Globalization: A Woman's Best Friend? Exporters and the Gender Wage Gap*

Esther Ann Bøler† Beata Javorcik‡ Karen Helene Ulltveit-Moe§

February 2015

Abstract

While the impact of globalization on income inequality has received a lot of attention, little is known about its effect on the gender wage gap (GWG). This study argues that there is a systematic difference in the GWG between exporting firms and non-exporters. By the virtue of being exposed to higher competition, exporters require greater commitment and flexibility from their employees. If commitment is not easily observable and women are perceived as less committed workers than men, exporters will statistically discriminate against female employees and will exhibit a higher GWG than non-exporters. We test this hypothesis using matched employer-employee data from the Norwegian manufacturing sector from 1996 to 2010. Our identification strategy relies on an exogenous shock, namely, the legislative changes that increased the length of the parental leave that is available only to fathers. We argue that these changes have narrowed the perceived commitment gap between the genders and show that the initially higher GWG observed in exporting firms relative to non-exporters has gone down after the changes took place.

JEL: F10, F14, F16, J16.

Keywords: Exporters, Globalization, Gender Wage Gap.

*We thank seminar participants at the University of Bergen, University of Oxford, University of Cambridge, Central European University, Center for Global Development in London, and conference participants at the European Research Workshop in International Trade (ERWIT) 2014, 10th Joint ECB/CEPR Labour Market Workshop, ETSG 2013, Annual Meeting of the Norwegian Association of Economists 2014, GEP Post-graduate Conference 2014, Nordic Workshop on Matched Employer-Employee Data 2014, Nordic International Trade Seminar (NOITS) 2014 conference and SNF Sinergia/CEPR Conference on Economic Inequality, Labor Markets and International Trade (ILMIT) for helpful comments. We thank Stefania Albanesi, Andy Bernard, Juan J. Dolado, Andrea Ichinio, Kjell Erik Lommerud, Monika Merz, Peter Neary, Mari Rege, Olga Solleder, Kjetil Storesletten and Tony Venables for valuable discussion. This paper is part of the research activities at the Centre for the Study of Equality, Social Organization, and Performance (ESOP) at the Department of Economics at the University of Oslo. ESOP is supported by the Research Council of Norway. Data received from Statistics Norway has been essential for the project and for the paper.

†University of Oslo and ESOP.

‡University of Oxford, ESOP and CEPR.

§University of Oslo, ESOP and CEPR.

1 Introduction

The link between globalization and income inequality has received a lot of attention in economic research as well as in the popular press. However, the debate has almost completely ignored one important dimension of inequality, namely the gender wage gap. It is a well-documented fact that women earn less than men, even in relatively equal societies such as the Northern European countries. This appears to be true even after controlling for observable worker characteristics, hours worked and occupation, and especially so in the private sector.[1] In this paper, we set out to explore one aspect of this issue by focusing on the link between exporting and the gender wage gap.

We argue that by the virtue of being exposed to higher competition, exporters require greater commitment to work and greater flexibility of their employees. For instance, working for an exporting firm may require taking late night phone calls to communicate with customers in different time zones and may involve international travel arranged at a short notice. The employees may be expected to be available around the clock seven days a week in case of unexpected problems arising on the production line or shipments being delayed. If commitment is not easily observable and women are perceived to be less committed workers than men, exporters will statistically discriminate against female employees and will exhibit a higher gender wage gap than non-exporters. We expect this to be particularly true among highly skilled employees.[2]

To investigate the link between the gender wage gap and exporting, we exploit a matched employer-employee data set covering close to all firms in the Norwegian manufacturing sector and their full-time employees between 1996 and 2010.[3] The data set includes detailed information on employees, such as number of years of education, labor market experience, gender and other demographics.

We estimate a Mincerian wage regression controlling for a host of worker and firm characteristics. We find evidence of a substantial overall gender wage gap of around 24%. The gender wage gap appears to be smaller in exporting firms where it is equal to 19%. Thus working for an exporting firm is associated with closing almost a quarter of the observed gender wage gap. These regressions, however, do not take into account unobservable worker characteristics that are likely to be correlated with their choice of working for an exporter. Interestingly, controlling for unobservable worker characteristics (or unobservable worker-firm heterogeneity) reverses our

[1] See Blau and Kahn (2000), Barth et al. (2013) and Goldin (2014) for overviews.

[2] Employer surveys from Iceland reveal that women are perceived as more family oriented than men and less committed to their work and less reliable than men (see Gislason (2007)). A third of managers surveyed in the UK claim that women are not as good at their jobs when they come back from maternity leave (see http://www.slatergordon.co.uk/media-centre/news/2014/08/slater-gordon-highlights-maternity-discrimination). In an experiment, people were asked to evaluate a professional profile which varied in terms of gender and whether or not the candidate had a child. When identified as a mother, as opposed to a father or a person whose parental status wasn't mentioned, the profile was judged to be significantly less competent and was least likely to be hired or promoted by the participants. The mere mention of a child led people to see the mother as less competent (see Cuddy and Glick (2004)).

[3] The data set covers all joint stock firms in the manufacturing sector, and thereby about 90% of manufacturing output in Norway in 2004.

results. We find that exporting firms exhibit a higher gender wage gap than non-exporters with the difference reaching about 3 percentage points. As expected, this effect is present only among college graduates. In other words, college educated women earn higher wages at exporting firms than at non-exporters, but they are underpaid given their unobservable characteristics.

Next we exploit an exogenous shock that is believed to have changed the perceived commitment gap between the genders. The shock consisted of a series of legislative changes that gradually increased the number of weeks of parental leave that are available only to the child's father, the so called paternal quota. Unless special circumstances exist, the paternal quota weeks are lost if not taken by the father. A quota of 4 weeks was first introduced in 1993. It was extended to 5 and 6 weeks in 2005 and 2006, respectively. In 2009, the number of weeks was further extended to 10. This nudge on the part of the Norwegian government has resulted in a huge increase in the fraction of fathers taking a substantial period of paternity leave.

In our empirical analysis, we proxy for the change in social attitudes, and thus the perceived commitment gap between men and women, using the fraction of fathers taking at least 8 weeks of leave in a given year. We choose 8 weeks as our cutoff because a two-month long absence from work is substantial and disruptive enough to affect the employers' perceptions. The share of fathers taking at least 8 weeks of leave went up from 8.4% in 1996 (the first year of our sample), to 10.8% in 2003 and 40.6% in 2010 (the last year of our sample).[4] Our variable of interest is then a triple interaction between the female dummy, the exporter dummy and the fraction of fathers taking at least 8 weeks of leave. It captures how the gender wage gap differential between exporters and non-exporters evolved with the changes in social attitudes.

The estimation results confirm our priors. We find that the gender wage gap is higher in exporting firms than in non-exporters, and the difference between the two narrows down with the changes in social attitudes. The estimated coefficients are statistically significant and economically meaningful. This is true in the full sample as well as in the subsamples of workers with and without college education. As one would expect, the results are stronger when we focus our attention on workers in their reproductive years (i.e., those under 45 years of age). They are also stronger for college graduates.

The magnitude of the estimated effects is economically meaningful. The change in the fraction of fathers taking at least 8 weeks of paternity leave between 1996 and 2008, corresponds to the gender wage gap in exporters dropping from being on average 4.5 percent higher than in other firms to being only 3.3 percent higher.[5] For the subsample of workers without college education, the corresponding gap of 1.3 percent is driven all the way down to zero.

We also exploit an alternative shock in our identification strategy. In 2003, the Norwegian government initiated an ambitious expansion of kindergarten coverage. The goal of this policy was to offer all children a high quality, low price place in a public or private kindergarten. It

[4]Note that fathers have always been entitled to take more leave than the number of weeks specified in the paternal quota. The legislation has stipulated a paternal and a maternal quota (the latter equal to 9 weeks since 1993) and has let the parents choose how to split the remainder of the leave.

[5]The cited results are based on estimates for college educated workers under 45 years of age.

was also seen as a measure to increase gender equality through the provision of reliable and formal child care. The initiative resulted in a massive increase in the share of children attending kindergarten. 9 of 10 children between the ages of 1 and 5 attended kindergarten in 2009, as compared to 54% in 1996 and 63% in 2001. The expansion of kindergarten coverage proceeded at different speeds in different municipalities, providing us with geographical variation as well as time variation in coverage rates. In our estimation, we examine whether the gender wage gap differential between exporters and non-exporters was affected by the increase in availability of kindergarten places in a given municipality. The logic behind this approach is that greater availability of reliable child care is associated with fewer disruptions to work hours and thus allows women to exhibit greater commitment to their jobs. Our results are consistent with those found for the paternity leave case. The gender wage gap differential between exporters and non-exporters decreased as a larger share of children was enrolled in kindergarten. Again the observed effect was stronger for workers under 45 years of age.

While the first part of the analysis focuses on the perceived commitment gap between the genders, the second part of the paper exploits heterogeneity among exporters. As firms exporting to a large number of locations tend to be larger and more productive than other exporters, it is also likely that they have higher expectations vis a vis their employees, which we expect to result in them having an even larger gender wage gap.[6] This appears to be the case in our data. We find that the gender wage gap in an exporter increases as the number of export markets increase.

In the final part of the paper, we turn to a possible alternative interpretation of our baseline findings of a higher gender wage gap among exporting firms. Becker's theory of taste-based discrimination predicts that more profitable firms are better positioned to engage in costly discrimination (Becker (1957)). The literature on trade and heterogeneous firms emphasizes that exporters are more profitable than other firms, and thus in this framework, exporters may find it easier to discriminate.[7] To address this issue we augment our model by allowing the gender wage gap to differ with firm profitability (as well as other proxies for profitability, such as the multinational status and size). Doing so does not affect our finding that the gender wage gap is higher in exporting firms. Our results indicating that the difference in the gender wage gap between exporters and non-exporters declined with the changes in gender-related social norms is also robust to controlling for profitability.

In summary, our findings are consistent with exporters being able to attract more able, more ambitious or more committed females, whom they subject to a larger degree of statistical discrimination than do other firms. Our results are consistent with this phenomenon being driven by exporters attaching greater importance to worker commitment due to operating in more competitive and fast changing environments than other firms.

This paper speaks to three strands of the existing literature. The first strand is the large

[6]See Bernard et al. (2011) and Eaton et al. (2011) for empirical and theoretical work on the relationship between firm productivity and the number of export destinations.

[7]For theoretical prediction see Melitz (2003), for empirical evidence Bernard and Jensen (1999).

literature on exporters and the exporter wage premium. Bernard et al. (1995) show that exporters pay higher wages than non-exporters in the US and that this wage premium goes to both production and non-production workers. Several papers confirm that this pattern holds in a host of other countries (see e.g. Schank et al. (2007)). More recently, the availability of matched employer-employee data has allowed researchers to examine whether the exporter wage premium is robust to controlling for various worker and firm characteristics. Schank et al. (2007), among others, show that the wage differential becomes smaller, but does not vanish, once these controls are included. According to Klein et al. (2013), however, the picture is more nuanced. The matched employer-employee data for the German manufacturing sector show that exporters pay a wage premium to high-skilled workers while giving a wage discount to low-skilled workers. A study by Irarrazabal et al. (2013) on Norwegian manufacturing firms finds that exporters' wage and TFP premia fall substantially once one controls for observable and unobservable worker characteristics, suggesting that exporters attract more able workers than non-exporters. Recent theoretical contributions have proposed some mechanisms for why exporters end up employing more able workers and paying higher wages than non-exporters. Helpman et al. (2010) present a model where exporters invest more in screeening and as a consequence hire more able workers who are paid accordingly higher wages. Eckel and Yeaple (2014) consider an environment with workers heterogeneous in their ability and information frictions, where multi-product exporting firms are able to use internal labor markets to offer higher compensation to more able workers, and thus end up paying higher average wages. We contribute to this literature by documenting another dimension along which the compensation structure varies between exporters and non-exporters, namely, the gender dimension.

The second strand is the large literature on the gender wage gap, reviewed by, for instance, Blau and Kahn (2000) and OECD (2012). Most closely related to our paper are studies on the impact of globalization on the gender wage gap. Black and Brainerd (2004) test Becker's model of discrimination by comparing the difference in residual wage gaps between concentrated relative to competitive industries that were exposed to comparable increases in import competition. They find that the gender wage gap narrowed more quickly in the originally more concentrated industries and interpret this result as supporting the classic predicition of Becker's theory. A theoretical contribution based on a Melitz-type framework by Ben Yahmed (2013) predicts that trade integration widens the gender wage gap among skilled workers.[8] Our results are line with these predictions. To the best of our knowledge, this is the first study investigating directly the relationship between the exporter status and the gender wage gap and doing so using matched employer-employee data.[9]

[8] In her setting, men and women have the same distribution of ability but differ in their commitment levels. Firms engage in statistical discrimination which creates the gender wage gap. Firm may choose to invest in a high technology by incurring an additional cost. Complementarities between commitment/ability and technology induce exporters (which are the ones choosing to adopt the high technology) to hire more able workers and have a higher gender wage gap among skilled workers.

[9] In a related study, Juhn et al. (2014) examine how trade liberalization affects gender inequality using Mexican firm-level data. Trade liberalization induces the most productive firms to start exporting and adopt a new tech-

Our work is also related to the recent findings of Goldin (2014) who shows that gender wage gap is due to employers disproportionately rewarding individuals for laboring long hours and working particular hours. While her work documents changes in different occupations in this respect, we focus on differences between different firm types. Moreover, our contribution lies in using a unique exogenous shock to identify the effects of interest.

Finally, there is a growing number of studies aiming to assess the impact of various gender equality policies initiatives on male and female labor force participation and earnings in general (see e.g. Cools et al. (2015), Andresen and Havnes (2014) and Havnes and Mogstad (2011)).

This paper is structured as follows. The next section describes the data and presents some summary statistics. Section 3 presents the empirical model and the baseline results. Section 4 contains our main analysis where we exploit two exogenous shocks which changed the perceived work commitment differential between men and women. Section 5 focuses on heterogeneity among exporters. In Section 6, we address a potential alternative explanation. Section 7 presents the conclusions.

2 Data and Basic Facts

2.1 Data

We employ a number of different data sets collected by Statistics Norway. We match data on firms, trade, foreign direct investment and employees for the period 1996-2010. We use firm-level data from Statistics Norway's *Capital database*, which contains variables such as value added, output, and employment for an unbalanced panel of all mainland joint-stock companies in the Norwegian manufacturing sector.[10] The manufacturing sector accounts for around 50 percent of total mainland exports.[11] The data set covers around 90% of manufacturing output in Norway. The industry classification used is the NACE Rev. 2.[12] The *Capital database* is merged with firm-level data on export and import values based on customs declarations, using a unique firm identifier. These data make up an unbalanced panel of all yearly export and import values by 8-digit HS product codes and a destination or source country.[13] Finally, we match this

nology that is more modern and requires less physical strength. This improves women's labor market outcomes in the blue-collar tasks, while leaving them unchanged in the white-collar tasks. The authors use the introduction of NAFTA to test the model. They find that liberalization is associated with entry of new firms and adoption of a more modern technology. In addition, firms hire relatively more blue-collar females and increase their share of the wage bill.

[10]Mainland Norway refers to all domestic production activity except from the exploration of crude oil and natural gas, services activities incidental to oil and gas, transport via pipelines and ocean transport. Statistics Norway's *Capital database* is described in Raknerud et al. (2004).

[11]In 2010, the manufacturing sector accounted for 26% of total exports, 34% of total goods exports and 50% of total mainland exports, i.e., exports excluding oil, oil-related services and ship- and platform-building. The top exporting industries within manufacturing were machinery and other equipment n.e.c.; basic metals; basic chemicals, chemical and mineral products; food products, beverages and tobacco; refined petroleum products.

[12]A list of the manufacturing industries can be found in the Appendix. Within the group of manufacturing industries, the highest share of females among full-time employees can be found in wearing apparel (74.4%), followed by pharmaceuticals (50.6%) and textiles (43%).

[13]In line with findings of studies from other countries, the majority of Norwegian manufacturing firms do not export. In 1996, only 34.9% were exporting, while in 2005, this number had risen to 38.1%. See Figure 1 in the

merged data set with firm-level data on outward foreign direct investment (FDI). This leaves us with a comprehensive panel data set on Norwegian manufacturing firms' performance and internationalization, which we then merge with data on their employees.

The main source of employment and wage data for the period 1996 to 2010 is the employee register (AT) which holds annual records of worked hours and earned wages at the individual level. Statistics Norway links this register to the tax office database (LTO) to create a correspondence between the wage reported by the employer and those reported to the tax authorities by the individual. This joint file (ATmLTO) is a much cleaner data set and is therefore used instead of the AT register. In addition to wages at the person-firm-year level, the database includes the first and the last date of the employment spell within a given year, the total number of days worked, the municipalities in which the individual lives and works, and an indicator for full-time and part-time employment. The ATmLTO data is then merged with time-varying demographic information about years of education, gender and the number of children, also from Statistics Norway.

From 2003 onwards, the employment register also contains an occupational classification, based on the International Standard Classification of Occupations, ISCO-88 (COM). This is a four-digit code describing the type of job the individual has, ranging from senior officials and managers to elementary occupations that require no formal education. The codes are grouped into ten categories.[14]

The parental leave data come from the Norwegian Labour and Welfare Administration (NAV). We have annual information on the number of days of paid leave a family is entitled to after having a child, as well as on the paternal quota, i.e., the share of that leave that is reserved for the father and cannot be transferred to the mother except under special circumstances. Table 9 in the Appendix provides a overview of the legislation on parental leave in Norway. In addition, and probably more important, we have data on the actual take-up of the leave. We know the number of men and women taking some parental leave each year. We also know the breakdown of how many fathers are taking a certain number days of leave (1-10 days, 11-19 days, 20 days, 21-24 days, 25 days, 26-39 days and more than 40 days.). A week is measured as the number of workdays, so 20 days of registered leave corresponds to one calendar month.

Finally, we collect data on the regional variation in kindergarten coverage from Statistics Norway. For each Norwegian municipality, of which there are 439, we have information on the percentage of children between the ages of 1 and 5 enrolled in kindergarten each year between 2000 and 2010.

Appendix for the share of exporting firms across Norwegian manufacturing industries.

[14]These ten categories are: 1. Managers, 2. Professionals, 3. Technicians and associate professionals, 4. Clerks, 5. Service workers and shop and market sales workers, 6. Skilled agricultural and fishery workers, 7. Craft and related trades workers, 8. Plant and machine operators and assemblers, 9. Elementary occupations, 0. Armed forces and unspecified. For a more detailed description of the occupational classification, see NOS C 521 Standard Classification of Occupations, http://www.ssb.no/a/publikasjoner/pdf/nos_c521/nos_c521.pdf.

2.2 Construction of the Sample and Variables

The data set for firms and employees leaves us with a panel covering the population of all mainland joint-stock manufacturing firms along with their trade, FDI and employees. For each worker-year combination, we assign to the worker the wage and the firm of the longest employment spell during the year. We restrict our sample to individuals who have worked for at least three months during a year. We keep only full time employees in the data set. This is done to avoid biases related to possible part time wage penalties.[15] We also restrict our sample to individuals who are between 19 and 67 years of age and to workers with at least one year of potential labor market experience. We measure daily wages as the wage earned in that spell, divided by the number of days worked in that spell, where a spell is defined a worker-firm match.

To remove outliers, we predict wages based on a simple Mincerian regression of log wages on education, experience and experience squared.[16] We then remove observations that lie outside five times the standard error of the residual. We are left with a sample of 2,713,623 worker-firm-year observations, based on roughly 6,000 firms each year spread across 24 industries (NACE Rev 2).

We use a host of variables to account for observable worker characteristics. The variable *Education* is an individual's total number of years of schooling. We classify a worker as being *College* educated if the worker has 14 or more years of education, and *Non-college* if not. *Experience* is a measure of actual experience calculated from the Pension register, and gives the actual number of years a person has been active in the labor market.[17] An alternative and often used measure of labor market experience is a person's potential experience, given by the age of the worker minus the number of years of education. However, given our focus on gender differences, we choose the actual experience to be our preferrred measure of labor market experience since women typically have noncontinuous labor market histories and thus potential experience may be a poor proxy for their actual experience.[18] We also include a dummy variable denoted *Children* that is equal to one if the worker has at least one child in the year of observation, and zero otherwise. An alternative demographic characteristic would be workers' marital status, but since cohabitation is very common in Norway also after having children, we believe a person's private life is better characterized by the *Children* variable.

To account for geographical aspects of the location of firms and workers, we employ a centrality measure constructed by the Norwegian Institute for Urban and Regional Research (NIBR). All Norwegian municipalities are grouped into residential and labor market regions. These regions are then split into five categories along the centre-periphery axis, based on the size of the population, availability of amenities, number of jobs and distance to nearest place categorized

[15] It is well known in the gender wage gap literature that part-time workers have lower hourly earnings and that women are overrepresented among part-time workers, see e.g. Manning and Petrongolo (2008).

[16] See below for how the experience and education variables are constructed.

[17] The Pension register contains data on incomes dating back to 1967.

[18] Note however, that since employees earn pension rights also during parental leave, the registered number of years in the labor market includes these periods of leave.

as central. The categories are: major cities, medium-sized towns, small towns, rural centres and periphery. We define a *Centrality* variable that equals one if an individual is working in a municipality that belongs to one of the first two categories in the year of observation, and zero otherwise.

For the firms, *Size* is a time-varying measure of firm size defined as the log of the number of employees. We define a firm as being an *Exporter* if the value of its total exports in the year of observation exceeds NOK 10,000 (USD 1,100). In addition to whether a firm is an exporter or a non-exporter, we are also interested in other characteristics of the firm. We measure *Profitability* as the log of profits divided by the operating income. *MNC* is a dummy that equals one if the firm is registered as having a positive ownership share in a firm located in a foreign country in the year of observation, and zero otherwise. To proxy for the complexity of a firm's operations, we calculate a variable referred to as *Destinations,* which is simply the number of destinations we observe a firm exporting to in a given year.

To address the impact of two exogenous shocks to perceived commitment, we calculate a paternity leave and a kindergarten variable. The *Paternity leave* (PL) variable is defined as the number of men taking 40 or more days (8 or more weeks) of leave in a given year expressed as a share of all men taking leave in that year. This is done for several reasons. First, we need to normalize the absolute number of men taking leave in a meaningfull way. Normalizing by the total number of men or fathers in a given year would introduce issues regarding immigration, which was substantial during our sample period. Secondly, the 40 days threshold represents a substantial share of the leave. Our hypothesis – that increasing the fathers' share of the parental leave will influence firms' perception of female commitment – only makes sense if fathers start taking a significant share of the leave, and we would not expect such effects from fathers taking a week or two. The choice of a rather high threshold should be seen in the light of the fact that almost all employees in Norway are entitled to five weeks (25 days) paid vacation every year. The 40 days threshold is the highest threshold for which we have consistent data throughout our period. We define the *Kindergarten* (KG) variable to be equal to the percentage of children between ages of 1 and 5 enrolled in kindergarten in a given year in the municipality where the worker lives.

2.3 Some Basic Facts on Women and Exporters

Before we proceed with our core analysis we document some basic facts on women and exporters in Norway. Table 10 in the Appendix provides an overview of the distribution of workers between exporters and non-exporters and the average characteristics of the labor force at these two types of firms. Despite the fact that a minority of firms are exporting, exporters employ around 80 percent of the labor force in manufacturing. We see that exporters on average employ workers with slightly higher education, slightly more labor market experience and who are slightly older, but have close to the same number of children. Their employees on average have substantially higher wages. The average female share in the labor force is approximately the same for exporters

and non-exporters.

To have a point of comparison, we estimate the gender wage gap in the Norwegian manufacturing sector by using worker-level data and regressing the log of wages on a female dummy. We find that the gender wage gap is sizable, and it is higher in manufacturing than in the rest of the Norwegian economy.[19]

Table 1: Overall Gender Wage Gap

	(1)
Female	**-0.248*****
	(0.009)
Observations	2713623
Adjusted R^2	0.040

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. Standard errors in parenthesis are clustered on firm.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Female workers in Norwegian manufacturing on average earn roughly 22 percent less than men, see Table 1.[20] Compared to what Blau and Kahn (2000) report for the US in 1999 (23.5 %), the gender wage gap in Norway is – even in the manufacturing sector – slightly smaller.

It is well known that exporters are different along a set of performance indicators. It has been documented for a number of countries, including Norway, that exporters on average pay higher wages.[21] However, it has also been found that international trade and exporters in particular, contribute to widening of income inequalities both within and between skill groups, see e.g. Klein et al. (2013). Thus, we procede by documenting some basic facts on the exporter wage premium and its variation across groups of workers with different educational levels and gender for the Norwegian manufacturing sector. To calculate the exporter premium, we follow the standard approach in the literature (see e.g. Bernard et al. (1995)) by regressing the firm's average wage on its exporting status, controlling for firm size and intrustry-year:

$$\ln \overline{Wage}_{jt} = \alpha_{st} + \beta Exporter_{jt} + \gamma Size_{jt} + \varepsilon_{jt}, \tag{1}$$

where $\ln \overline{Wage}_{jt}$ is the log of the average wage paid by firm j in year t, $Exporter_{jt}$ equals one if firm j exports in year t, and zero otherwise, and *Size* depicts firm size, and α_{st} denotes industry-year fixed effects. The results, presented in Table 11 in the Appendix, show that the estimated coefficient on the exporter status is positive and statistically significant (see Column (1)). When using the full sample, we find an exporter premium of 5.3% on average.

In Columns (2) and (3) of Table 11, we split the sample into male and female workers and find that the exporters on average pay higher wages to both sexes, but the exporter premium

[19] According to Barth et al. (2013) women in Norway have over the last decade earned between 12.5-15 percent less than men. Focusing only on the private sector, the gap has averaged 15-17 percent. These gender wage gaps are estimated based on the entire workforce, including both part-time and full-time employees.

[20] The gender wage gap is calculated as $100(e^{-0.250} - 1) = -22.12$.

[21] Irarrazabal et al. (2013) find that exporters in the Norwegian manufacturing sector pay higher wages, have higher productivity, profitability and capital intensity.

is slightly higher for males than females. Education is another worker characteristic regarded to be important for the extent to which workers gain from globalization. Hence, we split the sample into non-college and college educated workers (see Columns (4) and (5)). We find that the exporter premium is substantially higher for the college graduates. Finally, we consider both gender and education variation in exporter premium, and split the sample into four groups based on gender and education level (see Columns (6)-(9)). The exporter wage premium is positive and significant for all groups of workers, but there are substantial differences in the magnitudes. Within education groups, there seems to be a larger exporter premium for non-college educated females than males, as low educated males benefit the least from working at an exporter of the four groups of workers. The exporter wage premium is higher for college than for non-college educated for both genders, and college educated males are paid a substiantially higher exporter premium than college educated females.

With this descriptive evidence on gender wage gap and exporter premia as a background we set out to examine our main question of interest.

3 Empirical Model and Baseline Results

To shed light on the impact of globalization on gender inequality we examine the relationship between exporting and the gender wage gap. First, we simply account for observable worker and firm characteristics. Second, we investigate the role of unobservable worker characteristics by adding worker or spell fixed effects to our model. In the proceeding section we move on to exploit two exogenous shocks to cast light on the relationship between exporting and gender wage gap.

3.1 Exporters and the Gender Wage Gap: Controlling for Observables

The Gender Wage Gap in the Norwegian Manufacturing Sector How large is the gender wage gap when observable worker and firm characteristics are taken into account? To answer this question we adopt the approach of the existing literature and estimate a wage regression of the Mincer (1974) type adding a female dummy. A statistically significant dummy captures the wage gap between males and females, assuming that the included controls account for differences in worker productivity. Our model takes the following form:

$$\ln w_{ijst} = \delta fem_i + X_{it}\Phi + Z_{jt}\Delta + \alpha_{st} + \varepsilon_{ijst}, \tag{2}$$

where w_{ijst} is the daily wage of worker i employed by firm j operating in industry s at time t, fem_i is a dummy for being female, X_{it} is a vector of observable characteristics of worker i, Z_{jt} is a vector of observable characteristics of firm j, α_{st} is a industry-year fixed effect capturing any systematic variations in wages across industries, and ε_{ijst} is an error term. The vector X_{it} includes the variables *Education*, *Experience*, *Children*, and the dummy for working in a central location (*Centrality*). As is common practice, we also include experience squared (divided by

Table 2: Gender Wage Gap

	OLS	FE	OLS	FE
	(1)	(2)	(3)	(4)
Female	**-0.224*****	**-0.218*****	**-0.272*****	**-0.263*****
	(0.005)	(0.004)	(0.005)	(0.004)
Exporter			0.004	-0.005
			(0.006)	(0.003)
Female*Exporter			**0.059*****	**0.054*****
			(0.007)	(0.006)
Education	0.057***	0.051***	0.057***	0.051***
	(0.001)	(0.001)	(0.001)	(0.001)
Experience	0.034***	0.032***	0.034***	0.032***
	(0.000)	(0.000)	(0.000)	(0.000)
Experience^2	-0.058***	-0.054***	-0.058***	-0.054***
	(0.001)	(0.001)	(0.001)	(0.001)
Children	-0.026***	-0.019***	-0.026***	-0.019***
	(0.003)	(0.002)	(0.003)	(0.002)
Centrality	0.055***	0.070***	0.055***	0.070***
	(0.006)	(0.013)	(0.006)	(0.013)
Size	0.041***	-0.017***	0.039***	-0.017***
	(0.002)	(0.004)	(0.002)	(0.004)
Firm FE	No	Yes	No	Yes
Industry*year	Yes	Yes	Yes	Yes
Observations	2713623	2713623	2713623	2713623
Adjusted R^2	0.414	0.470	0.415	0.470

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

100). Z_{jt} for now includes the variable measuring firm size (*Size*). We refer to Section 2.2 for details on the variables and their construction. Standard errors are clustered at the firm level to account for group correlation across workers within firms.[22]

The results, given in Column (1) of Table 2, show that after controlling for education, experience and children, women earn roughly 20% less than men. The coefficients on the other variables have the expected signs, and their magnitudes are in line with the existing literature. Both experience and education are positively correlated with wages, while having children has a negative effect. Workers working for larger and more centrally located firms tend to earn more.

The estimate of the gender wage gap is merely about two percentage points lower than the overall gender wage gap in the manufacturing sector without controlling for worker or firm characteristics. Hence, our estimates tell us that only around 10 percent of the gender wage gap in the Norwegian manufacturing can be explained by observable worker characteristics. However, it is important to bear in mind that we are limiting our analysis to one sector of the economy and that a substantial part of the gender wage gap in Norway is explained by women primarily working in different sectors than men do (see e.g. Barth et al. (2013)).

To understand whether the result on the gender wage gap is driven mainly by between-firm or within-firm variation, we estimate the model above adding firm fixed effects. The results

[22] All of our results are robust to clustering at the level of individual workers.

from this regression, presented in Column (2) of Table 2, show that the within-firm gender gap is only slightly lower than the overall gender gap. This tells us that the aggregate gender wage gap stems mostly from female and male workers being paid different wages within a firm rather than being due to differences across firms.

Exporting and the Gender Wage Gap We now examine whether there is a difference in the gender wage gap between exporters and non-exporters. We do so by adding a dummy for exporting firms, as well as an interaction term between a firm's export status and the female dummy. The latter variable picks up any differential in the gender wage gap between exporting and non-exporting firms, controlling for the observable characteristics of the worker and the firm. Hence, the regression we estimate is given by:

$$\ln w_{ijst} = \eta fem_i + \zeta fem_i * Exporter_{jt} + X_{it}\Psi + Z_{jt}\Theta + \delta_{st} + \varepsilon_{ijst}, \tag{3}$$

where the vector of observable characteristics of firm j, Z_{jt}, now includes also the export status of the firm. The results from OLS and firm fixed effects regressions are given in Columns (3) and (4) of Table 2, respectively. Once we control for worker characteristics as well as firm size, we observe that the exporter premium is no longer statistically significantly different from zero.[23] The results further show that the gender wage gap is still statistically significant and economically large when we account not only for observable worker and firm characteristics, but also for the exporting status. This is true both for the OLS and firm fixed effects regressions. Most interesting from our point of view is the fact that female workers seem to get a positive and significant exporter wage premium. The interaction term between being female and working for an exporting firm is positive and statistically significant. The coefficient is almost the same regardless of whether or not we include firm fixed effects. We find that in general females are paid 24 percent less, while women working at exporting firms are paid only around 19 percent less than their male peers. Thus working at an exporter seems to close the gender wage gap by around a fifth.

Subsample Analysis according to Education and Occupation In the exploratory firm-level regressions (see Table 11 in the Appendix), we found large differences between education groups, with the college graduates enjoying a larger exporter premium than less educated workers. To examine this issue further, we split the sample into workers with and without college education and estimate equation (3) separately on each sub-sample. The results are given in Table 12 in the Appendix. They show that college educated workers in general get an exporter premium, even after we control for their observable characteristics and the size of the firm. This is, however, not the case for the workers without college education, where the exporter wage premium vanishes once we control for their observable characteristics and the size of the firm.

[23] If we exclude firm size from the set of control variables, the exporter premium is again positive and significant in the OLS estimation. This is not surprising given that most exporters are large firms.

The relative size of the two groups explain why the exporter premium disappears when we pool all workers: the non-college group constitues roughly 80% of the sample (Table 2). However, in both education groups, females get a sizable exporter premium. This result holds both across firms (Columns (1) and (3)) and within firms (Columns (2) and (4) where we add firm fixed effects). The exporter female premium is larger for workers without college education. As for the a general gender wage gap, this is found for both groups of education, but our estimates suggest that the gap is larger among workers without college education.

For the last part of our sample period, from 2003 onwards, we also know the occupation of the worker. While education may be suggestive of the type of work and tasks that an employee carries out, occupation may be even more informative. We proceed by splitting the sample into eight occupational categories: Managers (Mng), Professionals (Prof), Technicians and associate professionals (Tech), Clerks, Service workers and shop and market sales workers (Service), Craft and related trades workers (Craft), Plant and machine operators and assemblers (Mchn), and Elementary occupations (Elem), leaving out two categories that are not relevant for manufacturings firms, namely Armed forces and unspecified and Skilled agricultural and fishery workers. The results are reported in Table 13 in the Appendix.

We see that across all occupations, there is a statistically significant gender wage gap. This gap is smallest for Professionals, and largest for Service workers. Exporters pay a wage premium to Managers, Technicians and associate professionals, and Service workers, while Clerks as well as Plant and Machine operators and assemblers actually earn relatively less at exporters. These results seem to support the findings of Klein et al. (2013). In five of eight occupational categories, exporters pay an extra premium to females. The only statistically significant negative exporter effect on the gender wage gap is found for the group of Professionals. We also repeat this exercise adding firm fixed effects, but we do not report the results to save space. Again in five occupations we find that the gender wage gap is smaller in exporting firms. The result suggesting a larger gender wage gap in exporting firms among Professionals ceases to be statistically significant.

Allowing for Differential Returns to Worker Characteristics It might be the case that the exporters and non-exporters differ not only in terms of the gender wage gap but also in terms of the returns they offer to other worker characteristics, such as, education and experience. Therefore, we extend our specification to to allow for differential returns to all variables. We proceed first by allowing for returns to vary between exporting and non-exporting firms (Column (1)), then between females and males (Column (2)), and finally between all four subgroups (Column (3)).[24] The results are presented in Table 14 in the Appendix. Our results indicate that the return to observable characteristics such as education experience and children vary both across gender and between exporters and non-exporters. But most importantly, we find that the general exporter premium to females remains also after these differential returns have been accounted for.

[24]Our reference group is males in non-exporting firms.

3.2 Exporters and the Gender Wage Gap: Controlling for Unobservables

Our analysis so far has revealed persistent differences in the gender wage gap between exporters and non-exporters when controlling for observable characteristics. What if this is because the females working for exporters are different in ways the econometrician cannot observe? May the lower gender wage gap we observe in exporting firms simply be an artifact that can be explained by exporters employing different women than non-exporters? Such differences in firms' labor force could be explained by some kind of sorting, where women with different abilities and ambitions seek to be employed by exporters, or due to exporters being better at screening and thus employing women with higher productivity than non-exporters. To explore this issue we need to control for unobservable characteristics of the workers which affect their productivity. The most straightforward way of doing so is by adding worker fixed effects to the regressions. These fixed effects will account for all time-invariant heterogeneity of the workers, including their gender.[25] This means that we will not be able to identify the overall gender wage gap using this methodology. However, our interaction of interest between being female and working for an exporter is still identified in this framework. The coefficient on this variable will tell us how large the differential gender wage gap between exporters and non-exporters is, conditional on observable, time-varying characteristics of the worker and the firm, as well as unobservable time-invariant characteristics of the worker. If we believe that ability and ambition do not change over time, they will now be accounted for in the analysis. We proceed by estimating a model based on

$$\ln w_{ijst} = \zeta fem_i * Exporter_{jt} + X_{it}\Pi + Z_{jt}\mathrm{K} + \lambda_{st} + \vartheta_i + \varepsilon_{ijst}, \tag{4}$$

where X_{it} is again a vector of time-varying characteristics of the worker, Z_{jt} is a vector of time-varying characteristics of the firm including its exporter status, δ_{st} is the industry-year fixed effect, and ϑ_i is the worker fixed effect.[26] The results from this regression are given in Table 3, for the whole sample (Column (1)), as well as for the two education groups separately (Columns (2)-(3)).

These results tell a very different story. The coefficient on our interaction variable $Female * Exporter$ is statistically significant and negative for college graduates. In the pooled sample and the subsample of workers without college education, it also bears a negative sign but it is not statistically significant. In other words, when we account for unobservable heterogeneity among the workers, females no longer earn a gender-specific exporter premium. This suggests that the observable characteristics that we included in our previuos regressions did not capture all the relevant aspects of a worker's productivity and that exporters hire more "able" workers, in terms of unobservable characteristics. Taking these unobservable characteristics into account, there is a wage penalty for college educated women working in exporting firms of about 3 percentage

[25] No workers in our sample switch gender.

[26] Recall that the *Centrality* dummy is defined based on where the worker lives. Since workers move during a spell, we are able to include this variable in the regressions.

Table 3: Worker and Spell Fixed Effects

	Worker FE			Spell FE		
	All	Non	Coll	All	Non	Coll
	(1)	(2)	(3)	(4)	(5)	(6)
Exporter	0.005*	0.005	0.009	0.003	0.004	0.008
	(0.003)	(0.003)	(0.006)	(0.004)	(0.004)	(0.006)
Female*Exporter	-0.007	-0.003	**-0.029*****	**-0.010***	-0.007	**-0.032*****
	(0.004)	(0.005)	(0.008)	(0.005)	(0.005)	(0.010)
Education	0.066***	0.076***	0.089***	0.063***	0.075***	0.063***
	(0.002)	(0.003)	(0.006)	(0.002)	(0.003)	(0.008)
Experience	0.012***	0.027***	0.013**	0.020**	0.041***	0.013
	(0.005)	(0.006)	(0.006)	(0.008)	(0.010)	(0.011)
Experience^2	-0.059***	-0.056***	-0.067***	-0.053***	-0.050***	-0.064***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Children	-0.057***	-0.074***	-0.030***	-0.066***	-0.083***	-0.035***
	(0.004)	(0.004)	(0.007)	(0.006)	(0.006)	(0.009)
Centrality	0.018***	0.014***	0.020***	0.001	-0.004	0.010
	(0.004)	(0.005)	(0.005)	(0.007)	(0.008)	(0.007)
Size	0.027***	0.030***	0.016***	0.045***	0.044***	0.038***
	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)	(0.008)
Worker FE	Yes	Yes	Yes	No	No	No
Spell FE	No	No	No	Yes	Yes	Yes
Industry*year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2713623	2160012	553611	2713623	2160012	553611
Adjusted R^2	0.714	0.656	0.781	0.750	0.696	0.813

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

points. Note that the identifying variation in this model comes from firms changing their export status and from workers moving between exporters and non-exporters. In additional regressions, not reported to save space, we find that both sources of variation are responsible for our findings.

Next, we rely on spell fixed effects rather than worker fixed effects to investigate the role of unobservables. A spell is defined as a unique worker-firm combination. This strategy uses variation coming only from firms changing their export status, holding all worker- and match-specific time-invariant effects constant. In this way, we circumvent the problem of endogenous mobility and are able to account for firm-specific unobservable characteristics at the same time.[27] The results, presented in the last three columns of Table 3, are very similar in sign and magnitude to the results with worker fixed effects. A female wage penalty of about 3.3 percentage points is found among workers with college education. A smaller, but still weakly statistically significant, effect of 1 percentage point is present in the full sample.

[27]We could also use firm and worker fixed effects jointly to take out firm effects, but that would would still leave us with the problem of endogenous mobility.

4 Women, Commitment and the Gender Wage Gap: Exploiting Exogenous Shocks

As argued above, men are typically believed to be more committed employees than women. Over the last decades Norwegian policy makers have introduced a number of policy measures intended to promote equal rights and emancipation. Among them are a set of subsequent paternity leave reforms and a roll-out of subsidized day care for children. Doing so, policymakers have aimed to influence the relationship between partners - mothers and fathers, between parents and children, but also between employers and employees. We argue that, as a consequence, social attitudes have changed and so did the perceived commitment gap between the genders. If exporters are more dependent on employees commitment and flexibility, our hypothesis is that this change in perceived commitment will matter relatively more for these firms than for other firms. As a result, we would expect the difference in relative gender wage gap between exporters and non-exporters to be reduced. Below we proceed by exploiting the two exogenous shocks to emanipation - paternity leave and increased kindergarten coverage - and examine the impact of these on the gender wage gap differential between exporters and non-exporters. .

4.1 Paternity Leave Reforms

The first exogenous shock we consider consisted of legislative changes that have gradually increased the number of weeks of the parental leave that are available only to the child's father, the so called paternal quota. Unless there are special circumstances, the paternal quota weeks are lost if not taken by the father. A quota of 4 weeks was first introduced in 1993. It was extended to 5 and 6 weeks in 2005 and 2006, respectively. In 2009, the number of weeks was further extended to 10. Table 9 in the Appendix provides an overview of the subsequent reforms. These legislative changes have resulted in a huge increase in the fraction of fathers taking at least 8 weeks of leave. This share went up from 8.4% in 1996 (the first year of our sample), to 10.8% in 2003 and 40.6% in 2010 (the last year of our sample).

We argue that it is likely that the change in fathers' behaviour has had an impact on the perceived commitment gap between men and women. Our presumption is supported by time-use surveys of parents and the time they spend on domestic tasks (see Kitterød (2012)). The surveys show that over the last couple of decades mothers in Norway have consistently reduced the time they spend on childcare and household chores, while the opposite is true for fathers. In our empirical analysis, we proxy for the change in the perceived commitment gap between men and women, using the fraction of fathers taking at least 8 weeks of leave in a given year. As argued in Section 2.2, we choose 8 weeks as our cutoff because a two-month long absence from work is substantial and disruptive enough to affect the employers' perceptions. In line with our hypothesis that a change in the perceived commitment gap should affect exporters relatively more, our variable of interest is a triple interaction between the female dummy, the exporter dummy and the parental leave variable. It captures us how the gender wage gap

differential between exporters and non-exporters evolved with the change in social attitudes. The specification also includes the other components of the triple interaction separately.

The estimation results, presented in Table 4, confirm our priors. We find that the gender wage gap is higher in exporting firms than in non-exporters, and more importantly that the difference between the two narrows down with the change in social attitudes. All of the estimated coefficients are statistically significant, with all but one being significant at the one percent level. This is true for the full sample as well as for subsample of college educated workers and workers without college education. As one would expect, the results are stronger when we focus our attention to workers in their reproductive years, i.e., those under 45 years of age (see the last three columns of the table). They are also stronger for college graduates.

Table 4: Paternity leave and the Gender Wage Gap

	All Workers			Workers $<$ 45 years old		
	All	Non	Coll	All	Non	Coll
	(1)	(2)	(3)	(4)	(5)	(6)
Exporter	-0.014***	-0.010**	-0.014*	-0.009*	-0.005	-0.013
	(0.005)	(0.005)	(0.008)	(0.006)	(0.005)	(0.008)
Female*Exporter	**-0.029****	**-0.027****	**-0.047****	**-0.039****	**-0.034****	**-0.063****
	(0.007)	(0.007)	(0.014)	(0.010)	(0.010)	(0.018)
Female*Exporter*PL	**0.185****	**0.196****	**0.125***	**0.251****	**0.254****	**0.219****
	(0.036)	(0.039)	(0.067)	(0.052)	(0.058)	(0.090)
Exporter*PL	0.136***	0.108***	0.164***	0.104***	0.072**	0.135***
	(0.029)	(0.027)	(0.042)	(0.032)	(0.032)	(0.049)
Education	0.063***	0.075***	0.063***	0.069***	0.083***	0.062***
	(0.002)	(0.003)	(0.008)	(0.003)	(0.003)	(0.008)
Experience	0.021***	0.042***	0.014	0.009	0.030**	-0.009
	(0.008)	(0.010)	(0.011)	(0.011)	(0.012)	(0.013)
Experience^2	-0.054***	-0.051***	-0.065***	-0.064***	-0.074***	-0.047***
	(0.001)	(0.001)	(0.002)	(0.004)	(0.005)	(0.005)
Children	-0.067***	-0.084***	-0.035***	-0.076***	-0.096***	-0.043***
	(0.006)	(0.006)	(0.009)	(0.006)	(0.006)	(0.009)
Centrality	0.001	-0.004	0.011	-0.000	-0.005	0.008
	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)
Size	0.045***	0.045***	0.038***	0.045***	0.045***	0.031***
	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.008)
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Female*year	Yes	Yes	Yes	Yes	Yes	Yes
Industry*year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2713623	2160012	553611	1621583	1267545	354038
Adjusted R^2	0.750	0.696	0.813	0.733	0.688	0.787

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. PL is year specific and is defined as the share of men on paternity leave taking at least 8 weeks of leave. Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The magnitude of the estimated effects is economically meaningful. Let us consider the estimates from the last column, i.e., those pertaining college educated workers under 45 years of age. The change in the share of fathers taking at least two months of paternity leave between 1996 and 2008 results in the gender wage gap in exporters going from being on average 4.5 percent higher than in other firms to being only 3.3 percent higher. For the subsample of workers without college education, the corresponding gap of 1.3 percent is driven all the way

down to zero.

4.2 Kindergarten Roll-out

Now we move on to exploit an alternative shock in our identification strategy. In 2003, the Norwegian government initiated a substantial expansion of kindergarten coverage. The goal was to offer all children a high quality, low price place in a public or private kindergarten. Possibly just as important, the roll out of kindergarten places also meant much more reliable as well as full time day care. The initiative resulted in a massive change: 9 of 10 children between the ages of 1 and 6 attended kindergarten in 2009, as compared to 54% in 1996 and 63% in 2001. The increase in kindergarten coverage proceeded at different speeds in different regions of the country.

In our estimation, we examine whether the gender wage gap differential between exporters and non-exporters was affected by the increase in availability of kindergarten places in a given location. The measure of interest is the share of children between the ages of 1 and 5 enrolled in kindergarten. The logic behind this approach is that greater availability of reliable child care is associated with fewer disruptions to mothers' working hours and thus allows them to exhibit greater commitment to their jobs. Thus the availability of kindergartens should be negatively correlated with the perceived differences in work commitment between genders, which matters relatively more for commitment-dependent firms. As the speed of the kindergarten roll-out may have been related to locational characteristics, we control for county-year fixed effects.[28]

Table 5 shows that our results on the impact of the kindergarten reform are consistent with those found for the paternity leave (see Table 4). We find that the gender wage gap differential between exporters and non-exporters went down as a larger share of children of the relevant age was enrolled in kindergarten in a given location in a given year. The coefficients of interest are statistically significant in all specifications. As expected, the gender wage gap differential between exporters and non-exporters is higher for women in their reproductive years (i.e., those under 45).

The estimates are also economically meaningful. Let us again focus on the last column of the table pertaining to college educated workers under 45 years of age. The estimated coefficients suggest that an increase in the average kindergarten coverage from that observed in 2000 (the first year for which such data are available) to that observed in 2009 would change the gender wage gap differential between exporters and non-exporters from about 5 percent to zero. In other words, it would eliminate the wage penalty faced by college educated females working for exporting firms.

[28] There are 439 municipalities and 19 counties in Norway.

Table 5: Kindergarten and the Gender Wage Gap

	All Workers			Workers < 45 years old		
	All	Non	Coll	All	Non	Coll
	(1)	(2)	(3)	(4)	(5)	(6)
Exporter	-0.053***	-0.042***	-0.052	-0.029	-0.015	-0.037
	(0.016)	(0.015)	(0.035)	(0.018)	(0.018)	(0.037)
Female*Exporter	**-0.150*****	**-0.152*****	**-0.167****	**-0.189*****	**-0.197*****	**-0.178****
	(0.028)	(0.029)	(0.070)	(0.040)	(0.042)	(0.085)
Female*Exporter*KG	**0.002*****	**0.002*****	**0.002****	**0.002*****	**0.003*****	**0.002***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Exporter*KG	-0.002***	-0.003***	-0.002***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Female*KG	0.001***	0.001***	0.001**	0.000**	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
KG	-0.001***	-0.000**	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Education	0.073***	0.088***	0.057***	0.080***	0.097***	0.057***
	(0.003)	(0.004)	(0.009)	(0.003)	(0.004)	(0.009)
Experience	0.033***	0.041***	0.029**	0.020*	0.028***	0.005
	(0.008)	(0.009)	(0.015)	(0.011)	(0.011)	(0.019)
Experience^2	-0.052***	-0.049***	-0.060***	-0.054***	-0.064***	-0.033***
	(0.001)	(0.001)	(0.002)	(0.004)	(0.005)	(0.006)
Children	-0.068***	-0.087***	-0.034***	-0.076***	-0.096***	-0.041***
	(0.007)	(0.007)	(0.012)	(0.007)	(0.007)	(0.012)
Centrality	0.010	0.010	0.005	0.006	0.007	-0.000
	(0.006)	(0.008)	(0.010)	(0.008)	(0.010)	(0.012)
Size	0.047***	0.045***	0.042***	0.045***	0.043***	0.038***
	(0.009)	(0.007)	(0.012)	(0.008)	(0.007)	(0.011)
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
County*year	Yes	Yes	Yes	Yes	Yes	Yes
Industry*year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1896790	1485425	411365	1099014	842514	256500
Adjusted R^2	0.757	0.700	0.816	0.736	0.689	0.786

Notes: Estimates are based on the panel of worker-level data for 2000-2010. Dependent variable: log wage. KG is year and municipality specific and is defined as the share of children between the ages of 1 and 5 enrolled in kindergarten. Norway has 19 counties and 439 municipalities.
Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5 Exporter Heterogeneity and the Gender Wage Gap

So far our analysis has focused on differential gender wage gaps beween exporters and non-exporters. However, exporters differ substantially in their size, organization and technology. Now we set out to exploit the heterogeneity among exporters. It has been documented that firms exporting to a large number of locations tend to be larger and more productive (Bernard et al. (2011), Eaton et al. (2011)). It is also likely that these firms have even higher expectations vis a vis their employees than other exporters, which may translate into them having an even larger gender wage gap.

Table 6: Number of Export Destinations

	All	Non-college	College
	(1)	(2)	(3)
1-3 Destinations	0.004	0.005	0.005
	(0.003)	(0.003)	(0.006)
4-10 Destinations	0.004	0.003	0.015
	(0.006)	(0.006)	(0.009)
>10 Destinations	0.007	0.006	0.016
	(0.007)	(0.007)	(0.011)
Female*1-3 Destinations	**-0.010****	**-0.009***	**-0.025****
	(0.005)	(0.005)	(0.011)
Female*4-10 Destinations	**-0.012***	-0.007	**-0.039*****
	(0.007)	(0.007)	(0.014)
Female*>10 Destinations	**-0.024*****	**-0.020****	**-0.043****
	(0.009)	(0.009)	(0.017)
Education	0.063***	0.075***	0.063***
	(0.002)	(0.003)	(0.008)
Experience	0.020**	0.041***	0.013
	(0.008)	(0.010)	(0.011)
Experience^2	-0.053***	-0.050***	-0.064***
	(0.001)	(0.001)	(0.002)
Children	-0.066***	-0.083***	-0.035***
	(0.006)	(0.006)	(0.009)
Centrality	0.001	-0.004	0.010
	(0.007)	(0.008)	(0.007)
Size	0.045***	0.044***	0.038***
	(0.006)	(0.006)	(0.008)
Spell FE	Yes	Yes	Yes
Industry*year	Yes	Yes	Yes
Observations	2713623	2160012	553611
Adjusted R^2	0.750	0.696	0.813

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

To examine this issue we split the exporting firms into three bins: those exporting to between 1 and 3 destinations, 4-10 destinations and those serving more than 10 destinations. Then we allow the gender wage gap to be different across bins and estimate the model given by (4) using spell fixed effects. As expected, we find that the coefficient on the$Female * Exporter$ interaction becomes more negative as the number of destinations increases (see Table 6). This means that the gender wage gap is higher in exporters serving a larger number of markets. While the

difference between estimated coefficients of interest is statistically significant in the full sample and the subsample of workers without college education, this is not true for college educated workers.

6 Addressing an Alternative Explanation

Finally, we turn to a possible alternative interpretation for our baseline findings of a higher gender wage gap among exporting firms. Becker's (1957) theory of taste-based discrimination predicts that only very profitable firms can afford to discriminate. As exporters are more profitable than other firms, they may be *better* positioned to engage in costly discrimination against women. In other words, Becker's theory would lead to the same prediction of a higher gender wage gap among exporters, but its interpretation would be different.

Table 7: Multinationals, Profitability and Size

	All	Non-college	College
	(1)	(2)	(3)
Exporter	0.003	0.003	0.007
	(0.004)	(0.004)	(0.006)
Female*Exporter	-0.008	-0.006	**-0.030*****
	(0.005)	(0.005)	(0.011)
MNC	-0.016**	-0.012*	-0.017*
	(0.008)	(0.007)	(0.010)
Female*MNC	-0.001	0.002	-0.002
	(0.006)	(0.007)	(0.008)
Size	0.051***	0.050***	0.042***
	(0.006)	(0.006)	(0.009)
Female*Size	-0.023***	-0.022***	-0.018*
	(0.006)	(0.006)	(0.010)
Profitability	0.006***	0.006***	0.006***
	(0.001)	(0.001)	(0.001)
Female*Profitability	-0.001*	-0.002**	0.001
	(0.001)	(0.001)	(0.001)
Education	0.063***	0.075***	0.063***
	(0.002)	(0.003)	(0.008)
Experience	0.020**	0.041***	0.013
	(0.008)	(0.010)	(0.012)
Experience^2	-0.053***	-0.050***	-0.064***
	(0.001)	(0.001)	(0.002)
Children	-0.066***	-0.083***	-0.035***
	(0.006)	(0.006)	(0.009)
Centrality	0.001	-0.004	0.011
	(0.007)	(0.008)	(0.007)
Spell FE	Yes	Yes	Yes
Industry*year	Yes	Yes	Yes
Observations	2713623	2160012	553611
Adjusted R^2	0.750	0.696	0.813

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. Dummy for missing profitability included. Standard errors in parenthesis are clustered on firm.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

To address this alternative explanation we augment our specification with spell fixed effects from Section 3.2 by allowing the gender wage gap to differ with firm profitability.[29] We also allow it to differ with firm size (which in the Melitz (2003) framework is positively correlated with profitability) and its multinational status (again because it is a proxy for profitability). As evident from Table 7, doing so does not affect our main result suggesting that the gender wage gap is higher in exporting firms among college educated workers.

We also augment our exercises relying on the exogenous shocks by controlling for profitability and its interaction with the female dummy. As evident from Tables 15 and 16 in the Appendix, our results are robust to this change.

7 Conclusions

While the impact of globalization on income inequality has received a lot of attention, little is yet known about its effect on the gender wage gap. This study argues that there is a systematic difference between the gender wage gap in exporting firms and non-exporters. By the virtue of being exposed to higher competition, exporters require greater commitment and flexibility from their employees. If commitment is not easily observable and women are perceived to be less committed workers than men, exporters will statistically discriminate relatively more against female employees and will exhibit a higher gender wage gap than non-exporters. Moreover, we should expect a decrease in the perceived commitment gap between men and women to narrow the differential gender wage gap between these two types of firms.

We test this hypothesis using the matched employer-employee data from the Norwegian manufacturing sector for the 1996-2010 period. Our identification strategy relies on an exogenous shock, the legislative changes that increased the number of weeks of the parental leave that are available only to the child's father. We argue that these changes have narrowed the perceived commitment gap between the genders. We show that the initially higher gender wage gap observed in exporting firms (relative to non-exporters) has gone down after the shock. This effect was particularly pronounced for college graduates and for those in their reproductive years.We also show that another exogenous shock – an increase in the kindergarten coverage – has lead to a similar effect, and served as to close the gender wage gap between exporters and non-exporters.

[29]The *Profitability* variable is missing for approximately 22% of the sample. Instead of dropping these observations, we add a dummy for missing *Profitability* in all the specifications where *Profitability* is included.

References

Andresen, M. E. and T. Havnes (2014). Money for nothing? Universal child care and maternal employment. *Journal of Public Economics*.

Barth, E., I. Hardoy, P. Schoene, and K. M. Oestbakken (2013). Lønnsforskjeller mellom kvinner og menn. Hva skjedde på 2000-tallet? ISF Report 2013:7, Institute for Social Research.

Becker, G. S. (1957). *The Economics of Discrimination*. Chicago: University of Chicago Press.

Ben Yahmed, S. (2013). Gender wage gaps across skills and trade openness. Working paper.

Bernard, A. B. and J. B. Jensen (1999). Exceptional exporter performance: Cause, effect, or both? *Journal of International Economics 47*(1), 1–25.

Bernard, A. B., J. B. Jensen, and R. Z. Lawrence (1995). Exporters, jobs, and wages in US manufacturing: 1976-1987. *Brookings Papers on Economic Activity. Microeconomics 1995*, 67–119.

Bernard, A. B., S. J. Redding, and P. K. Schott (2011). Multiproduct firms and trade liberalization. *The Quarterly Journal of Economics 126*(3), 1271–1318.

Black, S. E. and E. Brainerd (2004). Importing equality? The impact of globalization on gender discrimination. *Industrial and Labor Relations Review 57*(4), 540–559.

Blau, F. D. and L. M. Kahn (2000). Gender differences in pay. *Journal of Economic Perspectives 14*(4), 75–99.

Cools, S., J. H. Fiva, and L. J. Kirkebøen (2015). Causal effects of paternity leave on children and parents. *Scandinavian Journal of Economics forthcoming*.

Cuddy, Amy, S. F. and P. Glick (2004). When professionals become mothers, warmth does not cut the ice. *Journal of Social Issues 60*(4), 701–718.

Eaton, J., S. Kortum, and F. Kramarz (2011). An anatomy of international trade: Evidence from french firms. *Econometrica 79*(5), 1453–1498.

Gislason, I. (2007). Parental leave in Iceland: Bringing the fathers in. Technical report, Centre for Gender Equality, Ministry of Social Affairs.

Goldin, C. (2014). A grand gender convergence: Its last chapter. *American Economic Review 104*(4), 1091–1119.

Havnes, T. and M. Mogstad (2011). Women and children first? Labor market effects of universal child care for toddlers. Technical Report 11-12.

Helpman, E., O. Itskhoki, and S. Redding (2010). Inequality and Unemployment in a Global Economy. *Econometrica 78*(4), 1239–1283.

Irarrazabal, A., A. Moxnes, and K. H. Ulltveit-Moe (2013). Heterogeneous firms or heterogeneous workers? Implications for the exporter premium and the impact of labor reallocation on productivity. *Review of Economics and Statistics 95*(3), 839–849.

Juhn, C., G. Ujhelyi, and C. Villegas-Sanchez (2014). Men, women and machines: How trade impacts gender inequality. *Journal of Development Economics 106*, 179–193.

Kitterød, R. H. (2012). Foreldrenes tidsbruk: Fedre deltar med i husarbeid og omsorg. *Statistics Norway Samfunnsspeilet* (4).

Klein, M. W., C. Moser, and D. M. Urban (2013). Exporting, skills and wage inequality. *Labour Economics 25*, 76–85.

Manning, A. and B. Petrongolo (2008). The part-time pay penalty for women in Britain. *The Economic Journal 118*, F28–F51.

Melitz, M. J. (2003). The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica 71*(6), 1695–1725.

Mincer, J. (1974). *Schooling, Experience, and Earnings*. Columbia University Press.

OECD (2012). *Closing the Gender Gap: Act Now*. OECD Publishing.

Raknerud, A., D. Rønningen, and T. Skjerpen (2004). Documentation of the capital database. Statistics Norway Reports 2004/16, Statistics Norway.

Schank, T., C. Schnabel, and J. Wagner (2007). Do exporters really pay higher wages? First evidence from German linked employer–employee data. *Journal of International Economics 72*(1), 52–74.

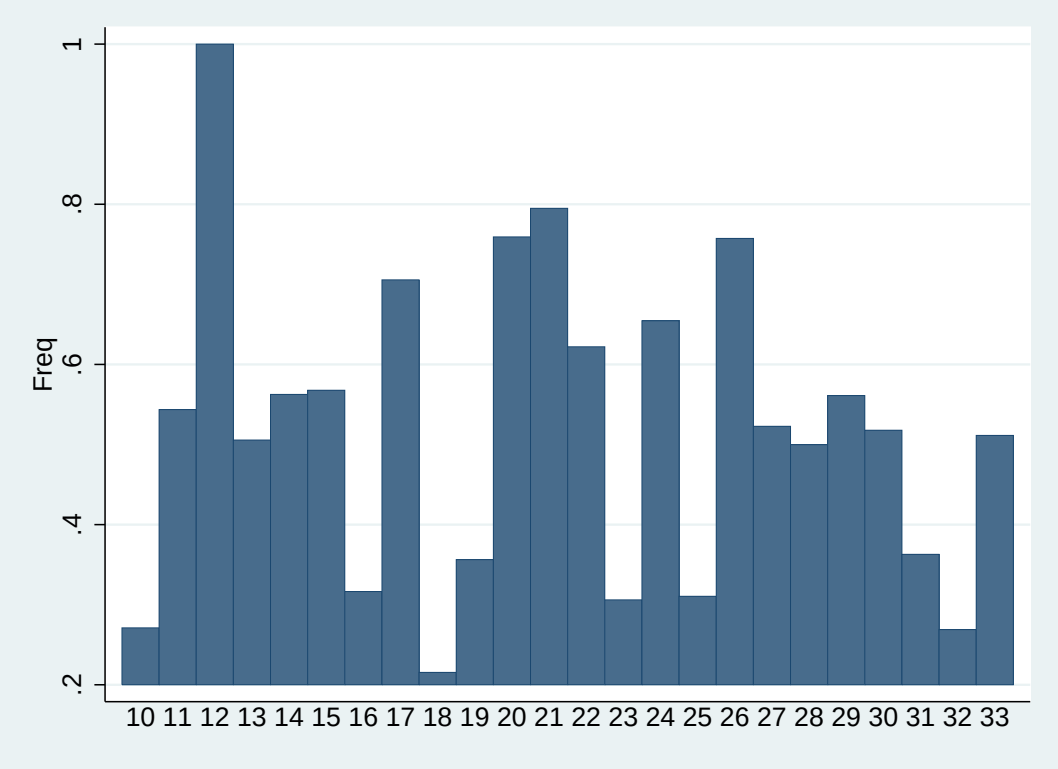
A Appendix

A.1 Manufacturing Industries

Table 8: NACE Rev. 2

NACE code	Industry name
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials, except furniture
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastic products
23	Manufacture of non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment

Figure 1: Share of exporters across industries



A.2 Additional Tables

Table 9: Parental leave reforms in Norway

	Parental leave (weeks)	Compensation Rate	Maternal quota (weeks)	Paternal quota (weeks)
July, 1 1977	18	100%	6	0
May 1, 1987	20	100%	6	0
July 1, 1988	22	100%	6	0
April 1, 1989	24(30)	100%(80%)	6	0
May 1, 1990	28(35)	100%(80%)	6	0
July 1, 1991	32(40)	100%(80%)	8	0
April 1, 1992	35(44.4)	100%(80%)	8	0
April 1, 1993	42(52)	100%(80%)	9	4
July 1, 2005	43(53)	100%(80%)	9	5
July 1, 2006	44(54)	100%(80%)	9	6
July 1, 2009	46(56)	100%(80%)	9	10
July 1, 2011	47(57)	100%(80%)	9	12

Table 10: Descriptive Statistics

	Non-exporters	Exporters
Average Wage	805.69	989.27
Average Education	12.26	12.93
Average Experience	21.06	22.64
Average Age	40.09	41.60
Children share	0.80	0.81
Average number of children	1.84	1.81
Centrality	0.47	0.53
Total share of labor force	0.19	0.81
Average Share of Females in the labor force	0.20	0.21

Notes: All numbers apart from average wages are based on the panel of worker-level data for 1996-2010. Average wages are for 2001. An exporters has by definition exports above NOK 10,000 (USD 1,100).

Table 11: Exporter premia

	All	M	F	Non	Coll	Non M	Non F	Coll M	Coll F
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Exporter	**0.052*****	**0.052*****	**0.043*****	**0.035*****	**0.087*****	**0.033*****	**0.037*****	**0.097*****	**0.052*****
	(0.005)	(0.005)	(0.006)	(0.004)	(0.007)	(0.004)	(0.007)	(0.007)	(0.011)
Size	0.032***	0.036***	0.050***	0.032***	0.049***	0.035***	0.048***	0.053***	0.050***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.004)
Industry*year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	89779	87386	54551	86830	51700	83907	50885	47456	22281
Adjusted R^2	0.322	0.309	0.304	0.314	0.262	0.301	0.289	0.266	0.261

Notes: Estimates are based on the panel of firm-level data for 1996-2010. Dependent variable: log wage. Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
M stands for Males, F for Females, Coll for College educated, Non for Non-College educated.

Table 12: Gender Wage Gap – Education Split

	Non-college		College	
	(1)	(2)	(3)	(4)
Female	**-0.278*****	**-0.265*****	**-0.238*****	**-0.257*****
	(0.005)	(0.004)	(0.009)	(0.012)
Exporter	-0.001	-0.006*	0.041***	-0.003
	(0.005)	(0.003)	(0.012)	(0.009)
Female*Exporter	**0.067*****	**0.061*****	**0.022****	**0.039*****
	(0.007)	(0.006)	(0.010)	(0.012)
Education	0.043***	0.039***	0.067***	0.060***
	(0.001)	(0.001)	(0.002)	(0.002)
Experience	0.033***	0.032***	0.042***	0.038***
	(0.000)	(0.000)	(0.001)	(0.001)
Experience^2	-0.059***	-0.055***	-0.062***	-0.053***
	(0.001)	(0.001)	(0.002)	(0.002)
Children	-0.042***	-0.035***	0.003	0.018***
	(0.002)	(0.002)	(0.005)	(0.004)
Centrality	0.048***	0.051***	0.069***	0.100***
	(0.005)	(0.010)	(0.010)	(0.018)
Size	0.038***	-0.010**	0.039***	-0.023***
	(0.002)	(0.004)	(0.003)	(0.006)
Firm FE	No	Yes	No	Yes
Industry*year	Yes	Yes	Yes	Yes
Observations	2160012	2160012	553611	553611
Adjusted R^2	0.331	0.396	0.420	0.498

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 13: Gender Wage Gap – Occupation Split

	(1) Mng	(2) Prof	(3) Tech	(4) Clerk	(5) Service	(6) Craft	(7) Mchn	(8) Elem
Female	**-0.246*****	**-0.118*****	**-0.202*****	**-0.212*****	**-0.336*****	**-0.278*****	**-0.295*****	**-0.237*****
	(0.017)	(0.021)	(0.015)	(0.013)	(0.019)	(0.012)	(0.012)	(0.019)
Exporter	0.028**	-0.030	0.027*	-0.031**	0.037*	-0.006	-0.016**	-0.023
	(0.013)	(0.023)	(0.015)	(0.012)	(0.019)	(0.011)	(0.008)	(0.015)
Female*Exporter	**0.061*****	**-0.066*****	-0.007	**0.078*****	**0.042***	**0.055*****	**0.098*****	-0.003
	(0.018)	(0.023)	(0.017)	(0.014)	(0.023)	(0.014)	(0.014)	(0.023)
Experience	0.038***	0.031***	0.032***	0.030***	0.036***	0.035***	0.027***	0.027***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Experience^2	-0.060***	-0.047***	-0.051***	-0.047***	-0.061***	-0.065***	-0.049***	-0.048***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.002)	(0.001)	(0.004)
Education	0.048***	0.042***	0.036***	0.026***	0.021***	0.036***	0.027***	0.015***
	(0.001)	(0.002)	(0.003)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)
Children	0.063***	0.024***	-0.005	-0.060***	-0.045***	-0.051***	-0.048***	-0.071***
	(0.011)	(0.008)	(0.007)	(0.008)	(0.015)	(0.004)	(0.003)	(0.010)
Centrality	0.091***	0.046***	0.047***	0.052***	0.003	0.039***	0.035***	0.043***
	(0.010)	(0.013)	(0.015)	(0.008)	(0.011)	(0.008)	(0.007)	(0.012)
Size	0.051***	0.035***	0.039***	0.027***	0.029***	0.040***	0.049***	0.044***
	(0.004)	(0.004)	(0.006)	(0.003)	(0.005)	(0.004)	(0.004)	(0.006)
Industry*year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	133908	75494	188774	93251	36272	291776	511977	51637
Adjusted R^2	0.337	0.316	0.352	0.209	0.343	0.215	0.253	0.192

Notes: Estimates are based on the panel of worker-level data for 2003-2010. Dependent variable: log wage.
Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 14: Allowing for differential returns to all worker characteristics

	(1)	(2)	(3)
Female	**-0.133*****	**-0.277*****	**-0.171*****
	(0.016)	(0.005)	(0.027)
Exporter	0.010*	-0.170***	-0.171***
	(0.005)	(0.037)	(0.035)
Female*Exporter	**0.031*****	**0.065*****	**0.075****
	(0.006)	(0.007)	(0.033)
Experience	0.035***	0.036***	0.037***
	(0.000)	(0.001)	(0.001)
Experience*Female	-0.008***		-0.008***
	(0.001)		(0.001)
Experience*Exporter		-0.002***	-0.002**
		(0.001)	(0.001)
Experience*Female*Exporter			-0.001
			(0.001)
Experience^2	-0.062***	-0.063***	-0.067***
	(0.001)	(0.001)	(0.001)
Experience^2*Female	0.023***		0.029***
	(0.001)		(0.003)
Experience^2*Exporter		0.006***	0.006***
		(0.002)	(0.002)
Experience^2*Female*Exporter			-0.007**
			(0.003)
Education	0.058***	0.044***	0.044***
	(0.001)	(0.002)	(0.002)
Education*Female	-0.005***		-0.000
	(0.001)		(0.002)
Education*Exporter		0.015***	0.017***
		(0.002)	(0.002)
Education*Female*Exporter			-0.006***
			(0.002)
Children	-0.007***	-0.048***	-0.019***
	(0.002)	(0.003)	(0.003)
Children*Female	-0.092***		-0.133***
	(0.006)		(0.008)
Children*Exporter		0.028***	0.015***
		(0.005)	(0.004)
Children*Female*Exporter			0.054***
			(0.010)
Centrality	0.050***	0.066***	0.058***
	(0.007)	(0.006)	(0.006)
Centrality*Female	0.018***		0.034***
	(0.007)		(0.009)
Centrality*Exporter		-0.013	-0.009
		(0.009)	(0.009)
Centrality*Female*Exporter			-0.020*
			(0.011)
Size	0.036***	0.045***	0.044***
	(0.002)	(0.003)	(0.003)
Size*Female	0.013***		0.005
	(0.003)		(0.003)
Size*Exporter		-0.008**	-0.010***
		(0.003)	(0.003)
Size*Female*Exporter			0.011**

(continued on next page)

Table 14: (continued)

			(0.005)
Industry*year	Yes	Yes	Yes
Observations	2713623	2713623	2713623
Adjusted R^2	0.416	0.416	0.417

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 15: Paternity leave and the Gender Wage Gap

	All Workers			Workers < 45 years old		
	All	Non	Coll	All	Non	Coll
	(1)	(2)	(3)	(4)	(5)	(6)
Exporter	-0.014***	-0.010**	-0.014*	-0.009*	-0.005	-0.013
	(0.005)	(0.005)	(0.008)	(0.006)	(0.005)	(0.008)
Female*Exporter	**-0.029*****	**-0.026*****	**-0.047*****	**-0.039*****	**-0.033*****	**-0.063*****
	(0.007)	(0.007)	(0.014)	(0.010)	(0.010)	(0.018)
Female*Exporter*PL	**0.182*****	**0.192*****	**0.127***	**0.249*****	**0.250*****	**0.220****
	(0.036)	(0.039)	(0.067)	(0.052)	(0.058)	(0.090)
Exporter*PL	0.133***	0.106***	0.159***	0.102***	0.071**	0.132***
	(0.029)	(0.027)	(0.042)	(0.032)	(0.032)	(0.049)
Profitability	0.006***	0.006***	0.006***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female*Profitability	-0.001	-0.001	0.001	-0.000	-0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Education	0.063***	0.075***	0.063***	0.069***	0.083***	0.062***
	(0.002)	(0.003)	(0.008)	(0.003)	(0.003)	(0.008)
Experience	0.021***	0.042***	0.014	0.009	0.030**	-0.009
	(0.008)	(0.010)	(0.011)	(0.011)	(0.012)	(0.013)
Experience^2	-0.054***	-0.051***	-0.065***	-0.065***	-0.074***	-0.047***
	(0.001)	(0.001)	(0.002)	(0.004)	(0.005)	(0.005)
Children	-0.067***	-0.084***	-0.035***	-0.076***	-0.096***	-0.043***
	(0.006)	(0.006)	(0.009)	(0.006)	(0.006)	(0.009)
Centrality	0.001	-0.004	0.010	-0.000	-0.005	0.008
	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)
Size	0.046***	0.045***	0.039***	0.045***	0.046***	0.031***
	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.008)
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Female*year	Yes	Yes	Yes	Yes	Yes	Yes
Industry*year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2713623	2160012	553611	1621583	1267545	354038
Adjusted R^2	0.750	0.696	0.813	0.733	0.688	0.787

Notes: Estimates are based on the panel of worker-level data for 1996-2010. Dependent variable: log wage. PL is year specific and is defined as the share of men on paternity leave taking at least 8 weeks of leave. Dummy for missing profitability included. Standard errors in parenthesis are clustered on firm.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 16: Kindergarten and the Gender Wage Gap

	All Workers			Workers < 45 years old		
	All	Non	Coll	All	Non	Coll
	(1)	(2)	(3)	(4)	(5)	(6)
Exporter	-0.053***	-0.042***	-0.051	-0.029	-0.015	-0.036
	(0.016)	(0.015)	(0.034)	(0.018)	(0.018)	(0.036)
Female*Exporter	**-0.149*****	**-0.151*****	**-0.171****	**-0.189*****	**-0.196*****	**-0.186****
	(0.028)	(0.029)	(0.070)	(0.040)	(0.042)	(0.085)
Female*Exporter*KG	**0.002*****	**0.002*****	**0.002****	**0.002*****	**0.003*****	**0.002***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Female*KG	-0.002***	-0.002***	-0.002**	-0.002***	-0.002***	-0.002
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Exporter*KG	0.001***	0.001***	0.001**	0.000**	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Profitability	0.005***	0.005***	0.006***	0.005***	0.004***	0.006***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Female*Profitability	-0.000	-0.001	0.001	0.000	-0.000	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
KG	-0.001***	-0.001***	-0.000	-0.000*	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education	0.073***	0.088***	0.057***	0.080***	0.097***	0.057***
	(0.003)	(0.004)	(0.009)	(0.003)	(0.004)	(0.009)
Experience	0.034***	0.042***	0.029**	0.020*	0.028***	0.006
	(0.008)	(0.009)	(0.015)	(0.011)	(0.011)	(0.019)
Experience^2	-0.052***	-0.049***	-0.060***	-0.054***	-0.065***	-0.033***
	(0.001)	(0.001)	(0.002)	(0.004)	(0.005)	(0.006)
Children	-0.068***	-0.087***	-0.034***	-0.076***	-0.096***	-0.040***
	(0.007)	(0.007)	(0.012)	(0.007)	(0.007)	(0.012)
Centrality	0.010	0.010	0.005	0.006	0.007	-0.001
	(0.006)	(0.008)	(0.010)	(0.008)	(0.010)	(0.012)
Size	0.048***	0.046***	0.044***	0.046***	0.044***	0.039***
	(0.008)	(0.007)	(0.011)	(0.008)	(0.007)	(0.010)
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Female*year	Yes	Yes	Yes	Yes	Yes	Yes
County*year	Yes	Yes	Yes	Yes	Yes	Yes
Industry*year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1896790	1485425	411365	1099014	842514	256500
Adjusted R^2	0.757	0.700	0.817	0.736	0.689	0.787

Notes: Estimates are based on the panel of worker-level data for 2000-2010. Dependent variable: log wage. KG is year and municipality specific and is defined as the share of children between the ages of 1 and 5 enrolled in kindergarten. Dummy for missing profitability included. Norway has 19 counties and 439 municipalities. Standard errors in parenthesis are clustered on firm. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.