Incentive pay and the wage structure of firms: Evidence from a panel of Dutch firms*

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Abstract:

Does incentive pay affect the wage structure of firms? Does the way individual productivity is measured matter for such effects? The aim of this paper is to analyze the wage structure of Dutch firms to answer these questions about the relation of wage structure and incentive pay. We use biennial data covering the period 1993-2001 from a panel of 3,000 Dutch establishments with detailed information about the wage structure of the establishment, background characteristics, along with the wage policy of the firm. It is the first representative study about the wage structure of firms in the Netherlands. In the cross-section firms using subjective evaluations to determine incentive pay, we find on average 4% higher wages with a 20% higher variance. Panel estimates of the effect of incentive pay on the wage distribution, using fixed establishment effects, reveal that changes in the variance of the distribution similar to the cross-sectional results, indicating that the incentive scheme fully accounts for these differences between firms. It takes about three years before this increase in variance is realized. The introduction of incentive schemes based on subjective evaluations increases the average wage by 1.6%. We find no effects for incentive schemes based on objective standards, no effect for the skewness and only a short run effect for the kurtosis of the wage distribution. Incentive pay based on objective standards is related to a higher job turnover, while workers in firms with subjective evaluations tend to stay longer in their firm.

JEL Code: M52, J33, J31

Keywords: Incentive Pay; Wage level; Wage distribution

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1. Introduction

Does incentive pay affect the wage structure of firms? Does the way individual productivity is measured matter for such effects? The aim of this paper is to analyze the wage structure of Dutch firms to answer these questions about the relation of wage structure and incentive pay. We use biennial data covering the period 1989-2001 from a panel of 3,000 Dutch establishments with detailed information about the wage structure of the establishment and the wage policy of the firm. It is also the first representative study about the wage structure of firms in the Netherlands. In our paper we examine the effect of incentive pay on the wage distribution within the firm. We link the various moments of the distribution to several aspects of the firms.

The data distinguishes between firms with and without incentive pay. Incentive pay schemes are further split up in systems based on subjective evaluations and systems based on objective measurement. Over the time period covered in the data a substantial fraction of establishments introduce or cancel incentive pay schemes, allowing fixed effect estimates of the effect of incentive pay on several moments of the wage distribution.

We find that only incentive pay based on subjective evaluation systems affects the wage structure. The mean wage of a firm increases slightly, while the variance of wages goes up substantially. While the wages increase rapidly after the introduction of a scheme, the variance increases only gradually. The effect after three years is substantially higher than the effect after one year. We find no effect for the skewness, and a modest short run effect for the kurtosis of the wage distribution. Changes in the wage structure could be generated by mobility of workers. We find that in firms that employ incentive pay based on objective measures job turnover is higher than in other firms. Workers in firms with subjective evaluations stay longer in their firm.

The paper is related to literature about the structure of wages in firms and to literature about the effects of incentive pay. Following Lazear and Shaw (2005) there are several papers that investigate differences in the wage distributions among firms. There is a wide heterogeneity among firms with observationally comparable workers with respect to their wage structure. These differences could reflect different wage policies of firms. Lazear and Shaw (2005) collect information on wage distribution and some key variable across industries

for several nations. The wage distribution has an impact on the behavior of the workers within the firm, its productivity and work organization. For several countries there are now studies that explicitly study wage distributions of firms across a country (Contini and Leombruni (2004), Edin, Holmlund and Nordström Skans (2004), Bellman and Alda (2004), Oyer (2004), Hunnes, Møen and Salvanes (2004), Uusitalo and Vartainen (2004), Rycx, Lallemand and Plasman (2004), Westergaard-Nielsen and Eriksson (2004), Kramarz and Perez-Duarte (2004)). This is the first study that investigates the wage structure of Dutch firms. The main contribution of this paper is that we relate the wage structure to information about the use of incentive pay in the firm. Panel data allow us to control for firm specific differences in the wage structure.

The literature on incentive pay itself has been either dealing with the development of optimal incentive schemes, predominantly in the principal-agent theoretical context, or by examining the effect of the introduction of incentive pay on the workers of a firm. This last literature has generated some interested as more detailed data-sets became available that include detailed data on productivity, wages and turnover per worker. A study that examines the effect of incentive pay on wage dispersion is Seiler (1984). Seiler shows that there is a wage premium for workers facing incentive pay, while they also exhibit higher dispersion. He concludes by postulating that future research should include direct measure of productivity and incentive pay. The principal set-up for a such a study is already described in Lazear (1986), in which he examines theoretically the relation between salaries and piece rates. He predicts that using incentive pay (piece rates) the workforce will be more heterogeneous, which would imply a larger variance of pay. In Lazear (2000) a prime example of the empirical assessment of the introduction of piece-rates on the behavior of the workforce is given. The introduction of piece-rate pay increases the mean (actual) pay slightly, while it increased the standard deviation by much more, despite the fact that the number of actual observations is higher after the introduction than before the introduction (cf. Lazear's Table 2 on p. 1352).

From the agricultural sectors there are several studies on tree-planters from British Columbia Paarsch and Schearer (1999) and Paarsch and Schearer (2000), and the Midwestern logging industry (Haley (2003)). They estimate the effect in the change of the piece-rate, in order to identify its incentive effect. For a refreshingly dissenting voice see Freeman and Kleiner (2005) who describes in detail a move from piece rates to fixed rates. They show that in their case the manufacturer actually gained from the shift, casting some doubt on the general notion that strong incentives are good for the performance.

Some industries are very suited to analyze the effects of incentive pay on wages and productivity, because the researcher can obtain data about the individual productivity of workers in a firm. This raises the question however to what extent these finding generalize to other sectors. Especially since an adequate measurement of productivity on an individual level will also support the firm in use of incentive pay scheme's the typical case study firm might be not very representative for many other firms for which less detailed information is available.

There are only a few papers comparing the effects of incentive pay between firms. Ichniowski, Shaw and Prennushi (1997) connect several forms of HRM policies and its effect on productivity in a comparison of steel finishing lines, where productivity can only be measured at the plant level. Parent (1999) examines the wages of individual workers in different firms based on the NLSY data-set, focusing on different methods of pay. Within the management literature which deals with related concepts, e.g. Huselid (1995) links the pay to the behavior of individuals and organizational performance in over 3,000 companies. The current paper is the first study in which the effects of incentive pay is investigated for a large representative panel of firms. This allows us to investigate whether the effects of incentive pay on the wage structure as found in case studies are similar to these effects in the average firm using incentive pay.

In this comparison of the results in an average firm using incentive pay and the examples of case studies the measurability of productivity will be important. In the analyses we therefore distinguish between firms using quantitative measure and firms using subjective evaluation of performance. Subjective evaluation could be prone to favoritism, but also to leniency towards paying out bonuses. Quantitative measures are often hard to implement and might lead towards a gaming of the system towards meeting the targets.[1] As a partial effect these processes might lead to increases in the average wages, but one might expect that when these changes in mean wages are not supported by an increase in productivity, the wage schema will not be sustainable. Increases in the within wage dispersion that do not reflect productivity differences might trigger mobility. We therefore also investigate whether the introduction of incentive pay did change mobility patterns in the firm in the short and long run.

[1] See also Prendergast (1999) for an excellent overview of the Literature on incentives in firms.

The paper is organized as follows. Section 2 gives a description of the data. In section 3 we link the wage distribution to some key variables as industry, age distribution and education. Section 4 examines the relationship between the wage distribution and incentive pay. Section 5 concludes.

2. Data description

The data we use come from a survey among Dutch establishments carried out on a biannual basis by the Institute for Labour Studies (OSA) in the period 1993-2001. The survey is issued to the person in charge of personnel, i.e. the head of the HRM department, or in smaller companies the owner or manager of the company. Many establishments are in the survey for several years, so we can use the data to construct a panel of establishments over this period of time. The primary advantage of the database is that it allows us to exploit a nationally representative survey of establishments to estimate the effects of the adoption of incentive pay. We use the five waves, 1993-2001, for this paper. There are more than 3,000 firms in the data-set, but not all are contained in all four waves.

Wage information

For each organization in the sample we have data about the number of workers with certain characteristics within pre-defined wage brackets. The wage brackets are transformed by using the number of workers within the wage brackets and the midpoint to represent wage distributions. In essence we first calculate the total wage sum and the total number of workers, to then use the information on the distribution over the seven brackets as to identify the higher moments of the wage distribution.

--- Figure 1 & 2 about here ---

Figure 1 gives the wage distribution of the mean wage within companies across the one-digit sectors of SBI. In figure 2 we can see that larger firms have a higher mean wage. They also have longer tails on to the right, i.e. more higher paid positions within the firm. This can be expected as it is especially in higher firms that we do find specialized functions and higher hierarchical (managerial) functions which are usually well paid.

3. Incentive pay: types and timing of introduction

The data-set contains data on the implementation of two distinct types of incentive pay. Firms can use *subjective* measures or evaluations which are linked to payments or bonuses, we call these *personal evaluation* or *subjective* based incentive pay. The other method of incentive pay is to link it to *objective* measures or figures; we denominate this group by *meeting targets*. In the survey the question is asked "Does incentive pay exist in this firm in one form or the other?" When the respondent answers yes the question is asked "Which form of incentive pay is used? (1) Individual assessment; (2) measurement or norms; (3) both individual assessment and measurement or norms; (4) Other forms." In some firms both means of incentive pay are used simultaneously. In these cases both the dummy for objective standards and subjective evaluation are put equal to 1. Analyses with separate dummies for the use of both methods did not provide substantially different results. The variable *incentive* indicates that a firm uses one or both of these pay methods. In 2001 the answer options in the second question changed. The answer that both individual assessment and measurement were used was excluded. This might have changed the answers about incentive pay. Partially this change is controlled for by the inclusion of year dummies. To check the robustness of the results we also perform the analyses without the data for 2001. This does not alter the findings. The questions in the survey refer to the use of incentive pay anywhere in the firm. We, thus, cannot identify the use in different parts of the organization, nor can we discriminate between the use at different hierarchical levels of the company.

Table 1 gives the distribution of the different forms of incentive pay across industries. Overall incentive pay is used quite strongly in governmental organization (58%) – mainly due to subjective forms of incentive.[2] Other sectors that use incentive pay are building (52%), and services (44%). Sectors in which few organizations use incentive pay are health care (10%) and education (11%).

The most predominant form of incentive pay is based on subjective measures. Strong proponents of this form of pay can be found in governmental organizations, the building sector, and the service industry. Objective measures are used for incentive pays predominantly in the sectors building, trade, services, agriculture and the industrial sector.

[2] The strong use of incentive pay in the governmental sector seems odd at first. Organizations that are collected in this sector have, however, similar collective agreements, so that the use of incentive pay is likely to be rather general if it is adopted. Given the nature of the work in the sector, the subjective evaluations are the form of incentive pay to be expected as there is usually not one single task that quantitative targets for incentive pay could or should be attached to.

-- Table 2 about here --

The use of incentive pay is actually diminishing in our data-set. Especially the bonuses and payments based on subjective evaluations are diminishing from a high of 31% in 1993 to a low of 16% in 2001. The low in 2001 could partly be attributed to a change in the questioning. To cope with these differences in the wording of the question we include year dummies in the regression. To check the robustness we also excluded 2001 from the analyses. This does not affect our findings. Objective measures peak in the year 1997 with 17%. While the downward shift is common to all sectors the degree of change differs by sector.

3. Wage Distribution – some explanations

Before we come to the effect of incentive pay on the wage distribution of the firm, let us first look at other aspects of the firm that can have an influence on the various moments of the distribution. Table 3 gives the regression results of cross sectional regression of the mean, variance, skewness and kurtosis on type of organization (one digit SBI), size, percentage of female, age, and tenure distribution of the workforce as well as the education level.

--- Table 3 about here ---

These regressions show that a higher proportion of females leads to lower wages, and lower variance, but higher skewness and kurtosis. A similar effect has a higher proportion of younger workers. Both can be explained by the fact that those workers are quite often at the lower end of the salary range, and they will therefore affect these four moments of the distribution. The (log) size of the workforce increases mean, variance and skewness of the distribution, while the kurtosis is not significantly affected. Higher education increases the mean wage, along with the variance, while it decreases skewness and kurtosis.

Mean wages differ also significantly over sectors. Figure 3 summarizes these findings. It shows the high average level of pay in Education, Government and Professional Services, relative to the Agriculture / Industry sector. Lower average pay are found in Trade, Health care, and Other services.

--- Figure 3 about here ---

4. Influence of incentive pay on the wage distribution

Figure 4 gives the distribution of mean wages for the firms using the different forms of incentive pay, or giving no incentive pay at all. While it has been generated for one year (1995), it is typical for the forms over all the years. One can see the distinct difference between the firms using subjective evaluations, and those using objective standards. The distribution of those firms that are using both methods resembles more those that use no incentive at all, but with thicker tails.

-- Figure 4 about here --

-- Table 5, 6 about here --

The cross-sectional regression of the mean of a firm's wage distribution (Table 5) shows that incentive pay is associated with a higher mean wage (first column), while the second regression reveals that this higher mean wage especially refers to firms using subjective evaluations. These results are corrected for several variables of the workforce that are related to the shape of the wage distribution (cf. Table 3). The fixed-effect estimation (Table 6) shows only a slight effect of subjective evaluations, in the second regression. The size of the effect equals approximately 1.6% of the mean wage in a firm. Thus introducing subjective evaluations slightly raises the mean level of pay.

The variance of pay can also be related to the use of incentive pay. In the cross-sectional regression, we see that the variance is actually positively correlated with incentive pay (column 1 of the results in Table 7). This relationship is only found for incentive pay based on subjective evaluation and not for incentive pay based on objective measures (column 2, Table 7). The increasing variance of piece rates translates through to the fixed-effect model (see Table 8). In the third column we include separate variables for the effect of incentive pay in the first wave of the panel after its introduction. The regression shows that the main effects of incentive pay only are not realized in this first wave. The effect of this separate variable almost offsets the effect of incentive pay in general. It therefore seems to take at lest three years before the effect of incentive pay on the variance of wages is fully established. One explanation for these lagged effects is that it takes some time before managers really discriminate workers in their subjective evaluations. Another straightforward

explanation for this result in our data is that incentive pay, once introduced, might start only with some part of the workforce, thus limiting its effect on the wage distribution.

Kurtosis and skewness are not significantly affected by incentive pay in firms (cf. Tables 9 and 10 for the skewness, and Tables 11 and 12 for kurtosis). Only the subjective evaluation seems to have a weak positive effect on the kurtosis, leading to fatter tails of the distribution.

Several studies have stressed that changes in the pay schemes of firms might also changes the type of workers that are employed in a firm. We therefore investigated whether the inflow and outflow of workers right after the introduction of incentive pay changed. Table 13 and 14 provide fixed effect estimates for the effect of incentive pay on the in- and outflow of workers. Objective standards and subjective evaluations do have quit different effects on the in- and outflow of workers. Incentive pay based on objective standards is related to a higher turn-over. The inflow of workers in firms with objective standards is 2%-point higher in comparison with other firms. Outflow is 3%-point higher. The estimates do not suggest that this is a temporary effect. For incentive pay based on subjective evaluation we find no effect on the inflow of workers with a 1.6%-point decrease in the outflow of workers. So while objective standards increase the turnover of personnel, workers in firms with subjective evaluations appear to stay in this firm longer. The higher mean wages might be a good incentive to stay.

6. Conclusions

In a cross-section, establishments with incentive pay are characterized by high mean wages (+4%), a high variance of the wages (+20%). The difference in mean wages and variance are only observed in firms with incentive schemes based on subjective evaluation.

Panel estimates of the effect of incentive pay on the distribution of wages, using fixed establishment effects, reveal a substantially smaller effect for the mean wages in comparison with cross-sectional results. This indicates that the introduction of incentive pay is associated with an increase of wages of about 1.6%. The remainder of the effect seems to be due to differences in firm characteristics not related to incentive pay schemes. For the variance of wages the fixed effect panel estimator, however, provides similar effects as the cross-sectional estimates, suggesting that all differences between firms with and without incentive pay based on subjective assessment, can be related to introduction of this scheme. The estimates show that it takes about three years before the effects on the variance of wages is fully effectuated.

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A. Tables

Table 1: The use of incentive pay across industries

SBI	Subjective Evaluations	Objective Measures	Any form of incentive pay
SBI 1 Agriculture and industry	0.264	0.170	0.348
SBI 2 Building	0.396	0.279	0.518
SBI 3 Trade	0.302	0.223	0.421
SBI 4 Transport	0.216	0.143	0.287
SBI 5 Professional Services	0.373	0.216	0.456
SBI 6 Health care	0.093	0.030	0.103
SBI 7 Other services	0.223	0.117	0.277
SBI 8 Government	0.554	0.102	0.584
SBI 9 Education	0.094	0.039	0.112

Notes: Table gives the mean of the dummy variable indicating that a firm belongs to the industry of the one-digit SBI code. The columns give respectively those firms that use the subjective evaluation, the objective measurement to link to incentive pay, while the last column indicates the use of any form of incentive pay.

Table 2: The use of incentive pay over time

Year	Subjective Evaluations	Objective Measures	Any form of incentive pay
1993	0.311	0.107	0.382
1995	0.289	0.158	0.334
1997	0.283	0.168	0.336
1999	0.288	0.150	0.313
2001	0.160	0.101	0.268

Notes: Table gives the mean of the dummy variable indicating that an observation is from a specific year. The columns give respectively those firms that use the subjective evaluation, the objective measurement to link to incentive pay, while the last column indicates the use of any form of incentive pay.

Table 3: Explaining the moments of the wage distributions

	Mean	Variance	Skewness	Kurtosis
SBI 2 Building	156.278**	-3.60e+05***	-93.108***	-542.095**
	(47.705)	(69943.756)	(26.003)	(208.907)
SBI 3 Trade	-224.022***	3.09e+05***	-80.305***	-322.585
	(41.591)	(60980.051)	(22.344)	(179.510)
SBI 4 Transport	113.240	-8.43e+04	-91.985**	-395.674
	(60.022)	(88002.581)	(32.856)	(263.963)
SBI 5 Professional Services	454.331***	5.62e+05***	-77.345***	28.790
	(41.340)	(60611.135)	(22.156)	(178.001)
SBI 6 Health care	-168.105***	-5.66e+05***	-154.543***	-992.358***
	(38.884)	(57010.099)	(20.828)	(167.327)
SBI 7 Other services	-157.533**	-1.36e+05	-90.935**	-472.461*
	(51.844)	(76012.672)	(28.145)	(226.115)
SBI 8 Government	664.945***	3.09e+05***	-164.662***	-916.379***
	(46.239)	(67794.043)	(24.699)	(198.428)
SBI 9 Education	857.675***	1.05e+05	-196.975***	-593.456**
	(50.446)	(73961.954)	(27.243)	(218.868)
Log number of workers	189.218***	1.58e+05***	48.289***	49.846
	(10.616)	(15565.177)	(5.831)	(46.844)
Female	-0.779***	-476.290**	0.865***	9.123***
	(0.124)	(182.314)	(0.069)	(0.557)
Age: < 20	0.507	-62.530	1.327***	5.636***
	(0.366)	(536.290)	(0.196)	(1.572)
Age: 20-29	-3.170***	-2321.721***	1.422***	17.951***
	(0.394)	(577.339)	(0.210)	(1.689)
Age: 40-49	-0.028	-1677.272***	3.187***	64.056***
	(0.328)	(480.572)	(0.175)	(1.404)
Age: >50	-0.116	440.339	2.715***	-11.848***
	(0.318)	(466.001)	(0.195)	(1.564)
Tenure: <5 yrs	0.256	684.076**	2.441***	13.523***
	(0.156)	(228.649)	(0.089)	(0.717)
Tenure: 5-10 yrs	0.324	678.189*	0.585***	-4.691***
	(0.221)	(324.600)	(0.119)	(0.952)
Proportion of workers with intermediate education	-0.072	-36.758	-2.494***	-20.571***
	(0.194)	(284.542)	(0.106)	(0.850)
Proportion of workers with college education	0.347*	617.611**	-1.099***	-20.776***
	(0.151)	(221.136)	(0.083)	(0.669)
Proportion of workers with postgraduate education	1.926***	1967.190***	-3.340***	-26.296***
	(0.152)	(222.824)	(0.089)	(0.716)
Constant	2830.399***	1.02e+06***	-97.009**	-127.193
	(54.831)	(80391.906)	(29.765)	(239.125)
R-squared	0.279	0.129	0.621	0.597
N	5988	5988	5867	5867

Notes: Standard deviations are given in parentheses next to the regression coefficient.
The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001. All regressions are pooled cross-sectional regressions which include year dummies for 1993-2001.

Table 4: Explaining the use of incentive pay: Probit estimations

	Incentive Pay		Meeting Standards		Subjective Standards	
SBI 2 Building	0.546***	(0.065)	0.461***	(0.071)	0.500***	(0.066)
SBI 3 Trade	0.250***	(0.057)	0.272***	(0.065)	0.203***	(0.059)
SBI 4 Transport	-0.185*	(0.085)	-0.174	(0.103)	-0.096	(0.088)
SBI 5 Professional Services	0.162**	(0.057)	0.067	(0.066)	0.220***	(0.059)
SBI 6 Health care	-0.882***	(0.060)	-1.000***	(0.089)	-0.688***	(0.062)
SBI 7 Other services	-0.171*	(0.073)	-0.226*	(0.091)	-0.053	(0.076)
SBI 8 Government	0.477***	(0.065)	-0.358***	(0.085)	0.690***	(0.065)
SBI 9 Education	-0.960***	(0.091)	-0.768***	(0.114)	-0.835***	(0.095)
Log number of workers	0.089***	(0.015)	0.098***	(0.019)	0.076***	(0.015)
female	-0.000	(0.000)	-0.000	(0.000)	-0.000	(0.000)
Age <20	0.001	(0.001)	-0.000	(0.001)	0.000	(0.001)
Age 20-29	-0.001	(0.001)	-0.002*	(0.001)	-0.001	(0.001)
Age 40-49	0.000	(0.000)	-0.002*	(0.001)	-0.000	(0.000)
Age >50	-0.001	(0.000)	-0.001	(0.001)	-0.000	(0.000)
Tenure <5 yrs	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)
Tenure 5-10 yrs	0.000	(0.000)	-0.000	(0.000)	0.000	(0.000)
Intermediate education	-0.000	(0.000)	0.001*	(0.000)	-0.000	(0.000)
College education	0.001*	(0.000)	0.001***	(0.000)	0.000	(0.000)
Postgraduate education	0.001***	(0.000)	0.001***	(0.000)	0.001***	(0.000)
Year 1995	-0.098	(0.056)	0.296***	(0.069)	0.006	(0.057)
Year 1997	-0.022	(0.053)	0.323***	(0.066)	0.039	(0.055)
Year 1999	0.074	(0.056)	0.389***	(0.070)	0.204***	(0.057)
Year 2001	-0.063	(0.079)	0.053	(0.105)	-0.214*	(0.084)
Year 2003	-0.081	(0.065)	-0.011	(0.088)	-0.059	(0.068)
Constant	-0.756***	(0.080)	-1.595***	(0.100)	-0.991***	(0.082)
N	6888		6900		6900	

Notes: Probit on the use of respectively incentive pay, objective standards based incentive pay, or subjective standards based incentive pay. Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001. All regressions are pooled cross-sectional regressions which include year dummies for 1993-2003.

Table 5: Explaining mean wages – cross sectional estimates including incentive pay variables

	Mean wage		Mean wage	
	Beta	s.e.	beta	s.e.
Incentive pay	135.273***	(26.139)		
Objective Standards			-20.139	(35.659)
Subjective Evaluation			177.044***	(28.631)
SBI 2 Building	127.748**	(47.956)	126.781**	(47.945)
SBI 3 Trade	-237.008***	(41.603)	-235.331***	(41.548)
SBI 4 Transport	119.623*	(60.023)	117.897*	(59.847)
SBI 5 Professional Services	447.391***	(41.304)	441.352***	(41.258)
SBI 6 Health care	-131.899***	(39.431)	-138.941***	(39.246)
SBI 7 Other services	-148.162**	(51.863)	-156.278**	(51.711)
SBI 8 Government	638.873***	(46.447)	615.694***	(46.928)
SBI 9 Education	898.093***	(50.938)	890.435***	(50.650)
Log(Number of Workers)	184.968***	(10.640)	185.370***	(10.610)
Female	-0.761***	(0.124)	-0.754***	(0.124)
Age <20	0.472	(0.365)	0.483	(0.365)
Age 20-29	-3.138***	(0.394)	-3.150***	(0.393)
Age 40-49	-0.036	(0.327)	-0.037	(0.327)
Age >50	-0.091	(0.317)	-0.092	(0.317)
Tenure <5 yrs	0.240	(0.156)	0.238	(0.156)
Tenure 5-10 yrs	0.313	(0.221)	0.300	(0.221)
Intermediate education	-0.064	(0.194)	-0.055	(0.193)
College education	0.326*	(0.151)	0.326*	(0.150)
Postgraduate education	1.895***	(0.152)	1.890***	(0.152)
Year 1995	223.582***	(36.822)	219.507***	(36.806)
Year 1997	309.335***	(35.203)	306.960***	(35.219)
Year 1999	515.163***	(36.580)	508.475***	(36.623)
Year 2001	662.493***	(50.160)	663.693***	(49.704)
Constant	2799.526***	(55.056)	2804.644***	(54.810)
R-squared	0.282		0.284	
N	5976		5988	

Notes: Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001. All regressions are pooled cross-sectional regressions which include year dummies for 1993-2001.

Table 6: Explaining the mean of the wage distribution – fixed-effect panel estimates including incentive pay variables

	Mean wage		Mean wage		Mean wage	
	beta	s.e.	beta	s.e.	beta	s.e.
Incentive pay	23.884	(26.318)				
Objective standards			-11.242	(33.013)	7.507	(60.043)
Subjective evaluations			66.204*	(27.791)	71.251	(41.091)+
Objective standards (first wave since introduction only)					-21.310	(56.938)
Subjective evaluations (first wave since introduction only)					-6.320	(39.487)
Log number of workers	-81.223**	(29.308)	-82.501**	(29.419)	-82.398**	(29.436)
Year 1995	262.369***	(31.691)	263.368***	(31.863)	263.098***	(31.881)
Year 1997	474.376***	(32.386)	476.411***	(32.566)	475.076***	(32.729)
Year 1999	672.498***	(34.836)	671.303***	(35.049)	669.406***	(35.358)
Year 2001	858.130***	(45.212)	855.253***	(45.167)	853.786***	(45.341)
Constant	3819.224***	(115.276)	3814.831***	(115.581)	3814.612***	(115.632)
N	7799		7822		7822	

Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. All regressions are fixed-effect panel regressions

Table 7: Explaining the variance of the wage distribution – cross-sectional estimates including incentive pay variables

	Variance of wage distribution		Variance of wage distribution	
Incentive pay	2.36e+05***	(38292.348)		
Objective standards			78950.061	(52294.526)
Subjective evaluations			2.16e+05***	(41988.648)
SBI 2 Building	-4.10e+05***	(70252.066)	-4.11e+05***	(70312.414)
SBI 3 Trade	2.86e+05***	(60945.692)	2.88e+05***	(60931.719)
SBI 4 Transport	-7.70e+04	(87929.921)	-7.45e+04	(87766.549)
SBI 5 Professional Services	5.50e+05***	(60508.528)	5.45e+05***	(60505.645)
SBI 6 Health care	-5.02e+05***	(57763.904)	-5.15e+05***	(57555.807)
SBI 7 Other services	-1.18e+05	(75976.702)	-1.29e+05	(75836.034)
SBI 8 Government	2.63e+05***	(68042.202)	2.56e+05***	(68821.411)
SBI 9 Education	1.70e+05*	(74620.730)	1.58e+05*	(74279.481)
Log (Number of workers)	1.51e+05***	(15587.441)	1.51e+05***	(15560.009)
Proportion female	-446.123*	(181.928)	-438.770*	(181.876)
Age <20	-112.761	(535.095)	-91.537	(534.729)
Age 20-29	-2242.382***	(577.594)	-2271.862***	(575.759)
Age 40-49	-1684.923***	(479.456)	-1670.684***	(479.250)
Age >50	497.126	(465.083)	483.413	(464.687)
Tenure <5 yrs	650.431**	(228.204)	648.699**	(228.083)
Tenure 5-10 yrs	656.506*	(324.075)	651.683*	(323.692)
Intermediate education	-29.282	(284.198)	-23.628	(283.768)
College education	573.684**	(220.890)	575.090**	(220.638)
Postgraduate education	1906.121***	(222.724)	1906.554***	(222.405)
Year 1995	71628.669	(53942.588)	57855.069	(53977.214)
Year 1997	2.94e+05***	(51570.191)	2.83e+05***	(51649.448)
Year 1999	6.17e+05***	(53588.020)	6.02e+05***	(53707.810)
Year 2001	3.43e+05***	(73481.663)	3.42e+05***	(72892.024)
Constant	9.62e+05***	(80653.652)	9.79e+05***	(80380.163)
R-squared	0.134		0.134	
N	5976		5988	

Notes: Standard deviations are given in parentheses next to the regression coefficient.
The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001.
All regressions are pooled cross-sectional regressions which include year dummies for 1993-2001.

Table 8: Explaining the variance of the wage distribution – fixed-effects estimates including incentive pay variables

	Variance of wage distribution		Variance of wage distribution		Variance of wage distribution	
Incentive pay	-5066.441	(49815.196)				
Objective standards			-3.29e+04	(62281.090)	-1.24e+05	(1.13e+05)
Subjective evaluations			96374.225	(52429.458)	2.29e+05**	(77438.663)
Objective standards (first wave since introduction only)					1.03e+05	(1.07e+05)
Subjective evaluations (first wave since introduction only)					-1.74e+05*	(74416.057)
Log number of workers	22480.455	(55476.489)	24693.652	(55500.224)	22118.802	(55473.225)
Year 1995	1.11e+05	(59985.260)	1.15e+05	(60110.284)	1.13e+05	(60082.176)
Year 1997	4.01e+05***	(61301.516)	4.05e+05***	(61436.644)	4.02e+05***	(61679.077)
Year 1999	8.47e+05***	(65939.154)	8.44e+05***	(66121.482)	8.37e+05***	(66634.340)
Year 2001	6.20e+05***	(85579.584)	6.07e+05***	(85209.491)	5.98e+05***	(85447.385)
Constant	1.39e+06***	(2.18e+05)	1.36e+06***	(2.18e+05)	1.36e+06***	(2.18e+05)
N	7799		7822		7822	

Notes: Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001. All regressions are fixed-effect panel regressions

Table 9 :Explaining the skewness of the wage distribution – cross-sectional estimates including incentive pay variables

	Skewness of wage distribution		Skewness of wage distribution	
Incentive pay	-2.614	(14.099)		
Objective standards			5.441	(19.226)
Subjective evaluations			-1.051	(15.432)
SBI 2 Building	-92.631***	(26.203)	-93.684***	(26.200)
SBI 3 Trade	-80.050***	(22.419)	-80.635***	(22.402)
SBI 4 Transport	-92.915**	(32.953)	-91.783**	(32.871)
SBI 5 Professional Services	-76.909***	(22.203)	-77.341***	(22.191)
SBI 6 Health care	-155.933***	(21.182)	-153.910***	(21.094)
SBI 7 Other services	-92.007**	(28.237)	-90.659**	(28.167)
SBI 8 Government	-164.469***	(24.881)	-163.997***	(25.157)
SBI 9 Education	-198.541***	(27.584)	-196.488***	(27.440)
Log number of workers	48.660***	(5.862)	48.213***	(5.849)
Female	0.864***	(0.069)	0.865***	(0.069)
Age <20	1.332***	(0.196)	1.327***	(0.196)
Age 20-29	1.441***	(0.211)	1.423***	(0.210)
Age 40-49	3.193***	(0.175)	3.188***	(0.175)
Age >50	2.715***	(0.195)	2.716***	(0.195)
Tenure <5 yrs	2.440***	(0.089)	2.440***	(0.089)
Tenure 5-10 yrs	0.578***	(0.119)	0.585***	(0.119)
Intermediate education	-2.501***	(0.106)	-2.495***	(0.106)
College education	-1.103***	(0.084)	-1.100***	(0.083)
Postgraduate education	-3.340***	(0.089)	-3.341***	(0.089)
Year 1995	24.268	(19.782)	23.996	(19.784)
Year 1997	43.100*	(18.920)	42.698*	(18.940)
Year 1999	99.797***	(19.695)	99.149***	(19.730)
Year 2001	-54.587*	(26.967)	-54.456*	(26.734)
Constant	-97.409**	(29.956)	-97.100**	(29.841)
R-squared	0.621		0.620	
N	5855		5867	

Notes: Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001.All regressions are pooled cross-sectional regressions

Table 10:Explaining the skewness of the wage distribution – fixed-effects estimates including incentive pay variables

	Skewness of wage distribution		Skewness of wage distribution		Skewness of wage distribution	
Incentive pay	-0.114	(30.872)				
Objective standards			-9.177	(38.449)	-23.514	(70.204)
Subjective evaluations			-4.729	(32.509)	27.464	(48.109)
Objective standards (first wave since introduction only)					16.013	(66.465)
Subjective evaluations (first wave since introduction only)					-41.855	(45.979)
Log number of workers	155.558***	(35.511)	155.642***	(35.430)	155.240***	(35.446)
Year 1995	-21.122	(36.841)	-20.747	(36.822)	-21.233	(36.839)
Year 1997	20.121	(37.725)	20.448	(37.701)	19.148	(37.884)
Year 1999	106.685**	(40.676)	107.345**	(40.677)	104.914*	(41.035)
Year 2001	-3.832	(53.036)	-4.256	(52.644)	-6.904	(52.841)
Constant	-417.266**	(140.673)	-415.214**	(140.209)	-414.163**	(140.256)
N	7594		7617		7617	

Notes: Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001. All regressions are fixed-effect panel regressions

Table 11: Explaining the kurtosis of the wage distribution – cross-sectional estimates including incentive pay variables

	Kurtosis of wage distribution		Kurtosis of wage distribution	
Incentive pay	194.483	(113.230)		
Objective standards			51.944	(154.405)
Subjective evaluations			223.679	(123.934)
SBI 2 Building	-585.337**	(210.441)	-588.836**	(210.414)
SBI 3 Trade	-344.813	(180.054)	-343.625	(179.911)
SBI 4 Transport	-388.529	(264.652)	-388.003	(263.987)
SBI 5 Professional Services	17.175	(178.319)	10.272	(178.215)
SBI 6 Health care	-950.931***	(170.114)	-944.534***	(169.403)
SBI 7 Other services	-468.289*	(226.779)	-467.735*	(226.209)
SBI 8 Government	-958.621***	(199.822)	-973.014***	(202.037)
SBI 9 Education	-547.208*	(221.531)	-542.893*	(220.375)
Log number of workers	45.801	(47.083)	43.005	(46.976)
Female	9.151***	(0.558)	9.171***	(0.558)
Age <20	5.647***	(1.574)	5.596***	(1.572)
Age 20-29	18.217***	(1.695)	17.989***	(1.689)
Age 40-49	64.126***	(1.405)	64.059***	(1.404)
Age >50	-11.713***	(1.567)	-11.750***	(1.564)
Tenure <5 yrs	13.489***	(0.718)	13.508***	(0.717)
Tenure 5-10 yrs	-4.767***	(0.954)	-4.724***	(0.952)
Intermediate education	-20.657***	(0.852)	-20.568***	(0.851)
College education	-20.875***	(0.671)	-20.828***	(0.670)
Postgraduate education	-26.387***	(0.718)	-26.376***	(0.717)
Year 1995	234.612	(158.873)	224.435	(158.882)
Year 1997	285.069	(151.947)	277.104	(152.107)
Year 1999	779.700***	(158.176)	764.215***	(158.449)
Year 2001	-21.245	(216.577)	-24.518	(214.701)
Constant	-175.421	(240.585)	-160.926	(239.657)
R-squared	0.598		0.598	
N	5855		5867	

Notes: Standard deviations are given in parentheses next to the regression coefficient.
The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001.
All regressions are pooled cross-sectional regressions which include year dummies for 1993-2001.

Table 12: Explaining the kurtosis of the wage distribution – fixed-effects estimates including incentive pay variables

	Kurtosis of wage distribution		Kurtosis of wage distribution		Kurtosis of wage distribution	
Incentive pay	520.170	(270.104)				
Log number of workers	981.732**	(310.687)	985.515**	(309.934)	988.815**	(310.063)
Objective standards			-234.854	(336.339)	-144.448	(614.112)
Subjective evaluations			583.945*	(284.379)	278.295	(420.839)
Objective standards (first wave since introduction only)					-100.285	(581.408)
Subjective evaluations (first wave since introduction only)					396.766	(402.202)
Year 1997	-22.056	(330.064)	-10.733	(329.799)	4.020	(331.388)
Year 1999	535.421	(355.882)	535.647	(355.832)	561.981	(358.956)
Year 2001	-116.651	(464.023)	-66.195	(460.513)	-38.813	(462.232)
Constant	-2983.295*	(1230.765)	-2963.003*	(1226.511)	-2971.437*	(1226.891)
N	7594		7617		7617	

Notes: Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001. All regressions are fixed-effect panel regressions

Table 13: Explaining the inflow (%) of workers – fixed-effects estimates including incentive pay variables

	Inflow					
Incentive pay	0.007	-0.007				
Objective standards			0.020*	-0.009	0.024	-0.016
Subjective evaluations			-0.002	-0.007	-0.004	-0.011
Objective standards (first wave since introduction only)					-0.005	-0.015
Subjective evaluations (first wave since introduction only)					0.002	-0.011
Log number of workers	-0.040***	-0.008	-0.041***	-0.008	-0.040***	-0.008
Year 1995	-0.003	-0.009	-0.004	-0.009	-0.004	-0.009
Year 1997	0.01	-0.009	0.009	-0.009	0.009	-0.009
Year 1999	0.020*	-0.009	0.019*	-0.009	0.019*	-0.009
Year 2001	0.061***	-0.012	0.059***	-0.012	0.059***	-0.012
Constant	0.276***	-0.031	0.279***	-0.031	0.279***	-0.031
N	7799		7822		7822	

Notes: Inflow is measured as percentage of current employment. Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001. All regressions are fixed-effect panel regressions

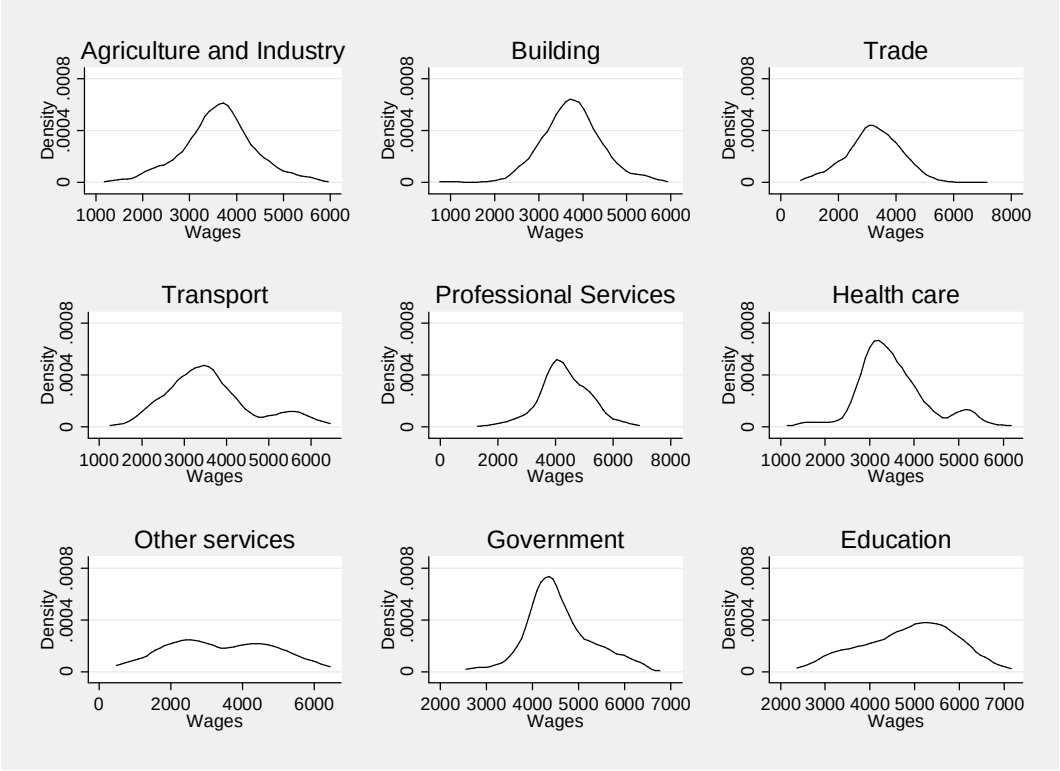
Table 14: Explaining the outflow (%) of workers – fixed-effects estimates including incentive pay variables

	Outflow					
Incentive pay	0.012	-0.007				
Objective standards			0.030**	-0.009	0.025	-0.017
Subjective evaluations			-0.016*	-0.008	-0.011	-0.011
Objective standards (first wave since introduction only)					0.005	-0.016
Subjective evaluations (first wave since introduction only)					-0.007	-0.011
Log number of workers	-0.059***	-0.008	-0.059***	-0.008	-0.059***	-0.008
jaar==1995	0.004	-0.009	0.002	-0.009	0.001	-0.009
jaar==1997	0.009	-0.009	0.008	-0.009	0.008	-0.009
jaar==1999	0.028**	-0.01	0.027**	-0.01	0.027**	-0.01
jaar==2001	0.046***	-0.013	0.043***	-0.012	0.043***	-0.013
Constant	0.327***	-0.032	0.333***	-0.032	0.333***	-0.032
N	7799		7822		7822	

Notes: Outflow is measured as percentage of current employment. Standard deviations are given in parentheses next to the regression coefficient. The asterisks give the level of significance: * p<0.05, ** p<0.01, *** p<0.001. All regressions are fixed-effect panel regressions

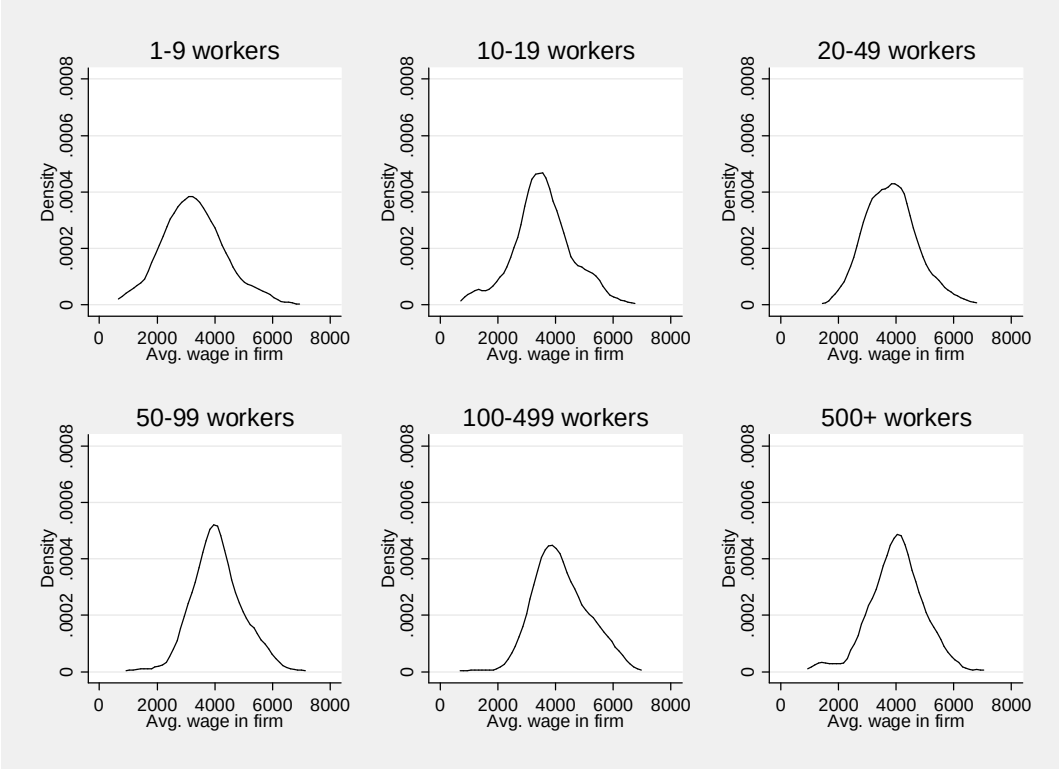
B. Figures

Figure 1: Density distribution of mean wages by SBI



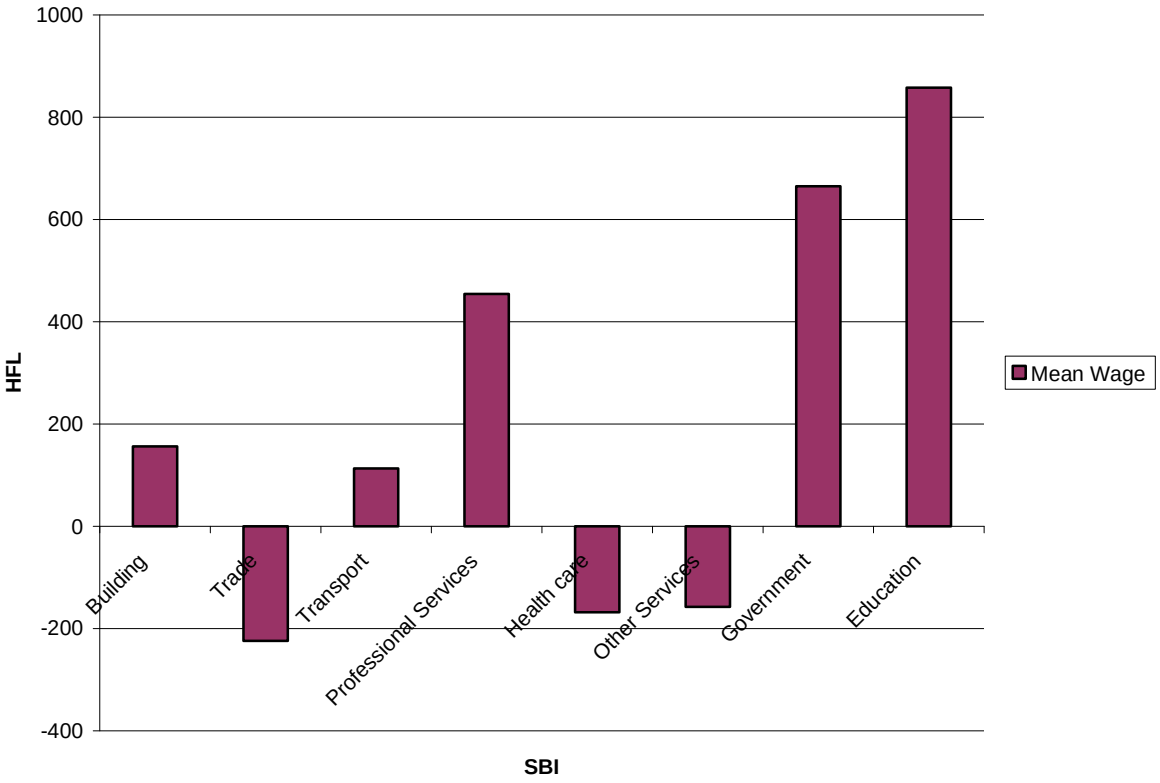
Notes: The figure gives the density distribution of mean monthly wages in the year 1995. A distinction is made between one-digit SBI sectors. Wages are given in Dutch guilders.

Figure 2: Density: Distribution of mean wages across different size categories



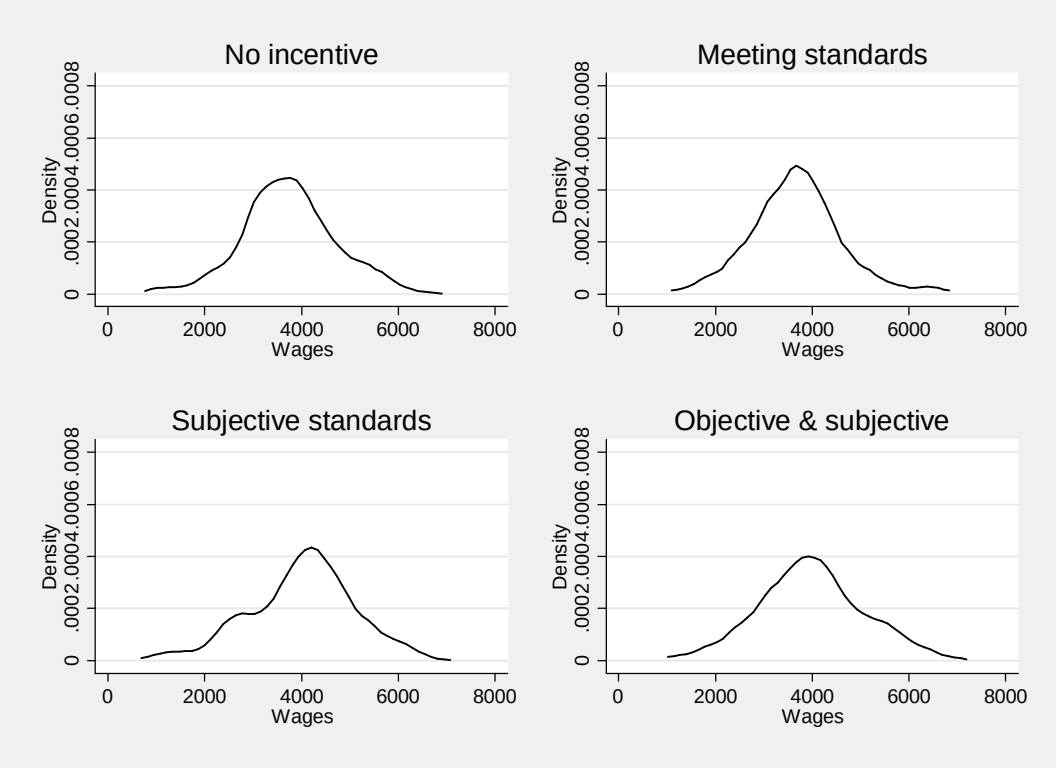
Notes: The figure gives the density distribution of mean monthly wages in the year 1995. A distinction is made between different sizes. Wages are in Dutch Guilders.

Figure 3: Mean wage difference by SBI sector



Notes: The figure gives the estimated difference between the SBI sector relative to the sector agriculture / industry (SBI 1). Estimated difference is based on the cross-sectional regression of mean wage levels of firms (cf. Table 3, column 1). Wages are in Dutch Guilders.

Figure 4: Density: Distribution of mean wages for firms using different forms of incentive pay



Notes: The figure gives the density distribution of mean monthly wages in the year 1995. A distinction is made between those organizations that know no incentive pay, that have incentive pay solemnly on subjective or objective standards, or both. Wages are in Dutch Guilders.