Obstacles to labour market participation among Arab Palestinian women in Israel

Sami H. MIAARI,* Nabil KHATTAB** and Maha SABBAH-KARKABI***

Abstract. *Despite recent increases in educational attainment among Arab Palestinian women in Israel, their labour force participation rates continue to be below those of Jewish women. This study draws on data from the Israeli Labour Force Survey and Social Survey covering the period 1995–2016 to investigate whether this pattern can be explained by socio-economic and demographic factors, level of religiosity, human capital assets, family structure and related public policies, and early retirement. All these factors are found to affect the probability of Arab Palestinian women participating in the labour market, raising implications for labour market policies.*

Keywords: *labour force participation, Arab Palestinian women, public policy, gender, ethnicity, religiosity, early retirement, Israel.*

1. Introduction

Research has found that women in Arab and Muslim countries are less likely to become economically active than men, and that Arab and Muslim women living in Western countries are less likely to become economically active than both Arab and Muslim men and other women (Kabeer, Deshpande and Assaad 2019; Kraus and Yonay 2018; Spierings 2015; Spierings, Smits and Verloo 2010; Khoudja and Fleischmann 2015; Khattab, Johnston and Manley 2018; Khattab et al. 2019; Miaari, Khattab and Johnston 2019). A similar pattern is found in Israel, where the labour force participation (LFP) of Palestinian women[1] has been consistently lower than that of Palestinian men and of Jewish women (figure 1).

* Tel-Aviv University, email: samimiaari@tauex.tau.ac.il (corresponding author); ** Doha Institute, email: nabil.khattab@dohainstitute.edu.qa; *** Ben-Gurion University of the Negev, email: mahasab@bgu.ac.il.

[1] The terms Palestinian and Arab (Palestinian) are used interchangeably in this article. These terms refer to Palestinian citizens living within the 1949 Armistice demarcation line.

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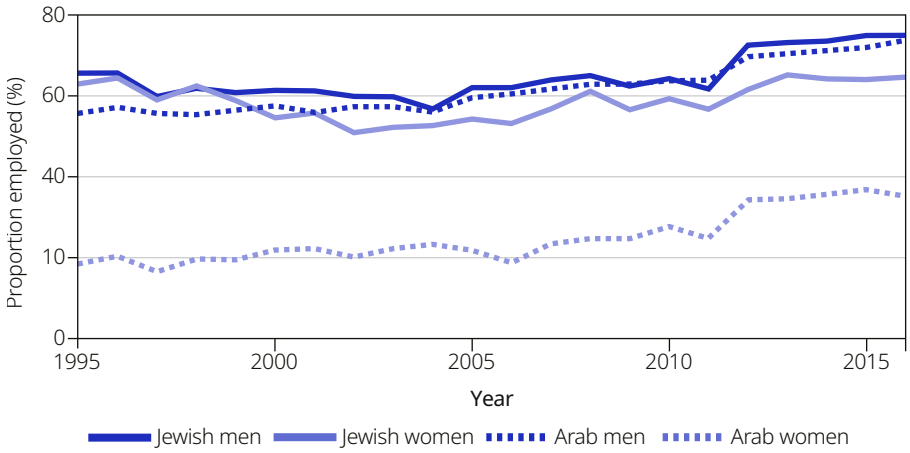
Figure 1. Employment rate by gender and ethnicity, 1995–2016



Notes: Sample does not include Arabs from East Jerusalem and the Golan Heights. The data relate to the main segment of the labour force – persons aged 18 to 64.

Source: Authors' calculations based on 1995–2016 Labour Force Survey data.

Recent studies have helped us understand some of the factors shaping this pattern, such as religiosity and gender norms (Sa'ar 2017; Abu-Baker 2016; Yonay, Yaish and Kraus 2015), spatial segregation (Lewin-Epstein and Semyonov 2019; Schnell and Shdema 2016) and state policies and employer discrimination (Miaari, Zussman and Zussman 2012; Lewin-Epstein and Semyonov 2019; Sa'ar 2015; Yonay and Kraus 2017). These studies have almost exclusively focused on the barriers to the labour market for women and pay less attention to whether and why Arab Palestinian women tend to leave the labour market earlier than Arab Palestinian men and Jewish women – a trend that has been found to affect Muslim minority women in various countries (Khoudja and Platt 2018; Maes, Wood and Neels 2019). Moreover, these studies offer no empirical examination of the claims that culture and religiosity have an impact on LFP – a subject of much debate among researchers (Khoudja and Fleischmann 2015; Khattab, Johnston and Manley 2018; Kraus and Yonay 2018).

This article's contribution to the literature is thus twofold. To the best of our knowledge, this is the first quantitative study that empirically examines the effect of religiosity and early retirement on women's LFP, alongside socio-economic and demographic factors. Second, our study uses two of the most important and recent data sets in Israel, the Labour Force Survey (1995–2016) and the Social Survey (2002–16), which allow us to examine socio-economic factors, level of religiosity, number of children in the family and public policy developments that may help explain the gap in LFP between Palestinian and Jewish women in Israel. In particular, these data sets give us a more comprehensive picture of the situation by allowing us to examine both "pull factors" – hindering the entry of Arab Palestinian women into the labour market – and "push factors" – causing women to retire early.

The remainder of this article is structured as follows. The second section provides a literature review and outlines the theoretical considerations of our

study. The third section presents the main data used in our analysis. The fourth section describes our empirical model and the fifth presents the main results. The sixth section discusses the implications of our findings and concludes.

2. Arab Palestinian women in Israel in the labour market

Arab Palestinians constitute an ethno-national minority in Israel, making up 21 per cent of the total Israeli population (ICBS 2019). Approximately 84 per cent are Muslim, while the rest are either Druze or Christian.[2] Since the establishment of the State of Israel in 1948, there have been persistent disparities between the Jewish majority and the Arab Palestinian minority (Smooha 1992). Despite continuous discrimination, Arab Palestinians have nevertheless experienced considerable social change in recent decades, including a significant increase in women's levels of educational attainment. However, the 36 per cent employment rate of Arab Palestinian women remains substantially lower than that of Arab men (67 per cent) and Jewish women (64 per cent) (ICBS 2022a). Disparities are greater in some occupational sectors, since the proportion of Arab women working in the education and service sectors and in unskilled jobs is substantially higher than that of Jewish women (Kasir and Yashiv 2020).

Scholars have explored both cultural and structural labour market and employment barriers for women (Khattab and Miaari 2013). Cultural barriers include patriarchal norms, which can prevent women from working outside the home or restrict them to jobs compatible with prioritizing domestic work and child-rearing (Abu-Baker 2002). Structural barriers include the segregation of Arab towns and villages, which suffer from limited resources and infrastructure, institutional discrimination and outright prejudice (Yonay and Kraus 2017). This produces an ethnic enclave economy with limited job opportunities, especially for highly qualified workers (Khattab and Miaari 2013). These findings highlight the importance of understanding the interconnectedness of these factors. For example, ethnic segregation and a lack of local jobs particularly affect Arab Palestinian women, who, for cultural reasons, often prefer to find jobs close to home (Sabbah-Karkabi 2021).

Less attention has been paid to labour market push factors, such as the fact that Arab Palestinian women in Israel tend to retire earlier, as indicated by the distribution of LFP by age (Yashiv and Kasir 2013). Understanding their employment trajectories might shed light on LFP patterns. Accordingly, this study expands our understanding of LFP by looking at several dimensions of marginalization faced by workers in the labour market, in addition to cultural factors.

[2] The socio-economic characteristics of Christians differ from those of Muslims and Druze, with, for example, higher female employment rates.

2.1. Theoretical considerations

Although this section will focus on several of the theoretical approaches to explaining why LFP rates are lower for Arab than for Jewish women,[3] we begin with a brief discussion of women's LFP rates in general. Economic and sociological approaches argue that the decisions of women, including married women, to participate in the labour market are determined by values and preferences (Ernst Stähli et al. 2009). These direct women to choose between different alternatives (choices), namely, leisure/consumption and domestic work, on the one hand, and paid work (Mincer 1962), on the other. Women decide to allocate their time in a way that maximizes their individual and household gains (Becker 1965).

2.1.1. Human capital

A key factor likely to influence women's choice is the expected returns to their human capital. Educational attainment, training, work experience and other skills are associated with higher productivity and wages, leading women to value paid work over other options. This may also account for differences in LFP among women from minority groups (Read 2004; Read and Oselin 2008). Most empirical studies focusing on women support the hypothesis that education is a main driver of higher female LFP (Bloemen and Kalwij 2001; England 2005). This holds true for both developing countries and developed countries (Osundina 2020).

Several studies have explored the role of human capital among Arab women living in Western countries. Contrary to the employment-boosting effect that educational attainment typically has for Western women, these studies suggest that the effect on employment among Arab women living in these countries is muted. For example, Read and Cohen (2007) use census data in the United States and find that higher educational attainment only weakly predicts higher employment for Arab women, contrasting with the strong relationship found for most other ethnic groups. Read and Oselin (2008) argue that Arab women use their education as a resource to fulfil their duties as wives and mothers instead of participating in the labour market (the education–employment paradox). Similarly, Khattab and Johnston (2015) find that, in Britain, female Muslim graduates are less likely to find a job commensurate with their qualifications than their white British Christian counterparts.

In the context of Israel, many studies have documented the low LFP of Arab women, despite the recent increase in their educational attainment (Khattab 2002; Miaari 2012; Kraus and Yonay 2018; Lewin-Epstein and Semyonov 2019). As noted by Yashiv and Kasir (2013), although human capital variables such as higher education are important in explaining the LFP of Arab women, they do not alone account for the gap in LFP rates between Arab and Jewish women. This is why our approach incorporates multiple other factors when attempting to understand LFP.

[3] Owing to space and data limitations, we do not provide an exhaustive discussion of the many factors that may explain LFP rates among Arab women. These factors include but are not limited to a lack of employment opportunities and labour market discrimination. Although policymakers must take all relevant factors into consideration when seeking to improve labour market outcomes, we do not feel that focusing on particular aspects of these outcomes, as we do in this study, detracts from the validity of our insights and the policy recommendations with which we conclude.

Furthermore, certain "modern" skills and assets, as part of a more general human capital portfolio, are highly relevant to women's LFP; these include computer and language (Hebrew) skills and having a driving licence (Moghadam 2004; Spierings, Smits and Verloo 2010).[4] Spierings, Smits and Verloo (2010) constructed an economic index, tracking car ownership and possession of other household assets, including electrical devices, across six Arab countries. They found a positive correlation between this index and female employment at the district level. Public transport is demonstrably limited and unreliable in Arab communities in Israel, such that access to private transport is essential to enable citizens to access employment opportunities beyond those available locally (Keinan and Bar 2007). The share of Arab women holding a driving licence is significantly smaller than that of their Jewish counterparts (Keinan and Bar 2007), which is likely to further reduce the relative likelihood of employment.

2.1.2. Public transport policies

Women are less geographically mobile than men owing to childcare responsibilities and the fact that a smaller percentage of women in the Middle East hold driving licences (Moghadam 2004). Accordingly, limited public transport is likely to reduce women's employability. In this regard, a smaller strand of research examines the impact of transport policy on LFP. Malchi (2013) notes that a lack of public transport in Arab localities in Israel can hinder women's LFP. Schnell and Shdema (2016) provide evidence that geographic proximity to the economic centre (Tel Aviv) is important for workers' employment prospects. Such findings suggest that public transport policy has a role in reducing labour market frictions for women.

2.1.3. Religiosity as a cultural factor

Another consideration is that religiosity and religious practices could have an impact on women's attitudes towards, and their decision to, work outside the home (Reimers 1985; Kabeer 1994; Abu-Baker 2002). A few studies have quantitatively examined the impact of cultural factors on the LFP of Muslim women living in Western countries by examining the effect of their level of religiosity. The results have been mixed. In Connor and Koenig's (2015) analysis of the European Social Survey from 2002 to 2011, it appears that attending religious services has a small positive effect on employment, but prayer and importance of religion have no effect on employment. Similar results were obtained by Spierings (2014) for Muslim women in Indonesia. Abdelhadi (2017), who investigated the correlation between female employment and the level of religiosity of Muslim women in the United States, also found a positive correlation between mosque attendance and employment. This finding was reinforced by Khattab, Johnston and Manley (2018), who found that religiosity had a positive impact on Muslim women's LFP rates in the United Kingdom. However, Reitz, Phan and Banerjee (2015) found

[4] We take the use of advanced technology and the acquisition of a second language by members of a minority group – especially one which is the language of the religious majority – as indicators of modernity in that they reflect openness to the latest technology and to engagement with citizens other than those belonging to the minority group.

no significant correlation between religiosity and employment among Canadian Muslim women. By studying whether religiosity has a direct effect on women's LFP, or whether the effect operates primarily through family behaviour, Read (2004) finds a significant interaction between religiosity and having children, suggesting that religiosity deters Arab women from participating in the labour market in the United States only when there are children in the home.

In the context of Israel, Abu-Baker (2016) and Sa'ar (2017) suggest that cultural norms and practices may operate in conjunction with discriminatory employment policies to affect LFP and employment opportunities. This article uses detailed information on the level of religiosity at the individual and family level over a longer time period (2002–16) to quantify the impact of this cultural factor, while allowing the impact to differ across Arab and Jewish women.

2.1.4. Family structure and childcare policies

Family structure and childcare policies have also been found to affect women's propensity to participate in the labour market (Greenlees and Saenz 1999). It is widely recognized that the presence of children in the household can place a considerable constraint on women's LFP (Pignatti 2020). Children of pre-school age tend to have the strongest negative effect on women's LFP (Khoudja and Platt 2018). Studies have focused on the large increase in the "opportunity cost" of children associated with a rise in female educational attainment, and on policies that affect work and care responsibilities, work culture and the welfare regime as factors determining mothers' LFP (Hook 2006). Recently, more studies have indicated that cultural context and the rigidity of gender-specific social norms, whereby mothers are expected to play a greater role in childcare than fathers, determine the family–work relationship (Thévenon and Luci 2012). Therefore, in countries where public childcare is not easily accessible, whether for financial reasons or because it is not available in all geographical areas, the mother is most likely to be the parent primarily responsible for raising children while the father is in paid work (Khoudja and Platt 2018). In Israel, given that Arab Muslim women tend to have a higher fertility rate than Jewish women (ICBS 2022b), child-rearing responsibilities may be particularly significant in reducing Arab women's LFP. It has been recognized that a lack of reasonably priced childcare and welfare services discourages a significant proportion of women, who might otherwise seek work, from participating in the labour force (Almagor-Lotan 2010).

2.1.5. Early retirement

Early retirement is a decision to exit the labour market that an economically active employee takes before the official retirement age in the country in which he or she lives. As with the decision to join the labour market, there are gender differences in the timing of retirement. However, these differences are country-specific (Dahl, Nilsen and Vaage 2003). In some countries, women are likely to retire earlier than men, whereas in others, such as Norway and Finland, no significant differences are found. Most research on early retirement focuses on advanced economies, exploring the factors influencing men and women's decisions to continue working or retire (Finch 2014). A few studies investigate how the nature, meaning and processes of retirement may differ between men and

women, and among women. They find that the division of labour between paid work and unpaid work within households and the gendered division of labour (in the home) have a profound impact on retirement timing, discourses, meaning and planning among men and women (Loretto and Vickerstaff 2015). Differences have also been found by ethnicity, emphasizing that disadvantaged locations in the labour market and human capital differences (namely, in educational attainment) are key drivers of retirement (Flippen 2005; Mudrazija 2010). This is particularly true for the differences in employment behaviour between Hispanic and white workers observed in the United States (Duncan, Hotz and Trejo 2006).

In Israel, the distribution of LFP by age shows that Arab women tend to retire early (Yashiv and Kasir 2013). Our study assumes that early retirement among this group may contribute to the overall gap in female LFP. However, the few studies that address retirement trends among different ethnic groups in Israel solely focus on men (Yashiv and Kasir 2013). This calls for consideration of the disparity in the age of retirement that exists in the country between Jewish and Arab women, alongside the other major differences in their employment trajectories. On the one hand, around 45 per cent of Arab women in the labour market are employed in mainly female-dominated social service occupations requiring the completion of higher education (such as teaching, nursing and social welfare), compared with only 31 per cent of Jewish women. On the other hand, the proportion of Arab women working in unskilled jobs is substantially higher than that of Jewish women and Jewish women are much more likely than Arab women to be employed in high-skilled jobs as engineers, technicians and managers, among others (Kasir and Yashiv 2020). Previous research has indicated that employees in social service occupations, particularly women, tend to retire earlier than the official retirement age because of burnout related to poor working conditions (Yinon and Orland-Barak 2017; Pit and Hansen 2014). Given this noticeable concentration of Arab women in lower-ranking jobs (jobs associated with poor working conditions) and in professional occupations concentrated mainly in health services, or in education (jobs associated with high levels of stress), it is perhaps not surprising that Arab women retire earlier than Arab men and Jewish women. Furthermore, from a cultural perspective, a woman's primary role in Arab society is seen as that of caring for her family and, if she is working, she is seen very much as a secondary breadwinner (Cinamon, Habayib and Ziv 2016).

3. Data

3.1. Data sources

In this analysis, we use two sources of data to provide a more complete picture of the factors affecting LFP: (i) the Israeli Labour Force Survey (LFS) for the period 1995–2016 and (ii) the Social Survey (SS) for the period 2002–16.[5] The LFS has a larger sample, while the SS contains a wider range of variables, which are particularly useful for the purposes of our study. In particular, SS data allow us to instrument for the degree of religiosity by using family religiosity at age 15,

[5] Both these sources of data are provided by the Israeli Central Bureau of Statistics.

arguably overcoming the potential endogeneity of the degree of religiosity. Moreover, the SS includes detailed information on respondents' accumulation of modern human capital assets (such as computer skills, having a driving licence and speaking Hebrew) and their satisfaction with local public transport.[6]

3.2. Descriptive statistics

Descriptive statistics by ethnicity, based on both LFS and SS data, are set out in table B1 in the online appendix. They indicate a 30 per cent likelihood of Arab women participating in the labour force, compared to 70 per cent for Jewish women. In general, the Arab respondents appear to be slightly younger than their Jewish counterparts. Almost 50 per cent of Jewish women have a bachelor's degree or more, compared to less than a third of Arab women. Jewish women are much more likely to be divorced or separated – a factor that could be interpreted as an indicator of modern values also affecting attitudes towards labour market participation. Furthermore, Arab women appear to be more religious than Jewish women, who are, in turn, more likely to use a computer at work and are almost 30 per cent more likely to have a driving licence. Arab women are also much more likely to have a child under the age of 5. In line with the literature suggesting that having children of pre-school age tends to have the strongest negative effect on women's LFP (Khoudja and Platt 2018), this finding suggests that differences in labour market outcomes could be driven by differences in family structure.

4. Empirical strategy

Our study seeks to understand whether differences in LFP rates between Jewish and Arab women in Israel can be explained by socio-economic and demographic factors, religiosity, human capital assets, family structure and the impact of public policy, and early retirement. Our main empirical probit specification deals with the first four of these factors and can be written out as:

$$Y_i = \alpha_0 + \beta_1 Arab_i + \beta_2 X_i + \beta_3 R_i + \beta_4 P + \beta_5 M_i + \gamma T + \epsilon_i \quad (1)$$

The variables in equation (1) are defined as follows: Y_i is the labour market outcome of individual i. We focus on two outcomes: (a) whether the individual is employed (conditional on being in the labour force) and (b) whether the individual is in the labour force. It is worth commenting on the distinction between these two definitions of LFP. Definition (a) requires individuals to have worked for at least one hour in the previous week and to be in the labour force; definition (b) includes individuals who have worked for over one hour in the previous week and individuals who have not worked in the previous week but are actively seeking work.

The variable $Arab_i$ takes on the value of 1 if the individual is Arab and 0 otherwise. This variable is available for all years in both data sets. We construct this variable by defining Arabs as being Muslims, Druze or Christians.

[6] More details about the two surveys are provided in section A2 of the online appendix; a description of our sample is provided in section A3.

The vector X_i consists of socio-demographic variables relating to the individual. In this vector, we include dummies for age categories (24 or below, 25–29, 30–44, 45–54, 55–59, 60–64), dummies for the highest educational attainment level (less than secondary school, secondary school, secondary school matriculation,[7] non-academic post-secondary qualification, bachelor's degree, master's degree and doctorate), dummies for marital status (single, married, divorced or separated, and widowed). These variables are available from 2001 onwards in the LFS and for all years (2002–16) in the SS.

R_i is a vector of religiosity variables (secular, traditional, religious, very religious). These variables are available from 2014 onwards in the LFS, whereas they are available for all years in the SS.[8]

P is a vector of family structure and public policy variables. Policies affecting the availability of childcare services and public transport are likely to affect the opportunity cost of working and therefore influence women's LFP. Unfortunately, neither the LFS nor the SS include information on the availability of childcare services. Therefore, we use a binary indicator for having children under the age of 5 as a proxy for this public policy variable. The intuition for this is that, while having a child under the age of 5 is likely to take time away from work, the availability of childcare services should reduce the negative effect on LFP of having young children. Where the presence of young children exerts a negative effect on LFP, this would suggest that there is weak support for mothers in the form of childcare services. To examine the effects of public transport on LFP, we use a variable in the SS that captures the percentage of respondents in a given district who are satisfied with local public transport.

M_i is a vector that captures human capital assets or modern skills among women. In this vector, we include indicators for whether the woman typically uses a computer, has a driving licence, and indicators for her level of proficiency in Hebrew. The inclusion of this vector is motivated by research suggesting that cultural factors, and in particular a woman's access to different types of modern human capital assets, affect labour supply.

Lastly, T is a vector of year and district dummy variables. The year and district dummies, respectively, help account for variation across survey years and across districts that might affect labour market outcomes.

In equation (1), we are interested in the β coefficients. β_1 captures the difference in LFP rates between Arab and Jewish women, conditional on the other variables included in the regression. β_2 to β_5 capture the effects of the other variables on LFP. Where possible, we extend equation (1) to allow for interactions between the *Arab* variable and the X, R, P and M vectors. This allows for variation in the effects of the variables of interest by ethnic group.

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[7] In the Israeli education system, students are required to pass a high school matriculation examination in order to access higher education. This should not be confused with the high school diploma, which is a certificate that attests to the completion of 12 years of study.

[8] To overcome concerns that the degree of religiosity is endogenous to labour market outcomes, we use the SS and a version of equation (1) where we instrument for the degree of religiosity in the survey period by the religiosity of the participant's family at age 15 (see section A4 of the online appendix).

The fifth factor in our investigation relates to the impact of early retirement among Arab Palestinian women on their labour force participation when compared to Jewish women, and the variation of this phenomenon across occupations. We examine this using two strategies. In the first strategy, we create aggregate LFP rates for a refined demographic cell. A demographic cell is defined by the interaction of the following characteristics: ethnicity (Arab or Jewish), age group, educational attainment categories, marital status, occupation (one-digit codes for eight categories), district of residence and survey year. We then regress the proportion of individuals employed (or in the labour force) in that cell on the ethnicity and age categories and the interaction between the two, while controlling for the marital status, educational attainment, district and year indicators. The interaction between the age categories and the ethnicity indicator is of particular interest and will inform us about how the effect of age on LFP differs across Jewish and Arab women.

To provide more direct evidence of the differences in retirement age between Jewish and Arab women, in the second strategy we exploit the panel nature of the LFS to find individuals who retire during the survey period. In particular, we find individuals who were employed in $t - 1$ but who have retired and are not in the labour force in t. It should be noted that, owing to the fact that the LFS is a fairly short panel (of roughly 1.5 years), there are not many individuals that retire over this time span. For the few existing cases, we find their age of retirement and their occupation before retirement. We then construct a dummy variable for retirement before the age of 55. Finally, we estimate probit models to explain variation in the probability of retiring before the age of 55, controlling for educational attainment and occupation dummies. In particular, we estimate the following equation:

$$\Pr(\text{retire before } 55_i) = \alpha + \beta Arab_i + \gamma X_i + \delta Occ_i + \epsilon_i \quad (2)$$

Where the dependent variable is an indicator for retiring before 55, the vector X_i includes educational attainment dummies and Occ_i is a vector of one-digit occupation dummies.

5. Results

5.1. Labour market disparities between Jewish and Arab women

Table 1 presents results from a simplified version of equation (1), where only an *Arab* variable is included. The coefficient on the *Arab* variable captures the disparity in LFP between Jewish and Arab women. The results from the LFS (columns 1 and 3) indicate that Arab women in the labour force are 3 percentage points less likely than Jewish women to be employed and 37 percentage points less likely to be in the labour force. Results from the SS (columns 5 and 7) give a similar picture, suggesting that Arab women in the labour force are 8 percentage points less likely to be employed and 31 percentage points less likely to be in the labour force, compared to Jewish women. This finding is consistent with Yashiv and Kasir (2013), who document the low participation rate of Arab women relative to Jewish women.

Table 1. Relationship between ethnicity and religion and women's labour market outcomes

	Labour Force Survey				Social Survey			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Employed		In labour force		Employed		In labour force	
Arab	–0.031***		–0.371***		–0.080***		–0.309***	
	(0.002)		(0.002)		(0.004)		(0.004)	
Reference: Jewish								
Muslim		–0.051***		–0.446***		–0.102***		–0.369***
		(0.002)		(0.002)		(0.005)		(0.005)
Druze		–0.033***		–0.397***		–0.120***		–0.295***
		(0.007)		(0.007)		(0.011)		(0.014)
Christian		0.005		–0.098***		–0.011		–0.069***
		(0.003)		(0.004)		(0.008)		(0.010)
Observations	195 807	195 807	301 106	301 106	31 363	31 363	43 503	43 503

*, ** and *** indicate statistical significance at the 10, 5 and 1 per cent levels, respectively.

Notes: Marginal effects from probit regressions reported. Regressions include year dummies. Robust standard errors appear in parentheses.

Sources: LFS 1995–2016 and SS 2002–16.

In the even columns of this table, we break down the *Arab* variable into three distinct religious groups: Muslims, Druze and Christians. The results from these columns indicate that the disparities in labour market outcomes between Arabs and Jewish women are predominantly driven by Muslim women who, compared to Jewish women, are over 5 percentage points less likely to be employed, conditional on being in the labour force, and 45 percentage points less likely to be in the labour force. There is also a statistically significant difference between the LFP rates of Druze women and Jewish women.

In comparison to Muslims and Druze, there is less disparity between Christians and Jewish women. Although the estimated difference in LFP is statistically significant (Christians are 7–10 percentage points less likely to be in the labour force), there is no statistically significant difference in employment conditional on being in the labour force. One potential reason for this is that Christian women in Israel are more secular compared to Muslim and Druze women. The variation in LFP across different religious Arab groups supports the findings of Khattab (2002), indicating that Christian women have the highest LFP rate relative to Muslim and Druze women.[9]

5.2. Socio-economic and demographic factors

Table 2 presents estimates of equation (1) where the X vector is included in addition to the *Arab* variable. The coefficient on the *Arab* variable suggests that, even when controlling flexibly for age, educational attainment and marital status, there

[9] In table B2 of the online appendix, we have estimated the same regression using the full LFS sample. The results are very similar in magnitude.

Table 2. Relationship between socio-economic characteristics and women's labour market outcomes

	Labour Force Survey						Social Survey					
	Employed			In labour force			Employed			In labour force		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Arab	−0.018***	−0.011***	−0.011***	−0.363***	−0.266***	−0.262***	−0.062***	−0.054***	−0.056***	−0.310***	−0.226***	−0.217***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
Age group												
Reference: 18–24												
25–29	0.045***	0.028***	0.021***	0.188***	0.125***	0.137***	0.055***	0.036***	0.034***	0.121***	0.077***	0.106***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)
30–34	0.060***	0.043***	0.033***	0.197***	0.136***	0.153***	0.079***	0.059***	0.056***	0.098***	0.047***	0.088***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
35–44	0.069***	0.056***	0.046***	0.197***	0.147***	0.163***	0.088***	0.073***	0.072***	0.095***	0.060***	0.103***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.004)	(0.006)	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)
45–54	0.078***	0.066***	0.057***	0.161***	0.131***	0.148***	0.094***	0.084***	0.084***	0.059***	0.047***	0.092***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.006)	(0.006)	(0.008)	(0.007)	(0.007)	(0.008)
55–59	0.080***	0.069***	0.059***	0.016***	0.015***	0.035***	0.096***	0.086***	0.087***	−0.051***	−0.050***	0.000
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.007)	(0.007)	(0.008)	(0.009)	(0.009)	(0.010)
60–64	0.094***	0.083***	0.073***	−0.210***	−0.192***	−0.170***	0.093***	0.085***	0.087***	−0.268***	−0.253***	−0.198***
	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.005)	(0.009)	(0.008)	(0.009)	(0.010)	(0.010)	(0.011)
Educational attainment												
Reference: Primary or below												
Secondary school		0.023***	0.020***		0.189***	0.191***		0.035***	0.032***		0.167***	0.170***
		(0.004)	(0.004)		(0.004)	(0.004)		(0.010)	(0.010)		(0.009)	(0.009)
Matriculation		0.063***	0.061***		0.218***	0.218***		0.082***	0.079***		0.208***	0.204***
		(0.004)	(0.004)		(0.003)	(0.003)		(0.009)	(0.009)		(0.009)	(0.009)

Table 2. Relationship between socio-economic characteristics and women's labour market outcomes *(concl.)*

	Labour Force Survey						Social Survey					
	Employed			In labour force			Employed			In labour force		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Non-academic post-secondary		0.064***	0.061***		0.312***	0.314***		0.087***	0.083***		0.296***	0.299***
		(0.004)	(0.004)		(0.004)	(0.004)		(0.009)	(0.009)		(0.008)	(0.008)
Bachelor's degree		0.081***	0.077***		0.360***	0.362***		0.112***	0.107***		0.357***	0.358***
		(0.004)	(0.003)		(0.004)	(0.004)		(0.009)	(0.009)		(0.008)	(0.008)
Master's degree		0.089***	0.085***		0.378***	0.379***		0.120***	0.116***		0.370***	0.369***
		(0.004)	(0.004)		(0.004)	(0.004)		(0.009)	(0.009)		(0.009)	(0.009)
Doctorate		0.088***	0.085***		0.424***	0.425***		0.137***	0.132***		0.397***	0.398***
		(0.007)	(0.007)		(0.009)	(0.009)		(0.015)	(0.015)		(0.020)	(0.020)
Marital status												
Reference: Single												
Married			0.018***			–0.031***			0.010*			–0.073***
			(0.002)			(0.003)			(0.004)			(0.006)
Divorced/ separated			–0.014***			0.030***			–0.033***			–0.013
			(0.003)			(0.004)			(0.006)			(0.009)
Widow			0.009			–0.050***			–0.013			–0.102***
			(0.005)			(0.006)			(0.012)			(0.013)
Observations	195 807	153 461	153 461	301 106	230 136	230 136	31 363	31 229	31 229	43 503	42 911	42 911

*, ** and *** indicate statistical significance at the 10, 5 and 1 per cent levels, respectively.
Notes: Marginal effects from probit regressions reported. Robust standard errors appear in parentheses.
Sources: LFS 2001–16 and SS 2002–16.

remains a statistically significant and economically meaningful disparity in LFP between Jewish and Arab women. Using data from the LFS, the coefficients suggest that Arab women are over 1–2 percentage points less likely to be employed, conditional on participating in the labour force, and over 25 percentage points less likely to be in the labour force compared to Jewish women, conditional on age, educational attainment, marital status and district of residence.

The significant differences in the estimated coefficient on the *Arab* variable in tables B1 in the online appendix and table 1 indicates that a significant proportion of the disparity in LFP across the two groups can be explained by socio-economic factors. The coefficients on the age category indicators suggest an inverted U-shape age and LFP profile. In particular, women between the ages of 35 and 44 have the highest LFP rate, defined both in terms of employment and being in the labour force, while women over 60 have the lowest LFP rate.

The coefficients on educational attainment indicate that the probabilities of being employed and being in the labour force increase with educational attainment. Those in the labour force with a bachelor's degree are over 7 percentage points more likely to be employed and 36 percentage points more likely to be in the labour force than those who have not completed secondary education. The effect of education on LFP continues even beyond the bachelor's degree level, although at a more gradual rate. The positive relationship between educational attainment and LFP documented in table 2 is consistent with a large causal and correlational literature, suggesting that education increases LFP, especially among women (Khattab 2002; Yashiv and Kasir 2013; Totouom, De Paul Mboutchouang and Kaffo Fotio 2018).

The coefficients on the marital status variables show that married women are significantly less likely than single women to be employed or in the labour force. For example, data from the LFS and the SS respectively show that married women are 3 percentage points (column (6)) and over 7 percentage points (column (12)) less likely to be in the labour force. One potential reason for this is that married women are more likely to have children or other family duties that increase the opportunity cost of working. Another reason is that married women are likely to have another wage earner in the household (their husband), decreasing the incentive to seek paid work.

The coefficients on the divorced/separated indicator (column (6)) using the LFS sample indicate that divorced/separated women are 3 percentage points more likely to participate in the labour force than single women, conditional on age and educational attainment. One potential reason for this is the absence of a partner's support, which may influence their propensity to seek employment. Our empirical findings on the effect of marital status on labour market outcomes are consistent with life cycle labour supply models that predict a trade-off between utility from marriage and LFP/wages (Blundell, MaCurdy and Meghir 2007).

5.3. Religiosity

Table 3 presents estimates based on LFS data where the *Arab* variable and the *X* and *R* vectors are included. Our main interest is in the effect of religiosity on LFP. For the sake of simplicity, we do not present the coefficients on the *X* vectors in the table.

Table 3. Relationship between religiosity and women's labour market outcomes (LFS)

	(1)	(2)	(3)	(4)
	Employed		In labour force	
Reference: Secular				
Traditional	–0.008**	–0.008**	–0.020***	0.010*
	(0.003)	(0.003)	(0.004)	(0.004)
Religious	–0.008*	–0.005	–0.053***	–0.014*
	(0.003)	(0.004)	(0.005)	(0.006)
Very religious	–0.021***	–0.022***	–0.093***	–0.078***
	(0.004)	(0.004)	(0.006)	(0.006)
Arab	–0.007*	–0.003	–0.246***	–0.118***
	(0.003)	(0.006)	(0.004)	(0.008)
Arab × traditional		–0.004		–0.166***
		(0.007)		(0.009)
Arab × religious		–0.014		–0.184***
		(0.009)		(0.011)
Arab × very religious		0.055		–0.078**
		(0.035)		(0.028)
Observations	46 155	46 155	63 328	63 328

*, ** and *** indicate statistical significance at the 10, 5 and 1 per cent levels, respectively.

Notes: Robust standard errors appear in parentheses. Regressions include age dummies, educational attainment categories, marital status, district dummies and year dummies.

Source: LFS 2014–16.

In columns (1) and (3), the model imposes that the religiosity variables have the same effect on Jewish and Arab women. The coefficients here indicate a strong effect of religiosity on LFP. For example, religious women are 0.8 percentage points less likely to be employed and 5 percentage points less likely to be in the labour force than secular women; the figures for very religious women are over 2 and 9 percentage points, respectively. Columns (1) and (3) also show that when the religiosity variables are included in addition to the socio-economic variables, the coefficient on the *Arab* variable decreases in magnitude, suggesting that differences in religiosity also contribute to disparities in LFP.

In columns (2) and (4), we present estimated coefficients from models where the *Arab* variable is interacted with the religiosity indicators. The estimated coefficients indicate that the effect of religiosity is even stronger for Arab than for Jewish women. For example, being religious is associated with a 1 percentage point decrease in the probability of being in the labour force, but this association is stronger for Arab women (over 18 percentage points). In table 4 we present analogous results using the SS sample. The results from the probit models, (columns (1), (2), (5) and (6)) are very similar to those found using the LFS sample. Columns (3), (4), (7) and (8) use an instrumental variable (IV) probit model, instrumenting the religiosity binary indicators by family religiosity levels at age 15. The estimated coefficients are remarkably similar to the estimates

Table 4. Relationship between religiosity and women's labour market outcomes (SS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Employed		Employed (IV)		In labour force		In labour force (IV)	
Reference: Secular								
Traditional	−0.015***	−0.015***	−0.017	−0.016	−0.005	0.011	−0.006	0.007
	(0.004)	(0.004)	(0.015)	(0.017)	(0.005)	(0.006)	(0.018)	(0.022)
Religious	−0.032***	−0.026***	−0.033*	−0.029	−0.047***	−0.008	−0.050**	−0.013
	(0.004)	(0.004)	(0.014)	(0.018)	(0.005)	(0.006)	(0.017)	(0.022)
Very religious	−0.041***	−0.037***	−0.042	−0.039	−0.127***	−0.102***	−0.131***	−0.106*
	(0.006)	(0.007)	(0.034)	(0.041)	(0.007)	(0.008)	(0.031)	(0.043)
Arab	−0.052***	−0.038***	−0.052***	−0.037	−0.214***	−0.082***	−0.213***	−0.079
	(0.004)	(0.008)	(0.006)	(0.024)	(0.005)	(0.010)	(0.007)	(0.040)
Arab		−0.007		−0.010		−0.129***		−0.121*
× traditional		(0.011)		(0.044)		(0.013)		(0.058)
Arab		−0.027**		−0.019		−0.190***		−0.181***
× religious		(0.010)		(0.037)		(0.012)		(0.054)
Arab		−0.029		−0.022		−0.182***		−0.162*
× very religious		(0.020)		(0.081)		(0.020)		(0.076)
Observations	31 229	31 229	31 229	31 229	42 911	42 911	42 911	42 911

*, ** and *** indicate statistical significance at the 10, 5 and 1 per cent levels, respectively.

Notes: Marginal effects from probit regressions reported in columns (1) to (2) and (5) to (6). Marginal effects from IV probit regressions reported in columns (3) to (4) and (7) to (8) where the religiosity variables are instrumented by family religiosity at age 15. Regressions include age dummies, educational attainment categories, marital status, district dummies and year dummies (see table 2). Robust standard errors appear in parentheses.

Source: SS 2002–16.

from the standard probit model (columns (1), (2), (5) and (6)), suggesting that endogeneity is unlikely to be a serious concern. For example, the probit estimate suggests that religious individuals are 3.2 percentage points less likely to be employed than secular individuals, conditional on being in the labour force (column (1)), while the corresponding IV estimate is 3.3 percentage points.

The main difference between the standard probit and IV probit estimates can be seen in the interaction models where the dependent variable is employment. While the standard probit model indicates a statistically significant difference between religious Jewish women compared to secular Jewish women (column (2), 2.6 percentage points), the IV probit model indicates no statistically significant difference between these two groups (column (4)). Reassuringly, comparing columns (6) and (8) indicates that the religiosity variables are stable for Arab women for the LFP outcomes, again highlighting that endogeneity is unlikely to be a concern. Overall, these results demonstrate that it is important to consider religiosity as a key determinant of labour supply. These results are consistent with Khoudja and Fleischmann (2015), who find a negative religiosity–LFP gradient,[10] and the findings of Spierings (2014) in the case of Muslim women in Indonesia. However, these results are not in line with the aforementioned studies by Abdelhadi (2017) and Khattab, Johnston and Manley (2018). The differences between the studies may be associated with the way in which religiosity is measured, which varies depending on the survey data available, given that they mainly use secondary data. While the methodological issue of measuring religiosity is important here and is likely to be one of the reasons for the differential impact of religiosity on LFP among women in different countries, it is also possible that the country context and the period (year) in which the data were collected may be relevant. These factors make it difficult to generalize our findings to Western countries where Muslim women are migrants, given the difference in the social, cultural, historical and political context. Nevertheless, the findings of this study can certainly shed light on how higher levels of religiosity are associated with lower levels of LFP among women in Muslim countries (Spierings 2015).

5.4. Family structure and public policies

Tables 5 and 6 present the effects of family structure (as a proxy for public policies) on women's labour market outcomes using the LFS and SS, respectively. Columns (1) and (3) in table 5 show that, conditional on ethnicity, age, educational attainment and marital status, having a child under the age of 5 reduces one's probability of participating in the labour market by 8 percentage points. Compared with the effect of educational attainment, examined in table 2, having at least one child under 5 years old is sufficient to offset the increase in the likelihood of being in the labour force resulting from acquiring a bachelor's degree rather than a non-academic post-secondary school qualification. In terms of public policies, these estimates indicate that childcare services in Israel could be improved to help women with young children stay in the labour force. The

[10] Khoudja and Fleischmann (2015) measure religiosity by the extent to which participants agree with the statement "my religion is an important part of myself".

disparity in LFP rates between women with and without young children suggests that having young children to look after presents an important obstacle to working.

Columns (2) and (4) in table 5 indicate that the negative effect of having a child under the age of 5 on labour market outcomes is more detrimental for Arab than for Jewish women. Having a child under the age of 5 decreases the probability of participating in the labour force by over 10 percentage points for

Table 5. Relationship between family structure and women's labour market outcomes (LFS)

	(1)	(2)	(3)	(4)
	Employed		In labour force	
Arab	–0.011***	–0.013***	–0.261***	–0.254***
	(0.002)	(0.002)	(0.002)	(0.003)
Child under 5	–0.014***	–0.015***	–0.082***	–0.076***
	(0.002)	(0.002)	(0.002)	(0.003)
Arab ×		0.008		–0.026***
child under 5		(0.005)		(0.005)
Observations	153 461	153 461	230 136	230 136

*, ** and *** indicate statistical significance at the 10, 5 and 1 per cent levels, respectively.

Notes: Marginal effects from probit regressions reported. Regressions include age dummies, educational attainment categories, marital status, district dummies and year dummies (see table 2). Robust standard errors appear in parentheses.

Source: LFS 2001–16.

Table 6. Relationship between family structure and women's labour market outcomes (SS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Employed				In labour force			
Arab	–0.056***	–0.049***	–0.063***	–0.253***	–0.216***	–0.207***	–0.220***	–0.711***
	(0.004)	(0.005)	(0.004)	(0.044)	(0.005)	(0.006)	(0.004)	(0.050)
Child under 5	–0.016***	–0.012*	–0.016***	–0.016***	–0.077***	–0.071***	–0.081***	–0.080***
	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)	(0.006)	(0.005)	(0.005)
Arab ×		–0.021*				–0.024*		
child under 5		(0.008)				(0.009)		
% in subdistrict satisfied with transport			0.051**	0.027			0.090***	0.021
			(0.019)	(0.019)			(0.025)	(0.025)
Arab × % in subdistrict satisfied with transport				0.348***				0.907***
				(0.082)				(0.093)
Observations	31 229	31 229	31 229	31 229	42 911	42 911	42 911	42 911

*, ** and *** indicate statistical significance at the 10, 5 and 1 per cent levels, respectively.

Notes: Marginal effects from probit regressions reported. "% in subdistrict satisfied with transport" refers to the percentage of respondents in the subdistrict who report being satisfied or very satisfied with public transport. All regressions include age dummies, educational attainment categories, marital status and year dummies (see table 2). Columns (1), (2), (5) and (6) also include district dummies. Robust standard errors appear in parentheses.

Source: SS 2002–16.

Arab women. One potential reason for this is that there are differences in access to childcare services across these two groups. Another potential reason is that the influence of norms associated with the "rightful" role of mothers is more prevalent among Arab women as a group than is the case for Jewish women. A further possible reason might be that Arab mothers are, on average, younger. Thus, for example, the opportunity cost of not working is lower because younger workers are likely to earn less and therefore have less money for childcare.

Table 6 performs the same exercise using the SS. The estimates in columns (1)–(2) and in columns (5)–(6) are similar in magnitude to those from the LFS. In columns (3)–(4) and columns (7)–(8), the regressions include a variable for the percentage of respondents who are satisfied with public transport in their subdistrict of residence. The estimated coefficients indicate a positive correlation between the percentage of respondents who are satisfied with public transport and the LFP rate in that subdistrict. This effect is stronger among Arabs.

Overall, these results indicate that family structure and geographical mobility are important factors in explaining the LFP gap between Jewish and Arab women.

5.5. Human capital assets

In table 7, columns (1) and (3) present coefficient estimates of models that augment the socio-economic variables (age, educational attainment and marital status) with variables that capture further human capital assets. Columns (2) and (4) of this table interact these additional variables with the *Arab* variable. For these regressions, we only use the 2005 and 2006 waves of the SS since these are the only years that contain measures for both computer use and having a driving licence.

When we include human capital assets in the regression, in addition to basic socio-economic variables, the coefficient on the *Arab* variable drops in magnitude from over –0.25 (table 2) to roughly –0.17. This decrease in the magnitude of the coefficients is larger than when religiosity (see table 4) and family structure and public policy variables (see table 6) are included in the regression, indicating that differences in access to modern skills (human capital assets) can explain a large proportion of the disparity in labour market outcomes. These results therefore contribute to a growing literature that indicates the importance of modern human capital assets for LFP (Yashiv and Kasir 2013). They also lend support to policies that aim to improve LFP by increasing training in computer skills and other technical skills.

Columns (1) and (3) in table 7 suggest that there is a positive relationship between access to modern skills and LFP. Women who use computers are 16–17 percentage points more likely to be in the labour force. Similarly, women who have driving licences are 2.5 percentage points more likely to be employed and over 3.4 percentage points more likely to be in the labour force. There is little evidence that Hebrew proficiency is positively correlated with LFP.

When modern skills and Hebrew proficiency variables are interacted with the *Arab* variable, the results provide weak evidence that these effects vary

Table 7. Relationship between human capital assets and women's labour market outcomes

	(1)	(2)	(3)	(4)
	Employed		In labour force	
Arab	–0.028	–0.025	–0.172***	–0.191***
	(0.017)	(0.027)	(0.018)	(0.024)
Modernity variables				
Uses computer	0.036**	0.037**	0.162***	0.166***
	(0.013)	(0.014)	(0.015)	(0.017)
Has driving licence	0.025*	0.022	0.034**	0.020
	(0.011)	(0.013)	(0.013)	(0.014)
Hebrew level Reference: No Hebrew				
Poor	–0.037	–0.047	–0.068*	–0.058
	(0.032)	(0.038)	(0.030)	(0.041)
Average	–0.021	0.018	–0.046	–0.053
	(0.023)	(0.039)	(0.024)	(0.039)
Good	0.031	0.060	–0.010	–0.005
	(0.027)	(0.053)	(0.026)	(0.051)
Very good	–0.035	–0.069	0.105***	–0.072
	(0.024)	(0.050)	(0.031)	(0.076)
Arab × modernity variables				
Arab ×		0.022		0.056
has driving licence		(0.028)		(0.029)
Arab ×		0.000		–0.015
uses computer		(0.026)		(0.028)
Arab × Hebrew level				
Arab × poor		0.023		–0.025
		(0.067)		(0.061)
Arab × average		–0.074		0.011
		(0.052)		(0.050)
Arab × good		–0.051		–0.007
		(0.064)		(0.060)
Arab × very good		0.022		0.189*
		(0.059)		(0.083)
Observations	4 072	4 072	5 837	5 837

*, ** and *** indicate statistical significance at the 10, 5 and 1 per cent levels, respectively.

Notes: Marginal effects from probit regressions reported. Robust standard errors in parentheses. All regressions include age dummies, education attainment categories, marital status, district dummies and year dummies.

Source: SS 2005–06.

across ethnicities. Furthermore, there is no evidence that the impact of Hebrew proficiency levels on LFP differs across Arab and Jewish women, as indicated by the low significance of the estimated interaction between the *Arab* variable and Hebrew proficiency levels.

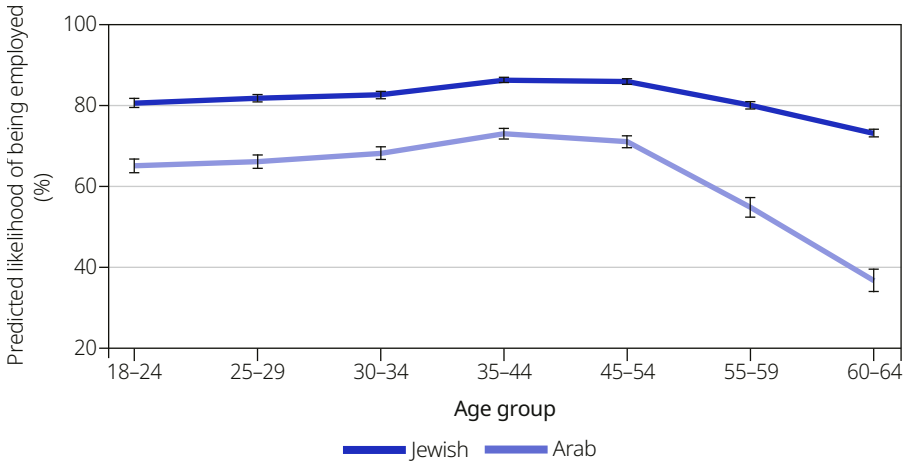
5.6. Early retirement

The results presented thus far indicate that for any given age Arab women are significantly less likely than Jewish women to participate in the labour market. An equally important and related question is whether Arab women are more likely than Jewish women to retire early and whether this varies across occupations.

Figures 2 and 3 use the estimates from our retirement models (see section 4) to plot age profiles for employment (figure 2) and LFP (figure 3) separately for Jewish and Arab women. The patterns depicted in these figures provide clear evidence that Arab women are much more likely to leave the labour force early compared to Jewish women. Both figures show a dramatic drop in employment and LFP rates after the age of 44–54, indicating that Arab women are more likely to retire after the age of 55. The figures show that by the age of 60–64, the gap in employment and LFP between Jewish and Arab women is of almost 40 percentage points.

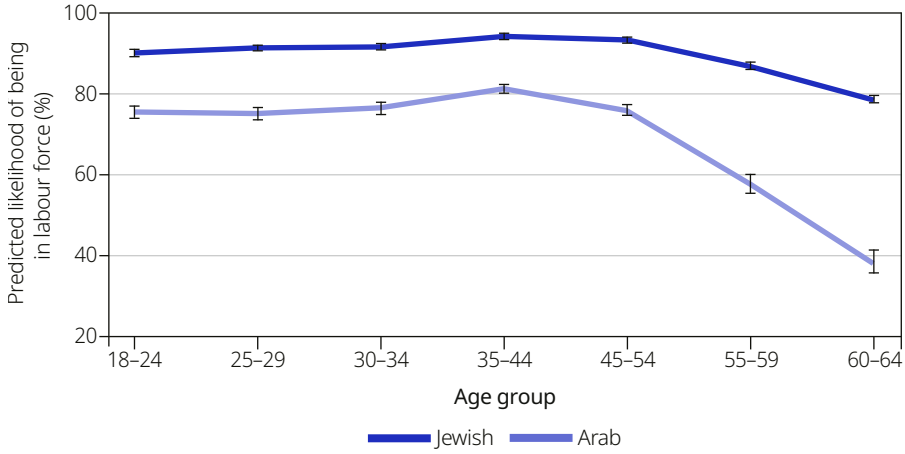
Our estimated coefficients for equation (2), presented in table 8, indicate that Arab women are 16.8 percentage points more likely than Jewish women to retire before the age of 55, conditional on educational attainment and occupation (column (1)). Thus, the microdata confirms the pattern observed in figures 2 and 3, indicating that Arab women are significantly more likely to retire early than Jewish women. In columns (2) to (4) of table 8, we estimate the regression by occupational categories. The estimates indicate heterogeneity across

Figure 2. Predicted likelihood of being employed by ethnicity and age, 1995–2016



Source: Authors' calculations based on 1995–2016 LFS data.

Figure 3. Predicted likelihood of being in the labour force by ethnicity and age, 1995–2016



Source: Authors' calculations based on 1995–2016 LFS data.

occupations: the early-retirement effects are strongest for individuals working in high-skilled occupations and weakest for individuals working in low-skilled occupations. For example, among women who work in high-skilled occupations, Arab women are 26 percentage points more likely to retire early than Jewish women; among women who work in middle-skilled occupations, Arab women are 13.7 percentage points more likely to retire early than Jewish women; and among low-skilled workers, there is no statistically significant difference in the retirement ages of Arab and Jewish women.[11]

There are several factors that explain early retirement among Arab women in Israel. First, employment is concentrated in demanding occupations, which are characterized by high levels of stress and are likely to leave older workers feeling drained and prone to burnout. Two thirds of Arab women in the labour force are employed by the welfare state in social service jobs (working as teachers, nurses and social workers, among others) (Shalev and Lazarus 2013). Second, the age differences between Arab couples (men generally being older) are greater than between Jewish couples (see table B6 in the online appendix). Couples often retire at the same time, which can help to explain why women generally retire earlier than men and, given the greater age gap between couples, why Arab women retire earlier than Jewish women. Of course, the age gap between couples could be partly attributable to the influence of cultural norms. Third, Arab women tend to have more children and to do so at a younger age; they will, therefore, be relatively younger when these children complete their studies and embark on a career. Table B6 in the online appendix shows that, for women in the 45–54 age group, the oldest child is on average 26 years old in the case of Arab women and only 23 years old in the case of Jewish women. Given

[11] It should be noted that there are no individuals with more than a bachelor's degree in this subsample.

Table 8. Early retirement and educational attainment (LFS)

Dependent variable: Probability of retiring before 55				
	(1)	(2)	(3)	(4)
	All jobs	Low-skilled	Middle-skilled	High-skilled
Arab	0.168***	0.134	0.137*	0.263***
	(0.036)	(0.073)	(0.059)	(0.063)
Educational attainment Reference: Primary or below				
Secondary school	0.006	0.027	0.041	–0.117
	(0.033)	(0.073)	(0.042)	(0.065)
Matriculation	–0.017	0.042	–0.007	–0.045
	(0.032)	(0.072)	(0.042)	(0.077)
Non-academic post-secondary	–0.001	–0.009	0.029	–0.009
	(0.031)	(0.067)	(0.043)	(0.069)
Bachelor's degree	0.011	0.083	–0.010	0.023
	(0.032)	(0.088)	(0.041)	(0.070)
Master's degree	–0.050		–0.025	–0.054
	(0.031)		(0.048)	(0.067)
Dependent variable mean	12.24	11.22	11.71	13.64
Observations	1 304	206	648	434

*, ** and *** indicate statistical significance at the 10, 5 and 1 per cent levels, respectively.

Notes: Sample includes individuals who retired during the survey period in which they are sampled (so that age of first retirement can be observed). Marginal effects from probit regressions are reported. Regression in column (1) includes nine one-digit occupation dummies. Column (2) estimates the regression on low-skilled workers (unskilled, industry/construction and skilled agricultural workers). Column (3) estimates the regression on middle-skilled workers (sales/services, clerical workers and managers). Column (4) estimates the regression on high-skilled workers (associate professionals and academic professionals). All regressions include year dummies. Robust standard errors appear in parentheses.

Source: LFS 1995–2006.

that some women are happier to retire once their children are established in the world of work, the fact that Arab mothers are younger than Jewish mothers when this happens may help to account for the earlier retirement of the former group. Fourth, as a result of having children earlier, Arab women are likely to become grandmothers before Jewish women. It is therefore possible that Arab grandmothers may be retiring early to support and thus give their working daughters, who also face greater challenges than others, a better chance to develop their careers.

Given the limited amount of attention that has been given to looking at the difference in retirement ages between Jewish and Arab women, we believe that these findings have important implications for policy. Since high-skilled and professional occupations tend to be better remunerated than lower-skilled occupations, the fact that early retirement tends to be concentrated in the former has implications for intergenerational mobility in the Arab community, reducing economic security and economic well-being.

6. Conclusion

This article has presented novel evidence on the differences in labour market outcomes between Jewish and Arab women living in Israel. We have documented three important differences in labour market outcomes across the two groups. First, although higher educational attainment generally correlates with an increased chance of employment, Arab women are less likely to be employed or to participate in the labour market compared to their Jewish counterparts, even when controlling for age, educational attainment, marital status and district of residence. Second, we detected a strong effect of religiosity on LFP, especially for Arab women in comparison to Jewish women. In fact, when controlling for religiosity, being part of the Arab group loses some of its importance in explaining the research question. Hence, we conclude that higher religiosity among the Arab survey participants in our sample, namely Arab women, leads to low LFP despite increasing levels of educational attainment, which is a pattern that has also been documented in other Arab and Muslim countries (Spierings 2015). Third, Arab women are much more likely to retire early than Jewish women. Possible explanations may include the more demanding and stressful nature of the social service sector jobs that Arab women tend to hold or the bigger age gap between Arab couples compared to Jewish couples in Israel. Furthermore, on average, Arab women tend to bear their first child earlier than their Jewish counterparts and earlier retirement may be linked to the age at which children become independent.

We have examined the factors that can contribute to these differences in LFP between Jewish and Arab women and have found that socio-economic and demographic factors, religiosity and public policy-related factors are important in explaining the gap. These results suggest that, in addition to improving institutional access to economic opportunities in areas such as higher education and employment recruitment processes, policymakers should also pay attention to additional factors that might enhance the effects of such institutions. Our results suggest a negative relationship between religiosity, all else being equal, and LFP, which is more in line with the findings in Read (2003). Nevertheless, the impact of religiosity on women's LFP in general, or Muslim women's LFP in particular, should be perceived as strongly contingent upon the context in which the study is conducted. For example, it is unlikely that the meaning of religiosity will be the same for a female Muslim graduate in a Western city, such as London, as it is for a woman living in a small village in a Muslim country, such as Indonesia.

It is possible that many religious women may opt for domestic activities, rather than work outside the home, not because of religious reasons and cultural norms per se, but due to the lack of employment opportunities that are found in places where these cultural norms exist. Religion and culture in Arab Palestinian communities tend to emphasize the role of women as mothers, which places the burden of responsibility for childcare primarily upon them. Therefore, our results suggest that the affordability of public childcare services and good public transport can be a particularly important means, in a less egalitarian cultural context, of encouraging the participation of Arab women in the labour force.

It should be emphasized that, although this study has not measured the effect of "culture" or "mentality" (as reflected in a woman's opinions about gender roles and the social status of women, and in the opinions of her husband, her parents and the parents of her spouse) on labour market outcomes, we believe that the impact of religiosity (which is examined in our study) is correlated with the influence of cultural values.

We have found that women who previously worked in high-skilled, professional occupations drive the differences in retirement age between Jewish and Arab women. This raises the concern that the early retirement of Arab women in such occupations will offset the gains from the general rise in high-skilled employment, thus slowing progress towards closing the economic gap between Jewish and Arab women. These findings therefore suggest that, while younger women should be encouraged to participate in the labour force, further study is needed to identify and better understand the underlying causes of earlier retirement.

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