Would you be willing to be compensated based on performance in your profession?
Swedish teachers' views on performance-related pay

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Abstract

Title: Would you be willing to be compensated based on performance in you profession? *Swedish teachers' views on performance-related pay*

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Key words: Performance-related pay, piece rates

Purpose: To examine Swedish teachers' views on performance-related pay. This was investigated letting teachers answer a specifically designed survey

Theoretical framework: Theories concerning performance-related pay, optimal compensation contracts and utility maximization

Empirical method: Econometrics was used for the data analysis concerning teachers' views on performance-related pay. More specifically regression analysis was used

Results: Approximately 67 percent of the respondents would be willing to be compensated based on performance, approximately 90 percent do not believe that their salary corresponds to the teaching activities that they do and women are found to be less satisfied with wages than men

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1. Introduction

Over the past decade average student test score performance in mathematics, science and reading among Swedish students has declined to a level below the Organisation for Economic Co-operation and Development (OECD) average. This was presented in the 2012 Program for International Student Assessment (PISA) report that was published on December 3rd 2013.[1] PISA is an international student assessment that measures 15-year-old students' performance in mathematics, science and reading. The PISA report also revealed that more than one fourth of Sweden's students do not reach the minimum criterion of performance in mathematics. This negative trend can be observed in both public and private schools, regardless of gender, age and other socio-economic factors. There are 34 OECD countries and Sweden was ranked #28 in mathematics, and #27 in both reading and science. Mathematic test scores declined in the other Nordic countries too between the years 2003 and 2012, but not as much as in Sweden. This negative trend has led to huge debates in Sweden concerning how to react to the poor student test scores and teachers have a lot to say in this matter since they are in daily contact with the students. The poor student test scores are of severe concern as education is the key to economic growth. The most important goal of education is that it generates future income or at least income capacity. Some studies show that there is a correlation between teacher compensation and student achievement. Neal (2011) provides evidence that when teachers in Arkansas were given bonuses based on students' improvements on the Iowa Test of Basic Skills, the students improved in all subjects tested. One possibility of improving the Swedish PISA results and the overall student performance could therefore be to change the ways in which teachers are compensated. But before a change can be implemented it is important to consider the opinions of the teachers. In the schools where performance-related pay has been introduced the opinions of the teachers have not explicitly been considered. Instead, its effects on student test scores have been the main focus. This is problematic as an introduction of performance-related pay essentially affects the teachers. I decided to let teachers around Sweden answer a survey regarding their attitudes towards introducing performance-related pay in the teaching profession to gain understanding of the target group, the teachers. What factors affect teachers' willingness to be compensated based on performance? After approximately 250 emails sent to teachers at both primary schools and high schools, 58 teachers decided to participate in the study. The main findings are that approximately 67 percent of the respondents would be willing to be compensated based on performance and approximately 90 percent of the respondents do not believe that their salary corresponds to the teaching activities that they do. It was also found that women are on average less satisfied with wages than men.

The limitations to the study are that the sample is relatively small, and although the results obtained in this small sample could be seen as a good indicator of what Swedish teachers believe, one must still be aware of that the intended respondents decided for themselves whether or not they wanted to participate in the study. This means that some teacher groups might not be represented; only a few teachers at private schools answered the survey for example. Furthermore, the survey

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[1] OECD (2013) "PISA 2012 Results In Focus" [Online]. Available:
http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf

was sent out in English, which increases the risk of Swedish teachers interpreting the survey questions incorrectly.

In performance-related pay, economic theory and actual practice sometimes seems inconsistent (Fryer, 2011, Lazear, 2000). The challenge to economists is to provide explanations to why the models in Personnel Economics sometimes do not correlate with reality. I believe that we have to acquire knowledge about what characterizes the teachers who would be willing to be compensated based on performance.

This study is organized as follows: In the first part of the thesis a background to why the research question was chosen will be presented. In the second part, previous studies and works examining performance-related pay will be discussed. Both a theoretical and an empirical review of the academic works written will be presented. Finally, in the third part of the thesis, my original contribution will be presented; the data collection, method used and the survey results will be discussed.

2. Background

In this section I briefly discuss teachers' impact on student performance in order to give the reader an understanding of why it is of value to consider the teachers' opinions when trying to improve student test scores.

2.1 Pisa Report and the Factors Affecting Student Performance

The OECD published a report in February 2014 concerning the 2012 PISA results and this section is to a great extent based on this report.[2] The purpose of the report was to reveal the underlying factors to the poor student test scores and compare policies and methods used for learning across schools in Sweden and in comparison to other OECD countries. In the report, it is presented that teachers' wages are relatively low in Sweden compared to the country's general wealth. By contrast, high-performing countries tend to prioritize higher salaries for teachers. Swedish secondary teachers are only paid 92 percent of Sweden's per capita GDP. This could be compared to Korea where teachers are paid approximately 182 percent of its per capita GDP. Interestingly enough, Korean students are the highest performing students among students in the OECD countries. Furthermore, in most other OECD countries teachers are paid more than 100 percent of per capita GDP. This suggests that there might be a correlation between teacher compensation and student performance.

An interesting discussion is conducted in the review "Teacher Incentives" where Lazear (2003) examines the compensation contracts of teachers in Sweden as well as in the United States and finds that in both countries the salaries of teachers are very low and the wage differentials among teachers are small. Low pay means that fewer people are likely to become teachers, this leads to lower quality among teachers, since talented workers might decide not to become teachers. Paying based on student achievement will benefit those teachers who have the greatest ability to influence student test scores. This will attract those who have the ability and discourage those who have not. A reason to introduce performance-related pay could

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[2] OECD (2014) "Resources, policies and practices in Sweden's schooling system: an in-depth analysis of PISA 2012 results" [Online]. Available:
http://www.regeringen.se/content/1/c6/23/42/93/11ed5f6d.pdf

therefore be to solve the problems of low teacher quality and poor student test scores (Lazear, 2003). Although, there might be many factors influencing student achievement, it cannot be denied that the fact that teacher salaries are low in Sweden might be one explanation to why the test scores of Swedish students are declining. The fact that teachers in Korea are the best paid and have the highest performing students supports this point (OECD, 2014).

Moreover, looking at other factors such as class size, the report shows that the Swedish class sizes are smaller than in other OECD countries. However, there is a weak relationship between class size and student achievement. This was presented in the OECD's report published in 2014.[3] Furthermore, Swedish schools have on average the same level of educational resources as other OECD countries but the resources are not shared equally between Swedish schools. The availability of educational resources including textbooks, computer software and internet connection is clearly correlated with student performance. This means that less fortunate schools are more likely to show poor student test scores. However, this relationship has not, interestingly enough, shown to be present in high-performing countries including Korea and the Netherlands.

2.2 Personnel Economics

In this section Personnel Economics will briefly be discussed. This branch of economics contains theories that explain optimal ways for workers to be compensated including performance-related pay which is the main focus of my study.

The main task in Personnel Economics is to study the interaction between employers and workers. By using a mathematical approach, one is able to come up with the employee's optimal compensation contract that make the worker exert the optimal level of effort and that maximizes the firm's profit. Employers and workers have different interests: worker effort leads to benefits to the firm and costs to the worker. However, both parties can benefit from trade if the workers are compensated for their cost of effort. Personnel Economics has been developed because traditional Production Theory does not say anything about how wages should be structured in order to motivate workers. In the standard model of compensation, workers are paid the competitive wage but it is not defined in what structure or form the competitive wage is given (Lazear, 1995). This is problematic as optimal wage contracts differ depending on what type of job is considered. Teaching differs from other professions since teachers often experience a lot of intrinsic motivation. This means that teacher motivation is often based on non-financial rewards rather than on financial rewards. Since teachers do not receive high wages this aspect of motivation is vital; psychological rewards play a major role and factors such as student learning and a genuine interest in the topic in which they teach become more important.

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[3] OECD (2014) "Resources, policies and practices in Sweden's schooling system: an in-depth analysis of PISA 2012 results" [Online]. Available:
http://www.regeringen.se/content/1/c6/23/42/93/11ed5f6d.pdf

2.3 Job Satisfaction

In this section job satisfaction is briefly discussed. Adams' Equity Theory of 1963 states that if employees believe that there is an imbalance between inputs and outputs they get de-motivated. In other words, if the compensation received does not correspond to worker skills and hours spent on the job they won't experience job satisfaction. Job satisfaction among teachers has been shown to be correlated with the level of compensation that the teachers' receive and is therefore closely connected to my research question that aims to investigate teachers' willingness to be compensated based on performance. Ingersoll and Smith (2003) show that high levels of turnover and dissatisfaction are due to low teacher wages. Moreover, Darling-Hammond (2003) shows that job satisfaction has a positive effect on teachers' effectiveness, which in turn improves student performance. She shows that skilled, well-prepared and satisfied teachers have the greatest positive influence on student learning and achievement.

3. Literature Review

In this section the existing studies on performance-related pay, which are closely related to my research question are discussed. More specifically, in section 3.1 the theoretical contributions on performance-related pay are presented. Special attention is given to the analysis conducted by Edward Lazear, who is considered to be one of the founders of Personnel Economics. In section 3.2, previous empirical studies focusing on performance-related pay will be considered. Both studies on where performance-related pay has had positive and negative effects on teacher and student performance will be brought up.

3.1 Review of Theoretical Papers

In this section, the economic models on why performance-related pay would work in theory are presented. It is often discussed if fixed or variable pay should be used when compensating workers. A fixed pay compensates the worker independently of the output (s)he produces and with variable pay the worker is compensated through an output-based measure of performance (Lazear, 1995). The most commonly used form of variable pay is the piece rate pay, which is a form of performance-related pay. For a compensation contract to be optimal it must make the worker exert the efficient level of effort so that the firm profit maximizes (Lazear, 1995). Lazear (1995) shows that if a piece rate scheme is used the worker will be paid according to the following equation:

$$w = \alpha + \beta y$$

Where α is equal to the base salary, β is equal to the piece rate received per unit of output and y is equal to the output that the worker produces. In the model, it is assumed that effort is equal to output ($e = y$). This means that the measurement of effort is assumed to be perfect. The worker also acquires a cost of effort, which is represented by $C(e)$.

The optimal effort level is therefore the solution to the maximization problem of the worker's supply function subject to the effort level e:

$$\alpha + \beta e - C\,(e)$$

With first-order condition $C'(e) = \beta$. This tells us that the effort level that the worker exerts increases as the piece rate increases. In order for the worker to take the job, the wage has to exceed the cost of effort; this is represented by the following expression:

$$\alpha + \beta e > C(e)$$

One question that is often addressed is whether workers should be paid based on input or output. The factor that has to be considered is the measurement cost; it is easier to obtain a measure for input than it is for output (Lazear, 1995). Output is measured at cost Γ and the firm will choose to pay wages based on input instead of output when the cost of measurement of the worker's output is high or requires a long time. For teachers, payment based on input, would be payment based on time worked and set of skills obtained. Payment based on output would refer to some metric of student achievement (Lazear, 2003). The role of risk-aversion also has to be considered; the risk-averse worker will prefer the straight salary based on input to the piece rate since the straight salary provides complete insurance to the worker. It might lead to a lower wage for the worker in total but for a risk-averse worker this might still be preferred. If the firm pays wages according to a piece rate system the total wage of the worker can either be low because (s)he has experienced a lot of bad luck or because (s)he has not put in sufficient amount of effort into the job. The trade-off between quantity and quality must also be considered. It can be argued that paying workers based on output produced will lead to high numbers of low-quality units produced. However, it can also be argued that a worker who is compensated based on input is in theory indifferent between spending all his/her time on one unit or on producing many (Lazear, 1995).

   A problem with introducing piece rates is what is commonly called the "Ratchet effect", where hard-working workers in the first period might signal that the task is easier than what the average worker thinks. This might lead to that the firm lowers the piece rate. If the workers are aware of this they might reduce the effort level in the first period and in this way face a higher piece rate than they deserve in the second period. In other words, the workers have incentives to keep output in period 1 lower than efficient.

   Despite some of the problems concerning piece rates, it can be argued that they are necessary because the marginal cost of additional effort exerted increases $C'(e) > 0$ at an increasing rate $C''(e) > 0$. This is illustrated in figure 1 below where $C(e)$ represents the cost of effort and e represents the effort level.

Figure 1: The marginal cost of effort

C(e)

e
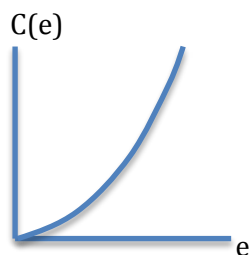
The worker will put in more effort as long as the marginal return (additional wages received for every unit of effort) is greater than the marginal cost of effort. In other words, if $\frac{dU}{de} > 0$ the worker will exert more effort as it will increase his/her utility. However, if $\frac{dU}{de} < 0$ effort decreases utility and the worker will choose not to work.

If a worker is paid straight salary according to the following equation:

$$U(w, e) = \alpha - C(e)$$

The worker will maximize utility when effort is equal to zero ($e = 0$) as the salary α is independent of effort; this is shown in figure 2 below. The straight vertical line represents the compensation contract, which in this case is the fixed wage level α, and U represents the utility function.

Figure 2: Effort exerted under a fixed wage

w

U

α

e
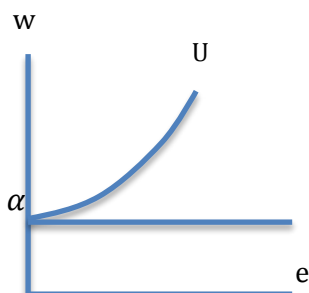
At $e = 0$ the worker reaches the highest utility function (s)he can reach given the compensation contract. If the firm wants the worker to exert effort the firm has to pay the worker more for every additional unit of effort exerted as every unit of effort increases the worker's cost of effort at an increasing rate. In figure 3 below, it is shown how an introduction of a piece rate system increases the amount of effort that the worker is willing to exert. The straight vertical line still represents the fixed wage level α and the line βe represents the additional wage that the worker receives if the piece rate system is introduced. The piece rate system makes the worker exert the optimal level of effort $e *$.

Figure 3: Effort exerted under a piece rate system
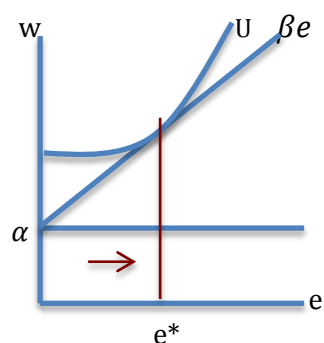
Furthermore, in figure 4 below, the two linear lines $\beta 1e$ and $\beta 2e$ represent two different compensation contracts given under a piece rate system. The piece rate $\beta 2$ is greater than the piece rate $\beta 1$. It is shown that the worker's choice of effort increases from $e1$ to $e2$ when the firm increases the piece rate from $\beta 1$ to $\beta 2$.

Figure 4:Two different piece rate systems
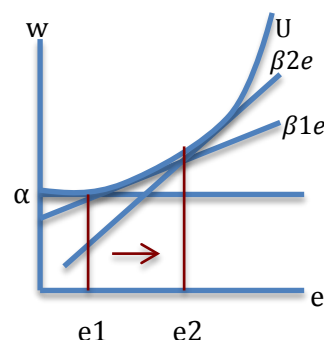
Another thing that has to be considered is the worker's participation constraint. The worker will pick the point where $\beta = C'(e)$ as long as the utility that it obtains by doing this exceeds the utility it gets from an outside option. This means that U (w, e) has to be greater than Ū, where Ū represents the utility the worker gets from an outside option. In the theory of Personnel Economics, it is often assumed, for simplicity, that the cost of effort is equal to $\frac{C}{2} e^2$. The first-order condition of the cost of effort subject to effort is therefore $C(e)$ and $\beta = C(e)$ is therefore the worker's utility maximizing choice. The worker will in other words maximize utility by picking the point where effort equals $\frac{\beta}{C}$. This equation $e* = \frac{\beta}{C}$ represents the workers incentive compatibility constraint. The two constraints: participation constraint and incentive compatibility constraint must be satisfied in order for the firm to profit maximize and the worker to exert the optimal level of effort. The utility function therefore looks like this:

$$U = \alpha + \beta e - \frac{C}{2} e^2$$

Substituting $e*$ into the equation gives us:

$$U = \alpha + \beta \left(\frac{\beta}{c}\right) - \frac{c}{2}\left(\frac{\beta}{c}\right)^2 = \alpha + \frac{\beta^2}{2C}$$

In order for the participation constraint to be satisfied $U \geq \bar{U}$:

$$\alpha + \frac{\beta^2}{2C} \geq \bar{U}$$

The firm's problem is to:
1.) Choose fixed salary α to ensure that the worker's participation constraint is satisfied.
2.) Choose piece rate β to induce the worker to exert the profit-maximizing amount of effort.

The firm's profit function is represented by the following equation:

$$\pi = py - w$$

Where p represents the price of the firm's product. Still assuming perfect measurement of effort $(e = y)$ this equation can be rewritten as follows:

$$\pi = pe - \alpha - \beta e = (P - \beta)\, e - \alpha$$

Since the firm's profit decreases in α, the firm will set the base salary as low as possible but so that the worker still chooses to participate. This is shown by the following equation:

$$\alpha \geq \bar{U} - \frac{\beta^2}{2C}$$

The firm will set the base salary α equal to $\bar{U} - \frac{\beta^2}{2C}$. The base salary will not affect effort level chosen; it is set to ensure that the worker is willing to participate. Substituting $e*$ and α into the firm's profit function we get the following expression:

$$\pi = (p - \beta)\frac{\beta}{C} - \bar{U} + \frac{\beta^2}{2C}$$

If we simplify this expression we get:

$$\pi = \frac{P\beta}{C} - \frac{\beta^2}{2C} - \bar{U}$$

The firm will maximize profits subject to the piece rate β and we get the following first-order condition:

$$\frac{d\pi}{d\beta} = \frac{p}{c} - \frac{\beta}{c}$$

In order to maximize profits the firm sets $\beta = p$. Where the piece rate equals the price of the product sold.

In theory, introducing performance-related pay incentivizes the worker to exert the optimal level of effort that leads to that the firm profit maximizes. However, the empirical findings show different results; some show evidence of that performance-related pay improves student achievement and some show that it has no significant impact on it. According to me, the goal should be to identify what categorizes the group of teachers that are positive to the idea of being compensated based on performance before we implement it.

3.2 Review of Empirical Papers

The studies discussed in this section provide mixed evidence, some show that the introduction of performance-related pay has had positive impacts on student achievement at the different schools, while other do not find any significant effect. In the first group of studies, it is not clear what typifies the schools at which the introduction of performance-related pay has had positive effects, and it is not discussed what characterizes the group of teachers that responded positively to being compensated based on performance.

i. Positive relationship between performance-related pay and student performance

Let us start with the studies that find a positive relationship between performance-related pay and student achievement. Neal (2011) provides evidence that teachers respond positively to performance-related pay. In Arkansas, teachers were given bonuses based on students' improvements on the Iowa Test of Basic Skills. Language, mathematics and reading skills were tested and the results show that students improved in all subjects.

Fryer et al. (2012) performed the first field experiment of teacher incentives where loss aversion is taken into account and finds evidence that framing a teacher financial incentive program in terms of losses instead of gains improves student achievement. Between the years 2010 and 2011 an experiment in nine low-performing schools in Chicago Heights was operated. Teachers were randomly picked out to participate in the financial incentive program. The teachers got awarded in two different ways. There was one gain treatment group where the teachers received financial incentives in the form of bonuses at a maximum of 8000 dollars. This was based on student achievement and was distributed in the end of the year. Also, there was one loss treatment group where a lump sum of 4000 dollars bonus was distributed to the teachers in the beginning of the school year. The teachers were told that they got to keep the bonus if the students met the performance goals. If student performance was below the target they had to return the difference between 4000 dollars and the bonus they actually earned. If the student results were above average however, an additional payment of up to 4000 dollars was awarded. In both groups, the maximum bonus possible was therefore the same. There were two different gain and loss treatment groups: one team and individual treatment group. In the individual treatment groups, the teachers got awarded based on their own students' test scores and in the team treatment groups the teachers got awarded

according to the average team performance. 150 out of 160 teachers that were eligible to participate decided to take part in the field experiment. Teachers were compensated based on the students' end of year test scores on the ThinkLink Predictive Assessment. In the case where students had teachers who were part of the loss treatment group there were statistically significant improvements in student achievement. For the gain treatment, mostly insignificant results were found. However, the null hypothesis that gain and loss treatments have the same impact on mathematics test scores could be rejected with at least 95 percent certainty. Our interpretation is that loss aversion might play an important role in implementing financial incentives for teachers.

In addition, Lavy (2009) also presents evidence that performance-related pay might have a positive impact on student test scores. His study was done in Israel where high school teachers received monetary bonuses based on how their classes performed on matriculation exams in mathematics and English. Teachers received monetary bonuses if they managed to improve student test scores. However, since the experiment took place during one year's time, the long-term effects are not known. But in the short-run the bonus system had more students take the matriculation exams and both the pass rates and the average student test scores increased.

ii. Negative relationship between performance-related pay and student performance

When it comes to performance-related pay, economic theory and actual practice sometimes seems inconsistent. In this section empirical evidence that goes against the traditional economic theories of Personnel Economics is presented. Fryer (2011) finds no evidence that incentivizing teachers increases student achievement when he performs a randomized trial in approximately 200 schools to see if there is a correlation. In 2007, financial incentives were provided to teachers in the lowest performing public schools in New York City to improve student attendance and achievement. 400 schools participated in the two-year pilot program. Middle schools and high schools were selected based on the average scores on the tests in fourth to eighth grade. Elementary schools were selected based on demographics including special education students and poverty rates. The sample in the first year consisted of 198 treatment schools and 163 control schools. The schools received a lump-sum bonus of 3000 dollars for every union-represented staff member if the school met the annual performance goal set by the Department of Education. The basis for awarding incentives to the teachers was the progress report card score, which consisted of different categories including learning environment, student performance, and student progress. The student progress depended on the average changes in the test scores and the percentage of students that at the state test for elementary and middle schools made at least one year of progress. Schools were incentivized relative to how other schools performed. In the first year 104 schools in the treatment group got the full bonus as they met the progress target and 18 schools met 75 percent of the progress target and received half of the bonus. In the second year, only 191 out of 198 schools in the treatment group decided to take part in the incentive program and 154 of these received full bonus while seven schools received half of the maximum bonus. Despite these results, Fryer (2011) shows that providing teachers with financial incentives did not increase the student result in any statistically meaningful way.

Furthermore, Lazear (2000) encounters something interesting when he investigates the introduction of a team incentive scheme in the petrol industry. He finds that the productivity increased by more than 12 percent over 6 months when

British Petrol and Exploration introduced a team incentive scheme to incentivize workers. Monthly output was measured and based on the team output; bonuses were given to the workers. However, when British Petrol and Exploration tried the same thing at the head office it was not appreciated; workers quit and hated it. How do we know when to introduce performance-related pay and not? I believe that we have to look at people as individuals and acquire knowledge about the workers who would be willing to be compensated based on performance.

iii. The consequences of introducing performance-related pay

In this section the possible problems with introducing performance-related pay will be considered. Despite the fact that performance-related pay in some cases seems to have positive effects on student achievement we have to be aware of its limitations including negative incentives and its effect on intrinsic motivation. There is a monitoring problem too as the education authorities cannot observe the majority of teachers' actions. Performance-related pay focuses on incentivizing actions and if these actions are linked to student achievement problems including negative incentives, can arise. Teachers might take actions that increase the measured student achievement relative to the students' true level of knowledge. Performance-related pay has a tendency to invite cheating actions that lead to higher bonuses when in fact, teacher performance and/or student achievement have not changed (Neal, 2011).

Chakrabarti et al. (2013) also show that implementing school policies might have negative consequences. In the paper, the Florida Opportunity Scholarship Program featured a policy that made it possible for students at low-performing schools to move to higher-performing schools. Students received vouchers that made it possible for them to move to high-performing schools if their school got two failing marks within four years. For a school, this meant that if students moved, the school would lose revenue and the transfers would lead to undesirable attention. In the study, various forms of strategic behavioral patterns were found including suspension of weak students during exam periods, putting weak students into special education groups and teacher cheating. Marks were based on the Florida Comprehensive Assessment Test. The school was given a failing mark if the students did not achieve the minimum criteria in the subjects of writing, reading and mathematics. If the school received two failing marks within four years, all students were given the chance to transfer to a different school. Test scores from students with limited English language knowledge were excluded from the sample as well as students in special education groups. As these two groups were excluded, teachers had incentives to reclassify weak students into one of these two groups, thus lower the risk of getting a failing mark. Using data from the Florida Department of Education, Chakrabarti et al. (2013) found evidence that threatened schools that had received one failing mark already, reclassified a greater extent of their students into the excluded groups than schools who were not threatened. And there is no evidence of that the threatened and non-threatened schools behaved differently before the Florida Opportunity Scholarship Program was implemented. This shows that negative incentives might occur when school policies are implemented as the policies might lead to strategic reclassification and improved test scores that are not due to genuine improvements.

Furthermore, teachers tend to be driven by intrinsic motivation. Since performance-related pay focuses on extrinsic benefits these might crowd-out intrinsic motivation. Teachers that felt like they were doing something important for the

society without getting high rewards and benefited from coming across as a nice person might decrease the amount of effort put in when paid higher wages.

4. Research question

In trying to answer the research question regarding if Swedish teachers would be willing to be compensated based on performance I prepared a survey that was administered online for teachers at different schools around Sweden to answer. The survey focused on how teachers perceive the possibility of being compensated based on performance in their profession. Studies have shown a positive relationship between teacher compensation and student achievement (Neal, 2011, Fryer et al., 2012, Lavy 2009) but the teachers' views on performance-related pay have seldom been emphasized. Instead, its effects on test scores have been the main focus. Since an introduction of performance-related pay would mainly affect the teachers I thought it would be of value to investigate the factors that affect teachers' willingness to be compensated based on performance. Furthermore, it has been shown that dissatisfaction is often due to low salaries (Ingersoll and Smith, 2003), but equally so in this area, teachers have been seen as a group instead of investigating the individual characteristics of those who experience job dissatisfaction. Since part of the questions in the survey revealed the teachers' demographic characteristics, it was possible to investigate if the answers differed depending on factors including gender, age, level of education and experience. In other words, the survey questions asked made it possible to see if certain factors increased the probability of teachers being positive towards introducing performance-related pay or if they increased the probability of teachers experiencing job satisfaction. Are men and women equally satisfied with wages? Are younger people generally more dissatisfied with wages than older teachers? By trying to answer these questions the dissatisfied teachers can be identified. In order for changes to occur we need to gain more understanding of the target group, the teachers. However, it is not just the teachers' opinions that should be considered. It is also important to investigate how the students feel about the declining test scores and the reasons for it. I would like to see these kinds of studies in the future.

5. Context of the study

In this section, aspects of the Swedish educational system are discussed. The information is taken from Lärarförbundets website. [4] Lärarförbundet is a union for teachers of all categories. The Swedish school system ranges from pre-school to adult education. Pre-school classes are voluntary, while nine years primary education is compulsory. Upper secondary education is three years and voluntary. The Education Act provides a framework for all school activities where goals and guidelines are stated. Municipalities, counties and the state organize education in Sweden but the municipalities have the main responsibility. In addition, private schools can be accepted to operate if they get permission from the municipality where the school is going to be conducted. Every school in Sweden has a principal that is in charge of the management and the coordination of the educational work. As a teacher in Sweden, one either works with children, adolescents or adult learning. Teachers are responsible for preparing lessons and for grading students. Teaching is carried out in pre-schools, primary schools, at leisure centers, in secondary- and adult education. Schools can be either private or public and teachers can be on either on-going contracts or on fixed-term contracts. Since December 2013 it is required that teachers acquire teacher certification for permanent employment. In the certification, it is defined at what type of schools that the teacher is qualified to teach at and which topics the teacher is qualified to teach in. Moreover, teachers' salaries are set individually at every school. There are no agreed entrance salaries that are set in any collective agreements.

6. Data

In this section details about the data collected, the procedure and the measures used are presented.

6.1 Data Collection

i. Participants

After approximately 250 emails sent over 8 days (April 23rd to April 30th) to teachers at both primary schools and high schools, 58 teachers decided to participate in the study. The characteristics of the participants can be seen in table 1, containing information about gender, highest level of formal education completed, the teacher's employment status, the type of contract that the teachers are on, whether the teachers work at private or public schools, age, and how long the teachers have worked in the teaching profession on average. It is important to have in mind that this study is not based on a representative sample. Few teachers from private schools answered the survey; as a consequence, it was not possible to base the analysis on if the teachers work at public or private schools.

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[4] Lärarförbundet, (2014-05-20) [Online]. Available: https://www.lararforbundet.se/

Table 1: Information about the participants

Gender	Women 64%	Men 36%		
Education completed	Gymnasium 10%	Bachelor degree 37%	Master's degree 44%	PhD 8%
Employment status	Full-time 71%	Part-time 29%		
Type of contract	On-going contract 65%	Fixed-term contract 35%		
Public/private	Public schools 97%	Private schools 3%		
Age	Mean: 45 years	Std dev. $\pm13{,}6$ years		
Years in the teaching profession	Mean: 16 years	Std dev. $\pm12{,}7$ years.		

ii. Procedure

The survey was administered online and concerned teachers' views on performance-related pay and job satisfaction. The teachers received an email with a description of the study and a link to the survey, which was administered using Google Drive's survey form *(see Appendix 2)*. The teachers were ensured that all information that was collected in the study would be treated confidentially and that the results would be made available using grouping criteria with guarantee that their school and their personnel would not be identifiable in any report of the results of the study. The advantages of using a web survey were that it was a quick and cheap method of data collection as the responses were recorded directly in the submission of the survey. The disadvantages however, were the risk of loss of responses due to technical problems and the risk of limited access to internet among the intended participants. Furthermore, the survey was sent out in English, which increased the risk of Swedish teachers misinterpreting the questions or choosing not to participate in the survey.

iii. Measures

All information reported in the study is based on Swedish teachers' views on the educational system. In times of downward trends in student performance it is important to examine what the people in the school system consider to be the causes of it to get a deeper understanding of the problem. With this said, it would be interesting to compare these results to other approaches including: the students' opinions about the Swedish school system and the declining student test scores in the 2012 PISA report. Furthermore, it would be noteworthy to compare the Swedish teachers' survey answers to teachers in other OECD countries.

6.2 Data content

The survey consisted of a total of 30 questions divided as follows: 14 questions concerning personal information, 4 questions regarding school variables, 3 questions on appraisal/feedback, 15 questions concerning job satisfaction, 8 questions regarding teachers' opinions about the teaching profession and one final open question on the teachers' views on the poor student test scores in the 2012 PISA report. Moreover, some of the questions included were taken from the following surveys: *Teacher Questionnaire*[5] and *Job Satisfaction Questionnaire*[6]. None of the questions were compulsory; teachers were free to skip questions if they wanted to. However, approximately 69 percent of the teachers answered all of the questions.

In the part concerning personal information, the following questions were asked:

Table 2: Questions concerning personal information

Personal information	
Gender	Female/Male
Birth year	The year when the respondent was born
Place of birth	City and Country
Education	Highest level of formal education that the respondent has completed
Degree	Year when last degree was completed
Years	Number of years at the school where the respondent is currently working
Teacher experience	Number of years in the teaching profession
Monthly wage	Net monthly wage in SEK
School(s)	Number of schools that the respondent currently works in
Employment status	Full-time/Part-time
Type of contract	Fixed-term contract/ On-going contract
Classes	Number of classes that the respondent teaches in
Class size	Number of students in the classes where the respondent teach
Subject(s)	Subject(s) that the respondent teaches in

(See Appendix 2 for detailed questions asked)

The questions on personal information were added to give a demographic aspect to the study. The questions give a measure of the proportions and dimensions of the respondents and make it possible to see if the answers vary depending on group belonging. And if so, to what extent it has an impact on the willingness to being compensated based on performance-related pay and the level of job satisfaction in salary.

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[5] OECD Teaching and Learning International Survey (2014-04-19) [Online]. Available: http://www.oecd.org/edu/school/43081362.pdf

[6] Job Satisfaction Questionnaire (2014-04-19) [Online]. Available: http://www.salisbury.edu/search.html?cx=012922190682254864109%3Ax5_7wzea6la&cof=FORID%3A11&q=job+satisfaction&sa=Search

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The school variable section consisted of the following variables:

Table 3: Questions concerning school variables

School variables	
Type of school	Primary school/ high school
School information	Public/private
School achievement	High/middle/ low
School performance	High-/average-/low-performing school
Ethnic constellation of students Proportion of Swedish, other Europeans, African-American, Hispanic-Latino, Middle East and other students	

(See Appendix 2 for detailed questions asked)

The school variable questions were added to investigate if the respondent believes that his/her school contributes to the downward trend in test scores or not. Moreover, the question on type of school was added to see whether or not it has an effect on job satisfaction in salary. Moreover, the questions on appraisal and feedback have to do with how often the teacher gets feedback from the principal, colleagues and students and what aspects that are considered to be important when the appraisal/feedback is given. It is also asked if the appraisal/feedback has lead to any changes or improvements. These questions were added as, in my opinion, this is a topic that is rarely discussed in Sweden.

The questions on job satisfaction ask the teacher to rate how satisfied (s)he is with the following aspects of his/her job situation:

Table 4: Questions concerning job satisfaction

Job satisfaction
Hours worked
Flexibility in scheduling
Location of work
Salary
Promotion
Opportunities
Benefits
Job security
Recognition
Relationship with co-workers
Relationship with supervisor
Use of skills
Job training
Variety in responsibilities
Independency

(See Appendix 2 for detailed questions asked)

For all questions on job satisfaction the rating system 1-5 (whole numbers) was used (1=not satisfied at all, 5= extremely satisfied). The job satisfaction questions were included, as higher levels of teacher job satisfaction have been found to have positive effects on student achievement (Darling-Hammond, 2003).

Furthermore, the questions regarding teachers' opinions about the teaching profession consisted of the following statements:

Table 5: Questions concerning teachers' opinions

Teacher compensation corresponds to teacher performance in Sweden
If teacher compensation would increase I would put more effort into my job
There is a correlation between teacher compensation and student achievement
In teaching, non-financial motivation is stronger than financial motivation
Increasing teacher wages would improve teacher quality
I would be more motivated to teach if teacher compensation was to increase

(See Appendix 2 for detailed questions asked)

The respondents were asked to what extent they agree with what is written. To their aid they had the following scale: 1. Strongly disagree, 2. Disagree, 3. Agree and 4. Strongly agree. How the teachers stand in these statements are important as they are a good indicator of if performance-related pay would be an effective way of compensating teachers.

7. Analysis

In trying to answer the research question it was first investigated whether or not teachers are satisfied with the salary they get. This aspect of job satisfaction is the basis to whether or not a change in the ways that teachers are compensated is required. If the case is that teachers are generally satisfied with wages, changing the ways in which teachers are compensated might not be the best way of trying to solve the problem of declining student test scores. To investigate this, I considered a regression where job satisfaction in salary was used as the dependent variable and gender, birth year, education, teacher experience, type of school that the teacher works in, monthly wage, employment status, and type of contract were used as the independent variables. The independent variables were chosen because in trying to investigate level of job satisfaction in salary in the teaching profession it is important to find out what it is that characterizes the teachers that are dissatisfied. Not all variables concerning personal information were added in the regression, the variable place of birth was not added, as it does not necessarily say anything about where the teacher currently works. The variable degree, which tells us when the teacher completed his/her last degree was not included in the regression as it is highly correlated with number of years in the teaching profession. Most people start working quite quickly after graduating. Furthermore, the variable years which tells us how long the teacher has worked at the school where (s)he currently works was not added since it is more interesting to look at number of total years in the teaching profession. In regression 1, an ordered logistic model was used, in this model, larger values are assumed to correspond to higher levels of job satisfaction in salary. The ordered logit model is based on the cumulative probability that the respondent experiences job satisfaction in the higher category. Which in my regression means that the respondent experiences a level of job satisfaction that is higher than the middle value of the ranking system. In other words, a level of job satisfaction in salary that is higher than 2.5. The values that are part of the higher category are therefore 3-5. For one unit increase in the independent variable the probability for that the respondent

experiences job satisfaction in salary in the higher category is expected to change by its respective regression estimate in percent.

Table 6: Names and descriptions of the variables used in regression 1

Variables	Description
Dependent variables	
Job satisfaction in salary	Binary variable=1-5, 1=not satisfied at all, 5=extremely satisfied
Independent variables	
Gender	Binary variable=1 if female, 0 if male
Birth year	The year when the respondent was born
Education	Binary variable=1 if high school/gymnasium, 2 if bachelor, 3 if master and 4 if PhD
Teacher experience	Number of years in the teaching profession
Type of school	Binary variable=1 if primary school, 2 if high school
Monthly wage	Net monthly wage in SEK
Employment status	Binary variable=1 if full-time, 0 if part-time
Type of contract	Binary variable=1 if fixed-term contract, 0 if on-going contract

In regression 2, the probit model was used and the estimates of the independent variables should be interpreted as marginal effects. The teacher's view on performance-related pay was used as the dependent variable. This, as it is the focus of the study and the main reason for the research. In order to start compensating teachers based on performance one needs to find out if it is a change that the teachers are willing to go through. The independent variables that were used are gender, birth year, whether or not the respondent believes that teacher compensation corresponds to teacher performance, monthly wage, employment status, education, and teacher experience. The justification to why these independent variables were chosen is to see whether or not women, whom to a greater extent are subject to wage discrimination would be more willing to being compensated based on performance. Furthermore, the variable birth year was included in the regression to see whether or not the view on performance-related pay varies among younger and older teachers. Moreover, the variable that tells us whether or not the respondent believes that teacher compensation corresponds to teacher performance is added to see whether or not teachers that do not think that compensation resembles performance are more positive towards performance-related pay. The variable monthly wage was added to investigate whether or not teachers with lower wages are more willing to being compensated based on performance-related pay than those with higher wages. Finally, the variables of employment status, education, and teacher experience were added to see whether or not the willingness to being compensated based on performance vary depending on if the respondent works full-time/part-time, what kind of formal education the respondent attains and how many years the respondent has worked as a teacher.

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Table 7: Names and descriptions of the variables used in regression 2

Variables	Description
Dependent variables	
Performance related-pay	Binary variable=1 if positive, 0 if negative
Independent variables	
Gender	Binary variable=1 if female, 0 if male
Birth year	The year when the respondent was born
Teacher compensation	Whether or not teachers believe that teacher compensation corresponds to teacher performance. Binary variable 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree
Monthly wage	Net monthly wage in SEK
Employment status	Binary variable=1 if full-time, 0 if part-time
Education	Binary variable=1 if high school/gymnasium, 2 if bachelor, 3 if master and 4 if PhD
Teacher experience	Number of years in the teaching profession

In table 8, summary statistics for the variables in the regressions where it is of value to account for mean, standard deviation and minimum/ maximum values are reported:

Table 8: Summary statistics

Variable	Observations	Mean	Standard deviation	Min	Max	Regression
Job satisfaction salary	57	2.193	1.025	1	5	1
Performance-related pay	57	0.737	0.444	0	1	2
Birth year	57	1969.175	13.692	1947	1991	1,2
Teacher experience	51	16.784	12.926	1	44	1,2
Monthly wage	54	19965.74	4409.401	6000	30300	1,2

In table 8, the mean wage 19965.74 SEK is lower than the 2013 Swedish average monthly wage for public and private sector teachers reported by SCB.[7] According to SCB's data, a primary school teacher earns 27 000 SEK a month. It is debatable whether my data is representative of what teachers earn, and it is perhaps not surprising that most of the teachers are dissatisfied with their wages when the average for the sample is lower than the national average.

Figures 5 and 6 contain histograms over the distribution of ranking in job satisfaction in salary and teacher compensation respectively. In figure 5, it appears that 39 percent of the respondents rated their level of job satisfaction in salary to a level of 2, which tells that the respondents are relatively dissatisfied with the wages they receive. Approximately 30 percent of the respondents rated their level of job satisfaction in salary to 1 and only one person rated his/her level of job satisfaction to a level of 5. It is clear that among the respondents participating in the study, the level of job satisfaction in salary is low.

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[7] Statistiska Centralbyrån (2014-05-24) [Online]. Available: http://www.scb.se/sv_/Hitta-statistik/Statistik-efter-amne/Arbetsmarknad/Loner-och-arbetskostnader/Lonestrukturstatistik-privat-sektor-SLP/7531/7538/Tjansteman-2012/28201/

Figure 5: Distribution of job satisfaction in salary
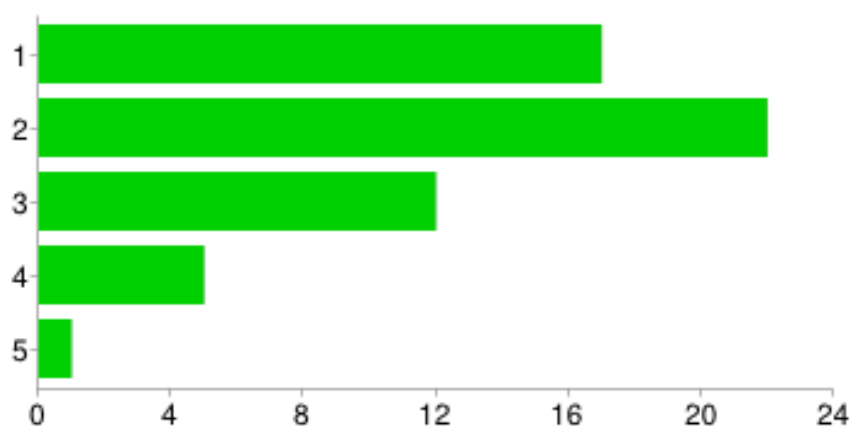
Note: The y-axis represents the rating system for job satisfaction in salary 1-5, 1=not satisfied at all, 5= extremely satisfied. The x-axis shows the number of respondents that rated in each category.

However, one should be aware of that overall job satisfaction is a result of many different components and in this study only job satisfaction in salary is highlighted as it is the component of job satisfaction that is the closest connected to my research question. In figure 6, it can be seen how the respondents answered on the survey statement "Teacher compensation corresponds to teacher performance in Sweden". Out of 58 respondents, 47 percent strongly disagreed, 32 percent disagreed and 21 percent agreed with the statement. In other words, the majority of the respondents do not believe that teacher compensation corresponds to teacher performance.

Figure 6: The respondents' views on teacher compensation
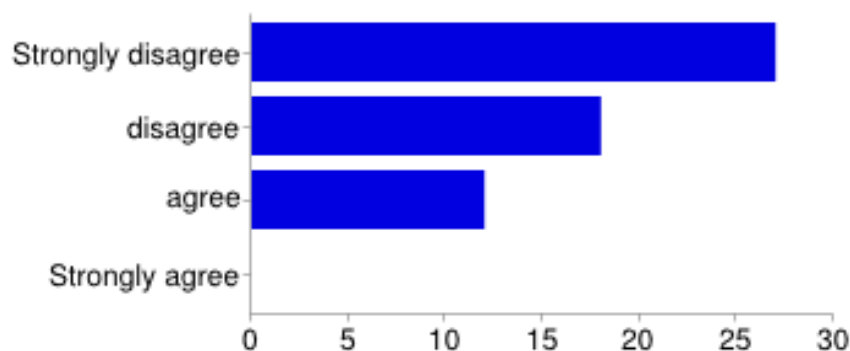
Note: The y-axis shows the different answer choices for the statement and the x-axis shows the number of respondents that replied in the different categories.

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In figure 7, it can be seen that out of 58 respondents, approximately 67 percent would be willing to be compensated based on performance.

Figure 7: Performance-related pay
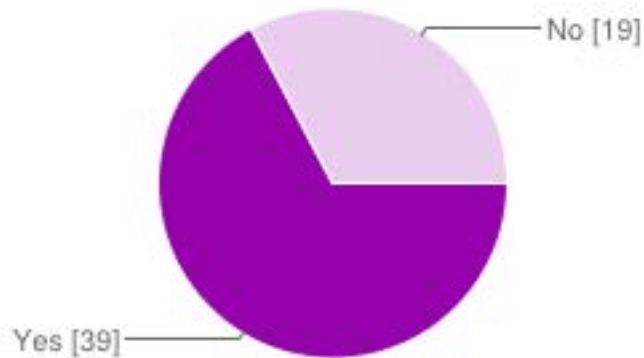
In figure 8, it can be seen that approximately 90 percent of the respondents believe that teacher compensation does not correspond to the teaching activities that they do. Comparing this result to the result in figure 7, we see that although 90 percent of the respondents are dissatisfied with the compensation they receive, not all of them would be willing to be compensated based on performance.

Figure 8: Teacher compensation corresponds to teaching activities
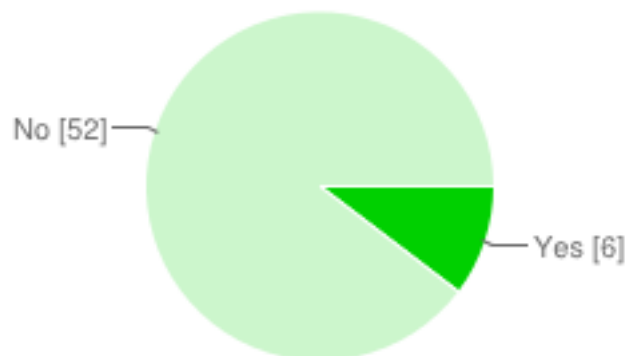
In table 9, the correlations between the variables that were presented in figures 5, 6, 7, and 8 are listed. As can be seen, performance-related pay and whether or not the respondent believes that teacher compensation corresponds to teaching activities correlate negatively. Most of the respondents that do not think that teacher compensation corresponds to teaching activities would be willing to be compensated based on performance. Moreover, as job satisfaction in salary goes up, the probability of being positive to performance-related pay goes down.

Table 9: Correlation matrix

	Job satisfaction in salary	Teacher compensation	Performance-related pay	Teacher compensation corresponds to teaching activities
Job satisfaction in salary	1.00			
Teacher compensation	0.075	1.00		
Performance-related pay	-0.101	0.146	1.00	
Teacher compensation corresponds to teaching activities	0.223	-0.045	-0.467	1.00

8. Results

In regression 1 the ordered logit model was used to estimate the respondents job satisfaction in salary. For one unit increase in the independent variable the probability for that the respondent experiences job satisfaction in the higher category is expected to change by its respective regression estimate in percent.

In regression 2, the probit model was used, and the outcome variable could only take two different values:(1/0): yes or no. The estimates of the independent variables should be interpreted as marginal effects. For one unit increase in the independent variable the probit regression estimate gives the change in the probability of the respondents being positive to an introduction of performance-related pay in percent. In tables 10 and 11, stars are used as indicators of the significance levels of the different estimates. Heteroscedastic probit models can sometimes be difficult to estimate. I failed to test for heteroscedasticity for all variables at the same time but as a next best solution the variables in the probit model were tested for heteroscedasticity separately. For all of the variables included in regression 2 the null hypothesis that the variables are heteroscedastic could be dismissed. However, it is uncertain whether this way of testing for heteroscedasticity is as reliable as when all variables are tested for it simultaneously. Moreover, for the ordered logit model, STATA could not converge any results on if the variables included in regression 1 are heteroscedastic. It would be problematic if the variables are heteroscedastic and the fact that we do not know makes the study less reliable. For all variables in regressions 1 and 2 correlation matrices were done in STATA to see to what extent the variables are correlated with each other. This was done in order to be able to detect the possibility of multicollinearity. Since the given correlations for all of the included variables were below 0.43, the concern of existing multicollinearity could be dismissed for both regressions.

8.1 Job satisfaction in salary

In equation 1 below, Y_i is the observed ordinal variable for job satisfaction in salary that takes on whole numbers 1 through 5. The marginal effects of the different dependent variables on job satisfaction in salary can be seen in table 10.

$$Y_i = \beta_1 gender + \beta_2 birthyear + \beta_3 education + \beta_4 teacherexperience + \beta_5 typeofschool + \varepsilon_i$$

Table 10: Results for regression 1

(Standard errors of the estimates are reported in parenthesis)

Model	(1)	(2)	(3)
Dependent variable	Job satisfaction in salary		
Independent variables			
Gender	−1.590* (0.847)	−1.739* (0.891)	−1.833* (0.922)
Birth year	0.039 (0.055)	0.413 (0.056)	0.043 (0.056)
Education	0.154 (0.436)	−0.202 (0.541)	−0.114 (0.582)
Teacher experience	−0.010 (0.072)	−0.023 (0.074)	−0.019 (0.075)
Type of school	−1.351 (1.179)	−1.227 (1.171)	−1.308 (1.205)
Monthly wage	-	0.0001 (0.0001)	0.0001 (0.0001)
Employment status	-	-	−0.103 (0.844)
Type of contract	-	-	−0.372 (0.794)

*Note: *, ** and *** denote significance levels 10, 5 and 1 percent respectively*

In model 1, the R^2 for the regression is 0.075. This means that 7.5 percent of the variation in the dependent variable can be explained by the independent variables. The estimate gender shows that if the respondent is a female and all other independent variables are held constant the ordered logit for females being in a higher category for job satisfaction in salary is 159 percent less than for men. Which means that on average women are less satisfied than men. This is significant on the 10 percent level. The estimate birth year shows that a unit increase in birth year increases the probability of job satisfaction in salary being in a higher category with 3.9 percent. This is however, not a significant result. The fact that a unit increase in education increases the probability of job satisfaction in salary being in a higher category with 15.4 percent and that teacher experience decreases the probability with 1 percent per unit increase in experience is not significant either. The ordered logit for teachers working in a high school rather than in a primary school decreases the probability of job satisfaction in salary being in a higher category with 135.1 percent, but this is not a significant result.

Furthermore, in model 2, where the independent variable monthly wage was added to the equation, it can be seen that the estimates are relatively unchanged. The estimate gender is slightly larger but it is still significant on the 10 percent level. The estimate for education shows, in contrast to model 1, that a unit increase in education has a negative impact on the probability of that the respondent experiences job satisfaction in salary. This result is however not significant. Furthermore, a unit increase in monthly wage (1 SEK) increases the probability of a teacher being satisfied with his/her salary with 0.01 percent.

Moreover, in model 3, the variables employment status and type of contract were added to the equation, the result we get is an even greater negative value for females being in a higher category for job satisfaction in salary than men. This result is significant on the 10 percent level. Otherwise, the estimates are similar to the ones in model 1. In addition, the estimates for employment status and type of contract show that the ordered logit for teachers working full-time and working under a fixed-term contract being in a higher category for job satisfaction in salary is 10.3 percent and 37.2 percent less than for teachers that work part-time and work under an on-going contract respectively.

8.2 Performance-related pay

In equation 2, the factors that influence whether teachers are willing to be compensated based on performance or not were investigated. In the analysis the probit model was used and the dependent variable could only take on two values:(1/0): yes or no. The independent variables used were: gender, birth year, whether or not teachers think that teacher compensation corresponds to teacher performance, monthly wage, employment status, education and teacher experience. The estimates that are presented in table 11 are the marginal effects calculated with the probit model.

$$Pr\ (Performancerelatedpay) = Pr(Y = 1) = \beta_1 + \beta_2 gender + \beta_3 birthyear + \beta_4 compensationappropriate + \beta_5 monthlywage + \varepsilon_i$$

Table 11: Results for regression 2
(Standard errors of the estimates are reported in parenthesis)

Model	(1)	(2)	(3)
Dependent Variable	Performance-related pay		
Independent variables			
Constant	−53.091 (45.173)	−52.709 (44.747)	9.650 (84.545)
Gender	−0.067 (0.520)	−0.455 (0.526)	−0.261 (0.653)
Birth year	0.029 (0.023)	0.029 (0.023)	−0.003 (0.043)
Compensation appropriate	0.914** (0.406)	0.878**(0.408)	1.446** (0.601)
Monthly wage	−0.0003***(0.00009)	−0.0003***(0.00009)	−0.0003***(0.0001)
Employment status	-	−0.326 (0.699)	-
Education	-	-	1.039** (0.467)
Teacher experience	-	-	−0.003 (0.048)

*Note: *, ** and *** denote significance levels 10, 5 and 1 percent respectively*

In model 1, the R^2 value of the regression is 0.356. It can be seen that a unit increase in the degree to which teachers believe that compensation corresponds to teacher performance increases the probability of the teacher being positive to performance-related pay with 91.4 percent. This is significant on the 5 percent level. One unit increase in monthly wage (1 SEK) decreases the probability of a teacher being positive towards performance-related pay with 0.03 percent. This is significant on the 1 percent level. Moreover, if the respondent is a female the probability of being positive towards being compensated based on performance decreases with 6.7 percent. This is however, not a significant result. Furthermore, a unit increase in birth

year increases the probability of the respondent being positive towards performance-related pay with 2.9 percent. These results are however, not significant.

In model 2, the variable employment status was added to the equation, this leads to that the negative impact on the probability of the respondent being positive towards performance-related pay if the teacher is a woman increases. Moreover, a unit increase in the degree to which teachers believe that compensation corresponds to teacher performance still increases the probability of the teacher being positive to performance-related pay but not as much. This estimate is still significant on the 5 percent level. The estimate for employment status shows that if the teacher is working full-time it decreases the probability of him/her being positive towards performance-related pay with 32.6 percent.

In model 3, the variables education and teacher experience were added. This makes the R^2 increase to 0.459. The compensation appropriate estimate is slightly larger than in the two previous models but it is still significant on the 5 percent level and the monthly wage estimate is unchanged. Moreover, the variable education shows that a unit increase in education increases the probability of the respondent being positive toward performance-related pay with 103.9 percent and this result is significant on the 5 percent level. A unit increase in teacher experience however, has a negative impact on the probability of being positive to performance-related pay. This result is however, not significant. Moreover, if the respondent is a female the probability of being positive towards being compensated based on performance decreases with 26.1 percent and a unit increase in birth year decreases the probability of a person wanting performance-related pay with 0.3 percent.

Generally, logit and probit models generate similar marginal effects; only if the sample is unbalanced the models give estimates that differ remarkably. The logit model was therefore used to see if the significant results in regression 2 were still significant if the logit model was used instead. Model 3 (regression 2) was regressed using the logit model and the results can be seen in table 12.

Table 12: Results for when the logit model was used
(standard errors of the estimates are reported in parenthesis)

Dependent Variable	Performance-related pay
Independent variables	
Compensation appropriate	2.442** (1.056)
Monthly wage	−0.0006***(0.0002)
Education	1.842**

Note: *, ** and *** denote significance levels 10, 5 and 1 percent respectively

The estimates that were significant in regression 2 (Model 3) are significant regardless of if the probit or logit model was used. Although, the estimate of the variable compensation appropriate changed, it can still be assumed that the sample is balanced.

8.3 The teacher view on PISA

In the survey, 51 teachers answered the final open question on their views on the poor student test scores in the 2012 PISA report. They were asked what they believe might be the reason for the declining student performance in Sweden. 16 percent of the teachers answered that it is due to lack of student motivation and the fact that students are not willing to put in the effort required to succeed in school. According to their opinion, students are not interested in learning and their concentration spans are too short. Furthermore, approximately 12 percent of the teachers answered that the weakened student test scores can be a result of a poor working environment for both students and teachers and that the schools' educational resources have to increase in order to stimulate students. Another common answer to the survey question regarded teachers' situation in Sweden where it was highlighted that teachers are exhausted and are paid low salaries (8%). Moreover, 8 percent of the respondents mentioned that school has lost its role in the society, as education is not considered to be important. 4 percent answered that parents need to be more involved in the student's learning process and 6 percent of the respondents mentioned that the Swedish schools focus not only on education but ethics and other knowledge that cannot be rated in grades *(see Appendix 4 for more detailed answers).*

9. Discussion/Conclusion

The decline in Swedish students test scores has lead to huge debates in Sweden about how to react to the negative trend. Teachers have a lot to say in this matter since they are in daily contact with the students. It is among students and teachers that we should start investigating the problem. In my study, I first present the background to why the research question was chosen. In the second part of the thesis I discuss the empirical and theoretical findings on how performance-related pay has affected teacher and student performance in the past. Moreover, the third part of the thesis consists of my original contribution where the data collection, method used and the survey results are discussed and evaluated. There are many possible explanations to the poor student test scores; but it cannot be denied that the low teacher salaries in Sweden might be one of them. The fact that teachers in Korea are the best paid and have the highest performing students supports this point (OECD, 2014). One possibility of improving the PISA results and the overall student performance could therefore be to change the ways in which teachers are compensated. In this study, I have chosen to turn to the teachers regarding their attitudes towards introducing performance-related pay in the teaching profession. In the past, performance-related pay has been introduced and its effect on student test scores has been studied. I think that it is the teachers' willingness to be compensated based on performance that should be in focus. Therefore, I thought it would be of value to look at the teachers with the goal of answering the following question: What factors affect teachers' willingness to be compensated based on performance? Since part of the questions in the survey revealed the teachers' demographic characteristics, it was possible to investigate how the different factors affected the teachers' willingness to being compensated based on performance and the level of job satisfaction in salary.

After approximately 250 emails sent to teachers at both primary schools and high schools, 58 teachers decided to participate in the study. 64 percent of the participants were women and the age of the teachers ranged from 23 to 67 years. In

the study, it was found that approximately 67 percent of the respondents would be willing to be compensated based on performance and approximately 90 percent of the respondents do not believe that their wages correspond to the teaching activities that they do. It is clear that the teachers are not satisfied with the ways in which they are compensated.

In the data analysis of job satisfaction in salary, women were found to be more dissatisfied with wages than men. One explanation to this could be that women to a greater extent are subject to wage discrimination than men. This is the only significant result for regression 1 and I find it surprising as I predicted monthly wage to have a significant impact on job satisfaction in salary. This because it is the variable that is in focus when job satisfaction in salary is rated.

For regression 2, 3 independent variables had significant effects: a unit increase in the degree to which teachers believe that teacher compensation corresponds to teacher performance increases the probability of the teacher being positive to performance-related pay. The more the respondent believes that teacher compensation corresponds to teacher performance the more willing (s)he is to be compensated based on performance. This could be because if the respondent thinks that teacher compensation corresponds to teacher performance, (s)he is more likely to believe in a system that compensates teachers based on performance. Moreover, a unit increase in monthly wage (1 SEK) decreases the probability of a teacher being positive to performance-related pay. This might be because the teacher becomes more satisfied with the compensation received as the salary increases and does not find a change as necessary. It is also found that a unit increase in education increases the probability of the respondent being positive to performance-related pay. One explanation to this could be that teachers with higher formal education believe more in their own ability, and being compensated based on performance would therefore benefit them.

Furthermore, women are found to be less willing to being compensated based on performance-related pay than men. Although this result is not significant, it is an interesting finding. The dissatisfaction in salary is greater among women than men but they are also less positive towards performance-related pay than men. Could this be because they have lost faith in the compensation system?

Moreover, when it comes to performance-related pay, economic theory and actual practice sometimes seems inconsistent (Fryer, 2011, Lazear, 2000). The challenge to economists is to provide explanations to why the models in Personnel Economics sometimes do not correspond with reality. I believe that it is because people are different, react differently to incentives and are motivated by different things. In economic theory, workers are viewed as a group with identical opinions. This means that when introducing performance-related pay in the workplace a clash arises. We have to look at people as individuals and acquire knowledge about the teachers who would be willing to be compensated based on performance.

In conclusion, as the majority of the teachers who participated in the study seem to be willing to be compensated based on performance, it might be worth trying to impose it, but on what premises can be discussed. Fryer et al. (2012) performed the first field experiment of teacher incentives where loss aversion is taken into account and finds evidence that framing teacher financial incentive programs in terms of losses instead of gains improve student achievement. Since several studies have shown that the introduction of performance-related pay has no significant impact on student performance it might be worth considering framing the incentive-programs in terms of losses.

In times of downward trends in student performance it is important to examine what the people in the school system consider to be the causes of it to get a deeper understanding of the problem. After this study, one has a greater understanding of the Swedish teachers' views on the teaching profession: the majority of the teachers are not very satisfied with the salary they receive and are willing to be compensated based on performance and only 10 percent of the teachers believe that teacher compensation corresponds to teacher activity. While female teachers are on average less satisfied with wages than men they are also less positive to the idea of being compensated based on performance. This tells us that performance-related pay might not be the best way of solving the situation for the teachers that are dissatisfied. Therefore, before a change in the ways in which teachers are compensated can be implemented, the teachers' views on it have to be investigated further. However, after this study it can at least be concluded that the majority of the teachers that participated in the survey seem open to the idea of performance-related pay and that is a good starting point.

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11. Appendices:

11.1 Appendix 1 Consent form

Dear teacher,

My name is Sofia Bramstång, I am a student at Lund University and I am currently writing my bachelor dissertation in economics. You are being contacted about participating in a research study that will examine the relationship between teacher variables, teacher compensation and job satisfaction. This study is aimed at teachers and the purpose is to find out about teachers' attitudes towards performance-related pay. I understand how valuable time is for educators and would truly appreciate any time you could offer in support of this study.

The Department of Economics at Lund University School of Economics and Management has approved the study and participation is voluntary. It will not be possible, at any stage of the study, to identify the teacher or the school participating.

If you choose to participate, you will complete a short survey about yourself and your current school that will take about 10 minutes to complete. The information gathered will remain confidential. No teacher or school names will be used in reporting results, when filling in the questionnaire, we will not ask for your name or any information which will make you identifiable. Only my dissertation advisor and I will have access to the data.

Thank you in advance for your cooperation. Your professional assistance is truly appreciated. If you have any questions about this study, please contact me at sbramstang@gmail.com. You may contact my advisor Natalia Montinari at natalia.montinari@nek.lu.se too.

By clicking on the following link and completing the attached survey, you agree to be a participant in this research study.

https://docs.google.com/forms/d/18RAqGrIrYPCVKtLwfkGOgkoCTDf5nw-5jNvrRi-paEY/viewform?usp=send_form

Also, I would appreciate if you could send this link to other teachers who according to you would be suitable participants of the study. If you rather wish to answer these survey questions on hard copy it could be arranged, and we will find some way to collect the answers.

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We would really appreciate if you could respond to the survey within a week.

Sincerely,

Sofia Bramstång

11.2 Appendix 2 Survey

In the survey below, questions 17, 18 and 19 are taken from the *Teacher Questionnaire* and question 20 is taken from the *Job Satisfaction Questionnaire.*

Survey

Confidentiality All information that is collected in this study will be treated confidentially. While results will be made available using grouping criteria (e.g. more experienced vs. less experienced teachers) you are guaranteed that neither you, your school, nor any of its personnel will be identified in any report of the results of the study. **Thank you very much for your cooperation!**

Personal information

1. **What is your gender?**
    a. Female
    b. Male

2. **What is your year of birth?**
    _____

3. **What is your place of birth?**
    City_____, Country_____

4. **What is the highest level of formal education that you have completed**?
    a. Gymnasium/High School
    b. Bachelor
    c. Masters
    d. PhD

5. **What year did you complete your last degree?**
    _____

6. **For how many years have you been working as a teacher?**
    _____

7. **Consider your situation in the current year. In how many schools do you work?**
   Please indicate, for each school, the level of school (e.g. primary school, high school, etc.) the location, whether it is private or public and how many hours per week you work at each school.
   a. **School 1**: Level_____
      i. Location _____
      ii. Public___ Private____
      iii. Hours per week _____

   b. **School 2**: Level_____
      i. Location _____
      ii. Public___ Private____
      iii. Hours per week _____

   c. **School 3**: Level_____
      i. Location _____
      ii. Public___ Private____
      iii. Hours per week _____

In questions 8-16 we ask you about your teaching activities and about the school where you teach. When answering the following questions, if you teach in more than one school, please consider your current situation and <u>the school where you teach the most hours per week.</u>

8. **How long have you been working as a teacher at the school where you are presently employed?**
   _____

9. **What is your employment status as a teacher?**
   a. Part-time
   b. Full-time

10. **What kind of contract do you have?**
    a. On-going contract
    b. Fixed term contract

11. **How many classes do you teach per week?**
    Please indicate the grade for each class.
    Class 1, grade:_____
    Class 2, grade:_____
    Class 3, grade:_____
    Class 4, grade:_____
    Class 5, grade:_____

12. **What subject(s) do you teach?**
    a. **Subject 1**: _____ hours per week_____
    b. **Subject 2**: _____ hours per week_____

      c. **Subject 3**: _____ hours per week_____

13. **How many students are in the classes where you are teaching?**
    a. **Class 1**: number of students_____ grade_____
    b. **Class 2**: number of students_____ grade _____
    c. **Class 3**: number of students_____ grade _____
    d. **Class 4**: number of students_____ grade _____
    e. **Class 5**: number of students_____ grade _____

14. **What is your estimate of the level of school achievement?**
    a. High (100% - 90% of students are at, or above grade level)
    b. Middle (89% - 70% of students are at, or above grade level)
    c. Low (69% or less of students are at, or below grade level)

15. **How would you categorize your school's overall performance level?**
    a. Low-performing school
    b. Average performing school
    c. High-performing school

16. **What is your estimate of the percentage of the following ethnic groups at your school?** *Please indicate your estimated percentage (Low, Middle, or High) for your school.*

	Low (25% or less)	Middle (26% - 59%)	High (60% - 100%)
Swedish			
Other European			
African-American			
Hispanic-Latino			
Middle east			
Chinese			
Other			

*In questions 17-19 we would like to ask you about the **appraisal** (defined below) of your work as a teacher and the **feedback** (defined below) you receive about your work in the school where you teach most hours per week. In regard to the questions before, if you teach in more than one school, when answering the following questions, please consider your current situation and the school where you teach most of the hours per week.*

*In this survey, **Appraisal** is defined as when a teacher's work is reviewed by the principal, an external inspector or by his or her colleagues. This appraisal can be conducted in a range of ways from a more formal, objective approach (e.g. as part of a formal performance management system, involving set procedures and criteria) to the more informal, more subjective approach (e.g. through informal discussions with*

the teacher).

*In this survey, **Feedback** is defined as a review of a teacher's work, often with the purpose of noting good performance or identifying areas of development. The feedback may be provided formally (e.g. through a written report) or informally (e.g. through discussions with the teacher).*

17. **How often do you receive appraisal and/or feedback about your work as a teacher?** *Please indicate the frequency of appraisals/or feedback (weekly, monthly, annually etc.) below.*
    a. From principal: _____
    b. From other teachers: _____
    c. From parents: _____

18. **In your opinion, how important were the following aspects considered to be when you received this appraisal and/or feedback?**
    a. Student test scores: _____
    b. Pass rates of students: _____
    c. Feedback from parents: _____
    d. How well you work with the principal and your colleagues: _____
    e. Classroom teaching: _____
    f. Knowledge and understanding of your subject: _____
    g. Relations with students: _____

19. **Concerning the appraisal and/or feedback you have received at this school, have they directly led to any of the following?**
    a. A change in salary? _____
    b. A financial bonus or monetary reward? _____
    c. A symbolic recognition (e.g. best teacher of the year)_____
    d. A change in likelihood of career advancement? _____
    e. Change in work responsibility? _____

In question 20 we ask you about your level of job satisfaction. Using the scale shown below, please rate your level of satisfaction with the following aspects of your job. As for the questions before, if you teach in more than one school, when answering the following question, please consider your current situation and the school where you teach most of the hours per week.

20. **Job satisfaction**

1	2	3	4	5
not satisfied at all				extremely satisfied

20. 1) General working conditions
_____ Hours worked each week

_____ Flexibility in scheduling
_____ Location of work

20. 2) Pay and promotion potential
_____ Salary
_____ Opportunities for Promotion
_____ Benefits (Health insurance, life insurance, etc.)
_____ Job Security
_____ Recognition for work accomplished

20. 3) Work relationship
_____ Relationships with your co-workers
_____ Relationship(s) with your supervisor(s)

20. 4) Use of skills and ability
_____ Opportunity to utilize your skills and talents
_____ Opportunity to learn new skills
_____ Support for additional training and education

20. 5) Work activities
_____ Variety of job responsibilities
_____ Degree of independence associated with your work roles

In answering questions 21-23 we ask you to think of your overall teaching activity (if you teach at more than one school, you should consider all of them)

21. **Which is your monthly wage after tax from your teaching activities?**

   _____

22. **Do you think that your salary is appropriate given the teaching activity that you do?**
   a. Yes
   b. No

23. **Do you think that being compensated partially through performance-related pay would be a positive change?**
   a. Yes
   b. No

   Finally, we would like to ask you about your opinion about the following statements. Please choose only one alternative for each of the following questions.

24. **Teacher compensation corresponds to teacher performance in Sweden**
   a. strongly disagree
   b. disagree
   c. agree
   d. strongly agree

25. If teacher compensation would increase I would put more effort into my job
    a. strongly disagree
    b. disagree
    c. agree
    d. strongly agree

26. There is a correlation between teacher compensation and student achievement
    a. strongly disagree
    b. disagree
    c. agree
    d. strongly agree

27. In teaching, non-financial motivation is stronger than financial motivation
    a. strongly disagree
    b. disagree
    c. agree
    d. strongly agree

28. Increasing teacher wages would improve teacher quality
    a. strongly disagree
    b. disagree
    c. agree
    d. strongly agree

29. I would be more motivated to teach if teacher compensation was to increase
    a. strongly disagree
    a. disagree
    b. agree
    c. strongly agree

30. Who sent you the invitation to participate in the study?
    _____

What is your view on the poor student test scores of Swedish students in the 2012 PISA report? What do you think might be the reasons for the declining student results?

_____
_____
_____
_____
_____
_____

_____
_____
_____
_____
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_____

11.3 Appendix 3 Summary statistics

Table 11 Summary statistics

Variable	Obs	Mean	Std. Dev	Min	Max
Birth year	57	1969.175	13.692	1947	1991
Year when last degree was completed	57	1997.456	13.769	1971	2013
Teacher experience	51	16.784	12.926	1	44
Years spent working at current school	51	9.471	9.023	1	38
Number of classes that teacher teaches	51	4.980	4.407	1	18
Job satisfaction work hours	57	3.947	0.854	2	5
Job satisfaction scheduling	57	2.912	1.106	1	5
Job satisfaction location of work	56	4.143	0.999	1	5
Job satisfaction salary	57	2.193	1.025	1	5
Job satisfaction promotion	56	2.071	0.871	1	4
Job satisfaction benefits	57	2.439	1.165	1	5
Job satisfaction job security	56	3.429	0.988	1	5
Job satisfaction recognition	57	2.737	1.094	1	5
Job satisfaction co-workers	57	3.947	0.854	2	5
Job satisfaction supervisor(s)	56	3.339	0.940	1	5
Job satisfaction use skills	57	3.649	0.896	2	5
Job satisfaction learn new skills	57	3.211	1.031	1	5
Job satisfaction support	57	2.772	1.018	1	5
Job satisfaction variety in job	57	3.246	0.969	1	5
Job satisfaction independency	56	3.482	0.934	2	5
Monthly wage	54	19965.74	4409.401	6000	30300
Performance-related pay	57	0.737	0.444	0	1

11.4 Appendix 4 Open question on the 2012 PISA results

Table 13 The respondents thoughts on the 2012 PISA results

What is your view on the poor student test scores of Swedish students in the 2012 PISA report? What do you think might be the reasons for the declining student results?
1. Teachers are not motivated enough to put in the extra effort. I think that it is sad. Declining motivation among teachers and students.
2. Declining student motivation, lack of support and decreasing recourses.
3. Not interested in the PISA report. I prefer a relaxed high school atmosphere instead of test score-related.
4. Students, parents and the overall attitude towards education and effort.
5. Couldn't care less about the PISA results. The PISA tests are quasi tests measuring what the neo-liberals want to measure.
6. I think there are several, interesting reasons. Children in Sweden are raised and taught to make there own decisions following their hearts, not to obey authorities or adapt to requirements formulated by somebody else. I honestly believe that children are surprised when they realize that they have to work pretty hard with seemingly boring assignments. Their emotional response screams ""boring"" and then they choose not to do it, just as they are taught. Another reason, I believe, is that the concentration span is shorter than it used to be. *
7. Exhausted teachers.
8. The students get to decide to much in school.
9. Low compensation and lack of appraisals and feedback don't attract top performing teachers. Poor work environment for both students and teachers affect the results negatively.
10. Wages are too low = being a teacher doesn't attract gifted young people. Instead, the good students with really high grades choose to pursue a career within business, law, medicine, technology etc. Only those with low grades become teachers today. *
11. I think one of the reasons why they were that bad is the fact that students do not feel the need to be good any more, they have a different view of school now. *
12. I'm not familiar with it.
13. One reason I think is the numbers of pupils in the classroom and lack of adults. To be able to learn you need to feel safe and comfortable with your friends. You need a good relation to the teacher otherwise it will be hard if not impossible to learn. *
14. Swedish schools try new student learning methods too easily without knowing if they have worked in the past.
15. The school does not stimulate the students enough mentally. More money should be spent on educational resources. *
16. The methods used for learning are not effective.
17. Lack of motivation among students and teachers. Teachers get paid poorly and students don't seem to understand why school is important.
18. The schools' resources aren't enough. Students are more interested in their smartphones.
19. Pisa only measures certain skills. I don't think Swedish students are that behind in comparison to other countries.

20. Students are more interested in what they want to do on their free time.
21. Students are distracted by the technical advancement. *
22. Spoiled and dependent on their phones.
23. Too much pressure on students, which leads to that they don't do anything at all.
24. Lack of motivation.
25. Focus on subjects and things that aren't tested on the PISA test.
26. I don't know.
27. Spoiled students. *
28. The fact that learning and teaching are viewed as useless occupations in Sweden.
29. Parents need to be more involved in the student's learning process and support homework. *
30. We focus not only on education but ethics and other knowledge that can't be rated in grades.
31. The class sizes are too big. *
32. The school needs to gain trust from the society and parents need to take bigger responsibility when it comes to raising their children to be respectful and ambitious. *
33. Teacher education programs are too broad and shallow. *
34. The test scores are depressing.
35. There are far too many distractions for young people in today's society. *
36. The classic way of teaching is considered to be old-fashioned.
37. Low teacher salaries; the job has lost its status. *
38. Too much responsibility is put on the school and the teachers. *
39. Students and teachers are not motivated enough
40. Exhausted teachers and lazy students
41. When the teacher salary is low the most advanced students don't turn to teaching. *
42. Laziness
43. The market liberal school system gives people the opportunity to make profits on tax money. *
44. The teacher training is of low standard. *
45. Many of the new teachers are not prepared for the heavy workload. *
46. Stress, low pay and low status could be some of the reasons. *
47. Students lack motivation and their reading skills are not good. *
48. The fact that the number of students with problems including autism, ADHD and dyslexia has increased very much could be reasons for the declining test scores. *
49. I find that the Swedish trained teachers are lazy and poorly informed on how to develop efficient lessons and appropriate relationships with students and parents. *
50. It is my firm belief that until the Swedish system realizes that its approach to pedagogics and teacher-student relationships must change PISA test scores will continue to be low. There is a fundamental problem with how students and teachers interact with each other and the expectations on teachers are too high. *
51. The technological activity

Note: The asterisks next to the respondents' answers indicate that the answers have been corrected to become more understandable.