Do you get what you ask? The gender gap in desired and realised wages

Jaanika Meriküll, Pille Mõtsmees

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Abstract

This paper will study the gender wage gap in desired wages, realised wages and reservation wages. The notion of desired wages shows workers' first bet to potential employers during the job-search process. Two datasets are employed, the electronic job-search portal database, where individuals signal their desired wages, and the labour force survey, where realised wages and reservation wages are reported. The Oaxaca-Ransom decomposition is implemented to investigate the contribution of characteristics and coefficients to the gender gap. It is found that: (1) The unexplained gender wage gap is 22–25% in desired and realised wages. (2) The unexplained gender wage gap is much larger in desired wages than in reservation wages for unemployed individuals showing women's higher disutility from unemployment. (3) Women's lower desired wages are revised up rather than men's higher desired wages being revised down on the job. The results suggest that women are more risk averse in wage bargaining and self-select into occupations and industries with stable employment.

JEL Codes: J16, J13, D13, J31

Keywords: gender wage gap; reservation wage; family, marriage and work; labour market mobility

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Non-technical summary

The gender wage gap varies a lot internationally, and the unconditional gap has been found to be between 3% and 37% and the unexplained gender wage gap between 7% and 20% in the EU (Christofides et al. (2013)). There is a large amount of research on the gender wage gap and the focus of this research has been shifting from easily measurable explanatory variables such as women's longer non-employment spells or vertical and horizontal segregation in the labour market (Altonji and Blank (1999)) to explanatory variables that are more difficult to measure such as psychological attributes, personality traits, and gender identity (Bertrand (2010)).

This paper studies the gender wage gap in desired wages, realised wages and reservation wages. We introduce a new term, desired wage, which is the job-seeker's first bet in the wage bargaining signalled to employers, and we aim to identify gender differences in wage bargaining by comparing the unexplained wage gap in desired, realised and reservation wages. The desired wage can be different from the reservation wage, because, depending on their risk aversion, disutility from unemployment and marginal utility from extra income, some individuals may signal a desired wage that is much higher than their reservation wage. As men are more willing to take risks, we expect the unexplained gender gap in desired wages to be larger than that in reservation wages.

The desired wages are obtained from the unique database constructed using data from CV Keskus, an electronic job-search portal where job-seekers report the wage for which they are willing to start a new job. The realised and reservation wages are obtained from the labour force survey. Both of the databases cover the Estonian labour market for the year 2009. Estonia has the largest unexplained gender wage gap in the EU (Christofides et al. (2013)), so the empirical material comes from an environment where gender really matters for income. The year analysed, 2009, marks the bottom of the crisis in Estonia, when employers had good bargaining power over wages because unemployment was increasing. The Oaxaca-Ransom decomposition is used to divide the unconditional wage gap into three components: the part due to differences in characteristics, the part due to male advantage in coefficients and the part due to female disadvantage in coefficients.

The results show that the unconditional gender gap is around 30% in desired and realised wages and 24% in reservation wages. After controlling for socio-demographics, education, occupation and industry, and after calculating the unexplained gender gap in desired and realised wages, the gap diminishes to 22–25%. Again, the unexplained gender gap in reservation wages is much lower at 14%. This means that women with the same characteristics

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such as age, family background, education, occupation and industry earn on average 22–25% less than men, while women with the same characteristics as men have only a 14% lower reservation wage. We interpret this result as a gender difference in risk aversion, disutility from unemployment and marginal utility from extra income. Unemployed men signal a much higher wage in the job-search portal than their reservation wage, while unemployed women ask for wages that are much closer to their reservation wage. Women get partly compensated for their lower desired wage on the job as the female disadvantage component diminishes on the job by two percentage points. Our results also indicate that longer breaks between jobs can explain a small additional part of the gender wage gap, while occupational and sectoral mobility cannot add much to the explained part.

Can it be speculated that if women were asking the same wages as men relative to their reservation wages, then the gender gap would be reduced from 22–25% to 14%? It is likely that if women were to ask for the same wage as men, they would also face longer unemployment spells and less stable employment. We show that women have a much lower probability of being unemployed than men and that most of the gender difference in unemployment probability can be explained by education, occupation and industry. This means that part of the gender gap in wages can be explained by women's preference for more stable employment.

It is also likely that part of the gender gap originates from a self-confirming equilibrium or a gender difference in labour demand. Further research is merited on all the records of wage bets in the wage negotiation process and on the gender differences in the demand for labour.

Contents

1. Introduction

The unconditional and conditional gender wage gap can vary a lot internationally and is found to range from 3% to 30% in the European Union (Christofides et al. (2013)). There is already a wide range of literature seeking to explain gender differences in income. The main factors explaining the gender wage difference are found to be educational attainment; women's longer non-employment spells; vertical and horizontal segregation in the labour market; psychological attributes; personality traits; and gender identity (Altonji and Blank (1999), Bertrand (2010)).

The job search process offers a potentially fruitful channel for understanding the differences in wage outcomes for men and women. Bertrand (2010) summarises the issue by saying that while there is laboratory experimental evidence on gender differences in psychological attributes, personality traits and gender identity, the role of these factors on actual labour market outcomes has received little research attention. Women are more risk averse; they do not prefer competitive environments and underperform in competitive environments; and they are worse negotiators than men (Bertrand (2010)). These regularities suggest that the gender wage gap is much more evident in desired wages and reservation wages than in actual wages, and part of the gender gap can result from women asking for too little in wages.

This paper will study the factors behind the gender wage gap by comparing the gender differences in desired wages, realised wages and reservation wages. The notion of desired wages is introduced here and it shows the employee's first bet during the job-search process. The desired wage is distinct from the reservation wage, as a wage signalled to an employer does not need to equal the reservation wage at which a worker is ready to start a new job. The difference between the desired wage and the reservation wage shows the worker's preferences in negotiations; a higher ratio of the desired wage to the reservation wage shows higher risk tolerance, lower disutility from unemployment and higher marginal utility from extra income.

The information about desired wages is obtained from an electronic job-search database of CV-Keskus and information about realised and reservation wages from the labour force survey. The electronic job-search portal database covers more than 16,000 individuals with rich retrospective panel information about tenure and mobility in the labour market and about desired wages; the labour force survey has a similar sample size and consists of the standard ILO set of labour market variables, the last month's pay of employed individuals, and the reservation wages of unemployed individuals. The data of both sources cover the labour market in Estonia, which has one of the largest unconditional and conditional gender wage gaps in Europe (Christofides et

al. (2013)), offering a valuable ground for testing gender issues in an environment where it really matters.

To the best of our knowledge, this is the first study comparing gender differences in desired wages, realised wages and reservation wages. The contribution of this paper is twofold. First, we seek to reveal gender differences during wage bargaining. The two data sources used let us understand the discrepancies between men and women in wage bargaining. The job search portal data reveals the first bet signalled by job-seekers in the wage bargaining process, and the labour force survey data report their realised and reservation wages. Although we cannot follow all the bets in the wage negotiations process, we can observe the first bets made by employees to their employers. We expect the unexplained gender difference in desired wages to be larger than that in reservation or realised wages as women ask for lower wages because of higher risk aversion. Second, we seek to explain one of the largest unexplained gender wage gaps in Europe by introducing a novel set of variables for occupational and sectoral mobility from a lengthy retrospective panel.

The paper is organised as follows: the next section provides an overview of the related literature and a background of the study; the third section presents and validates the data; the fourth section presents the results and the last section summarises.

2. Related literature and the background of the study

2.1. Related literature

The literature on gender inequality is vast and growing, and more emphasis has been put on behavioural economics and psychological attributes lately. A number of mechanisms have been provided by formal models to explain the gender pay difference. We describe three of these models that formalise gender differences in expectation.

Breen and Carcia-Penalosa (2002) use the Bayesian updating model to show the path-dependence in occupational choices of men and women. In their model men and women have equal ability, and individuals make their effort and educational decisions based on a prior that is formed by the beliefs of their parent. During the working-life, the outcome of educational investment is revealed; individuals update their prior and pass it on to the next generation. They show that occupational segregation can persist even after the preferences of men and women have equalised. They also show that it matters how the preferences change. As mothers pass the prior on to daughters and fathers on to their sons, the outcome is dependent on how the preferences

change. When "women become more like men" occupational segregation vanishes quicker, while when "men become more like women" the occupational segregation is more persistent. The former case involves more experimentation and is used to describe US labour market and the latter involves less experimentation and can describe the regularities of the Scandinavian labour market.

Filippin (2003) presents a matching model of employees and employers where workers believe they have been discriminated against, which leads to a self-confirming equilibrium. In this model men and women do not differ in terms of ability and effort, but women believe that they are discriminated against. Women put less effort into their work, because they believe they will be less rewarded anyway. As a result women become less frequently promoted and even if employers do not discriminate, the lower promotion frequency feeds the formation of the expectation of being discriminated against.

Santos-Pinto (2012) suggests a signalling model where men are overconfident and women under-confident even when they have equal abilities. He shows that gender differences in self-confidence contribute to the gender pay gap. Low-ability overconfident men underestimate the marginal cost of education and obtain higher education, but then employers cannot distinguish between low-ability and high-ability workers who have gained higher education and pay them their average wage. As a result low-ability overconfident men get higher pay than in unbiased model. There is also a disincentive for high-ability unbiased men to go into higher education because they would get a lower wage than they would if there were only unbiased agents. As the effect of low-ability overconfident men getting higher wages dominates the effect of high-ability unbiased men getting lower wages, men have higher wages on average. The exact opposite case works for women; high-ability under-confident women overestimate their marginal cost of higher education and obtain less education, resulting in lower average wages for high-ability women than is the case with unbiased agents.

There are also many papers on wage bargaining in the laboratory environment, but there is no consensus in the results. It has been found that men negotiate much higher wages for themselves than do women in the multistage alternating-offers game (Dittrich et al. (2014)) and that both men and women ask for a higher outcome when playing against women than when playing against men in the ultimatum game (Solnick (2001)). The multistage game conducted by Dittrich et al. (2014) is the closest to the situation captured by data of this paper. They show that men and women do not differ in negotiation skills, but just in their initial offers.

Bertrand (2010) summarises the recent experimental and empirical literature on gender issues into three main groups of factors: psychological attrib-

utes, personality traits and gender identity. Women sort by psychological attributes into more stable and less risky occupations due to their higher risk aversion, and into occupations that do not generally have a highly competitive environment, as they tend to underperform in competitive situations. Le et al. (2011) show that while women are more risk averse towards economic risk, the differences in risk aversion explain only a small part of the gender pay gap. Women have stronger redistributive preferences that may also sort them into specific jobs accordingly. They are less likely to negotiate and are not good negotiators for themselves, but rather for others. However, it has been found that while psychological attributes help to explain some part of the gender wage gap, the factors related to human capital have a much stronger role. It has also been found that men and women have differences in personality traits and that these can explain some part of the gender wage gap, but again the contribution of personality traits is smaller than that of educational attainment. The gender identity implies that women behave in the way expected by society and their current identity role. (Bertrand (2010))

There are many fewer studies on reservation wages than on realised wages. The realised gender wage gap could be caused because fewer high-ability women participate in the labour market than do high-ability men. Christofides et al. (2013) show that after controlling for selection to participate in the labour market, the gender wage gap increases in most of the countries in Europe. This is evidence of positive selection where women with rather better characteristics participate in the labour market. There could be also systematic differences in reservation wages between men and women. Brown et al. (2011) show that pre-school-age children explain most of the gender reservation wage gap in the UK. Baffoe-Bonnie and Ezeala-Harrison (2005) show that unemployment duration has a significantly different effect on the male and female reservation wage.

The closest study to our paper is the study by Filippin and Ichino (2005) on wage expectations and realised wages. Our notion of the desired wage is close to but can differ from the notion of wage expectation as information asymmetry means that job-seekers know their productivity and market wage but employers do not, so that job-seekers can ask for a higher wage than their perceived market wage. Filippin and Ichino (2005) study is limited to college students of business and economics. They match individuals from a survey of college students and a survey of graduates and find that the 10% gender income gap in expectations compares well with realised income shortly after graduation. However, the unconditional and conditional gender income gap enlarges with work experience, which is not consistent with students' expectations about their income in a more distant future. They argue that female students may expect their wage to be lower than that of male colleagues because of path dependent occupational choices formed by parents (the model

by Breen and Carcia-Penalosa (2002)) and because of self-confirming expectations about being discriminated against (the model by Filippin (2003)).

2.2. Background of the study

This paper studies the gender wage gap in Estonia, a former centrally planned economy where the gender wage differences in favour of men emerged forcefully during the transition process (Trapido (2007)). There are a number of papers emphasising the massive labour market adjustments during the transition from planned to market economies in Central and Eastern Europe[1]. There is evidence that worker flows exploded (Haltiwanger and Vodopivec (2002)), that around one third of workers changed their occupation during the first five years of transition (Campos and Dabušinskas (2009)), and that in general workers with more skills and longer tenure replaced those with fewer skills and shorter tenure (Lehmann et al. (2005)). At the same time, the formerly compressed wage distribution widened (Eriksson et al. (2013)) and wage gaps emerged across ethnicity (Leping and Toomet (2008)), gender (Pastore and Verashchagina (2011), Kecmanovic and Barrett (2011)) and age (Kovacheva (2011)). There are also studies confirming declining gender income differences throughout the transition process (Newell and Reilly (2011), Heyns (2005)). While the worker flows have been reduced to the conventional levels of developed countries, the wage disparities remain high and often unexplained.

Women earned on average 17% less in gross hourly wages than men did in the European Union (EU-27) and in the euro area (EA-17) in 2009 (see Eurostat Gender pay gap). Women earned 10–25 percent less than men did in OECD countries (Böheim et al. (2013)). Christofides et al. (2013) demonstrate that the gender wage gap amounts to 30% in our sample country Estonia. The unconditional gender wage gap decreased during the early years of transition in Estonia as the transition process shifted the economic structure towards industries with a high share of female employment and favoured a more educated labour force. Women were less likely to change jobs and more likely to exit the labour market than men (Orazem and Vodopivec (2000)). The later years of the transition process and the establishment of a strongly liberal economic environment have enlarged the gender wage gap and the unconditional gender wage gap has become one of the largest in Europe. Estonia is known for its very high economic freedom (see the index of economic freedom by the Heritage Foundation) and has a flexible labour market,

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[1] See for example Sorm and Terrell (2000) on Czech data; Haltiwanger and Vodopivec (2002) on Estonian data; Haltiwanger and Vodopivec (2003) on Slovenian data; and Jurajda and Terrell (2008) comparing the gradualist transition in the Czech Republic and the rapid transition in Estonia.

low union power and low enforcement of employment protection legislation (Eamets and Masso (2005)). As a result, the wage distribution is wide, and the unconditional wage gap is also large by ethnicity and gender.

Surprisingly, characteristics like education, language skills, industry, or occupation cannot explain much of the difference in wages by gender (Anspal et al. (2010)), though a much higher part of the ethnicity wage gap can be explained by these characteristics (Leping and Toomet (2008)). While the unexplained wage differential is around 10–15% for ethnic minorities (Leping and Toomet (2008)), the unexplained gender wage gap is substantially larger, at 24% in 2000–2008 (Anspal et al. (2010), Christofides et al. (2013)). Semykina and Linz (2010) argue that education and qualification differences are not useful predictors of the gender wage gap in post-communist economies as the education level and participation rate were high in Soviet times and so the observed gender differences in human capital are small.

The female participation rate is also high in Estonia, where the rate was 62% for females and 71% for males in 2009 (see Statistics Estonia general labour market data). However, the high participation rate does not explain the gender wage gap; Christofides et al. (2013) show that after controlling for the selection into labour market participation, the unexplained gender wage gap increases from 20% to 31%. This indicates that there is no negative selection into employment among women that would be able to explain the large gender difference in wages. Instead, positive selection indicates that women with a potentially higher reservation wage and better characteristics are more likely to be employed.

3. Data and methodology

The paper uses two data sources, the job-search database from CV Keskus and the Estonian labour force survey. The job-search dataset is drawn from the main Estonian electronic job search site CV Keskus (CV Centre in English, see http://www.cvkeskus.ee/). CV Keskus is a part of the international CV Market Group with representation in Estonia, Latvia, Lithuania and Hungary. CV Keskus is the largest job-search portal in Estonia and it offers a job search service for both employers and employees. Job-seekers can upload their CVs to the site and apply directly for jobs on offer via this electronic environment. Employers can upload job ads or make job-seekers a direct offer based on their profile or even track how particular job-seekers click on their advertisement. This gives job-seekers an incentive to upload and update their CVs in the web and to provide correct information about their skills and

work experience. The job search service is free for job-seekers, while employers need to pay for the service.

The data for CV Keskus job searchers was downloaded in January 2010. The unemployment rate was very high in 2010 and was rising, from 13.5% in 2009 to 16.7% in 2010 according to the Statistics Estonia labour force survey, which indicates low bargaining power for workers at this time. The database contained more than 200,000 CVs in 2010. The data on employment history covers the last five jobs, giving the name and country of the employer, the start and end months of the job, and the occupation. Individuals report employment breaks in their CVs and it is not possible to disentangle unemployment or inactivity in these breaks. All the individuals in the CV Keskus data can be considered as currently economically active as they are looking for a job. The data also include background information about the job-seeker, like age, family status, education, skills like language skills and a driving licence, and details of the desired job and wage. The self-reported occupations from CVs were converted into ISCO codes by the specialists at Statistics Estonia. The self-reported names of employers were merged with the Estonian commercial register to find employer characteristics like employer's field of activity by NACE 2003.

The CVs are limited to cover only those individuals who had updated their CVs within the last year, between January 2009 and January 2010. This exclusion means that only those individuals who are actively looking for a new job or seeking to exit unemployment to employment are included. As we investigate the gap in desired wages, we lose data on individuals who do not provide their desired wage[2]. The expected wage, phrased as "desired salary" in CVs, is provided by 16,228 job-seekers and this is our final database for the research. We conduct the analysis only for those individuals who are looking for a full-time job or if no full-time job is available are also willing to accept a part-time job. Those seeking only a part-time job are excluded.

The Estonian labour force survey (LFS) is used to complement the analysis with realised wages and reservation wages. The labour force survey is the source of official statistics for the labour market and is representative of all the demographic groups in the country. The sample size is around 16,000 yearly observations, where some individuals enter the survey repeatedly due to rotating panel method used (for the methodology please refer to http://www.stat.ee/labour-market "Estonian labour force survey. Methodology"). The wage of employed people is the gross salary of the last month and the reservation wage of the unemployed is the wage for which someone

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[2] Less than 20% of job-seekers report their desired wages. The choice of whether to report the wage or not may not be random and testing for selection bias is a subject for further research.

would start a job. As with the CV Keskus data, we conduct the analysis only for those individuals who are full-time employees or are looking for a full-time job or are also willing to accept a part-time job if no full-time job is available.

Wages are measured as gross monthly wages in euros in both of the datasets. The wages were reported in Estonian kroons and translated to euros by the authors. Logarithmic values will be used in the regressions as the distribution of wages has more mass concentrated in the lower values. The shape of the distribution is similar for males and females, with similar peaks emerging around rounded numbers.

Table 1 presents descriptive statistics of the variables analysed. The desired wages of employed women are around 26% lower than those of men. This unconditional wage gap is surprisingly similar to that for realised wages found from the labour force survey. The desired wage in the job-search portal is around one fourth higher for employed people than the realised wages in the labour force survey. This could be an indication that the reservation wage for leaving a job is higher than the wage at the current job.

The unconditional gender wage gap for unemployed individuals is remarkably different in the job search portal and in the labour force survey at 27% to 23%. Men signal 55% higher wages to employers than their reservation wage, at 862.4 euros against 556.1, while women signal 48% higher wages to employers than their reservation wage, at 633.4 euros against 428.2. This discrepancy suggests possible differences in risk aversion between men and women; while the gender wage gap is smaller in the reservation wage, men may ask for a significantly higher wage during the job search process.

Table 1: Descriptive statistics of the variables analysed: CV Keskus vs labour force survey, 2009

	CV Keskus job-seekers: employed + unemployed		Labour force survey (LFS): employed + unemployed	
	Men	Women	Men	Women
Employed: desired wage in CV Keskus and actual wage in LFS (EUR)	1057.1	778.5	830.3	593.6
Employed: unconditional gender wage gap	−0.264		−0.285	
Unemployed: desired wage in CV Keskus and reservation wage in LFS (EUR)	862.4	633.4	556.1	428.2
Unemployed: unconditional gender wage gap	−0.266		−0.230	
Age	33.3	33.0	39.7	42.5
Married or cohabiting	0.623	0.580	0.669	0.592

	CV Keskus job-seekers: employed + unemployed		Labour force survey (LFS): employed + unemployed	
	Men	Women	Men	Women
Number of children	0.852	0.861	0.573	0.594
Tertiary education	0.298	0.401	0.171	0.305
Vocational education	0.232	0.205	0.447	0.403
Secondary education, not vocational	0.396	0.345	0.235	0.216
Primary education or less	0.074	0.049	0.146	0.076
Field of activity of current/last job				
No previous job experience or field of activity not available	0.054	0.051	0.023	0.015
Agriculture	0.010	0.007	0.048	0.029
Fishing	0.001	0.001	0.002	–
Mining	0.001	0.002	0.015	0.004
Manufacturing	0.164	0.117	0.259	0.191
Electricity, gas and water	0.007	0.004	0.017	0.007
Construction	0.098	0.022	0.211	0.022
Wholesale and retail trade	0.243	0.273	0.101	0.168
Hotels and restaurants	0.022	0.053	0.013	0.049
Transport and communication	0.068	0.069	0.117	0.053
Financial intermediation	0.015	0.039	0.008	0.024
Real estate and business activities	0.148	0.140	0.063	0.057
Public administration	0.134	0.172	0.048	0.077
Education	0.005	0.007	0.039	0.164
Health	0.002	0.012	0.007	0.094
Other services	0.017	0.036	0.028	0.044
Self-employed	0.011	0.005	NA	NA
Occupation of current/last job				
No previous job experience or occupation not available	0.430	0.338	0.031	0.016
Managers	0.124	0.082	0.104	0.071
Professionals	0.032	0.056	0.078	0.177
Technicians and associate professionals	0.121	0.183	0.073	0.179
Clerical support workers	0.043	0.108	0.029	0.086
Service and sales workers	0.060	0.183	0.055	0.198
Skilled agricultural, forestry and fishery workers	0.001	0.002	0.009	0.010
Craft and related trades workers	0.099	0.009	0.309	0.033
Plant and machine operators, and assemblers	0.049	0.011	0.224	0.098
Elementary occupations	0.040	0.030	0.086	0.116
Employed	0.573	0.606	0.780	0.872
Duration of unemployment in months	4.403	4.878	2.454	1.312
… conditional on being unemployed	10.315	12.367	11.131	10.283
Average duration of break btw all the jobs in months	4.933	6.581	NA	NA

	CV Keskus job-seekers: employed + unemployed		Labour force survey (LFS): employed + unemployed	
	Men	Women	Men	Women
Count of breaks btw jobs	1.163	1.303	NA	NA
Average duration of all the jobs in months	27.934	27.457	NA	NA
Count of jobs	4.092	4.005	NA	NA
No of observations	5000	7020	3635	3727

Notes: Wage of employed people is the gross salary of the last month; reservation wage of the unemployed is the wage for which someone would start a job in the labour force survey. CV Keskus wage information is based on desired wages.

Unemployment duration may also refer to inactivity in CV Keskus. Duration is measured in months. Number of children in the labour force survey is based on children under the age of 19, the number of children in CV Keskus on all children.

Self-employed people are not reported for the labour force survey and are incorporated into groups of NACE field of activities.

Source: authors' calculation from CV Keskus and Estonian labour force survey data.

There are a couple more differences revealed by the comparison of the job search portal data and the labour force survey data. As expected, the job search portal contains more unemployed individuals, while as many as 60% of job-seekers are currently employed. The average duration of unemployment among unemployed individuals is very similar in both of the data sources, confirming the representativeness of the job search portal data compared to official statistics.

There are also some differences between the profile of individuals using the on-line job search portal for finding a job and the average characteristics of employed and unemployed individuals. The individuals using this source for job search are on average younger, more educated and more likely to be from white-collar occupations. There are also fewer people from manufacturing industry and from certain specialist occupations like education and health, while there are more individuals from service industries like business services, public administration and financial intermediation. The only remarkable difference between men and women in these two data sources is the underrepresentation of men from construction and transport looking for a job through the on-line job search portal. Overall, the CV Keskus database seems to be very representative, though the profile of young people and white-collar workers is somewhat overrepresented there. However, the similar overrepresentation of young and white-collar men and women will not affect our conditional gender gap comparison from these two datasets as we control for age and occupation in wage regressions.

4. Results

4.1. Conditional gender gap in desired and realised wages

This section presents the conditional gender wage gap in desired and realised wages. We present the results for employed and unemployed individuals separately to reveal the gender differences in risk aversion and negotiations under different labour market statuses. First simple wage regressions are presented for all individuals and for men and women separately, then in the next subsection the gender differences are decomposed into the part due to endowments or characteristics.

Tables 2 and 3 present the results of wage regressions from the job-search portal and the labour force survey. The conditional gender wage gap is of a similar large size to the unconditional one and tells the same story as the descriptive statistics of the previous section. This is that while there are no statistically significant differences in the conditional gender wage gap between the desired and realised wages for employed individuals, the wage gap between the desired and reservation wages is noticeable for unemployed individuals. The gender wage gap in reservation wages or in the wages individuals expect to get to move out from unemployment and take a job is 20%[3], while the gender wage gap in the desired wages of unemployed individuals is 30%. This confirms the story of gender differences in risk aversion as their reservation wages indicate that men ask for much higher wages than women do. Men seem much more to be risk lovers or gamblers during the job search process, while women ask for a wage that is much closer to their reservation wage. For employed individuals the idea of "what you ask is what you get" seems to hold, or there is evidence of the self-confirming equilibrium of Filippin (2003) that women expect to be discriminated against and this leads to the outcome where they actually are discriminated against.

The main differences in the coefficients of other explanatory variables for men and women are family related. Cohabitation or marriage and children have a stronger effect on the wages of men, while cohabitation or marriage has a weaker effect on the wages of women, and children have a negative effect on the wages of women. This suggests gender identity plays some role in society. Men seem to be seen as the traditional breadwinners and women as the traditional homemakers. Bertrand (2010) concludes that these gender identity patterns are usually quite stable over time and predict women's performance in the labour market well.

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[3] Malk (2014) finds a similar gender gap in reservation wages of 24%, in 2011–2013.

Table 2: Wage regressions, dependent variable log(wage): CV Keskus, 2009

	CV Keskus job-seekers: employed			CV Keskus job-seekers: unemployed		
	All	Men	Women	All	Men	Women
Female (1 – woman, 0 – man)	−0.289***			−0.300***		
	(0.010)			(0.011)		
Age	0.060***	0.054***	0.068***	0.052***	0.058***	0.048***
	(0.004)	(0.007)	(0.005)	(0.004)	(0.006)	(0.005)
Age squared /100	−0.073***	−0.066***	−0.084***	−0.061***	−0.068***	−0.056***
	(0.005)	(0.008)	(0.006)	(0.005)	(0.008)	(0.007)
Married or cohabiting	0.019*	0.036*	0.005	0.018	0.056***	−0.015
	(0.010)	(0.019)	(0.012)	(0.011)	(0.021)	(0.014)
One child (base no children)	−0.032***	−0.003	−0.056***	0.020	0.066***	−0.018
	(0.012)	(0.021)	(0.015)	(0.014)	(0.025)	(0.016)
Two children	−0.033**	0.018	−0.073***	0.026*	0.053**	0.004
	(0.014)	(0.024)	(0.018)	(0.016)	(0.026)	(0.019)
Three or more children	−0.040*	0.094**	−0.137***	0.028	0.109***	−0.059*
	(0.023)	(0.037)	(0.029)	(0.025)	(0.038)	(0.030)
Tertiary education (base primary)	0.226***	0.191***	0.242***	0.297***	0.279***	0.310***
	(0.022)	(0.034)	(0.028)	(0.020)	(0.031)	(0.026)
Vocational education	0.026	0.040	0.016	0.082***	0.084***	0.085***
	(0.023)	(0.034)	(0.029)	(0.019)	(0.028)	(0.026)
Secondary education, not vocational	0.016	−0.006	0.034	0.080***	0.083***	0.080***
	(0.022)	(0.033)	(0.028)	(0.018)	(0.026)	(0.024)
Duration of unemployment in months				−0.003***	−0.003***	−0.003***
				(0.000)	(0.001)	(0.001)
Duration of unemployment squared /100				0.001***	0.001***	0.001***
				(0.000)	(0.000)	(0.000)
Control for occupation and field of activity	yes	yes	yes	yes	yes	yes
No of observations	7761	3152	4609	6702	3045	3657
R^2	0.295	0.177	0.256	0.298	0.203	0.266

Table 3: Wage regressions, dependent variable log(wage): labour force survey, 2009

	Labour force survey: employed			Labour force survey: unemployed		
	All	Men	Women	All	Men	Women
Female (1 – woman, 0 – man)	−0.336***			−0.202***		
	(0.017)			(0.023)		
Age	0.023***	0.023***	0.021***	0.003	−0.005	0.013
	(0.004)	(0.006)	(0.005)	(0.007)	(0.009)	(0.009)
Age squared /100	−0.033***	−0.036***	−0.030***	−0.008	0.002	−0.019*
	(0.005)	(0.007)	(0.005)	(0.009)	(0.012)	(0.011)
Married or cohabiting	0.025	0.067**	−0.004	0.078***	0.072*	0.067**
	(0.017)	(0.034)	(0.017)	(0.026)	(0.042)	(0.034)
One child (base no children)	0.000	0.059*	−0.044**	0.025	0.058	−0.043
	(0.019)	(0.033)	(0.022)	(0.031)	(0.043)	(0.045)
Two children	0.012	0.057	−0.029	0.014	0.060	−0.035
	(0.020)	(0.035)	(0.024)	(0.039)	(0.062)	(0.047)
Three or more children	−0.066*	0.019	−0.166***	0.073	0.059	0.079
	(0.034)	(0.052)	(0.041)	(0.046)	(0.066)	(0.065)
Tertiary education (base primary)	0.243***	0.245***	0.262***	0.123***	0.098	0.084
	(0.029)	(0.043)	(0.036)	(0.044)	(0.060)	(0.057)
Vocational education	0.015	−0.001	0.040	0.052*	0.071**	0.015
	(0.024)	(0.033)	(0.031)	(0.028)	(0.035)	(0.041)
Secondary education, not vocational	0.046*	0.061	0.048	0.024	0.057	−0.017
	(0.027)	(0.040)	(0.032)	(0.030)	(0.038)	(0.046)
Duration of unemployment in months				−0.003**	−0.003**	−0.002
				(0.001)	(0.002)	(0.002)
Duration of unemployment squared /100				0.002**	0.002***	0.002**
				(0.001)	(0.001)	(0.001)
Control for occupation and field of activity	yes	yes	yes	yes	yes	yes
No of observations	6070	2824	3246	1292	811	481
R^2	0.405	0.297	0.452	0.272	0.240	0.176

Notes: See notes to Table 1 for variable definitions. ***, **, * indicate statistical significance at the levels of 1%, 5% and 10% respectively based on robust standard errors. Source: authors' calculation from CV Keskus and Estonian labour force survey data.

4.2. Decomposition of the gender gap into desired and realised wages

In addition to examining the differences in returns for men and women, we go further to contrast them with differences in endowments. For example it could be that education is not differently rewarded for men and women, but that there are significant differences in the educational attainment of men and women. Hence education itself could be driving the unconditional gap in wages and not necessarily different rewards for education.

We implement a Neumark (1988) and Oaxaca and Ransom (1994) decomposition to investigate the contribution of coefficients and endowments to the gender wage gap. The *nldecompose* command for Stata by Sinning and Hahn (2008) is implemented. The decomposition is performed over the variable "female" and the counterfactual group of coefficients is estimated from the pooled sample (Sinning and Hahn (2008)):

$$\bar{Y}_A - \bar{Y}_B = (\bar{X}_A - \bar{X}_B)\beta^* + \bar{X}_A(\beta_A - \beta^*) + \bar{X}_B(\beta^* - \beta_B) \tag{1}$$

where β^* denotes coefficients from the pooled sample, β_A coefficients from the sample of men and β_B coefficients from the sample of women; $\bar{Y}_A$ and $\bar{Y}_B$ denote the average wages of men and women; $\bar{X}_A$ and $\bar{X}_B$ the average values of explanatory variables for men and women. The left hand side of equation (1) captures the difference in the average wage of men and women. The first term on the right hand side captures the difference in wages due to differences in characteristics or endowments; this part is calculated by predicting the average wage gap of men and women based on the coefficients of the pooled sample. The next two terms on the right hand side capture the difference in wages due to differences in coefficients. The first of them indicates male advantage and is calculated as a combination of the average characteristics of men and the difference of male coefficients from the pooled sample coefficients. The very last term indicates female disadvantage and is calculated as a combination of the average characteristics of women and the difference of pooled coefficients from female sample coefficients. The sum of the last two parts is also denoted as the unexplained part and is often interpreted as a result of discrimination in the labour market[4], while the part explained by coefficients is taken as the explained part.

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[4] The decomposition is sensitive to the choice of counterfactual group of coefficients. If we used coefficients from the sample of men as a counterfactual for women, and not from the pooled sample, we would estimate the unexplained part to be somewhat larger. This is in line with the estimations provided by Elder et al. (2010). The choice of control group does not change our results in terms of comparison of the gender gaps in desired, realised and reservation wages.

Table 4 presents the decomposition estimation results for the gender wage gap. The set of explanatory variables is the same as in Tables 2 and 3. The raw difference in wages strongly favours men and the smaller part of the raw difference can be explained by the different characteristics of men and women, like segregation into different sectors and occupations. A much larger part of the gender wage gap can be explained in the labour force survey data than in the job-search portal data. The female disadvantage component is much more important for the unexplained part of desired wages during the wage negotiation process than in realised or reservation wages. The female disadvantage component contributes to the gap in desired wages by 47% and 45%, in contrast to the contribution to the gap in realised wages of 38% and to that in reservation wages of 21%. This again points to large gender differences in risk aversion during wage negotiations. The unexplained female disadvantage diminishes to 12% on the job from 14% in desired wages, which indicates that after their productivity has been revealed women get partly compensated for their low initial wages. The component of male advantage is also large in the job-search portal data, indicating that men ask for higher wages than women with the same characteristics do; however, this component is of similar size in the job search portal data and the labour force survey.

It is found that women ask for lower rewards than do men in their desired wages. Women seem to be strongly more risk averse as the unexplained gender wage gap in wages that they signal to employers when they are unemployed is twice that in the actual wage for which they are willing to start to work. As women ask for significantly lower wages, the unexplained gender gap in wages signalled to employers is as large as 24.9% for the unemployed and 24.4% for employed individuals. The unexplained gender gap in realised wages is roughly the same, 22.4%, but falls to 13.7% in reservation wages.

It is tempting to speculate that if men and women were to ask for a similar wage relative to their true reservation wage, the unexplained gender wage gap would be reduced from 22.4% to 13.7%, or would be reduced by 39%. It is not possible to observe empirically what the labour market outcome for women would be if they had the same desired and reservation wage ratio as men. There are two possible mechanisms that could explain the gender differences in desired and reservation wages. First, women desire lower wages because they expect to be discriminated against and rationally signal their market wage. This is most likely related to self-confirming equilibria or differences in labour demand for men and women. Second, women ask for lower wages because of their higher disutility from unemployment. They are more risk averse and prefer stable employment and look to move from unemployment to employment more quickly. Stable employment is compensated by lower wages and shorter unemployment spells reduce job match quality and also contribute to the gender gap in realised wages.

Table 4: Oaxaca–Ransom decomposition, dependent variable log(wage), 2009

	Total gap (log difference)	Explained	Unexplained: male advantage	Unexplained: female disad-vantage
CV Keskus job-seekers: employed	−0.306***	−0.062***	−0.099***	−0.145***
(in %)	(100)	(20.2)	(32.4)	(47.4)
CV Keskus job-seekers: unemployed	−0.301***	−0.052***	−0.113***	−0.136***
(in %)	(100)	(17.3)	(37.6)	(45.1)
LFS employed	−0.313***	−0.089***	−0.104***	−0.120***
(in %)	(100)	(28.4)	(33.2)	(38.3)
LFS unemployed	−0.241***	−0.104***	−0.086***	−0.051***
(in %)	(100)	(43.2)	(35.7)	(21.2)

Notes: See notes to Table 1 for variable definitions and to Table 2 for the list of explanatory variables included and coefficients of the model for men, women and pooled sample. ***, **, * indicate statistical significance at the levels of 1%, 5% and 10% respectively based on bootstrapped standard errors.

Source: authors' calculation from CV Keskus and Estonian labour force survey data.

We can use the labour force survey to test whether women have a higher probability of being unemployed. Appendix 1 presents the gender gap decomposition results based on logit models where the dependent variable takes the value zero if a person is employed and the value one if the person is unemployed. The same set of controls is used as in Table 3 for employees. Appendix 1 shows that women have a statistically significantly lower probability of being unemployed and that the majority of the difference in unemployment probability can be explained by characteristics such as education, occupation and industry.[5] It can be concluded that women probably have higher disutility from unemployment, which makes them choose an education, occupation and industry that give them more stable employment. Women are more risk averse; desire lower wages, especially after becoming unemployed; and are rewarded by a lower probability of unemployment.

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[5] The bottom of the crisis in Estonia came in 2009. There were certain male-dominated industries that suffered most from the crisis, such as construction and manufacturing, which contributed to the large unconditional gender gap in unemployment. However, the results presented in Appendix 1 also hold for the later non-recession years, and female unemployment rates are usually lower and seggregation by education, occupation and industry contribute to the gender gap in the unemployment rate.

4.3. Decomposition of the gender wage gap in quantiles

As a robustness test we also decompose the gender wage gap in a quantile equation. The advantage of this exercise is that explanatory variables can have different effects on the dependent variable over the conditional distribution. The decomposition of the gender wage gap into the part due to coefficients and endowments is done over the distribution of conditional wages.

There could be different patterns for the role of the unexplained part in different conditional wage quantiles. For example if the largest unexplained part is observed for lower wage earners the "sticky floor" phenomenon for women in the labour market is observed. Under this notion women occupy the lowest distribution of jobs and are not promoted to higher ranking jobs. From the other end, if the largest unexplained part is observed for higher conditional wage quantiles the "glass ceiling" phenomenon is observed. Under this notion women do not have access to the jobs with the highest wages. Christofides et al. (2013) demonstrates that European countries evolve different patterns of unexplained gender wage gaps in quantiles, and there are roughly as many countries where the sticky floor phenomenon is found as countries where the glass ceiling phenomenon is found. Estonia stands out here for having an increasing unexplained gender wage gap in higher quantiles with no evidence of a sticky floor or a glass ceiling. We replicate this exercise on the data of the job search portal and the labour force survey.

Appendix 2 presents the decomposition results graphically, showing the unexplained part with a confidence interval[6]. The rqdeco command for Stata written by Melly (2006) is implemented. This approach uses an Oaxaca-Blinder-style approach and decomposes the conditional wage differences in quantiles into two parts: one due to coefficients and one due to endowments. The results based on the labour force survey demonstrate the same result as that found by Christofides et al. (2013) using EU-SILC data, which is that Estonia appears to have an increasing unexplained part of the gender wage gap in higher wage quantiles with no clear evidence of the sticky floor or glass ceiling phenomena. A similar pattern is also found in the job search portal data, with a single difference in the upper parts of the conditional wage distribution. While the conditional gender gap in desired wages is roughly the same from the 40th percentile to the 90th percentile, the gap starts to increase exponentially in the very top quantiles. This could be interpreted as evidence of the glass ceiling phenomenon in desired wages. Interestingly the same pattern cannot be observed in realised and reservation wages, which is further

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[6] The results are present together for employed and unemployed individuals. The results of a similar exercise on employed and unemployed individuals are not presented as they provide similar distributional patterns. In addition, the sample size of unemployed individuals in the labour force survey is quite small for a reliable distributional pattern.

evidence of gender differences in risk aversion and wage negotiations – men seem to gamble more for high pay jobs at the very top of the wage distribution.

4.4. Labour market experience and the gender wage gap

The CV Keskus database contains unique information about the labour market experience of job-seekers. The same information is unfortunately not available in the labour force survey, but it enables us to test on the CV Keskus data whether employment and non-employment breaks and labour market mobility can explain an additional part of the gender wage gap in Estonia. The same methodology as in subsection 4.2 is applied and equation (1) is estimated with different subgroups of explanatory variables. As decomposition results from the job-seekers database did not differ much for the employed and the unemployed, these two groups are analysed jointly. The results are presented for all the individuals in the database irrespective of their tenure in the labour market.

Table 5 presents the results. Family characteristics explain only 4.8% of the gender gap in desired wages. It is intuitive that family characteristics can explain only a small part of the wage gap as there is little variation in these characteristics across economically active men and women. Adding education reverses the explained part to negative. This shows that while men have less education, their educational returns are on average higher. Adding occupation increases the part explained to 23.5%, while adding industry does not add much to the explained part. This result overlaps with international evidence that occupational and sectoral segregation explains a large part of gender pay differences. However, the part explained by these characteristics amounts only to a quarter in Estonia.

Labour market experience, such as current employment status, count of previous jobs and average duration of previous jobs, can add only a small part to the explained gender wage gap. Men and women tend to have similar labour market experience. However, women have longer non-employment spells (please see Table 1) and this explains some additional part of the gender gap in desired wages. Less than one third of the gender gap is explained after controlling for all these variables in the decomposition. Lastly, occupational and sectoral mobility cannot add a significant contribution to the explained part.

Table 5: Oaxaca–Ransom decomposition, dependent variable log(wage) in desired wages, 2009

	Age, marriage, children	Previous + education	Previous + occupation	Previous + field of activity	Previous + employment experience	Previous + non-employment breaks	Previous + occupational and sectoral mobility
Total gap (log difference)				−0.291			
Explained (in %)	−0.014*** (4.8)	0.013** (-4.3)	−0.068*** (23.5)	−0.075*** (25.6)	−0.077*** (26.3)	−0.087*** (30.0)	−0.088*** (30.1)
Unexplained: male advantage (in %)	−0.105*** (36.1)	−0.115*** (39.6)	−0.085*** (29.0)	−0.082*** (28.2)	−0.081*** (28.0)	−0.077*** (26.6)	−0.077*** (26.5)
Unexplained: female disadvantage (in %)	−0.172*** (59.0)	−0.188*** (64.7)	−0.138*** (47.4)	−0.134*** (46.1)	−0.133*** (45.7)	−0.126*** (43.4)	−0.126*** (43.4)
No. of obs.				4494 women and 2751 men			

Note: Occupational and sectoral mobility is measured as a sum of squares of shares of jobs at one particular occupation or sector to the total job counts. Occupations and sectors refer to ISCO88 9 major groups and NACE 2003 1-digit industries. ***, **, * indicate statistical significance at the levels of 1%, 5% and 10% respectively.

Source: authors' calculation from CV Keskus data.

The most important characteristics for the wage gap are women's employment in less well paid occupations and their longer non-employment breaks. Only an additional 4.5 percentage points of the gender gap are explained by controlling for labour market experience.[7] The unexplained gender gap amounts to 20.3% even after all these controls on labour market history are introduced.

The lower wages desired by women originate partly from their higher alternative cost of working, as women are more resilient to switching to the labour market when they have children. Brown et al. (2011) find that in the UK the existence of pre-school-age children can explain most of the gender reservation wage gap. They interpret this result as perceived labour market discrimination due to children, which influences the reservation wage setting of women. Baffoe-Bonnie and Ezeala-Harrison (2005) find that the duration of unemployment spells can explain a large part of the gender wage gap. Table 5 and the regression coefficients presented in section 4.1 show the importance of the same factors for the gender wage gap in Estonia, but children and longer non-employment spells can explain only a small part of the gender pay gap in Estonia.

5. Summary

This study compared gender differences in desired wages, realised wages and reservation wages to reveal gender differences in wage bargaining. It is found that the unexplained gender pay gaps in desired and realised wages are very similar and are 22–25% in Estonia. The unexplained gender gap in the reservation wage is much smaller at 14%. Given their reservation wage, men ask for much higher wages than women do during their job-search. Our results also show that women have a much lower unemployment probability and that most of it can be explained by their segregation to more stable employment in terms of education, occupation and industry. It can be concluded that women are more risk averse than men in their job-search and that they have higher disutility from unemployment and a preference for more stable employment and shorter unemployment spells.

According to the decomposition in realised wages, women's lower expectations are revised up than rather men's high expectations being revised down on the job. Our results also indicate that longer breaks between jobs can ex-

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[7] The fourth model in Table 5 corresponds to the same model as that presented in tables 2–4. However, the gender gap explained by these characteristics is 26% in Table 5 and around 20% in Table 4. This discrepancy originates from differences in the sample size. The sample size of Table 5 is limited to individuals who have data available for all the variables analysed.

plain a small additional part of gender wage gap, while occupational and sectoral mobility cannot add much to the explained part.

However, the question of how much the gender wage gap would be reduced by if women desired the same wage as men cannot be answered by this paper. Part of the gender gap cannot be reduced because of women's preference for more stable employment. If women were as risk averse as men in signalling their desired wage to employers, the resulting gender gap in wages would be reduced, but their unemployment probability would also increase. The other part of the gender gap, originating from a self-confirming equilibrium or a gender difference in labour demand, deserves further research. A possible avenue for further research is on all the records of wage bets in the non-experimental wage negotiation process and on the gender differences in the demand for labour.

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Appendix 1: Decomposing the probability of being unemployed: labour force survey, 2009

Table 1: Oaxaca–Ransom decomposition based on logit model, dependent variable 0 – employed, 1 – unemployed: labour force survey, 2009

	Age, marriage, children	Previous + education	Previous + occupation	Previous + field of activity
Total gap (log difference)	−0.060*** (0.112 for women and 0.172 for men)			
Explained (in %)	−0.009*** (15.1)	−0.027*** (45.0)	−0.056*** (93.9)	−0.055*** (92.0)
Unexplained: male advantage (in %)	−0.026*** (44.0)	−0.017*** (28.6)	−0.002 (3.2)	−0.003 (4.2)
Unexplained: female disadvantage (in %)	−0.024*** (40.7)	−0.016*** (26.4)	−0.002 (2.9)	−0.002 (3.9)
No. of observations	4403 women and 4740 men			

Notes: See notes to Table 1 for variable definitions and list of explanatory variables; the table uses nonlinear decomposition of nldecompose command for Stata. ***, **, * indicate statistical significance at the levels of 1%, 5% and 10% respectively based on robust standard errors.

Source: authors' calculations from Estonian labour force survey data.

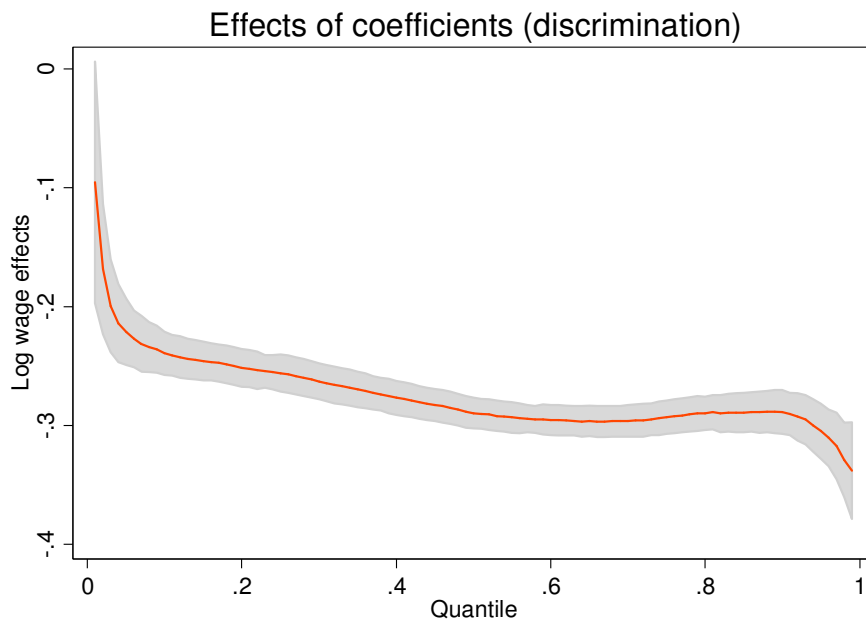# Appendix 2: Unexplained gender wage gaps in quantiles

Figure 1a: Unexplained gender wage gap in quantiles of desired wage, employed and unemployed individuals in 2009
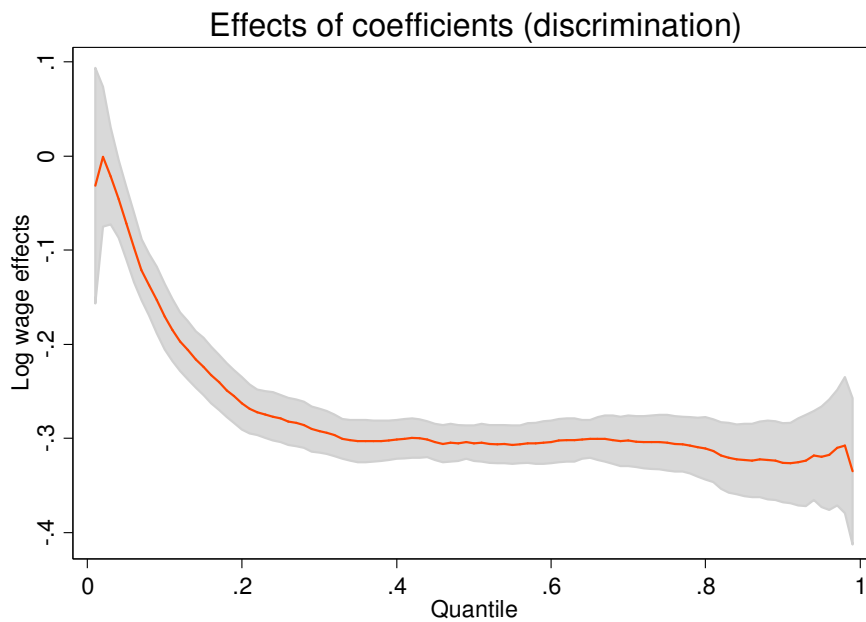
Source: authors' calculation from CV Keskus data.

Figure 1b: Unexplained gender wage gap in quantiles of realised and reservation wage, employed and unemployed individuals in 2009

Source: authors' calculation from labour force survey data.

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