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Peter H van Der Meer

To cite this version:

Peter H van Der Meer. Is the gender wage gap declining in the Netherlands?. Applied Economics, 2008, 40 (02), pp.149-160. 10.1080/00036840600749557 . hal-00581992

HAL Id: hal-00581992

https://hal.science/hal-00581992v1

Submitted on 1 Apr 2011

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Journal:	*Applied Economics*
Manuscript ID:	APE-05-0519
Journal Selection:	Applied Economics
Date Submitted by the Author:	22-Sep-2005
JEL Code:	J31 - Wage Level, Structure; Differentials by Skill, Occupation, etc. < J3 - Wages, Compensation, and Labor Costs < J - Labor and Demographic Economics, J71 - Discrimination < J7 - Discrimination < J - Labor and Demographic Economics
Keywords:	gender wage gap, discrimination

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1 Introduction

Since the mid nineteen eighties several labour market differences between men and women in the Netherlands have been declining. First of all women have increased their labour market participation enormously, whereas the participation of men only slightly increased. Between 1985 and 2003 women's participation increased from 30 per cent to 55 per cent, whereas men's participation rate increased only from 65 to 75 per cent. A large part of the increase in women's participation rate can be explained by the huge increase in part-time jobs in the Netherlands (Visser and Hemerijck, 1997; Wielers and Van der Meer, 2003). Another part of their increase can be explained by the rise in their educational attainment (Wielers and Van der Meer, 1998). Besides the declining difference in labour market participation, the job levels of men and women became more equal (Van der Meer, 2005).

It even appears that in 2000 young women have higher job levels than young men, thereby overtaking men for the first time. This is explained by their advantage in educational attainment, which is for young women higher than for young men. Although female workers now have the same or even higher educational attainments as male workers do, the differences in overeducation have declined too. Women were in the early nineties more often overeducated than men; in 2000 this difference almost disappeared. Women's job level rose much faster than their educational level, whereas men's job level lagged behind their educational attainment. So on different aspects gender differences on the Dutch labour market declined.

However, it is less well known what happened to the gender wage gap in the Netherlands. There is some evidence that this wage gap is declining too, but systematic evidence is missing (Fouarge et al., 2004; Portegijs et al., 2002). Although some researchers published about the Dutch gender wage gap (i.e. Bakker et al., 1999; De Ruijter et al., 2003; Schippers, 1987) systematic research into the trend, over a longer period, in this wage gap is

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missing. Therefore the aim of this paper is to describe and explain the trend in the Dutch gender wage gap between 1985 and 1998. The main question I seek to answer is: can the trend in the Dutch gender wage gap be explained by the decreasing gap in labour market participation between men and women in the Netherlands?

Several explanations will be put forward and tested. Some explanations rely or elaborate on human capital theory and other rational choice theories. Other explanations refer directly to the source of discrimination, like Becker's 'taste' for discrimination (Becker, 1957) or statistical discrimination.

The structure of the paper is as follows. The next section discusses explanations of the gender wage gap and how the trend might be affected. In section three I describe the decomposition methods and estimation techniques that are used to test the hypotheses. I also describe the OSA labour supply panel, which is the data source for the trend in the wage gap. The fourth section contains the main results and section five summarizes and concludes the paper.

Contrary to my expectation I did not find a decreasing gender wage gap in the Netherlands. Neither the gross wage gap nor the unexplained wage gap decreased between 1985 and 1998. Only a small proportion of the gross wage gap is explained by productivity differences between men and women.

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2 Explaining the gender wage gap

Much has been written about labour market differences between men and women. In essence two types of theories coexist. First some theories try to explain labour market behaviour of men and women. These theories are useful in explaining the supply side of the labour market and can explain why women less often have jobs, work fewer hours than men do or experience different wage elasticity. A prominent example of this strand of research is the model of the division of labour in households and families by Becker (1993).

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According to Becker (1993) women tend to invest less and in different types of human capital than men do. The reasoning is as follows: because women expect to participate less on the labour market than men, they will invest less in schooling. The expected lower participation is explained by biological differences. Women expect to bear and raise children, which reduces their time, spend on the labour market. Their careers might be interrupted or a full-time job might be exchanged for a part-time job. Because women expect to spend less time on the labour market than men, they will invest less in human capital, because the income gain from the investment will be lower. They expect to have lower revenues, which makes an investment less worthwhile. This difference in investment behaviour not only results in a lower educational attainment, but also in less on-the-job training and less investment in firm-specific human capital.

Because women expect to interrupt their career they are less likely than men to invest in firm-specific human capital that only starts to pay off after several years, that is just when they want to interrupt their labour market career. The difference in on- the-job training and firm-specific human capital should result in a less steep age-earning profile for women than for men. In a cross-sectional analysis this might show as higher wages, cet. par., for young women and lower wages for older women, cet. par., than for men.

Given the increasing educational attainment of women and specially the decreasing difference in educational attainment between men and women in the Netherlands it is to be expected that the gross gender wage gap has declined in the last decade. Naturally this also depends on other productive characteristics like labour market experience, but cet. par. it should hold. Also given the increasing participation of Dutch women on the labour market the difference in labour market experience might have declined too, supporting the hypothesis that the gross gender wage gap has declined.

With these models the division of labour is explained, given the wages that can be earned on the labour market. Of course these wages depend on human capital. However these models do not explain why wages differ between men and women, given the same

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supply characteristics. Men and women are perfect substitutes on the labour market and should therefore earn equal wages, given their productive characteristics. This is so because on a competitive labour market wages equal marginal productivity and in equilibrium equal productive labour will be paid the same wage.

From many empirical studies (i.e. Blau and Kahn, 2000 and others), it is known that wages between men and women differ even if one controls for productivity differences. This difference is called the gender wage gap and is explained by theories of discrimination. In essence the argument is, because women are discriminated against women earn lower wages than men. An excellent example of such a theory is Becker's idea of a 'taste' for discrimination (Becker, 1957). Because employers, colleagues and or customers prefer not to be in contact with a minority group, the minority group has to compensate the employers, colleagues or customers, by accepting lower wages. The employer who has a preference for a particular group of workers has to be compensated for hiring workers from these groups to attain the same level of utility as an employer who has no particular preference.

In a static world this model explains why wages differ between otherwise equal groups of workers, be it men or women or whites and blacks or Hispanic. Given this model the gross wage gap can be decomposed in a productivity difference and a discrimination effect (Oaxaca, 1973). However, in a more dynamic world the model of Becker does not hold, or stated more precisely, the wage differences caused by a 'taste' for discrimination should whither away, or the labour market will be completely segregated. This is so because non-discriminating employers are able to hire the minority workers against slightly higher wage than the discriminating employer is likely to pay. The minority workers are still paid below there productivity so employers will still have a profit. In this way the discriminating employer will loose all the minority workers and ends up with an expensive labour force, making less profit than the non-discriminating employer. In the end the non-discriminating employer will out-compete the discriminating employer and the discriminating differences

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in wages will have gone away. All wage differences can then be explained by productivity differences between groups of workers (Schippers, 1987).

Another possible outcome of the model is a complete segregation of workers between employers or between departments of organizations. So if the model of Becker holds one would expect a steady decline in the gender wage gap. That is, one would expect that the unexplained differences in wages would decline. Due to productivity differences gross wages might still differ between men and women. This is exactly what has been found in the United States of America (Blau, 1998; Blau and Kahn, 2000; Durden and Gaynor, 2000), The United Kingdom (Manning, 2004) , Hong Kong (Fan, 2003) and Australia (Preston, 2003). Also the sparse evidence for the Netherlands suggests a decline in the gender wage gap, as stated in the introduction.

Due to institutional changes in the Netherlands, i.e. privatization and deregulation, both the product market and the labour market have become more competitive. Because of this increased competitiveness it should have become more difficult for an employer who has a 'taste' for discrimination to survive. So it is to be expected that the unexplained gender wage gap has become smaller in the Netherlands.

Besides this theory of direct discrimination, other theories seek to explain the gender wage gap by imperfections on the labour market. Neoclassical economic theory predicts that in a competitive market wages will equalize. Because the labour market is not as competitive as the theory supposes, there is room to pay otherwise equal workers different wages. One of the first to recognize this was John Stuart Mill (Mill, 1849) with his idea of non-competing groups. The non-competing groups could result in a crowding of women in a small segment of the labour market reducing their wages to a lower level than men's wages (Bergmann, 1974). The supply of women is relatively more concentrated than that of men, which reduces their wages. This concentration might be driven by the division of labour in the household, which let women invest in human capital that is less profitable on the labour market than that of men. Although the crowding hypothesis is not confirmed for the Netherlands (De

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Ruijter et al., 2003) we will take account of this effect. The increased labour market participation of women could have strengthened the crowding effect.

A further prominent model of explaining discrimination is by means of statistical discrimination. This model is based on the idea that it is difficult to measure the productivity of workers (Arrow, 1972). In the hiring process the employer bases the decision on past experience. Because the knowledge about the productivity of the majority is more precise than that of the minority group, workers form the majority group receive more and better wage offers than workers from the minority group (Bielby and Baron, 1986). This results in tougher hiring criteria for the minority group and will lower their wages compared to the workers from the majority group.

Because the participation rate of women increased drastically in the Netherlands the last decade or so, it is difficult to sustain that those women are a small minority group on the labour market. At least not such a small minority group that statistical discrimination is warranted. So, because of this increase in labour market participation of women it is to be expected that the unexplained gender wage gap has declined.

There is yet another reason why I can expect that the gender wage gap should have declined in the Netherlands. It is well known that labour supply of women is more elastic than the labour supply of men. Women change their labour market behaviour, the number of hours worked and the decision to participate, much more in reaction to changes in wages than men do. Whereas women tend to increase labour market participation and hours worked when wages increase, men do not change their labour market behaviour or even work less. This last phenomenon is known as the backward bending supply curve (Bosworth et al., 1996). As far as known this results also hold for the labour market behaviour of Dutch men and women (Van der Lippe, 1993). So the increase in labour market participation of women in the Netherlands the last decade suggests that wages for women have increased and that the gender wage gap has decreased too. Of course, this last conclusion also depends on the change in men's wage rate.

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All in all I have enough arguments to expect a drop in the Dutch gender wage gap. After considering all theories but one expect the gender wage gap to drop. If the wage gap indeed did fall that I will study in the next sections.

3 Method and data

Measuring wage differentials can be done in different ways. First of all one should calculate the gross or unadjusted wage differentials (G_{wf}). This can simply be done by:

$$G_{wf} = W_m / W_f - 1 \tag{1}$$

Where W_m is the hourly wage of the men and W_f the hourly wage of the women. Taking the logarithms results in:

$$\ln(G_{wf} + 1) = \ln(W_m) - \ln(W_f) \tag{2}$$

This returns the wage gap in log points that I will present in the next sections. This wage differential is gross because it does not adjust for productivity differences between men and women. One method to calculate this difference is to regress ln(wage) on a gender dummy. To adjust for productivity differences one can simply add more variables, like education, experience and others, in the regression equation. If these variables (or productivity differences) explain the wage difference between men and women than the effect of the gender dummy variable will become smaller and even insignificant. Some use this measure as the adjusted wage gap. Therefore I will present these adjusted differentials along the unadjusted.

To gain more insight into the gender wage gap it is possible to estimate separately wage equations for men and women and use these equations to decompose the gross

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differential. It becomes visible how much of the wage gap can be explained by productivity differences between men and women and how much can be explained by an overpayment of men or underpayment of women. Decomposition along these lines were developed by Oaxaca (1973) and Blinder (1973). Their decomposition is as follows:

$$\ln(G_{wf}+1)=\hat{\beta}_m(\bar{x}_m-\bar{x}_f)+\bar{x}_f(\hat{\beta}_m-\hat{\beta}_f) \tag{3}$$

The first term on the right hand side represents the contribution of productivity differences between men and women and the second term is a price effect. The problem with this decomposition is that one can use both the men's and women's equation as the basis of comparison and that both decompositions can give different answers. Researchers therefore proposed that the comparison should be made with the 'true' wage equation, i.e. the parameters of the wage equation in absence of discrimination. This 'true' wage equation should lie somewhere in between the wage equations of men and women. To estimate this 'true' wage equation the parameters should be weighted. The question then is which weights should be used. The parameters can be calculated as the mean of the men's and women's parameters; both having equal weights, or could be weighted by the proportions of men and women in the labour force. Oaxaca and Ransom (1994) propose a weighing scheme in which the precision of the parameter estimates act as weight. Parameters with relatively low variation are given more weight than parameters with more variation. The Oaxaca and Ransom decomposition is as follows:

$$\ln(G_{mf}+1)=\overline{X}'_m(\hat{\beta}_m-\beta^*)+\overline{X}'_f(\beta^*-\hat{\beta}_f)+(\overline{X}_m-\overline{X}_f)'\beta^* \tag{4}$$

The first term on the right-hand side represents the overpayment of men, the second term the underpayment of women and the third term the productivity difference. In this equation β^* represents the 'true' parameter in absence of discrimination and is calculated as:

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$$\beta^* = [\mathrm{var}(\hat{\beta}_m)^{-1} + \mathrm{var}(\hat{\beta}_f)^{-1}]^{-1}[\mathrm{var}(\hat{\beta}_m)^{-1}\hat{\beta}_m + \mathrm{var}(\hat{\beta}_f)^{-1}\hat{\beta}_f] \quad (5)$$

Because I start with Becker's discrimination model (Becker, 1957) which states that employers do not only care about profits but also about the gender composition of the workforce it is natural to use the Oaxaca decomposition that is derived from this model. The wage equations can be estimated with OLS-regression on cross-section data. Because I have panel data at my disposal I can estimate the wage equation using panel techniques. These techniques can deal with unobserved heterogeneity that cannot be dealt with in cross-section analyses. Correcting for unobserved heterogeneity improves the estimates of the parameters. So besides the cross-section analyses I estimate the following wage equation on panel data and use it in the decomposition:

$$\ln(W_{it}) = \mu + \beta' x_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (6)$$

In which μ is an overall constant, α_i is an individual specific random effect controlling for the unobserved heterogeneity, λ_t a time specific random effect controlling for unobserved heterogeneity over time, and ε_{it} an error term that varies both over individuals and over time. Equation 6 is estimated using a random effects model and contains both time-variant and time-invariant variables.

The data stem from the Dutch Institute for Labour Studies (OSA). Every two-year they hold a panel survey among a random selection of the Dutch population. The first survey was held in March 1985, the second one in September 1986 and since then biennially. I have access to the surveys held in 1985, 1986, 1988, 1994, 1996 and 1998. The two in between surveys lack necessary information on the current job and therefore cannot be used.

In the cross-sectional analyses I used the information of everyone being in paid employment and of whom all information is available. The number of cases varies between

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1688 and 2447. This variation is mainly due to the increase in labour market participation over the years and not by an increase in the sample. For the panel analyses I use only those persons who were in paid employment in at least two cross-sections. Persons who joined the survey only once are left out because they hardly contribute to the panel estimates.

In 1985 I have 1779 persons; in 1986 1780, in 1988 1688, in 1994 2292, in 1996 2447 and in 1998 2323 persons. In the panel analysis I have in total 8590 observations of 3208 individuals. Besides estimating the panel model over the whole period I also analysed 1985, 1986 and 1998 as one panel and 1994, 1996 and 1998 as a second panel. This gives me two estimates of the gender wage gap controlled for unobserved heterogeneity and I can test if the gender wage gap has declined. In these last two models I used a one-factor random effects model, leaving out λ_t the time specific random coefficient.

The variables contained in the analyses are: the log (real after tax hourly wage), educational level, job level, total labour market experience and its square, years at current employer and its square, performing unpaid overtime, being a supervisor, log firm size, having changed employer in the last two year, having changed the job at the current employer, having a permanent position, having small children at home, gender and marital status, log hours worked, percentage women in an occupation and having a managerial or professional occupation, a supportive occupation or a productive occupation.

A shortcoming of the dataset is that I only have after tax wages and not before tax wages. Because the taxes affect wages of partners differently, the same before tax wage can lead to different after tax wages, women paying fewer taxes than men do within the same household. To see how the analyses are affected by using the after tax wage I also analyse before tax hourly wages which are available for the years 1994, 1996 and 1998. The before tax wages are not available for the eighties and therefore cannot be used to present a long-term trend. However if the before tax wage gap declines then also the after tax wage gap should decline and probable even more.

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The descriptive statistics of the data are presented in table 1. To save space I present only the descriptive statistics of 1985 and 1998. It can be seen that almost all variables show a significant difference between men and women, except for internal job change (in every year) and education since 1988. So in all years men attain higher job levels, are more experienced, have more tenure, perform more often unpaid overtime, are more often supervisors, work in larger firms, change less often employers, have more often indeterminate contracts, have more often children, are more often married, work longer hours, work less often in female dominated occupations, have less often a supportive occupation but more often an productive occupation and about equally often a managerial or professional occupation. Men earn higher wages and the absolute difference in wages between men and women increased with a quarter of a Dutch guilder (fl 0.27) but the relative wage difference (gross gender wage gap) decreased from 20 log points to 17 log points, that is with 3 log points.

The men score better on the characteristics that I expect to have a positive effect on the wage. So these differences suggest that the gender wage gap can be explained to a large extent by productivity differences. I know that wages increase with education and job level, that supervisors earn higher wages than non-supervisors, that large employers pay better wages than small employers etc. On almost all of these productive characteristics men outperform women, so this should contribute to the explanation of the gender wage gap of about twenty per cent. What strikes at first sight is the small decrease in the gross or unadjusted gender wage gap between 1985 and 1998. I see that the wage gap falls with only three log points. The absolute wage gap even increased in this thirteen-year period, which is very remarkable given the disappearance of other gender differences on the Dutch labour market.

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4 Results

Table 2 contains the results of the men's wage equation. To save space I only present the results for 1985, 1998 and the panel analyses. I see that the rate of return on education increased from two and a half percent in 1985 to four and a half per cent in 1998, with a panel estimate of three[1] per cent. A higher job level increases the wage with approximately 2 per cent and the highest wage is earned when a man has acquired somewhere between thirty eight years and forty years of experience. Actually this means that men earn their highest wage just shortly before they retire. Although the effect is curve linear the wage peaks just before retirement, which is for almost everyone mandatory at age 65. Surprisingly, the years of experience at the current employer do not contribute to the wage, so one could say that men do not invest in firm specific human capital.

Men performing unpaid overtime receive six per cent higher wages than men not performing unpaid overtime. This effect is larger than the effect of being a supervisor, which raises wages with four per cent. Wages also increase with firm size. Changing employers or changing jobs at the current employer does not affect wages. The panel analysis shows even a decrease in wage after a change of employer. This change can be preceded by unemployment. Men having an indeterminate contract earn eight per cent more than men working on other contracts. Children do not affect the wages of the men whereas marital status does. Married men earn a ten per cent higher wage than unmarried men. Part-time workers earn more than full-time workers, which could be caused by the progressive tax system of the Dutch. The wages of the men are hardly affected by the percentage of women working in the same occupation. This implies that the wages of the men are not affected by crowding. Professionals and managers (white collar) earn higher wages than supportive and productive workers, although the productive workers earn the lowest wages.

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[1] Differences between educational levels are two to three years of schooling. So obtaining a higher educational degree increases wages with somewhere between six and nine per cent.

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The results for the women show some remarkable differences to that of the men. The rate of return on education does not show the increase as it does for men, although the panel estimate for men and women is the same three per cent. The effect of job level is twice as high as that of the men. The effect of general experience seems to be less steep than for men, but women reach there earning peak earlier then men, needing only thirty-six years of experience. Contrary to the men tenure has a positive effect on women's wages, making the combined age earning profile equally steep. This effect might be caused by the imprecise measure of experience as years since leaving full-time education.

The effect of unpaid overtime is only half the effect of men and women do not get paid for being a supervisor. The effect of working in large firms does not differ between men and women. Contrary to men an internal job change appears to have a positive effect on women's wages (according to the panel analyses) and having children to take care of decreases their wage (according to the panel analyses). Marital status does not affect women's wages, but the difference between part-time and full-time workers is bigger than for men, part-timers having a higher after tax wage than full-timers. The crowding of women in occupations has a negative effect on their wages. If women would be distributed over the occupations like men, their wages would increase by two per cent. The type of work carried out does not seem to affect women's wages; I do not see a difference between managerial workers, professionals, supportive and productive workers.

On basis of the wage equations I can expect that part of the gross gender wage gap is explained by price differences. Some of the effects favour women and some of the effects favour men. How the gross gender wage gap is decomposed is presented in table 4.

In table 4 I see that the gender wage gap hardly changed between 1985 and 1998 and is approximately nineteen log points. The year 1986 seems to be an outlier because the wage differential is much higher than in 1985 or 1988 and it is the only year in which both men and women are underpaid. Most strikingly is that the gender wage gap is not explained by productivity differences between men and women, despite the differences in productive

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characteristics (see table 1). The productivity differences narrow the gap with no more than four log points for every single year. This means that less than twenty per cent of the wage differential is explained by the productivity differences between men and women and that the remaining unexplained gap is approximately sixteen log points, which is fairly high. Although the remaining difference is comparable with the estimates for other countries (cf. Blau and Kahn, 2000; Hayfron, 2003) and numerous other studies, the effect attributed to productivity differences is low.

This inability of the productive characteristics to explain the Dutch gender wage gap can be shown in another way. Estimation of a pooled male-female wage equation shows strong gender effects even after controlling for the productivity measures. The effect of the gender dummy, before and after inclusion of the control variables is shown in table 5. The gender effect decreases with approximately four log points after controlling for various characteristics. This is much less than the estimate of the Dutch Labour Inspectorate (Hoeben and Venema, 2004) who reduces the gender effect in the profit sector with fifteen percentage points, after controlling for several characteristics.

So I have to conclude that the Dutch gender wage gap is explained by price differences between men and women and not by productivity differences. However it is not certain that these price differences are completely caused by discrimination (Chiplin, 1981), although the differences are that large that discrimination cannot be ruled out. Table 4 shows that men are overpaid, somewhere up to seven log points, and that women are underpaid, somewhere between eight and twenty log points. These results look robust and stable throughout the years.

In these cross-sections I cannot control for unobserved heterogeneity, which might explain the large unexplained difference between men and women. However, the panel estimates also show a large unexplained wage differential between men and women (see table 4). The panel estimates show a productivity advantage of women of about ten log points, which is opposite to the estimate for Norway (Hayfron, 2003), and a large

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underpayment of women of approximately thirty-five log points. So controlling for unobserved heterogeneity worsens the picture, seen through the eyes of the women, instead of improving it. Women are even worse of than one would think based on the cross sections. Also the men are slightly underpaid by approximately six log points.

Although I stratified on period in the panel analyses to control for labour market differences in the various years, it might be better to divide the panel into two sub samples, one containing the eighties and a second one containing the nineties. One reason to do so is that I miss observations for the years 1990 and 1992. Another reason is that the Netherlands experienced a short but deep recession in 1993, which restructured the labour market. Because of this recession effects and gender differences might have changed. Besides that in this way I get two estimates, one for each decade, of the gender wage gap controlled for unobserved heterogeneity. I present the results of these analyses in tables 4 and 5. Between the eighties and the nineties the gender gap hardly decreased. I find a difference of two log points, which isn't much and need not be statistically significant. However, I find a decrease in the underpayment of women by seventeen log points, but an increase in the overpayment of men with sixteen log points. There is no change in productivity differences between the eighties and the nineties. Also if I look at the controlled and uncontrolled gender effect for the eighties and the nineties I hardly see a decrease in the effect. The uncontrolled effect decreased with one log point, from twenty to nineteen and the controlled effect increased with one log point, from twenty-two to twenty-three. Remarkably the controlled effect is larger than the uncontrolled effect in both periods, reflecting the productivity advantage of the employed women.

To see how sensitive these results are for hours worked, cohorts and the use of after tax wages I did some additional analyses. First I compared the gender before tax wage gap between full-time working men and women in the nineties. The gross before wage gap for the full-time workers (twenty-eight log points) is higher than the gross wage gap of all workers (twenty-four log points). However the controlled effect is much smaller, sixteen log

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points versus twenty-two log points. So a large part of the wage differences are explained by working full-time or part-time. Because most of the women work part-time this might explain why the wage gap has hardly narrowed (Van Vuuren, 2004).

Furthermore the gender wage gap is for the younger cohorts much smaller than for the entire sample, this holds both for the eighties and for the nineties. The after tax wage gap is approximately twelve log points and declined with only one and a half log point between the eighties and nineties. The controlled and uncontrolled before tax wage gap in the nineties is only thirteen log points. As for the complete sample differences in productive characteristics do not account for the wage gap. Human capital theory would predict that the smaller gap for younger workers is not a cohort effect but a career effect and that therefore the wage differences, also for these younger cohorts, will become larger in later stages of their careers. However, for the complete sample I did not find significant differences between the age-earning profiles of men and women. The combined effect of experience and tenure is the same for men and women. This indicates that the wage gap for this younger cohort will not become as large as it is for the older cohorts now, unless women experience more breaks in their career than men. In our sample women have less experience and tenure than men, which would be the cause for the gender wage gap. But nowadays I see that Dutch women stay longer and longer on the labour market. In the seventies they withdrew from the labour market after marriage, in the eighties after the birth of the first child and now they seem to continue participation even after the birth of the first child, although they appear to reduce the hours worked.

I see that the before tax gender wage gap is larger than the after tax wage gap, approximately five log points. A larger part of the before tax gender wage gap is explained by productivity differences than the after tax wage gap. This difference between the before and after tax wage gap is due to the differences in taxes. Because men earn higher wages they pay more taxes which declines the after tax wage gap. Although before and after tax wages lead to a different estimate of the wage gap, the trend is the same. There is no

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convergence in men's and women's wages in the Netherlands. These findings differ from the before tax wages as published by Statistics Netherlands on their web site. The gender wage gap calculated on basis of the published wages by Statistics Netherlands is twenty-seven log points in 1995, twenty-five log points in 1998 and decreased further to twenty-one in 2003. Unfortunately, I do not yet have the data for 2000 and 2002 of the OSA panel.

5 Summary and conclusion

In this paper I try to answer the question whether the gender wage gap in the Netherlands is declining. I posed this question because on several other indicators labour market differences between men and women in the Netherlands declined or disappeared altogether. Also researchers in other countries found a decline in the gender wage gap, especially in the USA. I have several reasons to believe that the gender wage gap is declining. First of all the labour market participation of women has increased and women on the labour market are no longer a small minority. Second, the difference in productive characteristics between men and women is disappearing. For example, nowadays working women have the same level of education as working men. Also Becker's model of 'taste for discrimination' predicts that in competitive markets the tastes do not hold and will disappear. In the Netherlands both product and labour markets have become increasingly competitive, due to changes in regulation like anti-trust laws, which should have an effect on the gender wage gap.

Contrary to these expectations I did not find a declining gender wage gap. The data in the OSA labour supply panel show a steady gender gap of approximately twenty per cent. Despite significant differences in productive characteristics between men and women these differences do not explain the gender wage gap. At most six log points of the total gap, that is twenty-five to thirty per cent of the gap, can be explained by productivity differences. Some of the characteristics favour men and some of the characteristics favour women, cancelling out the total effect. The largest part of the gender wage gap is due to 'price'

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differences. Men are slightly overpaid, whereas women are to a larger extent underpaid. Both the cross-section analyses and the panel analyses give about the same answer. However, data from Statistics Netherlands suggests that after 1998 the gender wage gap in the Netherlands has declined with one log point per year.

I do find smaller differences between the young than between the older men and women. Combined with the same age-earning profile this could lead to smaller wage differences in the future, especially since women nowadays tend to withdraw less often from the labour market, due to marriage or children, then they did ten or twenty years ago.

However, Van Vuuren (2004) predicts that by an increasing income inequality, as is the case in the Netherlands, and an increase in labour market participation of women the gender wage gap will increase, because women will enter the medium and low paying jobs whereas men enter all jobs, including the higher paying ones. The increase in income inequality is caused by an increase in the top-level incomes and not so much by a decrease of the lower incomes.

Although in some other countries the gender wage gap declined in all countries where the wage gap is investigated this gap is persistent. The question still remains if the unexplained differences are the result of discrimination against women. The differences in price effects, according to the Oaxaca and Ransom decomposition, suggest that at least some part of the gap is caused by labour market discrimination. However one should not jump to conclusions. For instance, Wielers and Van der Meer (2003) show that women prefer part-time work above full-time work and full-time work above no work, whereas men have a preference for full-time work.

These differences in preferences could lead to differences in wages. The more so because it is unlikely that both members of the household will work full-time, according to Becker's theory of household labour division. So women will invest in different types of human capital than men. This human capital will have a lower rate of return on the labour market, causing persistent wage differentials between men and women.

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The gender difference in preferences also leads to a segregated labour market with typical male and female jobs, where women are crowded in fewer jobs than men, despite the increase in labour market participation. This crowding could cause lower wages. It is well documented that female jobs pay less than male jobs. Also women might have different preferences for job amenities accepting jobs that pay lower wages, because they have favourable job amenities, and thus receive less compensating wage differentials than men do. Men work to earn a family income whereas women work to increase social approval and less for the money.

However, we did control for the percentage of women in occupations and also that did not contribute much to the explanation of the gender wage gap. So we have to look in other directions for explanations. One possible direction is to look at incentive theories. Lazear (1998) shows that employers have the choice to offer jobs with strong incentives and thus higher wages and to offer jobs with only weak incentives and thus lower wages. If men are more committed to the labour market or to employers than women, men will choose for the high incentive jobs and high incentive employers. Although they have to work harder they feel they are compensated for their extra effort by the higher wages. In the available data it is very difficult to control for the differences in incentive structures, which might lead to the gender wage gap.

Besides segregation on the labour market it explains the gender wage gap, its persistence and the steeper age-earning profiles of men. Contrary to Becker's taste for discrimination the gender wage gap did not fall over time and did not fall with an increase in labour market participation of women in the Netherlands.

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Table 1. Descriptive statistics (mean and standard deviation)

	1985				1998			
	men		women		men		women	
	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
Education	11.35	3.10	11.01	3.08	12.38	2.49	12.33	2.32
Job level	3.82	1.67	3.44	1.36	4.16	1.65	3.90	1.51
experience	26.51	10.53	22.71	11.18	27.64	10.25	25.24	10.51
experience Sq.	813.4	625.3	640.7	601.6	869.2	586.4	747.6	573.9
Tenure	10.97	9.03	6.67	5.43	11.82	9.68	8.13	7.19
Tenure Sq.	201.7	309.3	74.0	133.1	233.5	313.4	117.8	180.6
Unpaid overtime	0.24	0.43	0.18	0.38	0.32	0.47	0.26	0.44
supervisor	0.40	0.49	0.18	0.39	0.37	0.48	0.20	0.40
Log firm size	4.73	1.76	4.51	1.82	4.49	1.71	4.26	1.77
change of employer	0.26	0.44	0.37	0.48	0.18	0.39	0.28	0.45
internal job change	0.18	0.38	0.16	0.37	0.10	0.30	0.11	0.31
Indeterminate contract	0.92	0.27	0.87	0.34	0.92	0.28	0.86	0.35
children	0.65	0.48	0.36	0.48	0.58	0.49	0.52	0.50
unmarried	1.13	0.34	1.31	0.46	1.18	0.39	1.24	0.43
Log (hours worked)	3.66	0.14	3.29	0.46	3.60	0.14	3.21	0.39
Percentage women	18.31	22.62	62.99	28.88	31.13	25.95	61.57	22.24
supportive workers	0.28	0.45	0.64	0.48	0.27	0.44	0.56	0.50
productive workers	0.42	0.49	0.07	0.25	0.38	0.49	0.05	0.22
Log (real wage)	2.54	0.30	2.34	0.28	2.71	0.36	2.54	0.31
Real wage	13.30	4.60	10.82	3.65	15.99	6.39	13.25	4.16
Number of cases	1232		547		1367		956	

Source: OSA labour supply panel, own calculations.

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Table 2. Regression results of log (wage) for men 1985, 1998 and panel 1985-1998

	1985		1998		Panel	
	Parameter	s.d.	Parameter	s.d.	Parameter	s.d.
Education	0.026	0.002	0.045	0.003	0.029	0.001
Job level	0.026	0.006	0.027	0.006	0.018	0.002
experience	0.033	0.003	0.034	0.004	0.042	0.002
experience Sq.*100	-0.042	0.006	-0.041	0.006	-0.051	0.003
Tenure	0.000	0.003	-0.002	0.003	-0.002	0.001
Tenure Sq.*100	0.001	0.007	0.011	0.008	0.005	0.003
Unpaid overtime	0.064	0.015	0.093	0.015	0.058	0.005
supervisor	0.086	0.013	0.041	0.014	0.034	0.004
Log firm size	0.009	0.003	0.020	0.004	0.009	0.002
change of employer	0.042	0.021	-0.045	0.022	-0.022	0.006
internal job change	-0.011	0.017	0.002	0.021	-0.007	0.006
Indeterminate contract	0.115	0.024	0.122	0.026	0.060	0.008
children	0.040	0.015	-0.014	0.016	-0.005	0.006
unmarried	-0.050	0.020	-0.136	0.020	-0.067	0.009
Log (hours worked)	-0.525	0.044	-0.384	0.044	-0.639	0.015
percentage women *100	-0.079	0.033	-0.033	0.027	-0.014	0.010
supportive workers	-0.032	0.021	-0.017	0.020	-0.014	0.007
productive workers	-0.133	0.024	-0.065	0.023	-0.065	0.008
Constant	3.389	0.176	2.686	0.178	3.794	0.069
adj R2	0.545		0.597		0.564	
s.e.	0.202		0.227		0.216	
N	1232		1367		5811	

Source: OSA labour supply panel, own calculations.

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Table 3. Regression results of log (wage) for women 1985, 1998 and panel 1985-1998

	1985		1998		Panel	
	Parameter	s.d.	Parameter	s.d.	Parameter	s.d.
Education	0.032	0.004	0.030	0.004	0.031	0.002
Job level	0.050	0.011	0.071	0.008	0.045	0.004
experience	0.036	0.005	0.024	0.004	0.030	0.002
experience Sq.*100	-0.055	0.008	-0.034	0.007	-0.040	0.004
Tenure	0.007	0.006	0.012	0.004	0.008	0.002
Tenure Sq.*100	0.000	0.021	-0.022	0.014	-0.013	0.007
Unpaid overtime	0.056	0.027	0.029	0.017	0.023	0.009
supervisor	0.002	0.027	-0.019	0.019	0.010	0.009
Log firm size	0.014	0.005	0.008	0.004	0.009	0.002
change of employer	0.036	0.034	0.027	0.022	0.007	0.010
internal job change	0.053	0.032	-0.009	0.024	0.031	0.010
Indeterminate contract	0.041	0.031	0.080	0.024	0.055	0.012
children	-0.002	0.026	-0.008	0.019	-0.027	0.010
unmarried	0.002	0.023	0.024	0.019	0.015	0.011
Log (hours worked)	-0.074	0.027	-0.129	0.022	-0.155	0.012
percentage women *100	-0.062	0.038	-0.075	0.036	-0.043	0.018
supportive workers	-0.004	0.029	-0.018	0.022	-0.027	0.012
productive workers	-0.038	0.052	-0.052	0.044	-0.039	0.024
Constant	1.459	0.131	1.826	0.107	1.904	0.070
adj R2	0.391		0.49		0.485	
s.e.	0.221		0.22		0.218	
N	547		956		2779.000	

Source: OSA labour supply panel, own calculations.

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Table 4 The gender wage gap and its decomposition

	gross wage gap	overpayment of men	underpayment of women	productivity differences
1985	0.202	0.002	0.161	0.039
1986	0.248	-0.162	0.385	0.025
1988	0.180	-0.036	0.215	0.001
1994	0.187	0.077	0.083	0.028
1996	0.193	0.004	0.162	0.027
1998	0.169	0.004	0.166	-0.002
Panel estimate, after tax	0.187	-0.065	0.347	-0.095
Panel estimate, 80's after tax	0.203	-0.142	0.399	-0.053
Panel estimate, 90's after tax	0.185	0.019	0.223	-0.058
Panel estimate, before tax	0.242	0.014	0.212	0.016
1994, before tax	0.241	0.058	0.104	0.080
1996, before tax	0.235	-0.052	0.240	0.047
1998, before tax	0.247	0.026	0.182	0.039

Source: OSA labour supply panel, own calculations.

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Table 5. The controlled and uncontrolled gender effect

	after tax hourly wage		before tax hourly wage	
	uncontrolled	controlled	uncontrolled	controlled
1985	-0.202	-0.125		
1986	-0.248	-0.199		
1988	-0.180	-0.145		
1994	-0.187	-0.140	-0.241	-0.146
1996	-0.193	-0.150	-0.235	-0.171
1998	-0.169	-0.150	-0.247	-0.200
Panel estimate, 80's and 90's	-0.209	-0.241		
Panel estimate, 80's	-0.200	-0.220		
Panel estimate, 90's	-0.188	-0.230	-0.241	-0.217
Panel estimate, full-time	-0.242	-0.139		
Panel, estimate, 80's fulltime	-0.236	-0.143		
Panel estimate, 90's fulltime	-0.228	-0.153	-0.279	-0.163
Panel estimates, 80's younger than 35	-0.125	-0.119		
Panel estimates, 90's younger than 35	-0.110	-0.134	-0.140	-0.126

Source: OSA labour supply panel, own calculations.

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