# Finland: firm factors in wages and wage changes*

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## 1 Introduction

This paper analyses the role of firm specific factors in the determination of salaries in the Finnish manufacturing industry. It comments on the Finnish data set included in this volume and reports some other and more detailed analyses on the determination of salaries and career patterns in Finnish manufacturing.

## 2 The Finnish data sets and tables

### 2.1 General

The principal data source contains payroll records of all firms that respond to the wage survey of the Confederation of Finnish Industry (TT). In 2000, these companies employed 500,000 employees which is about a third of all private sector employees in Finland. Most TT members are large firms in manufacturing and construction industries. The wage statistics cover roughly 70 percent of all employees in these sectors. The data are used to monitor wage growth in the manufacturing sector and national statistics on earnings growth in manufacturing and construction are based mainly on these data.

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The data also serve as an information base for collective wage bargaining between the unions and the employer organizations.

TT gathers information on blue-collar workers (who receive an hourly wage) from the last quarter of each year, and information on white-collar workers (who receive a monthly salary) from each December. Answering the survey is compulsory for the member companies with more than 30 employees. For smaller companies, answering is voluntary. The survey gathers information on all employees of the firm. Only the top management and those working abroad are excluded. In 2000, the data contain information on 255ă000 blue-collar and 172ă000 white-collar employees. The records are stored at individual level; each individual is identified by a personal identity code.

Currently, we have complete wage records for both the blue-collar and the white-collar workers from 1980 to 2002. The last years of data (1996-2000) have been used previously by ourselves and by other researchers in Finland. Data up to 1995 has previously been available only for a smaller sample of individuals. Comprehensive data covering all employees and al years has been used only recently, and only in a handful of mainly ongoing studies. Therefore, not much is known about the quality of the data that covers the 1980's and the early 1990's. Also, previous analyses have mainly used the white-collar and the blue-collar data separately. Combining white-collar and blue-collar worker data using firm identifiers is possible for the later years of data, but has not been previously done for the earlier period.

The wage statistics contain basic information on the employees and include details on all forms of compensation. The basic information on employees include age, sex, job category, education, industry, occupation and tenure (date of entry). Wage information differs somewhat between the blue-collar and the white-collar employees. The differences are mainly due to the fact that wages are calculated at the hourly level for the blue-collar workers and at the monthly level for the white-collar workers.

For both the white-collar and blue-collar workers the wages are reported in great detail. Data contain wages and hours divided into time-rate, piece-rate and partial piece-rate pay. Overtime pay, Sunday, and shift premiums, as well as, performance-related bonuses are reported separately. Most workers, therefore, receive compensation in several different forms. (For example, some time-rate pay, some piece-rate pay, and some overtime pay). For the purposes of this paper, we have defined wage as total compensation divided by total hours. To make the white-collar workers data comparable we have calculated the hourly wages based on the monthly wage and the usual weekly hours also for the white-collar workers.

The wage statistics contain a respondent code that reveals who provided

the wage information. Most often this respondent code refers to a plant. It is possible to create firm codes based on the respondent codes, essentially combining the respondent codes that refer to the same firm. For the last years of data, the procedure is reliable, for the early years we are less certain.

## 2.2 Details on variable definitions and the sample

In the main table supplement, we chose to analyze three years of data, namely 1981, 1990, and 2000. The motivation is to cover as long a time span as possible, skip the years that involve large changes in coding practice, and, at the same time, choose years that are comparable in terms of the business cycle (See table 1). For analyzing wage growth and entry rates, we calculate all statistics from year t-1 to year t. For exits, we calculate changes from the year t to the year t+1. Any restrictions on the firm size (?25 employees) will refer to the year t. Therefore, we do not require that a firm would have had at least 25 employees or even that a firm would have existed in year t-1 or year t+1.

Some employees appear several times in data. This may happen, for example, if the employee changes firms during the observation period, or if he has several employers simultaneously. For these employees we always select the observation that has most hours, and discard the other observations on the same person. We also require that an employee can be unambiguously identified and, therefore, delete any observations that do not have a valid personal id-number.

We calculate wages including all wage components (including bonuses, overtime, etc.) and divide the total wages by total hours. For white-collar workers we calculate hourly wages dividing monthly wages by the average number of weeks per month (365/7/12) and further dividing the result by usual weekly hours. All wages are deflated to year 2000 euros using the consumer price index1. To get rid of extreme observations (possibly errors), we delete all observations where the hourly wage is larger than three times the median, or less than a third of the median. This rather conservative trimming only affects approximately 0.5

We focus on full-time workers and therefore delete all observations where the usual weekly hours are less than 30. We make no restrictions by worker status and, therefore retain trainees and workers with very short contracts. Only after doing all the data cleaning we limit the sample to the firms that have at least 25 employees. Imposing the size limit has little effect on our data because only the firms with more than 30 employees (varies slightly by industry) are required to answer the wage survey. Note that in calculating statistics for the high-level and low-level jobs we make no additional restric-

tions to the sample. It is therefore possible that a firm has only one high-level worker.

## 2.3 Specific issues for tables on wage dynamics

We perform the same data cleaning procedure for the year t-1, with the exception that we do not require that the firm had 25 employees in the previous year. Nor do we impose any limits on the firms size for the year t+1 in calculating the exit rates. The wage growth for the workers that enter the firm as well as the wage growth by tenure are naturally defined using the information on the date when the employer was hired to the current firm. In general, all measures where the observation is a person are easy to define. In contrast, the measures where the observation is a firm can be defined in several ways. For example, we have calculated the "Average of firm average change in wage, observ = a firm" by calculating the firm averages in year t and t-1, taking the difference, and then the across firm average of these differences. In this calculation the firm does not necessarily have the same employees in both years. Equally well one could calculate the average growth of wages of individual workers by firm, and then take across firm average, but it is not clear how one should treat the employees that changed the firm between t-1 and t.

## 2.4 On low-level and high-level jobs

The Finnish data includes an occupation code for each employee. The new coding system also identifies a level for each job, but the older codes do not have such hierarchial structure. There is also a code for the job category3 that is different for each industry but constant within industries. These job categories are important for the wage bargaining as the union bargains typically set a minimum wage for each job category. In some sense the job categories are ideal for the analysis of the wage structures, because they are defined by the qualifications required for each job and they are independent of the characteristics of the worker. (Of course these categories are to some extent arbitrary: If the employer wishes to give a worker a rise, he can easily appoint a machinist to a senior machinist without the change in title implying any changes in the tasks).

Despite the appeal of the job categories, we chose to define high-level and low-level jobs based on the occupation codes. The main reason is that there is a lot less missing data on the occupation codes. We, therefore, calculated the mean wage for each occupation code, sorted the data according to these occupation mean wages, and defined the employees who have the occupation

mean wage on top 20 percent to be in the high-level jobs. It should be noted that in calculating entry and exit rates by quartiles and deciles, we first calculated the relevant percentiles at each firm and selected the high / low -level jobs after that. For example, top quartile, therefore, refer to top quartile of firm wages calculated over all employees in the firm, not just to top quartile of high-level jobs.

# 3 Wage setting institutions

As in other Scandinavian countries, union density is high in Finland. Union density increased fast in the 1960s and has even later on been going up rather steadily, reaching 82 per cent in 1992.

The Finnish pay bargaining system is a mixture of collective and individual mechanisms. The collective constraints put on the local bargains consist of two elements4. Firstly, unions in each industry have established minimum tariff wages for occupational categories and job levels. Secondly, in each bargaining round, the collective parties - i.e. an industrial union and its corresponding employer association - agree on a general wage increase that is as a general rule applied to all workers, regardless of their present wage level. The local parties can in principle deviate from that general wage increase, but a deviation requires the consent of both parties. Thus, in most cases, the general wage increase is rather mechanically applied to each person's wage. In that sense, the unions can effectively influence the speed of wage increases. The firms, on the other hand, can effectively affect the local wage structure: when recruiting a new worker, the wage can be set according to the firm's own personnel policy, as long as the wage exceeds the minimum tariff listed in the relevant collective agreement.

The general increases are formally negotiated at the industry-level between the worker and the employer organizations. Collective agreements cover even non-union members in the sectors where at least half of the employers belong to an employer organization. In practice, this implies that 95 percent of the workers in Finland are covered by the union contracts.

The central labour market organisations have no binding mandate for bargaining on behalf of their member associations. However, most bargaining rounds have started with negotiations between the central employer and employee confederations, creating a high degree of de facto co-ordination in the individual union contracts. The union bargains have then been negotiated, taking as a starting point the wage increases agreed upon in the central agreement. There has been considerable variation in the degree of centralization between the different bargaining rounds. During the period 1980 -

2002, there have been six bargaining rounds (1980, -83, -88, -94, -95, and 2000) when no central bargain was reached and bargaining occurred at the industry-level. The decentralised rounds usually generate a higher average rate of wage increases.

The comprehensiveness of centralized bargaining does not necessarily imply an extremely rigid wage structure. The firms also bargain locally with their employees. Wage drift, defined as the difference between union bargains and average actual wage increases, has accounted for approximately 40

Furthermore, various performance-related pay components have become common. In 2000, more than half of the white-collar and about a third of the blue-collar workers in the sample received some performance-related pay components other than traditional piece rate pay. On average, these components were 4.4 percent of the total pay. For white-collar employees, the inclusions of such performance-related pay elements into a total compensation measures imply a far higher likelihood of pay cuts than what an analysis of the monthly salary would imply.

# 4 Decomposing salaries and salary changes

In this section, we take a closer look at the variation of wages in the group of salaried employees. We lose some generality by leaving out time-remunerated workers, but can instead carry out more detailed analyses on employees. We exploit this by describing our variation measures for a all years 1980 through 2000.

Firstly, we report a variance decomposition for monthly salaries, through years 1980-2000. This analysis is rather descriptive but it permits comparisons with results from other countries. Furthermore, it permits comparisons in time. The following tables report an ANOVA decomposition for the log of the monthly wage, computed first using the raw logwages of all full-time salaried employees, and then after projecting the wages on three conventional covariates, namely education, age and gender.

We see, firstly, that the firm component is rather low, in comparison with simiilar analyses conducted on comparable data sets from other countries (eventual reference to other papers of the project). With an organised labour market, unexplained wage variation is low, a result that has in various guises been reported in many other analyses[1]. Secondly, we note that the firm component increases steadily. Measurement and classification changes can probably account for a part of this trend, but it is discernible from year to year even in years with unchanged classification schemes. The latter part of

[1] A classic reference is Holmlund and Zetterberg 1981

Table 1: *

Table 1: Variance decomposition for raw logsalary and residual logsalary, firms

| ANOVA for raw wage and residual wage | | | | | |
|---|---|---|---|---|---|
| year | sd, raw | between-Rsquare | sd, resid | between-Rsquare | n(firms) |
| 1980 | 0.36 | 0.03 | 0.24 | 0.04 | 548 |
| 1981 | 0.34 | 0.03 | 0.24 | 0.04 | 592 |
| 1982 | 0.34 | 0.03 | 0.24 | 0.04 | 654 |
| 1983 | 0.34 | 0.03 | 0.24 | 0.04 | 683 |
| 1984 | 0.34 | 0.03 | 0.24 | 0.04 | 695 |
| 1985 | 0.34 | 0.03 | 0.25 | 0.04 | 691 |
| 1986 | 0.34 | 0.03 | 0.25 | 0.05 | 691 |
| 1987 | 0.34 | 0.04 | 0.25 | 0.05 | 700 |
| 1988 | 0.34 | 0.04 | 0.25 | 0.05 | 748 |
| 1989 | 0.34 | 0.04 | 0.25 | 0.06 | 801 |
| 1990 | 0.34 | 0.10 | 0.26 | 0.13 | 2690 |
| 1991 | 0.33 | 0.10 | 0.25 | 0.13 | 2702 |
| 1992 | 0.33 | 0.10 | 0.25 | 0.13 | 2423 |
| 1993 | 0.32 | 0.10 | 0.25 | 0.12 | 1404 |
| 1994 | 0.32 | 0.11 | 0.21 | 0.12 | 1545 |
| 1995 | 0.32 | 0.13 | 0.21 | 0.13 | 1532 |
| 1996 | 0.31 | 0.12 | 0.21 | 0.11 | 1534 |
| 1997 | 0.33 | 0.20 | 0.22 | 0.16 | 1593 |
| 1998 | 0.33 | 0.27 | 0.23 | 0.18 | 1637 |
| 1999 | 0.33 | 0.27 | 0.23 | 0.19 | 1601 |
| 2000 | 0.33 | 0.29 | 0.24 | 0.21 | 1714 |

Table 2: *

Table 2: Variance decomposition for raw logsalary and residual logsalary, establishments

| | ANOVA for raw wage and residual wage | | | | |
|---|---|---|---|---|---|
| year | sd, raw | between-Rsquare | sd, resid | between-Rsquare | n(est.) |
| 1980 | 0.36 | 0.10 | 0.24 | 0.15 | 3551 |
| 1981 | 0.34 | 0.10 | 0.24 | 0.15 | 3601 |
| 1982 | 0.34 | 0.11 | 0.24 | 0.15 | 3736 |
| 1983 | 0.34 | 0.11 | 0.24 | 0.15 | 3791 |
| 1984 | 0.34 | 0.11 | 0.24 | 0.15 | 3837 |
| 1985 | 0.34 | 0.11 | 0.25 | 0.16 | 3865 |
| 1986 | 0.34 | 0.11 | 0.25 | 0.16 | 3858 |
| 1987 | 0.34 | 0.11 | 0.25 | 0.16 | 3872 |
| 1988 | 0.34 | 0.11 | 0.25 | 0.16 | 3840 |
| 1989 | 0.34 | 0.12 | 0.25 | 0.17 | 3869 |
| 1990 | 0.34 | 0.12 | 0.26 | 0.18 | 3988 |
| 1991 | 0.33 | 0.13 | 0.25 | 0.18 | 4117 |
| 1992 | 0.33 | 0.12 | 0.25 | 0.17 | 3636 |
| 1993 | 0.32 | 0.13 | 0.25 | 0.17 | 2289 |
| 1994 | 0.32 | 0.13 | 0.21 | 0.16 | 2550 |
| 1995 | 0.32 | 0.16 | 0.21 | 0.17 | 2660 |
| 1996 | 0.31 | 0.16 | 0.21 | 0.15 | 2635 |
| 1997 | 0.33 | 0.24 | 0.22 | 0.19 | 2679 |
| 1998 | 0.33 | 0.29 | 0.23 | 0.21 | 2664 |
| 1999 | 0.33 | 0.29 | 0.23 | 0.22 | 2574 |
| 2000 | 0.33 | 0.31 | 0.24 | 0.24 | 2695 |

the 1990s deserves attention in particular. That was a time of large migration between firms, associated with a rapid productivity growth and a reallocation of resources to the growing electronic industry (Maliranta 2000). These trends are reflected in the growth of the firm specific variance component.

The next table reports the same exercise, computed for establishments. Establishment codes generate a finer partition of the employee material, since one firm can consist of many establishments. Furthermore, there are less structural changes in the way establishments are coded.

It was argued above that the observed increase in firm-specific wage differentials is not necessarily in contradiction with the existing wage setting institutions, the main of which is to control the average growth of wages and salaries. We turn next to an analysis of the variation and level of salary increases.

Table 3: *

Table 3: Incidence of job changes and internal promotions

| | Prob of job change and internal promotion | |
|---|---|---|
| year | P(employer changes) | P(task changes) |
| 1980 | 0.05 | 0.06 |
| 1981 | 0.05 | 0.06 |
| 1982 | 0.06 | 0.07 |
| 1983 | 0.07 | 0.07 |
| 1984 | 0.07 | 0.07 |
| 1985 | 0.08 | 0.07 |
| 1986 | 0.15 | 0.07 |
| 1987 | 0.12 | 0.07 |
| 1988 | 0.13 | 0.08 |
| 1989 | . | 0.10 |
| 1990 | 0.08 | 0.07 |
| 1991 | 0.07 | 0.06 |
| 1992 | 0.08 | 0.07 |
| 1993 | 0.08 | 0.07 |
| 1994 | 0.05 | 0.06 |
| 1995 | 0.07 | 0.07 |
| 1996 | 0.00 | 0.08 |
| 1997 | 0.04 | 0.08 |
| 1998 | 0.05 | . |
| 1999 | 0.06 | 0.01 |

Table reports the relative frequencies of changing employer and, for those who do note change employer, the probability of a task change. The next table reports the mean year-to-year salary increases for all employees, and then separately for three groups: those who change employer, those who stay with their firm but change occupation, and those who carry on with the present occupation at the present firm.

The differences between these groups are in general very small, and the general wage trends dominate the wage changes in all categories[2]. A similar picture emerges from the next table, Table 5 which reports the coefficient of variation of the salary change in each group. Years 1991 through 1993 were depression years in which there was clearly more variation than in normal times. Interestingly, the high variability years 1991-1992 show more variation for those who stay in their jobs with unchanged occupations. Could it be that

[2]This calculation will be refined with a more thorough exploitation of tenure variables

Table 4: *

Table 4: Mean salary increases for job stayers and job changer, promoted job stayers and stagnant job stayers

| | Mean salary increases for four groups | | | |
|---|---|---|---|---|
| year | stayers | changers | occ. changes | occ. unchanged |
| 19801981 | 0.13 | 0.16 | 0.16 | 0.13 |
| 19811982 | 0.11 | 0.14 | 0.14 | 0.11 |
| 19821983 | 0.11 | 0.13 | 0.14 | 0.11 |
| 19831984 | 0.10 | 0.13 | 0.13 | 0.10 |
| 19841985 | 0.08 | 0.12 | 0.12 | 0.08 |
| 19851986 | 0.07 | 0.10 | 0.10 | 0.07 |
| 19861987 | 0.07 | 0.08 | 0.10 | 0.07 |
| 19871988 | 0.10 | 0.11 | 0.13 | 0.09 |
| 19881989 | 0.08 | 0.10 | 0.12 | 0.08 |
| 19891990 | 0.09 | 0.09 | 0.12 | 0.09 |
| 19901991 | 0.06 | 0.07 | 0.08 | 0.06 |
| 19911992 | 0.01 | 0.01 | 0.02 | 0.01 |
| 19921993 | 0.02 | 0.03 | 0.04 | 0.02 |
| 19931994 | 0.05 | 0.05 | 0.06 | 0.04 |
| 19941995 | 0.09 | 0.10 | 0.11 | 0.08 |
| 19951996 | 0.04 | 0.05 | 0.07 | 0.03 |
| 19961997 | 0.03 | . | 0.08 | 0.02 |
| 19971998 | 0.05 | 0.08 | 0.08 | 0.05 |
| 19981999 | 0.04 | 0.06 | 0.04 | . |
| 19992000 | 0.06 | 0.09 | 0.05 | 0.06 |

Table 5: *

Table 5: Coefficient of variation of salary changes

| | Coefficient of variation | | | |
|---|---|---|---|---|
| year | stayers | changers | occ. changes | occ. unchanged |
| 19801981 | 0.49 | 0.74 | 0.56 | 0.47 |
| 19811982 | 0.53 | 0.77 | 0.63 | 0.51 |
| 19821983 | 0.55 | 0.77 | 0.64 | 0.52 |
| 19831984 | 0.60 | 0.81 | 0.69 | 0.58 |
| 19841985 | 0.72 | 0.95 | 0.79 | 0.69 |
| 19851986 | 0.87 | 1.09 | 0.91 | 0.85 |
| 19861987 | 0.92 | 1.05 | 0.91 | 0.91 |
| 19871988 | 0.68 | 0.84 | 0.74 | 0.66 |
| 19881989 | 0.87 | 1.03 | 0.90 | 0.84 |
| 19891990 | 0.83 | 0.84 | 0.88 | 0.80 |
| 19901991 | 1.05 | 1.21 | 1.12 | 1.03 |
| 19911992 | 6.69 | 5.06 | 3.57 | 7.30 |
| 19921993 | 3.26 | 3.18 | 2.16 | 3.43 |
| 19931994 | 1.41 | 1.52 | 1.51 | 1.37 |
| 19941995 | 0.80 | 0.84 | 0.82 | 0.79 |
| 19951996 | 1.77 | 1.85 | 1.46 | 1.77 |
| 19961997 | 2.74 | . | 1.68 | 2.89 |
| 19971998 | 1.66 | 1.57 | 1.39 | 1.67 |
| 19981999 | 2.14 | 1.93 | 2.14 | . |
| 19992000 | 1.53 | 1.46 | 1.99 | 1.53 |

incomes were better protected in those firms in which a flexible reorganisation of occupations was effectuated?

Finally, table 6 reports an ANOVA decompostion of yearly salary increases, with firm means as the conditioning variable as in the first table. There, we can again see a clear trend towards a more firm specific determination of wage increases. The depression years stand out again, since these special years called for dramatic cost readjustments in some firms and not in others. It is quite interesting that such large shifts in variance components can occur within an unchanged institional framework for wage determination.

Table 6: *

Table 6: Decomposition of variance for salary increases, job stayers

ANOVA for salary increases

| year-to-year | sd | between-Rsquare |
|---|---|---|
| 19801981 | 0.06 | 0.03 |
| 19811982 | 0.06 | 0.03 |
| 19821983 | 0.06 | 0.03 |
| 19831984 | 0.06 | 0.03 |
| 19841985 | 0.06 | 0.03 |
| 19851986 | 0.06 | 0.03 |
| 19861987 | 0.06 | 0.07 |
| 19871988 | 0.07 | 0.05 |
| 19881989 | 0.07 | 0.03 |
| 19891990 | 0.07 | 0.09 |
| 19901991 | 0.06 | 0.10 |
| 19911992 | 0.05 | 0.10 |
| 19921993 | 0.06 | 0.12 |
| 19931994 | 0.06 | 0.15 |
| 19941995 | 0.07 | 0.19 |
| 19951996 | 0.07 | 0.08 |
| 19961997 | 0.08 | 0.10 |
| 19971998 | 0.08 | 0.07 |
| 19981999 | 0.09 | 0.09 |
| 19992000 | 0.09 | 0.09 |

# 5 Job and occupation transitions and career profiles

Finally, we characterize the career dynamics of a couple of cohorts of new entrants into the industry. We select two cohorts, one that enters the industry in 1981 and another that enters in 1987. We select all the entrants that were under 35 years of age in the initial year and who were not observable in the panel in the year preceding the initial year. From these cohorts, we further select all those who are observed in the industry for 12 consecutive years after the initial year. For each individual, we compute the sum of job changes within a current employer ("promotion") and a change of employer ("job transition"). We measure the effect of such cumulated changes on the relative position of the employee. To this end, start the analysis by computing, for each employee, his or her "permillentile" in the aggregate salary distribution; that is, the group of the employee when all employees have been ranked and then divided into 1000 groups. Our career variable is then the gain in the relative position of the employee during the 12 years of interest. This procedure abstracts from aggregate productivity shock and inflations shocks and other business cycle phenomena and focuses solely on the relative performance of the employee.

The following matrices report the average increase in the relative position of an employee, as a function of the number of promotions (horizontal direction) and job changes (vertical direction). For example, for the first matrix that concerns the 1981 cohort, we see that a person who has no such changes at all has an average climbed 82 permille points in the industry's salary distribution. If he/she has got one promotion but has stayed with the same employer, his gain is 160 points, and so on. The matrix below reports the headcounts of all "promotion" - "job transition" combinations, from year 1981 to 1993.

The two later matrices report a similar exercise for the 1987 cohort. It is interesting to note that the mean gain, in 12 career years, is very different in the two groups. The earlier group gained on average 140 promille points in the salary distribution, whereas the mean gain of the later group was almost twice as large, namely 257. We can only speculate on these differences. Both cohorts were hit by the depression of years 1991 through 1993. Otherwise, se can note that the earlier cohort did best when it stuck with one employer and aimed for promotions; in contrast, the later cohort that was soon hit by the depression, often did best by changing employer, a finding that rhymes with studies that have shown the large productivity effects of firm-to-firm job flows in the 1990s (see Maliranta 2000).

Table 7: *

Table 7: 1981 cohort wage gains as a function of external and internal promotions

$$\begin{pmatrix} 82 & 160 & 201 & 149 & 140 & 86 & . & 153 \\ 101 & 132 & 188 & 287 & 196 & 170 & 381 & . \\ 95 & 152 & 209 & 218 & 216 & 93 & -51 & . \\ 118 & 150 & 125 & 183 & 199 & . & . & . \\ 131 & 194 & 130 & 343 & 301 & . & . & . \\ 126 & 191 & 269 & . & . & . & . & . \\ 37 & 203 & 397 & . & . & . & . & . \\ 143 & -13 & 521 & 159 & . & . & . & . \\ 111 & . & . & . & . & . & . & . \end{pmatrix}$$

Table 8: *

Table 8: 1981 cohort headcounts according to number of external and internal promotions

$$\begin{pmatrix} 624 & 504 & 300 & 156 & 84 & 24 & 0 & 12 \\ 4752 & 2928 & 1284 & 648 & 120 & 60 & 24 & 0 \\ 5124 & 3780 & 1704 & 516 & 180 & 96 & 24 & 0 \\ 2916 & 2328 & 900 & 384 & 48 & 0 & 0 & 0 \\ 1044 & 1116 & 288 & 84 & 12 & 0 & 0 & 0 \\ 468 & 288 & 108 & 0 & 0 & 0 & 0 & 0 \\ 240 & 120 & 60 & 0 & 0 & 0 & 0 & 0 \\ 72 & 12 & 24 & 12 & 0 & 0 & 0 & 0 \\ 12 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

Table 9: *

Table 9: 1987 cohort wage gains as a function of external and internal promotions

$$\begin{pmatrix} . & 255 & 330 & 362 & 371 & 404 & . & . & . \\ 20 & 185 & 240 & 264 & 326 & 363 & . & 494 & 78 \\ 175 & 236 & 269 & 343 & 400 & 472 & . & . & . \\ 195 & 241 & 306 & 344 & 323 & 813 & . & . & . \\ 255 & 297 & 330 & 293 & 396 & . & . & . & . \\ 381 & 327 & 542 & 566 & . & . & . & . & . \\ 395 & 191 & . & 261 & . & . & . & . & . \end{pmatrix}$$

Table 10: *

Table 10: 1981 cohort headcounts according to number of external and internal promotions

$$\begin{pmatrix} 0 & 564 & 396 & 348 & 120 & 36 & 0 & 0 & 0 \\ 24 & 3324 & 1824 & 996 & 456 & 156 & 0 & 12 & 12 \\ 384 & 2268 & 1464 & 648 & 180 & 36 & 0 & 0 & 0 \\ 408 & 948 & 552 & 312 & 60 & 12 & 0 & 0 & 0 \\ 108 & 228 & 276 & 60 & 24 & 0 & 0 & 0 & 0 \\ 84 & 156 & 36 & 36 & 0 & 0 & 0 & 0 & 0 \\ 60 & 24 & 0 & 12 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

# 6 New pay forms and pay flexibility

We have so far confined our analyses to a narrowly defined base monhthly salary. However, in the 1990s, new pay forms related to firm profits or some group or firm performance measures became increasingly popular in Finnish manufacturing. This may due to two factors at least. Production technologies may evolve in a way that makes the measurement of individual performance more difficult at the same time when productivity comes increasingly to to depend on group performance. Another motivation for an increased use of performance related pay may be disinflation: when inflation is low, maintaining a given downward real wage flexibility necessitates a higher propensity of nominal pay cuts (see Macleod and Malcomson). Pay cuts are probably easier to carry out for such pay components as performance pay and profit sharing, since they are not regulated by collective agreements and are athe discretion of management.

In the context of this paper, one would expect that such new pay forms would also increase the firms specific component in wage variation.

We illustrate this with a table on the incidence of nominal pay cuts, computed for both narrowly defined monthly salary and the total salary which is a sum of the narrow salary and eventual performance pay.

Table 11 shows that this effect can be quite important for salaried employees. For hourly paid workers, there is no such effect and the incidence of pay cuts is fairly high to start with.

Finally, we conduct an analysis of variance for pay increases, this time separately for “narrow” and “wide” pay. The results are displayed in table 12, which shows that profit sharing and performance pay function as an increasingly important firm specific component of pay changes.

Table 11: *

Table 11: Probability of a wage cut from base year to next and the coefficient of variation of pay changes, both computed for narrow and wide pay, job stayers

Prob(salary cut) and CV(salary change), job stayers

| year | salary no PP | salary+PP | CV(salary no PP) | CV(with PP) |
|---|---|---|---|---|
| 9697 | 0.04 | 0.13 | 2.10 | 2.06 |
| 9798 | 0.02 | 0.07 | 1.21 | 1.23 |
| 9899 | 0.04 | 0.14 | 1.45 | 1.63 |
| 99100 | 0.02 | 0.06 | 1.04 | 1.11 |

Table 12: *

Table 12: Decomposition of variance for salary increases, computed for narrow and wide pay, computed for all employees in PP-firms

ANOVA for salary increases

| year-to-year | sd, narrow | between-Rsquare | sd, wide | between-Rsquare |
|---|---|---|---|---|
| 9697 | 0.06 | 0.11 | 0.07 | 0.15 |
| 9798 | 0.06 | 0.09 | 0.08 | 0.23 |
| 9899 | 0.07 | 0.10 | 0.08 | 0.21 |
| 99100 | 0.07 | 0.10 | 0.08 | 0.18 |

# 7 References

-to be added