence cognitive workers' well-being, which indicates that workers who receive future income increases have a higher cognitive workers' well-being than workers' who do not receive future income increases. Further is shown that gender and risk attitude are no explanation for the relation of the two types of incentive pay to affective and cognitive workers' well-being.

1.6 Structure

This thesis is structured as follows. Chapter 2 gives an overview of the related literature. In Chapter 3 the data and methodology are explained. The results of the relations of the two types of incentive pay to affective and cognitive workers' well-being are presented in Chapter 4, where the cross-sectional and fixed-effects panel estimates are contrasted. Lastly, Chapter 5 answers the main research question of this thesis and gives the conclusions and recommendations.

2. Related literature

2.1 Effects of incentive pay

The influence of incentive pay is examined in different areas of economics. Incentive pay is designed among other things to align the interests of the firm and the worker, which is expected to lead to higher effort and productivity of the worker. Lazear (2000) was one of the first to empirically test this theory of incentive pay on productivity. He used data of one company to empirically study the effect of incentive pay on productivity. Just like Paarsch and Shearer (2000) he found that incentive pay increases productivity and earnings.

The introduction of incentive pay does not only affect productivity, earning, and effort, but also other areas of economics such as reciprocity and job satisfaction. Job satisfaction increases with higher earnings through incentive pay, while job satisfaction decreases with additional effort through incentive pay. The effect of incentive pay on job satisfaction is widely studied in the last years. Green and Heywood (2008) estimated cross-sectional and panel data of the British Household Panel Survey (BHPS) to investigate the influence of incentive pay on different dimensions of job satisfaction. They found a positive effect of incentive pay on job satisfaction. However, the opposite effect is also found for lower-paid workers, where incentive pay influences job satisfaction negatively (McCausland, Pouliakas, & Theodossiou, 2005). Cornelissen et al. (2011) examined the effect of incentive pay on job satisfaction with German Socio-Economic Panel (GSOEP) data and found a positive effect on job satisfaction. But this effect disappeared after controlling for higher earnings.

2.2 Different types of incentive pay

There are other studies that investigate the effect of incentive pay on job satisfaction more thoroughly. Heywood and Wei (2006) made a distinction between different types of incentive pay and estimated these types directly on job satisfaction. They showed that all but piece rates influence job satisfaction positively. Drago et al. (1993) made another distinction of incentive pay with individual and company-level incentive pay, where they showed that only individual incentive pay affects job satisfaction. Other research found that only bonuses influence job satisfaction (Pouliakas & Theodossiou, 2009).

With data of the GSOEP it is also possible to distinguish between different types of incentive pay. In the study of Dur et al. (2010) incentives are analyzed for workers who are reciprocal to attention of the manager. With use of the GSOEP data they distinguished between the

incentive pay types promotions and bonuses. In this thesis I also use data of the GSOEP to distinguish between two different types of incentive pay. The distinction between bonuses and future income increases has not been made in previous research with GSOEP data. Unlike Cornelissen et al. (2010), where only group incentives are examined with GSOEP data, I examine individual incentives, where the income of a worker is dependent on the performance of solely the worker.

2.3 Workers' well-being

Different studies showed that incentive pay influences job satisfaction. Jonge and Schaufeli (1998) showed in a study on Dutch health care workers that job satisfaction is just a part of workers' well-being. This indicates that it is possible that there is also a relation of the two types of incentive pay to workers' well-being.

Measuring workers' well-being is hard because it is based on self-reported measures. Galinha and Pais-Ribeiro (2012) found that affective and cognitive factors are the main predictors of well-being. They showed in their study with adult students that affective and cognitive factors give different predictions for well-being and it is therefore best to separately report the two factors. Knabe et al. (2010) also found that dividing well-being in separate parts leads to different results. They investigated the effect of unemployment on general life satisfaction and experienced utility, which are two measures of well-being. It was shown that unemployment leads to lower general life satisfaction, while experienced utility stays unchanged. The data of the GSOEP are also used to divide workers' well-being into two parts. Schimmack (2008) examined that well-being in the GSOEP can be measured best by affective and cognitive measures. Another study of Schimmack et al. (2008) showed that both the affective and cognitive components should be used in measuring well-being with GSOEP data, because the two components give different results and using them together provides more information. Therefore I distinguish workers' well-being into affective and cognitive well-being in this thesis. In literature with GSOEP data and in other literature on the relation of incentive pay to workers' well-being is this separation in affective and cognitive measures not yet made. By separately measuring affective and cognitive well-being I contribute to the existing literature on incentive pay.

2.4 Gender and risk attitude differences

Different studies ascertain that gender can be of influence on the relation of incentive pay to workers' well-being. A study by Clark (1997) showed that women have a higher job satisfaction than men because women have lower expectations at work. Further, Heywood and Wei (1997) and Green and Heywood (2008) showed that women earlier adopt piece-rate schemes while men participate earlier in incentive pay schemes. Therefore, firms with incentive pay are expected to have more men employed. This result is explained by Croson and Gneezy (2009) by the fact that men rather interact in a competitive environment. They also showed that men improve their performance in competitive environments, while women are not affected by competition. These studies show that there are gender differences that can confound the results on incentive pay. Heywood and Wei (2006) took note of this in their study and divided the results by gender. They found that incentive pay for men affects job satisfaction more than incentive pay for women. Especially group incentives do not generate additional satisfaction for women. This same result is verified in another study by Artz (2008) where individual incentive pay leads to higher job satisfaction for men, while job satisfaction stays unchanged for women.

Besides gender, Artz (2008) also noted that risk attitude can be of importance. He explained that men have a higher job satisfaction under incentive pay than women because men are less risk averse. Incentive pay schemes contain more risk because there are fluctuations and uncertainty in income. Cornelissen et al (2010) also indicated that risk attitude matters for incentive pay. They showed with data of the GSOEP that less risk averse workers are more likely to choose profit sharing schemes. A study by Grund and Sliwka (2006) confirmed these results. They also used GSOEP data to examine the effect of risk attitude on incentive pay and found that workers with incentive pay have greater risk tolerance. Another study showed that risk attitude is a strong positive determinant of job satisfaction for workers with incentive pay (Cornelissen, Heywood, & Jirjahn, 2011).

2.5 Summary

Summarizing, earlier research has been done on the effect of incentive pay on job satisfaction and indicates that there could be a relation to workers' well-being. A contribution is made to the existing literature by separately examining the relation of incentive pay to affective and cognitive workers' well-being. The distinction of individual incentive pay between bonuses and future income increases with GSOEP data has also not yet been made in this context.

Previous literature indicated that gender and risk attitude can influence the relation of incentive pay to workers' well-being, so this is included in this thesis. The next chapter discusses the data and methodology to examine the relation of different types of incentive pay to affective and cognitive workers' well-being.

3. Data and methodology

This chapter discusses how the two different types of incentive pay are defined and measured. It also defines affective and cognitive workers' well-being and explains how these variables are measured. Further, it discusses the method used and control variables included in the regressions. This chapter answers thus the first four sub questions of this thesis.

3.1 Measurement of the variables

The data used in this thesis are drawn from the German Socio-Economic Panel (GSOEP), which is a large household survey representative for the German population. I use data from the waves of 2008 and 2011 because these are the only years where information is included about different types of incentive pay and affective and cognitive workers' well-being. The information is obtained from the individual questionnaires.

The indicators of incentive pay are derived from two questions. First the question 'Is your own performance regularly assessed by a superior as part of an agreed procedure?' and second 'Does this performance assessment influence your monthly gross salary and/or a yearly bonus and/or future salary increases and/or potential promotion?'. If both questions are answered affirmatively, I consider that the worker receives incentive pay. With these questions it is possible to distinguish between the two types of incentive pay. Workers who indicate that their performance assessment has consequences for their monthly gross salary increases, future salary increases, and/or potential promotions belong to the independent variable future income increases, because all types mainly indicate future income. Bonuses are measured as a separate independent variable because bonuses are about present income and may influence workers' well-being differently. Both independent variables are types of individual incentive pay.

The dependent variables are affective and cognitive workers' well-being. Affective well-being concerns short term emotional states and is also called experienced utility, while cognitive well-being is about the overall life satisfaction of a worker. Measuring affective workers' well-being is done by asking the questions 'How often have you felt angry in the last four weeks?', 'How often have you felt worried in the last four weeks?', 'How often have you felt happy in the last four weeks? ', and 'How often have you felt sad in the last four weeks?' on a 5 point scale from very rarely till very often. I make one measure of affective workers' well-being by subtracting the average of the three negative items from the average of the positive

item¹. The dependent variable cognitive workers' well-being is derived from the question 'How satisfied are you with your life, all things considered?' on a 0 till 10 scale from completely dissatisfied till completely satisfied. These measures of affective and cognitive well-being provide the best measures for workers' well-being (Schimmack, Schupp, & Wagner, 2008).

3.2 Control variables

When examining the relation of incentive pay to workers' well-being, interactions with gender and risk attitude are included. This makes it possible to control for confounding relations of gender and risk attitude. Risk attitude is measured by the question 'How do you see yourself: Are you generally a person who is fully prepared to take risks, or do you try to avoid taking risks?'. Answers are given on an 11-point scale, where 0 means unwilling to take risks and 10 means fully prepared to take risks. It has been shown that measuring risk attitude through this question is reliable (Dohmen, Falk, Huffman, & Sunde, 2011). The analysis also includes the control variables earnings, age, age², education, tenure, East-Germany, firm size, and industry. Table 1 lists the definitions for all variables. Further some descriptive statistics are given. Table 2 summarizes the mean levels of affective and cognitive workers' well-being by the two different types of incentive pay. It shows that the means for affective and cognitive workers' well-being are always higher with incentive pay than without incentive pay. Further can be seen that with affective workers' well-being future income increases have a higher mean, while with cognitive workers' well-being bonuses have a higher mean. In table 3 the means and standard deviations of the independent variables are shown.

Table 1: Variable definitions (German Socio-Economic Panel, 2008 and 2011 waves).

Variable	Definition
Affective workers' well-being	Measured by angry, worried, happy, and sad in the last four weeks coded on a 5 point scale from very rarely till very often
Cognitive workers' well-being	Measured by overall satisfaction coded from 0, completely dissatisfied, to 10, completely satisfied
Bonuses	Dummy = 1 if the worker faces a regular appraisal that has consequences for his yearly bonus
Future income increases	Dummy = 1 if the worker faces a regular appraisal that has consequences for his monthly gross salary, future salary increases, and/or potential promotion
Male	Dummy = 1 if the worker is male

¹ This is the standard procedure with negative and positive items of affective workers' well-being (Schimmack, Schupp, & Wagner, 2008; Knabe, Rätzl, Schöb, & Weimann, 2010).

Risk attitude	Measured by risk preferences coded from 0, risk averse, to 10, fully prepared to take risk
Earnings	Monthly net earnings in Euros last month
Age	Age of the worker in years
Age ²	Age of the worker in years squared
Education	Years of schooling
Tenure	Number of years with the current employer
East-Germany	Dummy = 1 if the place of work is in East-Germany or East-Berlin
Firm size	Number of employees n where (1) $n < 5$, (2) $5 \leq n < 20$, (3) $20 \leq n < 100$, (4) $100 \leq n < 200$, (5) $200 \leq n < 2000$, (6) $5 n \geq 2000$, (7) Self Employed without staff
Industry	10 controls for industrial sector where industry is classified by one-digit industry code: 1=Agriculture, 2=Energy, 3=Mining, 4=Manufacturing, 5=Construction, 6=Trade, 7=Transport, 8=Bank and Insurance, 9=Services

Table 2: Descriptive statistics: Means of affective and cognitive workers' well-being by the two types of incentive pay.

Independent variable:	Affective workers' well-being	Cognitive workers' well-being
Without bonuses	1.149	7.088
With bonuses	1.267	7.327
Without future income increases	1.132	7.075
With future income increases	1.317	7.316
Sample size	9083	9091

Table 3: Descriptive statistics: Means and standard deviations of the independent variables.

Independent variable:	Mean	Standard deviation
Bonuses	0.112	0.315
Future income increases	0.168	0.374
Male	0.522	0.500
Risk attitude	5.326	2.202
Earnings	1684.479	1289.743
Age	43.366	11.330
Education	12.779	2.767
Tenure	11.334	10.168
East-Germany	0.233	0.423

3.3 Methodological approach

I start the analysis with cross-sectional OLS estimates of the year 2008. In economics it is common to use ordered probit estimations for dependent variables with an ordinal scale. Affective and cognitive workers' well-being are ordinal dependent variables, but cannot be estimated by ordered probit in this thesis. The reason is that my measure for affective workers' well-being is made out of four questions which results in incorrect estimates with ordered probit². Therefore I follow the psychology procedure where linear estimates are used. Ferrer-i-Carbonell and Frijters (2004) support running OLS by showing that there is little difference between assuming ordinal or cardinal scores of well-being. Other research has shown that estimating OLS instead of ordered probit gives similar results (Clark & Oswald, 1996; Clark & Oswald, 2002). Second I use panel data for the years 2008 and 2011 to control for fixed-effects. I estimate linear fixed-effects panel regressions using the within worker variation across the two waves against unobserved heterogeneity. The time-invariant variables are omitted from this estimation. Ferrer-i-Carbonell and Frijters (2004) and Riedl and Geishecker (2012) showed that linear fixed-effects panel estimates can be used for ordinal measures and that allowing for fixed-effects does change results substantially. After defining the data and methods, the results will be discussed.

² Ordered probit takes values between 0 and 1 for the dependent variables (Verbeek, 2012). Because one measure of affective workers' well-being is made by subtracting the average of the three negative items from the average of the positive item, the measure for affective workers' well-being takes values around $\frac{1}{3}$. With this measure is not the correct relation estimated.

4. Empirical results

This chapter presents my main research findings. I first discuss the OLS regressions of affective workers' well-being on bonuses and future income increases, with and without control variables and interactions. Then I present the OLS regressions of cognitive workers' well-being on bonuses and future income increases, with and without control variables and interactions. The linear fixed-effects panel regressions of affective and cognitive workers' well-being are examined lastly. The results are discussed and make it possible to answer the last four sub questions of this thesis.

4.1 OLS estimates

I start this analysis with OLS estimates using the 2008 wave of the GSOEP. In this thesis linear regression methods are used instead of ordered probit methods, because ordered probit methods estimate incorrect relations. A consequence of using linear regressions for ordinal dependent variables is that the absolute values of the estimates are inaccurate. The relative size, sign, and significance of the coefficients can be obtained. Linear regression methods deliver essentially the same results as ordered probit methods so can be used well (Riedl & Geishecker, 2010).

Table 4 presents the results of the regression of affective workers' well-being on bonuses and future income increases. Column (1) shows that there is a positive significant relation of future income increases to affective workers' well-being. However, this significant relation disappears after controlling for some variables and interactions in column (2). The control variables male, risk attitude, earnings, age, education and firm size eliminate the relation of future income increases to affective well-being, while the interaction terms have no influence. Bonuses are not of influence in both regressions. Therefore no relation can be found in the OLS estimates of bonuses and future income increases to affective workers' well-being. In this thesis I expected a negative relation of the two types of incentive pay to affective workers' well-being. Although not significant, I found a positive relation of bonuses in column (1) and a positive relation of future income increases in column (1) and (2). This positive relation cannot be explained through feelings of fear, anxiety and sadness, which arise from reaching for a higher goal during the process of incentive pay. Positive emotions arising from incentive pay may explain this positive relation.

Table 4: OLS estimates: Relation of bonuses and future income increases to affective workers' well-being (Standard errors in parentheses).

Independent variable:	(1)	(2)
Bonuses	0.021 (0.044)	-0.003 (0.151)
Future income increases	0.176*** (0.038)	0.030 (0.126)
Male		0.141*** (0.034)
Risk attitude		-0.049*** (0.007)
Earnings		0.000*** (0.000)
Age		-0.036*** (0.008)
Age ²		0.000*** (0.000)
Education		0.016*** (0.006)
Tenure		0.003 (0.002)
East-Germany		-0.045 (0.032)
Firm size		
2		-0.083 (0.053)
3		-0.108** (0.052)
4		-0.118* (0.062)
5		-0.087* (0.053)
6		-0.082 (0.054)
7		-0.155* (0.087)
Industry		
2		0.235 (0.181)
3		-0.221 (0.295)
4		0.114 (0.124)
5		0.135 (0.126)
6		0.109 (0.125)

7		0.218 (0.134)
8		0.155 (0.138)
9		0.140 (0.122)
Bonuses*Male		0.028 (0.099)
Future income increases*Male		-0.053 (0.084)
Bonuses*Risk attitude		-0.003 (0.023)
Future income increases*Risk attitude		0.013 (0.019)
Constant	1.131*** (0.013)	1.942*** (0.215)
Observations	11145	9083
Adjusted R ²	0.003	0.029

***, **, * indicate significance at 1%, 5%, and 10% level respectively.

The relation of bonuses and future income increases to cognitive workers' well-being is presented in table 5. The parsimonious estimation in column (1) shows that both bonuses and future income increases have a significant positive relation to cognitive workers' well-being. I expected that the relation of bonuses was larger than the relation of future income increases but the opposite appears to be true. The expected positive relations of the two types of incentive pay to cognitive workers' well-being do exist and may be due to eventually achieving a goal during the process of incentive pay which raises overall satisfaction. After controlling for some variables and interactions in column (2) the significant relation of both types of incentive pay to cognitive workers' well-being disappears. In this estimation all the control variables are highly significant and may be an explanation for the earlier relation of incentive pay to cognitive workers' well-being. The interactions with gender and risk attitude have again no influence. Hence, from the OLS estimates it cannot be shown that incentive pay influences cognitive workers' well-being.

Table 5: OLS estimates: Relation of bonuses and future income increases to cognitive workers' well-being (Standard errors in parentheses).

Independent variable:	(1)	(2)
Bonuses	0.136** (0.056)	-0.116 (0.185)
Future income increases	0.188*** (0.047)	0.050 (0.154)
Male		-0.162*** (0.041)
Risk attitude		-0.077*** (0.008)
Earnings		0.000*** (0.000)
Age		-0.065*** (0.009)
Age ²		0.001*** (0.000)
Education		0.033*** (0.007)
Tenure		0.009*** (0.002)
East-Germany		-0.249*** (0.039)
Firm size		
2		-0.054 (0.065)
3		-0.101 (0.064)
4		-0.151** (0.076)
5		-0.118* (0.065)
6		-0.105 (0.066)
7		-0.268** (0.106)
Industry		
2		0.540** (0.222)
3		0.299 (0.361)
4		0.375** (0.152)
5		0.417*** (0.154)
6		0.267* (0.153)

7		0.265 (0.163)
8		0.335** (0.169)
9		0.440*** (0.149)
Bonuses*Male		0.154 (0.121)
Future income increases*Male		-0.118 (0.102)
Bonuses*Risk attitude		0.026 (0.028)
Future income increases*Risk attitude		0.012 (0.023)
Constant	7.069*** (0.017)	8.180*** (0.264)
Observations	11171	9091
Adjusted R ²	0.003	0.049

***, **, * indicate significance at 1%, 5%, and 10% level respectively.

The two different types of incentive pay do not significantly affect affective and cognitive workers' well-being in the OLS estimates. This means that in the wave of 2008 there is no difference in affective and cognitive workers' well-being between workers who receive incentive pay and workers who do not receive incentive pay.

4.2 Linear fixed-effects panel estimates

Next the linear fixed-effects panel estimates for the years 2008 and 2011 are discussed. These fixed-effects panel regressions are run to improve and extend the cross-sectional estimates. Fixed-effects panel regressions contain data of several years and can identify changes over time at the individual level. Individuals are repeatedly observed which increases efficiency and ensures that unobserved heterogeneity disappears. Hence these fixed-effects panel regressions are run to control for unobserved worker-specific effects on workers' well-being and causes that the time-invariant worker characteristics are omitted from the estimations.

The fixed-effects panel regression of affective workers' well-being on incentive pay is presented in table 6. Column (1) shows that there is no relation of the two types of incentive pay to affective workers' well-being. Only the control variable age affects affective workers' well-being negatively. After adding the control variable risk attitude and the interactions in column (2) the relation of bonuses and future income increases to affective well-being stays insignificant. The control variable risk attitude has a significant influence, while the

interactions with risk attitude are insignificant. The interactions with gender are omitted in the linear fixed-effects panel regressions because of collinearity. As with the OLS estimates, I expected a negative relation of incentive pay to affective workers' well-being. Table 6 shows that in almost all cases the relation of incentive pay to affective well-being is positive, which may be caused by positive emotions. But the coefficients are insignificant, so no relation can be found of incentive pay to affective workers' well-being in the linear fixed-effects panel estimates.

Table 6: Linear fixed-effects panel estimates: Relation of bonuses and future income increases to affective workers' well-being (Standard errors in parentheses).

Independent variable:	(1)	(2)
Bonuses	-0.026 (0.049)	0.077 (0.118)
Future income increases	0.049 (0.043)	0.115 (0.104)
Earnings	0.000 (0.000)	0.000 (0.000)
Age	-0.080*** (0.022)	-0.082*** (0.022)
Age ²	0.000** (0.000)	0.001** (0.000)
Risk attitude		-0.020** (0.008)
Bonuses*Risk attitude		-0.020 (0.021)
Future income increases*Risk attitude		-0.013 (0.018)
Constant	3.490*** (0.501)	3.649*** (0.505)

***, **, * indicate significance at 1%, 5%, and 10% level respectively.

Lastly, table 7 presents the linear fixed-effects panel estimates of incentive pay on cognitive workers' well-being. Column (1) shows that future income increases and earnings significantly influence cognitive well-being. In column (2) these relations stay significant, which means that in the linear fixed-effects panel estimates future income increases affect cognitive workers' well-being. The interactions with risk attitude have no influence, but the control variable risk attitude is significant. Because of collinearity the interactions with gender are omitted from the estimates. The expected positive relation of future income increases to cognitive workers' well-being was confirmed by the estimates and may be due to achieving a goal with incentive pay.

Table 7: Linear fixed-effects panel estimates: Relation of bonuses and future income increases to cognitive workers' well-being (Standard errors in parentheses).

Independent variable:	(1)	(2)
Bonuses	0.047 (0.057)	-0.016 (0.138)
Future income increases	0.125** (0.051)	0.248** (0.121)
Earnings	0.000** (0.000)	0.000** (0.000)
Age	-0.039 (0.026)	-0.043 (0.026)
Age ²	-0.000 (0.000)	-0.000 (0.000)
Risk attitude		-0.028*** (0.009)
Bonuses*Risk attitude		0.011 (0.025)
Future income increases*Risk attitude		-0.023 (0.021)
Constant	8.794*** (0.586)	9.020*** (0.590)

***, **, * indicate significance at 1%, 5%, and 10% level respectively.

4.3 Main results

I combine the results of the OLS and fixed-effects panel estimates and discuss the results in comparison with the expectations. In this thesis is examined if the incentive pay types bonuses and future income increases increase cognitive and affective workers' well-being. I expected that the two types of incentive pay had a negative influence on affective workers' well-being, but the results show that no relation can be found to affective workers' well-being. This means that I find no difference in affective workers' well-being between workers who receive incentive pay and workers who do not receive incentive pay. Further I expected a positive influence of incentive pay on cognitive well-being. The results indicate that future income increases positively affect cognitive workers' well-being, but bonuses show no influence. From these findings I can derive that the expectation that bonuses have more influence than future income increases is not fulfilled. I can show that workers with future income increases have a higher cognitive workers' well-being than workers' without future income increases.

In the regressions I included several control variables to ensure that the relation of bonuses and future income increases is measured. It appears that including control variables is important because almost all control variables affect workers' well-being. For example, age is

highly significant in most estimates. A negative relation of age and a positive relation of age² to affective workers' well-being is demonstrated. This indicates that the relationship between age and workers' well-being takes the form of a U (Clark, Oswald, & Warr, 1996). Further, the control variable earnings is important to include. A positive relation to cognitive workers' well-being is shown, which means that higher earnings lead to higher cognitive workers' well-being. The control variables gender and risk attitude also affect workers' well-being. There is shown with OLS estimates that men have a higher affective workers' well-being while women have a higher cognitive workers' well-being. Lastly, I expected higher workers' well-being for workers with a higher risk attitude, but the opposite was found, which means that a higher risk attitude decreases workers' well-being.

I also included several interactions in the regressions to control for confounding relations. First interactions with gender were added to the regressions. I expected to find gender differences between the relation of incentive pay to workers' well-being, but the OLS estimates showed that no gender differences are present. This means that these estimates cannot support the expectation that men with incentive pay have a higher well-being than women with incentive pay. The result of no gender differences is not confirmed by the fixed-effects panel estimates, because these interactions could not be estimated. To ensure that no gender differences are present, further research must be done. Second interactions with risk attitude were added. I expected risk attitude differences between the relation of bonuses and future income increases to workers' well-being, but no relation of the interactions was found. This means that in this thesis I cannot support the expectation that workers' well-being increases with a higher risk attitude for workers who receive incentive pay.

5. Conclusions

In this thesis I have studied incentive pay in relation to workers' well-being. Through the effect of incentive pay on job satisfaction I expected that there was a relation of incentive pay to workers' well-being. I contributed to the literature on incentive pay by separately examining the relation of incentive pay to affective and cognitive workers' well-being. Previous literature showed a difference between affective and cognitive workers' well-being and therefore I expected a different relation of incentive pay to affective and cognitive workers' well-being. Further I divided incentive pay in the types bonuses and future income increases to examine differences in the relation of the two types of incentive pay. I also examined if the variables gender and risk attitude are an explanation for the relation of incentive pay to affective and cognitive workers' well-being. The research question for this thesis therefore was:

'Do different types of individual incentive pay, in which individual incentive pay is measured by bonuses and future income increases, increase affective and cognitive workers' well-being?'

I have run linear OLS and fixed-effects panel estimates to answer my research question. It is shown that affective workers' well-being is not affected by bonuses and future income increases and no differences exist in affective well-being between workers who receive incentive pay and workers who do not receive incentive pay. I also demonstrated that cognitive workers' well-being is not influenced by bonuses, which means that cognitive workers' well-being is the same for workers who receive bonuses and workers who do not receive bonuses. Further I provided evidence that future income increases increase cognitive workers' well-being with which I have shown that workers with future income increases have a higher cognitive workers' well-being than workers' without future income increases. The main findings in this thesis correspond to the expectations of a difference between affective and cognitive workers' well-being. Also the expectations of a different relation of the two types of incentive pay are supported by these results.

Adding interactions with risk attitude in the regressions revealed that no risk attitude differences exist for workers who receive incentive pay. The interactions with gender could not be estimated in the fixed-effects panel regressions due to collinearity, so I cannot exclude that gender is an explanation for the relation of incentive pay. Further research must

determine with other data whether there are gender differences between the relation of incentive pay to affective and cognitive workers' well-being.

To extend the research of the relation of incentive pay to affective and cognitive workers' well-being, the role of earnings should be examined separately. Earnings could be an important determinant of workers' well-being and further research is needed to determine the size of the impact of earnings on workers' well-being. Linear regression methods were used to estimate the coefficients, because ordered probit methods, which are normally used with ordinal dependent variables, estimate incorrect relations due to the measure of affective workers' well-being. As a result of using linear regressions methods, the size of the coefficients is inaccurate. A suggestion for further research would be to choose another measure for affective workers' well-being, which allows it to use ordered probit methods. Thereby the absolute values of the estimates of the relation of incentive pay to workers' well-being can be obtained. Further note that the findings of this thesis are specific to the time and place of my data. To generalize the results, more research must be done over more years and in other countries.

Still, this thesis has contributed to the examination of the consequences of incentive pay. I contributed to the literature on incentive pay by examining the relation of incentive pay to affective and cognitive workers' well-being. This is important to explore because well-being can have influence on productivity, social behaviour, and the work environment. This thesis showed that there are no negative relations of incentive pay to workers' well-being, only no relations and a positive relation of future income increases to cognitive workers' well-being. This indicates that it is best for workers' well-being to choose for the incentive pay type future income increases if incentive pay is used. Other factors and circumstances must to be taken into account to determine which type of incentive pay can be used best for all consequences of incentive pay.

Bibliography

- Allison, P. D. (2005). *Fixed Effects Regression Methods for Longitudinal Data Using SAS*. North Carolina: SAS Press.
- Artz, B. (2008). Firm Size, Performance Pay and Job Satisfaction. *Labour* , 2, 315-343.
- Azmat, G., & Iriberry, N. (2012). The Provision of Relative Performance Feedback Information: An Experimental Analysis of Performance and Happiness. *Centre for Economic Performance* , 1-50.
- Babbie, E. (2009). *The Practice of Social Research*. Belmont: Wadsworth Publishing Company .
- Becker, A., Deckers, T., Dohmen, T., Falk, A., & Kosse, F. (2012). The Relationship Between Economic Preferences and Psychological Personality Measures. *Annual Review of Economics* , 4, 453-478.
- Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How Much Should We Trust Difference-in-Difference Estimates? *The Quarterly Journal of Economics* , 119, 249-275.
- Clark, A. E. (1997). Job Satisfaction and Gender: Why Are Women So Happy At Work? *Labour Economics* , 4, 341-372.
- Clark, A. E., & Oswald, A. J. (1996). Satisfaction and Comparison Income. *Journal of Public Economics* , 61, 359-381.
- Clark, A. E., & Oswald, A. J. (2002). Well-being in Panels. Working Paper, University of Warwick. 1-27.
- Clark, A. E., Oswald, A., & Warr, P. (1996). Is Job Satisfaction U-shaped in Age? *Journal of Occupational and Organization Psychology* , 69, 211-234.
- Cornelissen, T., Heywood, J. S., & Jirjahn, U. (2011). Performance Pay, Risk Attitudes and Job Satisfaction. *Labour Economics* , 18, 229-239.
- Cornelissen, T., Heywood, J. S., & Jirjahn, U. (2010). Profit Sharing and Reciprocity: Theory and Survey Evidence. SOEPpaper. 1-32.
- Croson, R., & Gneezy, U. (2009). Gender Differences in Preferences. *Journal of Economic Literature* , 47, 1-27.
- Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2011). Individual Risk Attitudes: Measurements, Determinants, and Behavioral Consequences. *Journal of the European Economic Association* , 9, 522-550.
- Drago, R., Estrin, S., & Wooden, M. (1993). Pay for Performance Incentives and Work Attitudes. *Australian Journal of Management* , 17, 217-231.

- Dur, R., Non, A., & Roelfsema, H. (2010). Reciprocity and Incentive Pay in the Workplace. *Journal of Economic Psychology* , 31, 676-686.
- Ferrer-i-Carbonell, A., & Frijters, P. (2004). How Important Is Methodology for the Estimates of the Determinants of Happiness. *The Economic Journal* , 114, 641-659.
- Frederick, S., Loewenstein, G., & O'Donoghue, T. (2002). Time Discounting and Time Preference: A Critical Review. *Journal of Economic Literature* , 40, 351-401.
- Galinha, I. C., & Pais-Ribeiro, J. L. (2012). Cognitive, Affective and Contextual Predictors of Subjective Well-Being. *International Journal of Wellbeing* , 2, 34-53.
- Green, C., & Heywood, J. S. (2008). Does Performance Pay Increase Job Satisfaction. *Economica* , 75, 710-728.
- Grund, C., & Sliwka, D. (2006). Performance Pay and Risk Aversion. IZA Discussion Papers, no. 2012. 1-11.
- Heywood, J. S., & Wei, X. (2006). Performance Pay and Job Satisfaction. *Journal of Industrial Relations* , 48, 523-540.
- Heywood, J. S., & Wei, X. (1997). Piece-Rate Payment Schemes and the Employment of Women: The Case of Hong Kong. *Journal of Comparative Economics* , 25, 237-255.
- Heywood, J., Siebert, W., & Wei, X. (2002). Worker Sorting and Job Satisfaction: The Case of Union and Government Jobs. *Industrial and Labor Relations Review* , 55, 595-609.
- Hill, R. C., Griffiths, W. E., & Lim, G. C. (2008). *Principles of Econometrics*. Hoboken: John Wiley & Sons, Inc.
- Jonge, J. d., & Schaufeli, W. B. (1998). Job Characteristics and Employee Well-being: a Test of Warr's Vitamin Model in Health Care Workers Using Structural Equation Modelling. *Journal of Organizational Behavior* , 19, 387-407.
- Knabe, A., Rätzl, S., Schöb, R., & Weimann, J. (2010). Dissatisfied With Life But Having a Good Day: Time-Use and Well-Being of the Unemployed. *The Economic Journal* , 120, 867-889.
- Lazear, E. P. (2000). Performance Pay and Productivity. *The American Economic Review* , 90, 1346-1361.
- McCausland, W. D., Pouliakas, K., & Theodossiou, I. (2005). Some Are Punished and Some Are Rewarded: A Study of the Impact of Performance Pay on Job. *International Journal of Manpower, Special issue on Human Resource Management and Performance Incentives* , 26, 636-659.
- McKelvey, R., & Zavonia, W. (1975). A Statistical Model for the Analysis of Ordinal Level Dependent Variables. *Journal of Mathematical Sociology* , 4, 103-120.

- Murphy, K. J. (1999). Executive Compensation. In O. Ashenfelter, & D. Card, *Handbook of Labor Economics* (3 ed., pp. 2485-2563). Amsterdam.
- Paarsch, H. J., & Shearer, B. (2000). Piece Rates, Fixed Wages, and Incentive Effects: Statistical Evidence From Payroll Records. *International Economic Review* , 41, 59-92.
- Parent, D. (1999). Methods of Pay and Earnings: A Longitudinal Analysis. *Industrial and Labour Relations Review* , 53, 71-86.
- Pouliakas, K., & Theodossiou, I. (2009). Confronting Objections To Performance Pay: The Impact of Individual and Gain-sharing Incentives On Job Satisfaction. *Scottish Journal of Political Economy* , 56.
- Riedl, M., & Geishecker, I. (2010). Ordered Response Models and Non-Random Personality Traits: Monte Carlo Simulations and a Practical Guide. *Center for European Governance and Economic Development Research Discussion Paper* , 1-24.
- Schimmack, U. (2008). Measuring Wellbeing in th SOEP. *Presented on SOEPPapers on Multidisciplinary Panel Data Research at DIW Berlin* .
- Schimmack, U., Schupp, J., & Wagner, G. G. (2008). The Influence of Environment and Personality on the Affective and Cognitive Component of Subjective Well-being. *Social Indicators Research* , 89, 41-60.
- Verbeek, M. (2012). *A Guide to Modern Econometrics*. West Sussex: John Wiley & Sons Ltd.