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OF PAY CHANGES
AT THE LOCAL
LEVEL

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Abstract

In this paper the distribution of pay changes in the Finnish industry 1997–2000 across employees and plants is examined. The study supports the hypothesis that such pay measures that are more closely dependent on contracts exhibit less variation in pay. It is also shown that pay cuts and pay rises are concentrated to certain plants and to a rather large extent to the same plants.

1 Introduction

The institutions of the labour market and the bargaining system are of great importance for wage formation. Rather than being a spot market the Finnish labour market is characterised by long-term relations and collective agreements. This limits the possibilities of firms to implement pay cuts but the collective agreements also prevent trade unions from demanding wage rises at the local level in excess of those agreed on at the industry level. The issue examined in this paper is to what extent deviations from the general pay rise prescribed by the collective agreements occurs. It is also tested whether the distribution of such pay changes can be explained by plant-specific needs for renegotiations of contracts.

For wage changes to deviate from the general pay rise, given that the job and employee characteristics remain the same, it is necessary that both the firm and the local union accept it. One reason for employees and local unions to accept wage cuts is that they reduce the risk for dismissals. For an employee to get a pay rise in excess of the general pay rise, it may be enough that a superior agrees to it. Raising the pay of individual workers may be in the interest of the firm, because it improves incentives or prevents the exit of a productive employee.

This study takes the contracts as its starting point. For an international survey of wage changes that takes the contracts of the individuals as its starting point, see Malcomson [1999]. Although wage formation on the Finnish labour market is characterised by the collective bargaining, it has been shown that there are large individual deviations from what is agreed on in the collective agreements. For example a large proportion of the employees experience wage cuts from one year to the next [Vartiainen, 2000], although the general pay rise has never been negative. See also Vartiainen [1996, 1994] for earlier empirical studies of wage formation, wage drift and wage cuts and Böckerman et al. [2003] for a contemporary study of wage cuts with a wider perspective on the Finnish labour market. This study goes further than these studies by investigating the concentration of pay changes. Above all I examine the hypothesis that wage cuts are concentrated to certain plants.

The second section includes a presentation of the institutional framework and an examination of the possibilities it and the theory suggest there are for deviations from the pay changes stipulated by collective agreements. In the third section follows a short presentation of the data used in the study. The

fourth section provides a general characterisation of the pay changes of the individuals according to different measures of pay. In the fifth section the plant-wise concentration of the pay changes of wage earners is examined. The sixth section provides an examination of the same issue for salaried employees. In the seventh section follows an investigation of whether pay cuts of wage earners and salaried employees take place in the same plants. Section eight is the conclusion.

2 The institutional framework in Finland and the concept of rigidity

Because the large majority of employees continue to work in the same plant from one year to the next, the change in the wage level in the economy to a rather large extent depends on pay changes of employees who stay in the same plant. This study concentrates on this component of the change in wage cost and disregard changes in average pay associated with reallocation of workers from one employer to another or changes in the workers' employment status.

The pay of the employees is regulated by collective agreements, which determine minimum wages, and unless the firm and its employees (the local union) agree on something else, the minimum change in the pay employees actually receive. Because employees usually do not object to pay rises to other employees, firms are in general allowed to rise the pay of employees more than the general pay rise. Reasons for doing this may be that managers want to motivate employees to be productive or prevent productive employees from quitting.¹ However, unless there are changes in the job characteristics on which pay is based, a firm must not lower the employees' pay without approval of the local union branch. Because there is extra compensation associated with such job characteristics as overtime work and working Sundays for wage earners, less overtime and working fewer Sundays should clearly in accordance with the contracts be associated with a reduction in total pay for them. Job changes inside a plant can also take place or, alternatively, what is required in the job can change. Such changes can also affect what should be paid according to the contract.

The alternative way for wage changes to take place is through changes in the contracts. This includes the possibility that the local union agrees to pay being cut, even though there should be a general pay rise in the industry according to the collective agreement. This can take place, if the employees in the firm accept it and the pay does not fall below the minimum wage level in the collective agreement. In consequence, how much wages exceed the minimum wage level sets an upper limit to how large wage cuts firms can implement at the local level.

It is uncertain to what extent these types of changes take place. It has often been claimed that wages are rigid, meaning that they do not change frequently

¹To the explanations categorised under increased motivation I also include rent-sharing, which is likely to be, at least partly, a consequence of firms paying employees higher wages to prevent strikes and other protests among employees against the firm.

and especially that wages are rarely cut. Earlier studies have mostly been concerned with whether there exist any rigidity and wage cuts. Since this study is aimed at examining the occurrence of pay changes of different origin and especially of those not in accordance with the general pay rises, this study takes a slightly different perspective on the issue.

The contractual framework suggests that the general pay rises should form starting points for any negotiations concerning deviations. It therefore seems useful to define rigidity in this paper as a tendency to not deviate from the general pay rises. The discussion above suggests that one should use observations for which there are no changes in the observable job characteristics, because then there are no extra pay changes in accordance with contracts the rigidity effects of collective agreements should be most visible. Reasons for employees and local unions to accept a wage cut by changing the contracts might be bad performance of the firm or redesign of jobs that change job characteristics, which possibly are not included in the contracts.

If firms are more free to set pay in response to changes in their needs, it seems likely that they are more able to maximise profit and productivity and that the allocation on the labour market also is more efficient. Some studies have argued the opposite, pointing to the positive effect of closing down inefficient plants and supplying inexpensive labour to more efficient plants [Hibbs and Locking, 2000, Moene and Wallerstein, 1997, Agell and Lommerud, 1993]. Less responsiveness of wages to productivity might also raise the firms' return on investments [Teulings and Hartog, 1998]. However, examining the extent to which wage flexibility increases productivity or profitability is beyond the aim of this paper.

Because the changes stipulated by the collective agreements are poorly known, this study concentrates on the occurrence of wage cuts and the concentration of these to certain plants. As nominal wage cuts are examined, the study is closely related to studies concerned with nominal pay rigidities.

The theoretical framework gives a number of hypothesis to test. Since labour demand and the performance of the employees is likely to vary over time, pay more directly related to output should be less rigid also when measured as pay per hour. This gives the following hypothesis.

H_1 : Variation in pay is larger and pay cuts more frequent for types of pay directly dependent on variables not determined by the collective agreements.

One type of pay which is dependent on a variable not determined by contracts is piece rate pay. A part of a reduced demand for labour input should be reflected in a somewhat slower working pace of the employees, as it is not necessary to finish the work so fast. This should also mean that decreases in pay occur more frequently for piece rate pay. Also overtime pay should clearly be more variable, as overtime hours are rather easily adjusted.

For the change in pay to be different from what the collective agreement prescribes, both parties have to accept the deviation. Pay cuts are possible only if the local union branch accepts that wages are cut, for example because

it saves jobs. Such circumstances are likely to be plant- and firm-specific. In consequence, pay cuts not in accordance with collective agreements should be a plant-specific (or possibly firm-specific) phenomenon. This observation gives the following hypothesis.

H_2 : Pay cuts should be concentrated to certain plants.

The null hypothesis then is that wage cuts occur with the same relative frequency in all plants. According to the theory the management's decision to raise an employee's pay is more related to the characteristics of the individual. The local union should not resist such pay changes, since it does not make any employee worse off. Moreover, even a poorly performing plant could be willing to raise the pay of individual employees to keep productive employees motivated. In consequence, pay rises above what is prescribed by the collective agreement should be less of a plant-specific phenomenon than pay cuts.

H_3 : Pay rises higher than the general rise should be less concentrated than pay cuts.

In addition to the hypothesis that firms manage to negotiate down the wages of employees in some plants, one could further hypothesise that some plants have more wage flexibility with both high pay rises and pay cuts. Alternatively, there are more measurement errors in the data for some plants. Then the following should be observed.

H_4 : Pay cuts occur in plants which also have a high frequency of large pay rises.

Finally it seems likely that wage earners and salaried employees are treated in the same way by firms so that wage cuts among wage earners is more common when there also are some cuts in the pay of salaried employees. This gives Hypothesis H_5 .

H_5 : Cuts in the pay of salaried employees occur in plants in which also the pay of wage earners is cut.

In the next section there is a short presentation of the data.

3 The data and possibilities of examining the hypotheses

The data sets used in this study have been obtained from the Confederation of Finnish Industry and Employers. For each year there is one data set which comprises wage earners in the manufacturing sector and another one that comprises salaried employees in this sector. For every year the data sets contain

more than 200000 observations on wage earners and somewhat less than 200000 observations on salaried employees. For both categories data from the years 1997–2000 are used. In consequence, there are observations on changes in pay from three years.

Only ordinary employees who have started to work in the plant before the beginning of the year are included. Everyone who has been employed in more than one plant is also excluded. As are wage earners for whom there is given an ending date for the employment relationship (value different from zero or missing for the variable) or who do not work between 1400 and 2200 hours. For salaried employees there are usually no data on working hours but salaried employees earning less than 60000 markkas are excluded, since full time employees do not earn so little. Wage earners who do not get any pay according to the data are also dropped from the data set. All these criteria should be satisfied in two consecutive years for an employee in a given plant to give an observation of a change in pay. The majority of observations dropped are dropped because of the employee's mobility or failure to meet the requirements of full-time employment. However, observations on employees who change jobs inside the plant are also deleted. Finally to avoid influence from extreme observations and measurement errors, all observations in which total pay rises by more than 50 percent or fall by more than 33 percent are deleted. As are observations on each pay type when it rises by more than 50 percent or falls by more than 33 percent. Such huge changes should not usually take place and are likely to indicate some kind of measurement error in the data.

To get a thorough description of the changes in pay, a number of different concepts of pay are used in the analysis. Payment schemes do not exclude each other; some employees are paid according to one system a part of their working time and according to a different system for other working hours. The number of observations in the tables varies as only some employees are remunerated using more than one payment scheme. Categories of payment schemes are time rate, partial piece rate and pure piece rate. Pure piece rate means individual piece rate and that pay depends completely on output. Partial piece rate is often associated with teamwork and then partly relates pay to the joint output of a number of persons. In addition to these types of pay there is also performance-related-pay which gives bonuses to employees whose firm, plant or team has reached certain aims. These bonuses are not included in this analysis.

Data from the same source have been used earlier by Juhana Vartiainen to examine wage changes and cuts. See Vartiainen [2000] for a more extensive presentation of the data. Although the data set for the years 1997–2000 is somewhat different from that in earlier years, there are no differences of any greater significance for this study.

4 The distribution of changes in pay for wage earners

Total pay consists of a number of components. In each of them there can be a change. To decompose the changes in pay for wage earners I use the pay measures or types listed in Table 1.

Table 1: Measures of wage earners' pay and how they relate to each other

Measure	Definition or relation to preceding measure
Partial piece rate pay	Pay per hour when pay is based on (usually team based) piece rates, base pay and personal increments
Pure piece rate pay	Pay per hour when pay is based only on the output of the individual
Time rate pay	Pay per hour when pay is based only on time rate base pay
Average pay per hour excl. increments	Time weighted average of pure piece rate, partial piece rate, and time rate pay
Pay for regular hours	As above but including increments for working conditions, time of the day etc.
Total pay	The total pay of the wage earner but excluding bonuses from performance related pay schemes

According to the discussion earlier and hypothesis H_1 , pay measures directly determined through collective agreements should be more difficult to change. Changes in pay not related to the conditions given by the collective agreements include changes due to changes in overtime hours and usually changes in the number of hours worked with different types of pay. The former type of changes is included in changes in "total pay". The latter type of changes is included in changes in "total pay", "pay for regular hours" and "average pay per hour excl. increments". "Total pay" is the concept which includes all types of changes and "time rate pay" is the pay measure which should be most strictly bound by collective agreements.

To test hypothesis H_1 I examine changes in different categories of pay. The results given from a calculation of the mean and the standard deviation for changes in pay measured in accordance with the different pay categories are displayed in Table 2.²

The standard deviations (s.d.) show that the change in the total pay of employees from one year to the next varies more than its listed components. This is in accordance with hypothesis H_1 , since the changes in total pay is only weakly dependent on contract changes that require the acceptance of the local union. In addition, the variance of changes in one type adds to variances of changes in other type of pay, unless there is negative correlation in the changes. The

²The deletion of observations for which large changes in pay had taken place had the greatest impact on the number of observations of pure piece rate changes.

Table 2: Statistics for the wage earners' pay changes according to different measures of pay.

Pay measure and years	Mean	S.d.	Percent cuts	Obs.
Total pay				
1997-98	3.15	8.40	30.04	88488
1998-99	4.12	8.45	25.09	88046
1999-2000	5.99	8.59	17.59	86248
Pay for regular hours				
1997-98	3.77	6.18	17.10	88465
1998-99	3.73	6.32	16.42	88014
1999-2000	5.65	6.32	10.31	86215
Average pay per hour excl. increments				
1997-98	3.73	5.18	11.15	88445
1998-99	3.57	5.22	10.68	87997
1999-2000	5.22	5.41	7.00	86212
Time rate				
1997-98	4.05	6.60	10.18	48827
1998-99	3.40	6.40	11.20	47014
1999-2000	5.01	6.47	7.55	47009
Pure piece rate				
1997-98	3.91	7.28	15.18	14009
1998-99	3.46	7.80	16.65	12922
1999-2000	4.62	7.64	13.78	12682
Partial piece rate				
1997-98	3.29	5.26	16.15	30536
1998-99	3.83	5.31	13.78	31404
1999-2000	5.42	5.65	8.89	29645

same conclusions also applies to the difference in standard deviation between changes in "pay for regular hours" and "average pay per hour excl. increments". However, a bit surprising is that the standard deviation for changes in "average pay per hour excl. increments" is smaller than for changes in time rate, pure piece rate, and partial pece rate pay.

Table 3: Statistics for wage earners' pay changes according to different measures of pay, when only workers, for whom the degree of difficulty of the job tasks is unchanged, are included.

Pay measure and years	Mean	S.d.	Percent cuts	Obs.
Total pay				
1997-98	3.01	8.29	30.33	81854
1998-99	3.98	8.24	25.29	81510
1999-2000	5.80	8.31	17.52	79686
Pay for regular hours				
1997-98	3.65	6.05	17.16	81835
1998-99	3.61	6.09	16.42	81488
1999-2000	5.51	6.03	9.91	79662
Average pay per hour excl. increments				
1997-98	3.61	5.03	11.22	81817
1998-99	3.43	4.92	10.48	81472
1999-2000	5.02	5.03	6.53	79664
Time rate				
1997-98	3.95	6.40	9.86	45125
1998-99	3.27	6.23	11.00	43557
1999-2000	4.78	6.34	7.62	43559
Pure piece rate				
1997-98	3.82	7.23	15.67	12883
1998-99	3.23	7.08	16.35	11418
1999-2000	4.54	6.81	12.75	11485
Partial piece rate				
1997-98	3.16	5.15	16.62	27773
1998-99	3.73	5.13	13.61	29548
1999-2000	5.21	5.36	8.09	26982

In table 3 only workers for whom the classification of the degree of difficulty of the job tasks is constant are included. A comparison of the statistics yields the conclusion that excluding workers whose job classification has changed with respect to the degree of difficulty of the job, somewhat reduces the mean change in pay and the standard deviation of the pay. In the fraction of declines there are no obvious systematic changes. The average effect on the pay changes seem to be very small, even though collective agreements often explicitly connect pay

to the classification of the difficulty of the job tasks.

The average pay rise was somewhat higher in 1999–2000 than in other years for all measures of pay. However, the table indicates that the shape of the distribution has been rather constant, as the standard deviation has been similar. Graphs of the distribution of changes shown below confirm this.³ Figure 1 shows the distribution of changes in total pay of employees from one year to the next. There is much variation and the distribution is positively sloped. However, the distribution of changes in pay seem to be rather similar from year to year.

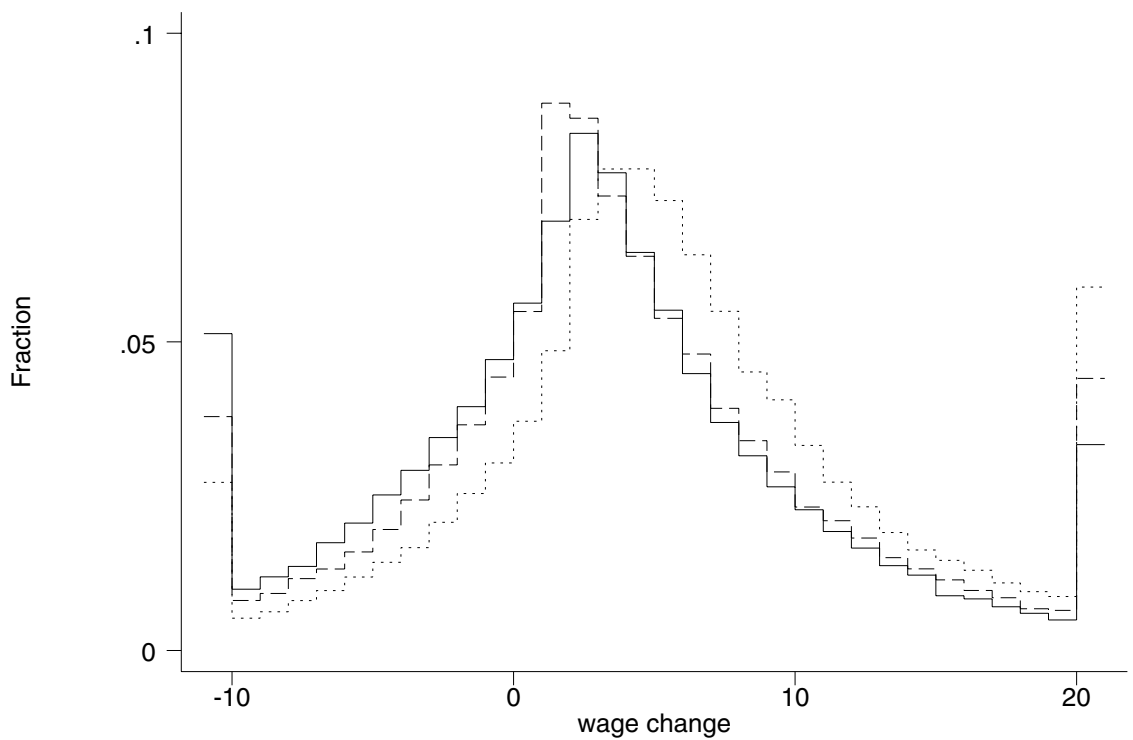


Figure 1: Distributions for changes in total pay. The solid line represents the distribution of pay changes 1997–98, the dashed line 1998–99 and the dotted line 1999–2000.

Some of the changes in total pay are consequences of changes in number of hours worked as well as overtime pay. The change in pay per hour for regular hours is likely to be much more dependent on parameters determined by collective agreements. This was supported by the fact that the standard deviations for the changes in Table 2 were much smaller for them. Figure 2 shows the

³In the histograms observations of pay increases larger than 20 percent and pay reductions larger than 10 percent form the columns farthest to right and farthest to the left, respectively.

distribution of changes in wage earners' pay for regular hours. Especially the relative frequency of large changes in pay is lower for changes in pay for regular hours, as the tails in Figure 2 are much thinner.

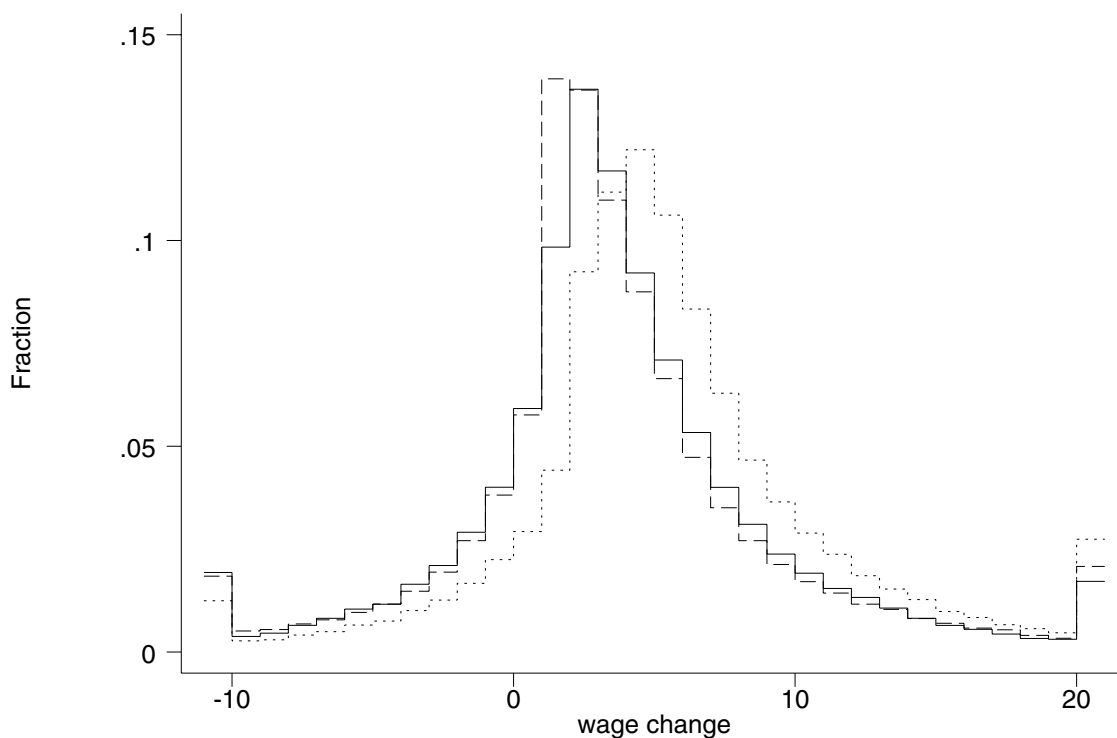


Figure 2: Distribution of changes in pay for regular hours. The solid line represents the distribution of pay changes 1997–98, the dashed line 1998–99, and the dotted line 1999–2000.

Increments of various kinds may also be easier for the firm to adjust, especially if they are connected to changing job characteristics. Figure 3 shows that the variation in changes in pay per hour excluding increments (for working conditions and working time) is even smaller than for changes in pay for regular hours.

Although a number of factors that add to the variability in pay have been eliminated in the distributions in Figure 3, the conclusion that there has been reductions in pay still holds for average pay per hour without increments. A part of the reductions may be a consequence of switches from one kind of pay to another for at least a part of the hours. The elements of the average pay per hour excluding increments are time rate, pure piece rate and partial piece rate pay. Time rate pay is completely determined in the contracts but for the

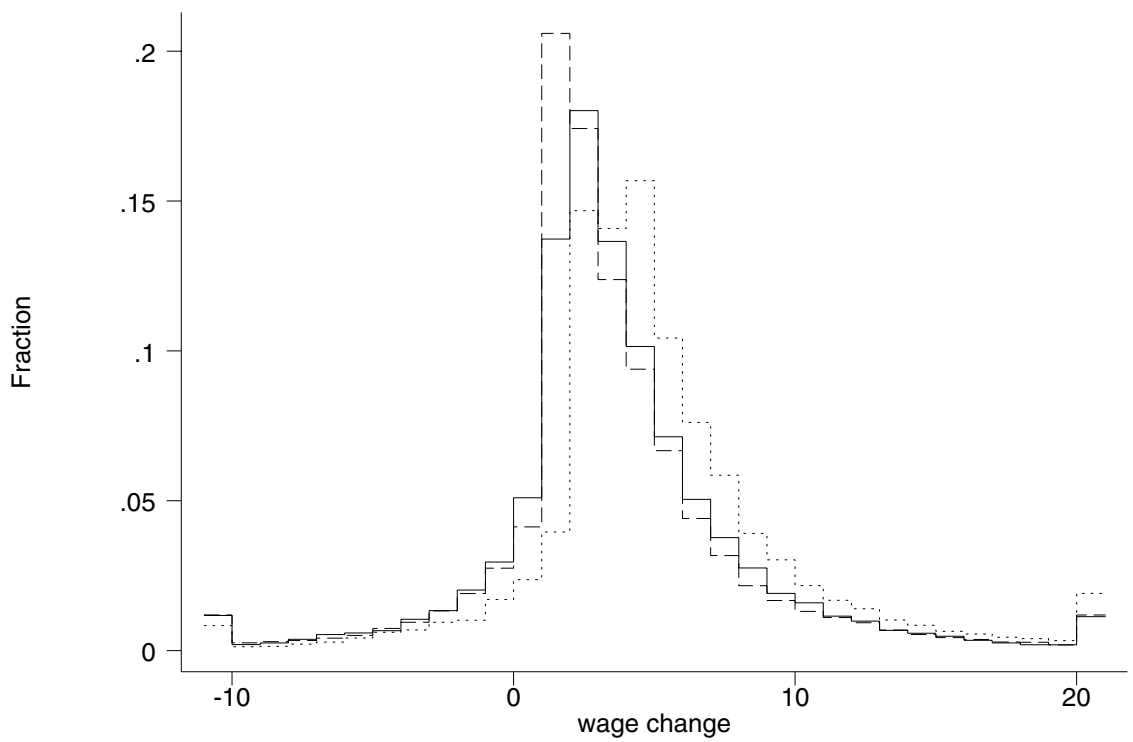


Figure 3: Distribution of changes in wage earners' pay excluding increments. The solid line represents the distribution of pay changes 1997-98, the dashed line 1998-99, and the dotted line 1999-2000.

other pay types pay partly depends on the output of the employees. Hypothesis H_1 means that piece rate pay should be more variable than time rate pay. The standard deviations in Table 2 gave support to the hypothesis, but only for pure piece rates and not for partial piece rates. The graph of the distribution of the changes in pure piece rate pay in Figure 4 also show that the tails of the distribution are much fatter and the top lower than for the average pay per hour without increments in Figure 3 and time rate pay in Figure 5.⁴

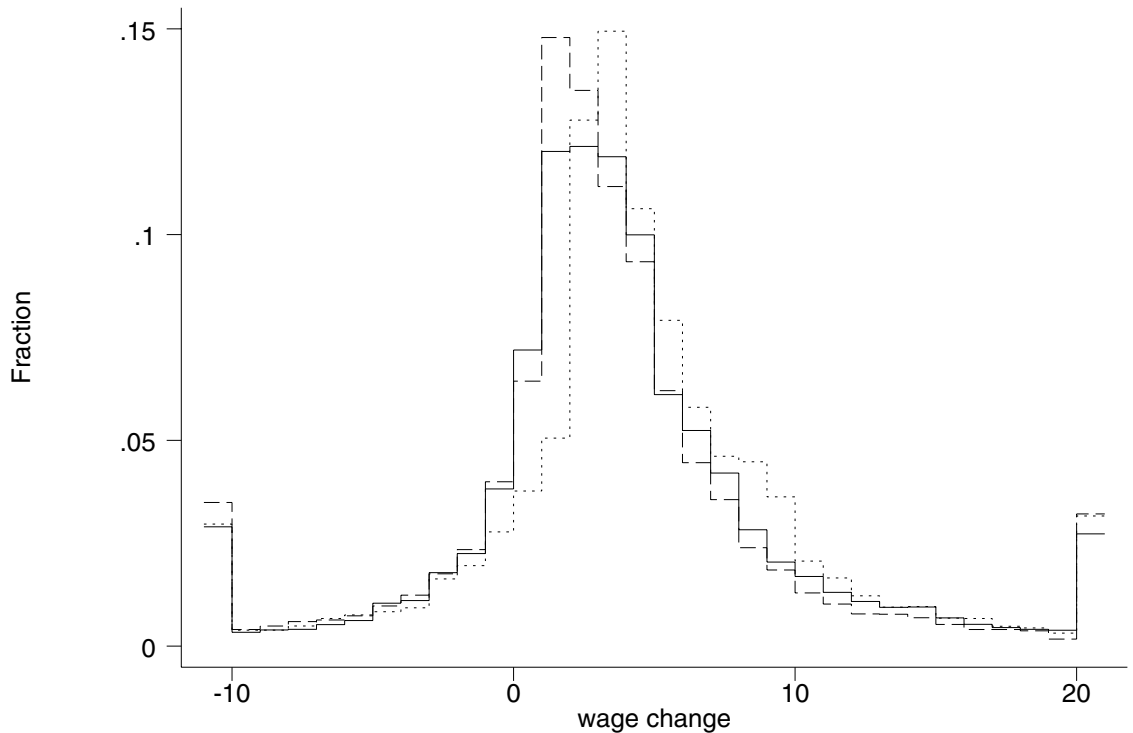


Figure 4: Distribution of changes in wage earners' pay per hour for hours with pure piece rate pay. The solid line represents the distribution of pay changes 1997–98, the dashed line 1998–99, and the dotted line 1999–2000.

The distribution for changes in pay based on partial piece rates in Figure 6 seems to have a broad top but thinner tails than the distribution for changes in pay based on pure piece rates. Large changes in pay per hour are rather rare for partial piece rate pay.

Hypothesis H_1 thus receives support except for that partial piece rates seem

⁴A problem might be that there are larger measurement errors in the pay per hour for pure piece rates than for the other kinds of pay, since the number of hours worked is of less importance.

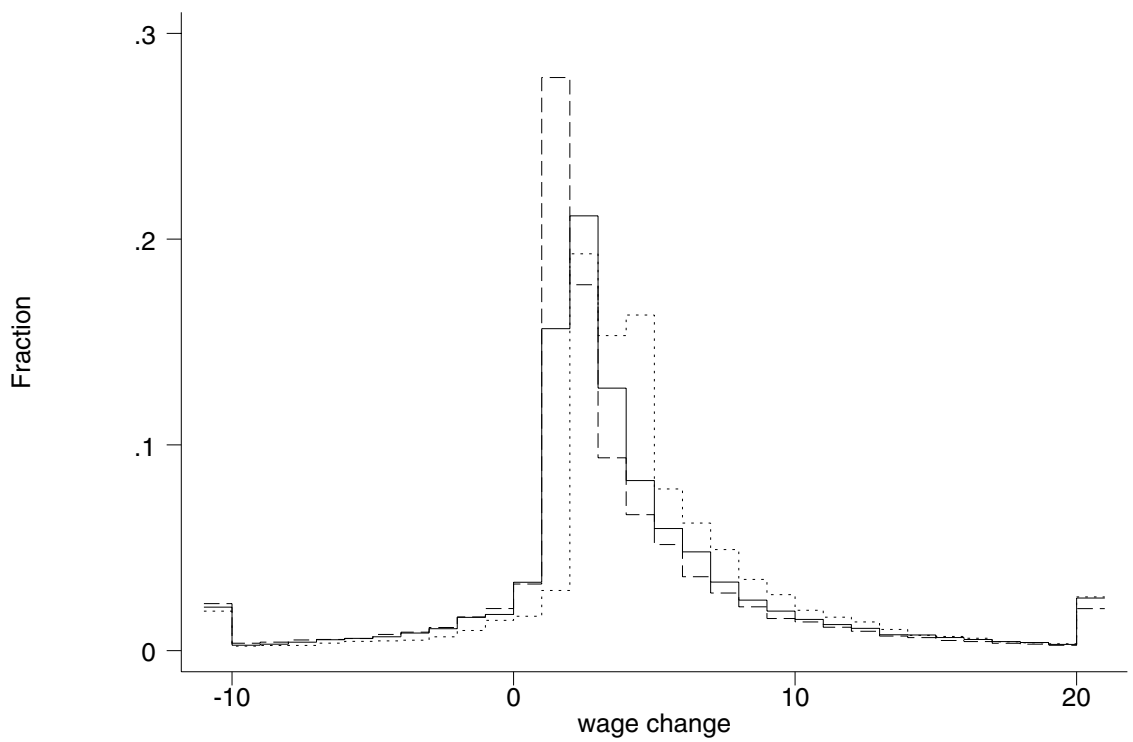


Figure 5: Distribution of changes in wage earners' pay per hour for hours with time rate pay. The solid line represents the distribution of pay changes 1997-98, the dashed line 1998-99, and the dotted line 1999-2000.

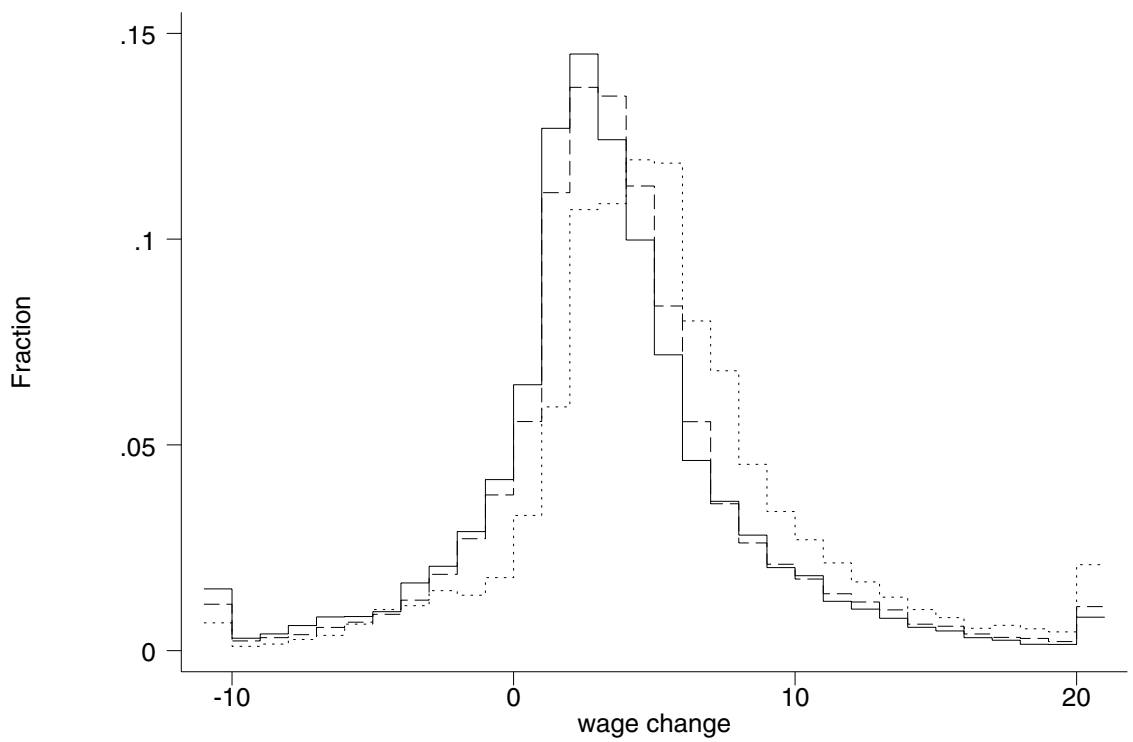


Figure 6: Distribution of changes in wage earners' pay per hour for hours with partial piece rate pay. The solid line represents the distribution of pay changes 1997-98, the dashed line 1998-99, and the dotted line 1999-2000.

to lead to rather little variation in pay. However, at least in some years a substantial part of the employees have had to take a cut even in the time rate pay, which means that their pay change has not been in accordance with the general pay rise and that contracts probably have been renegotiated. The following section will examine the concentration of pay cuts and high pay rises across plants.

5 The concentration of wage cuts and the structure of wage changes across plants

This section tests the hypothesis H_2 that wage cuts of employees are concentrated to certain plants. For each plant I calculate the share of employees that get a cut in a certain type of pay of all those in the plant for whom a change in the type of pay was observed. Table 4 gives a presentation of statistics concerning concentration of wage changes across plants.⁵

Table 4 shows that a considerable proportion of employees work in plants in which there have been no cuts in time rate pay per hour.⁶ However, more than a tenth of the employees receiving time rate pay work in plants in which there have been cuts in the time rate pay for at least 20% of the employees. This indicates that there is a concentration of wage cuts to certain plants.⁷

To investigate whether substantial pay rises also are concentrated to certain plants, the share of wage rises of at least 10% is also calculated for each plant. Table 5 presents the statistics corresponding to those in Table 4 when the employee observations are ordered according to the share of employees in the plant receiving a pay rise of at least 10%. An examination of the tables leads to the conclusion that high pay rises are also concentrated.

As was pointed out in the previous section, the extent to which renegotiations and acceptance of employees are necessary to implement pay cuts, varies with how closely connected to the collective agreements the measure of pay is. However, Table 4 and Table 5 indicate that there are concentrations of cuts

⁵Excluding workers for whom the classification of the difficulty of their job tasks changed, had only small effects on the numbers in Table 4 and the other tables. Only employees who get a share of their pay according to the respective pay measure in both years are included when the proportions of employees getting a pay cut in pure piece rate, partial piece rate, and time rate pay are calculated. The number in the plants column means the number of plants with at least one accepted observation on a change in the pay measure.

⁶The mean is the average share of employees getting pay cuts and the standard deviation is calculated as the standard deviation for the share of employees getting pay cuts at the plants of the employees. The percentiles are calculated when the employees are ranked according to the share of employees getting pay cuts at their plants. Thus the table says that in the plants the share of cuts in time rate pay was 25.0% from 1997 to 1998 for the 90th percentile of the employees when they are ranked with respect to the share of cuts in time rate pay at their plants.

⁷Other methods to examine the concentration of wage changes across plants include a decomposition of the wage changes for employees into plant components and individual components. However, a decomposition of the average pay change into plant and individual components do not say anything about wage cuts.

Table 4: The share of wage earners in the plants getting pay cuts for different types of pay when the employees are ordered according to the share of pay cuts in the plant.

Pay type and years	Mean	S.d.	p25	Median	p75	p90	Obs.	Plants
Total pay								
1997–98	30.04	19.41	16.4	26.4	38.9	57.9	88488	1815
1998–99	25.09	16.88	14.6	21.7	31.9	48.1	88046	1732
1999–2000	17.59	15.37	6.9	13.0	23.6	40.4	86248	1755
Pay for regular hours								
1997–98	17.10	19.67	4.0	10.5	21.9	42.2	88465	1815
1998–99	16.42	18.06	4.4	10.0	22.2	41.2	88014	1732
1999–2000	10.31	15.09	1.2	4.7	12.4	28.2	86215	1754
Pay per hour excl. increments								
1997–98	11.15	17.43	0.8	4.6	13.3	28.6	88445	1814
1998–99	10.68	16.43	0.3	4.3	13.5	30.4	87997	1732
1999–2000	7.00	14.26	0.0	1.8	6.9	19.3	86212	1754
Time rate								
1997–98	10.18	14.56	0.0	5.7	14.3	25.0	48829	1587
1998–99	11.20	15.86	0.0	5.6	16.6	30.6	47015	1509
1999–2000	7.55	13.07	0.0	1.9	9.5	21.1	47009	1539
Pure piece rate								
1997–98	15.18	17.85	2.0	10.0	22.2	34.6	14009	578
1998–99	16.65	18.43	4.2	11.6	25.0	42.9	12922	577
1999–2000	13.78	18.85	1.7	8.3	16.7	40.5	12682	546
Partial piece rate								
1997–98	16.15	22.11	2.4	7.4	20.9	46.1	30536	445
1998–99	13.78	19.84	1.1	5.3	20.0	36.1	31404	402
1999–2000	8.89	18.13	0.6	2.3	7.5	19.4	29645	398

Table 5: The concentration of wage earners getting pay rises $\geq 10\%$ for different types of pay. Employees ordered according to the share of employees in their plant receiving such a pay rise.

Pay type and years	Mean	S.d.	p25	Median	p75	p90	Obs.	Plants
Total pay								
1997–98	15.32	13.24	6.5	12.1	20.9	31.3	88488	1815
1998–99	17.78	16.26	7.2	12.8	23.9	38.9	88046	1732
1999–2000	23.48	17.73	11.4	18.0	31.8	47.4	86248	1755
Pay for regular hours								
1997–98	10.66	13.17	2.2	6.3	13.7	28.7	88465	1815
1998–99	10.79	15.99	1.9	4.9	12.0	26.7	88014	1732
1999–2000	16.18	17.85	3.8	10.6	21.3	38.5	86215	1754
Pay per hour excl. increments								
1997–98	7.59	11.97	1.0	3.5	8.4	19.3	88445	1814
1998–99	7.32	12.56	0.7	3.1	8.3	18.2	87997	1732
1999–2000	11.40	16.06	1.6	5.5	13.3	30.8	86212	1754
Time rate								
1997–98	10.26	13.10	1.5	6.0	13.2	25.0	48829	1587
1998–99	8.72	12.51	0.2	5.0	11.4	22.2	47015	1509
1999–2000	11.79	14.33	2.2	6.6	16.2	31.2	47009	1539
Pure piece rate								
1997–98	11.16	16.65	1.6	6.1	12.7	30.2	14009	578
1998–99	9.64	14.68	0.0	4.8	12.2	25.0	12922	577
1999–2000	12.60	16.25	2.1	6.5	17.4	33.3	12682	546
Partial piece rate								
1997–98	7.54	12.32	0.3	3.0	9.5	19.2	30536	445
1998–99	8.84	14.82	1.1	3.7	10.8	21.4	31404	402
1999–2000	13.83	18.95	1.6	7.0	14.0	40.8	29645	398

and rises for all types of pay, although the numbers may to some extent reflect that small plants exhibiting either no cuts at all or a rather large share of cuts when the work force is small and the number of plants was too great to allow tests of significance of the concentrations. To reduce the number of plants (to enable a statistical test) and avoid concentrations that reflect differences between industries, I take the metal industry and test for whether the pay cuts of individuals are randomly distributed between plants in which there are at least 20 observations. Pearson's χ^2 -test for the distribution of pay cuts yields the result that the null hypothesis (independently distributed observations) can be rejected for all pay measures, which is shown in Table 6. The pay cuts are thus concentrated to certain plants.

Table 6: A test for whether pay cuts are independently distributed across plants with at least 20 employees in the metal industry.

Pay type and years	χ^2	$p(\chi^2 H_0)$	Plants (=df+1)	Obs.
Total pay				
1997–98	5620.43	0.0000	249	29227
1998–99	4778.54	0.0000	247	29082
1999–2000	4825.07	0.0000	259	28088
Pay for regular hours				
1997–98	8010.82	0.0000	249	29223
1998–99	6786.80	0.0000	247	29074
1999–2000	7513.14	0.0000	259	28084
Pay per hour excl. increments				
1997–98	9953.32	0.0000	249	29222
1998–99	7719.17	0.0000	247	29071
1999–2000	12735.15	0.0000	259	28082
Time rate				
1997–98	3790.62	0.0000	234	18764
1998–99	5367.06	0.0000	232	18430
1999–2000	5560.15	0.0000	245	18339
Pure piece rate				
1997–98	463.61	0.0000	86	2756
1998–99	474.24	0.0000	68	2131
1999–2000	602.07	0.0000	73	2193
Partial piece rate				
1997–98	5200.06	0.0000	128	12525
1998–99	3619.26	0.0000	120	12793
1999–2000	6799.80	0.0000	115	11603

The tests in table 6 thus confirm the hypothesis H_2 . To enable a check of the hypothesis H_3 , that high pay rises should be less concentrated, I also make

the corresponding examination of the independence of the distribution of pay rises higher than or equal to 10% in Table 7. The results show that pay rises are also significantly concentrated to certain plants, although the χ^2 -values for the tests concerning the concentration of wage rises are lower than for pay cuts.

Table 7: A test for whether pay rises $\geq 10\%$ are independently distributed across plants with at least 20 employees in the metal industry.

Pay type and years	χ^2	$p(\chi^2 H_0)$	Plants (=df+1)	Obs.
Total pay				
1997–98	3715.08	0.0000	249	29227
1998–99	6484.57	0.0000	247	29082
1999–2000	4374.58	0.0000	259	28088
Pay for regular hours				
1997–98	4527.85	0.0000	249	29223
1998–99	8814.11	0.0000	247	29074
1999–2000	6220.47	0.0000	259	28084
Pay per hour excl. increments				
1997–98	5247.87	0.0000	249	29222
1998–99	6533.96	0.0000	247	29071
1999–2000	4449.94	0.0000	259	28082
Time rate				
1997–98	3639.61	0.0000	234	18764
1998–99	3078.61	0.0000	232	18430
1999–2000	2839.74	0.0000	245	18339
Pure piece rate				
1997–98	424.82	0.0000	86	2756
1998–99	288.51	0.0000	68	2131
1999–2000	360.36	0.0000	73	2193
Partial piece rate				
1997–98	3382.98	0.0000	128	12525
1998–99	4318.69	0.0000	120	12793
1999–2000	2186.93	0.0000	115	11603

Finally to test Hypothesis H_4 I cross tabulate plants according to the share of wage cuts and high increases ($\geq 10\%$) in wages. The plants are categorised into three groups according to the share of wage cuts and high wage increases respectively: Those in which none have taken place, those in which a small share have received a wage cut and high pay rise respectively, and those in which a large share have received it.

The χ^2 -values are so high that the test strongly reject that pay cuts and high pay rises would be independently distributed across firms. The Tables 8 and 9 show that there is a tendency that there in plants, in which there are no wage

Table 8: Cross tabulation of plants when they are categorised according to share of cuts in the total pay of wage earners and share of wage earners getting increases $\geq 10\%$ in total pay.

Plants categorised by share of wage rises $\geq 10\%$	Share of wage cuts			All plants	χ^2 (4df)/ Prob.
	No cuts	Small	Large		
1997-98					
Large	39.43	49.47	23.71	37.09	157.64 0.00000
Small	11.43	38.38	45.69	37.18	
No rises $\geq 10\%$	49.14	12.15	30.60	25.72	
Number of plants	175	469	464	1108	
1998-99					
Large	55.50	45.91	25.48	39.49	145.76 0.00000
Small	8.38	43.86	49.29	39.58	
No rises $\geq 10\%$	36.13	10.23	25.24	20.93	
Number of plants	191	440	420	1051	
1999-2000					
Large	43.84	47.62	31.10	40.30	121.91 0.00000
Small	20.09	46.67	47.13	41.34	
No rises $\geq 10\%$	36.07	5.71	21.77	18.35	
Number of plants	219	420	418	1057	

Table 9: Cross tabulation of plants when they are categorised according to share of cuts in the time rate pay of wage earners and share of wage earners getting increases $\geq 10\%$ in time rate pay.

Plants categorised by share of wage rises $\geq 10\%$	Share of wage cuts			All plants	χ^2 (4df)/ Prob.
	No cuts	Small	Large		
1997-98					
Large	20.13	32.54	36.48	27.52	119.60 0.00000
Small	17.99	43.65	29.51	27.62	
No rises $\geq 10\%$	61.88	23.81	34.02	44.86	
Number of plants	467	252	244	963	
1998-99					
Large	18.93	31.06	30.64	25.62	109.62 0.00000
Small	15.09	42.42	24.26	25.62	
No rises $\geq 10\%$	65.98	26.52	45.11	48.76	
Number of plants	391	264	235	890	
1999-2000					
Large	25.52	38.92	39.67	31.15	121.38 0.00000
Small	24.20	53.51	30.43	31.49	
No rises $\geq 10\%$	50.28	7.57	29.89	37.36	
Number of plants	533	185	184	902	

cuts, also are no high wage increases. This applies both for changes in the total pay of the wage earners and for changes in the time rate pay. This supports the hypothesis H_4 and that the wage flexibility varies across plants. However, a comparison of the numbers in the tables also yields the conclusion that plants in which there is a large share pay cuts have a larger probability of having no wage rises at all than those with only a small share of pay cuts. However, this may also indicate that the random distribution of cuts and increases in plants with only few workers have affected the categorisation.

To eliminate the influence of random categorisation due to few workers in the plant I also tested with excluding all plants with less than 25 observations of pay changes. This had some effect on the distribution for changes in the total pay. Nevertheless, the results indicated that there was a division between a group of plants with both many pay cuts and high pay increases and a group with many cuts but no high pay rises.

The results thus largely support Hypothesis H_2 , that is there is a concentration of pay cuts to certain plants. The support for Hypothesis H_3 is weak. The results in Tables 8 and 9 suggest that pay cuts and pay rises to a large extent coexist in the plants and the concentration to certain plants may be a consequence of higher flexibility in these plants, or alternatively measurement errors. This result supports the hypothesis H_4 . Although this last result points in a somewhat different direction in explaining the concentration of wage cuts, the results do not contradict the claim that plant-specific needs are important for explaining the concentration of wage cuts to certain plants. However, it indicates that these to a rather large extent are related to a higher wage flexibility inside the plants.

Characteristics of pay changes and cuts among salaried employees

The data for salaried employees is not as detailed as for wage earners, since salaries are not dependent on the number of hours actually worked and there is no information on hours worked. The pay of salaried employees consists of a fixed monthly salary to which bonuses are added. It is natural to compare the changes in total pay of the salaried employees to the changes in total pay of wage earners. Because the salary in the short run is fixed and independent of the performance of the employee, it seems most appropriate to compare the changes in the fixed monthly salary of the salaried employees to changes in the time rate pay per hour of the wage earners.

The mean pay changes are somewhat larger for salaried employees than for wage earners. Much of the variation is accounted for by increments and bonuses (not including bonuses from profit sharing schemes), which leads to a much higher standard deviation for changes in total pay than for changes the fixed monthly salary. The proportion of salaried employees who get a cut in the fixed salary is also much smaller than the proportion getting a cut in the

Table 10: Statistics for the pay changes of salaried employees.

Pay type and years	Mean	S.d.	Percent decl.	Percent rises $\geq 10\%$	Obs.
Total pay					
1997–98	6.14	9.31	17.44	25.01	73570
1998–99	4.25	9.29	25.34	19.30	75666
1999–2000	6.75	9.47	15.99	27.78	74057
Fixed monthly salary					
1997–98	4.71	5.13	1.13	11.78	75057
1998–99	4.01	5.45	3.82	10.17	77126
1999–2000	6.14	5.66	1.61	16.65	75951

total pay. This is in accordance with the theory since the increments are likely to change with the state of the world and the performance of the individual in accordance with contracts. The fixed salary is likely to be much more rigid since changing the contract requires the acceptance of both parties. The distribution of changes in total pay and monthly salaries are shown graphically in Figures 7 and 8 respectively. The graphs confirm the rigidity of fixed salaries compared to total pay.

The proportion of salaries being cut is very small even compared to the proportion of cuts in the time rate pay of wage earners. An investigation of the distribution of pay cuts show that there is some concentration of them to certain plants. See Table 11 for statistics concerning the distribution of pay cuts.

Table 11: Statistics for the share of salaried employees getting lower pay in the plants.

Pay type and years	Mean	S.d.	p25	Median	p75	p90	Obs.	Plants
Total pay								
1997–98	17.42	13.00	8.7	14.6	23.1	34.3	73448	2088
1997–98	25.29	18.51	12.5	20.7	31.5	50.0	75457	2000
1997–98	15.93	13.18	7.9	12.8	20.0	29.1	73822	1975
Fixed salary								
1997–98	1.12	3.82	0.0	0.0	0.9	2.7	73448	2088
1997–98	3.82	10.05	0.0	0.4	3.1	8.2	75457	2000
1997–98	1.58	5.32	0.0	0.0	1.3	3.6	73822	1975

Similarly there is some concentration of high pay increases ($\geq 10\%$). The statistics concerning the distribution of these are shown in Table 12.

To test the hypothesis H_4 concerning the coexistence of pay rises and pay cuts also for salaried employees I cross tabulate the plants according to the

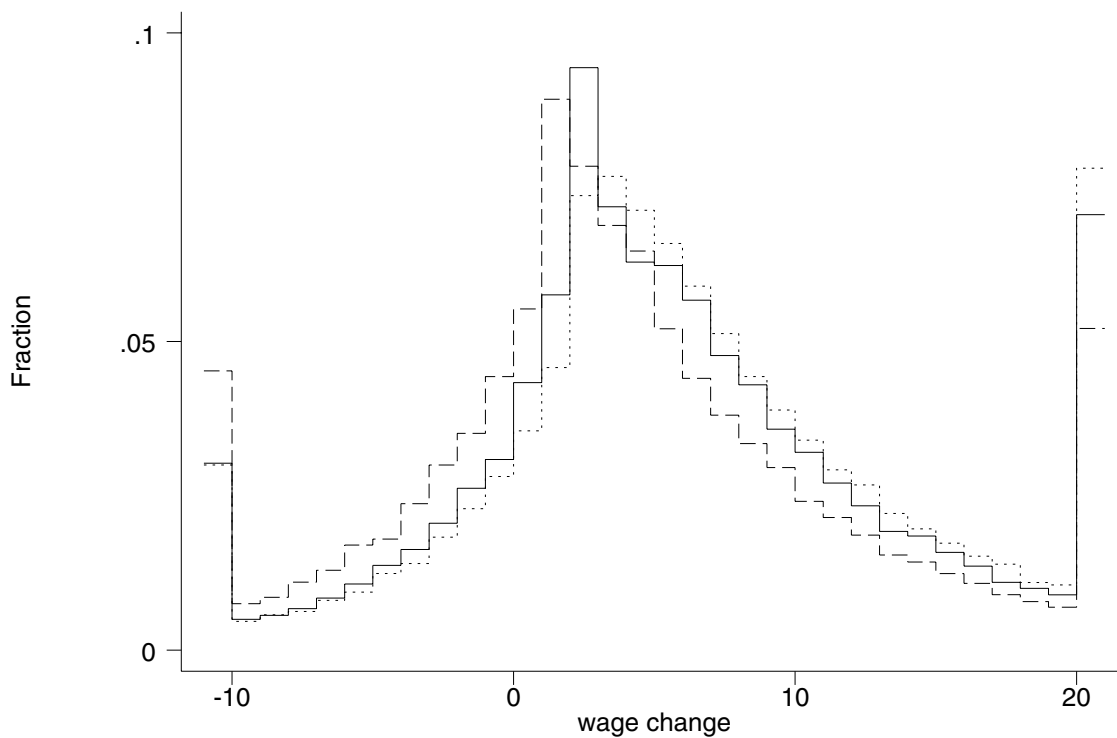


Figure 7: Distribution of changes in total pay for salaried employees. The solid line represents the distribution of pay changes 1997–98, the dashed line 1998–99, and the dotted line 1999–2000.

Table 12: Statistics for the share of salaried employees getting pay rises of at least 10% in the plants.

Pay type and years	Mean	S.d.	p25	Median	p75	p90	Obs.	Plants
Total pay								
1997–98	24.99	17.65	13.3	21.0	31.6	50.0	73448	2088
1997–98	19.26	14.72	8.7	16.0	26.3	38.9	75457	2000
1997–98	27.73	18.45	14.7	23.6	37.4	60.7	73822	1975
Fixed salary								
1997–98	11.67	10.17	4.8	9.5	15.2	26.0	73448	2088
1997–98	10.07	9.95	3.3	7.7	14.2	21.4	75457	2000
1997–98	16.51	13.75	7.9	13.1	21.3	31.8	73822	1975

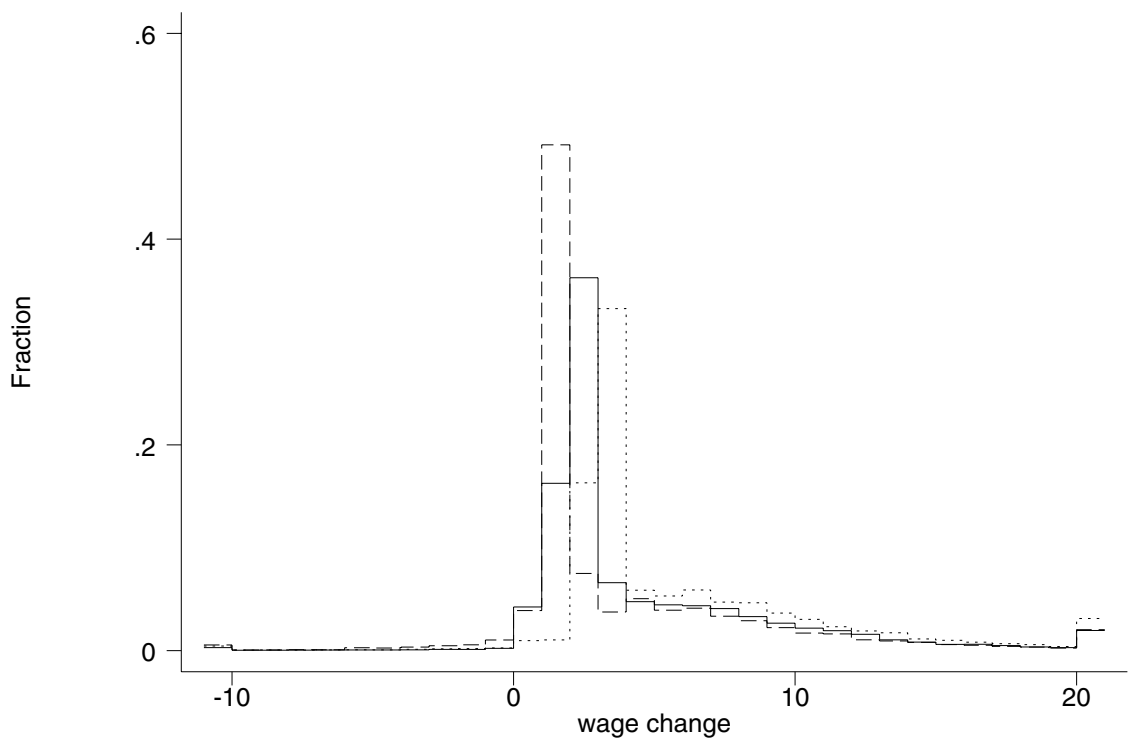


Figure 8: Distribution of changes in fixed monthly pay for salaried employees. The solid line represents the distribution of pay changes 1997–98, the dashed line 1998–99, and the dotted line 1999–2000.

categorisation of the relative frequency of pay cuts and high pay increases. In the cross tabulation based on changes in total pay in Table 13 there is less evidence in support of hypothesis H_4 than for wage earners. On the contrary the numbers in the table show that in plants with large number of pay cuts there have been fewer high pay increases, at least when one examines total pay. However, plants with no pay cuts are still very likely to also have no high pay rises among their salaried employees. However, a large proportion of these plants also have many high pay rises.

Table 13: Cross tabulation of plants when they are categorised on the basis of the share of cuts and high increases in total pay of salaried employees.

Plants categorised by share of pay rises $\geq 10\%$	Share of pay cuts			All plants	χ^2 (4df)/ Prob.
	No cuts	Small	Large		
1997–98					
Large	44.89	39.27	20.29	34.92	199.19 0.00000
Small	14.86	53.20	46.86	40.05	
No rises $\geq 10\%$	40.25	7.53	32.86	25.02	
Number of plants	323	438	350	1111	
1998–99					
Large	46.46	42.75	9.71	30.70	246.50 0.00000
Small	9.06	45.34	51.46	38.97	
No rises $\geq 10\%$	44.49	11.92	38.83	30.32	
Number of plants	254	386	412	1052	
1999–2000					
Large	42.04	46.73	18.73	36.17	208.24 0.00000
Small	18.15	49.25	51.59	40.79	
No rises $\geq 10\%$	39.81	4.02	29.68	23.04	
Number of plants	314	398	347	1059	

That cuts in the fixed salary are rare is likely to mean that random variations have greatly affected the categorisation in Table 14. Nevertheless the numbers rather contradict than support the hypothesis H_4 . Plants in which there is a large share of salary cuts do not more frequently have a large share of high increases in the salaries of the employees.

That there is a concentration of cuts in salaries indicates that the employer in some plants have managed to negotiate down pay for salaried employees. Especially this is supported by the fact that a large share of cuts is not accompanied by a large share of high increases in the pay. Whether pay cuts or pay rises occur for both groups in the same plants is examined in the next section.

Table 14: Cross tabulation of plants when they are categorised on the basis of the share of cuts and high increases in the fixed monthly salary of salaried employees.

Plants categorised by share of salary rises $\geq 10\%$	Share of salary cuts			All plants	χ^2 (4df)/ Prob.
	No cuts	Small	Large		
1997-98					
Large	28.97	39.60	21.18	29.34	60.23 0.00000
Small	29.73	56.44	32.94	32.40	
No rises $\geq 10\%$	41.30	3.96	45.88	38.25	
Number of plants	925	101	85	1111	
1998-99					
Large	24.45	31.25	21.48	25.00	112.22 0.00000
Small	26.39	63.89	31.85	32.22	
No rises $\geq 10\%$	49.16	4.86	46.67	42.78	
Number of plants	773	144	135	1052	
1999-2000					
Large	29.33	28.85	29.20	29.27	50.67 0.00000
Small	33.37	63.46	28.32	35.79	
No rises $\geq 10\%$	37.29	7.69	42.48	34.94	
Number of plants	842	104	113	1059	

6 Does the pay of salaried employees move in the same direction as for wage earners?

If the wages of wage earners are cut due to plant-specific circumstances, it would seem natural that pay cuts of salaried employees occur more frequently in these plants as well. To examine this hypothesis (H_5) I divide the plants of the salaried employees into three groups: Those in which there are no cuts in monthly salary of the employees, those in which the pay is cut for a small share of the employees, and those in which the salary is cut for a large share of the employees. Then I merge this data set with the corresponding data set for wage earners using the plant code to pair the observations. Below I test for whether the share of these pay changes for salaried employees and wage earners are independently distributed using Pearson's χ^2 -test.

Table 15: Cross tabulation of the plants according to the share of wage earners receiving cuts in the total pay and the share of salaried employees experiencing cuts in the total pay.

Plants categorised by share of wage cuts	Share of salary cuts			All plants	χ^2 (4df)/ Prob.
	No cuts	Small	Large		
1997-98					
Large	34.67	41.55	48.86	41.85	91.15 0.00000
Small	34.67	51.60	37.43	42.21	
No cuts	30.65	6.85	13.71	15.93	
Number of plants	275	438	350	1111	
1998-99					
Large	33.07	36.01	47.82	39.92	92.98 0.00000
Small	30.71	53.37	37.86	41.83	
No cuts	36.22	10.62	14.32	18.25	
Number of plants	319	386	412	1052	
1999-2000					
Large	34.08	38.69	45.24	39.47	54.09 0.00000
Small	33.76	49.25	34.01	39.66	
No cuts	32.17	12.06	20.75	20.87	
Number of plants	314	398	347	1059	

Table 15 confirms that cuts in the total pay of the wage earners have occurred more frequently in plants in which there are a higher proportion cuts in the total pay of salaried employees. More generally the proportions in the diagonal representing similar shares of changes for two groups tend to be larger than those outside the diagonal. The hypothesis H_5 is thus supported.

Changes in bonuses take place automatically but changes in time rate pay and in the fixed monthly salary are likely to require renegotiations. It has been concluded in earlier section that such changes are concentrated to certain plants.

In Table 16 it is tested whether also cuts in these pay measures are concentrated to the same plants for salaried employees and wage earners.

Table 16: Cross tabulation of the plants according to the share of wage earners receiving cuts in the time rate pay and the share of salaried employees experiencing cuts in the fixed salary.

Plants categorised by share of wage cuts	Share of salary cuts			All plants	χ^2 (4df) Prob.
	No cuts	Small	Large		
1997-98					
Large	23.83	24.68	40.51	25.26	28.72 0.00001
Small	24.94	45.45	18.99	26.09	
No cuts	51.23	29.87	40.51	48.65	
Number of plants	810	77	79	966	
1998-99					
Large	24.24	33.33	31.20	26.35	21.91 0.00021
Small	27.44	40.54	31.20	29.60	
No cuts	48.32	26.13	37.60	44.06	
Number of plants	656	111	125	892	
1999-2000					
Large	19.64	21.43	24.51	20.35	20.20 0.00046
Small	18.25	36.90	22.55	20.46	
No cuts	62.12	41.67	52.94	59.18	
Number of plants	718	84	102	904	

Table 16 shows that the relation between cuts in fixed salaries and cuts in time rate pay is significant but weaker than for cuts in total pay. However, due to the rareness of cuts in fixed salaries small plants with cut in the pay of only one person are strongly over-represented among the plants with a large share of cuts in fixed salaries. The results may therefore reflect effects related to the size of the plants. To avoid this problem and compare the distribution of cuts in time rate pay with less random cuts in the total pay of salaried employees, in Table 17 I cross-tabulate plants according to the share of cuts in the time rate pay and the share of cuts in the total pay of the salaried employees. The total pay of salaried employees is also more likely to respond to the performance of the plant.

Table 17 confirms that the frequency of wage cuts are related to the share of cuts in the total pay of salaried employees. However, in large proportions of those plants with a large share of salary cuts there are no cuts in wages. This might be a consequence of the small size of the plants.

To test whether the same relation exists for pay rises I also cross tabulate plants according to the share of pay rises of at least 10%. The categorisation of the plants are made on the basis of the proportion of pay rises relative to those in other plants and the cross tabulations are made for the same pay measures

Table 17: Cross tabulation of the plants according to the share of wage earners receiving cuts in the time rate pay and the share of salaried employees receiving cuts in the total pay.

Plants categorised by share of wage cuts	Share of salary cuts			All plants	χ^2 (4df) Prob.
	No cuts	Small	Large		
1997–98					
Large	23.65	23.56	28.85	25.26	44.01 0.00000
Small	15.88	36.44	23.61	26.09	
No cuts	60.47	40.00	47.54	48.65	
Number of plants	296	365	305	966	
1998–99					
Large	25.32	26.73	26.69	26.35	37.95 0.00000
Small	15.45	34.28	34.90	29.60	
No cuts	59.23	38.99	38.42	44.06	
Number of plants	233	318	341	892	
1999–2000					
Large	19.24	22.96	18.64	20.35	46.05 0.00000
Small	12.03	31.13	17.29	20.46	
No cuts	68.73	45.91	64.07	59.18	
Number of plants	291	318	295	904	

as for cuts. The three categories are plants with no pay rises of at least 10%, plants with a low share of pay rises of at least 10%, and plants with a high share of pay rises $\geq 10\%$. Table 18 shows that there are significant relationships for pay rises as well.

To enable an examination of the corresponding distribution for high increases in the time rate pay and fixed monthly salary the corresponding statistics for these are displayed in Table 19. There is once again a concentration to the diagonal meaning that wages have tended to rise to the same extent as salaries.

When the share of high rises in the total pay of salaried employees and the share of high rises in time rate pay are used for the categorisation of the plants for the cross tabulation in Table 20, the results are very similar to the corresponding results for cuts in Table 17.

There are other variables which might affect changes in pay. One such is the size of the plants. Especially one could imagine that the division of plants on the basis of their rank concerning the share of cuts in the salaried employees' pay leads to an underrepresentation of small plants among those plants with a small share of pay cuts. To test whether this has affected the results I make tests corresponding to those in cross tables above for plants in which there are at least 50 observations of pay changes for salaried employees and 50 observations of pay changes of wage earners (see Table 21). The main result of deleting small plants is such a large elimination of plants that the differences become

Table 18: Cross tabulation of plants with categorisation on the basis of the share wage earners receiving high increases in the total pay and the share of salaried employees receiving high increases in the total pay.

Plants categorised by share of wage rises $\geq 10\%$	Share of salary increases $\geq 10\%$			All plants	χ^2 (4df)/ Prob.
	No rises	Small	Large		
1997-98					
Large	29.45	35.06	44.85	37.09	99.37 0.00000
Small	26.18	49.66	30.67	37.18	
No rises $\geq 10\%$	44.36	15.28	24.48	25.72	
Number of plants	275	445	388	1108	
1998-99					
Large	35.74	34.88	49.07	39.49	65.74 0.00000
Small	30.72	50.24	34.78	39.58	
No rises $\geq 10\%$	33.54	14.88	16.15	20.93	
Number of plants	319	410	322	1051	
1999-2000					
Large	35.95	35.42	48.56	40.30	61.20 0.00000
Small	32.23	51.62	35.51	41.34	
No rises $\geq 10\%$	31.82	12.96	15.93	18.35	
Number of plants	242	432	383	1057	

Table 19: Cross tabulation of plants with categorisation on the basis of the share wage earners receiving high increases in the time rate pay and the share of salaried employees receiving high increases in the monthly salary.

Plants categorised by share of wage rises $\geq 10\%$	Share of pay increases $\geq 10\%$			All plants	χ^2 (4df) Prob.
	No rises	Small	Large		
1997-98					
Large	24.39	28.52	30.36	27.52	22.29 0.00018
Small	25.20	36.08	22.44	27.62	
No rises $\geq 10\%$	50.41	35.40	47.19	44.86	
Number of plants	369	291	303	963	
1998-99					
Large	25.38	21.13	31.17	25.62	53.21 0.00000
Small	15.48	38.11	28.57	25.62	
No rises $\geq 10\%$	59.14	40.75	40.26	48.76	
Number of plants	394	265	231	890	
1999-2000					
Large	29.12	26.56	39.30	31.15	51.04 0.00000
Small	22.35	43.93	28.79	31.49	
No rises $\geq 10\%$	48.53	29.51	31.91	37.36	
Number of plants	340	305	257	902	

Table 20: Cross tabulation of plants with categorisation on the basis of the share wage earners receiving high increases in the time rate pay and the share of salaried employees receiving high increases in the total pay.

Plants categorised by share of wage rises $\geq 10\%$	Share of pay increases $\geq 10\%$			All firms	χ^2 (4df) Prob.
	No rises	Small	Large		
1997-98					
Large	23.02	27.06	31.44	27.52	42.96 0.00000
Small	19.05	37.40	23.05	27.62	
No rises $\geq 10\%$	57.94	35.54	45.51	44.86	
Number of plants	252	377	334	963	
1998-99					
Large	24.13	25.47	27.27	25.62	42.63 0.00000
Small	15.03	36.16	24.48	25.62	
No rises $\geq 10\%$	60.84	38.36	48.25	48.76	
Number of plants	286	318	286	890	
1999-2000					
Large	29.91	25.07	38.53	31.15	47.52 0.00000
Small	19.64	42.17	28.13	31.49	
No rises $\geq 10\%$	50.45	32.76	33.33	37.36	
Number of plants	224	351	327	902	

insignificant. However, overall Hypothesis H_5 receives support from the cross tabulations of the wage changes for wage earners and the changes in salary for salaried employees.

Table 21: Cross tabulation of plants with categorisation on the basis of the share wage earners receiving cuts in the time rate pay and the share of salaried employees receiving cuts in the monthly salary. Only plants with at least 50 salaried employees and 50 wage earners included.

Firms categorised by share of wage cuts	Share of salary cuts			All plants	χ^2 (4df) Prob.
	No cuts	Small	Large		
1997-98					
Large	34.67	25.00	100.00	32.23	6.53 0.16299
Small	42.67	56.82	0.00	47.11	
No cuts	22.67	18.18	0.00	20.66	
Number of plants	75	44	2	121	
1998-99					
Large	33.96	43.24	35.71	37.50	1.26 0.86890
Small	45.28	43.24	42.86	44.23	
No cuts	20.75	13.51	21.43	18.27	
Number of plants	53	37	14	104	
1999-2000					
Large	29.03	26.47	0.00	27.00	4.63 0.32796
Small	30.65	44.12	25.00	35.00	
No cuts	40.32	29.41	75.00	38.00	
Number of plants	62	34	4	100	

Conclusion

The results indicate that there is a concentration of pay cuts to certain plants but also a concentration of high pay increases. Moreover, these cuts and rises are for wage earners to some extent concentrated to the same plants. The study thus supports the claim that there are some flexibility in wages but that they tend to be concentrated to certain plants.

These observations form a basis for other examinations of changes in pay. Further studies are required to identify the characteristics of the plants which implement pay cuts as well as of the employees, whose pay is cut in such wide-ranging pay cuts. One can also examine to what extent minimum wages block pay cuts for those employees with the lowest pay in the plants.

Further examinations should also include an investigation of the persistence of changes in pay. It seems likely that pay changes are less persistent in plants in which there is a larger variation in pay changes.

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