



THE INDUSTRIAL INSTITUTE FOR ECONOMIC AND SOCIAL RESEARCH

WORKING PAPER No. 470, 1996

**THE WITHIN-JOB GENDER
WAGE GAP: THE CASE OF
SWEDEN**

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The Within-Job Gender Wage Gap, The Case of Sweden*

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October 23, 1996 (Preliminary First Version)

*This article is based on individual-level wage data made available by the main employer's association in Sweden, the Swedish Employer's Confederation (Svensk Arbetsgivarforening or SAF). We are grateful to Ari Hietasalo and Marianne Lindahl at SAF for their extensive and exceptionally expert cooperation in preparing these data for analysis. We also thank Karen Modesta Olsen at the Institute for Social Research, Oslo, who helped greatly in this study and who participated and was a coauthor of the earlier Norwegian study (Petersen et al. 1997). We are grateful for financial support from the Swedish Council for Research in the Humanities and Social Sciences (HSFR).

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TITLE

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ABSTRACT

For the U.S. and for Norway it has been established that men and women working in the same occupation for the same employer receive more or less the same pay. So-called within-job wage discrimination is hence not a driving force for the gender wage gap. We report a comparative and comprehensive empirical study of wage differences between men and women in the same detailed occupation within the same establishment for a European economy, Sweden. We report three striking findings. The first is that within-job wage differences are relatively small. When one compares men and women who work in the same occupation and establishment: Women on average earn 1.4% less per hour than men among blue-collar workers, while 5.0% less among white-collar workers. The second finding is that among white-collar workers it is occupational segregation which really accounts for the existing wage differences and that establishment segregation accounts for less, whereas among blue-collar workers the two types of segregation are about equally important. The third finding is that even the within-occupation gaps are relatively small, less than 5% and 7% among blue- and white-collar workers respectively. We conducted these analyses for the period 1970–1990 and the results are stable over time.

1 Introduction

Wage differences between men and women caused by discrimination can come about by several mechanisms (Petersen and Morgan 1995). In a first, women are differentially allocated to occupations and establishments that differ in the wages they pay. This may involve discrimination in the matching process at the point of hire, in subsequent promotions, and in firings. We call this process “allocative discrimination”. In a second, women receive lower wages than men within a given job or occupation within a given establishment. We call this process “within-job wage discrimination”. In a third, occupations held primarily by women are paid lower wages than those held primarily by men, although skill requirements and other wage relevant factors are the same, the issue addressed by *comparable worth*. We call this process “valuative discrimination”.

In allocative and within-job wage discrimination, the discrimination is against specific individuals. Both forms are illegal, in North America, Australia, and most European countries. In the U.S., the former is covered by Title VII of the 1964 Civil Rights Act, the latter by the Equal Pay Act of 1963 (Treiman and Hartmann 1981, pp. 1–7), with similar laws in Europe (Ellis 1991; Rhoads 1993). Valuative discrimination is discrimination against classes of jobs occupied primarily by women, but not discrimination against any specific individual. Its legal status is unclear in most countries.¹

These issues surrounding pay equality have been central for about 30 years, often seen as equally important to contemporary society as such rights as freedom of religion and equal opportunity regardless of race (e.g., Ellis 1991, p. 1). They are moreover international in scope, with similar concerns in North America, Europe, and Australia, with much diffusion and mimicking of practices between nations: During the last 30 years most First World countries have made within-job wage, as well as allocative discrimination illegal, as was done in the U.S. in 1963.²

One conjecture currently accepted by many researchers and policy makers is

¹Recent legislations in Canada (1991) and Sweden (1994) have opened up for pursuing valuative discrimination in the courts.

²For example, Great Britain passed an Equal Pay Act in 1970, which became effective in 1975, while Norway and Sweden passed such acts in 1978 and 1979. In the European Union, Article 119 of the 1957 Treaty made within-job wage discrimination illegal, but the actual implementation of the law was slower, speeding up in the 1970s with the passing of additional legislation (see Ellis 1991; Rhoads 1993, chap. 5).

that wage differences are today less a question of within-job wage discrimination and more a matter of allocative and valuative processes. For the U.S. case, but also with relevance for Europe and elsewhere, Treiman and Hartmann (1981, pp. 92–93) write: “Although the committee recognizes that instances of unequal pay for the same work have not been entirely eliminated, we believe that they are probably not now the major source of differences in earnings.” In Norway, during the debate prior to passing an Equal Pay Act in 1978 a female member of parliament from the socialist party stated: “What has been achieved is that men and women working for the same employer, doing the same work, receive the same pay. For this we do not need a new law. It has already been accomplished.” (see *Forhandlinger i Lagtinget 1977–78*, p. 70, our translation).

Except for one study covering the U.S., as well as one forthcoming study covering Norway (Petersen et al. 1997; see also Petersen, Becken, and Snartland 1994), it has however not been established that men and women receive more or less equal pay within given jobs or occupations in given establishments, or that within-job wage discrimination is less important. Petersen and Morgan (1995) analyzed wage differences between men and women employed in the same detailed occupation and establishment, using data collected by the U.S. Bureau of Labor Statistics covering about 1.5 million employees in the period 1974–1983. Within given occupation-establishment units, wage differences were relatively small: on average women earned 1.7% less than men among blue-collar and clerical employees, while on average 3.1% less in seven professional and three administrative occupations. Hence, in the U.S. within-job wage discrimination is no longer a central source for the gender wage gap.

Yet nothing is currently known, and might never be known on a large scale, about the extent to which these legal and other efforts have been successful elsewhere, whether within-job wage discrimination still is a significant source of wage differences in other countries.³

Against this broader background and against the results in Petersen and Morgan (1995), this article therefore reports a comparative and similar but more comprehensive analysis of data from the private sector in a European economy,

³In many countries within-job wage discrimination was not only legal but was in fact built into the institutional structure of the labor market, as in Australia and Great Britain where union agreements stipulated different rates for men and women doing the same work up until 1970, practices that have been made illegal since passing of equal pay acts. In Sweden separate wage lists for men and women were abolished in the period 1960–1965 (see SOU 1993, p. 169).

Sweden, partially replicating the Norwegian study (Petersen et al. 1997). We use data on entire populations of establishments in several important sectors of the Swedish economy, covering about 60% of employees in the private sector. We have access to individual-level wage data at the occupation-establishment level, so that we can compare men and women working in the same occupation in the same establishment.⁴ We analyze data from the period 1970–1990, including data from 1978 and 1980, one year before and one year after the passing of the equal pay act in 1979, thus being able to address some crucial historical trends.

Even though the theoretical questions we address are not deep, our contribution being mainly empirical, the implications of our findings are not shallow: They are unambiguous for policy, theory, and future research. And the knowledge provided can be gained only by analyzing the same type of data as done here, being inaccessible through more standard regression analysis of the wage gap based on for example national probability samples. It is the uniqueness of the data that allows the simple analysis that will follow, an analysis that in spite of being simple provides unambiguous answers to difficult questions.

Four issues will be addressed: (1) What is the wage gap at the occupation-establishment level? (2) What is more important for the raw wage gap, segregation on establishments or segregation on occupations? (3) What are the changes over a 20-year period in (1)–(2) above? (4) How does what is reported in (1)–(2) compare to the U.S. and Norwegian experiences, the only countries for which such studies have been conducted?

2 The Setting

Sweden may not be the most strategic research site for investigating these questions, chosen mainly because the unusual data needed for this kind of study was made available there and the fact that it appears to be the only country for which systematic over-time data is available, so that conditions over a 20-year period can be compared. It is however a country that is not without interest either, for several reasons.

First, an Equal Pay Act was passed in 1979, which became effective in 1980

⁴Although there is a substantial literature addressing the gender wage gap in Sweden and Scandinavia (e.g., for Sweden, Gustafsson 1989; le Grand 1991; Rosenfeld and Kalleberg 1991; see also SOU 1993; for Scandinavia generally, Westergård-Nielsen 1994; and for Norway, Birkelund 1992), no study addresses the gap at the level done here: the occupation-establishment level.

(see SOU 1993, pp. 49, 172), similar to the U.S. Equal Pay Act of 1963 and Title VII of the 1964 Civil Rights Act and also similar to equal pay legislation in the European Union as well as the Norwegian legislation from 1978 (Ellis 1991; Rhoads 1993; Petersen et al. 1997). Both before and after 1979 Sweden has pursued vigorous policies to diminish wage differences between men and women. The 1979 law made within-job wage discrimination illegal.⁵ The comparison of conditions in the period 1970–1990 and especially of the years 1978 and 1980, immediately before and after passing of the equal pay act in 1979, will be particularly interesting, giving information relevant both to theory and social policy.

Second, the legal systems and legal cultures in Sweden and Norway are quite similar but very different from those in the U.S., both generally and more specifically when it comes to enforcement of equal pay legislation, to which we return in our concluding discussion.

Third, and most distinctively, Sweden is a society with strong egalitarian traditions, allowing for much less inequality in pay than the U.S., but more than Norway (for the latter, see Høgsnes 1989).⁶ The countries are at opposite ends with respect to wage, income and other forms of inequality, so much to the extent that every Swede and Norwegian including quite young ones is familiar with the first commandment of the Law of Jante, proclaimed by a Danish-Norwegian novelist, meant to characterize part of Danish, Norwegian, and Swedish culture (Sandemose 1936, p. 77): “Thou shalt not believe thou *art* something.” And while this ‘law’ should in part be read as a call for humility, it is also about inequality and is understood as such, as an expression of the wide sentiment against it. As for comparative survey evidence on public opinion toward inequality, there is little on Norway but much on Sweden.⁷ In their comparison of Japan, Sweden, and the U.S., Verba et al. (1987, p. 363) conclude: “the most egalitarian group in the United States favors a wider in-

⁵The law was expanded in 1991 and 1994, but those are years not covered in our quantitative data analysis below.

⁶In his comparative study of Denmark, Norway, and Sweden, Esping-Andersen (1985, pp. 174, 176, 323) makes clear that Norway has had an “exceptionally aggressive drive for equality” and provides evidence showing considerably less income inequality between occupational groups in Norway than in Denmark or Sweden (see also OECD 1995a).

⁷Norway as well as Sweden are included in the 1992 version of the Ideology of Inequality module of the International Social Survey Programme (ISSP). Results from this cross-national survey have yet to be published. See Kelley and Evans (1993) for an analysis of the comparable 1987–88 survey.

come gap than that favored by the most conservative group in Sweden.” The perhaps most clear expression of the aversion against inequality one finds in the system of solidaristic wage bargaining in Sweden, which was particularly strong in the 1950–1983 period, where conscious attempts were made to minimize wage differences between various groups as well instituting the principle of equal pay for equal work and sometimes even equal pay for all (e.g., Edin 1993). But since 1983, when the central bargaining system collapsed, there has been a move toward less solidaristic and especially less rigid wage policies (SOU 1993, pp. 76–78). We ascertain whether this Swedish aversion against inequality also translates into smaller social differences between the sexes, addressing how the overall stratification system intersects with gender inequality.

Fourth, there is in Sweden great concern for equality of the sexes, which has had a particularly strong impact in the political sphere, with high levels of participation of women in government and political leadership.⁸ As for employment-related policies, this concern has been most pronounced in the area of family policies, where Sweden since the 1970s has had more aggressive and progressive policies than any other country. Maternity as well as paternity leave have been more extended than elsewhere, and child care is provided universally with a strengthening of policies since 1979 (see Kamerman 1988, 1991*a*, 1991*b*).⁹

All of these institutional arrangements should in principle facilitate the positions of women in employment and careers. There is however some disagreement about the extent to which this is the case. Some scholars argue that there is a major impact of the equal pay laws, of solidaristic wage bargaining, and of family policies on women’s position in the labor market and the gender wage gap (e.g., Gustafsson and Lantz 1985; Löfström 1989, 1991), while others claim that changes in women’s relative wages to a large extent are unrelated to these institutional changes, stressing instead such factors as technical changes and the demand for work requiring various levels of qualification which in turn may affect wage dispersions and the wage gap (e.g., Svensson 1992, 1995). Take the

⁸In 1990 the percent of women in legislative assemblies was 38%, higher than in other countries (Phillips 1995, p. 59).

⁹Sweden saw several changes in parental-leave policies and child-care provisions over the period 1970–1990. For example, the total leave period after childbirth was 7 months at 90% pay in 1975, increased to nine months in 1978, with fathers being able to share leave periods since 1974. In 1973, 11% of preschoolers had access to public child care, 38% in 1983, and 49% in 1988, at a subsidized rate (see Rösen and Sundström 1996). Fathers accounted for 7% of leaves taken in 1988 (OECD 1995*b*; see also Haas 1991), with much lower numbers in other European countries.

case of family policies, which are much more extensive in Norway and particularly Sweden than in the U.S. It is quite difficult to assess how such policies impact women's employment and career opportunities. The first order effect is straightforward, in that the policies make it easier to combine family and work, as when there is public provision of child care and jobs are protected during absences surrounding childbirth (Hoem 1992). But such policies also change incentives for families, making it cheaper to have children. So there may be a second-order effect on fertility, which in turn interacts with employment and career opportunities for women. For example, since passing of the Swedish maternity leave provisions of 1985, which gave 72 weeks of leave at 90% pay, there has been a sharp increase in fertility, with Sweden for a period having the highest fertility rate in Western Europe (e.g., Hoem 1993). The lower costs of having children thus led to an increase in the number of children born per women, which in turn may have been detrimental to employment and career development. It has in fact been suggested that the high level of maternity benefits is part of the reason for why Sweden has what appears to be a more sex-segregated labor market than other countries (Stoiber 1990; Hoem 1995).

3 Data

The wage data were collected and compiled by the Central Confederation of Employers (SAF), from their database on wage statistics, assembled from establishment-level personnel records. Compared to the Norwegian and the U.S. studies these data are even more extensive and detailed and contain information for all blue- and white-collar workers in every industry (except the insurance and banking industries) in the private sector within the SAF domain. Member firms have been providing information to the database since 1970 up to 1990, once or twice a year. The data have been used for inputs in the the yearly wage negotiations and are monitored not only by the SAF but also by the labor unions. They should be very reliable compared to information from standard sample surveys with personal reports of pay rates and hours worked.

The establishment characteristics include the following: detailed industry code; size (the number of employees); region and area within region. For each employee surveyed, information was obtained on method of wage payment (incentive- or time-rated), education, age, hours worked, part-time or full-time

employed, union status and if unionized the name of the union, and a detailed description of job content, usually a four-digit code. We shall refer to this job content information as occupational codes, although it might also be described as job titles. The occupational codes for the blue-collar workers are industry specific and are quite detailed, typically corresponding to the titles used in collective agreements. The white-collar occupations are less detailed, covering altogether 276–285 positions. It consists of 51 broad occupational groups. Within each group a further distinction is made with respect to the level of difficulty in the job, a code that in the data runs from 2 (high) to 8 (low), which for the present purposes has been recoded to 1 (low) to 7 (high). This so-called BNT-code was developed first in 1955 and has been revised several times since then (SOU 1993, p. 204). Its main purpose was to aid in the collection of wage statistics but not for setting wages for jobs and individuals. It is not unlike the salary grade level structure in use in many large U.S. organization (e.g., Spilerman 1986), where a salary grade level indicates the level of responsibility, qualification, and the like of the incumbent in the position, but without there being a strong tie between the grade level and the actual salary itself, though a clear correlation exist. The data for blue- and white-collar employees thus cover practically the entire occupational spectrum, including low and middle managers. An overview of the data is given in Table 1.

(Table 1 about here)

The wage data are reported in an unusually detailed manner. For each individual, the wages (as well as hours worked), are reported separately for those earned during regular hours and those earned during overtime hours. Furthermore, for employees receiving some incentive pay (piece-rate, bonuses, or commissions), the wages are specified separately for two components: baseline (i.e., fixed) pay and incentive pay. For blue-collar workers, the wages are given in hourly units, while for white-collar workers they are given as monthly pay.

The partition of the wage data into the part earned on regular hours and the part earned on overtime is very important, and also unusual, like in the Norwegian data. It makes the wage data less prone to bias than virtually every other study used for assessing wage discrimination. Men usually work more overtime hours than women, either due to preference for more overtime or due to better access to overtime hours, and overtime hours are usually paid at a

higher rate. The present data do not conflate pay at regular and overtime hours, focusing only on wages during regular hours.

As mentioned above, there is no lack of studies addressing the gender wage gap. There is however a lack of studies addressing this gap at the occupation-establishment level, the level most relevant for understanding one part of potentially discriminatory behaviors by employers. Doing so requires unusual data. We now highlight and summarize the three central features of the data used in this study.

First, in each of the industries studied, the data give information about a large number of establishments and all their employees, covering a large number of employees in a large number of establishments, for the entire population of establishments organized by SAF. This allows one to study intra- versus inter-establishment processes. In particular, it allows one to compare men and women in the same occupation and establishment. No other data set available or likely to be collected in the near future is so extensive in this regard. Usually, only a few workers are sampled within each establishment, making intra- versus inter-establishment comparisons infeasible. Or, if many workers are sampled within each establishment, only a few establishments are sampled, possibly making the data set specific to features of a few establishments.

Second, the wage data are unusually good. Most survey data record only monthly or annual earnings. In those cases one needs to impute wages from weeks worked and usual hours worked per week in the period earnings cover (see Stolzenberg 1975, pp. 651–52).¹⁰ This is likely to lead to some error, partly, as discussed above, in connection with the overtime versus regular hours issue. The Swedish, as well as the earlier Norwegian and U.S. wage data, in contrast, come from establishment records, are not subject to recall error, and ought to be extraordinarily reliable.

Third, few surveys obtain as detailed information on occupational characteristics as the one used here. It is based on the classifications developed by firms and the employer's associations in each of the sectors, usually coinciding with actual job titles. A job is customarily defined as a "particular task within a particular work group in a particular company or establishment performed by one or more individuals" (Reskin and Hartmann 1986, p. 9), while an occupa-

¹⁰The exchange rate for Swedish kroners hovered in 1995 around 1 U.S. dollar = 6.50 Swedish kroner and 1 German mark = 4.40 Swedish kroner.

tion is an aggregation of jobs. We use the term within-job wage discrimination but refer to the jobs interchangeably as jobs or occupations.

There is a question as to what is the appropriate level of detail for occupational or job titles, because if they get too detailed, the titles may just be indicators of wage levels rather than distinguishing the content of work performed. The titles in the present data do predominantly indicate content of work, including aspects of the amount of responsibility involved, such as whether the incumbent is in a position of leadership or supervision. It is naturally a question of judgement when titles are too fine versus too coarse. We have worked with these data over several years, have good knowledge of the occupational titles, and it is our judgement that these titles mostly correspond to distinctions about the kind of work performed and that they are not synonymous with wage levels. This claim we also support by statistics presented in the section on wages and positions below. Had we used broader job or occupational categories the gap would most likely have been larger. But given the goals of our analysis, there is no justification for using broader categories. The central intention of equal pay drives is that likes should be treated alike, but no claim is made for equality of unlikes, and as long as the titles delineate differences in content of work and responsibilities they should be treated as unlike jobs.

4 Methods

We report the relative wages between men and women at various levels, following Petersen and Morgan (1995, Sect. 3), with technical details given in the Appendix. For each sector we first compute the average female wage as percentage of the average male wage, where, for example, the number 88% means that on average women earn 12% less than men. The relative wages we then decompose in four ways, separately by sector. We start by computing separately for each industry, each occupation, each establishment, and each occupation-establishment pair the average female wage as percentage of the average male wage. This can only be done for industries, occupations, establishments, and occupation-establishment units that are sex integrated. For example, at the occupation-establishment level we compute the average female wage as percentage of the average male wage in each sex-integrated occupation-establishment pair. Next, we compute the average of these relative wages across the sex-

integrated units within a level, that is, for industries, occupations, establishments, and occupation-establishment units. For example, at the occupation-establishment level, we compute the average of the relative wages at that level across the sex-integrated occupation-establishment pairs in the sector.¹¹

These computations give the average relative wages for each of four levels: industry, occupation, establishment, and occupation-establishment. The wage gap itself obtains as 100 minus the relative wages. We additionally report the percent of the raw wage gap explained separately by each of the four levels.¹²

The average wage gap at the occupation-establishment level gives an estimate of an upper bound on the amount of within-job wage discrimination, the quantity at the greatest interest here. But also the within-occupation and within-establishment gaps are of interest, as they document the extent to which differential distribution of men and women on occupations and establishments can account for the overall gender wage gap.

5 Wages and Positions

One issue requires attention before presenting our results. In Sweden, Norway and in most European countries, firm-internal wage structures are quite rigid: To each position a fixed wage or salary is often attached. Somewhat facetiously one may say that European personnel managers in many ways act as if they were Weberians, following his description of a bureaucracy where the sixth characteristic reads (Weber [1922–23]1978, p. 220): “They are remunerated by fixed salaries in money...”

This is quite foreign to practices in the U.S., where within given occupations or jobs for the same employer, there typically is a wide range in pay. Equally facetiously and no doubt stretching ideas one may hence say that U.S. personnel managers in many ways act as if they were Marxists, adhering to his description

¹¹We have tried a variety of alternative decomposition weights, with only negligible changes in the qualitative pattern of our results. For example, at the occupation-establishment level, we computed the average relative wages weighting the relative wages in each sex-integrated occupation-establishment pair with respectively the proportion of workers, of male workers, or of female workers that is employed in the integrated occupation-establishment pair. The basis for the proportion is the number of workers, of males, or of females employed in integrated occupation-establishment pairs in the given sector.

¹²This is computed by first by taking the difference between the raw relative wages and the relative wages at the level in question, then dividing this difference by 100 minus the raw relative wages, and finally multiplying the ratio with 100, as in Petersen and Morgan (1995). See equation (6) in the Appendix.

of work and rewards under capitalism and the first stage of communism as laid out in the *Critique of the Gotha Program* (Marx [1875]1972, pp. 15–17), paraphrased as: From each according to ability, to each according to contribution.

Against this background, noticeably different from the U.S. system, one may object to our research, as in fact several Swedish researchers and policy makers initially did, that once we focus on wages at the occupation-establishment level there is by definition or by practice no variation in pay. Everyone will receive the same pay, so our analysis becomes tautological. We therefore address this concern, reporting the amount of wage differentiation that occurs within the occupations and occupation-establishment pairs we analyze.

We report the percentage range in wages at the occupation and the occupation-establishment level. We first computed how many percent the highest wage was above the lowest wage in each occupation and each occupation-establishment pair. Thereafter we took the average of this percent across all occupations and all occupation-establishment pairs, for each of the six sectors.

The results are reported in Table 2, for blue- and white-collar workers in panels A and B respectively, separately for each year. Columns 1 and 2 give the average of the percentage ranges within occupations, first for all occupations and next for sex-integrated occupations. Columns 3 and 4 give the same averages at the occupation-establishment level, first for all occupation-establishment pairs and next for sex-integrated pairs.

(Table 2 about here)

Table 2 shows in a striking way that there is considerable variation in wages at the occupation and the occupation-establishment level, in all years. The variation is always larger at the occupation level. It is also larger in units that are sex integrated, at the occupation and the occupation-establishment levels. The range is three to twelve times larger at the occupation level than at the occupation-establishment level. At the latter level, which is most relevant here, the average of the percentage range among blue-collar workers in 1990 was 20% across all units, while 28% among units that were integrated by sex. The corresponding numbers among white-collar employees were 24% and 35%. This means that the best paid person on average earned 20–35% more than the lowest paid person, a considerable range. We have shown that variation in pay at the

occupation-establishment level is possible and does occur even in Sweden.¹³

The range in wages is somewhat higher among white- than among blue-collar workers, perhaps reflecting the coarser occupational titles among the former or perhaps greater flexibility in pay among such employees. Over time, the range at the occupation-establishment level declined from 1970 to 1985 but then increased somewhat between 1985 and 1990, though not reaching the same level as in 1970. This development clearly reflects compression of wages at the occupation-establishment level in the period. Among blue-collar workers such compression also occurred at the occupation level, but with an increase in the range between 1985 and 1990, reflecting an increase in wage differentiation within occupations, reaching the same level as in 1970.

These results show that our occupational titles which are quite detailed nevertheless are not synonymous with wage levels, a question addressed more abstractly in the section describing the data above.

6 The Wage Gap

Earlier investigations have shown that the average wage of females is about 24% below that of men in Sweden (e.g. Gustafsson 1989; le Grand 1991; Rosenfeld and Kalleberg 1991; SOU 1993; Chen and Edin 1994; Westergård-Nielsen 1994). We focus on employees in the private sector, showing a similar gap. In 1990, women on average earned 12.8% and 27.8% less than men among blue- and white-collar workers respectively (see Tables 3-4).

Tables 3-4 report averages of the relative wages as well as various measures of dispersion for blue- and white-collar workers respectively, for each of six years between 1970 and 1990. For each year, column 1 gives the average female wage as a percentage of average male wage: overall (line 1), and by industry, occupation, establishment, and occupation-establishment respectively (lines 2-5). Equations (1)-(5) in Appendix were used for computing the ratios. Column 2 gives in lines 2-5 the percentages of the raw wage gap explained by industry, occupation, establishment, and occupation-establishment respectively, from equation (6) in Appendix. Columns 3-5 give standard deviations, minimum and maximum values for the numbers that were used to compute the figures in column 1. Column 6, denoted N , gives in line 1 the total number of employees in

¹³Petersen et al. (1997) show similar results for Norway.

the year, while lines 2–5 give the number of sex-integrated units, that is, the number of units where both men and women are employed in the same industry, same occupation, same establishment, and same occupation-establishment respectively. The number of women and men used for computing the ratios in column 1 are given in columns 7–8. To illustrate, consider the occupation-establishment level (line 5) for blue-collar workers in 1990. There are 16,704 sex-integrated occupation-establishment units (column 6), employing 153,375 women and 220,454 men (columns 7–8), a total of workers 373,829. From line 1 column 6 we see further that there were 643,349 blue-workers in 1990. Hence, a total of 269,520 ($=643,349 - 373,829$) or 42% of the workers are excluded from the computation of the wage gap at the occupation-establishment level because they worked in units that were entirely segregated by sex.

(Table 3 about here)

(Table 4 about here)

Focusing on blue-collar workers in 1990, there are three striking results in Table 3. The first is that the wage gap is quite small when we compare men and women working in the same occupation for the same employer, in 1990 1.4%.¹⁴

The second result is that occupational segregation is somewhat but not much more important for the gender wage gap than establishment segregation, meaning that differential allocation of men and women on establishments accounts for a smaller portion of the wage gap. The percent of the gap explained by establishment segregation is 67.6 while the percent explained by occupational segregation is 73.6. This is quite similar to what was found in Norway (Petersen et al. 1997), for blue-collar workers, where occupation explained 93% and establishment 91% of the wage gap.

The third result is that the within-occupation gap relatively small, less than 10%. This reflects that within an occupation, wage levels are rather uniform across firms. So even if men and women are differentially distributed across firms, this does not necessarily translate into a large wage gap as long as occupation is held constant. We shall return to this in our concluding discussion.

¹⁴The overall pattern of these results is also replicated in a regression analysis, using so-called fixed-effects models for the occupation-establishment level. These models add no new information relative to the more translucent descriptive results in Table 3, as was also the case in Petersen and Morgan (1995).

Turning next to white-collar employees in 1990, Table 4 shows a wage gap at the occupation-establishment level of 5.0%, with an overall gap of 27.8%. The gap is thus bigger among white- than blue-collar workers. But note that the occupational classification among white-collar workers in Sweden is coarse. It encompasses 276 positions across the entire occupational spectrum and across rather diverse industries. Thus we probably have a major overestimate of the actual gap at the occupation-establishment level. Among white-collar workers the role of occupational segregation is more important than among blue-collar workers, whereas establishment segregation is of little importance.

The conclusion is straightforward: Within-job wage discrimination is in Sweden, as in Norway and the U.S., no longer a central force in explaining the gender wage gap.

Changes Over Time

For Sweden we have a consistent and long time series for the wage gap, for every five years from 1970 through 1990 plus for 1978 the year prior to the passing of the Swedish equal pay act in 1979.

Focusing first on blue-collar workers, it is striking that the major changes in the occupation-establishment level wage gap occurred between 1970 and 1978, when it dropped from about 5% to its current level of about 1.5%, with a small but steady decline from 1978 through 1990. Much the same is the case for white-collar workers, where the major drop occurred between 1970 and 1975, except that here the occupation-establishment gap never became as small as among blue-collar workers. As argued above this is most likely an artifact of the data; the occupational classification is too crude. Thus the major changes in the wage gap occurred prior to passing of the law making within-job wage discrimination illegal. One may speculate whether employers adapted to anticipated changes in legal environments, coming into compliance with the law prior to its implementation.

7 Discussion

We have reported a large-scale empirical investigation of wage differences between men and women working in the same occupation for the same employer in Sweden over the period 1970–1990, providing comparative results to an ear-

lier U.S. study (Petersen and Morgan 1995) as well as to a Norwegian study (Petersen et al. 1997).

We report three striking results, focusing on the year 1990. The first is that the wage gap is quite small when we compare men and women working in the same occupation for the same employer: At the occupation-establishment level, the gap is lowest among blue-collar workers, about 1.4%, while it is larger among white-collar workers, about 5%. But this larger gap probably reflects that the occupational codes among white-collar workers are cruder than those we have access to among blue-collar workers.

We underline that these results are novel. More specifically, as we now shall elaborate, they could not be obtained from standard regression analysis of data from national probability or similar samples. In the latter, the real mechanisms are obscured. One compares men and women working in broadly similar occupations but invariably in different firms. A large wage gap is usually found and the researcher often concludes that there is wage discrimination, implicating that men and women doing the same work for the same employer are paid differentially. But no such conclusion can be had and the analysis is inconclusive. All they show is that men and women doing broadly similar kinds of work with about the same amount of education and experience, tend to earn different wages. But this does not imply that the differential pay is the outcome of any given employer treating men and women differentially. Such results may as well reflect that men and women tend to work for different employers. But more importantly, the occupational classifications used are mostly too broad to allow much inference regarding discrimination.

The second result is that among white-collar workers, establishment segregation is dramatically less important for the gender wage gap than occupational segregation, each explaining 9% and 82% of the gap respectively, meaning that differential allocation of men and women on establishments does not account for a large portion of the wage gap. Among blue-collar workers in contrast establishment segregation is quite important for the wage gap. Once one takes into account the distribution of employees on establishments, the wage gap drops to about 4%. This means that men tend to work in establishments with somewhat higher wage levels. But note that this may also be due to those establishments employing people in predominantly high-paying occupations, so that after all, the observed establishment effect may be an occupational effect.

The third result is that the within-occupation gaps are relatively small, less than 5% among blue-collar workers and less than 7% among white-collar employees. This reflects that within an occupation, wage levels are rather uniform across firms. Since the 1950s it has been an objective of the central labour union to make wages in a given line of work or occupation independent of who you are and where you work. With respect to the female wage gap, it thus is less a matter of where women work than what they do. The low within-occupation wage gaps clearly reflect the effects of solidaristic wage bargaining: equal pay for equal work.

We also compared conditions over a 20-year period, probably having the most consistent time-series for any country, for every five years from 1970 through 1990 plus for 1978 the year prior to the passing of the Swedish equal pay act.

Focusing first on blue-collar workers, it is striking that the major changes in the occupation-establishment level wage gap occurred between 1970 and 1975, when it dropped from about 5% to about its current level of 1.5%, with a small but steady decline from 1978 through 1990. Much the same is the case for white-collar employees except that here the occupation-establishment gap never became as small as among blue-collar workers. As argued above this is most likely an artifact of the data; the occupational classification is too crude.

Comparing Sweden to the U.S., at the occupation-establishment level we have found about the same gender wage gaps among blue-collar workers but somewhat larger gaps among white-collar employees (see Petersen and Morgan 1995). The results for Sweden closely parallel those for Norway, with somewhat smaller gaps in Sweden (see Petersen et al. 1997). The contrast to the U.S. is surprising given the higher flexibility of pay there than in Sweden, Norway and Europe elsewhere. One should expect that greater flexibility in pay would lead to larger wage gaps. But that is not what we found, rather the opposite. This difference between the U.S. on the one hand and Sweden and Norway on the other, albeit small, may reflect several factors. One may be dissimilarities in the occupational classifications used in the countries, where perhaps the Swedish and also Norwegian classifications are based on broader categories which in turn will translate into a larger gap, as well as the fact that the Swedish and Norwegian data comprise a larger spectrum of the occupations than the U.S., where the gap may be higher in more managerial, administrative,

and professional occupations. This issue is not easy to settle because detailed occupational classifications are difficult to compare across countries. Another reason may be that an Equal Pay Act has been in operation for a longer time in the U.S. than Sweden and Norway, so there has been more time to deal with this type of inequality. A third reason may be differences in the legal systems and legal cultures in the countries, the U.S. for one being considerably more litigious putting employers at higher risk of being sued and hence possibly more on guard. But perhaps more importantly, in Sweden and Norway (Stabel 1991), equal pay cases typically are and have to be initiated vis-à-vis the legal system by individuals, as in Britain (Wilborn 1989), whereas in the U.S. some proportion of cases are brought to the courts as class action suits often covering large groups of employees (see Rhoads 1993). And even though few class action suits are currently being filed, down from 1,106 in 1975 to 51 in 1989 (Donohue and Spiegelman 1991, p. 1019), these were important in the 1974–1983 period covered in the data analyzed by Petersen and Morgan (1995), may still cover a large number of individuals and act as a deterrent. This creates a legal climate where the costs of litigation and of subsequent conviction can be high for employers and hence the deterrents against discrimination are stronger. In contrast, between 1980 and 1991, Sweden had only one equal pay case concerning within-job wage discrimination tried in the Work Courts (see SOU 1993, p. 49).

As the wage gap at the occupation-establishment level is quite small in the three countries, within-job wage discrimination is no longer a driving force for wage differences between men and women. This conclusion is likely to hold also for many other European countries. Although there are large differences in industrial and organizational structures and cultures between European nations, Swedish and Norwegian (Due 1991) equal pay laws are very similar to those in the European Union (see Ellis 1991; Rhoads 1993). There may also be great variations in enforcement of such laws, but as within-job wage discrimination is the most straightforward to deal with, this is the form that most likely is the least important. One should expect the Swedish and Norwegian cases to be most similar to other Scandinavian and Central European countries as well as to the United Kingdom.

Regarding the relative importance of establishments versus occupations in explaining the wage gap, some informative juxtaposition between Sweden, Norway and the U.S. can be made, even though the data are not entirely compa-

rable. The sector blue-collar workers in Sweden and Norway is quite similar to the eleven U.S. manufacturing industries used in part of the analysis in Petersen and Morgan (1995, Table 2), where the latter mostly cover blue-collar workers. In Sweden, the percentages of the raw wage gap explained by occupation and establishment respectively are 73.6% and 67.6%, while in Norway they were 45.8% and 22.1%, and in the U.S. they were 47.4% and 27.0% (using an unweighted average across the 11 industries). In all three countries segregation on occupations is more important than on establishments, but both are more important in Sweden than in the two other countries. For white-collar employees, the situation is quite similar across the three countries. Occupation explains a major part of the wage gap and establishment very little, again with establishment segregation appearing to be somewhat more important in Sweden and Norway than in the U.S. In all three cases, a redistribution of men and women on occupations will have a larger impact on the overall wage gap than a redistribution on establishments. Among white-collar workers in Sweden in 1990, the overall wage gap would drop from 27.0% to 6.6% with a redistribution on occupations, while only to 24.6% with a redistribution on establishments.¹⁵

We were somewhat perplexed by the similarities between the countries in this respect, that establishment had about the same or even larger impact on the wage gap in Sweden and Norway than in the U.S. It may be instructive to reflect briefly on the source of our surprise here, though without being able to offer a resolution.

Sweden and Norway are highly egalitarian societies: Wage differences between firms and sectors in the economy are quite restrained, where at times even the government interferes when some industry or set of firms moves too far out of alignment with other industries or firms, which can be done through the annual wage negotiations (for Norway, see Høgsnes 1989).

Under such institutional arrangements one would expect establishment segregation to be considerably less important in Sweden and Norway than the U.S., because similar structures are absent in the U.S. But that is not what we found. So although firms or establishments matter for the wage gap in the

¹⁵These computations hold under two conditions. In the case of occupation, but with similar conditions in the case of establishment, we assume that (a) men and women get to be equally distributed on occupations and (b) the wage gap within each occupation is the same across all occupations, equal to the average wage gap across occupations. For how to compute the overall wage gap after redistribution of men and women on occupations but allowing for a wage gap that varies by occupation, see equation (8) in Appendix.

three countries, it really is occupations and the matching of occupations and establishments that drive the gap. Ironically, with respect to the relative importance of occupations versus establishments for the gender wage gap, the same outcome is achieved in the three countries: In Sweden and Norway this is in part through concerted coordination attempting to minimize wage differences between establishments, in the U.S. through market competition. This clearly warrants further speculation, but not in the present article.

As for research and policy, the implications of our findings are straightforward. Research as well as policy should focus less on studying within-job wage discrimination and more on studying differential access to occupations and establishments, differential rates of promotion, and differential rates of pay for lines of work done primarily by women. The analysis of differential access requires addressing the hiring process, in terms of procedures for recruitment, for who receives offers and who does not, and for conditions offered among those who receive offers of employment, a process that hardly has been studied (see e.g., Granovetter 1995 [1974]; Collinson, Knights, and Collinson 1990). The analysis of promotion processes is more developed (e.g., Spilerman 1986; Rosenfeld 1992), but has not been extensively studied, while the analysis of valuative discrimination, the differential pay in occupations held primarily by women, has been carefully addressed in a large number of studies in many countries (see, e.g., England 1992). These two other forms of discrimination, allocative and valuative, are obviously harder to deal with, but that is also where the highest payoff can be realized, which clearly is of importance for policy, but with relevance for research as well.

Appendix

We give the equations used for computing the decompositions in column 1 of Tables 3 and 4. The average wages for women, for men, the relative wages, and the number of sex-integrated units [only in (2)–(5)] are given by (1) in a sector, \bar{w}_f , \bar{w}_m , and $w_{(r,r)} = \bar{w}_f / \bar{w}_m$; (2) in industry b , $\bar{w}_{b,f}$, $\bar{w}_{b,m}$, $w_{b,r} = \bar{w}_{b,f} / \bar{w}_{b,m}$, and $N_{b(I)}$; (3) in occupation o , $\bar{w}_{o,f}$, $\bar{w}_{o,m}$, $w_{o,r} = \bar{w}_{o,f} / \bar{w}_{o,m}$, and $N_{o(I)}$; (4) in establishment e , $\bar{w}_{e,f}$, $\bar{w}_{e,m}$, $w_{e,r} = \bar{w}_{e,f} / \bar{w}_{e,m}$, and $N_{e(I)}$; (5) in occupation-establishment pair oe , $\bar{w}_{oe,f}$, $\bar{w}_{oe,m}$, $w_{oe,r} = \bar{w}_{oe,f} / \bar{w}_{oe,m}$, and $N_{oe(I)}$.

The *raw* relative wages between men and women is given as the ratio of average women's to average men's wages (multiplied by 100):

$$w_{(r,r)} = \frac{\bar{w}_f}{\bar{w}_m} \times 100. \quad (1)$$

The relative wages controlling for industry obtains as

$$w_{(b,r)} = \frac{1}{N_{b(I)}} \sum_{b=1}^{N_{b(I)}} w_{b,r} \times 100 = \frac{1}{N_{b(I)}} \sum_{b=1}^{N_{b(I)}} \frac{\bar{w}_{b,f}}{\bar{w}_{b,m}} \times 100. \quad (2)$$

The relative wages controlling for occupation, obtains as

$$w_{(o,r)} = \frac{1}{N_{o(I)}} \sum_{o=1}^{N_{o(I)}} w_{o,r} \times 100 = \frac{1}{N_{o(I)}} \sum_{o=1}^{N_{o(I)}} \frac{\bar{w}_{o,f}}{\bar{w}_{o,m}} \times 100. \quad (3)$$

The relative wages controlling for establishment obtains as

$$w_{(e,r)} = \frac{1}{N_{e(I)}} \sum_{e=1}^{N_{e(I)}} w_{e,r} \times 100 = \frac{1}{N_{e(I)}} \sum_{e=1}^{N_{e(I)}} \frac{\bar{w}_{e,f}}{\bar{w}_{e,m}} \times 100. \quad (4)$$

The relative wages controlling for occupation-establishment obtains as

$$w_{(oe,r)} = \frac{1}{N_{oe(I)}} \sum_{oe=1}^{N_{oe(I)}} w_{oe,r} \times 100 = \frac{1}{N_{oe(I)}} \sum_{oe=1}^{N_{oe(I)}} \frac{\bar{w}_{oe,f}}{\bar{w}_{oe,m}} \times 100. \quad (5)$$

The percentage of the raw wage gap—that is, 100 minus $w_{(r,r)}$, where $w_{(r,r)}$ comes from (1)—due to occupation-establishment segregation alone is given by

$$\%w_{(oe,r)} = \frac{w_{(oe,r)} - w_{(r,r)}}{100 - w_{(r,r)}} \times 100. \quad (6)$$

The percentage due to industry, occupation, or establishment alone, obtains by replacing $w_{(oe,r)}$ in (6) with $w_{(b,r)}$, $w_{(o,r)}$, or $w_{(e,r)}$.

One interpretation that can be given to the measures in (3)–(5) is this. In the case of occupation, with similar interpretations for establishment and occupation-establishment, equation (3) gives the overall wage gap one would observe if (a) men and women were equally distributed on occupations and (b) the wage gap within each occupation is the same across all occupations, equal to the average gap across occupations, $w_{o,r}$ from (3).

The assumption made in (b) above, that the wage gap within each occupation is the same across all occupations, equal to the average gap across occupations, namely $w_{o,r}$ from (3), amounts to the relationship

$$\bar{w}_{o,f} = \frac{1}{100} w_{(o,r)} \cdot \bar{w}_{o,m}. \quad (7)$$

If instead one wants to see what the overall wage gap would be like with equal distribution of men and women on occupations, but where the gap within an occupation varies across occupations, one would have to proceed as follows. Let $\pi_{o,m}$ be the proportion of the men who are in occupation o . With women having the same distribution on occupations as men, we get that the overall wage gap, which we can call $w_{r,r}^*$, would be

$$w_{(r,r)}^* = \frac{\sum_{o=1}^{N_o(I)} \pi_{o,m} \cdot \bar{w}_{o,f}}{\sum_{o=1}^{N_o(I)} \pi_{o,m} \cdot \bar{w}_{o,m}} \times 100. \quad (8)$$

Inserting the right-hand side of (7) into (8) yields that $w_{(r,r)}^*$ equals $w_{(o,r)}$. In (8), one could use other distributions on occupation than the male distribution, for example, the marginal distribution on occupation.

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TABLE 1
Documentation of Data for Blue- and White-Collar Workers, By Year, in Sweden

Sector	N		N_m	$\%f$	N_o	N_e	N_{oe}	N_b	\bar{w}	\bar{w}_f	\bar{w}_m
	1	2									
BLUE-COLLAR WORKERS											
1990	643,349	188,540	445,809	29.7	1,849	23,544	87,640	23	64.10	58.99	67.69
1985	626,601	179,235	447,366	28.6	2,070	24,165	89,334	22	44.60	41.08	46.01
1980	676,323	185,648	490,675	27.4	2,482	24,916	95,917	22	29.15	26.70	30.07
1978	646,466	167,589	478,857	25.9	1,926	23,939	94,401	20	26.05	23.79	26.83
1975	644,540	171,183	473,357	26.6	1,832	19,290	86,227	18	19.02	17.21	19.68
1970	583,963	139,146	444,817	23.8	1,438	18,049	80,592	19	11.25	9.70	11.74
WHITE-COLLAR WORKERS											
1990	391,997	135,581	256,416	34.6	280	22,031	146,940	32	92.71	74.63	102.27
1985	380,513	124,423	256,090	32.7	279	20,669	145,070	32	63.03	50.03	69.35
1980	381,702	117,798	263,904	30.9	281	19,769	148,461	31	44.06	34.56	48.30
1978	367,207	110,460	256,747	30.1	271	18,457	144,309	34	37.19	28.93	40.74
1975	351,459	100,050	251,409	28.4	345	15,894	135,340	36	29.09	21.83	31.98
1970	299,154	73,318	222,472	24.8	256	13,779	108,121	40	17.09	11.46	18.94

Note: N =total number of employees, N_f =number of women, N_m =number of men, $\%f$ =percent women, N_o =number of occupations, N_e =number of establishments, N_{oe} =number of occupation-establishment pairs, N_b =number of industries, \bar{w} =mean wage, \bar{w}_f =women's mean wage, and \bar{w}_m =men's mean wage.

TABLE 2
Average Sample Range (in Percent) of Hourly Wage Within Occupation and Occupation-Establishment for All and
for Integrated Units, Sweden

Sector	Sample Range (in Percent)						Number of Units (N)			
	Occupation		Occup-Estab		Occupation		Occupation		Occup-Estab	
	All	Integ.	All	Integ.	All	Integ.	All	Integ.	All	Integ.
	1	2	3	4	5	6	7	8		
BLUE-COLLAR WORKERS										
1990	93.96	110.06	19.94	28.10	1,728	1,202	54,933	16,704		
1985	70.69	83.67	16.19	23.49	1,911	1,247	54,870	14,554		
1980	80.06	110.28	17.37	25.00	2,209	1,182	59,187	14,197		
1978	90.44	118.71	17.09	25.89	1,762	990	57,647	12,532		
1975	146.22	208.33	27.29	42.95	1,669	936	53,517	11,436		
1970	128.48	159.07	29.74	49.46	1,329	745	50,116	8,529		
WHITE-COLLAR WORKERS										
1990	296.41	315.85	24.14	34.71	276	251	58,341	16,416		
1985	195.81	206.79	21.17	30.65	275	246	56,431	13,628		
1980	204.46	222.05	20.15	29.02	276	232	56,831	11,890		
1978	211.81	229.09	20.59	29.08	271	225	54,546	10,971		
1975	217.24	247.67	24.49	34.58	336	263	50,612	9,907		
1970	274.68	316.24	31.82	53.27	256	191	40,747	7,733		

Note: The figures represent the average percentage ranges of wages at the occupation and occupation-establishment levels, calculated for occupations and occupation-establishment pairs with two or more employees, separately for all units and for integrated units. We first computed how many percent the highest wage was above the lowest wage in each occupation and each occupation-establishment pair. Thereafter we took the average of this percent across all occupations and all occupation-establishment pairs, in each of the six sectors. Consider white-collar workers in 1990, with 251 different occupations employing two or more persons (see col. 5). The average sample range (in percent) for these 251 occupations is 296.41. 'Occup-Estab' stands for occupation-establishment and 'Integ.' stands for integrated.

TABLE 3
Women's Wages Relative to Men's (in Percent), for Blue-Collar Workers, by Overall, Industry, Occupation, Establishment, and Occupation-Establishment, Sweden

Year	Mean	% Ex.	St. dev.	Min.	Max.	N	Women	Men
	1	2	3	4	5	6	7	8
1990								
Overall	87.16					643,349	188,540	445,809
Industry	90.10	22.9	4.22	80.95	95.59	22	188,540	442,289
Occupation	96.61	73.6	8.77	55.37	171.80	1,202	188,117	415,201
Establishment	95.84	67.6	12.46	24.27	189.23	9,808	177,323	333,895
Occ-Establishment	98.63	89.3	9.72	35.19	224.13	16,704	153,375	220,454
1985								
Overall	89.28					626,601	179,235	447,366
Industry	90.40	10.5	5.75	71.77	96.47	21	179,235	443,466
Occupation	97.05	72.5	7.42	49.62	138.55	1,247	178,460	407,099
Establishment	95.88	61.6	11.03	34.48	206.56	9,353	165,884	325,987
Occ-Establishment	99.07	91.3	8.91	31.05	226.66	14,554	138,063	202,572
1980								
Overall	88.78					676,323	185,648	490,675
Industry	89.32	4.8	5.59	73.73	95.45	20	185,648	484,193
Occupation	96.01	64.4	8.55	66.53	232.98	1,182	184,355	433,273
Establishment	94.16	48.0	11.47	36.17	380.37	9,257	170,800	350,908
Occ-Establishment	98.24	84.3	9.51	31.24	341.50	14,197	136,757	211,518
1978								
Overall	88.67					646,466	167,589	478,857
Industry	88.45	—	7.75	63.34	95.53	19	167,589	475,750
Occupation	96.23	66.7	8.58	63.74	172.90	990	166,308	415,470
Establishment	93.97	46.8	12.58	28.44	693.29	8,738	154,074	334,167
Occ-Establishment	98.05	82.8	9.27	38.55	334.51	12,532	118,961	193,142
1975								
Overall	87.45					644,540	171,189	473,357
Industry	87.72	2.2	6.60	70.88	94.75	17	171,183	470,229
Occupation	94.44	55.7	11.96	44.63	202.92	936	169,293	428,611
Establishment	90.19	21.8	13.23	17.35	341.85	7,505	159,245	347,673
Occ-Establishment	96.76	74.2	12.72	17.27	553.84	11,436	120,344	196,814
1970								
Overall	82.61					583,963	139,146	444,817
Industry	81.71	—	8.41	61.46	80.70	19	139,146	444,817
Occupation	92.48	56.8	11.16	54.68	149.94	745	137,076	392,644
Establishment	86.57	22.8	15.74	14.53	243.38	6,044	127,044	293,349
Occ-Establishment	94.91	70.7	14.96	38.24	268.15	8,529	89,768	150,766

Note: Within each of the six sectors the figures in the first column obtain as follows. The raw relative wages is reported in the first line and obtains as women's average wages as a percentage of men's average wages. The raw relative wages is then decomposed in four ways. First, in line 2, we calculate, separately for each industry in each sector, women's average wages as a percentage of men's average wages. This figure may only be calculated for integrated industries, that is, industries where both men and women work. We present the mean of these percentages across industries in each sector. Analogous with the industry figures we calculate by occupation in line 3, by establishment in line 4, and by occupation-establishment in line 5. '% Ex.' denotes the percent explained of the raw wage gap by each of the four levels separately, while 'st. d.', 'Min.', and 'Max.' denote the standard deviation, the minimum, and maximum values respectively of the numbers used to compute column 1.

TABLE 4
Women's Wages Relative to Men's (in Percent), for White-Collar Workers, by Overall, Industry, Occupation, Establishment, and Occupation-Establishment, Sweden

Year	Mean 1	% Ex. 2	St. dev. 3	Min. 4	Max. 5	N 6	Women 7	Men 8
1990								
Overall	72.97					391,997	135,574	256,398
Industry	72.97	—	3.91	63.29	85.04	32	135,574	256,398
Occupation	93.24	75.0	8.00	46.12	147.30	251	135,567	254,361
Establishment	75.43	9.1	15.11	27.45	258.60	15,002	130,274	246,355
Occ-Establishment	95.00	81.5	13.93	21.86	256.40	16,416	52,157	92,606
1985								
Overall	72.14					380,513	124,422	256,090
Industry	73.55	5.1	3.57	66.99	81.33	32	124,422	256,090
Occupation	93.91	78.1	7.78	61.16	134.60	246	124,375	252,956
Establishment	75.70	12.8	13.76	24.43	180.10	13,767	119,888	244,856
Occ-Establishment	95.49	83.8	13.03	14.15	219.90	13,628	41,384	77,172
1980								
Overall	71.56					381,702	117,783	263,894
Industry	73.41	6.5	4.45	65.11	84.43	31	117,783	263,894
Occupation	93.10	75.7	8.19	25.91	117.30	232	117,774	257,335
Establishment	75.58	14.1	13.04	28.63	221.00	13,319	114,234	252,338
Occ-Establishment	95.51	84.2	12.59	28.63	216.10	11,887	35,744	66,594
1978								
Overall	71.01					367,207	110,741	257,492
Industry	72.73	5.9	3.87	65.30	83.91	34	110,741	257,492
Occupation	92.64	74.6	7.53	52.79	121.10	225	110,741	247,167
Establishment	74.57	12.3	13.02	24.80	250.00	12,263	107,654	244,926
Occ-Establishment	95.97	86.1	13.06	26.70	234.80	10,970	33,431	59,271
1975								
Overall	68.26					351,459	101,184	255,304
Industry	70.57	7.3	4.43	53.89	77.20	36	110,184	255,304
Occupation	92.07	75.0	9.22	41.19	131.60	263	101,125	247,031
Establishment	71.96	11.7	13.64	21.04	263.80	10,901	98,317	242,336
Occ-Establishment	94.61	83.0	14.82	32.36	246.40	9,896	30,262	55,593
1970								
Overall	60.94					299,154	72,217	222,103
Industry	62.92	5.1	3.98	53.52	74.35	40	72,217	222,103
Occupation	89.35	72.7	11.15	50.58	140.20	191	72,217	206,587
Establishment	62.56	4.1	15.41	15.89	212.10	8,605	70,765	209,628
Occ-Establishment	89.85	74.0	18.60	37.06	272.20	7,646	28,230	41,866

Note: Within each of the six sectors the figures in the first column obtain as follows. The raw relative wages is reported in the first line and obtains as women's average wages as a percentage of men's average wages. The raw relative wages is then decomposed in four ways. First, in line 2, we calculate, separately for each industry in each sector, women's average wages as a percentage of men's average wages. This figure may only be calculated for integrated industries, that is, industries where both men and women work. We present the mean of these percentages across industries in each sector. Analogous with the industry figures we calculate by occupation in line 3, by establishment in line 4, and by occupation-establishment in line 5. '% Ex.' denotes the percent explained of the raw wage gap by each of the four levels separately, while 'st. d.', 'Min.', and 'Max.' denote the standard deviation, the minimum, and maximum values respectively of the numbers used to compute column 1.