Higher Participation But Lower Pay?

Occupational Segregation and the Gender Wage Gap in Turkey

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Abstract

Womens labor force participation rate in Turkey hit its lowest value in the mid-2000s at 23% and has been rising since then. The latest statistics put the female labor force participation rate at 35.1% in 2022 (TurkStat, 2022). Using a synthetic cohort analysis, Tunalı et al. (2021) find empirical support for the U-shaped pattern of female labor force participation over the course of development 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, nearly half of employed women held a paid job, this figure increased to nearly 70% in 2022. Unlike many MENA countries, women are primarily employed in the private sector. Against these favorable developments, it is also the case that the gender wage gap grew over time. While prior to 2010, womens monthly wages were 96% of mens, the gap gradually opened up so that in 2021 it reduced to 91%. This is despite the fact that, on average, women wage earners are more educated than men.

In this paper, we examine occupational gender segregation and consider its impact on mens and womens wages. We use microdata from several rounds of the regularly conducted Household Labor Surveys of TurkStat, which provide information on wages and the occupation held by labor market participants based on a two-digit ISCO-08 occupational classification.

JEL classifications:
Keywords: Gender Discrimination, Segregation, Wage Distribution, Turkey

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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 in feminine jobs and men in masculine jobs. Burchell (2014) find 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. The effects of occupational gender segregation likely extend to other spheres of public and private life from educational investments to bargaining with the family.

Women in Turkey boast the lowest labor force participation rate in the OECD. In 2021, among 15-64-year-old women only 31.7% participated in the labor market as compared to 60.4% in the OECD and 63.4% in the EU-27. In the same year, mens labor force participation rate was 68.6% in Turkey. The current labor force participation of women, although still low, is significantly higher than what it was a decade ago. Womens labor force participation hit its lowest value in the mid-2000s at 23% and has been rising since then. Using a synthetic cohort analysis, Tunalı 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 2021 (TurkStat, 2021). Unlike many MENA countries that share similarly low labor force participation rates and where public employment among women is pervasive, Turkish women are primarily employed in the private sector.[1] At the same time, we observe a widening gender wage gap; while in 2012, womens monthly wages were 96% of mens wages, in just a decade it reduced to 89% in 2022. This is despite the fact that, on average, women wage earners are more educated than men.

In this paper, we examine occupational gender segregation and consider its impact on both

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[1]See appendix Figure 3

mens and womens wages. We use micro data from several rounds of the regularly conducted Household Labor Force Surveys (HLFS) of TurkStat covering the 2012-2022 period. The HLFS provide rich information on labor market outcomes of wage earners including their wages and occupation 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 move on to examining 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 the paid employment. Hence, we seek to understand what happens to mens and womens wages as the relative representation of women in a given occupation increases. In other words, we aim to explore whether occupations with a higher-than-average representation of females experience a corresponding decrease in wages due to segregation.

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 declining occupational gender segregation over time and in new contracts, but an increasing wage penalty for being in a relatively feminized occupation. So, while women appear to be making inroads to holding male jobs those remaining in female jobs are suffering higher wage penalties.

The study is organized as follows. Section 2 is a brief account of the relevant literature.

Section 3 is on the data and empirical methodology we employ. We present our main findings in Section 4 under two sub-headings; we first define the FO index as a continuous variable and estimate the wage penalty accordingly. Alternatively, we define the FO index as a discrete variable allowing for non-linear FO effect on wages. In Section 5, we take occupations as the unit of analysis and consider how changes in the FO index impact on occupational wages. Section 6 extends the analysis further by considering how the FO index changes in new contracts. Section 7 concludes.

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, the human capital theory would predict that lower human capital of women measured in terms of schooling, job tenure (Munasinghe et al., 2008), training ((Grönlund, 2012)) or experience precludes them from holding high-paying occupations. Another related factor is the lower expected work life of women or higher work-life interruptions due to caring duties that incentivize women to hold jobs that do not penalize temporary withdrawals from the labor market. Flexibility is an amenity that is traded for higher wages.Goldin (2014) argues that in certain occupations, such as law or high level management, where long hours and particular hours are demanded of workers, there is a high wage penalty for temporal flexibility.

On the demand side, labor market segmentation and discrimination may also explain gender crowding and lower wages for women. In the spirit of Bergmann's (1974) crowding model, if women are more likely to be pushed to the secondary sector (in the case of Turkey, this would be the informal sector) with lower capital intensity and labor productivity, their wages would be lower. Employers may discriminate against women as they may believe them not to be suited for certain jobs or that employing women workers is more expensive (due, for instance, to their higher expected turnover rates or more frequent absences from work, or protective regulations on women workers (Goldin, 1986)).

Feminist theory, on the other hand, emphasizes how the traditional division of labor in non-market activities, societal norms and perceptions about womens role in the society and the labor market, and the stereotyping of womens characteristics help explain their lower hu-

man capital investment, occupational segregation and lower wages. Treiman and Hartmann (1981) further argue that jobs that are typically done by women are undervalued and therefore pay lower wages.

Empirical evidence the bulk of which come from developed countries suggests that controlling for an array of individual characteristic as well as industry and occupation level variables, female-dominated occupations pay less (Blau and Kahn, 2003; Levanon et al., 2009; Macpherson and Hirsch, 1995; Sorensen, 1990). Many of these studies also find that men in female-dominated occupations receive lower wages than men 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 women. Most of the explanations offered above to explain why women receive lower wages in female dominated jobs are not likely to apply to men. Lower wages for men may arise if jobs are rationed so that some are pushed to 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) and Levanon et al. (2009).

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 2012 through 2022 rounds of the HLFS that 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. The former information is provided on a 2-digit ISCO classification detail (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 years. All wages are expressed in 2022 Liras. In the pool data, we have nearly 1.2 million observations. [2]

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[2]We omitted a small number of observations falling into occupation-education cells with fewer than 25 observations on average over 11 years (see Table 12).

We develop a simple female over-representation index by comparing womens 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 the wage earners, less than 1 if they are under-represented, and bigger 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 worker and the total number of workers in in occupation i.

We define female over-representation index in occupation i as

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

The overall female over-representation index weighted by the employment share 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 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, with secondary education, and 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. Note that crowding is falling, so this should not be explaining the dis-improvement in wages, increasing participation of low educated women. [3]

In Table 1, we present the female share and the FO index by education level. Women

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[3]See table 11

constitute 23.4% of the wage workers with the less than secondary schooling, 24.8% of those with secondary schooling and 40.3% of those with above-secondary schooling. These figures suggest that women wage workers are 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
Less than secondary		
Mean	0.75	1.80
Std. Dev.	0.68	1.03
Secondary		
Mean	0.82	1.53
Std. Dev.	0.66	0.67
Post-secondary		
Mean	0.87	1.20
Std. Dev.	0.45	0.34

The FO index falls with education for women (Table 1). The mean of 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 show variation by education, include health professionals, health associate professionals, teaching professionals, personal care workers, clerks, food preparation assistants. These findings are in line with the occupational segregation literature that find women to be concentrated in occupations that align with their supposed comparative advantage in work that involve 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 the secondary school graduates but not for the 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

Table 2: Average female segregation bu 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	0.50	0.15	0.44	0.04
12	Administrative and commercial managers	0.40	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	0.10	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	0.30	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	0.50	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	1.10	0.19	1.84	0.10	1.37	0.04
43	Numerical and material recording clerks	0.62	0.15	1.38	0.10	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	0.90	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	0.80	0.06	0.48	0.07
82	Assemblers	0.57	0.10	0.46	0.09	0.36	0.09
83	Drivers and mobile plant operators	0.01	0.00	0.01	0.01	0.02	0.01
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	0.20	1.01	0.28
95	Street and related sales and service workers	0.56	0.17				
96	Refuse workers and other elementary workers	0.20	0.05	0.15	0.06	0.18	0.06

an effort to identify whether simply being in a feminized occupation reduces ones wages.

Figure 1: Relative average occupational wage and FO index by education level
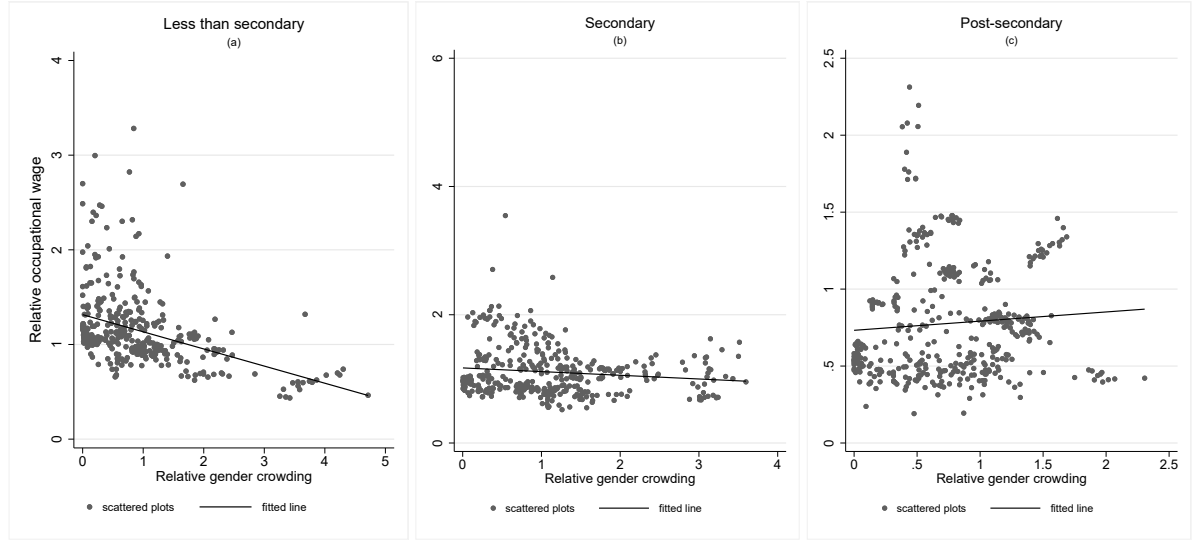
Source: TurkStat, HLFS 2012-21, Only positive wage earners are included in the sample. Sampling weights are used. Certain occupations are excluded due to a limited number of observations, specifically those with mean average observation less than 25. Real hourly wages are obtained by dividing monthly wage by the CPI (TurkStat).

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 human capital variables - education, age, marital status- and year effects. The second specification adds job characteristics to the human capital variables and the third specification, which is given below, includes as additional controls industry and region fixed effects.

$$lnw_{e,i,t} = \beta_0 + \beta_x \cdot X_{e,i,t} + \beta_c \cdot FO_{e,i,t} + DI + DR + DT \tag{1}$$

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 hourly wages. FO is as defined above. The coefficient of FO, β_c, shows how womens and mens wages change as the occupation becomes relatively more populated by women. The five sets of control variables denoted as X - include human capital variables as noted above, job characteristics, and industry (DI -87 categories) and re-

gion level (DR- 26 categories) controls. The vector of job characteristics include tenure (years with the same employer), formal employment (vs. informal employment), public employment (vs. private employment), firms 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 controls for the possibility that occupations in different industries command different wages. As noted above, all specifications include year fixed effects (DT-11 categories).

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.

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 the wage earners is nearly 37. Totally 85.2% have social security coverage due to their employment (i.e. are formally employed), 2226.6% 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% is in public employment and have 9.5 years of tenure. Their likelihood of working in a large firm, full time and with a permanent contract are 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 to do with 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 is employed formally. The gap mainly stems from distinctly lower formal employment among women with less than lower secondary educa-

tion, 60.2% of whom are employed formally as compared to 77.1% of men. With the exception of the most educated group, a larger fraction of men than women is employed in the public sector.

4 Impact of FO index on hourly wages

4.1 Continuous measure

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 on 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.

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 womens 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.

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	0.430	0.245	0.430	0.399	0.490
Real hourly wage	T	35.031	30.005	21.727	12.115	29.909	20.624	57.466	39.282
	F	35.410	31.096	18.236	10.397	26.267	22.213	54.403	35.668
	M	34.874	29.538	22.861	12.413	31.089	19.940	59.497	41.381
Female over-representation	T	1.000	0.775	1.000	0.955	1.000	0.743	1.000	0.453
	F	1.543	0.832	1.910	1.105	1.552	0.704	1.226	0.340
	M	0.797	0.632	0.735	0.688	0.822	0.663	0.880	0.466
No schooling	T	0.036	0.185	0.081	0.272	-	-	-	-
	F	0.057	0.233	0.156	0.363	-	-	-	-
	M	0.026	0.161	0.056	0.230	-	-	-	-
5-years of schooling	T	0.227	0.419	0.515	0.500	-	-	-	-
	F	0.200	0.400	0.543	0.498	-	-	-	-
	M	0.238	0.426	0.506	0.500	-	-	-	-
8-years of schooling	T	0.178	0.383	0.404	0.491	-	-	-	-
	F	0.110	0.314	0.301	0.459	-	-	-	-
	M	0.206	0.405	0.438	0.496	-	-	-	-
General secondary	T	0.115	0.319	0.000	0.000	0.474	0.499	-	-
	F	0.106	0.307	0.000	0.000	0.522	0.500	-	-
	M	0.119	0.324	0.000	0.000	0.458	0.498	-	-
Vocational secondary	T	0.128	0.334	0.000	0.000	0.526	0.499	-	-
	F	0.097	0.296	0.000	0.000	0.478	0.500	-	-
	M	0.141	0.348	0.000	0.000	0.542	0.498	-	-
Post-secondary	T	0.317	0.465	0.000	0.000	0.000	0.000	1.000	0.000
	F	0.430	0.495	0.000	0.000	0.000	0.000	1.000	0.000
	M	0.270	0.444	0.000	0.000	0.000	0.000	1.000	0.000
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	12.330	32.908	10.030	34.641	8.759
	M	37.138	11.131	37.825	12.151	35.470	10.276	37.545	9.819
Social Security	T	0.852	0.355	0.730	0.444	0.910	0.286	0.977	0.150
	F	0.823	0.381	0.602	0.489	0.892	0.311	0.980	0.139
	M	0.864	0.343	0.771	0.420	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	0.560	0.496
Tenure years	T	6.526	7.892	4.580	6.297	6.188	7.504	9.492	9.178
	F	5.806	7.180	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	10.190	9.514
Firmsize <=10	T	0.320	0.467	0.443	0.497	0.308	0.462	0.159	0.366
	F	0.326	0.469	0.500	0.500	0.368	0.482	0.158	0.364
	M	0.318	0.466	0.425	0.494	0.289	0.453	0.160	0.366
Firm size -11-49	T	0.285	0.451	0.262	0.440	0.268	0.443	0.329	0.470
	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	0.460
Firm size>=50	T	0.395	0.489	0.294	0.456	0.423	0.494	0.512	0.500
	F	0.375	0.484	0.269	0.443	0.357	0.479	0.475	0.499
	M	0.403	0.490	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	0.030	0.170
Permanent Job	T	0.906	0.292	0.840	0.366	0.937	0.242	0.973	0.162
	F	0.916	0.277	0.851	0.356	0.933	0.250	0.965	0.184
	M	0.902	0.298	0.837	0.369	0.939	0.240	0.978	0.146
Observations	T	1,150,051		506,548		279,332		364,171	
	F	337,676		124,124		68,387		145,165	
	M	812,375		382,424		210,945		219,006	

Source: TurkStat, HLFS 2012-22, Only positive wage earners are included in the sample. Sampling weights are used in the regressions. Real hourly wages are obtained by dividing monthly wage by the CPI (TurkStat). T, F, and M represent Total, Female, and Male, respectively. Industry (87 categories), region (26 categories), and year (11 categories) are not reported.

Table 4: All Wage Earners

	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***	-0.045***	-0.022***	-0.104***	-0.066***	-0.035***	-0.024***	-0.026***	-0.007***	0.122***	0.041***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(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
	Female Sample											
FO index	-0.115***	-0.057***	-0.062***	-0.157***	-0.061***	-0.059***	-0.028***	-0.015***	-0.010***	0.126***	-0.090***	-0.136***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(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
	Male Sample											
FO index	-0.018***	-0.025***	-0.008***	-0.059***	-0.057***	-0.030***	-0.022***	-0.025***	-0.005***	0.122***	0.087***	0.052***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(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

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Source: TurkStat, HLFS 2012-22, Only positive wage earners are included in the sample. Sampling weights are used in the regressions. Real hourly wages are obtained by dividing monthly wage by the CPI (TurkStat).

The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. We account for fixed effects considering industry (87 categories), region (26 categories), and year (11 categories).

When we turn to the wage-penalty by education groups, we find a relatively larger penalty for women with less than secondary education and for those with above secondary education as compared to women with just secondary education. Controlling for human capital variables alone, we find the wage penalty to be 15.7% for women with less than secondary education and 2.8% for women with secondary education. We find women with above secondary education to actually enjoy a wage premium on the order of 12.6%. The differential impact of the FO index by education is likely to be due 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.

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 than low education. Furthermore, the minimum wage 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)).

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 the role 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 the socially held values may be internalized. The same mechanisms will probably make it less likely for women to be hired in a masculine job. Considered 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 social attributes of a feminine job is compensated with 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 the highly educated women, whose labor force participation rate exceeds 70%, social values are less likely to be binding in 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 can 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 medical doctor - carry a high social status.

The bottom panel of Table 4 presents the results for men. As noted above, mens 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

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from the findings in the wider literature, where mens wage penalty in found to be higher than womens 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.

4.2   Discrete measure

So far, 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 5. Note that the minimum and the maximum values of the FO index by quartiles changes 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.

The results of this estimation are presented in Table 6. 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 the 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 quartile 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 5: Segregation categories- cut points of FO index

| | 4 quartiles of FO index by education level | | | | |
	1	2	3	4	Total
Less than secondary					
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
Secondary					
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
Post-secondary					
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
Total					
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

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 that 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 faced by women.

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 women 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) find womens (mens) earnings to fall by 15 to 23% (24%)

Table 6: All Wage Earners - 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***	-0.058***	-0.042***	-0.010***	-0.020***	-0.000	-0.020***	0.047***	0.065***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Quartile 3	-0.062***	-0.064***	-0.027***	-0.051***	-0.031***	-0.014***	-0.087***	-0.106***	-0.120***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Quartile 4	-0.144***	-0.124***	-0.067***	-0.044***	-0.053***	-0.031***	0.236***	0.101***	0.065***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Constant	1.471***	1.601***	1.781***	2.303***	2.023***	2.174***	2.044***	1.635***	1.895***
	(0.010)	(0.009)	(0.010)	(0.015)	(0.015)	(0.019)	(0.020)	(0.023)	(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
					Female Sample				
Quartile 2	-0.085***	-0.037**	-0.025*	-0.088***	-0.039***	-0.025**	-0.115***	-0.065***	-0.029***
	(0.015)	(0.014)	(0.014)	(0.012)	(0.010)	(0.011)	(0.007)	(0.007)	(0.006)
Quartile 3	-0.048***	0.002	0.019	-0.077***	-0.013	-0.049***	-0.160***	-0.209***	-0.206***
	(0.014)	(0.014)	(0.014)	(0.011)	(0.010)	(0.011)	(0.006)	(0.006)	(0.006)
Quartile 4	-0.236***	-0.047***	-0.040***	-0.089***	-0.047***	-0.074***	0.134***	-0.048***	-0.054***
	(0.014)	(0.014)	(0.014)	(0.011)	(0.010)	(0.011)	(0.006)	(0.006)	(0.006)
Constant	1.640***	1.439***	1.767***	2.401***	1.887***	2.144***	1.928***	1.601***	1.805***
	(0.025)	(0.024)	(0.024)	(0.036)	(0.034)	(0.042)	(0.031)	(0.035)	(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
					Male Sample				
Quartile 2	-0.044***	-0.055***	-0.040***	-0.002	-0.013***	0.001	0.002	0.073***	0.088***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Quartile 3	-0.084***	-0.073***	-0.039***	-0.057***	-0.037***	-0.011***	-0.082***	-0.089***	-0.108***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Quartile 4	-0.086***	-0.114***	-0.070***	-0.042***	-0.051***	-0.023***	0.289***	0.176***	0.120***
	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Constant	1.389***	1.585***	1.733***	2.199***	2.023***	2.153***	2.096***	1.675***	1.929***
	(0.012)	(0.011)	(0.012)	(0.018)	(0.017)	(0.022)	(0.027)	(0.030)	(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

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: TurkStat, HLFS 2012-22, Only positive wage earners are included in the sample. Sampling weights are used in the regressions. Real hourly wages are obtained by dividing monthly wage by the CPI (TurkStat).
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 FO index is in the first quartile. We account for fixed effects considering industry (87 categories), region (26 categories), and year (11 categories).

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) criticizes Filer (1989), who concludes that the gender composition of an occupation does not impact on womens 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 wage regression with controls for standard human capital and job characteristics, womens (mens) hourly wages are 27.5% (32.4%) lower in an all-female than an all-male job. When 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 find highly educated women to suffer from a significantly higher wage penalty (p. 227). They find, for instance that, women with 16 years of education suffer a 23% wage penalty as compared to 7.6% estimate for women with 13 to 15 years of education.

5   Change in FO index and relative hourly wages

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

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

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

Table 7 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 fixed effects increases this

penalty slightly to 9.7%. With full controls, the wage penalty increases further to 10.2%. 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 the least educated (Panel a of Figure 2). In Panel b and c, where wage changes for secondary school and above secondary school graduates are shown, a negative effect of an increase in FO can also be discerned.

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 an evidence for the devaluation of the occupation with the change in its gender composition.

Table 7: Change in relative wages and FO index

DV: log relative wage ratio (RWt/RWt-1)	(1)	(2)	(3)
Difference in gender segregation (FOt-FOt-1)	-0.094***	-0.097***	-0.102***
	(0.027)	(0.026)	(0.027)
Education level effects			yes
Occupation levels			yes
Year effects		yes	yes
Constant	0.002	0.004	0.000
	(0.003)	(0.008)	(0.045)
Observations	1,087	1,087	1,087
R-squared	0.024	0.030	0.051
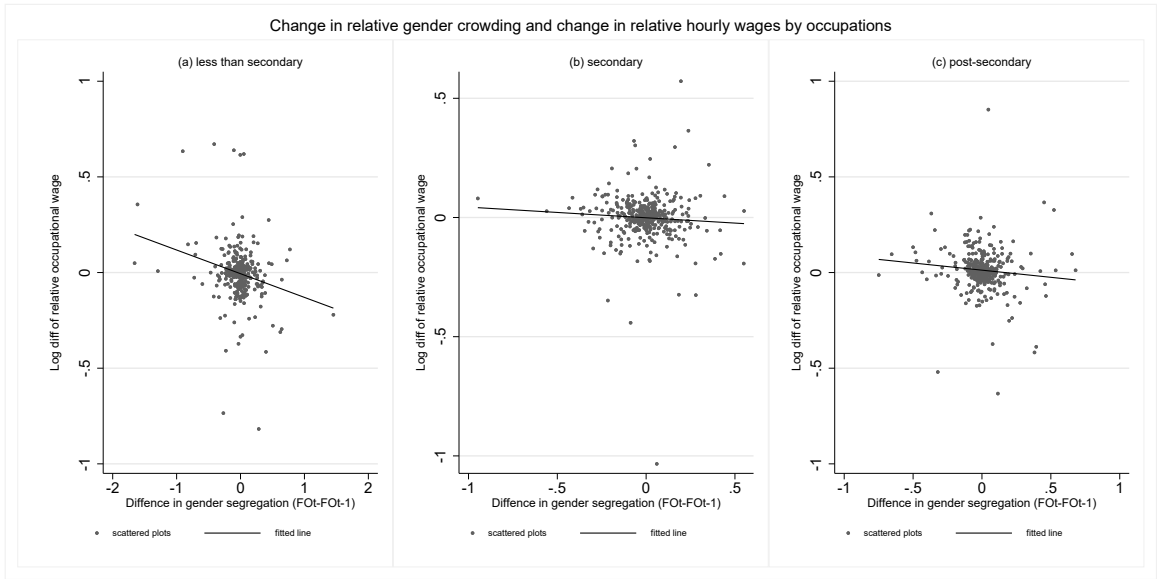
Change in relative gender crowding and change in relative hourly wages by occupations

Source: TurkStat, HLFS 2012-21, 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).

6 Changes in the FO index over time in 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 in the new contracts over time. For this purpose, 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 women wage earners we estimate the following regression:

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

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, working in a different job or were out-of-the labor market because they were students, home-makers,

incapacitated or retired. X denotes personal characteristics that include education and age. DR and DT are region and time fixed effects. 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 8 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, 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 8: 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.
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	

Before discussing the year effects, it is interesting to note that of the new hires, those who change 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 may help women access less female dominated higher wage jobs. An alternative and less positive interpretation is also possible:

unemployment push women into accepting more male dominated jobs though they also offer a higher wage (income effect). Looking at the coefficient estimates, it seems that the previous labor market status is less important in determining the 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 9). 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.

Going back to our concern about the rising gender wage inequality over time, that the overall 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, it is possible that the wage penalty could exhibit variations across different years. We may expect a diminishing effect over time with decreasing segregation. However, upon introducing an interaction term (FO*year) to equation 1 to capture this trend, we observe that the impact of FO becomes stronger across the years (Table 10). In other words, we see an increasing wage penalty which is likely to contribute to the increasing gender wage gap.

Table 9: Occupational preferences 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)
Last year labor market status												
Working in a job		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)
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 or training		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
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

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: TurkStat, HLFS 2012-19, Only positive wage earners are included in the sample. Sampling weights are used in the regressions.
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.

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	Full Sample				Women				Men			[b]
	All	LTS	S	PS	All	LTS	S	PS	All	LTS	S	PS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FO index	0.013***	-0.007***	-0.000	0.063***	-0.015***	-0.029***	0.027***	0.065***	0.021***	0.002	-0.004	0.061***
	(0.002)	(0.002)	(0.004)	(0.007)	(0.003)	(0.004)	(0.007)	(0.015)	(0.003)	(0.003)	(0.005)	(0.008)
year 2013	0.035***	0.040***	0.029***	0.030***	0.024***	0.031**	0.047***	-0.002	0.034***	0.041***	0.023***	0.036***
	(0.003)	(0.004)	(0.006)	(0.010)	(0.008)	(0.012)	(0.019)	(0.026)	(0.004)	(0.005)	(0.007)	(0.011)
year 2014	0.065***	0.075***	0.062***	0.050***	0.043***	0.076***	0.034*	0.039	0.067***	0.077***	0.064***	0.048***
	(0.003)	(0.004)	(0.006)	(0.010)	(0.009)	(0.012)	(0.019)	(0.027)	(0.004)	(0.005)	(0.007)	(0.011)
year 2015	0.096***	0.115***	0.095***	0.046***	0.077***	0.123***	0.070***	0.078***	0.095***	0.114***	0.095***	0.032***
	(0.003)	(0.004)	(0.006)	(0.010)	(0.009)	(0.012)	(0.018)	(0.027)	(0.004)	(0.005)	(0.007)	(0.011)
year 2016	0.198***	0.238***	0.201***	0.111***	0.212***	0.320***	0.261***	0.137***	0.192***	0.228***	0.193***	0.103***
	(0.003)	(0.004)	(0.006)	(0.009)	(0.008)	(0.012)	(0.018)	(0.025)	(0.004)	(0.005)	(0.006)	(0.010)
year 2017	0.187***	0.230***	0.194***	0.107***	0.181***	0.302***	0.245***	0.108***	0.185***	0.221***	0.183***	0.103***
	(0.003)	(0.004)	(0.006)	(0.009)	(0.008)	(0.012)	(0.018)	(0.024)	(0.004)	(0.005)	(0.007)	(0.010)
year 2018	0.168***	0.214***	0.188***	0.086***	0.149***	0.278***	0.199***	0.113***	0.168***	0.205***	0.180***	0.077***
	(0.003)	(0.004)	(0.006)	(0.009)	(0.008)	(0.012)	(0.018)	(0.024)	(0.004)	(0.005)	(0.007)	(0.010)
year 2019	0.198***	0.259***	0.215***	0.101***	0.201***	0.366***	0.301***	0.102***	0.194***	0.241***	0.200***	0.099***
	(0.003)	(0.004)	(0.006)	(0.009)	(0.008)	(0.012)	(0.020)	(0.024)	(0.004)	(0.005)	(0.007)	(0.010)
year 2020	0.206***	0.271***	0.248***	0.098***	0.189***	0.370***	0.351***	0.071***	0.208***	0.256***	0.230***	0.101***
	(0.003)	(0.004)	(0.006)	(0.009)	(0.009)	(0.013)	(0.021)	(0.024)	(0.004)	(0.005)	(0.007)	(0.010)
year 2021	0.212***	0.288***	0.261***	0.094***	0.177***	0.420***	0.334***	0.070***	0.217***	0.269***	0.249***	0.095***
	(0.003)	(0.004)	(0.006)	(0.009)	(0.008)	(0.012)	(0.024)	(0.024)	(0.004)	(0.005)	(0.007)	(0.010)
year 2022	0.206***	0.284***	0.245***	0.095***	0.220***	0.473***	0.364***	0.109***	0.200***	0.250***	0.229***	0.087***
	(0.003)	(0.004)	(0.006)	(0.010)	(0.008)	(0.012)	(0.019)	(0.024)	(0.004)	(0.005)	(0.007)	(0.010)
FO index*year 2013	-0.005**	-0.007**	-0.000	-0.009	-0.003	-0.006	-0.014	0.017	-0.002	-0.006	0.008	-0.015
	(0.003)	(0.003)	(0.005)	(0.008)	(0.005)	(0.005)	(0.011)	(0.020)	(0.004)	(0.005)	(0.006)	(0.010)
FO index*year 2014	-0.009***	-0.007**	-0.006	-0.014	-0.002	-0.013**	0.008	-0.006	-0.006*	-0.007	-0.004	-0.008
	(0.003)	(0.003)	(0.005)	(0.009)	(0.005)	(0.006)	(0.011)	(0.020)	(0.004)	(0.005)	(0.007)	(0.011)
FO index*year 2015	-0.017***	-0.018***	-0.009*	-0.008	-0.018***	-0.032***	-0.004	-0.037*	-0.007**	-0.012***	-0.002	0.011
	(0.003)	(0.003)	(0.005)	(0.009)	(0.005)	(0.006)	(0.010)	(0.020)	(0.004)	(0.005)	(0.006)	(0.011)
FO index*year 2016	-0.020***	-0.022***	-0.005	-0.011	-0.034***	-0.064***	-0.035***	-0.027	-0.010**	-0.012***	0.000	-0.006
	(0.003)	(0.003)	(0.005)	(0.008)	(0.005)	(0.006)	(0.010)	(0.019)	(0.004)	(0.005)	(0.006)	(0.010)
FO index*year 2017	-0.019***	-0.017***	-0.011**	-0.024***	-0.025***	-0.055***	-0.044***	-0.022	-0.009***	-0.005	0.003	-0.021**
	(0.003)	(0.003)	(0.005)	(0.008)	(0.005)	(0.005)	(0.011)	(0.018)	(0.004)	(0.004)	(0.006)	(0.010)
FO index*year 2018	-0.023***	-0.017***	-0.021***	-0.037***	-0.024***	-0.055***	-0.034***	-0.054***	-0.013***	-0.004	-0.008	-0.029***
	(0.003)	(0.003)	(0.005)	(0.008)	(0.005)	(0.005)	(0.011)	(0.019)	(0.004)	(0.005)	(0.006)	(0.010)
FO index*year 2019	-0.018***	-0.019***	-0.010**	-0.027***	-0.032***	-0.077***	-0.061***	-0.024	-0.008**	-0.000	0.004	-0.027***
	(0.003)	(0.003)	(0.005)	(0.008)	(0.005)	(0.006)	(0.012)	(0.019)	(0.004)	(0.005)	(0.007)	(0.010)
FO index*year 2020	-0.013***	-0.008***	-0.020***	-0.024***	-0.018***	-0.063***	-0.084***	-0.001	-0.008**	0.006	-0.002	-0.031***
	(0.003)	(0.003)	(0.005)	(0.008)	(0.005)	(0.006)	(0.013)	(0.018)	(0.004)	(0.005)	(0.006)	(0.010)
FO index*year 2021	-0.023***	-0.014***	-0.026***	-0.050***	-0.020***	-0.084***	-0.069***	-0.033*	-0.017***	0.006	-0.016**	-0.048***
	(0.003)	(0.003)	(0.005)	(0.008)	(0.005)	(0.006)	(0.011)	(0.018)	(0.004)	(0.005)	(0.006)	(0.010)
FO index*year 2022	-0.041***	-0.038***	-0.033***	-0.071***	-0.068***	-0.141***	-0.100***	-0.082***	-0.024***	0.005	-0.020***	-0.063***
	(0.003)	(0.003)	(0.005)	(0.008)	(0.005)	(0.006)	(0.011)	(0.019)	(0.004)	(0.005)	(0.007)	(0.010)
Constant	2.300***	1.853***	2.571***	2.430***	2.338***	1.992***	2.488***	2.251***	2.273***	1.798***	2.553***	2.515***
	(0.009)	(0.014)	(0.021)	(0.032)	(0.017)	(0.045)	(0.049)	(0.078)	(0.011)	(0.015)	(0.024)	(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

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: TurkStat, HLFS 2012-22, 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.

7 Discussion

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. By employing both linear and non-linear measures of the FO index, we find that our results remain unchanged, emphasizing the educational dimensions of segregation. We show that despite the FO index showing a tendency to decrease over time, the wage penalty has concurrently risen across the years.

Occupational segregation is a threat to the labor market integration of women. Just as womens participation has started to increase in Turkey, we argue that occupational segregation needs to be tackled for labor market efficiency and to integrate more women into the labor market. The empirical literature on the effect of employment subsidies given to women in Turkey suggests they can be effective in increasing the demand for female labor (Gizem et al., 2014); (Uysal, 2013). Targeted employment subsidies may serve to not only integrate more women into the labor market but tackle occupational segregation.

8 Appendix

Figure 3: Share of public sector by gender

Source: TurkStat, HLFS 2002-21, Sampling weights are used.

8.1 Female segregation and female share across years

Table 11: Summary statistics of FO index over the years

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Occupational FO index											
Less than secondary											
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
Secondary											
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
Post-secondary											
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
Occupational female share											
Less than secondary											
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
Secondary											
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
Post-secondary											
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

8.2 Restrictions on data

Table 12: Excluded occupations due to low number of observations

Code	Occupation (Isco 08)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
	Less than secondary												
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
	Secondary												
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
	Post-secondary												
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

8.3 Preferences for FO during school to work transition

Table 13: Occupational preferences of new entrants female workers - past work status education and training

	Total		Less than secondary		Secondary		Pos-secondary	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5-years of schooling	0.104	0.140	0.055	0.099				
	(0.287)	(0.269)	(0.300)	(0.269)				
8-years of schooling	0.186	0.248	0.146	0.207				
	(0.232)	(0.211)	(0.249)	(0.215)				
General secondary	-0.195	-0.119						
	(0.235)	(0.214)						
Vocational secondary	-0.089	-0.008			0.107***	0.124***		
	(0.234)	(0.213)			(0.029)	(0.029)		
Post-secondary	-0.706***	-0.630***						
	(0.237)	(0.216)						
Age	0.179***	0.176***	0.289***	0.290***	0.199***	0.186***	0.042***	0.036**
	(0.023)	(0.023)	(0.066)	(0.065)	(0.042)	(0.043)	(0.015)	(0.015)
Age squared	-0.003***	-0.003***	-0.005***	-0.005***	-0.004***	-0.003***	-0.001**	-0.001**
	(0.000)	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)	(0.000)	(0.000)
Year 2013	0.037	0.039	0.092	0.104	-0.009	-0.004	0.016	0.007
	(0.033)	(0.033)	(0.083)	(0.083)	(0.061)	(0.061)	(0.025)	(0.025)
Year 2014	0.041	0.035	0.165**	0.129	-0.052	-0.057	-0.002	-0.002
	(0.033)	(0.033)	(0.083)	(0.081)	(0.060)	(0.059)	(0.026)	(0.026)
Year 2015	0.079**	0.068**	0.232***	0.209***	-0.032	-0.036	0.031	0.022
	(0.032)	(0.032)	(0.078)	(0.078)	(0.059)	(0.058)	(0.024)	(0.024)
Year 2016	0.160***	0.149***	0.399***	0.369***	0.002	0.003	0.061**	0.055**
	(0.033)	(0.032)	(0.078)	(0.077)	(0.061)	(0.059)	(0.024)	(0.024)
Year 2017	0.100***	0.093***	0.315***	0.272***	-0.053	-0.048	0.025	0.021
	(0.032)	(0.032)	(0.080)	(0.078)	(0.056)	(0.055)	(0.025)	(0.025)
Year 2018	0.108***	0.111***	0.269***	0.249***	0.038	0.053	0.010	0.006
	(0.033)	(0.032)	(0.079)	(0.077)	(0.058)	(0.056)	(0.025)	(0.025)
Year 2019	0.054*	0.039	0.236***	0.188**	-0.108**	-0.106**	0.012	0.008
	(0.032)	(0.031)	(0.076)	(0.074)	(0.053)	(0.052)	(0.025)	(0.024)
Constant	-0.596*	-0.631*	-1.991***	-2.110***	-0.872*	-0.688	0.573***	0.639***
	(0.340)	(0.326)	(0.697)	(0.683)	(0.481)	(0.490)	(0.198)	(0.202)
Regional fixed effcets	no	yes	no	yes	no	yes	no	yes
Observations	10,766	10,766	3,925	3,925	2,916	2,916	3,925	3,925
R-squared	0.120	0.136	0.024	0.063	0.022	0.059	0.007	0.042

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Source: TurkStat, HLFS 2012-19, Only positive wage earners are included in the sample. Sampling weights are used in the regressions. 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.

8.4 Regression tables in detail

Table 14: All

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

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: TurkStat, HLFS 2012-22, Only positive wage earners are included in the sample. Sampling weights are used in the regressions. Real hourly wages are obtained by dividing monthly wage by the CPI (TurkStat).
The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. We account for fixed effects considering industry (87 categories), region (26 categories), and year (11 categories).

Table 15: Women

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

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: TurkStat, HLFS 2012-22, Only positive wage earners are included in the sample. Sampling weights are used in the regressions. Real hourly wages are obtained by dividing monthly wage by the CPI (TurkStat).
The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. We account for fixed effects considering industry (87 categories), region (26 categories), and year (11 categories).

Table 16: Men

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

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
 Source: TurkStat, HLFS 2012-22, Only positive wage earners are included in the sample. Sampling weights are used in the regressions. Real hourly wages are obtained by dividing monthly wage by the CPI (TurkStat).
 The excluded categories include individuals with no schooling for education level and working in a firm with less than 10 workers. We account for fixed effects considering industry (87 categories), region (26 categories), and year (11 categories).

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