

# Case Study: Equal Pay the Headquarters of Novo Nordisk



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**T**his paper provides an example of collaboration between a company and academia. The collaboration investigated the efficiency of salary systems that ensure equal pay in a company committed to eliminating gender bias. The analysis's main findings follow.

First, the estimated wage differential between men and women is about 2 percent once controlled for experience, age, education and occupation. Moreover, this wage differential declined from 3 percent to 2 percent between January 1997 and May 2004. Second, controlling for other factors, there appears to be a declining bias toward men for the promotion to manager during the study's first period (January 1997 to July 2001), but no bias for the other promotions. This bias is reduced from 25 percent to 3 percent when controlling for the job category before promotion during the first period. Moreover, this bias has almost entirely disappeared, decreasing from 3 percent to 1.9 percent between the first and second period (September 2001 to May 2004). Therefore, these results suggest that women are relatively more represented in occupations where wages and career prospects are lower; and that once the fact that men and women work in



different occupations is controlled, signs of only a small bias in favor of men were found. Third, women appear to receive less responsibility in managerial positions. They have typically less subordinates in their teams or departments.

The analysis resulted in at least one suggestion to each of the three findings. The most important was the necessity of convincing all workers that they are treated fairly.

Because the number of companies facing court cases (Morris 2006) regarding equal-pay issues continues to grow, and huge damage sums are at stake, HR must step up to the challenge and look inside the pay policies and systems that have been created and supported.

Such was the case at Novo Nordisk (NN). The corporation is a leader in the health-care industry and a world leader in diabetes care. The company has the broadest diabetes product portfolio in the industry, including what it considers to be the most advanced products in insulin-delivery systems. In addition, it has a leading position within areas such as haemostasis management, growth-hormone therapy and hormone-replacement therapy. With headquarters in Denmark, Novo Nordisk employs approximately 25,000 full-time employees in 79 countries, and markets its products in 179 countries. Novo Nordisk's B shares are listed on the stock exchanges in Copenhagen and London. Its American Depositary Receipts are listed on the New York Stock Exchange.

The initial challenge for the company was looking into equal-pay matters in the country where the company headquarters is based: Denmark. The Danish labor market is rather well regulated with general collective agreements and legislation. However, since 1979, NN holds a special position on the labor market as written, and unwritten agreements in NN take precedence beyond general collective agreements.

## **DANISH LABOR MARKET**

A central, national agreement in 1973 stated that agreements containing clauses with different wage scales for men and women were abolished. As Denmark became a member of the European Economic Community (EEC) in 1973, the equal-pay principle had to be enacted by law because the EEC countries are subject to the Treaty of Rome, which includes the equal-pay principle. Thus, the equal-pay act was enacted by Danish law in 1976 (Rosholm and Smith 1996). The initial version of the Danish equal-pay act concerned equal pay for equal work; this principle was broadened in 1986 to meet the principle of equal pay for equal work or work of equal value. Lately, the equal-pay act has been updated, introducing a requirement for companies with more than 35 employees to publish salary statistics based on every a grouping within the International Standard Classification of Occupations (ISCO) nomenclature when more than 10 employees are in a grouping. Furthermore, should any employee initiate a court case, the burden of proof would then lie with the employer.

## **EMPLOYER BRAND IN THE DANISH LABOR MARKET**

With one of the strongest employer brands in the Danish labor market, the company is rated among the top three to five employers at local universities and business schools.

The latest national employer value-proposition survey (Universum Communications Sweden AB 2006), which focused on young professionals, shows that a majority of those who would prefer to work at the business are women (62 percent) and that the corporation is associated with values like market success, financial strength, strong corporate culture, exciting products, innovation, high ethical standards and corporate social responsibility. Furthermore, the company is seen as offering flexible working hours, competitive compensation, increasingly challenging tasks, internal education and inspiring colleagues.

## REASONS FOR INVESTIGATING EQUAL PAY

The company gave this topic special attention for the past four to six years for various reasons. The first reason is ethical, as equality represents a key value in Scandinavian societies, and this key value has received more importance in the eyes of the shareholders, as well as present and potential employees. The second reason is based on efficiency considerations. Women might feel demoralized and unmotivated for their work if they feel they don't have equal opportunities. The firm, on the other hand, should be concerned in selecting the most able individuals for managerial positions, and biases in promotion decisions obviously go against this objective. The third reason is juridical. In the United States (Blau and Kahn 2000) and many other countries, including Denmark, discrimination is considered illegal, and an increasing number of cases have been brought to justice (Morris 2005). Firms have, therefore, more incentives to guarantee equal opportunities.

When NN previously tried to investigate this area, analysts at the firm were often challenged from primarily union representatives regarding the validity of the results, given the obvious conflict of interest. Furthermore, the fact of using statistical models created an additional challenge as management and union representatives would question the methodology and the findings' validity. Novo Nordisk felt that using an external consultancy firm would not necessarily reduce any skepticism due to the business relationship. The company began a partnership with a Danish business school in 2002 that had just started a new institute called the Center for Corporate Performance (CCP), and analyses of this type were at the core of its competencies.

## ANALYSIS

The focus of the analysis is on the size and the evolution of the gender wage gap in the business and, if possible, on identifying the main factors explaining the wage differential between men and women, focusing in particular on differences in experience and occupation. The analysis, therefore, provides an assessment of the firm's policy effectiveness, which has recently become more active in guaranteeing equal treatment.

The main results are the following.

- First, the estimated wage differential between men and women is extremely small compared to the Danish labor market—a comparable study showed a 6.6-percent gender-specific wage gap for salaried employees (Danish Employer Association

and the Danish Confederation of Trade Unions 2003), or approximately 2 percent, once controlled for experience, age, education and occupation. Moreover, this wage differential declined from 3 percent to 2 percent between January 1997 and May 2004, but still remains larger.

- Second, controlling for other factors, there appears to be a declining bias toward men for the promotion to manager, but no bias for the other promotions. This bias is reduced from 25 percent to 3 percent when controlling for the job category before promotion during the first period (between January 1997 and July 2001). Moreover, this bias has almost entirely disappeared, decreasing from 3 percent to 1.9 percent between the first and second period (between September 2001 and May 2004). Therefore, these results suggest that women are relatively more represented in occupations where wages and career prospects are lower. Once controlled for the fact that men and women work in different jobs, one can only find signs of only a small bias in favor of men.
- Third, women appear to receive less responsibility in managerial positions. They have typically fewer subordinates in their teams or departments.

The team behind the analysis provided a few suggestions to correct this small bias. The most important goal is to convince all workers that they are treated fairly. This can be achieved by better communication between supervisors and potential candidates, and more transparency regarding the pay structure within the firm and the criteria required for the promotion. To guarantee that wages are set fairly, a formal salary system should be used. Regarding promotions, the decision could be decided by a committee equally composed of men and women. Finally, for outside hires at all levels, a formal rule could be designed that is based on the importance of attracting talented individuals and guaranteeing a level playing field (e.g. equal pay for all individuals with no previous experience and with similar education).

The analysis was structured in sections describing the data set and shows preliminary summary statistics. One explains the empirical methodology that was applied, results are in a subsequent section, and the last section discusses the results interpretation and some recommendations.

## **DATA SET AND SUMMARY STATISTICS**

In the context of the cooperation between Novo Nordisk and CCP, the team used personnel records for all employees working for the firm in Denmark. The pay frequency is monthly and spans the period from January 1997 to May 2004. The data was extracted in two waves: the first one covered the period January 1997 to July 2001, and the second period was from September 2001 to May 2004. The data in these two waves differ slightly with respect to the definition of the job but are otherwise comparable. The data set provides information about job description, position in the chain of command, department and unit, wage, bonus, tenure in the firm, education, age, gender, nationality and many other aspects not included in this analysis.

## WAGES

The first step is to create the ratio between the average wage of women and the average wage of men (the earning ratio between women and men). This ratio has systematically been found to be below 1, and the most recent estimate for Denmark was 85 percent, i.e. the average Danish woman earned 15 percent less than Danish men (European Commission 2004).

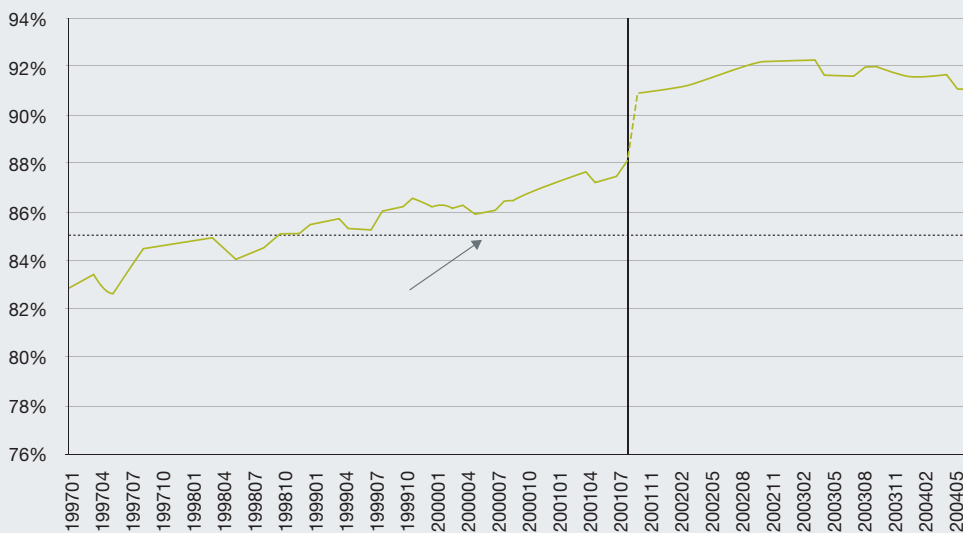
Figure 1 shows the evolution of the ratio. The ratio increased from 83 percent to 92.5 percent during the period analyzed and has recently slightly decreased to 91 percent. This provides a first, although imperfect, indication that the situation of women with respect to men has improved at NN.

The problem with the averages is that they do not necessarily reflect discrimination, but could also be due to differences in education levels, seniority or the fact that men and women work in different occupations or industries. The next section describes how to control for these factors to obtain better estimates.

## PROMOTIONS

The company's main focus is on one specific type of promotion: the promotion from worker to manager (carrying responsibility for people and the budget). In the first period that was analyzed (January 1997 to July 2001), a total of 112 promotions to the managerial job level were observed. Among these, 42 were female workers (37.5 percent). This contrasts with the overall larger percentage of women at the nonmanagerial job level (62 percent in January 1997 and 58 percent in July 2001). However, this crude observation does not control for the fact that women work in different

**FIGURE 1** The Evolution of the Wage Ratio between Men and Women (Average Wage of Woman Divided by Average Wage of Men)



occupations where career opportunities are different. Figure 2 shows the occupations of promoted workers before the promotion for the first period of analysis. As one can see, the proportion of men and women varies widely across occupations.

From September 2001 to May 2004, 52 promotions to managers during the period were observed, 21 of which involved female workers. The percentage increased slightly. Figure 3 on page 72 shows the different occupations of individuals before they were promoted.

As for the wage analysis, other factors could explain these differences in promotion rates, as explained in the next section.

## METHODOLOGY

The difference in wages and promotion rates between men and women could be attributed to observable factors other than gender. One simple way to control for these differences is to run a regression estimating separately the effect of experience, age, education and gender on wages and the probability of promotion. A negative coefficient for the female variable could mean two different things. First, men and women could have different unobservable individual characteristics such as effort and efficiency (Danish Employer Association and the Danish Confederation of Trade Unions 2003) that could explain differences in wages, and second, higher wages for men could be due to a bias in wage setting in their favor.

## WAGE ANALYSIS

In the first specification, the determinants of individual wages ( $W$ , measured in logarithm) are estimated. The analysts considered tenure in the firm, age, education, dummies for the job level or position in the firm hierarchy ( $J$ ), a dummy variable for the type of cost-center category (administration, administration in production,

**FIGURE 2** Promotion from Worker (Job Level 0) to Manager (Job Level 1) by Occupation Before Promotion

Occupation	Number of Men in January 1997	Number of Women in January 1997	Number of Men in July 2001	Number of Women in July 2001	Number of Men Promoted	Number of Women Promoted
IT employee	15	5	22	4	1	0
Line manager	89	72	13	7	1	0
Engineer	24	4	90	16	5	2
Chemist	306	285	473	610	44	29
Medical secretary	0	14	0	13	0	1
Employee	166	155	159	189	7	5
Production manager	14	7	10	8	3	2
Economist	3	3	21	16	6	2

**FIGURE 3** Promotion from Worker (Job Level 0) to Manager (Job Level 1) by Occupation before Promotion

Occupation	Number of Men in September 2001	Number of Women in September 2001	Number of Men in May 2004	Number of Women in May 2004	Number of Men Promoted	Number of Women Promoted
Professional: Finance	29	11	40	23	2	1
Professional: Human Resources	12	11	15	13	1	2
Professional: IT	31	19	53	35	1	2
Professional: Marketing	41	39	39	41	5	2
Professional: Other	20	51	35	61	1	0
Professional: Production	228	202	296	266	5	5
Professional: Quality	44	99	92	178	0	1
Professional: Regulation	5	20	9	38	1	1
Professional: R & D	306	300	387	340	13	7

production, sales and marketing, and research and development) and finally gender.  $\varepsilon_{it}$  is an error term that captures all unobserved factors.

$$W = \alpha + \beta_T T + \beta_{TS} T^2 + \beta_{AA} + \beta_{AS} A^2 + \beta_{EE} + \beta_{CC} + \beta_J + \beta_G G + \varepsilon_{it}$$

where:

$T$  = Tenure in years of service with the company

$A$  = Age of employee

$E$  = Education level (measured by dummy variables)

$C$  = Cost center (usually a reflection of the areas within the company where the staff member is employed and measured by dummy variables)

$J$  = Job level (measured by dummy variables)

$G$  = Gender (dummy variable equal to 1 if the employee is a woman and 0 otherwise).

Finally,  $\alpha$  is a constant, and the  $\beta$ 's are the estimated coefficients.

In another specification, a more precise definition of the job is sought as the team used occupation (O) dummies defining precisely the function of the worker, instead of the job level. This controls for the fact that women could be working in different occupations, and this fact alone could explain wage a difference. Our specification therefore becomes:

$$W = \alpha + \beta_T T + \beta_{TS} T^2 + \beta_{AA} + \beta_{AS} A^2 + \beta_{EE} + \beta_{CC} + \beta_{OO} + \beta_G G + \varepsilon_{it}$$

The evolution of the gender coefficient during the period was examined, and the same regression was run by month. This permitted the study of the dynamics of the wage difference between men and women, and therefore permitted verification of the effectiveness of the equal-pay policy.

## PROMOTION ANALYSIS

To study the probability of promotion ( $P$ ), a regression was performed where the dependent variable is a dummy variable equal to 1 if the individual is promoted and 0 otherwise. Regarding explanatory variables, the effect of gender was particularly analyzed. As before, age and age squared were applied to control for the accumulation of (general) human-capital variables. Similarly, tenure and tenure squared controlled for the accumulation of firm-specific human capital, education dummies (additional general human-capital variables) and cost-center category dummies.

$$P^* = \alpha + \beta_T T + \beta_{TS} T^2 + \beta_{AA} + \beta_{AS} A^2 + \beta_{EE} + \beta_{CC} + \beta_{OO} + \beta_{GG} + \varepsilon_{it}$$

If  $P^*$  more than 0, then  $P = 1$

If  $P^* = 0$  or less, then  $P = 0$ .

## RESULTS

### Wage Analysis

Figure 4 on page 74 and Figure 5 on page 75 show the results for the wage analysis. The first two columns use job dummy variables to control for the fact that women work in different occupations. Once controlling for occupations and other factors such as experience, age and education to measure human capital, a small wage gap of 3 percent for the first period and 2.4 percent for the second period is found. This also shows that the wage gap has been reduced between the first and second period by 20 percent. Figure 6 (on page 76), Figure 7 (on page 76) and Figure 8 (on page 77) show the changes in the wage gap by month between January 1997 and May 2004. The gap has been reduced gradually but has recently slightly increased. Controlling for job levels (columns 3 and 4 and Figure 9 on page 77) provides higher estimates because it less precisely measures the difference in initial conditions between individuals.

### Promotion Analysis

In the second part of the analysis, the presence of a gender bias in promotions was checked. Such a gender bias would tend to demotivate women to work hard to clinch a promotion and would be unethical. The results, displayed in Figure 10 (on page 78), show evidence of a small bias for the first period: women have a 3-percent lower probability of being promoted to manager, other things being equal. Moreover, this bias has been reduced to 1.9 percent in the second period. As in the wage analysis, it is important to control for the position before the promotion, as women could be represented differently across occupations. Once controlling for occupation, it is estimated that the bias diminishes from 25 percent to 3 percent for the first period, and from 2.6 percent to 1.9 percent in the second period. These figures are



**FIGURE 4 Wage Regression (First Period)**

January 1997 - July 2001

Dependent Variable:  
log *W*

Tenure	5.64 x 10 <sup>-3</sup> *** (9.50*10 <sup>-5</sup> )	5.55 x 10 <sup>-3</sup> *** (9.46*10 <sup>-5</sup> )	5.33 x 10 <sup>-3</sup> *** (1.18*10 <sup>-4</sup> )	5.25 x 10 <sup>-3</sup> *** (1.18*10 <sup>-4</sup> )
Tenure <sup>2</sup>	-8.51 x 10 <sup>-6</sup> *** (3.38*10 <sup>-6</sup> )	-8.34 x 10 <sup>-6</sup> *** (3.37*10 <sup>-6</sup> )	-4.77 x 10 <sup>-6</sup> *** (4.23*10 <sup>-6</sup> )	-4.63 x 10 <sup>-6</sup> *** (4.23*10 <sup>-6</sup> )
Age	0.026*** (2.17*10 <sup>-4</sup> )	0.026*** (2.16*10 <sup>-4</sup> )	0.037*** (2.68*10 <sup>-4</sup> )	0.037*** (2.68*10 <sup>-4</sup> )
Age <sup>2</sup>	-2.78 x 10 <sup>-4</sup> *** (2.63*10 <sup>-5</sup> )	-2.77 x 10 <sup>-4</sup> *** (2.62*10 <sup>-5</sup> )	-4.09 x 10 <sup>-4</sup> *** (3.27*10 <sup>-5</sup> )	-4.09 x 10 <sup>-4</sup> *** (3.26*10 <sup>-5</sup> )
Dummy: Education 3	0.012*** (7.37*10 <sup>-4</sup> )	0.012*** (7.34*10 <sup>-4</sup> )	0.04*** (8.73*10 <sup>-4</sup> )	0.043*** (8.72*10 <sup>-4</sup> )
Dummy: Education 5	0.098*** (1.17*10 <sup>-3</sup> )	0.096*** (1.16*10 <sup>-3</sup> )	0.21*** (1.17*10 <sup>-3</sup> )	0.206*** (1.17*10 <sup>-3</sup> )
Dummy: Education 6	0.167*** (1.28*10 <sup>-3</sup> )	0.167*** (1.28*10 <sup>-3</sup> )	0.34*** (1.11*10 <sup>-3</sup> )	0.337*** (1.11*10 <sup>-3</sup> )
Female	-0.03*** (0.0005)	-0.03*** (0.0005)	-0.06*** (0.0006)	-0.06*** (0.0006)
Job Dummies	Yes	Yes	No	No
Job Level: Team Leader	-	-	-	-
Job Level: Prof. Manager	-	-	0.27*** (0.002)	0.27*** (0.002)
Job Level: Manager	-	-	0.32*** (0.002)	0.30*** (0.002)
Job Level: Prof. Middle Manager	-	-	0.46*** (0.003)	0.46*** (0.003)
Job Level: Middle Manager	-	-	0.56*** (0.002)	0.53*** (0.003)
Span as Manager	-	1.08 x 10 <sup>-3</sup>	-	9.93 x 10 <sup>-4</sup>
Span as Middle Manager	-	4.57 x 10 <sup>-4</sup>	-	3.82 x 10 <sup>-4</sup>
Adj. R <sup>2</sup>	0.84	0.84	0.73	0.73
Nr. Obs.	256,696		256,696	

\*\*\*/\*\*/\* indicates statistical significance at the 1%/5%/10% level.

relatively small, the trend is decreasing and the remainder of the gap could be due to factors other than discrimination, such as unobserved heterogeneity, that is, individual characteristics unobserved by the econometrician.

Furthermore, the analysis showed no evidence of bias when promoting from manager to vice president, as suggested by theory (Lazear and Rosen 1990): “Promotion rates should differ less by gender at very high levels of ability than at middle or low levels of ability.”

### Responsibilities

The final question to be analyzed was whether gender affects managerial responsibility, as measured by the number of subordinates. The analysis shows that female executives supervise fewer subordinates on average. This finding could be quite important if it was believed that the firm associates higher span of control with

**FIGURE 5 Wage Regression (Second Period)**

Sept 2001 - May 2004

Dependent Variable:  
log W

<b>Tenure</b>	4.80 x 10 <sup>-3</sup> *** (7.23*10 <sup>-3</sup> )	4.77 x 10 <sup>-3</sup> *** (7.22*10 <sup>-3</sup> )	4.71 x 10 <sup>-3</sup> *** (1.01*10 <sup>-4</sup> )	4.64 x 10 <sup>-3</sup> *** (1.01*10 <sup>-4</sup> )
<b>Tenure<sup>2</sup></b>	-7.99 x 10 <sup>-6</sup> *** (2.46*10 <sup>-6</sup> )	-7.94 x 10 <sup>-6</sup> *** (2.45*10 <sup>-6</sup> )	-2.98 x 10 <sup>-6</sup> *** (3.45*10 <sup>-6</sup> )	-2.86 x 10 <sup>-6</sup> *** (3.44*10 <sup>-6</sup> )
<b>Age</b>	0.019*** (1.66*10 <sup>-4</sup> )	0.019*** (1.66*10 <sup>-4</sup> )	0.029*** (2.28*10 <sup>-4</sup> )	0.029*** (2.28*10 <sup>-4</sup> )
<b>Age<sup>2</sup></b>	-1.99 x 10 <sup>-4</sup> *** (1.96*10 <sup>-6</sup> )	-1.98 x 10 <sup>-4</sup> *** (1.95*10 <sup>-6</sup> )	-3.09 x 10 <sup>-4</sup> *** (2.69*10 <sup>-6</sup> )	-3.08 x 10 <sup>-4</sup> *** (2.69*10 <sup>-6</sup> )
<b>Dummy: Education 3</b>	0.010*** (5.77*10 <sup>-4</sup> )	0.010*** (5.76*10 <sup>-4</sup> )	0.05*** (7.79*10 <sup>-4</sup> )	0.05*** (7.77*10 <sup>-4</sup> )
<b>Dummy: Education 5</b>	0.047*** (9.84*10 <sup>-4</sup> )	0.047*** (9.82*10 <sup>-4</sup> )	0.28*** (0.001)	0.28*** (0.001)
<b>Dummy: Education 6</b>	0.074*** (1.1*10 <sup>-3</sup> )	0.075*** (1.1*10 <sup>-3</sup> )	0.39*** (0.001)	0.39*** (0.001)
<b>Female</b>	-0.024*** (0.0004)	-0.024*** (0.0004)	-0.04*** (0.0005)	-0.04*** (0.0005)
<b>Job Dummies</b>	Yes	Yes	No	No
<b>Job Level: Team Leader</b>	-	-	0.21*** (1.73*10 <sup>-3</sup> )	0.21*** (1.73*10 <sup>-3</sup> )
<b>Job Level: Prof. Manager</b>	-	-	0.29*** (1.33*10 <sup>-3</sup> )	0.29*** (1.33*10 <sup>-3</sup> )
<b>Job Level: Manager</b>	-	-	0.36*** (1.45*10 <sup>-3</sup> )	0.35*** (1.69*10 <sup>-3</sup> )
<b>Job Level: Prof. Middle Manager</b>	-	-	0.47*** (3.32*10 <sup>-3</sup> )	0.47*** (3.32*10 <sup>-3</sup> )
<b>Job Level: Middle Manager</b>	-	-	0.59*** (2.15*10 <sup>-3</sup> )	0.56*** (2.40*10 <sup>-3</sup> )
<b>Span as Manager</b>	-	3.21 x 10 <sup>-4</sup> *** (2.37*10 <sup>-3</sup> )	-	6.47 x 10 <sup>-4</sup> *** (3.31*10 <sup>-3</sup> )
<b>Span as Middle Manager</b>	-	2.80 x 10 <sup>-4</sup> *** (9.38*10 <sup>-6</sup> )	-	2.94 x 10 <sup>-4</sup> *** (1.32*10 <sup>-3</sup> )
<b>Month Dummies</b>	Yes			
<b>Adj. R<sup>2</sup></b>	0.91	0.91	0.81	0.81
<b>Nr. Obs.</b>	241,949			

\*\*\*/\*\*/\* indicates statistical significance at the 1%/5%/10% level.

higher ability to manage and better career prospects. It might also be because female managers are proportionally more represented in nonproduction departments, although the research controls for the department in its analysis. Figure 11 (page 78) presents the determinants of the number of subordinates as a manager. Figure 12 (page 79) presents the number of subordinates as a middle manager.

## DISCUSSION

### Interpreting the Results

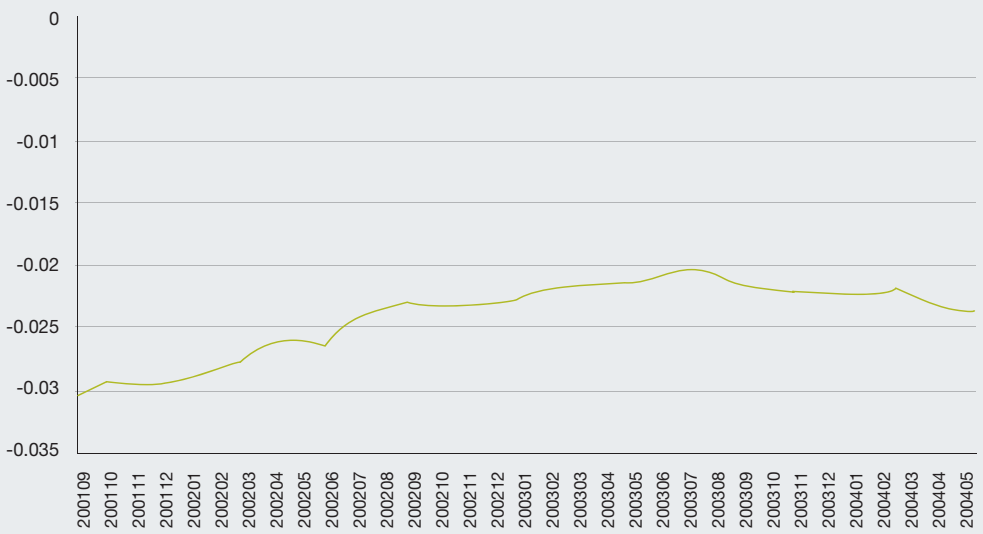
The analysis attempted to answer three questions:

- Is there a gender-specific wage gap?
- How has the wage gap developed over time?
- How large is the promotion bias?

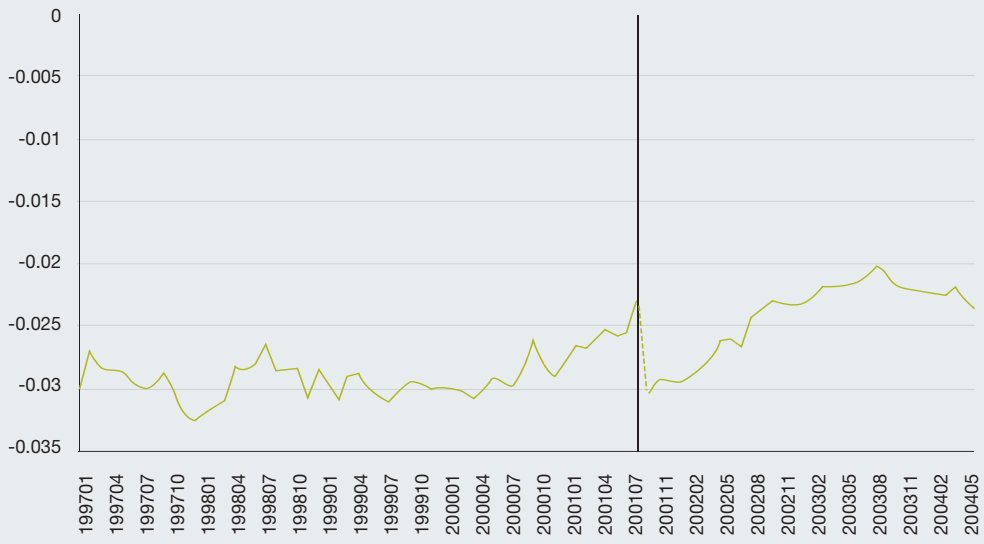
**FIGURE 6** Evolution of the Gender Wage Gap (Using Job Dummies)



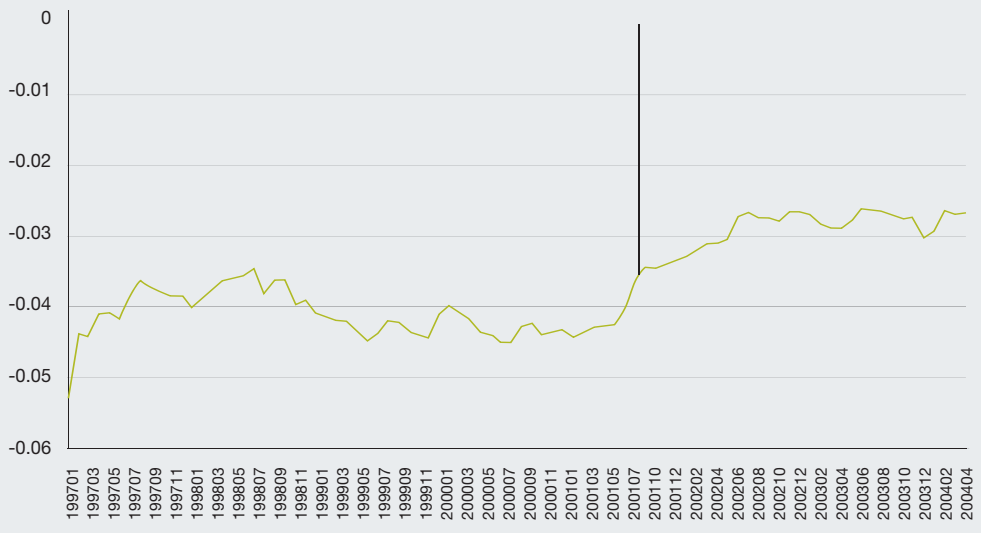
**FIGURE 7** Evolution of the Gender Wage Gap (Using Job Dummies)



**FIGURE 8** Evolution of the Gender Wage Gap (Using Job Dummies)



**FIGURE 9** Evolution of the Gender Wage Gap (Controlling for Job Level)



**FIGURE 10** Determinants of Promotion to Manager-Type 1

	January 1997 - July 2001		Sept. 2001 - May 2004	
Dependent Variable: PROM <sub>01</sub>				
Tenure	1.39 x 10 <sup>-5</sup> ** (6.38*10 <sup>-9</sup> )	2.88 x 10 <sup>-6</sup> *** (2.29*10 <sup>-9</sup> )	1.95 x 10 <sup>-6</sup> ** (1.76*10 <sup>-9</sup> )	1.38 x 10 <sup>-6</sup> ** (1.39*10 <sup>-9</sup> )
Tenure <sup>2</sup>	-8.82 x 10 <sup>-7</sup> ** (3.78*10 <sup>-7</sup> )	-1.56 x 10 <sup>-7</sup> ** (1.26*10 <sup>-7</sup> )	-1.05 x 10 <sup>-7</sup> * (9.62*10 <sup>-9</sup> )	-7.56 x 10 <sup>-8</sup> * (7.66*10 <sup>-9</sup> )
Age	4.25 x 10 <sup>-3</sup> *** (1.53*10 <sup>-9</sup> )	6.46 x 10 <sup>-6</sup> *** (5.20*10 <sup>-9</sup> )	5.38 x 10 <sup>-6</sup> ** (4.86*10 <sup>-9</sup> )	4.28 x 10 <sup>-6</sup> *** (4.23*10 <sup>-9</sup> )
Age <sup>2</sup>	-5.31 x 10 <sup>-7</sup> *** (1.92*10 <sup>-7</sup> )	-8 x 10 <sup>-8</sup> *** (6.48*10 <sup>-8</sup> )	-7.43 x 10 <sup>-8</sup> ** (6.66*10 <sup>-8</sup> )	-5.85 x 10 <sup>-8</sup> *** (5.75*10 <sup>-8</sup> )
Dummy: Education 5	5.24 x 10 <sup>-4</sup> *** (1.77*10 <sup>-4</sup> )	1.34 x 10 <sup>-5</sup> (1.49*10 <sup>-5</sup> )	2.26 x 10 <sup>-4</sup> *** (1.37*10 <sup>-4</sup> )	3.17 x 10 <sup>-4</sup> *** (2.10*10 <sup>-4</sup> )
Dummy: Education 6	1.23 x 10 <sup>-3</sup> *** (2.78*10 <sup>-4</sup> )	2.91 x 10 <sup>-5</sup> *** (2.45*10 <sup>-5</sup> )	4.88 x 10 <sup>-4</sup> *** (2.45*10 <sup>-4</sup> )	8.22 x 10 <sup>-4</sup> *** (4.86*10 <sup>-4</sup> )
Female	-1.02 x 10 <sup>-4</sup> (3.27* 10 <sup>-5</sup> )	-1.13 x 10 <sup>-5</sup> *** (9.19*10 <sup>-6</sup> )	-7.17 x 10 <sup>-6</sup> (6.89*10 <sup>-6</sup> )	-5.28 x 10 <sup>-6</sup> *** (5.57*10 <sup>-6</sup> )
Job Dummies	No	Yes	No	Yes
Cost Center Category Dummies	Yes	Yes	Yes	Yes
Pseudo-R <sup>2</sup>	0.15	0.21	0.19	0.21
Log Likelihood	-875.54	-779.86	-459.56	-452.20
		4.04*10 <sup>-4</sup>		2.77*10 <sup>-4</sup>

\*\*\*/\*\*/\* indicates statistical significance at the 1%/5%/10% level.

The answer to all questions was comforting: Relatively small and declining.

To investigate this further, the team examined the most recent data (until February 2007), finding evidence in the most recent evolution of a further reduction in the gender wage gap. Yet, there is indisputable evidence of a small

bias in favor of men in terms of wages, promotions and responsibilities. Furthermore, the proportion of women in occupations with career opportunities is lower than the firm average, but also, the situation has evolved positively, as the proportion of women in those occupations has increased during the period.

The small remaining bias is not necessarily explained by discrimination. When women have children, they take a leave from the company, putting a brake on their career. When they go back to the company, one could assume that it takes some time to catch up, and they are at a disadvantage with male colleagues who have fewer constraints. One

**FIGURE 11** Determinants of the Number of Subordinates as Manager

Dependent Variable: Number of Subordinates as Manager	
Seniority When Promoted Manager	2.40*** (0.37)
(Seniority When Promoted Manager) <sup>2</sup>	-0.13*** (0.03)
Age	2.60*** (0.51)
Age <sup>2</sup>	-0.035*** (0.006)
Gender	-4.06*** (0.78)
Category Dummies	Yes
Education Dummies	Yes
Constant	-43.07*** (11.62)
Adj. R <sup>2</sup>	0.33
Nr. Obs:	4,586

\*\*\*/\*\*/\* indicates statistical significance at the 1%/5%/10% level.

could also assume that it would change the point of view of the woman, who could decide to put relatively more emphasis on the family rather than her career. Unfortunately, NN cannot test the validity of these alternative explanations due to lack of data on these issues. However, increased incentives for paternity leaves in Scandinavian societies should make this explanation less valid in the future.

Another reason (mentioned recently in the August 2006 *Quarterly Journal of Economics* article) is that women negotiate less than men for their starting salary. Support for this is found in recent academic studies (Niederle

and Vesterlund 2006) revealing evidence for the thesis that women tend to be more risk-averse than men in situations, such as: deciding whether to choose a low-pay-low-risk or a high-pay-high-risk job or occupation; deciding whether or not to exert effort to be promoted or to apply for a better-paid job (Gupta, Poulsen and Villeval 2005). A small difference at the beginning of a career can generate much larger differences later. This is an explanation that will be analyzed in the future as the necessary data has been collected.

Could additional data help explain the remaining bias? Probably. Information regarding work-time percentage, inclusion of performance data on the number of job changes prior to employment at Novo Nordisk and whether or not the employee has children are factors that have shown some explanatory value in comparable studies (Danish Employer Association and the Danish Confederation of Trade Unions 2003). Unfortunately, some of these data are unavailable or were unavailable at the time of the study. Further research is needed to better understand the reasons for these differences.

## ACTIONS

The analysis results suggest that the company has been successful with improving the guarantee of equal pay and opportunities. The team from CCP stated an additional question: Can the firm go even further and suppress entirely these small differences?

As a response to the general increased focus on equal pay and the question stated by CCP, initiatives were begun showing the corporate commitment as an employer. These included:

**FIGURE 12** Determinants of the Number of Subordinates as Middle Manager

Dependent Variable: Number of Subordinates as Middle Manager	
Number of Subordinates as Manager before Promotion	0.42*** (0.20)
Age	138.99*** (26.79)
Age <sup>2</sup>	-1.76*** (0.32)
Gender	-44.18*** (17.06)
Category Dummies	Yes
Education Dummies	Yes
Constant	-2369.31*** (556.11)
Adj. R <sup>2</sup>	0.47
Nr. Obs:	774

\*\*\*/\*\*/\* indicates statistical significance at the 1%/5%/10% level.

## RESOURCES PLUS

For more information related to this paper:

[www.worldatwork.org](http://www.worldatwork.org)

- Type in this key word string on the search line: **Equal pay** or **Pay bias** or **Gender bias**.

[www.worldatwork.org/bookstore](http://www.worldatwork.org/bookstore)

- *When Pay Plans Go Wrong*
- *Managing Compliance Issues Before the Audit*
- *Elements of Base Pay Administration.*

[www.worldatwork.org/education](http://www.worldatwork.org/education)

- C1: Regulatory Environments for Compensation Programs.

## Strategic Setup

- Implementing a global-remuneration strategy consisting of five remuneration principles to be used as the reference point when designing local remuneration systems and processes:
  - Total reward/remuneration perspective
  - Transparent and well-governed remuneration
  - Market-linked/competitive remuneration
  - Performance-linked remuneration
  - Flexible remuneration.

## Change of Existing Agreements

- Change of a local salary agreement ensuring that the unskilled group/blue-collar workers had their salary levels aligned.
  - Prior to this change, different departmental tasks were evaluated and paid in different levels, catering and cleaning tasks being the lowest levels.
- Establishing salary-agreement committees together with local unions.
  - The committees have been a forum for investigating actual questions from unions regarding salary equity. Novo Nordisk labor-relations representatives presented data requested from local unions.

## Increased Awareness

- Article in the October 2005 edition of the internal employee magazine, *People Magazine*, describing the findings of the 2004 analysis regarding whether a gender-specific wage gap exists.
- Hosting a summit in November 2006 under the theme “Women and Leadership.”
  - The purpose of the summit was to bring the theme “Women and Leadership” into focus in line with the corporate approach to diversity as a doorway to discovering and developing potential. In addition, the objective was to further expand opportunities for attaining women in top-management positions companywide.
  - The Women and Leadership Summit served as a “kickoff” event for establishing global inclusion and commitment throughout Novo Nordisk. The outcome of the summit was the development of an action-plan proposal for the company’s top executives with concrete initiatives to be implemented throughout the organization.

## CONCLUSION

The collaboration between Novo Nordisk and CCP as presented in this paper has created some valid findings regarding how efficiently the salary systems ensure equal pay at NN. The primary findings being:

- The wage gap is relatively small and declining.
- There is a small bias toward men for the promotion to manager, and it is declining.
- There is no bias for the promotions above manager level.

The validity of the findings created a fact base that is a solid foundation for future initiatives.

The methodology used in this work represents a valid and comprehensive approach that Novo Nordisk sees as being an appropriate methodology for analyzing equal-pay matters going forward. The findings have been widely accepted throughout the organization and, therefore, no objections have been raised by either local unions or management. Management at NN indicated that this can—to a large extent—be credited to the collaboration partner, given the high professional standard that CCP stands for.

Novo Nordisk will continue to perform this analysis and take appropriate actions to ensure equal pay at the company. ■

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## REFERENCES

- Blau, F. and L. Kahn. 2000. "Gender differences in pay." *Journal of Economic Perspectives*, 14: 75-99.
- Danish Employer Association and the Danish Confederation of Trade Unions. 2003. "Women and Men's Salary." August.
- European Commission. 2004. "The social situation in the European Union, Bruxelles."
- Gupta, Nabanita Datta, Anders Poulsen and Marie-Claire Villeval. 2005. "Male and Female Competitive Behavior: Experimental Evidence." Discussion Paper Series, November: 1-29.
- Lazear, Edward P. and Sherwin Rosen. 1990. "Male-Female Wage Differentials in Job Ladders." *Journal of Labor Economics*, January.
- Morris, Betsy. 2005. "How Corporate America Is Betraying Women." *Fortune*: Jan. 10: 64-74.
- Niederle, Muriel and Lise Vesterlund. 2006. "Do Women Shy Away From Competition? Do Men Compete Too Much?" (Draft). *Quarterly Journal of Economics*. August: 1-33.
- Rosholm, Michael and Nina Smith. 1996. "The Danish Gender Wage Gap in the 1980's: A Panel Data Study," Oxford Economic Papers, 48.
- Universum Communications Sweden AB. 2006. "Universum Young Professional Survey—Employer Branding Report, NovoNordisk."