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Abstract

Women's labor market participation rate in Turkey hit its lowest value in the mid 2000s at 23% and has been rising since then. The latest statistics put this figure at 35.1%. Just as more women are entering the labor market and turning to wage employment, occupational gender segregation threatens their labor market attachment. In this paper, we examine occupational gender segregation and consider its impact on wages. Using representative micro-data, we find that a unit increase in the segregation index reduces wages received by women by 6.2% but has only a slightly negative effect (0.8%) on men. Furthermore, we observe the most severe wage penalty (13.6%) among the most educated women. Although more women are making inroads into male jobs, those who remain in relatively female-dominated jobs are found to suffer a higher wage penalty. Addressing occupational segregation is important to preserve the momentum of women's participation.

Keywords: Gender discrimination, Occupational segregation, Earnings, Wage distribution, Turkey

JEL Classifications: J31; J16; J71

ملخص

بلغ معدل مشاركة المرأة في سوق العمل في تركيا أدنى قيمة له في منتصف العقد الأول من القرن الحادي والعشرين عند 23%، وهو يرتفع منذ ذلك الحين. تشير أحدث الإحصاءات إلى أن هذا الرقم بلغ 35.1%. مثلما يدخل المزيد من النساء سوق العمل ويتجهن إلى العمل بأجر، فإن الفصل المهني بين الجنسين يهدد ارتباطهن بسوق العمل. في هذه الورقة، ندرس الفصل المهني بين الجنسين وننظر في تأثيره على الأجور. باستخدام البيانات الدقيقة التمثيلية، نجد أن زيادة الوحدة في مؤشر الفصل تخفض الأجور التي تتلقاها النساء بنسبة 6.2% ولكن لها تأثير سلبي طفيف (0.8%) على الرجال. علاوة على ذلك، نلاحظ أشد عقوبة للأجور (13.6%) بين النساء الأكثر تعليماً. وعلى الرغم من أن المزيد من النساء يحرزن تقدماً في وظائف الذكور، إلا أن أولئك الذين يبقون في وظائف تهيمن عليها الإناث نسبيًا يعانون من عقوبة أجور أعلى. ومن المهم معالجة مسألة الفصل المهني للحفاظ على زخم مشاركة المرأة.

1. Introduction

Occupational gender segregation – that men and women do different jobs – is a common phenomenon around the world. Even in countries high up on the list of gender equality, such as Sweden or Finland, women are crowded into 'feminine jobs' and men into 'masculine jobs'. Burchell et al. (2015) finds that 83% of women in Finland are employed in female-dominated occupations, where women make up more than 60% of the employees. This figure is 62% in Sweden. Anker (1997) argues that occupational gender segregation is a 'major source of labor market rigidity and economic inefficiency' (p. 315). From an individual perspective to the extent that female-dominated jobs are undervalued or offer workers fewer career advancement opportunities, men and women working in these occupations are penalized. Furthermore, the effects of occupational gender segregation likely extend to other spheres of public and private life, from educational investments to bargaining with the family.

Turkey boasts the lowest female labor force participation rate in the OECD. In 2021, among 15-64-year-old women, only 31.7% participated in the labor market, compared to 60.4% in the OECD and 63.4% in the EU-27. In the same year in Turkey, men's labor force participation rate was 68.6%. The current labor force participation of women, although still low, is significantly higher than it was a decade ago. Women's labor force participation hit its lowest value in the mid-2000s at 23% and has been rising since then. Using a synthetic cohort analysis, Tunali et al. (2021) find empirical support for the 'U-shaped' pattern of female labor force participation over the course of development (Goldin, 1995) and evidence that Turkey is on the rising part of the U. Another important development is the rising wage employment among women. While in 2004, only half of the employed women held a paid job, this figure increased to nearly 70% in 2022 (TurkStat, 2023). At the same time, we observe a widening gender wage gap; while in 2012, women's monthly wages were 96% of men's wages, in just a decade, it reduced to 89% in 2022.

In this paper, we examine occupational gender segregation and consider its impact on both men's and women's wages. We use microdata from several rounds of the regularly conducted Household Labor Force Surveys (HLFS) of TurkStat covering the period 2012-2022. The HLFS provides rich information on labor market outcomes of wage earners, including their wages and occupations held based on the two-digit ISCO-08 occupational classification. Our operational sample consists of nearly 1.2 million observations. We begin by documenting occupational gender segregation and then proceed to examine how occupational crowding affects wages.

Our study contributes to the rich literature on occupational gender segregation – discussed shortly – by presenting a case study from a middle-income country, where women constitute a small share of the total labor supply, so that in any given (two-digit) occupation, the number of men typically exceeds the number of women (with the exception of 'health associate professionals'). This is unlike most developed countries, where the gender composition of the labor force is (nearly)

balanced; yet, in certain occupations, very few women are found, and in others, the number of women grossly exceeds the number of men. In our context, occupational crowding is determined in a relative sense to refer to a situation where the share of women in an occupation exceeds their overall share in paid employment. Hence, we explore whether occupations with a higher-than-average representation of women experience a corresponding decrease in wages due to segregation. Additionally, we contribute to the literature on the low participation of women in Turkey and the gender wage gap. Although there is rich literature on both topics (see Duman, 2023; Tunalet et al., 2021; Dildar, 2015; Goksel, 2013; Ilkcaracan, 2012; Dayand K, 2010; Gunduz-Hoor and Smits, 2008), occupational crowding and its impact on wages have not been studied.

We find that, controlling for a rich set of individual and job characteristics, women in 'feminized' occupations earn less than their counterparts in less 'feminized' occupations. We also observe heterogeneous occupational crowding effects by education. The results for men suggest that those employed in 'feminized' occupations also earn less, although this wage penalty is somewhat lower than for women. In the model where we take occupations as our unit of analysis, we find that the feminization of an occupation leads to lower wages, confirming our individual-level analysis of a wage penalty associated with working in a 'feminized' job. At the same time, we observe a decline in occupational gender segregation over time and in new contracts, but an increasing wage penalty for being in a relatively feminized occupation. Thus, while women appear to be making inroads into holding 'male' jobs, those remaining in 'female' jobs are suffering higher wage penalties.

The study is organized as follows: Section 2 provides a brief account of the relevant literature. Section 3 discusses the data and empirical methodology we employ. In Section 4, we present our main findings under two sub-headings. Firstly, we define what we call the female overrepresentation (FO) index as a continuous variable and estimate the wage penalty accordingly. In Section 5, we take occupations as the unit of analysis and consider how changes in the FO index impact occupational wages. Section 6 extends the analysis further by considering how the FO index changes in new contracts. Finally, Section 7 provides our conclusions.

2. Related Literature

Occupational gender segregation and lower wages for women in female-dominated occupations may result from supply- or demand-side factors. On the supply side, human capital theory predicts differential investment in human capital by men and women due to the traditional division of labor (Becker, 1981; 1985). The lower human capital of women, measured in terms of schooling, job tenure, experience, or training may preclude them from holding high-paying occupations. Another related factor is the shorter expected work lives of women, which makes expensive human capital investments less worthwhile. The argument is that higher work-life interruptions due to caring duties that fall more heavily on women incentivize them to hold jobs that do not penalize temporary withdrawals from the labor market (Polachek, 1981; 1985). Even among women committed to their careers, flexibility is an amenity traded for higher wages. Goldin (2014) argues that there is

a high wage penalty for temporal flexibility in certain occupations, such as law or high-level management, where long hours and particular schedules are demanded of workers. The fact that women have not only caught up with men but also surpassed them in education, and have significantly narrowed the gap in job tenure and experience in many advanced countries, has renewed the interest in the role of job amenities in explaining the gender wage gap. Apart from temporal flexibility (Wiswall and Zafar, 2018), shorter commute time (Le Barbanchon et al., 2021) and job stability (Wiswall and Zafar, 2018) have been shown to be valued more by women than men.

On the demand side, labor market segmentation, monopsony power and discrimination may also explain gender crowding and lower wages for women. In the spirit of Bergmann's (1974) occupational crowding model, if women are more likely to be pushed into the secondary sector (in the case of Turkey, this would be the informal sector) with lower capital intensity and organizational inefficiency, their wages would be lower. Employers may discriminate against women, believing they are not suited for specific jobs or that employing women workers is more expensive due to factors such as higher expected turnover rates, more frequent absences from work, or protective regulations on women workers (Goldin, 1986). Aside from employer (mis)perceptions or 'statistical discrimination' (Phelps, 1972), Becker-type 'taste discrimination' and inertia may also make it difficult for women to gain inroads into traditionally men's jobs. Women's lower willingness to commute may give monopsony power to employers. Manning (2003) shows that in 'thin' labor markets, where small number of employers exist within a 'reasonable' commuting distance, firms may exercise some monopsony power. Labor market frictions may also cause departures from perfect competition. Information asymmetries about job opportunities is a potential source of friction. If women's business networks are thin, locating job opportunities may be more difficult. Roussille (2024) finds women's asking wages to be lower than men's and attributes this difference to information asymmetries.

The feminist theory, on the other hand, asserts that societal norms and perceptions about women's role in the society and the labor market, discriminatory social institutions and practices, and the stereotyping of women's characteristics help explain their lower human capital investment, occupational segregation and lower wages. Agarwal (1997) argues that gender ideology and the weaker fallback position of women determined by economic assets, information, and social institutions, weaken their bargaining power within the household and the market. Folbre (2021) draws attention to the social institutions and practices that are themselves products of unequal bargaining as forces that maintain gender inequality. Treiman and Hartmann (1981) and England (1992) further argue that jobs that are typically done by women are undervalued because they are done by women. Based on job evaluation studies, Treiman and Hartmann (1981) show that aside from the content of jobs, sex composition also matters in determining pay rates. Comparable-worth policies, although they have had limited application, rest on the assumption that women's jobs are undervalued.

Empirical evidence, the bulk of which comes from developed countries, suggests that, controlling for an array of individual characteristics as well as industry and occupation level variables, female-dominated occupations pay less (see, for instance, Blau and Kahn, 2003; Blau and Kahn, 2017; Levanon et al., 2009; Sorensen, 1990; Macpherson and Hirsch, 1995; Munasinghe et al., 2008; Gronlund, 2012; Hansen and Wahlberg, 2008). Many of these studies also find that men in female-dominated occupations receive lower wages than their counterparts in male-dominated occupations. In fact, Killingsworth (1990) note that the negative association between wages and the proportion of women workers in an occupation is stronger for men than for women. Furthermore, most of the explanations offered above to explain why women receive lower wages in female-dominated jobs are not likely to apply to men. A plausible explanation can be that jobs are rationed so that some men are pushed into female-dominated occupations, where wages are depressed either because of the large supply of women or because female occupations are devalued, as argued by Treiman and Hartmann (1981), England (1992) and Levanon (2009).

While there is consensus on the existence of a wage penalty in female-dominated jobs, the causal pathway is less well understood. In the literature, a lot of attention is paid, for instance, the relationship between wages and job tenure and experience (see Munasinghe et al., 2008; Gronlund, 2012; Hansen and Wahlberg, 2008). However, as Gronau (1988) argues in the case of career interruptions and lower wages for women, in the presence of feedback effects, i.e. that lower wages may encourage women reduce their work-attachment, separating supply-side factors from demand-side factors becomes quite difficult.³ Nonetheless, even if one takes the extreme view that the observed wage penalty stems entirely from women choosing less-demanding occupations because they want to care for their families (essentially opting for a family-career dual path), this does not reduce the importance of assessing the magnitude of the wage penalty and its impact on women's labor market integration.

3. Data and Empirical Methodology

3.1. Data

The data we employ come from the regularly conducted Household Labor Force Surveys (HLFS) of TurkStat. We pool annual micro-data from the 2012 through 2022 rounds of the HLFS, which provide information on a rich set of personal and job characteristics of wage earners. The two key variables of interest are the occupation held and wages. Information on the former is provided at a 2-digit ISCO classification level (i.e., 40 occupations), while the latter is the sum of regular monthly remuneration and the monthly share of any lump-sum bonus or premium received. We calculate hourly wages using the usual weekly hours of work. We use the consumer price index (with 2003 as the base year) published by TurkStat to correct for cost-of-living differences across

³ (Gronau, 1988) finds that employers' perceptions lead to greater work interruptions of women, leading to lower wages.

years. All wages are expressed in 2022 Liras. In the pooled data, we have nearly 1.2 million observations.⁴

We develop a simple ‘female over-representation’ (FO) index by comparing women’s representation in a given 2-digit occupation to their overall representation in the labor market for each year under study. Our index is equal to 1 if the female ratio in a given occupation is equal to their overall ratio among wage earners, less than 1 if they are under-represented, and greater than 1 if they are over-represented. For instance, a value of 2 would suggest that in a given occupation, the share of women is twice their overall share among wage earners.

Let F_i and N_i be respectively, the number of female workers and the total number of workers in occupation i . We define female over-representation index in occupation i as

$$FO_i = \frac{\frac{F_i}{N_i}}{\frac{\sum_i^k F_i}{\sum_i^k N_i}}$$

The overall female over-representation index weighted by the employment share of occupations equals to one.

$$\sum_i^k FO_i = \sum \frac{\frac{F_i}{N_i}}{\frac{\sum_i^k F_i}{\sum_i^k N_i}} \frac{N_i}{\sum_i^k N_i} = \sum \frac{F_i}{\sum_i^k F_i} = 1$$

A drawback of the FO index as expressed above is that it assumes that in a given 2-digit occupation, workers compete for the same jobs, which is probably not the case. To take into account the possible hierarchy within occupations, we compute the FO index by education groups. For this purpose, we divide the wage earners into three education groups: those with less than secondary (high school) education, those with secondary education, and those with post-secondary education. In doing so, we assume that wage earners of the same type compete with each other so that, for instance, for a university graduate woman, what matters is the number of men and women with the same credentials as her. Similar to the above discussion, the weighted sum of education-occupation-specific FO equals 1, where the weights are the share of wage earners with a given level of education in an occupation.

In Table 1, we present the FO index by education level. Women constitute 23.4% of the wage workers with less than secondary schooling, 24.8% of those with secondary schooling, and 40.3% of those with above-secondary schooling. These figures suggest that female wage workers are

⁴ We omitted a small number of observations falling into occupation-education cells with fewer than 25 observations on average over 11 years (see Table 9).

positively selected. The FO index shows the largest variation among wage workers with less than secondary education, with a minimum value of 0 and a maximum value of 4.3. In contrast, the smallest variation is observed for post-secondary graduates; the range is much narrower (0-2.31), and the standard deviation of the index is nearly half of what is estimated for those with less than secondary schooling.

Table 1. Occupational FO index by gender, 2012-2022

	Men	Women
<i>Less than secondary</i>		
Mean	0.75	1.80
Std. Dev.	0.68	1.03
<i>Secondary</i>		
Mean	0.82	1.53
Std. Dev.	0.66	0.67
<i>Post-secondary</i>		
Mean	0.87	1.20
Std. Dev.	0.45	0.34

Source: TurkStat, HLFS 2012-22.

Authors' calculations.

Table 2. Average female segregation by occupation (2012-22)

Code	Description	Less than secondary		Secondary		Post-secondary	
		Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
11	Chief executives, senior officials and legislators	0.07	0.04	0.5	0.15	0.44	0.04
12	Administrative and commercial managers	0.4	0.29	0.85	0.14	0.77	0.05
13	Production and specialised services managers	0.13	0.13	0.56	0.13	0.53	0.06
14	Hospitality, retail and other services managers	0.51	0.07	0.89	0.1	0.62	0.07
21	Science and engineering professionals			1.45	0.38	0.75	0.02
22	Health professionals	3.42	0.54	3.08	0.3	1.58	0.07
23	Teaching professionals			3.19	0.23	1.45	0.04
24	Business and administration professionals	0.41	0.39	0.23	0.11	0.78	0.04
25	Information and communications technology professionals					0.55	0.08
26	Legal, social and cultural professionals	0.95	0.35	1.04	0.16	1.05	0.05
31	Science and engineering associate professionals	0.26	0.06	0.24	0.04	0.34	0.02
32	Health associate professionals	1.58	0.24	2.33	0.11	1.37	0.08
33	Business and administration associate professionals	0.76	0.18	1.32	0.07	1.13	0.05
34	Legal, social, cultural and related associate professionals	0.88	0.14	0.97	0.15	1.01	0.07
35	Information and communications technicians	0.48	0.17	0.5	0.22	0.45	0.11
41	General and keyboard clerks	1.87	0.26	1.91	0.17	1.29	0.11
42	Customer services clerks	1.1	0.19	1.84	0.1	1.37	0.04
43	Numerical and material recording clerks	0.62	0.15	1.38	0.1	1.15	0.06
44	Other clerical support workers	0.88	0.37	1.27	0.16	1.18	0.04
51	Personal service workers	1.19	0.07	1.15	0.11	0.9	0.08
52	Sales workers	1.02	0.12	1.51	0.05	1.05	0.03
53	Personal care workers	3.69	0.28	3.07	0.11	1.94	0.11
54	Protective services workers	0.11	0.05	0.29	0.05	0.18	0.03
61	Market-oriented skilled agricultural workers	0.62	0.06	0.37	0.16	0.62	0.31
62	Market-oriented skilled forestry, fishery and hunting workers	0.28	0.15				
71	Building and related trades workers, excluding electricians	0.02	0.01	0.02	0.01	0.04	0.04
72	Metal, machinery and related trades workers	0.08	0.01	0.09	0.02	0.06	0.03
73	Handicraft and printing workers	1.19	0.19	0.78	0.14	0.64	0.22
74	Electrical and electronic trades workers	0.06	0.02	0.05	0.02	0.02	0.02
75	Food processing, wood working, garment and other craft	0.99	0.04	1.11	0.08	0.92	0.09
81	Stationary plant and machine operators	1.14	0.08	0.8	0.06	0.48	0.07
82	Assemblers	0.57	0.1	0.46	0.09	0.36	0.09
83	Drivers and mobile plant operators	0.01	0	0.01	0.01	0.02	0.01

Table 2. Average female segregation by occupation (2012-22) (continued)

Code	Description	Less than secondary		Secondary		Post-secondary	
		Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
91	Cleaners and helpers	1.82	0.03	1.37	0.14	1.03	0.19
92	Agricultural, forestry and fishery labourers	2.05	0.26	1.15	0.15	0.75	0.28
93	Labourers in mining, construction, manufacturing and transport	0.87	0.04	0.84	0.09	0.55	0.11
94	Food preparation assistants	2.21	0.13	1.87	0.2	1.01	0.28
95	Street and related sales and service workers	0.56	0.17				
96	Refuse workers and other elementary workers	0.2	0.05	0.15	0.06	0.18	0.06

Notes: Based on 2-digit ISCO-08 classification.

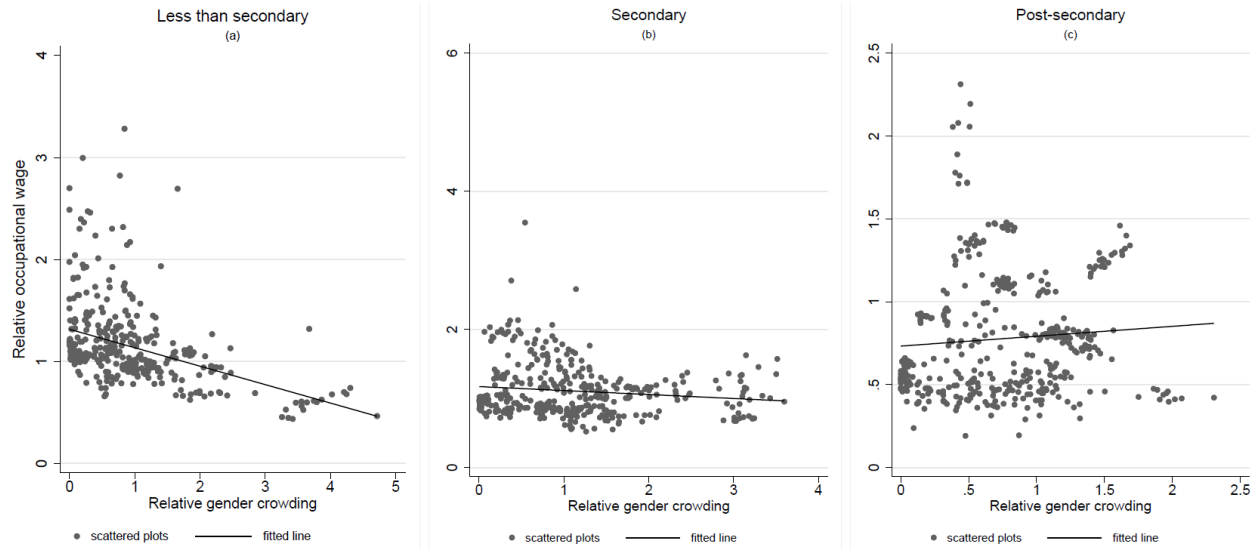
Source: TurkStat, HLFS 2012-22. Authors' calculations.

The FO index falls with education for women (Table 1). The mean of the FO index is 1.8 for women with less than secondary schooling, 1.53 for women with secondary schooling, and 1.2 for women with higher than secondary schooling, suggesting that more educated women are employed in more integrated jobs. The corresponding figures for men are 0.75, 0.82, and 0.87.

In Table 2, we show the mean of the FO index by occupation-education cells. The 'feminized' occupations, although varying by education, include health professionals, health associate professionals, teaching professionals, personal care workers, clerks, and food preparation assistants. These findings are in line with the occupational segregation literature that finds women to be concentrated in occupations that align with their supposed comparative advantage in work that involves caring and nurturing (Anker, 1997).

In Figure 1, we show how the relative occupational wage (defined as the average hourly wage in an occupation divided by the average hourly wage in a given year) is associated with the FO index by education. The strongest negative association is observed for wage workers with less than secondary schooling. A mild negative association is also observed for secondary school graduates but not for upper-secondary graduates. In fact, for the most educated group, we observe a positive association. Note that we draw these figures without any controls. Next, we turn to the empirical model and explain the controls we use in an effort to identify whether simply being in a 'feminized' occupation reduces one's wages.

Figure 1. Relative average occupational wage and the FO index by education level



Notes: Relative gender crowding is the FO index. Relative occupation wage is the ratio of the mean hourly wage in a given occupation to the overall mean hourly wage in a given year. Only positive wage earners are included in the sample. Sampling weights are used. A small number of occupations are excluded, specifically those with mean average observation less than 25 over the studied period. Source: TurkStat, HLFS 2012-22. Authors' calculations.

3.2. Empirical Model

The empirical model we employ can be viewed as an augmented Mincer-type earnings function, where FO is included among the determinants of hourly wages. We estimate three earnings functions separately for men and women. The first specification includes FO and the basic demographic and human capital variables - education, age, and marital status - along with year effects. The second specification adds job characteristics to the human capital variables. The third specification, which is given below, includes industry and region fixed effects as additional controls.

$$\ln w_{e,i,t} = \beta_0 + \beta_x \cdot X_{e,i,t} + \beta_c \cdot FO_{e,i,t} + DI + DR + DT \quad (1)$$

where, i stands for either female or male wage workers with an education level e at time t . The dependent variable is the log of real hourly wages. FO is as defined above. The coefficient of FO, β_c , shows how women's and men's wages change as the occupation becomes relatively more populated by women. The five sets of control variables – denoted as X - include demographic and human capital variables as noted above, job characteristics, and industry (DI -87 categories) and region level (DR- 26 categories) controls. The vector of job characteristics includes tenure (years with the same employer), formal employment (vs. informal employment), public employment (vs. private employment), firm size (in the form of dummies for micro, medium and large firms), part-time employment, and contract status (permanent vs. temporary). Industry level fixed effects

control for the possibility that occupations in different industries command different wages.⁵ As noted above, all specifications include year fixed effects (DT-11 categories).

3.3. Descriptive Statistics

Table 3 presents the descriptive statistics on key variables by gender and schooling. Less than secondary school graduates constitute 44.0%, secondary school graduates 24.3%, and post-secondary graduates 31.7% of the wage earners. Real hourly wages increase with schooling. The average age of wage earners is nearly 37. A total of 85.2% have social security coverage due to their employment (i.e., are formally employed), 26.6% work in the public sector, and they have been working for the same employer for nearly 6.5 years. Formal employment, public sector employment, and tenure are higher among more educated workers, with 97.7% of post-secondary graduates working formally, nearly 56% in public employment, and having 9.5 years of tenure. Their likelihood of working in a large firm, full-time, and with a permanent contract is also much higher. These grossly different job characteristics suggest sharp divides in jobs held by wage earners with different schooling, justifying their separate treatment.

The average hourly earnings of women fall short of male earnings in each education group, although overall, they appear to have higher hourly earnings than men. The latter observation is due to the fact that high-earning post-secondary school graduates make up a larger proportion of female wage earners (43%) than male wage earners (27%). With the exception of women with less than lower secondary schooling, women wage earners are younger than men. The average age gap is about a year, and so is the average tenure with the same employer. A larger proportion of men than women are employed formally. The gap mainly stems from distinctly lower formal employment among women with less than lower secondary education, 60.2% of whom are employed formally compared to 77.1% of men. With the exception of the most educated group, a larger fraction of men than women are employed in the public sector.

Table 3: Summary statistics by broad education groups

		Total		Less than secondary		Secondary		Post-secondary		
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Female	T	0.294	0.455	0.245	0.43	0.245	0.43	0.399	0.49	
	Real hourly wage	T	35.031	30.005	21.727	12.115	29.909	20.624	57.466	39.282
	F	35.41	31.096	18.236	10.397	26.267	22.213	54.403	35.668	
FO Index	M	34.874	29.538	22.861	12.413	31.089	19.94	59.497	41.381	
	T	1	0.775	1	0.955	1	0.743	1	0.453	
	F	1.543	0.832	1.91	1.105	1.552	0.704	1.226	0.34	
No schooling	M	0.797	0.632	0.735	0.688	0.822	0.663	0.88	0.466	
	T	0.036	0.185	0.081	0.272	-	-	-	-	
	F	0.057	0.233	0.156	0.363	-	-	-	-	
5-years of schooling	M	0.026	0.161	0.056	0.23	-	-	-	-	
	T	0.227	0.419	0.515	0.5	-	-	-	-	
	F	0.2	0.4	0.543	0.498	-	-	-	-	
	M	0.238	0.426	0.506	0.5	-	-	-	-	

⁵ A concern with the third specification is that the incorporation of industry controls may mitigate the impact of segregation. For instance, it is plausible that individuals sharing the same occupation may be disproportionately assigned to specific industries. The inclusion of industry controls may selectively influence the overall effect.

Table 3. Summary statistics by broad education groups (continued)

		Total		Less than secondary	Secondary	Post-secondary		Total	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean		Mean	
8-years of schooling	T	0.178	0.383	0.404	0.491	-	-	-	-
	F	0.11	0.314	0.301	0.459	-	-	-	-
	M	0.206	0.405	0.438	0.496	-	-	-	-
General secondary	T	0.115	0.319	0	0	0.474	0.499	-	-
	F	0.106	0.307	0	0	0.522	0.5	-	-
	M	0.119	0.324	0	0	0.458	0.498	-	-
Vocational secondary	T	0.128	0.334	0	0	0.526	0.499	-	-
	F	0.097	0.296	0	0	0.478	0.5	-	-
	M	0.141	0.348	0	0	0.542	0.498	-	-
Post-secondary	T	0.317	0.465	0	0	0	0	1	0
	F	0.43	0.495	0	0	0	0	1	0
	M	0.27	0.444	0	0	0	0	1	0
Age	T	36.823	11.043	38.229	12.216	34.843	10.275	36.388	9.518
	F	36.066	10.789	39.472	12.33	32.908	10.03	34.641	8.759
	M	37.138	11.131	37.825	12.151	35.47	10.276	37.545	9.819
Social Security	T	0.852	0.355	0.73	0.444	0.91	0.286	0.977	0.15
	F	0.823	0.381	0.602	0.489	0.892	0.311	0.98	0.139
	M	0.864	0.343	0.771	0.42	0.916	0.278	0.975	0.156
Public employee	T	0.266	0.442	0.094	0.292	0.196	0.397	0.559	0.496
	F	0.297	0.457	0.067	0.251	0.157	0.364	0.559	0.496
	M	0.253	0.435	0.102	0.303	0.208	0.406	0.56	0.496
Tenure years	T	6.526	7.892	4.58	6.297	6.188	7.504	9.492	9.178
	F	5.806	7.18	3.389	4.332	4.607	6.248	8.438	8.538
	M	6.825	8.152	4.967	6.769	6.701	7.799	10.19	9.514
Firm size <=10	T	0.32	0.467	0.443	0.497	0.308	0.462	0.159	0.366
	F	0.326	0.469	0.5	0.5	0.368	0.482	0.158	0.364
	M	0.318	0.466	0.425	0.494	0.289	0.453	0.16	0.366
Firm size -11-49	T	0.285	0.451	0.262	0.44	0.268	0.443	0.329	0.47
	F	0.298	0.458	0.231	0.421	0.275	0.446	0.368	0.482
	M	0.279	0.449	0.272	0.445	0.266	0.442	0.304	0.46
Firm size >=50	T	0.395	0.489	0.294	0.456	0.423	0.494	0.512	0.5
	F	0.375	0.484	0.269	0.443	0.357	0.479	0.475	0.499
	M	0.403	0.49	0.303	0.459	0.445	0.497	0.536	0.499
Part time	T	0.043	0.203	0.049	0.216	0.026	0.159	0.048	0.213
	F	0.078	0.268	0.097	0.295	0.051	0.219	0.075	0.263
	M	0.028	0.166	0.033	0.179	0.018	0.133	0.03	0.17
Permanent Job	T	0.906	0.292	0.84	0.366	0.937	0.242	0.973	0.162
	F	0.916	0.277	0.851	0.356	0.933	0.25	0.965	0.184
	M	0.902	0.298	0.837	0.369	0.939	0.24	0.978	0.146
Observations	T	1150051		506548		279332		364171	
	F	337676		124124		68387		145165	
	M	812375		382424		210945		219006	

Notes: Wage earners with non-zero wages are included only. T, F, and M represent Total, Female, and Male workers, respectively. Industry (87 categories), region (26 categories), and year (11 categories) are not reported. Sampling weights are used.

Source: TurkStat, HLFS 2012-22. Authors' calculations.

4. Impact of the FO index on hourly wages

Table 4 presents the results by gender and education groups. In the table, we only report the coefficient estimates for the FO index. The full estimation results are given in the Appendix. The results suggest that when we do not distinguish between male and female wage earners and education groups, a higher relative female representation in a given occupation impacts the wage rate negatively. With basic human capital controls, the wage penalty is on the order of 6% for a unit increase in the FO index but reduces to 4.5% when job characteristics are controlled for and further to 2.2% when the specification includes industry and region-level fixed effects.⁶

⁶ The coefficient estimates for the FO index obtained from separate regressions in each year are given in Appendix Tables 17-19. Out of 44 sets

This overall figure hides substantial heterogeneity by gender and education groups. First, consider how the wage penalty changes for men and women. We find that in the full specification, women's wages are reduced by 6.2% for a unit increase in the FO index, but the penalty is less than 1% for men. Even with just human capital controls, the penalty for men is limited to 1.8%, while it is 11.5% for women.

Controlling for demographic and human capital variables alone, we find a wage penalty on the order of 15.7% for women with less than secondary schooling and 2.8% for women with secondary schooling but a wage premium on the order of 12.6% for women with above secondary school education. The differential impact of the FO index by education may be related to the different job requirements in occupations where women are relatively more over-represented as compared to where they are less well represented. Controlling for job characteristics turns the wage premium into a wage penalty (on the order of 9%) for the highly educated women as well. In the specification with controls for job characteristics, the wage penalty reduces to 6.1% for women with less than secondary schooling and to 1.5% for women with just secondary education. In the model with full controls, the wage penalty decreases further to 5.9% and 1% for these two education groups, respectively, but increases to 13.6% among women with above secondary education.

of estimates, in only 6 cases, the coefficient estimates are not statistically significant. In the rest, the FO index is consistently negative and statistically significant.

Table 4. Effect of female over-representation on wages

	Total			Less than secondary			Secondary			Post-secondary		
	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Full Sample												
FO index	-0.062*** (0.001)	-0.045*** (0.001)	-0.022*** (0.001)	-0.104*** (0.001)	-0.066*** (0.001)	-0.035*** (0.001)	-0.024*** (0.002)	-0.026*** (0.001)	-0.007*** (0.001)	0.122*** (0.002)	0.041*** (0.002)	0.007*** (0.003)
Observations	1,150,051	1,150,051	1,150,051	506,548	506,548	506,548	279,332	279,332	279,332	364,171	364,171	364,171
R-squared	0.456	0.581	0.619	0.230	0.370	0.412	0.149	0.392	0.447	0.211	0.395	0.481
Women												
FO index	-0.115*** (0.001)	-0.057*** (0.002)	-0.062*** (0.002)	-0.157*** (0.002)	-0.061*** (0.002)	-0.059*** (0.003)	-0.028*** (0.003)	-0.015*** (0.003)	-0.010*** (0.003)	0.126*** (0.005)	-0.090*** (0.005)	-0.136*** (0.005)
Observations	337,676	337,676	337,676	124,124	124,124	124,124	68,387	68,387	68,387	145,165	145,165	145,165
R-squared	0.499	0.636	0.669	0.219	0.371	0.415	0.098	0.368	0.427	0.223	0.443	0.522
Men												
FO index	-0.018*** (0.001)	-0.025*** (0.001)	-0.008*** (0.001)	-0.059*** (0.001)	-0.057*** (0.001)	-0.030*** (0.001)	-0.022*** (0.002)	-0.025*** (0.002)	-0.005*** (0.002)	0.122*** (0.003)	0.087*** (0.003)	0.052*** (0.003)
Observations	812,375	812,375	812,375	382,424	382,424	382,424	210,945	210,945	210,945	219,006	219,006	219,006
R-squared	0.440	0.558	0.599	0.205	0.347	0.395	0.149	0.392	0.449	0.196	0.366	0.460

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, region, and year fixed effects. Sampling weights are used in all estimations. Detailed regression results are presented in Appendix Table 12-14. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: TurkStat, HLFS 2012-22. Authors' calculations

It may seem surprising at first that the most educated women suffer from a higher wage penalty as compared to less educated women. However, we must recognize that there is a greater scope for skill and, therefore, wage differentiation in jobs that require high rather than low education. Furthermore, the minimum wage, which is likely to be more relevant for less skilled than more skilled women, compresses wages from below. Take the case of women with lower than secondary schooling. The difference in the wages received in jobs where women are relatively over-represented and where they are nearly non-existent is much lower than in jobs held by women with above secondary education. For the former, the wage rate is around the minimum wage or slightly below it (for those employed informally). For the latter, the gap is much larger. Although in both cases, women suffer a wage penalty in jobs where they are relatively over-represented, the penalty is larger for more educated women. The lower penalty for secondary school graduates as compared to either of the two education groups can be explained by the wages of this education group to being around the minimum wage. This situation is probably peculiar to Turkey, where the minimum wage is very close to the median wage (Bakis and Polat, 2023). Apart from the public sector, wage setting is, by and large, decentralized. Union membership has dwindled over time, with only 12.6% of the formal workforce in 2022 belonging to a workers' union (SGK, 2023). Without sector-wide collective wage agreements, the minimum wage is the main reference point in wage bargaining.

Why do women suffer from a wage penalty in jobs where they are relatively more over-represented? The reason is likely to differ by education. The jobs held by the less educated women might be devalued, as argued by Treiman and Hartmann (1981) leading to lower wages. These women are likely to face greater barriers to labor market entry due to the socially held values that ascribe women to the roles of home-making and child care. For these women, employment in a job that is deemed socially appropriate, which among other attributes may include employment alongside other women, is more likely to be both out of "choice" and discrimination. Choice is in quotation marks because even though socially held values may be internalized, the same mechanisms will probably make it less likely for women to be hired in a "masculine" job. From this perspective, the wage penalty might be regarded as a price to pay for gaining access to a socially acceptable job. The utility gain from the social attributes of a feminine job is compensated for by the utility loss due to the wage penalty. This also might indicate that these jobs have greater value when labor force participation is lower and conservative attitudes towards working are higher.

For highly educated women, whose labor force participation rate exceeds 70%, social values are less likely to be binding in their occupational choice. This is evident from the much lower FO index for this group of women. The wage penalty for being in a relatively over-represented job can be consistent with a number of explanations. One explanation could be the glass-ceiling phenomenon. Women might be less likely to be promoted, and this practice might be more likely in occupations where women are relatively more heavily represented. An alternative but connected

explanation is Goldin (2014)'s argument that in certain occupations, temporal flexibility is costly. Even if such a demand is not made, the anticipation of it may result in women being passed over in promotion. The occupational choice itself and the relative representation of women may be taken as a signal (incorrectly for some women) for such intentions. Undervaluation is less likely to be an explanation for this group of women when one considers that occupations where highly educated women are relatively more heavily represented - such as a medicine - carry a high social status.

The bottom panel of Table 4 presents the results for men. As noted above, men's wages are only marginally lower -0.8% - in occupations where women are relatively more represented. Among men with less than secondary education, this figure is only marginally higher at 3% but even lower at 0.5% among secondary school graduates in the specification with full controls. In contrast, men receive a wage premium on the order of 5.2% in the full-model. This finding supports our conjecture that in high human capital occupations where women are relatively more represented, men are more likely to be promoted. Our findings for men differ from the findings in the wider literature, where men's wage penalty is found to be higher than women's in female-dominated occupations (Killingsworth, 1990). In the Turkish context, the relatively small number of women wage earners vis-à-vis men and their concentration in a handful of occupations discussed above give men the opportunity to avoid these occupations so that the average wage penalty for them reduces.

We have employed a continuous FO index to measure the wage penalty of being in a job where women are relatively over-represented. To allow for a non-linear relationship between the FO index and wage, we re-estimate equation 1 by replacing the continuous FO index with a series of dummies corresponding to the four quartiles of the FO index. The results of this estimation is inline with the basic findings of the model above (appendix Table 21) .

How do our findings of a wage penalty for women in feminized occupations compare with the extant literature? Most of the studies in the literature estimate the occupational wage penalty by considering how much less women (or men) would earn if they were employed in an all-female job rather than an all-male job, controlling for individual and job related characteristics. In these studies, the gender composition of an occupation is measured by a dummy variable showing the proportion of women in an occupation. Due to the considerably lower number of female wage earners than men in Turkey, we have chosen to use an alternative measure that we denote as the FO index. Hence, our results are not directly comparable with the existing literature. Sorensen (1990) finds women's (men's) earnings to fall by 15 to 23% (24%) if they are employed in an all-female job rather than in an all-male job. Her findings fall within the 0-42% range she reports from the earlier literature. The sizeable variation in the estimates is related to the unit of analysis (i.e., whether occupations or individuals) and the number of control variables used. Sorensen (1990),

for instance, criticizes Filer (1989), who concludes that the gender composition of an occupation does not impact women’s wages, for using 225 control variables with just 430 observations.

Addison et al. (2018) update an earlier study by Macpherson and Hirsch (1995) and find that in a cross-sectional set up with controls for standard human capital and job characteristics, women’s (men’s) hourly wages are 27.5% (32.4%) lower in an all-female than an all-male job. With additional controls for occupational and industry level characteristics, the wage penalty is found to be 13% for women and 20.2% for men. Addison et al. (2018) also estimate the wage equations by schooling, and similar to us, highly educated women suffer from a significantly higher wage penalty. They find, for instance, that women with 16 years of education suffer a 23% wage penalty as compared to a 7.6% wage penalty for women with 13 to 15 years of education.

Lastly, we also ran separate regressions using our FO index to understand how wages react in different sectors (appendices Tables 15 and 16). We will not discuss the results in detail, but the regression’s main message remained intact when the private sector was involved. For the public sector, we have mixed results.

5. Change in the FO index and relative hourly wages

In this section, we investigate whether changes in gender composition lead to hourly wage changes. More precisely, we examine whether changes in the female over-representation index lead to hourly wage changes within specific education-occupation cells using the following specification:

$$\log\left(\frac{RW_{e,i,t}}{RW_{e,i,t-1}}\right) = \beta_0 + \beta_1 \cdot \Delta FO_{e,i,t} + DE + DO + DT \quad (2)$$

Our dependent variable is relative real hourly wages (RW) for each broad education group within two-digit occupational classifications. It is defined as $\log\left(\frac{RW_{e,i,t}}{RW_{e,i,t-1}}\right)$ where $RW_{e,i,t} = \frac{W_{e,i,t}}{W_{e,t}}$. We use relative hourly wages to avoid real wage increases from biasing our results. $\Delta FO_{e,i,t}$ is the one-year difference of the FO index. DE, DO and DT control for education, occupation and time fixed effects.

Table 5 presents the results. Without any controls, we find that one-unit increase in the FO index leads to a 9.4% decrease in hourly wages. Controlling for year fixed effects increases this penalty slightly to 9.7%. With full controls, the wage penalty decreases to 5.7%. Figure 2 shows the change in relative wages with the change in the FO index by education. In parallel to our previous results, where we take individual men and women as our unit of analysis, we observe stronger negative effects for occupations held by the least educated workers (Panel a of Figure 2). In Panels b and c, where wage changes for occupations held by secondary school and above secondary school graduates are shown, a negative effect of an increase in FO can also be discerned. Note that the

negative FO effect found for occupations held by the most educated wage earners is not as strong as found from individual level analysis. This is likely to stem from the mixed effects the gender composition has on women's and men's wages. Recall that we find wage premium for men among the most educated only.

Our results are consistent with the findings of (Levanon et al., 2009) that the 'feminization' of an occupation, controlling for an array of factors that determine occupational wages, leads to lower occupational wages. They interpret their finding as evidence for the devaluation of the occupation with the change in its gender composition.

Table 5. Change in relative wages and the FO index

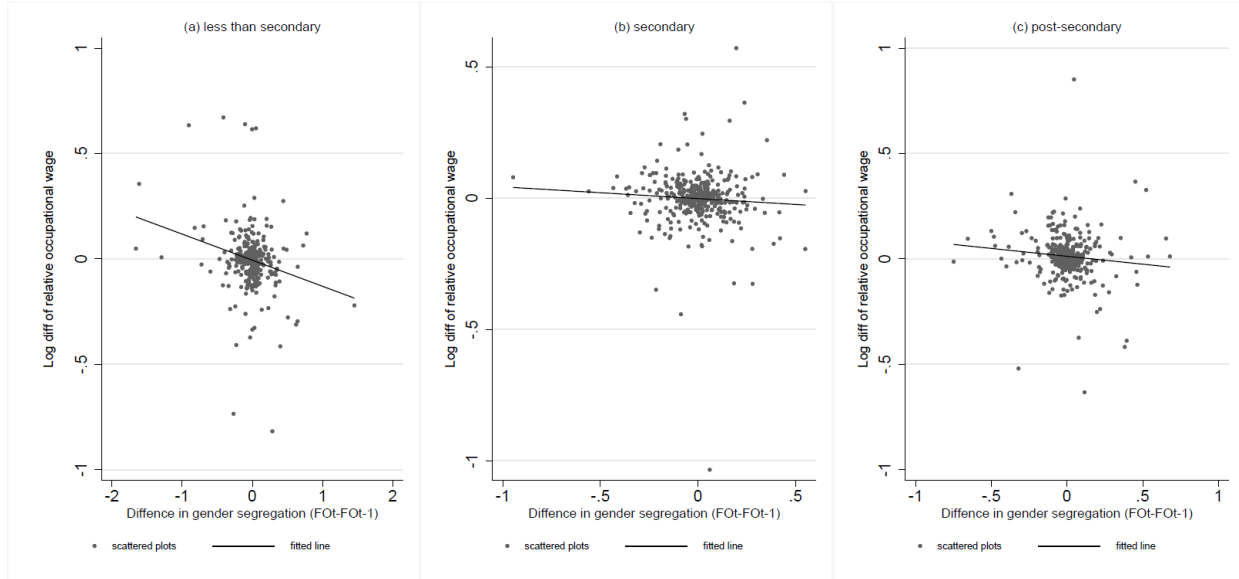
DV: log relative wage ratio (RW_t/RW_{t-1})	(1)	(2)	(3)	(4)
Difference in gender segregation ($FO_t - FO_{t-1}$)	-0.094*** (0.027)	-0.097*** (0.026)	-0.051** (0.026)	-0.057** (0.026)
Education level controls				yes
Occupation controls				yes
Differences in endowment and job characteristics			yes	yes
Year controls		yes	yes	yes
Constant	0.002 (0.003)	0.004 (0.008)	-0.003 (0.009)	-0.008 (0.040)
Observations	1,087	1,087	1,087	1,087
R-squared	0.024	0.030	0.208	0.224

*Notes: The dependent variable (DV) is the real hourly wage (RW) ratio in period t and t minus 1. Endowment and job characteristics include cell-specific averages: age, tenure, share of public employment, part-time jobs, informal jobs and small firms < 10 employees. We also control for education, occupation controls and year fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Source: TurkStat, HLF5 2012-22. Authors' calculations.

Figure 2. Changes in the relative wages and the FO index

Change in relative gender crowding and change in relative hourly wages by occupations



Notes: Only positive wage earners are included in the sample. Sampling weights are used. Certain occupations are excluded due to a limited number of observations, specifically those with mean average observation less than 25. Real hourly wages are obtained by dividing monthly wage by the CPI (TurkStat).

Source: TurkStat, HLFS 2012-22. Authors' calculations.

6. Changes in the FO index over time and new contracts

We have illustrated so far that women suffer a wage penalty in occupations where they are relatively over-represented. We have also noted that the gender wage gap has grown over time. To see whether occupational segregation is a factor in this development, we investigate how the FO index has changed over time and in the new contracts. Table 10 in the Appendix shows how the FO index has evolved over time. We observe an improvement in the index for all education groups as can be deduced from the decrease in the maximum values assumed by the index and its standard deviation. These summary statistics suggest that women are making inroads to male-dominated jobs.⁷ To analyze the evolution of the FO index in new contracts, we make use of the retrospective data available in the HLFS. The data pertain to years 2012-2019 and solicit information on the labor market status of respondents in the previous year. For currently employed female wage earners, we estimate the following regression:

$$FO_{i,t} = \beta_0 + \beta_x \cdot X_{i,t} + \sum_s \beta_s \cdot LS_{i,t} + DR + DT \quad (3)$$

where, FO is the dependent variable that represents the degree of over-representation of women in a given occupation. LS denotes the labor market status of newly hired workers from the previous year. The new hires might have been unemployed in the previous year, worked in a different job, or were out-of-the labor market because they were students, home-makers, incapacitated, or

⁷ Appendix Table 11 presents the changing female representation over time. Notice that women of all educational backgrounds have increased their presence in the labor market. The share of women among wage workers with less than secondary school education increased from 20% in 2012 to 27% in 2022. The corresponding increases have been from 23% to 27% for secondary school graduates and from 38% to 43% among above secondary school graduates.

retired. X denotes personal characteristics that include education and age. DR and DT are region and time fixed effects, respectively. In this specification, our interest mainly lies with the change in the time coefficients. Controlling for human capital variables and the composition of new hires, we are interested in observing whether the FO index has increased over time.

Table 6 gives the descriptive statistics for this group of women who have either entered wage employment or changed jobs by education groups. Over three-quarters of women who have started working in a new job were employed in a different job in the previous year. The other three sizeable groups are the unemployed (7.9%), home-makers (9.2%) and students (5.3%). Among the post-secondary graduates, those previously employed constitute a significantly larger proportion of new starts at 84.8% as compared to secondary (74.1%) and lower secondary (71.6%) graduates.

Table 6. Summary statistics of newly hired female workers

	Total		Less than secondary		Secondary		Post-secondary	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
the FO index	1.514	0.807	1.805	1.033	1.537	0.692	1.198	0.344
FO>1=1	0.785	0.410	0.775	0.418	0.835	0.371	0.771	0.420
Age	34.314	10.639	37.006	12.331	31.399	9.612	33.016	8.353
No schooling	0.069	0.254	0.170	0.376	0.000	0.000	0.000	0.000
5-years of schooling	0.206	0.404	0.506	0.500	0.000	0.000	0.000	0.000
8-years of schooling	0.132	0.339	0.324	0.468	0.000	0.000	0.000	0.000
General secondary	0.103	0.304	0.000	0.000	0.510	0.500	0.000	0.000
Vocational secondary	0.099	0.299	0.000	0.000	0.490	0.500	0.000	0.000
Post-secondary	0.390	0.488	0.000	0.000	0.000	0.000	1.000	0.000
Year 2012	0.039	0.194	0.055	0.229	0.041	0.199	0.021	0.143
Year 2013	0.043	0.203	0.059	0.236	0.046	0.210	0.025	0.155
Year 2014	0.132	0.338	0.134	0.340	0.137	0.344	0.127	0.333
Year 2015	0.141	0.348	0.141	0.348	0.142	0.350	0.141	0.348
Year 2016	0.150	0.357	0.146	0.353	0.147	0.354	0.156	0.363
Year 2017	0.158	0.364	0.150	0.357	0.155	0.362	0.166	0.372
Year 2018	0.168	0.374	0.159	0.366	0.165	0.371	0.178	0.382
Year 2019	0.169	0.375	0.155	0.362	0.165	0.371	0.186	0.389
Working in a job	0.773	0.419	0.716	0.451	0.741	0.438	0.848	0.359
Retired	0.001	0.027	0.001	0.030	0.001	0.024	0.001	0.026
Job seeking	0.079	0.270	0.072	0.259	0.102	0.303	0.075	0.263
Engaged with household chores	0.092	0.289	0.164	0.370	0.081	0.273	0.022	0.147
Education or training	0.053	0.224	0.044	0.205	0.073	0.261	0.052	0.223
Ill or disabled	0.001	0.039	0.003	0.053	0.001	0.028	0.001	0.022
Elderly	0.000	0.009	0.000	0.015	0.000	0.000	0.000	0.000
Other	0.001	0.026	0.000	0.018	0.001	0.026	0.001	0.032
Observations	198,026		84,281		39,298		74,447	

Notes: Labor market status (e.g. working, retired etc.) refers to individual' status a year before the survey application. Regional distribution at NUTS2 level is not presented.

Source: TurkStat, HLFS 2012-22. Authors' calculations.

Before discussing the year effects, it is interesting to note that of the new hires, those who changed jobs, home-makers and (former) students are more likely to be employed in jobs with a higher FO

index than women who were unemployed in the previous year (the base category). This finding may suggest that a period of unemployment helps women access less female-dominated, higher-wage jobs. An alternative and less positive interpretation is also possible: unemployment pushes women into accepting more male-dominated jobs, though they also offer a higher wage. Looking at the coefficient estimates, it seems that the previous labor market status is less important in determining FO status of an occupation held by more educated women. The negative coefficients of the education variables also suggest that more educated women are more likely to hold occupations with a lower FO index. This was also evident in our previous analysis on the total of wage earners and not just the new hires.

For the total of new hires, the FO index falls over time in all specifications (Table 7). In the full specification, the year coefficients are negative and statistically significant, starting with year 2015. The FO index is 0.088 points lower in 2019 than in 2012 (the base year). When we analyze the newly employed women wage workers by education, we observe different time trends. For women with lower secondary and secondary education, the FO index improves over time. In 2019, the index is lower by 0.191 points for the former and 0.09 points for the latter in the full specification. Interestingly, the FO index slightly increases for women with above secondary education. Although the change in 2019 is limited to 0.015 points and is not statistically significant, in most other years, the FO index increases by 0.024-0.042 points.

Table 7. Female over-representation in occupations of newly hired female workers

	All		Less than secondary			Secondary			Post-secondary			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
5-years of schooling	-0.313***	-0.325***	-0.238***	-0.324***	-0.353***	-0.209***						
	(0.012)	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)						
8-years of schooling	-0.591***	-0.604***	-0.511***	-0.464***	-0.495***	-0.337***						
	(0.013)	(0.013)	(0.012)	(0.013)	(0.013)	(0.013)						
General secondary	-0.613***	-0.625***	-0.533***									
	(0.012)	(0.012)	(0.012)									
Vocational secondary	-0.452***	-0.461***	-0.359***				0.146***	0.147***	0.160***			
	(0.013)	(0.013)	(0.012)				(0.008)	(0.008)	(0.008)			
Post-secondary	-0.866***	-0.880***	-0.794***									
	(0.012)	(0.012)	(0.011)									
Age	-0.031***	-0.024***	-0.021***	-0.019***	-0.002	0.006***	-0.033***	-0.029***	-0.026***	-0.002	-0.002	-0.003**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Age squared	0.001***	0.001***	0.000***	0.001***	0.000***	0.000***	0.001***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<i>Last year labor market status</i>												
Working		0.086***	0.085***		0.176***	0.160***		0.061***	0.066***		0.042***	0.043***
		(0.006)	(0.006)		(0.012)	(0.012)		(0.012)	(0.012)		(0.006)	(0.006)
Retired		-0.030	0.004		0.046	0.126		0.149	0.210		0.065	0.072
		(0.075)	(0.074)		(0.140)	(0.140)		(0.153)	(0.151)		(0.050)	(0.051)

Table 7. Female over-representation in occupations of newly hired female workers (continued)

		All		Less than secondary			Secondary		Post-secondary				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Engaged with household chores		0.078***	0.060***		0.189***	0.150***		0.013	0.014		0.000	-0.009	
		(0.009)	(0.009)		(0.014)	(0.014)		(0.017)	(0.017)		(0.010)	(0.010)	
Education training	or	0.280***	0.274***		0.725***	0.724***		0.128***	0.130***		0.059***	0.050***	
		(0.010)	(0.010)		(0.024)	(0.024)		(0.019)	(0.018)		(0.008)	(0.008)	
Ill or disabled		-0.082*	-0.066		-0.070	-0.055		0.042	0.078		0.036	0.047	
		(0.042)	(0.042)		(0.051)	(0.051)		(0.129)	(0.121)		(0.044)	(0.045)	
Elderly		0.138	0.163		0.047	0.089							
		(0.251)	(0.246)		(0.251)	(0.249)							
Other		0.171***	0.154***		0.054	0.115		0.391**	0.399**		0.112**	0.095**	
		(0.059)	(0.055)		(0.141)	(0.137)		(0.190)	(0.183)		(0.044)	(0.043)	
year 2013		0.027**	0.025**	0.020	0.037*	0.030	0.017	0.004	0.005	0.002	0.017	0.015	0.015
		(0.012)	(0.012)	(0.012)	(0.019)	(0.019)	(0.019)	(0.024)	(0.024)	(0.024)	(0.012)	(0.012)	(0.012)
year 2014		-0.007	-0.012	-0.012	-0.015	-0.021	-0.015	-0.041**	-0.053**	-0.061***	0.056***	0.047***	0.042***
		(0.010)	(0.010)	(0.010)	(0.017)	(0.017)	(0.017)	(0.021)	(0.021)	(0.021)	(0.010)	(0.010)	(0.010)
year 2015		-0.012	-0.017*	-0.022**	-0.031*	-0.040**	-0.045***	-0.019	-0.031	-0.039*	0.044***	0.035***	0.028***
		(0.010)	(0.010)	(0.010)	(0.017)	(0.017)	(0.016)	(0.021)	(0.021)	(0.021)	(0.009)	(0.010)	(0.010)
year 2016		-0.012	-0.018*	-0.025**	-0.042**	-0.057***	-0.068***	-0.014	-0.026	-0.034	0.052***	0.043***	0.035***
		(0.010)	(0.010)	(0.010)	(0.017)	(0.017)	(0.016)	(0.021)	(0.022)	(0.021)	(0.009)	(0.010)	(0.009)
year 2017		-0.022**	-0.027***	-0.034***	-0.046***	-0.058***	-0.068***	-0.067***	-0.079***	-0.090***	0.054***	0.045***	0.038***
		(0.010)	(0.010)	(0.010)	(0.017)	(0.017)	(0.016)	(0.021)	(0.021)	(0.021)	(0.009)	(0.010)	(0.009)
year 2018		-0.033***	-0.038***	-0.047***	-0.086***	-0.102***	-0.116***	-0.025	-0.037*	-0.048**	0.040***	0.031***	0.024**
		(0.010)	(0.010)	(0.010)	(0.017)	(0.017)	(0.016)	(0.021)	(0.021)	(0.021)	(0.009)	(0.009)	(0.009)
year 2019		-0.069***	-0.075***	-0.088***	-0.155***	-0.174***	-0.191***	-0.066***	-0.077***	-0.090***	0.033***	0.025***	0.015
		(0.010)	(0.010)	(0.010)	(0.017)	(0.017)	(0.016)	(0.020)	(0.021)	(0.020)	(0.009)	(0.009)	(0.009)
Constant		2.442***	2.240***	1.988***	2.045***	1.562***	1.102***	1.985***	1.871***	1.796***	1.145***	1.118***	1.068***
		(0.021)	(0.022)	(0.022)	(0.032)	(0.033)	(0.033)	(0.045)	(0.048)	(0.049)	(0.021)	(0.022)	(0.022)
Region effects (Nuts2)			yes		yes		yes		yes		yes		yes
Observations		198,026	198,026	198,026	84,281	84,281	84,281	39,298	39,298	39,298	74,447	74,447	74,447
R-squared		0.192	0.196	0.224	0.132	0.144	0.199	0.020	0.021	0.043	0.005	0.006	0.038

Notes: The excluded categories include individuals with no schooling for education level and those who define their status as job seeking for last year's status. Only positive wage earners are included in the sample. Sampling weights are used in the regressions. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: TurkStat, HLFS 2012-19.

Going back to our concern about the rising gender wage inequality the over time, that the FO index and for the newly hired women is falling over time, particularly among the less educated women for whom the gender wage gap is larger are welcoming developments. However, before we can conclude that occupational segregation is not a factor in the rising gender wage inequality, we need to consider how the FO effect is evolving over time. While there appears to be a downward trend in FO over time, the wage penalty could exhibit variations across years. For this purpose, we re-estimate Equation 1 by including an interaction term between the FO index and the year dummies (FO*year). The results of this estimation by education and gender are given in Table 8. The interaction terms are generally statistically significant and negative, suggesting that the impact of FO has strengthened over time, which is likely to contribute to the increasing gender wage gap. The rising wage penalty for working in a job with more women workers is especially apparent for the less educated women. Although the coefficient estimates of the interaction term FO*year are negative for women with above-secondary education, their magnitude is generally smaller and, in some years, lack statistical significance. In the case of men, we also generally observe negative

coefficient estimates, but these are more likely to be statistically significant for the relatively more educated.

Table 8. Effect of the FO index on wages over time

	Full Sample				Women				Men			
	All	LTS	S	PS	All	LTS	S	PS	All	LTS	S	PS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
the FO index	0.013*** (0.002)	-0.007*** (0.002)	-0.000 (0.004)	0.063*** (0.007)	-0.015*** (0.003)	-0.029*** (0.004)	0.027*** (0.007)	0.065*** (0.015)	0.021*** (0.003)	0.002 (0.003)	-0.004 (0.005)	0.061*** (0.008)
year 2013	0.035*** (0.003)	0.040*** (0.004)	0.029*** (0.006)	0.030*** (0.010)	0.024*** (0.008)	0.031** (0.012)	0.047** (0.019)	-0.002 (0.026)	0.034*** (0.004)	0.041*** (0.005)	0.023*** (0.007)	0.036*** (0.011)
year 2014	0.065*** (0.003)	0.075*** (0.004)	0.062*** (0.006)	0.050*** (0.010)	0.043*** (0.009)	0.076*** (0.012)	0.034* (0.019)	0.039 (0.027)	0.067*** (0.004)	0.077*** (0.005)	0.064*** (0.007)	0.048*** (0.011)
year 2015	0.096*** (0.003)	0.115*** (0.004)	0.095*** (0.006)	0.046*** (0.010)	0.077*** (0.009)	0.123*** (0.012)	0.070*** (0.018)	0.078*** (0.027)	0.095*** (0.004)	0.114*** (0.005)	0.095*** (0.007)	0.032*** (0.011)
year 2016	0.198*** (0.003)	0.238*** (0.004)	0.201*** (0.006)	0.111*** (0.009)	0.212*** (0.008)	0.320*** (0.012)	0.261*** (0.018)	0.137*** (0.025)	0.192*** (0.004)	0.228*** (0.005)	0.193*** (0.006)	0.103*** (0.010)
year 2017	0.187*** (0.003)	0.230*** (0.004)	0.194*** (0.006)	0.107*** (0.009)	0.181*** (0.008)	0.302*** (0.012)	0.245*** (0.018)	0.108*** (0.024)	0.185*** (0.004)	0.221*** (0.005)	0.183*** (0.007)	0.103*** (0.010)
year 2018	0.168*** (0.003)	0.214*** (0.004)	0.188*** (0.006)	0.086*** (0.009)	0.149*** (0.008)	0.278*** (0.012)	0.199*** (0.018)	0.113*** (0.024)	0.168*** (0.004)	0.205*** (0.005)	0.180*** (0.007)	0.077*** (0.010)
year 2019	0.198*** (0.003)	0.259*** (0.004)	0.215*** (0.006)	0.101*** (0.009)	0.201*** (0.008)	0.366*** (0.012)	0.301*** (0.020)	0.102*** (0.024)	0.194*** (0.004)	0.241*** (0.005)	0.200*** (0.007)	0.099*** (0.010)
year 2020	0.206*** (0.003)	0.271*** (0.004)	0.248*** (0.006)	0.098*** (0.009)	0.189*** (0.009)	0.370*** (0.013)	0.351*** (0.021)	0.071*** (0.024)	0.208*** (0.004)	0.256*** (0.005)	0.230*** (0.007)	0.101*** (0.010)
year 2021	0.212*** (0.003)	0.288*** (0.004)	0.261*** (0.006)	0.094*** (0.009)	0.177*** (0.008)	0.420*** (0.012)	0.334*** (0.018)	0.070*** (0.024)	0.217*** (0.004)	0.269*** (0.005)	0.249*** (0.007)	0.095*** (0.010)
year 2022	0.206*** (0.003)	0.284*** (0.004)	0.245*** (0.006)	0.095*** (0.010)	0.220*** (0.008)	0.473*** (0.012)	0.364*** (0.019)	0.109*** (0.024)	0.200*** (0.004)	0.250*** (0.005)	0.229*** (0.007)	0.087*** (0.010)
the FO index*year 2013	-0.005** (0.003)	-0.007** (0.003)	-0.000 (0.005)	-0.009 (0.008)	-0.003 (0.005)	-0.006 (0.005)	-0.014 (0.011)	0.017 (0.020)	-0.002 (0.004)	-0.006 (0.005)	0.008 (0.006)	-0.015 (0.010)
the FO index*year 2014	-0.009*** (0.003)	-0.007** (0.003)	-0.006 (0.005)	-0.014 (0.009)	-0.002 (0.005)	-0.013** (0.006)	0.008 (0.011)	-0.006 (0.020)	-0.006* (0.004)	-0.007 (0.005)	-0.004 (0.007)	-0.008 (0.011)
the FO index*year 2015	-0.017*** (0.003)	-0.018*** (0.003)	-0.009* (0.005)	-0.008 (0.009)	-0.018*** (0.005)	-0.032*** (0.006)	-0.004 (0.010)	-0.037* (0.020)	-0.007** (0.004)	-0.012*** (0.005)	-0.002 (0.006)	0.011 (0.011)
the FO index*year 2016	-0.020*** (0.003)	-0.022*** (0.003)	-0.005 (0.005)	-0.011 (0.008)	-0.034*** (0.005)	-0.064*** (0.006)	-0.035*** (0.010)	-0.027 (0.019)	-0.010*** (0.004)	-0.012*** (0.005)	0.000 (0.006)	-0.006 (0.010)
the FO index*year 2017	-0.019*** (0.003)	-0.017*** (0.003)	-0.011** (0.005)	-0.024*** (0.008)	-0.025*** (0.005)	-0.055*** (0.006)	-0.044*** (0.010)	-0.022 (0.019)	-0.009*** (0.004)	-0.005 (0.005)	0.003 (0.006)	-0.021** (0.010)
the FO index*year 2018	-0.023*** (0.003)	-0.017*** (0.003)	-0.021*** (0.005)	-0.037*** (0.008)	-0.024*** (0.005)	-0.055*** (0.006)	-0.034*** (0.010)	-0.054*** (0.019)	-0.013*** (0.004)	-0.004 (0.005)	-0.008 (0.006)	-0.029*** (0.010)
the FO index*year 2019	-0.018*** (0.003)	-0.019*** (0.003)	-0.010** (0.005)	-0.027*** (0.008)	-0.032*** (0.005)	-0.077*** (0.006)	-0.061*** (0.010)	-0.024 (0.019)	-0.008** (0.004)	-0.000 (0.005)	0.004 (0.006)	-0.027*** (0.010)

Table 8. Effect of the FO index on wages over time (continued)

	Full Sample			Women			Men			Full Sample			Women			Men			
	All	LTS	S	All	LTS	S	All	LTS	S	All	LTS	S	All	LTS	S	All	LTS	S	
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	
the FO index*year 2020	-0.013*** (0.003)	-0.008** (0.003)	-0.020*** (0.005)	-0.024*** (0.008)	-0.018*** (0.005)	-0.063*** (0.006)	-0.084*** (0.013)	-0.001 (0.018)	-0.008** (0.004)	0.006 (0.005)	-0.002 (0.006)	-0.031*** (0.010)							
the FO index*year 2021	-0.023*** (0.003)	-0.014*** (0.003)	-0.026*** (0.005)	-0.050*** (0.008)	-0.020*** (0.005)	-0.084*** (0.006)	-0.069*** (0.011)	-0.033* (0.018)	-0.017*** (0.004)	0.006 (0.005)	-0.016** (0.006)	-0.048*** (0.010)							
the FO index*year 2022	-0.041*** (0.003)	-0.038*** (0.003)	-0.033*** (0.005)	-0.071*** (0.008)	-0.068*** (0.005)	-0.141*** (0.006)	-0.100*** (0.011)	-0.082*** (0.019)	-0.024*** (0.004)	0.005 (0.005)	-0.020*** (0.007)	-0.063*** (0.010)							
Constant	2.300*** (0.009)	1.853*** (0.014)	2.571*** (0.021)	2.430*** (0.032)	2.338*** (0.017)	1.992*** (0.045)	2.488*** (0.049)	2.251*** (0.078)	2.273*** (0.011)	1.798*** (0.015)	2.553*** (0.024)	2.515*** (0.035)							
Observations	1,150,051	506,548	279,332	364,171	337,676	124,124	68,387	145,165	812,375	382,424	210,945	219,006							
R-squared	0.650	0.417	0.480	0.565	0.696	0.426	0.456	0.584	0.634	0.403	0.485	0.557							

Notes: Only positive wage earners are included in the sample. Sampling weights are used in the regressions. LTS, S and PS stand for Less than secondary, secondary and post-secondary, respectively. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: TurkStat, HLFS 2012-22.

7. Conclusion

Using a nationally representative, rich microdata set that includes nearly 1.2 million observations, we have examined whether occupations that are relatively more populated by women workers pay lower wages. Considering that the types of jobs within occupations differ by education, we have carried out our analyses by broad educational groups. Our primary analyses that take individuals as the unit of analysis suggest that female over-representation – defined as above-average female employment in a given occupation vis-à-vis women’s overall share among wage earners – reduces wages. Using a continuous female over-representation (FO) index, we find that controlling for a rich set of individual and job-related characteristics, a unit increase in the index reduces wages received by women by 6.2% but has only a slightly negative effect (0.8%) on men. Among women, we observe the most severe wage penalty (13.6%) among the most educated (i.e., those above secondary school). For men, the wage penalty – where it exists – does not exceed 3% and turns into a (5.2%) premium for the most educated. When we consider a discrete segregation measure, we continue to observe the most severe wage penalty for the most educated women and a wage premium – where it exists - for the most educated men. In an alternative exercise, where we take occupations as the unit of analysis, we find that the feminization of an occupation leads to a deterioration in wages, corroborating the results obtained from individual-level analysis. Our results are in line with the literature from more advanced economies, where significant gender occupational disparity and wage penalties for working in feminized occupations are documented. Where we depart from the literature is the effect on men. We generally find smaller negative effects and a wage premium among the most educated. We interpret these findings to be the result of the ability of men to avoid feminized occupations in the Turkish case, which is not so difficult given

the dismally low female employment rate and men's higher likelihood of being promoted in their jobs, which may also explain the higher wage penalty among the highly educated women.

Analyzing the change in the female over-representation index over time and in new contracts suggests that the labor market is becoming less segregated. Notwithstanding this favorable development, the wage penalty associated with being in a more feminized occupation has risen. This finding suggests that women who can find work in male-dominated jobs can avoid the wage penalty, while those remaining face a steeper one, adding to the gender wage disparity.

Our results suggest that a combination of factors, including discrimination, undervaluation of women's work, and the trade-off between women/family-friendly workplaces and wages, are likely to contribute to the wage penalty observed for women employed in occupations with a relatively higher presence of women. Just when women's participation is finally on the rise in Turkey, occupational segregation poses a threat to this progress and must be tackled to support women's labor market integration. The empirical literature on the effect of employment subsidies given to women in Turkey suggests that they can effectively increase the demand for female labor (Gizem et al., 2014; Uysal, 2013). Targeted employment subsidies may integrate more women into the labor market while tackling occupational segregation. As Agarwal (1997) argues, social norms and practices that reduce women's bargaining power are not hardwired but are subject to change. They themselves are the result of bargaining. As the relative fallback position of women improves with the greater economic participation of women and their higher wages, so will their labor market participation and integration.

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Appendix

Online Appendix: Not for Publication

Tables

Table 9. Excluded occupations due to low number of observations

Code	Occupation (Isco 08)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
<i>Less than secondary</i>													
21	Science and engineering professionals	43	5	17	15	11	18	15	9	23	15	6	177
22	Health professionals	20	13	23	24	23	13	13	17	13	19	12	190
25	Information and communications technology professionals	1			1		1			2	2		7
63	Subsistence farmers, fishers, hunters and gatherers			1	1			2	1		12		17
<i>Secondary</i>													
25	Information and communications technology professionals	8	7	6	3	13	9	7	9	22	22	18	124
62	Market-oriented skilled forestry, fishery and hunting workers	16	16	8	14	7	5	7	17	14	18	29	151
95	Street and related sales and service workers	6	14	20	11	18	15	15	19	25	14	18	175
<i>Post-secondary</i>													
62	Market-oriented skilled forestry, fishery and hunting workers	3	2	4	5	2	2	3	3	2	5	6	37
63	Subsistence farmers, fishers, hunters and gatherers									1			1
95	Street and related sales and service workers	1	2	4	3		2	2	2	3	7	5	31
Total		98	59	83	77	74	65	64	77	105	114	94	910

Source: TurkStat, HLFS 2012-22. Authors' calculations

Table 10. Summary statistics of the FO index over the years

Occupational the FO index	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<i>Less than secondary</i>											
Std. Dev.	0.91	0.92	0.90	0.90	0.90	0.91	0.90	0.87	0.87	0.88	0.88
Mean	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Min	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00
Max	4.30	4.71	4.02	3.86	3.79	3.75	3.64	3.47	3.56	3.56	3.67
<i>Secondary</i>											
Std. Dev.	0.78	0.75	0.72	0.74	0.75	0.71	0.74	0.71	0.73	0.70	0.68
Mean	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Min	0.00	0.01	0.00	0.02	0.02	0.01	0.01	0.02	0.00	0.01	0.02
Max	3.60	3.43	3.34	3.29	3.50	3.12	3.15	3.08	3.10	3.01	2.92
<i>Post-secondary</i>											
Std. Dev.	0.46	0.45	0.46	0.44	0.45	0.46	0.44	0.43	0.43	0.43	0.43
Mean	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Min	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.03
Max	1.91	2.07	2.31	1.97	1.93	1.89	1.96	1.86	1.75	1.97	2.02

Source: TurkStat, HLFS 2012-22. Authors' calculations

Table 11. Summary statistics of the occupational female share over the years

Occupational female share	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<i>Less than secondary</i>											
Std. Dev.	0.18	0.20	0.20	0.21	0.21	0.22	0.23	0.22	0.22	0.22	0.24
Mean	0.20	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.25	0.25	0.27
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	0.86	1.00	0.89	0.89	0.90	0.90	0.91	0.90	0.89	0.89	1.00
<i>Secondary</i>											
Std. Dev.	0.18	0.18	0.18	0.18	0.19	0.18	0.19	0.19	0.18	0.18	0.18
Mean	0.23	0.24	0.24	0.25	0.25	0.25	0.26	0.26	0.25	0.25	0.27
Min	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	0.84	0.82	0.82	0.81	0.87	0.78	0.81	0.81	0.77	0.75	0.78
<i>Post-secondary</i>											
Std. Dev.	0.17	0.17	0.18	0.17	0.18	0.19	0.18	0.18	0.18	0.18	0.18
Mean	0.38	0.39	0.39	0.39	0.40	0.41	0.42	0.41	0.41	0.42	0.43
Min	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Max	0.73	0.80	0.89	0.77	0.77	0.77	0.81	0.77	0.72	0.83	0.87

Source: TurkStat, HLFS 2012-22. Authors' calculations

Table 12. Effect of female over representation on wages - All

	Total		Less than secondary				Secondary			Post-secondary		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Female	-0.081*** (0.001)	-0.077*** (0.001)	-0.087*** (0.001)	-0.107*** (0.002)	-0.103*** (0.002)	-0.102*** (0.002)	-0.088*** (0.003)	-0.063*** (0.002)	-0.062*** (0.002)	-0.062*** (0.002)	-0.064*** (0.002)	-0.083*** (0.002)
the FO index	-0.062*** (0.001)	-0.045*** (0.001)	-0.022*** (0.001)	-0.104*** (0.001)	-0.066*** (0.001)	-0.035*** (0.001)	-0.024*** (0.002)	-0.026*** (0.001)	-0.007*** (0.001)	0.122*** (0.002)	0.041*** (0.002)	0.007*** (0.003)
5-years of schooling	0.103*** (0.003)	0.010*** (0.003)	-0.008*** (0.003)	0.096*** (0.003)	0.018*** (0.003)	-0.001 (0.003)						
8-years of schooling	0.294*** (0.003)	0.100*** (0.003)	0.078*** (0.003)	0.213*** (0.003)	0.084*** (0.003)	0.066*** (0.003)						
General secondary	0.472*** (0.003)	0.221*** (0.003)	0.188*** (0.003)									
Vocational secondary	0.525*** (0.003)	0.252*** (0.003)	0.213*** (0.003)				0.052*** (0.002)	0.027*** (0.002)	0.019*** (0.002)			
Post-secondary	1.074*** (0.003)	0.642*** (0.003)	0.537*** (0.003)									
Age	0.059*** (0.000)	0.036*** (0.000)	0.032*** (0.000)	0.062*** (0.000)	0.042*** (0.000)	0.037*** (0.000)	0.039*** (0.001)	0.023*** (0.001)	0.021*** (0.001)	0.086*** (0.001)	0.042*** (0.001)	0.037*** (0.001)
Age squared	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Never Married	-0.102*** (0.002)	-0.062*** (0.001)	-0.074*** (0.001)	-0.027*** (0.002)	-0.027*** (0.002)	-0.037*** (0.002)	-0.068*** (0.003)	-0.044*** (0.002)	-0.060*** (0.002)	-0.162*** (0.003)	-0.083*** (0.003)	-0.093*** (0.003)
Social Security=1		0.270*** (0.002)	0.225*** (0.002)		0.255*** (0.002)	0.213*** (0.002)		0.314*** (0.004)	0.265*** (0.004)		0.391*** (0.009)	0.313*** (0.008)
Public employee=1		0.327*** (0.001)	0.357*** (0.002)		0.269*** (0.002)	0.307*** (0.005)		0.351*** (0.003)	0.332*** (0.004)		0.287*** (0.002)	0.341*** (0.003)
Firm size = 2, 11-49		0.135*** (0.001)	0.097*** (0.001)		0.112*** (0.002)	0.086*** (0.002)		0.100*** (0.002)	0.082*** (0.002)		0.228*** (0.003)	0.147*** (0.003)
Firm size = 3, >=50		0.206*** (0.001)	0.164*** (0.001)		0.155*** (0.002)	0.133*** (0.002)		0.171*** (0.002)	0.141*** (0.003)		0.339*** (0.003)	0.233*** (0.003)
Tenure years		0.013*** (0.000)	0.013*** (0.000)		0.001*** (0.000)	0.004*** (0.000)		0.016*** (0.000)	0.015*** (0.000)		0.018*** (0.000)	0.017*** (0.000)
Tenure squared		-0.013*** (0.001)	-0.016*** (0.001)		0.026*** (0.001)	0.016*** (0.001)		-0.006*** (0.001)	-0.005*** (0.001)		-0.053*** (0.001)	-0.046*** (0.001)
Part Time		0.281*** (0.004)	0.241*** (0.004)		0.146*** (0.006)	0.109*** (0.006)		0.333*** (0.010)	0.292*** (0.010)		0.424*** (0.005)	0.389*** (0.005)
Permanent Job		0.138*** (0.002)	0.176*** (0.002)		0.108*** (0.003)	0.129*** (0.003)		0.158*** (0.005)	0.151*** (0.006)		0.397*** (0.006)	0.382*** (0.007)
Constant	1.518*** (0.008)	1.634*** (0.007)	1.847*** (0.008)	1.545*** (0.010)	1.619*** (0.009)	1.778*** (0.010)	2.302*** (0.015)	2.023*** (0.015)	2.171*** (0.019)	1.893*** (0.020)	1.587*** (0.023)	1.871*** (0.032)
Industry (Nace)			yes			yes			yes			yes
Region (NUTS2)			yes			yes			yes			yes
Observations	1,150,051	1,150,051	1,150,051	506,548	506,548	506,548	279,332	279,332	279,332	364,171	364,171	364,171
R-squared	0.456	0.581	0.619	0.230	0.370	0.412	0.149	0.392	0.447	0.211	0.395	0.481

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, region, and year fixed effects. Sampling weights are used in all estimations. The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: TurkStat, HLF5 2012-22. Authors' calculations

Table 13. Effect of female over representation on wages - Women

	Total		Less than secondary			Secondary			Post-secondary			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
the FO index	-0.115*** (0.001)	-0.057*** (0.002)	-0.062*** (0.002)	-0.157*** (0.002)	-0.061*** (0.002)	-0.059*** (0.003)	-0.028*** (0.003)	-0.015*** (0.003)	-0.010*** (0.003)	0.126*** (0.005)	-0.090*** (0.005)	-0.136*** (0.005)
5-years of schooling	0.115*** (0.005)	-0.001 (0.005)	-0.004 (0.005)	0.117*** (0.005)	0.021*** (0.005)	0.002 (0.005)						
8-years of schooling	0.338*** (0.006)	0.080*** (0.005)	0.064*** (0.005)	0.215*** (0.006)	0.068*** (0.005)	0.048*** (0.005)						
General secondary	0.533*** (0.006)	0.220*** (0.005)	0.185*** (0.005)									
Vocational secondary	0.627*** (0.006)	0.266*** (0.005)	0.234*** (0.005)				0.061*** (0.004)	0.028*** (0.004)	0.037*** (0.003)			
Post-secondary	1.146*** (0.006)	0.611*** (0.005)	0.498*** (0.005)									
Age	0.055*** (0.001)	0.032*** (0.001)	0.026*** (0.001)	0.045*** (0.001)	0.031*** (0.001)	0.024*** (0.001)	0.034*** (0.002)	0.018*** (0.002)	0.015*** (0.002)	0.095*** (0.002)	0.042*** (0.002)	0.034*** (0.002)
Age squared	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Never Married	-0.124*** (0.003)	-0.064*** (0.003)	-0.075*** (0.002)	-0.034*** (0.006)	-0.028*** (0.005)	-0.036*** (0.005)	-0.052*** (0.005)	-0.049*** (0.005)	-0.064*** (0.004)	-0.149*** (0.004)	-0.065*** (0.004)	-0.071*** (0.003)
Social Security=1		0.358*** (0.004)	0.322*** (0.004)		0.370*** (0.005)	0.324*** (0.005)		0.445*** (0.009)	0.377*** (0.009)		0.420*** (0.015)	0.344*** (0.014)
Public employee=1		0.359*** (0.003)	0.378*** (0.004)		0.190*** (0.006)	0.169*** (0.008)		0.310*** (0.006)	0.303*** (0.008)		0.365*** (0.004)	0.389*** (0.005)
Firm size = 2, 11-49		0.144*** (0.002)	0.104*** (0.003)		0.120*** (0.004)	0.112*** (0.004)		0.083*** (0.004)	0.060*** (0.004)		0.215*** (0.004)	0.125*** (0.004)
Firm size = 3, >=50		0.183*** (0.002)	0.157*** (0.003)		0.100*** (0.004)	0.133*** (0.004)		0.112*** (0.004)	0.089*** (0.005)		0.292*** (0.004)	0.193*** (0.005)
Tenure years		0.019*** (0.000)	0.018*** (0.000)		-0.002** (0.001)	0.003*** (0.001)		0.021*** (0.001)	0.018*** (0.001)		0.022*** (0.001)	0.020*** (0.001)
Tenure squared		-0.034*** (0.001)	-0.032*** (0.001)		0.027*** (0.005)	0.008* (0.004)		-0.008*** (0.003)	-0.005 (0.003)		-0.066*** (0.002)	-0.056*** (0.002)
Part Time		0.313*** (0.005)	0.265*** (0.005)		0.196*** (0.009)	0.141*** (0.008)		0.314*** (0.014)	0.272*** (0.014)		0.423*** (0.006)	0.374*** (0.006)
Permanent Job		0.303*** (0.005)	0.358*** (0.005)		0.254*** (0.006)	0.279*** (0.007)		0.253*** (0.012)	0.252*** (0.012)		0.446*** (0.008)	0.464*** (0.009)
Constant	1.582*** (0.014)	1.448*** (0.014)	1.852*** (0.015)	1.855*** (0.020)	1.555*** (0.019)	1.843*** (0.020)	2.364*** (0.035)	1.874*** (0.034)	2.105*** (0.042)	1.657*** (0.031)	1.596*** (0.035)	1.823*** (0.069)
Industry (Nace)			yes		yes			yes		yes		yes
Region (NUTS2)			yes		yes			yes		yes		yes
Observations	337,676	337,676	337,676	124,124	124,124	124,124	68,387	68,387	68,387	145,165	145,165	145,165
R-squared	0.499	0.636	0.669	0.219	0.371	0.415	0.098	0.368	0.427	0.223	0.443	0.522

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, region, and year fixed effects. Sampling weights are used in all estimations. The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Source: TurkStat, HLFS 2012-22. Authors' calculations

Table 14. Effect of female over representation on wages - Men

	Total		Less than secondary				Secondary			Post-secondary		
	(1)	(2)	(3)	(5)	(6)	(7)	(9)	(10)	(11)	(13)	(14)	(15)
the FO index	-0.018*** (0.001)	-0.025*** (0.001)	-0.008*** (0.001)	-0.059*** (0.001)	-0.057*** (0.001)	-0.030*** (0.001)	-0.022*** (0.002)	-0.025*** (0.002)	-0.005*** (0.002)	0.122*** (0.003)	0.087*** (0.003)	0.052*** (0.003)
5-years of schooling	0.048*** (0.004)	-0.007** (0.004)	-0.007** (0.003)	0.068*** (0.004)	0.012*** (0.004)	0.006* (0.003)						
8-years of schooling	0.226*** (0.004)	0.083*** (0.004)	0.081*** (0.003)	0.191*** (0.004)	0.082*** (0.004)	0.077*** (0.003)						
General secondary	0.389*** (0.004)	0.193*** (0.004)	0.183*** (0.004)									
Vocational secondary	0.440*** (0.004)	0.225*** (0.004)	0.203*** (0.004)				0.048*** (0.002)	0.028*** (0.002)	0.011*** (0.002)			
Post-secondary	0.974*** (0.004)	0.619*** (0.004)	0.538*** (0.004)									
Age	0.061*** (0.000)	0.039*** (0.000)	0.036*** (0.000)	0.068*** (0.001)	0.047*** (0.001)	0.043*** (0.001)	0.043*** (0.001)	0.027*** (0.001)	0.025*** (0.001)	0.081*** (0.001)	0.042*** (0.002)	0.040*** (0.001)
Age squared	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Never Married	-0.097*** (0.002)	-0.064*** (0.002)	-0.077*** (0.002)	-0.028*** (0.003)	-0.025*** (0.002)	-0.038*** (0.002)	-0.070*** (0.003)	-0.046*** (0.003)	-0.061*** (0.003)	-0.172*** (0.004)	-0.102*** (0.004)	-0.113*** (0.003)
Social Security=1		0.228*** (0.002)	0.192*** (0.002)		0.216*** (0.002)	0.177*** (0.002)		0.264*** (0.005)	0.225*** (0.005)		0.370*** (0.011)	0.294*** (0.010)
Public employee=1		0.313*** (0.002)	0.339*** (0.003)		0.289*** (0.003)	0.365*** (0.006)		0.364*** (0.003)	0.353*** (0.005)		0.247*** (0.003)	0.298*** (0.005)
Firm size = 2, 11-49		0.131*** (0.001)	0.094*** (0.001)		0.111*** (0.002)	0.079*** (0.002)		0.108*** (0.003)	0.091*** (0.003)		0.236*** (0.004)	0.159*** (0.004)
Firm size = 3, >=50		0.218*** (0.001)	0.167*** (0.002)		0.169*** (0.002)	0.130*** (0.002)		0.194*** (0.003)	0.159*** (0.003)		0.373*** (0.004)	0.257*** (0.004)
Tenure years		0.011*** (0.000)	0.011*** (0.000)		0.002*** (0.000)	0.004*** (0.000)		0.015*** (0.000)	0.014*** (0.000)		0.016*** (0.001)	0.015*** (0.001)
Tenure squared		-0.007*** (0.001)	-0.009*** (0.001)		0.023*** (0.001)	0.017*** (0.001)		-0.003** (0.002)	-0.003* (0.001)		-0.045*** (0.002)	-0.040*** (0.002)
Part Time		0.277*** (0.005)	0.248*** (0.005)		0.146*** (0.008)	0.128*** (0.008)		0.376*** (0.014)	0.331*** (0.013)		0.421*** (0.009)	0.407*** (0.009)
Permanent Job		0.087*** (0.002)	0.108*** (0.003)		0.066*** (0.003)	0.081*** (0.003)		0.126*** (0.006)	0.114*** (0.006)		0.344*** (0.010)	0.300*** (0.010)
Constant	1.494*** (0.010)	1.665*** (0.009)	1.826*** (0.010)	1.398*** (0.012)	1.583*** (0.011)	1.717*** (0.012)	2.196*** (0.018)	2.023*** (0.017)	2.151*** (0.022)	1.989*** (0.028)	1.637*** (0.030)	1.909*** (0.036)
Industry (Nace)			yes			yes			yes			yes
Region (NUTS2)			yes			yes			yes			yes
Observations	812,375	812,375	812,375	382,424	382,424	382,424	210,945	210,945	210,945	219,006	219,006	219,006
R-squared	0.440	0.558	0.599	0.205	0.347	0.395	0.149	0.392	0.449	0.196	0.366	0.460

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, region, and year fixed effects. Sampling weights are used in all estimations. The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 Source: TurkStat, HLF5 2012-22. Authors' calculations

Table 15. Effect of female over-representation on wages - Private sector

	Total			Less than secondary			Secondary			Post-secondary		
	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Full Sample												
FO index	-0.100*** (0.001)	-0.057*** (0.001)	-0.030*** (0.001)	-0.114*** (0.001)	-0.068*** (0.001)	-0.038*** (0.001)	-0.049*** (0.002)	-0.024*** (0.002)	-0.014*** (0.002)	-0.092*** (0.004)	-0.058*** (0.004)	-0.070*** (0.004)
Observations	844,206	844,206	844,206	459,036	459,036	459,036	224,707	224,707	224,707	160,463	160,463	160,463
R-squared	0.340	0.425	0.489	0.225	0.328	0.375	0.140	0.277	0.354	0.179	0.302	0.434
Women												
FO index	-0.158*** (0.002)	-0.053*** (0.002)	-0.061*** (0.002)	-0.159*** (0.002)	-0.047*** (0.002)	-0.046*** (0.003)	-0.077*** (0.004)	-0.017*** (0.003)	-0.022*** (0.004)	-0.234*** (0.008)	-0.198*** (0.007)	-0.225*** (0.008)
Observations	237,423	237,423	237,423	115,758	115,758	115,758	57,659	57,659	57,659	64,006	64,006	64,006
R-squared	0.379	0.479	0.540	0.211	0.359	0.405	0.103	0.294	0.375	0.190	0.314	0.444
Men												
FO index	-0.058*** (0.001)	-0.044*** (0.001)	-0.021*** (0.001)	-0.075*** (0.001)	-0.065*** (0.001)	-0.038*** (0.001)	-0.037*** (0.002)	-0.022*** (0.002)	-0.010*** (0.002)	-0.025*** (0.005)	0.008* (0.005)	-0.013** (0.005)
Observations	606,783	606,783	606,783	343,278	343,278	343,278	167,048	167,048	167,048	96,457	96,457	96,457
R-squared	0.324	0.403	0.470	0.204	0.295	0.350	0.143	0.268	0.345	0.166	0.290	0.431

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure squared, part-time status, contract type, and industry, region, and year fixed effects. Sampling weights are used in all estimations. Detailed regression results are available upon request. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Source: TurkStat, HLFS 2012-22. Authors' calculations

Table 16. Effect of female over-representation on wages - Public sector

	Total			Less than secondary			Secondary			Post-secondary		
	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Full Sample												
FO index	0.030*** (0.002)	0.025*** (0.001)	0.018*** (0.001)	0.015*** (0.002)	-0.001 (0.002)	0.006*** (0.002)	-0.025*** (0.003)	-0.029*** (0.002)	0.001 (0.002)	0.136*** (0.002)	0.125*** (0.002)	0.095*** (0.002)
Observations	305,845	305,845	305,845	47,512	47,512	47,512	54,625	54,625	54,625	203,708	203,708	203,708
R-squared	0.401	0.511	0.526	0.355	0.536	0.564	0.129	0.358	0.388	0.110	0.259	0.290
Women												
FO index	0.012*** (0.004)	-0.004 (0.003)	-0.012*** (0.004)	-0.049*** (0.007)	-0.038*** (0.006)	-0.022*** (0.006)	-0.025*** (0.007)	-0.024*** (0.006)	-0.007 (0.006)	0.097*** (0.005)	0.058*** (0.004)	0.014** (0.006)
Observations	100,253	100,253	100,253	8,366	8,366	8,366	10,728	10,728	10,728	81,159	81,159	81,159
R-squared	0.442	0.563	0.583	0.586	0.660	0.677	0.177	0.435	0.459	0.098	0.319	0.356
Men												
FO index	0.053*** (0.002)	0.044*** (0.002)	0.036*** (0.002)	0.029*** (0.003)	0.003 (0.002)	0.012*** (0.002)	-0.029*** (0.003)	-0.033*** (0.003)	-0.001 (0.003)	0.148*** (0.002)	0.148*** (0.002)	0.114*** (0.003)
Observations	205,592	205,592	205,592	39,146	39,146	39,146	43,897	43,897	43,897	122,549	122,549	122,549
R-squared	0.393	0.492	0.506	0.227	0.461	0.496	0.083	0.310	0.350	0.116	0.216	0.251

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, region, and year fixed effects. Sampling weights are used in all estimations. Detailed regression results are available upon request. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 Source: TurkStat, HLFS 2012-22. Authors' calculations

Table 17. Effect of the FO index on wages across years- Full sample

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>All</i>											
FO index	-0.011*** (0.003)	-0.019*** (0.003)	-0.020*** (0.003)	-0.030*** (0.003)	-0.032*** (0.003)	-0.032*** (0.003)	-0.026*** (0.003)	-0.019*** (0.003)	-0.016*** (0.003)	-0.015*** (0.003)	-0.033*** (0.003)
Observations	95,467	97,645	95,700	97,257	95,962	96,988	98,623	94,744	114,513	127,499	135,653
R-squared	0.654	0.640	0.640	0.636	0.649	0.639	0.624	0.624	0.586	0.571	0.547
<i>Less than secondary</i>											
FO index	-0.028*** (0.003)	-0.038*** (0.004)	-0.036*** (0.004)	-0.044*** (0.004)	-0.044*** (0.004)	-0.040*** (0.003)	-0.037*** (0.004)	-0.039*** (0.004)	-0.035*** (0.004)	-0.031*** (0.004)	-0.041*** (0.004)
Observations	45,885	46,864	46,651	46,545	44,591	44,274	44,521	40,620	45,510	49,754	51,333
R-squared	0.404	0.377	0.387	0.388	0.431	0.409	0.408	0.429	0.355	0.400	0.409
<i>Secondary</i>											
FO index	0.004 (0.005)	-0.010** (0.005)	0.004 (0.005)	-0.006 (0.005)	-0.003 (0.005)	-0.008* (0.005)	-0.009* (0.005)	-0.013** (0.005)	-0.020*** (0.005)	-0.022*** (0.004)	-0.043*** (0.005)
Observations	23,457	23,691	22,718	22,826	22,422	22,956	23,441	22,423	27,642	31,890	35,866
R-squared	0.525	0.507	0.497	0.487	0.482	0.459	0.459	0.445	0.393	0.378	0.349
<i>Post-secondary</i>											
FO index	-0.010 (0.009)	0.026*** (0.009)	-0.036*** (0.009)	-0.018* (0.009)	-0.006 (0.008)	-0.012 (0.008)	-0.016* (0.009)	0.042*** (0.008)	0.040*** (0.008)	0.041*** (0.008)	0.009 (0.008)
Observations	26,125	27,090	26,331	27,886	28,949	29,758	30,661	31,701	41,361	45,855	48,454
R-squared	0.498	0.509	0.514	0.512	0.511	0.519	0.505	0.503	0.485	0.455	0.418

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, and region fixed effects. Sampling weights are used in all estimations. The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Source: TurkStat, HLFS 2012-22. Authors' calculations

Table 18. Effect of the FO index on wages across years- Men

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>All</i>											
FO index	-0.002 (0.003)	-0.002 (0.003)	-0.005 (0.003)	-0.011*** (0.003)	-0.010*** (0.003)	-0.013*** (0.003)	-0.013*** (0.003)	-0.005 (0.003)	0.000 (0.003)	-0.004 (0.003)	-0.017*** (0.003)
Observations	71,065	71,554	70,291	70,394	68,715	68,679	68,608	65,141	79,007	87,797	91,124
R-squared	0.640	0.623	0.622	0.615	0.631	0.619	0.603	0.603	0.556	0.545	0.508
<i>Less than secondary</i>											
FO index	-0.023*** (0.004)	-0.029*** (0.004)	-0.029*** (0.004)	-0.033*** (0.004)	-0.035*** (0.004)	-0.031*** (0.004)	-0.032*** (0.004)	-0.036*** (0.005)	-0.031*** (0.005)	-0.026*** (0.004)	-0.031*** (0.005)
Observations	36,819	36,798	36,460	35,772	33,900	33,382	32,931	29,664	33,360	36,680	36,658
R-squared	0.411	0.377	0.386	0.372	0.412	0.388	0.384	0.402	0.322	0.355	0.321
<i>Secondary</i>											
FO index	0.005 (0.005)	-0.002 (0.005)	0.003 (0.006)	-0.008 (0.006)	0.004 (0.005)	-0.004 (0.006)	-0.010* (0.005)	-0.009 (0.006)	-0.010* (0.005)	-0.021*** (0.005)	-0.036*** (0.005)
Observations	17,990	18,071	17,443	17,384	17,059	17,378	17,518	16,663	20,882	24,130	26,427
R-squared	0.525	0.506	0.497	0.482	0.490	0.456	0.460	0.450	0.397	0.375	0.342
<i>Post-secondary</i>											
FO index	0.035*** (0.010)	0.074*** (0.010)	0.020* (0.011)	0.037*** (0.011)	0.048*** (0.010)	0.032*** (0.010)	0.020** (0.010)	0.079*** (0.010)	0.083*** (0.009)	0.076*** (0.009)	0.055*** (0.009)
Observations	16,256	16,685	16,388	17,238	17,756	17,919	18,159	18,814	24,765	26,987	28,039
R-squared	0.500	0.503	0.505	0.492	0.496	0.500	0.485	0.482	0.454	0.436	0.391

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, and region fixed effects. Sampling weights are used in all estimations. The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Source: TurkStat, HLFS 2012-22. Authors' calculations

Table 19. Effect of the FO index on wages across years- Women

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>All</i>											
FO index	-0.045*** (0.005)	-0.066*** (0.006)	-0.063*** (0.007)	-0.075*** (0.006)	-0.081*** (0.006)	-0.084*** (0.006)	-0.053*** (0.006)	-0.058*** (0.007)	-0.070*** (0.007)	-0.051*** (0.006)	-0.082*** (0.007)
Observations	24,402	26,091	25,409	26,863	27,247	28,309	30,015	29,603	35,506	39,702	44,529
R-squared	0.701	0.693	0.694	0.696	0.699	0.697	0.680	0.675	0.653	0.629	0.617
<i>Less than secondary</i>											
FO index	-0.051*** (0.007)	-0.079*** (0.008)	-0.076*** (0.010)	-0.075*** (0.009)	-0.083*** (0.009)	-0.078*** (0.008)	-0.059*** (0.009)	-0.065*** (0.009)	-0.068*** (0.010)	-0.054*** (0.008)	-0.084*** (0.009)
Observations	9,066	10,066	10,191	10,773	10,691	10,892	11,590	10,956	12,150	13,074	14,675
R-squared	0.347	0.344	0.344	0.367	0.433	0.425	0.416	0.454	0.389	0.464	0.502
<i>Secondary</i>											
FO index	-0.011 (0.009)	-0.029*** (0.011)	0.017 (0.012)	0.002 (0.011)	-0.005 (0.010)	-0.012 (0.012)	0.009 (0.010)	-0.031** (0.014)	-0.063*** (0.015)	-0.027** (0.011)	-0.052*** (0.011)
Observations	5,467	5,620	5,275	5,442	5,363	5,578	5,923	5,760	6,760	7,760	9,439
R-squared	0.537	0.514	0.505	0.493	0.485	0.488	0.453	0.417	0.370	0.377	0.352
<i>Post-secondary</i>											
FO index	-0.199*** (0.020)	-0.148*** (0.019)	-0.187*** (0.019)	-0.199*** (0.020)	-0.183*** (0.019)	-0.151*** (0.017)	-0.127*** (0.018)	-0.081*** (0.017)	-0.109*** (0.017)	-0.057*** (0.017)	-0.101*** (0.016)
Observations	9,869	10,405	9,943	10,648	11,193	11,839	12,502	12,887	16,596	18,868	20,415
R-squared	0.525	0.543	0.559	0.569	0.563	0.573	0.552	0.551	0.551	0.494	0.465

*Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, and region fixed effects. Sampling weights are used in all estimations. The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Source: TurkStat, HLFS 2012-22. Authors' calculations*

Discrete measures of FO index

We have employed a continuous FO index to measure the wage penalty of being in a job where women are relatively over-represented. To allow for a non-linear relationship between the FO index and wage, we re-estimate equation 1 by replacing the continuous FO index with a series of dummies corresponding to the four quartiles of the FO index. Occupations where the relative representation of women is the lowest (i.e. the bottom quartile) is the reference category. The values for the FO index in different quartiles are given in Table 20. Note that the minimum and maximum values of the FO index by quartiles change across the education groups. For instance, moving from the lowest to the highest quartile for a woman with less than secondary education would mean moving from practically an all-male job to a job where significant numbers of women are found. A similar move would not be as drastic for a woman with above secondary education. It should also be mentioned that, to some extent, the construction of the discrete segregation measure is arbitrary. In the absence of natural cut-offs, we follow the literature and use quartiles of the FO index to create occupational groups with varying degrees of segregation.

The results of this estimation are presented in Table 21. For women with less than secondary education, the basic model suggests an 8.5% wage penalty for being in the 2nd quartile, 4.8% for being in the 3rd quartile, and a staggering 23.6% wage penalty for being in the 4th FO quartile than the bottom quartile, where there are practically no women. However, controlling for the job characteristics reduces the wage penalty for the 2nd quartile and the top quartile to 3.7% and 4.7%, respectively. For the 3rd quartile, the effect is no longer statistically significant and is practically zero, suggesting a non-linear FO effect. In the full-model, the statistically significant effects are further reduced to 2.5% and 4%, respectively. For secondary school educated women, a mild non-linear FO effect is observed in the basic model, where the wage penalty ranges between 7.7% to 8.9%. In the full-model, the wage penalty increases with the FO index, such that being in the top quartile is associated with a wage penalty of 7.4% but with a smaller wage penalty of 4.9% and 2.5% in the 3rd and 2nd quartiles, respectively. For the most educated group, a non-linear FO effect is observed in all specifications. In the full-model, while being in the 2nd and the top quartiles is associated with a 2.9% and 5.4% wage penalty, respectively, being in the 3rd quartile is associated with a 20.6% wage penalty.

Table 20. Segregation categories- cut points of the FO index

	4 quartiles of the FO index by education level				Total
	1	2	3	4	
<i>Less than secondary</i>					
Min	0.00	0.09	0.97	1.25	0.00
Max	0.09	0.97	1.25	4.71	4.71
Observations	126,637	126,637	126,637	126,637	506,548
<i>Secondary</i>					
Min	0.00	0.28	1.04	1.48	0.00
Max	0.28	1.04	1.48	3.60	3.60
Observations	69,833	69,833	69,833	69,833	279,332
<i>Post-secondary</i>					
Min	0.00	0.74	1.10	1.42	0.00
Max	0.74	1.10	1.42	2.31	2.31
Observations	91,042	91,043	91,043	91,043	364,171
<i>Total</i>					
Min	0.00	0.09	0.97	1.25	0.00
Max	0.74	1.10	1.48	4.71	4.71
Observations	287,512	287,513	287,513	287,513	1,150,051

Source: TurkStat, HLFS 2012-22. Authors' calculations.

Table 21. Effect of female over-representation on wages - Discrete case

	Less than secondary			Secondary			Post-secondary		
	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)	Basic	Basic+(Job)	Basic+(Job, Industry, Region)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Full sample									
Quartile 2	-0.041*** (0.002)	-0.058*** (0.002)	-0.042*** (0.002)	-0.010*** (0.003)	-0.020*** (0.002)	-0.000 (0.002)	-0.020*** (0.003)	0.047*** (0.003)	0.065*** (0.003)
Quartile 3	-0.062*** (0.002)	-0.064*** (0.002)	-0.027*** (0.002)	-0.051*** (0.003)	-0.031*** (0.002)	-0.014*** (0.003)	-0.087*** (0.003)	-0.106*** (0.003)	-0.120*** (0.003)
Quartile 4	-0.144*** (0.002)	-0.124*** (0.002)	-0.067*** (0.002)	-0.044*** (0.003)	-0.053*** (0.003)	-0.031*** (0.003)	0.236*** (0.003)	0.101*** (0.003)	0.065*** (0.003)
Constant	1.471*** (0.010)	1.601*** (0.009)	1.781*** (0.010)	2.303*** (0.015)	2.023*** (0.015)	2.174*** (0.019)	2.044*** (0.020)	1.635*** (0.023)	1.895*** (0.031)
Observations	506,548	506,548	506,548	279,332	279,332	279,332	364,171	364,171	364,171
R-squared	0.212	0.366	0.412	0.149	0.392	0.447	0.240	0.409	0.495
Women									
Quartile 2	-0.085*** (0.015)	-0.037** (0.014)	-0.025* (0.014)	-0.088*** (0.012)	-0.039*** (0.010)	-0.025** (0.011)	-0.115*** (0.007)	-0.065*** (0.007)	-0.029*** (0.006)
Quartile 3	-0.048*** (0.014)	0.002 (0.014)	0.019 (0.014)	-0.077*** (0.011)	-0.013 (0.010)	-0.049*** (0.011)	-0.160*** (0.006)	-0.209*** (0.006)	-0.206*** (0.006)
Quartile 4	-0.236*** (0.014)	-0.047*** (0.014)	-0.040*** (0.014)	-0.089*** (0.011)	-0.047*** (0.010)	-0.074*** (0.011)	0.134*** (0.006)	-0.048*** (0.006)	-0.054*** (0.006)
Constant	1.640*** (0.025)	1.439*** (0.024)	1.767*** (0.024)	2.401*** (0.036)	1.887*** (0.034)	2.144*** (0.042)	1.928*** (0.031)	1.601*** (0.035)	1.805*** (0.068)
Observations	124,124	124,124	124,124	68,387	68,387	68,387	145,165	145,165	145,165
R-squared	0.158	0.363	0.413	0.097	0.368	0.429	0.261	0.456	0.535
Men									
Quartile 2	-0.044*** (0.002)	-0.055*** (0.002)	-0.040*** (0.002)	-0.002 (0.003)	-0.013*** (0.003)	0.001 (0.003)	0.002 (0.004)	0.073*** (0.003)	0.088*** (0.003)
Quartile 3	-0.084*** (0.002)	-0.073*** (0.002)	-0.039*** (0.002)	-0.057*** (0.003)	-0.037*** (0.003)	-0.011*** (0.003)	-0.082*** (0.003)	-0.089*** (0.003)	-0.108*** (0.003)
Quartile 4	-0.086*** (0.003)	-0.114*** (0.002)	-0.070*** (0.003)	-0.042*** (0.003)	-0.051*** (0.003)	-0.023*** (0.003)	0.289*** (0.004)	0.176*** (0.004)	0.120*** (0.004)
Constant	1.389*** (0.012)	1.585*** (0.011)	1.733*** (0.012)	2.199*** (0.018)	2.023*** (0.017)	2.153*** (0.022)	2.096*** (0.027)	1.675*** (0.030)	1.929*** (0.036)
Observations	382,424	382,424	382,424	210,945	210,945	210,945	219,006	219,006	219,006
R-squared	0.203	0.347	0.396	0.151	0.393	0.449	0.222	0.380	0.475

Notes: Wage earners with non-zero wages are included only. The covariates used in the regressions include education, age, age squared, marital status, formal employment, public employment, firm size, tenure, tenure squared, part-time status, contract type, and industry, region, and year fixed effects. The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers and working in an occupation where the FO index is in the first quartile. Sampling weights are used in all estimations. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Source: TurkStat, HLF5 2012-22. Authors' calculations.

In the case of men with less than secondary education, an increasing wage penalty with the FO quartiles is observed in the full-model; in the top quartile, the wage penalty is 7% as compared to 4% in 2nd and 3rd quartiles. For men with secondary education, the wage penalty is highest at the top quartile but is limited to 2.3% in the full-model. For the most educated men, instead of a wage penalty, a wage premium is observed in the 2nd and 4th quartiles which is about 8.8%-12%. In the 3rd quartile, however, a wage penalty on the order of 10.8% is observed. This penalty, although significant, is substantially lower than that faced by women.