

# Running Ahead or Running in Place? Educational Expansion and Gender Inequality in the Labor Market

Haya Stier<sup>1</sup>  · Efrat Herzberg-Druker<sup>2</sup>

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**Abstract** This study focuses on gender inequality in access to professional and managerial jobs and in pay among highly educated workers in Israel. Like many other Western countries, Israel has experienced a dramatic rise in higher education since the early 1990s, and more so for women than for men. In light of this change, the study asks whether women’s opportunities in the labor market have improved or rather deteriorated in access to professional and managerial jobs and in pay. The findings show that, in general, women with academic education improved their market position vis-à-vis men. They have entered formerly male-dominated jobs and managed to reduce some of the gaps in access to the better-paying professions. There is also a general decline in the gender pay gap. However, women still lag behind men, especially in the highly-paid “classic” professions. Inequality is lowest in non-professional jobs, where more women than men are employed and for which the workers are overeducated.

**Keywords** Gender inequality · Occupations · Professions · Wages · Educational expansion · Employment

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✉ Haya Stier  
haya1@post.tau.ac.il

Efrat Herzberg-Druker  
efratherzberg@gmail.com

<sup>1</sup> Department of Labor Studies, Department of Sociology, Tel Aviv University Ramat Aviv, 69978 Tel Aviv, Israel

<sup>2</sup> Department of Labor Studies, Tel Aviv University, Tel Aviv, Israel

## 1 Introduction

The expansion of higher education, evident in most industrial countries, has pointed attention to its possible consequences for social and economic inequality. Education affects individuals' life chances and wellbeing (Hout 2012) and is closely related to labor market achievements. As such, education is often seen as a vehicle for reducing group inequality (Brand and Xie 2010). The rise in education, which is especially pronounced among women (Diprete and Buchman 2013; England 2010), transformed the composition of the labor force in meaningful ways. First, the skill composition of the labor force changed, with the influx of highly skilled workers. Second, because education is closely related to women's economic behavior, the gender composition of the labor force changed as well. Finally, the entrance of women to new fields of study (England 2010) further affected the composition of highly-skilled occupations.

In this study we ask whether, in a context of expanded higher education, gender inequalities in labor market outcomes decline. Highly educated women, who have high investments in human capital, tend to postpone entry to family life, have fewer children and are more committed to market work. In a context where men's and women's educational attainment converges and work patterns become more similar, gender inequality is expected to decline (Cha and Weeden 2014). The expansion of higher education, therefore, is expected to contribute to increasing gender equality in the labor market. Indeed, there are indications that the gender gaps in wage and position narrowed over time (England 2010; O'Reilly et al. 2015). Yet, education for itself, can not account for the entire gender gap as there are still important gender differences in types of jobs, positions and rewards (O'Reilly et al. 2015). Moreover, with the expansion of higher education, the supply of highly skilled workers might surpass the demand. In the competition over prestigious positions, women may still find themselves in a disadvantaged position relative to men.

The current study aims, therefore, to track changes in gender inequality among the highly educated, and asks whether in a context of expanding tertiary education women have improved their standing in the labor market. We focus on the highly educated, the group that is most likely to benefit in the labor market, because a decline in gender inequality could reflect changes in composition rather than real gains in women's access to highly paid jobs, as more highly educated women join the labor force. The study analyses gender differences in occupation and wages in the Israeli (highly educated) workforce, during two points of time—the early 1980s (1983) and three decades later (2008). Israel provides a suitable case for examining the consequences of expanding higher education on gender gaps. Higher education rose considerably since the early 1990s for men and more so for women (Shavit and Bronstein 2011). Women increased their participation in formerly male-dominated fields of study (Israel 2012) and women with academic education increased their involvement in paid employment in terms of working hours (Stier and Herzberg 2013). The expansion of higher education took place in a period characterized by growing opportunities for highly skilled workers. There are some indications that gender inequalities in the labor market have declined, but the gender gap is still high (Mandel and Bierger 2015). This context allows us to examine several theoretical assertions regarding gender differences in pay and position and to provide some understanding to the role of educational expansion in reducing (or rather preserving) group inequality.

## 2 Education and Gender Inequalities in the Labor Market

As noted above, women have improved their educational achievements, and in many countries their rate of high school and college graduation now surpasses that of men's (Diprete and Buchman 2013; England 2010; Bobbitt-Zeher 2007). Women not only increased their participation in universities and colleges, but also increased their presence in formerly male-dominated professions (such as medicine and law) and in the sciences (Diprete and Buchman 2013). The literature on gender and higher education has documented a substantial decline in gender segregation in fields of study, which might have led to a greater similarity in occupations, although men did not enter female-dominated fields, either in school or in the labor market (England 2010). The education of women is closely related to their labor force participation and patterns of employment, as the economic activity of women is much more pronounced among the highly educated. Education, in general, is associated with better opportunities in the labor market and higher wages (Hout 2012), and as the demand for educated workers increased, more individuals entered higher education to prepare themselves for the changing occupational opportunities (Walters 1986). Therefore, the increase in women's education is expected to improve their economic position. Higher education is also associated with lower level of occupational sex segregation as highly educated women enter professional and managerial jobs (Cotter et al. 2004).

However, the effect of educational expansion on gender inequality is complex, and depends on the interplay between demand for and supply of highly educated workers. First, education has expanded for both men and women, so it is not clear whether women indeed have improved their position relative to men, and whether they have managed to translate their educational attainments to real gains in the labor market. This question relates to gender inequality in the returns to education, as well as to structural constraints (mainly, women's familial role), individual preferences and discriminatory mechanisms that operate in the labor market. Second, the labor market has changed, new jobs were created and skill demands were updated, either because of technological changes or as a response to a surplus of highly skilled workers. As Figueiredo et al. (2015) argue, many highly educated workers, females more than males, are employed in jobs for which they are over-educated. In such a case the gender gap in pay is not expected to narrow.

Gender inequality in the labor market is usually analyzed through the lenses of several theoretical perspectives. One set of explanations focuses on the supply side, arguing that differences in investments in human capital and occupational choices explain disparities in market gains (Polachek 1981). It had been argued that women are less likely to develop high commitment and career aspirations. They invest fewer hours in market work and enter less demanding positions, which while allowing them to combine work and family, consequently translates into lower wages and limited opportunities for promotion (Glass 1990). More recently, scholars adopting a "gender essentialism" perspective (e.g., England 2010, 2011) have claimed that women prefer specific types of occupations (e.g., occupations that involve care for others) and this, in turn, affects their wages, as these occupations have lower value in the labor market and pay lower wages.

While these arguments pertain to all women, it is not entirely clear whether they are still valid for those who made a decision to acquire higher education and, specifically, for those who enter the formerly male-dominated fields of study. On the one hand, these investments are expected to decrease the significance of gender in the labor market, as employers have a pool of highly skilled, probably highly productive workers to choose from. Educational

credentials serve as a signal of ability, talent and productivity (Kalleberg 2007; Solga 2002) and therefore raise the price of discrimination. On the other hand, the rise in education may have created a surplus of skilled (male and female) workers (Verhaest and Van der Valden 2013). The result is an enhanced competition over good jobs and lucrative positions, in which women might still be at a disadvantage.

In a recent study of gender inequality among Italian graduates, Castagnetti and Rosti (2013) employed the “tournament theory” (Lazear and Rosen 1981) to suggest conditions which reduce discrimination against women. This theory claims that employers assign and reward workers based on their talent and capabilities. In a competitive market, higher investments in human capital and higher abilities ensure workers better positions in the labor market because they are expected to have higher productivity and thus are preferred by employers (Lazear 1998; Rosen 1982). However, employers’ choices are affected not only by measures of talent and skills, but also by gender stereotypes that enter the evaluation process. Employers favor men over women as employees because they believe that women are less productive. In such case, women are pushed into positions for which they are overqualified, and the gender gap in position and wages persists or even increases. Castagnetti and Rosti (2013) specify the conditions under which gender stereotypes are less likely to dominate employers’ choices. They argue that women’s disadvantage declines in positions or occupations that demand clear judgment or specific skills and where there are good criteria for measuring productivity. In positions with a more ambiguous assessment of individual productivity (e.g., clerical jobs), employers usually invoke gender stereotypes and, hence, discriminate against women (Heilman 2001). Women gain equal access to jobs and positions when discrimination becomes too expensive.

From a somewhat different perspective, the “gender queue” theory (Reskin and Roos 1990) claims that employers have preferences for certain types of workers—they rank workers according to their abilities and skills, but also according to preferred characteristics (for example, white males). Workers also have a set of preferences for specific jobs (e.g., with high earnings), so that the workers ranked higher on employers’ preference lists get the most attractive jobs, and those at the bottom are forced to take low-quality jobs (Thurow 1972). Adding the gender dimension, Reskin and Roos (1990) argue that employers prefer men over women, so men get the good jobs while women are left with the jobs that pay less and offer fewer opportunities for promotion. Here, again, this discriminatory process varies across occupations and positions. For example, when the supply falls short of the demand, as is the case in growing occupations, women will be hired for the better jobs. Also, in occupations that are new and expanding, those that are still perceived as gender-neutral, or occupations for which women’s specific skills are highly evaluated, women may be seen as attractive as men.

Both theories agree that even after increasing their education women are still at a disadvantage compared to men in access to professional and managerial jobs. This contention is generally supported in research (Figueiredo et al. 2015; Castagnetti and Rosti 2013; Schultze 2015). However, the two theories differ in their expectations regarding the gender gap in access to specific types of professional occupations. The “tournament theory” would argue that the gender gap will be lower in access to professions that are formally certified (e.g., medicine, law, engineering) than in managerial or other professional (and non-professional) jobs. This is because the requirement for certification provides direct and clear measures of talent and the competition is based less on stereotypes than on credentials. The opposite is argued by the queuing theory, which expects the gender gap to be highest in the classic professions (similar to the expectation regarding managerial jobs) as these are the best positions in the labor market. Because men still enjoy

an advantage in the “queue” for good jobs, they will have better access to these occupations and will get the best-paid positions. Therefore, the gender gap will be the highest in these more desirable jobs and the lowest in the least attractive non-professional occupations.

Regarding earnings, again, the two theories share some similarities, but there are also important differences between them. The two theories expect that women will earn less in managerial jobs. The tournament theory argues that in managerial positions productivity is less specified, hence it is easier to apply gender stereotypes and discriminate against women. The queuing theory would argue similarly that women will not get access to the best-paying jobs, as these are more likely to be occupied by male workers, and that in these occupations women will be concentrated in sub-areas (such as human resource management) that are less rewarding compared to other areas (Roos and Manley 1996). Regarding the certified professions and non-professional jobs, however, the two theories lead to opposing predictions. The tournament theory expects a lower (unexplained) gender gap in the certified professions, where certification and productivity are more clearly defined and a larger gender gap in other professions, managerial and non-professional jobs. The “queuing theory” predicts, in contrast, a harsher competition in the most lucrative positions, which will lead to a higher gender gap in pay in the managerial and classical professions and lower in the less attractive non-professional jobs.

While the theories of competition and queuing in the labor market explain the existing gender gaps in access to good positions and high wages, it is still an open question whether gender inequalities are expected to decline, increase or persist in the context of expansion in higher education. The logic of the tournament theory implies that an increased supply of highly educated and officially certified women will reduce gender stereotypes and raise the price of discrimination. Gender inequalities might therefore decline over time. In contrast, the queuing theory would argue that in the context of massive entrance of women to lucrative fields, the supply of highly qualified women to the labor market might enhance the competition over good positions, especially because men also have increased their education. Even if the professional and managerial occupations expand, the competition is still expected to favor men. However, it is also plausible to expect the opposite, mainly because even though employers may still prefer to hire and promote men, quantity matters as well, and it will become too risky and costly to ignore women from among the pool of talents and skills.

## 2.1 The Israeli Context

To examine gender inequalities and how they have changed in a context of expanding educational attainment, we study the occupations and wages of Israeli men and women who acquired higher education. We compare gender inequalities at two points in time—the early 1980s and late 2000s. Israel provides an appropriate and interesting case study in this respect. During this period, education increased in Israel, with a particularly steep rise in the percentage of college graduates since the early 1990s (Addi-Raccah and Mcdossi 2009; Shavit and Bronstein 2011; Shwed and Shavit 2006). According to official data (Israel 2012), women increased their participation in medicine and legal studies (from amount 44 % in 1990 to 53 % in 2008) and their share is also growing in engineering, where they are still a minority (from 16 to 28 %). This general trend notwithstanding, there is ethnic and national variation in men’s and women’s graduation rates, as several studies have shown (e.g., Cohen et al. 2007; Dahan et al. 2002), with higher rates of college graduation among men and women from the more advantaged Ashkenazi group and a recent rise

(although still in low numbers) in the level of academic education among Israeli-Palestinians (Israel 2012).

At the same time, the structure of the industrial sector changed, with a transition to knowledge-based industries, alongside a growth in the social service and white-collar sectors. These changes increased the demand for highly skilled workers, in particular women whose wages increased as well (Stier 2006; Kimhi 2011). In accordance with rising education and increasing demand for female labor, the labor force participation of women increased as well. Currently, 54 % of all Israeli women aged 15 and above participate in the labor force, compared to 29 % at the beginning of the 1970s (Israel 2012). Jewish women exhibit an even higher participation rate (58 %). While men's participation rates are still higher, the gender difference among Jews of prime working age (25 to 54) is miniscule: 83 % of all women and 84 % of all men take part in the labor force (Israel 2012).

These processes, which characterize most industrialized countries, were accompanied by legislation and institutional arrangements, in particular aimed at increasing gender equity and improving the employability of mothers. Changes have occurred also in the family sphere, with age at first marriage and, in particular, age at entering parenthood rising (currently the age at first birth is 27.2, 28.1 among Jews), although the fertility level in Israel is relatively high and has remained stable over time (around 3 children) (Okun 2013). In most Israeli families, both partners participate in the labor force and the rate of dual-earner families has increased accordingly (Stier 2010). Nevertheless, women's employment patterns are still influenced by family constraints, particularly the presence of children, and gender inequality in the labor market is pervasive. As Haberfeld and Cohen (2007) found, wage differentials between major demographic groups (gender and ethnic) did not narrow much from the early 1980s to early 2000s. While gender inequality in the labor market has declined somewhat in recent years it is still high and reflects the unequal division of labor and women's limited involvement in paid employment (Israel 2012; Mandel and Bierger 2015).

In light of the growing demand for highly educated workers, the current study focuses on this particular segment of workers. While this group enjoys some advantages in the labor market, as they possess the necessary skills and are seen as most attractive to employers, it is also the case that the supply of workers exceeds the demand. How this affects gender inequality is not entirely clear. Hence, the characteristics of the Israeli labor market and the trends in education make this context suitable for examining the effect of growing competition on gender inequality.

### 3 Data and Methods

The study is based on data obtained from two Israeli censuses that were conducted in 1983 and 2008. These data files, which provide large representative samples of the Israeli population, allow us to focus attention on the highly educated, their occupations and other work characteristics. We limited the samples to include Jewish men and women with full academic education in the age range 25–64 who participated in the labor force at the time of the census. We focus on Jews, as the rate of academic education among the Arab population of Israel and the rate of Arab women's labor force participation were both very low in 1983, and although they have increased since, they still differ considerably from the Jewish workforce. Academic education is defined by the highest diploma obtained (BA or higher).

Our main empirical interest is in the type of occupations men and women with academic education manage to secure and in their wages. To measure occupation we first make a distinction between professional and managerial occupations and other occupations, including the semi-professional, clerical, sale and services and blue-collar occupations. Within the professional occupations, we make a further distinction, based on 2-digit occupational categories, between four types of occupations: the classical professions (including: law, medicine, engineering and university professors); managers; and other professional occupations (which include occupations such as psychologists, economists, biologists, chemists). In addition, we use a separate category for high-school teachers (an occupation that would otherwise be categorized as “other professionals”) because it is an occupation highly populated by women.<sup>1</sup> We use multinomial logistic regression to analyze the likelihood of entering a specific professional or managerial occupation. Our main independent variable is gender, and our models include also the level of education (1 = MA+, 0 = BA); age (in four categories: 25–34 (the reference group), 35–44, 45–54 and 55–64); family status (1 = married, 0 = otherwise); ethnicity (Israeli-born, European origin, and Asian-African origin as the reference group<sup>2</sup>), and weekly working hours. To analyze earnings, we employ OLS regressions. Wages are self-reported monthly gross earnings. We used the same variables mentioned above in the earnings model, adding also the type of occupation (non-professional occupation as the reference group), age and squared age as a proxy for experience in the labor market.

## 4 Findings

We start the analysis by describing the main employment characteristics of men and women with academic education in 1983 and 2008. We first describe the change in the level of education between the two time periods. Table 1 indicates not only a rise in the general level of education, but also that women acquired higher education significantly more than men did during this period. In 1983 only 15.7 % of Jewish men and 11.7 % of Jewish women in Israel had academic education. By 2008 the rate for men had increased to 30.7 % and for women to 37.1. Furthermore, the figures show that about 42 % of men who acquired higher education had an advanced degree in 1983 compared to 35 % of women. By 2008, the proportion of men with an advanced degree declined somewhat, probably due to the influx of students to universities and colleges acquiring mainly the necessary academic degrees. Women’s level of education increased, so the gap between the genders declined over time. As might be expected, in both time periods the labor force participation of both men and women is high—92 % of men were in the labor force, and the labor force participation of women with academic education grew from 86 to almost 89 %. These figures mean that the supply of highly educated workers grew substantially over time.

An examination of the occupational distribution of these workers reveals, however, that this is not the case for the demand for workers: in 1983, 54 % of men with academic education worked in professional occupations—occupations that match their level of education, as all of them demand academic education. By 2008 their rate declined by 9

<sup>1</sup> All professional occupations including high school teachers require a BA, but except for Physicians and university professors, there is no requirement for an advanced degree.

<sup>2</sup> While there are important ethnic differences in education and wages, the census data does not allow us to determine the ethnicity of Israeli-born Jews whose parents were also born in Israel. About 40 % of the Israeli-born (more than half of the younger group aged 24–34) did not have information on ethnicity.

**Table 1** Descriptive characteristics of the highly educated in Israel, 1983 and 2008

	1983		2008	
	Men	Women	Men	Women
% with academic education	15.7	11.7	30.7	37.1
% in labor force	92.3	86.0	92.2	88.5
Occupation				
Professional	54.1	44.6	45.4	36.2
Classic	34.6	15.0	27.5	15.0
Other	15.0	15.7	14.5	12.8
High school teachers	4.5	13.9	3.4	8.4
Managerial	15.3	4.2	14.9	6.8
Semi-professional	14.0	32.7	13.5	27.4
Clerical	6.8	12.6	6.2	14.9
Service and sales	4.4	4.1	11.0	11.1
Skilled and semi-skilled	5.4	1.9	8.9	3.5
Weekly hours of work				
1–20	4.7	22.0	3.8	11.8
21–35	6.4	30.7	5.8	26.0
36–42	13.9	23.0	15.3	26.4
43+	75.1	24.3	75.1	35.8
Age				
25–34	37.3	47.5	27.2	32.6
35–44	32.3	30.2	28.1	26.9
45–54	18.8	13.6	22.9	22.4
55–64	11.6	8.7	21.7	17.8
% with MA	42.1	32.8	38.8	35.8
N				

percentage points. 15.3 % of men with academic education worked in managerial jobs in 1983 compared to 14.5 % in 2008. The proportion of workers in the semi-professional jobs was stable over time. These figures mean that the supply exceeded the demand and many men with academic education experienced a mismatch between their level of education and the occupations open to them—the rate of men with higher education working in the services grew from 4.4 to 11 %, and a more moderate growth is observed also in manufacturing jobs (from 5.4 to almost 9 %).

The figures for women are not so different—about 45 % of them worked in professional jobs in 1983 and this rate declined to 36 % in 2008. Women increased their share in managerial jobs (from 4 to almost 7 %) although they still lag behind men. The rate of women employed in technical semi-professional jobs declined from 33 to 27 %. These occupations include the traditional female-dominated occupations—teachers in elementary schools and preschools, and nurses. It is possible that fewer women are attracted to these occupations (that are usually characterized by low wages) or that these occupations became saturated over time. Many of the women with academic education entered clerical and service jobs, indicating again their inability to find jobs in professional areas.

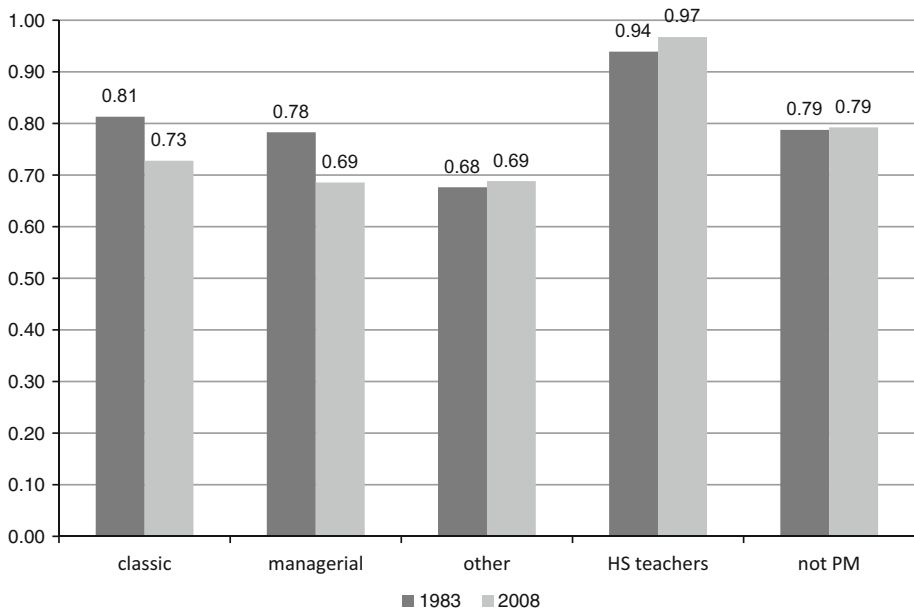
From these figures it is hard to know whether men's position improved over time compared to that of women. This question will be analyzed in the next section. However, it is clear that both men and women found difficulties in finding adequate employment given the large



supply of highly educated workers. A closer look at the type of occupations professional men and women held at the two points in time reveals a stagnation in women's participation in the "classic professions" which include medicine, law, engineering and university professors (teachers in higher education) and a decline in the share of men in these occupations (from about 35 to less than 28 %). Women's share in other professional occupations has decreased from 15.7 to 12.8 %. Furthermore, their share in the high-school teaching occupation declined from 14 to 8.4 %, indicating again women's flight from traditional female-typed occupations. Men's share in the other professions remained almost unchanged, with a slight decline in the teaching profession. The Index of Dissimilarity, based on the 2-digit occupations, reveals a decline in the gender segregation (from 0.55 to 0.50).

The table further shows that while the distribution of men's working hours did not change over time, this is not the case for women with academic education. Women work more hours than before—in 1983 more than 50 % of them worked on a part-time basis (less than 35 h a week), compared to only a third in 2008. Only a quarter of women worked long hours (more than 43 a week) in 1983, while 36 % invest long hours on the job in 2008. This implies that the gender gap in working hours has narrowed over time. The age distribution of the two groups shows that women are younger than men but the age differences are changing: in 1983 almost half of all women with academic education were in the youngest age group (25–34), compared to a third of men. While the share of the younger cohort declined for both genders, the decline is more pronounced among women of whom only a third are in this age range (compared to 27 % of men). In accordance, the share of older highly educated men and women increased (for men, from 11 to 22 %, and for women, from less than 9 to almost 18 %).

Gender wage differentials are presented in Fig. 1. The ratio of women's to men's wages was calculated based on their hourly wage in each of the occupational categories. In 1983 women in the classic professions earned 81 % of men's wages per hour. This rate declined



**Fig. 1** Gender ratio in hourly wage by occupation, 1983–2008

**Table 2** The likelihood of entering the different occupational categories, 1983 and 2008: Results from a multinomial regression analysis

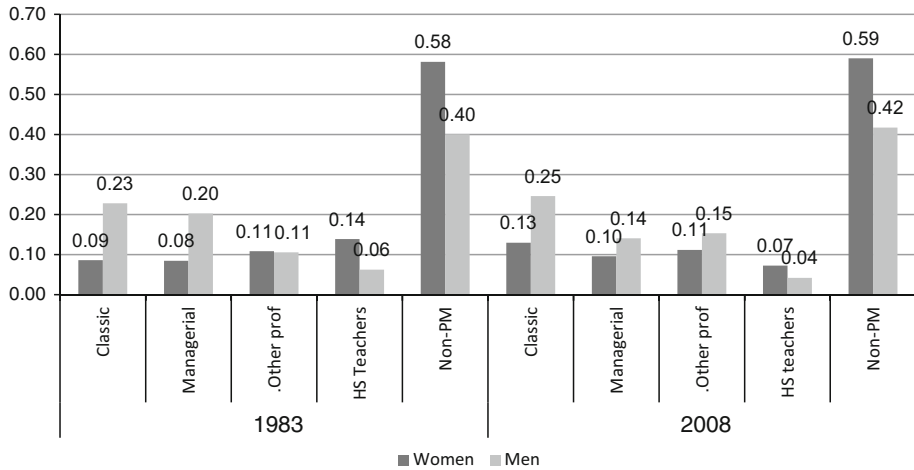
	2008							
	Classic Prof.	Managers	Other Prof.	HS teachers	Classic Prof.	Managers	Other Prof.	HS teachers
Female	-1.344* (0.050)	-1.246* (0.065)	-0.346* (0.056)	0.426* (0.064)	-0.988* (0.024)	-0.731* (0.030)	-0.663* (0.027)	0.197* (0.043)
MA	1.016* (0.042)	0.146* (0.054)	1.813* (0.054)	0.755* (0.082)	0.857* (0.025)	0.394* (0.031)	0.675* (0.030)	0.724* (0.054)
MA × female	0.618* (0.071)	-0.191 (0.117)	-0.187* (0.076)	-0.452* (0.103)	0.373* (0.035)	0.250* (0.046)	0.511* (0.040)	0.223* (0.062)
Age groups								
35–44	0.011 (0.039)	0.602* (0.053)	0.020 (0.044)	0.508* (0.054)	-0.170* (0.023)	0.418* (0.030)	-0.168* (0.025)	0.407* (0.038)
45–54	0.088 (0.047)	0.801* (0.061)	-0.133* (0.056)	0.534* (0.069)	-0.366* (0.025)	0.279* (0.033)	-0.462* (0.029)	0.654* (0.040)
55–64	0.337* (0.056)	0.657* (0.078)	-0.074 (0.068)	0.286* (0.092)	-0.285* (0.027)	0.289* (0.038)	-0.436* (0.032)	0.601* (0.045)
Ethnicity								
European	0.223* (0.047)	0.038 (0.059)	0.061 (0.055)	-0.340* (0.063)	0.091* (0.022)	-0.500* (0.027)	-0.139* (0.025)	-0.682* (0.032)
Israel born	0.053 (0.083)	0.119 (0.103)	0.253* (0.090)	-0.161 (0.107)	0.311* (0.026)	0.101* (0.031)	0.259* (0.028)	-0.210* (0.039)
Weekly hours	0.021* (0.000)	0.033* (0.000)	-0.008* (0.000)	-0.046* (0.000)	0.020* (0.000)	0.052* (0.000)	0.010* (0.000)	-0.034* (0.000)
Married	0.360* (0.045)	0.352* (0.066)	-0.020 (0.047)	0.635* (0.068)	0.154* (0.021)	0.340* (0.029)	0.073* (0.023)	0.563* (0.037)
Constant	-1.816* (0.080)	-3.081* (0.112)	-1.252* (0.088)	-1.017* (0.107)	-1.651* (0.045)	-3.935* (0.062)	-1.497* (0.050)	-1.727* (0.071)
Pseudo-R <sup>2</sup>	0.112				0.069			
N	29,568				105,706			

**Table 2** continued

	1983			2008				
	Classic Prof.	Managers	Other Prof.	HS teachers	Classic Prof.	Managers	Other Prof.	HS teachers
Age group 25–34 <sup>a</sup>								
Female	-1.250* (0.069)	-0.970* (0.099)	-0.429* (0.074)	0.657* (0.106)	-0.899* (0.035)	-0.461* (0.053)	-0.578* (0.039)	-0.144 (0.079)
MA	1.014* (0.074)	0.260* (0.113)	1.446* (0.090)	0.694* (0.179)	0.790* (0.057)	0.659* (0.082)	0.778* (0.064)	0.576* (0.140)
MA × female	0.425* (0.118)	-0.274 (0.221)	0.195 (0.123)	-0.429* (0.213)	0.321* (0.073)	0.378* (0.104)	0.408* (0.079)	0.320* (0.158)
Pseudo-R <sup>2</sup>	0.111				0.056			
N	11,983				33,206			

\*  $p < 0.05$

<sup>a</sup> Models control for hours of work, marital status and ethnicity



**Fig. 2** Predicted probabilities of entering the different occupational categories

in 2008 to 73 %. The same trend can be found in the managerial occupations. The wage ratio remained unchanged (and even increased slightly) in all other occupational categories. These figures point to a widening gender gap over time, although they may also reflect differences in the age distribution and other characteristics of the two gender groups. In the next sections we examine these gaps in a multivariate framework.

### 4.1 Changes in Entering Professional Occupations

In general, then, both men and women with high education encounter difficulties in securing adequate employment in terms of skill match, probably as a result of the supply of high-skilled workers, which exceeds the demand. The question is: who suffered more? Did women manage to close the gap with men in terms of occupation and income, or are they still considered “second best” employees?

In the following, we test gender differences in the likelihood of entering professional and managerial occupations. Table 2 presents the results of a multinomial logistic regression that examines the likelihood of being employed in the four occupational categories (classic professions, managerial positions, high school teachers, and other professions) in comparison to employment in the non-professional occupations (the reference category). The models, for 1983 and 2008, include, in addition to the effect of gender, an interaction term between gender and the level of education (whether respondent acquired a graduate degree). All models control for age, ethnicity, marital status and hours of work.

Starting with the gender effect, the models reveal that both in 1983 and 2008 women’s likelihood of entering professional and managerial occupations (except for high-school teaching) is lower than that of men, in comparison to their likelihood of being in a non-professional job. This is in line with our expectations. Note that because we include an interaction term with degree, the main effect of gender pertains to women with a bachelor degree. Specifically, women’s likelihood of entering the classic professions was about a quarter of that of men ( $e^{-1.344} = 0.26$ ) in 1983 and their disadvantage in managerial positions was similar. In comparison, women were 1.5 times as likely as men to become high-school teachers ( $e^{0.426} = 1.53$ ). These findings do not support the claim raised by the “tournament theory” that the gap will be lower in the professions that demand formal

certification (i.e., the classical professions), but rather are in line with the queuing theory. The findings for 2008 further support this expectation. While in general women considerably improved their position, they still lag behind men, in particular in the classic professions. Their likelihood of entering these occupations (relative to occupying a non-professional position) is 37 % ( $e^{-0.988} = 0.37$ ) of that of men, and they are half as likely as men to enter managerial jobs ( $e^{-0.731} = 0.48$ ). Gender differences also declined in the teaching profession (from 0.426 to 0.197). Only in the other professions did gender differences increase—in 1983 women with a BA degree were 70 % as likely as men to hold these positions, while in 2008 their likelihood declined to 50 % ( $e^{-0.663}$ ).<sup>3</sup> The findings generally suggest that entering the classic professions and managerial positions is easier now than it was in the past.

One way to reduce the gender gap in accessing the more lucrative positions is to acquire an advanced degree. A higher degree in general increases the likelihood of working in a professional occupation as opposed to settling on a non-professional job. The gender differences in the effect of having an MA degree are interesting—in 1983, having a higher degree improved women's likelihood of entering the classical professions more than it contributed to men ( $b = 1.016 + 0.618$  for women), there was no difference in the effect of a higher degree on the likelihood of holding a managerial position, and in the two other categories a higher degree benefited men more than it did women. By 2008 the picture had changed—in all occupational categories, an advanced degree benefited women more than it did men, although women lost part of their advantages in the classic professions. These effects are in line with both the tournament theory and the queuing theory, as having an advanced degree indicates high skills and improves the attractiveness of the worker.

To better understand gender differences and how they have changed over time, we have calculated the predicted probabilities of married, Israeli-born men and women holding a BA degree, and in the age range 35–44, of entering each of these categories for men and women. The results, presented in Fig. 2, show a growing similarity over time in working in the classic and managerial positions. Women have increased their share in these two occupational categories, men's probability of being in the classic professions remained unchanged over time, while their probability of entering managerial jobs declined. There is also a declining gap in the teaching profession, mainly due to women's lower probability of working in this profession.

In order to provide a more accurate account of the change in men's and women's occupational distribution, the lower panel of Table 2 presents the gender effect on the likelihood of working in each occupational category for the youngest group, ages 25–34. To the extent that there is a real change in gender differences, it should be more pronounced among this group that more recently entered the labor market. The findings show that indeed the effect of gender is smaller in all occupational categories, indicating that the change takes place for young cohorts upon entering the labor market. However, the gender gap in entering those occupations still exists, with the highest gap in the classic professions, and the lowest in the non-professional and teaching occupations, in line with the expectations of the queuing theory.

## 4.2 The Gender Wage Gaps

While there are gender differences in access to the different occupations, it is hard to understand their causes. Men and women still differ in their fields of study, so part of this difference is a matter of "choice." Men and women also differ in their constraints, and it is possible that women leave demanding positions or refrain from entering those jobs, taking

<sup>3</sup> Coefficients are significantly different between the two time periods.

into account their (current or future) familial obligations. It is also plausible that employers refrain from offering these jobs to women. The advantages and disadvantages associated with gender can be more clearly discerned by looking at wage differences in the labor market, while taking into account the different occupational distribution. Table 3 presents the results of an OLS regression analysis that tests for gender differences in (ln) monthly gross wages during 1983 and 2008 (Model 1). The models control for occupational categories and demographic characteristics (including age, the level of education and hours of work, marital status and ethnicity). As expected by the two theories, controlling for occupation and other characteristics, women's earnings are lower than men's, as the first model indicates. However, the gender differences declined over time from an average 40 % difference in 1983 to 23.2 % in 2008. Furthermore, the model shows that workers with academic education that were employed in any professional occupation earned more than those who worked in a non-professional job. Moreover, different types of professional occupations entail different levels of wages, as expected. In 1983, the highest wage, controlling for hours of work, level of education and other characteristics, was recorded in managerial occupations (32 % more than in the non-professional jobs), followed by high school teachers, the classic professions and the other professional occupations. In 2008, the wage differences between the professional and non-professional occupations was significantly higher: again, the highest wages were found in the managerial occupations (54 % more than in the non-professional jobs), followed by the classic professions and other professional jobs. The only occupation that fell in wage level was that of high school teachers—in 2008 their wage was lower by 9 % than that of workers with academic education who worked in non-professional jobs. These changes in returns to occupations can partly explain the decline in the gender gap in earnings, as more women entered the more lucrative jobs. In large, these findings support the claim that gender inequality declined as more women entered lucrative jobs. However, the findings also show that the different occupational distributions of men and women account for a large part of the gender gap in pay, as women are still underrepresented in the better-paying occupations.

To test our expectations regarding gender gaps within specific occupations the second model in Table 3 adds also the interaction between occupational categories and gender (Model 2). The gender main effect shows that in 1983, women in the non-professional jobs earned 38 % less than men. In that year, men and women that were employed in the classic professions and in managerial occupations earned significantly more than those in the non-professional occupations; however, the interaction with gender was not significant. This means that the gender gap was similar in all of these occupations. In other professional occupations, women had an additional penalty of 12 % in comparison to men in the same occupational group, but the gender gap was significantly lower for high school teachers where the interaction term is positive. However, by 2008 the gender gaps changed considerably—the main effect of gender declined to 16 % in the non-professional occupations, but widened in all other occupational groups, contrary to the expectations raised by the tournament theory. Women earned 19 % less than men in the classic professions; 10 % less in managerial occupations; and 18.5 % less in the other professional occupations. As was found in 1983, women benefited from being high-school teachers, as their wages were 29 % higher than those of men in the same occupation. Overall, these findings provide consistent support for the queue theory, as in the more attractive occupations the gender gap is higher (and also grew over time), while the gaps have declined or even reversed their course in the female-dominated areas.<sup>4</sup>

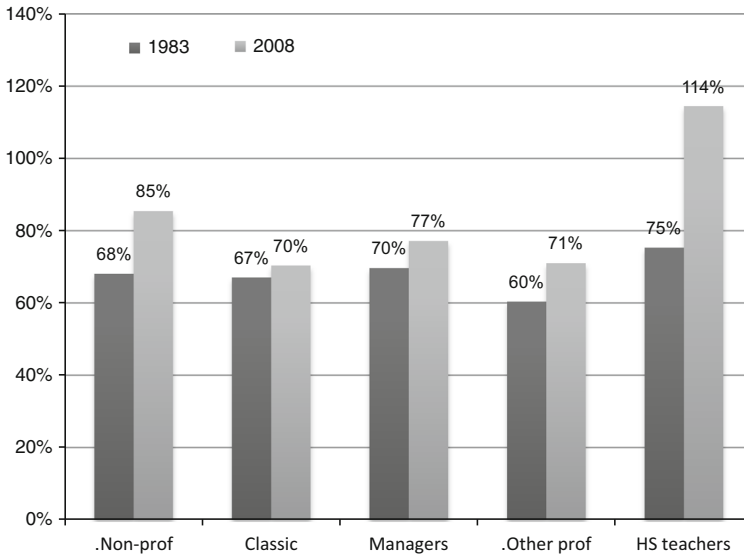
<sup>4</sup> A separate model for women, including the effect of children, revealed that in 1983 the number of children did not affect women's wages, while in 2008 the effect was positive.

**Table 3** OLS regression predicting the LN of monthly wages, 1983–2008

	Model 1		Model 2		Age group 25–34	
	1983	2008	1983	2008	1983	2008
Female	−0.400*	−0.232*	−0.385*	−0.158*	−0.307*	−0.136*
	(0.010)	(0.005)	(0.014)	(0.007)	(0.021)	(0.011)
Occupational						
Classic profession	0.164*	0.384*	0.172*	0.481*	0.123*	0.254*
	(0.012)	(0.006)	(0.014)	(0.009)	(0.022)	(0.014)
Managerial	0.321*	0.537*	0.323*	0.596*	0.246*	0.290*
	(0.015)	(0.008)	(0.017)	(0.010)	(0.032)	(0.021)
Other profession	0.127*	0.355*	0.181*	0.462*	0.007	0.282*
	(0.013)	(0.007)	(0.018)	(0.011)	(0.029)	(0.017)
HS teacher	0.208*	−0.087*	0.137*	−0.285*	0.029	−0.393*
	(0.016)	(0.011)	(0.027)	(0.020)	(0.054)	(0.039)
Interaction terms						
Female × classic			−0.015	−0.194*	−0.048	−0.112*
			(0.024)	(0.012)	(0.038)	(0.019)
Female × managerial			0.023	−0.102*	0.014	0.027
			(0.036)	(0.016)	(0.058)	(0.028)
Female × other			−0.120*	−0.185*	−0.041	−0.099*
			(0.025)	(0.014)	(0.039)	(0.021)
Female × HS teacher			0.101*	0.293*	0.143*	0.296*
			(0.033)	(0.024)	(0.060)	(0.045)
Weekly work hours	0.012*	0.023*	0.012*	0.023*	0.014*	0.027*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.076*	0.176*	0.077*	0.176*	0.062*	0.142*
	(0.012)	(0.006)	(0.012)	(0.006)	(0.016)	(0.008)
Ethnicity						
European	0.015	−0.159*	0.013	−0.157*	−0.005	−0.025*
	(0.012)	(0.006)	(0.012)	(0.006)	(0.017)	(0.010)
Israel born	0.012	−0.040*	0.009	−0.038*	−0.003	−0.011
	(0.021)	(0.007)	(0.021)	(0.007)	(0.029)	(0.009)
Age	0.087*	0.104*	0.087*	0.103*	0.312*	0.217*
	(0.004)	(0.002)	(0.004)	(0.002)	(0.057)	(0.032)
Age <sup>2</sup>	−0.001*	−0.001*	−0.001*	−0.001*	−0.004*	−0.002*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
MA	0.033*	0.063*	0.033*	0.068*	−0.003	0.024*
	(0.009)	(0.005)	(0.009)	(0.005)	(0.016)	(0.009)
Constant	6.268*	5.645*	6.260*	5.620*	2.745*	3.425*
	(0.075)	(0.041)	(0.076)	(0.041)	(0.838)	(0.482)
Adjusted R <sup>2</sup>	0.311	0.365	0.313	0.365	0.270	0.3655
Number of observations	23,500	99,084	23,500	99,084	9662	32,177

\*  $p < 0.05$ 

To better capture the complex interaction effects, Fig. 3 presents women's predicted earnings (calculated from Model 2) as a percentage of men's predicted earnings in the five occupational categories. The figure shows that indeed the gender gaps in earnings (net of working hours and other characteristics) are declining in all occupations, although not at the same rate—women scored gains in both the less prestigious female-typed occupations



**Fig. 3** Women's predicted earnings as percentage of men's predicted earnings (based on Table 3 model 2)

and in the more lucrative managerial positions. Among high school teachers, the gap reversed, and while in 1983 women earned three quarters of men's wages, they now earn 14 % more than their male counterparts. This is probably because women entered the better positions (e.g., high school principals) in this area. The gap was reduced significantly in the less rewarding non-professional jobs. But women also improved their position vis-à-vis men in managerial occupations where the gap declined by 7 percentage points, and in the other professions. The smallest decline is evident in the classic occupations—women earned 67 versus 70 % of what men earned in 1983 and 2008, respectively. The gap could result from the different occupational distribution within this broad category—women are still under represented in engineering and are usually located in lower positions in those areas where they did increase their representation, such as medicine and universities. Whether this means that the earnings gap results from different choices or from different treatment of men and women in the labor market is still an open question. Overall, these findings provide support for the queuing theory regarding the expected gender wage gaps in the classic and other professions, on the one hand, and in teaching and non-professional occupations, on the other hand. Both theories cannot explain the reduction in the wage gap in the managerial positions.

The right column of Table 3 presents, again, the figures for the youngest group in order to capture gender differences at early stages of the career. These gaps are smaller for the youngest group, as might be expected—the main effect for gender was similar to that of the entire population, indicating that women's disadvantage starts early in life and is not necessarily a consequence of changes in their employment patterns along the life course. This difference may result from the specific occupations in which men and women are employed or from discriminatory practices in the labor market. As for the gap within occupational groups, in 1983 none of the interaction terms were significant, indicating that the gap was similar across all occupational categories. In 2008 women earned significantly less than men in all professional jobs (except for teaching in high school where they had an



advantage over men). Only in managerial jobs did women and men attain equality. This is probably because at this stage of life both men and women are in lower-level managerial jobs. These findings suggest that women's disadvantages start early in life, either because women acquire specific skills and credentials that lead to their employment in specific occupations [see for example Ku (2011) on gender differences in medical specialties], or because they are denied access to lucrative jobs from the outset. The difference across time may indicate that the increase in supply of highly educated women does not necessarily work to their benefit, once their occupational distribution is taken into account; and that specific mechanisms within lucrative occupations may result in disadvantage that is carried on through women's working lives.

## 5 Discussion

The rise in education substantially increased the supply of highly skilled workers. Although labor markets in many advanced societies have shifted to a knowledge-based economy and increased their demand for highly skilled workers, the rise in education exceeds the demand for highly educated workers. Israel represents such a case, in which a dramatic increase in the rate of college completion has taken place since the 1990s. In addition to the general increase in education, women improved their representation in higher education, entered new fields of study, and in many areas outnumbered men. In light of these changes, this study examined changes in gender inequalities in the labor market, focusing on access to lucrative jobs and on pay.

This paper has adopted two theoretical approaches—the tournament and the gender queue theories—to understand trends in gender inequality in light of expanding educational achievements. The two theories share some similarities, but there are also important differences in the way they predict how gender inequalities are expected to change. The tournament theory would expect that when women enter certified occupations in large numbers and have the necessary credentials, gender inequality in access to good jobs will decline. This theory also expects a decline in the gender wage gap in these types of occupations, as professional certifications validate the productivity of workers and reduce employers' reliance on gender stereotypes (Castagnetti and Rosti 2013). The gender queue theory (Reskin and Roos 1990) expects the opposite—the expansion of education will heighten the competition over good jobs, and as men still have an advantage in the labor market, gender gaps will not decline. Another important difference between the two approaches concerns the least attractive, non-professional jobs. The tournament theory expects a high wage gap in these occupations, where productivity measures are vague and positions depend on stereotypes more than credentials. In contrast, the queuing approach expects the lowest wage gap in these less desirable jobs.

The findings reveal that, in general, women have improved their position in the Israeli labor market. They have entered formerly male-dominated jobs and managed to reduce some of the gaps in access to the better-paying professions. There is also a general decline in the gender pay gap. These findings may suggest that the supply of high-skilled women is not being ignored by potential employers, as the tournament theory argues. However, when we look at specific occupational groups, the findings provide support to the gender queue hypothesis. Women still lag behind men, especially in the certified professions, as earnings disparities are especially pronounced in the classic professions that pay the highest wages.

Inequality is lowest in non-professional jobs, where more women than men are employed and for which the workers seem to be over educated. These disparities may reflect gender segregation and a “glass ceiling” in the classic professions, so women have only limited access to the high positions and high wages.

Last, inequality is (somewhat) lower for younger workers—this may raise some optimistic expectations for the future. However, the findings also suggest that women’s disadvantage starts early in life, probably before they enter family and parenthood. It is impossible to know, given the data we used, whether women prefer different types of jobs than men or they are compelled to settle on less attractive positions because of employers’ preferences. In any case, if women further accumulate disadvantages along their life course, as is expected given their familial roles, then it is hard to see how the expansion of education and women’s gains in this area also benefit them in the long run.

This study is not without its limitations. First, we based the analysis on cross-sectional census data that does not provide information on fields of study and does not allow us to track the career path of university graduates. It is therefore not possible to determine whether within specific areas men and women are channeled to different jobs. For example, there are differences between specific areas of engineering, medicine and legal practice that may result in substantial wage differences. Second, it is not clear whether the occupational distribution of men and women reflects employers’ or employees’ choices. Future studies should examine the career paths of university graduates in order to shed more light on these issues. In addition, the current Israeli census data did not allow us to examine more closely ethnic and national differences in the effect of expanding education on gender inequality. This is partly because there are difficulties in determining ethnicity for third-generation Israelis (a substantial group among university graduates), and partly because for some groups (e.g., Israeli Arabs) the entrance to higher education in meaningful numbers occurred only recently.

With these limitations in mind, our main question was whether women with higher education are running ahead, achieving more equality with men, or rather running in place. The findings show that women are running forward, but they still have a long way to go before they close the gap with men. While it is not entirely clear whether the Israeli labor market is unique or representative of a Western labor market, the findings draw attention to possible consequences of educational expansion for gender inequality in the labor market. On the one hand, women accumulate more resources and are better equipped to compete over good positions in the labor market. Their educational attainment and the fields they enter probably affect their prospects in the labor market and raise the cost of discrimination. In this sense, the more women acquire higher education, the more likely they are to enter good jobs and to close the gap with men. On the other hand, there might still be persistent barriers to achieving equality, partly because women specialize in different areas than men, within broad categories of occupations, or because employers are still reluctant to hire them to the high-ranked jobs. State policies and organizational practices can provide a way of further reducing the gender gaps (Kalev et al. 2006; Hirsh 2009). Such policies can help women to run ahead, and employers to take full advantage of this highly skilled segment of the labor force.

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