Transitions between states of labor-force participation among older Israelis

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Abstract The study examines the labor-force behavior of Israelis at older ages, focusing on the determinants of the transitions between states of labor-force participation between 2005 and 2010. The study uses panel data from the first two waves of the SHARE-Israel longitudinal survey. A multinomial logit model is used to examine the impact of sociodemographic characteristics, health state, and economic resources on labor-force transitions of people aged 50–67. The results emphasize the role of age and poor health in “pushing” older people out of the labor force or “keeping” them there. Spouse’s participation is found to encourage individuals to leave the labor force or to refrain from joining it. However, living with a participating spouse is negatively associated with staying out of the labor force, consistent with the dominance of the complementarity of leisure effect found in the literature. Wealth as an economic resource available to individuals for retirement is also found to encourage individuals to leave the labor force or to refrain from joining it.

Keywords Labor-force transition · Retirement · Health · Wealth · Multinomial logistic regression · SHARE

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Introduction

Since the mid 1990s, the trend to early retirement that characterized OECD countries in the 1970s and the 1980s has waned; and during the 2000s, the proportion of labor-force participants aged 50–64 has even started to increase (OECD 2011). Concurrently, aging populations continue to put substantial pressure on public expenditure, and governments’ projections for public expenditure on pensions rely on the assumption that people will retire later. Accordingly, governments pursue policies that offer improved incentives for workers to extend their working lives. Toward this end, better understanding of the forces behind older workers’ transitions between labor-force states and the diverse patterns of retirement is needed.

This paper examines the labor-force behavior of older Israelis. The increase in the effective retirement age and older people’s participation rates since the late 1990s have been quite pronounced in Israel. This is mainly due to the increase of two years in the age at which people can first claim the basic old-age benefit from the social security and in the statutory retirement age. The eligibility age also applies to the defined benefit (DB) occupational pension plans. Between 2004 and 2010, the eligibility age for benefit (hereafter, the state retirement age) was gradually raised from 65 to 67 for men and from 60 to 62 for women, and the statutory retirement age was raised from 65 to 67 for both men and women.

In this paper, we focus on labor-force transitions among older Israelis aged 50–67 during the 2005–10 period using data from the first two waves of the Survey of Health, Ageing and Retirement in Europe (SHARE). The data are timely because the new statutory retirement age of 67 was announced just a year before the first wave was conducted. We use a probability model to examine determinants of the

choice of transition between labor-force states among respondents who were interviewed in both waves. We also present information about the observable changes over time in the participation rates and in the effective retirement age among the entire sample.

Literature review

According to the life-cycle retirement model developed by Gustman and Steinmeier (1986), an individual is assumed to maximize lifetime utility of consumption and leisure, subject to a budget constraint that does not allow lifetime consumption to exceed lifetime wealth. To find the optimal time paths of consumption and leisure, individuals will change their labor-supply path in response to changes in the budget constraint. Personal characteristics appear to play a role in determining such preferences.

The literature cites factors that explain labor-force transitions in later life. These include sociodemographic characteristics, health and health shocks, retirement incentives, employment characteristics, and attitudes and preferences for work and retirement. We relate to several of them.

Sociodemographic characteristics

Studies have found consistently that participation in the labor force declines with age and that the rate of dropout from the labor force accelerates as the retirement age approaches (Achdut and Gera 2008; Gordo 2011). Large spikes in the retirement hazard observed at the early and the normal state retirement ages have been well documented for both genders (Coile and Gruber 2000; Banks et al. 2010). Transition studies show that the tendency to retire increases with age and that the probability of entering the labor force after being out of it decreases with age (Thomson 2007; Zissimopoulos and Karoly 2007; Maestas 2010).

The labor-force behavior of older women differs from that of men. Several studies on transitions (Thomson 2007; Carr and Kail 2013) support the hypothesis that due to women's family role and responsibilities, including taking care of older spouses and parents, women are more likely to leave the labor force. However, an opposite hypothesis appears in the literature as well (Hill 2002; Kim and DeVaney 2005), claiming that older women are more likely to have a strong attachment to the labor market near the end of their work careers, since their employment history is more interrupted by family commitments.

Marital status is another important determinant in view of the evidence which found that joint retirement among couples is a common phenomenon (Gustman and Steinmeier 2002; Kapur and Rogowski 2006). Recent literature

has suggested different possible explanations for joint retirement, highlighting the spillover effects of one individual's financial incentives on the spouse's retirement behavior. Such spillover effects are likely due to both the income effect and the complementarity of leisure effect between the spouses (one enjoys leisure time more with a partner). In theory, the spillover effect can be negative (complementarity of leisure effect dominates the income effect) or positive. There is consensus that spillover effects are important and that complementarity of leisure is more important in explaining joint retirement than either correlation in preferences or shared household finances (Baker 2002; Gustman and Steinmeier 2002; Coile 2004; Banks et al. 2010; Casanova 2010). A related finding is that the wife exerts a stronger influence on the husband's retirement decision. Gustman and Steinmeier (2002) also found that having a retired spouse increases the probability of retirement. Thomson (2007) found that for men as well as women, having a working spouse encourages the individual to remain in full-time employment, whereas having a non-working partner mostly encourages full retirement.

With regard to minorities, the literature suggests two contrasting hypotheses. The first is that minorities are more likely to exit the labor force (Zissimopoulos and Karoly 2007) or to stay out of it insofar as they suffer from higher unemployment and unstable employment (Gordo 2011). The second hypothesis is that minorities need employment in their older years to bolster income due to the unfavorable labor market during their work history, and are thus less likely to retire fully or partially than the majority group. This was supported by Cahill et al. (2012) for Black men and non-Black women who were less likely to exit the labor force than white men, but other studies did not find a significant effect (Kim and DeVaney 2005).

Studies on the effect of education on labor-force transitions are mixed. Kim and DeVaney (2005) found that workers with more than a college degree were less likely to choose full retirement than to continue to work full time but more likely to move to partial retirement. In contrast, Thomson (2007) found that while workers with high and low education were more likely to retire partially (rather than continue working full time), those with moderate education displayed the opposite behavior. Thomson (2007) found that education was negatively related to either full or partial retirement among women, but positively related among men. Cahill et al. (2012) found that more educated men are more likely to remain in their job than to retire, but this effect was not significant for women.

Health

From a theoretical perspective, the relationship between health and labor-force participation is not self-evident and

potentially endogenous due to the dual causal connection between these variables (Benjamin et al. 2003; Haan and Myck 2009). The decision to work at older ages is affected by health, but employment may also have positive or negative impact on health, through income and time devoted to work, working conditions, or job satisfaction. Many empirical studies indicate, however, that individuals in poor health are more likely to drop out of the labor force and that the probability of exiting the labor force increases as health becomes poorer over time (Kim and DeVaney 2005; Thomson 2007). It has also been found that individuals in poor health are less likely to return to the labor force (Maestas 2010).

Resources for retirement

A higher level of household assets plays an important role in increasing demand for leisure time and decreasing the number of years of work without taking the risk of harming economic well-being. People who have more financial and/or real wealth (net of liabilities) are more likely to make an early exit from the labor force (Giandrea et al. 2009; Cahill et al. 2012). Living with a working spouse may be considered as an economic resource for retirement as well. Other economic resources for retirement include eligibility for an occupational pension and the kind of personal pension-insurance plans, DB or defined contribution (DC). Incentives to retire at particular ages in DB plans are stronger than in DC plans, and therefore a worker with a DB plan is more likely to retire (Maestas 2010).

The Israeli labor market

Israel is a multi-ethnic country inhabited by Jews from various backgrounds (75.5 % of the population in 2010), Arabs (20.5 % of the population, of which nearly 85 % are Muslim), and other non-Jewish groups (non-Arab Christians and those not classified by religion). Just over a quarter of the population, about 30 % of employed persons are foreign-born (Israel Central Bureau of Statistics 2013). In addition, non-Israeli temporary workers (cross-border and overseas labor migrants) make up a significant share (about 10 %) of the workforce.

In the past two decades (1990–2010), Israeli labor-force participation rose from 57 to 64 %. Male participation rates changed little over this period (around 68 %) with the exception of a shakeout of older male workers around the turn of the millennium. Labor-force participation rates among the 55–64 age group rose from 65 % in 2000 to 73 % in 2010, in contrast to the sharp decline from 1970–2000. Female labor-force participation increased strongly, from 47 % in 1990 to 60 % in 2010. The

participation rates of women in the 55–64 age group rose steadily as well, from 30 % in 1990 to 54 % in 2010 (Israel Central Bureau of Statistics 2013).

Despite the overall upward trend, Israeli labor-force participation remains low in comparison with the OECD average due to low participation among Arab women and “Ultra-Orthodox” Jewish men. These low-employment groups are characterized by high fertility rates and relatively low education. The segmentation of the Israeli labor market is expressed also in wage disparities. Low-paid employment is widespread among employees in low-skill sectors and among minorities (OECD 2010).

Most Israeli studies on the determinants of labor-force behavior are based on the Central Bureau of Statistics Labor Force Survey and relate to the entire population. As expected, the participation profile by age is hump shaped (Dahan 2007; Yashiv and Kasir 2011). In comparison with Jewish men, however, Arab men enter the labor market at younger ages, retire much earlier, and show a steeper decline in participation rates after the age of 50 (two main explanations for this are their higher concentration in “physical” occupations and their greater reliance on transfers from adult children). Education has a positive effect on females’ participation (among both Arabs and Jews). Among those who are married, men are more likely than women to participate. Among women, however, divorced and separated Jews and divorced and never-married non-Jews are more likely to participate than married women. Participation relates negatively to the number of children but positively to the number of earners in the household. Analyses also emphasize the adverse effect on participation of age and poor health (Achdut and Gera 2008; Yashiv and Kasir 2011).

Data, model, and variables

Data

This study takes advantage of a multidisciplinary longitudinal survey on persons aged 50 and older in Israel, conducted as part of the SHARE project. The survey includes microdata on health, employment status, socioeconomic status, and social and family networks. The longitudinal database for Israel is available for the first two waves of data collection, carried out in 2005–06 (a sample of 2,598 respondents in 1,752 households) and in 2009–10 (a sample of 2,464 respondents in 1,569 households). Of the total population interviewed in the first wave, 772 people were not interviewed in the second wave (184 of them died between the waves). The population investigated in this study was the 50–67 age group. Of the 1,706 respondents aged 50–67 in the first wave, 475 were not interviewed in

the second wave (56 died between the two waves, while 419 left for other reasons). Thus, the panel for our analysis comprises 1,231 persons aged 50–67 in the first wave. Respondents who dropped out (for reasons other than death) resembled the panel sample in age (56.6 vs. 57.1) and participation (61 vs. 59 %) but were less healthy (55 vs. 65 %). Those who died between the waves were slightly older (59.3 years), less likely to assess their health as good or very good (34 %), and less likely to participate (38 %).

The model

A multinomial logit (MNL) model is used to examine the determinants affecting the probability an individual followed a particular labor-force transition. The MNL model is an extension of the logistic regression model, and it is used in situations where the response variable is composed of more than two categories, and there is no natural ordering of the categories.

In our analysis, the dependent variable, labor-force transition, is a discrete variable that takes four unordered and independent outcomes: remaining in the labor force in both waves ($j = 0$), withdrawing from the labor force in the second wave ($j = 1$), joining the labor force only in the second wave ($j = 2$), or remaining outside the labor force in both waves ($j = 3$). This approach was used by other transitions studies (Glewwe et al. 2002; Niimi et al. 2004, 2007; Justino et al. 2008).

The probability that an individual belongs to any of the four categories is conditional on a set of p explanatory variables (x) and is given by the conditional probability model in Eq. 1:

$$\Pr_{ij}(y = j|x_i) = \frac{\exp(x_i\beta_j)}{1 + \sum_{k=1}^j \exp(\beta_k x_i)} \quad (1)$$

The reference category in our model is “remaining in the labor force in both waves” ($j = 0$). To find the relationship between this probability and the explanatory variables, the multinomial logistic regression model then is given in Eq. (2), where $\pi_j(x_i) = \Pr_{ij}(y = j|x_i)$ and β_j are the parameters to be estimated:

$$\log \left[\frac{\pi_j(x_i)}{\pi_0(x_i)} \right] = \beta_0 + \beta_{1j}x_{1i} + \beta_{2j}x_{2i} + \dots + \beta_{pj}x_{pi} \quad (2)$$

where $j = 1, 2, 3$

The model parameters β_j are estimated by the method of maximum likelihood. To determine the correct specification of the model, a likelihood ratio test is used to jointly test the significance of explanatory variables.

Finally, the MNL model is an appropriate model to use if the Independence of Irrelevant Alternatives (IIA)

assumption holds. That requires the odds ratio between any two choices to be independent of other available choices (Winkelmann and Boes 2005). The Hausman (1978) test results support the IIA assumption, which means that the difference in coefficients is not systematic when we exclude one of the outcomes from the model ($P = 0.9985$). The Small and Hsiao (1985) exact test also supports that result ($P = 0.7583$). However, as will be mentioned later, the estimation of the multinomial probit model leads to the same results.

Variables

The dependent variable (LFT) is the labor-force transition between the two waves chosen by an individual i . To determine if an individual belonged to the labor force, we use responses to items about working for pay and self-reported labor-force status. Respondents are recorded as participants in the labor force if they reported that they had worked for pay in the last week, even if they defined themselves as “retired,” “disabled,” or “unemployed.”

The explanatory variables are based on the theoretical model and previous studies. Table 1 presents the three sets of variables that we include in our empirical model. The first set considers *sociodemographic characteristics* of the respondent as reported in the first wave: age, gender (dummy variable, male = 1), an interaction variable between age and gender, number of children born to the family, an ethnicity indicator for Jewish and non-Jewish (Jewish = 1), an interaction variable between ethnicity and gender, and education (years of study). We also added a variable that indicates whether the respondent reached the new state retirement age in Wave 2 (dummy variable, age equal to or above state retirement age = 1). The second set includes variables on *health* and functioning as reported in Wave 1: the number of chronic illnesses and limitations in routine activity due to a health problem (a dummy variable: having limitations = 1). The third set includes two variables related to the individual’s *retirement resources (incentives)*: (a) an interaction variable between respondent’s living with a spouse and the labor-force status of the respondent’s spouse in Wave 1. Three categories are defined: living without a spouse (dummy variable: yes = 1), living with a spouse in the labor force (dummy variable: yes = 1), living with spouse out of the labor force (dummy variable: yes = 1). The first category serves as a reference group. (b) Family’s net wealth in Wave 1, which is equal to the sum of real and financial assets net of liabilities. The variable comprises four categories according to level of wealth in terms of wealth distribution quartiles. A dummy variable is defined for each category (belong to quartile = 1), with the first category serving as a reference group. We also consider two alternative variables for

Table 1 Transitions between states of labor-force participation, ages 50–67 in Wave 1 (pct.)1, 2

Variable	Categories	W1—In labor force; W2—In labor force	W1—In labor force; W2—Not in labor force	W1—Not in labor force; W2—In labor force	W1—Not in labor force; W2—Not in labor force	F/χ^2
Population		47.7	14.2	6.4	31.7	
<i>Sociodemographic characteristics</i>						
Age (avg.)		56.4	57.7	60.3	60.0	49.06***
State retirement age	Passed state retirement age	20.7	15.2	6.2	57.9	196.53***
	Up to state retirement age	57.1	12.3	5.9	24.7	
Gender	Male	59.9	13.6	5.1	21.4	51.16***
	Female	37.6	14.9	7.4	40.1	
Ethnicity	Jewish	51.1	14.7	6.5	27.7	125.99***
	Non-Jewish	24.2	10.8	5.2	59.8	
Education		13.5 (3.8)	12.7 (3.9)	13.1 (4.0)	10.4 (4.6)	60.51***
Number of children (avg.)		2.3 (2.1)	2.0 (1.9)	1.9 (2.0)	2.4 (2.6)	1.98
<i>Health and functioning</i>						
Chronic (avg.)		1.2 (1.2)	1.4 (1.4)	1.5 (1.2)	2.1 (1.8)	21.57***
Limitations	Limitations in Activity	27.5	10.7	9.4	52.4	114.83***
	No-limitations in activity	57.4	15.9	4.9	21.8	
Subjective health assessment	Excellent	59.4	12.3	4.7	23.6	96.63**
	Very good	60.5	12.8	3.9	22.8	
	Good	50.1	17.5	6.5	25.9	
	Fair	32.9	16.3	11.6	39.2	
	Poor	16.5	7.8	3.4	72.3	
<i>Retirement resources of the individual or family</i>						
Spouse	No spouse	47.8	14.2	6.3	31.7	347.19***
	Spouse in the labor force	67.8	17.4	1.6	13.2	
	Spouse out of the labor force	18.4	9.5	13.2	58.9	
State retirement age (spouse)	Passed state retirement age	17.9	16.4	5.4	60.3	145.78***
	Up to state retirement age	54.3	11.7	4.8	29.2	
Net worth (avg.)		100,497	96,969	138,072	93,046	2.73**
Net worth	Quartile 1	51.3	11.8	4.8	32.1	14.02**
	Quartile 2	41.8	12.9	7.6	37.7	
	Quartile 3	48.8	18.8	5.6	26.8	
	Quartile 4	46.5	13.1	6.5	33.9	
Assets	Own a home	49.3	14.8	7.1	28.8	39.98*
	Doesn't own a home	49.9	14.3	5.6	30.2	
Months elapsed between the two a Waves		47.6 (3.9)	48.1 (3.3)	47.5 (3.7)	47.5 (3.7)	2.58*

Weighting is based on weights of Wave 1. *Parentheses* denote standard deviation value

* $P < 0.1$; ** $P < 0.05$;

*** $P < 0.01$

retirement incentive: (c) ownership of real assets (dummy variable, yes = 1) and (d) an interaction variable between respondent's living with a spouse and an indication whether the spouse passed or did not pass the state retirement age in wave 2. Finally, we add a variable to indicate the number of months that elapsed between the two waves.

Similar to models used by several studies to examine retirement paths and transitions to bridge jobs (Kim and DeVaney 2005; Zissimopoulos and Karoly 2007; Cahill et al. 2012), our main specification includes the spouse's labor status and wealth measures as explanatory variables. However, we are aware of the potential endogeneity of these variables, particularly of the spouse's labor, in a model that explains labor-force participation. A possible alternative variable to the spouse's labor status as a retirement incentive is whether the spouse has passed the state retirement age at which people become eligible to the almost universal basic old-age benefit. There are large spikes in the retirement hazard at the state retirement age for both men (67) and women (62). With regard to net wealth, it is accumulated over the life cycle through income generated in the labor market as well as through inheritance (Semyonov and Lewin-Epstein 2013). It also tends to increase with age, but at a diminishing rate. Moreover, it is reasonable to assume that the endogeneity of house ownership is even weaker because of the lower liquidity (compared to financial assets) and because most Israelis (75 % and more) live in their own apartment and continue to do so when they become older (71 % among those aged 50+). Therefore, we estimate two additional specifications of the model: in the first, we replace the spouse's labor-force status with the variable indicating whether the spouse has passed the state retirement age, and in the second, we replace net wealth with ownership of real assets (dummy variables) as well.

Descriptive statistics¹

Labor force participation rates and effective retirement age

Based on the data of the entire sample of each wave, the labor-force participation rate was 56 % in Wave 1 and increased to 61 % in Wave 2. The participation rate rose from 68.7 to 70.4 % for men and from 48.6 to 49.3 % for women. Figure 1A1, A2 presents the participation rates by age for the two waves and for men and women, respectively. As expected, participation decreases with age, but

the curve of Wave 2 runs above that of Wave 1 across almost the entire age range. The increase in participation rates is more significant at around 60–67 years of age for men and around 57–63 years of age for women, indicating a possible effect of the increase in the state retirement age. Another indication of this effect is provided by comparing the average actual retirement age of workers who retired in 2005–10 with that of workers who retired in 1990–2004. The average age of actual retirement increased between these periods from 60.8 years to 62.7 for men and from 59.9 years to 61.1 for women.

Descriptive statistics of the model variables based on the panel sample

Descriptive statistics of the variables used for the analysis as well as Chi-square and ANOVA tests for examination of the bivariate association between labor-force transitions and each of the explanatory variables are presented in Table 1. The distribution of the panel population among the groups of labor-force transition between the waves shows that 47.7 % continued to participate, 14.2 % exited, 6.4 % joined, and 31.7 % remained out of the labor force. With the exception of the number of children, differences in the rates of labor-force transitions across the various sociodemographic and economic categories are statistically significant. The determinants of these labor-force transitions will be described in detail on the basis of the multivariate analysis presented in the next section. However, the findings related to the non-Jewish part of the sample are worth mentioning here. This group comprises 12.3 % of the 50–67-year-old respondents in Wave 1, most of them Arabs. As shown in Table 1, only 25 % of the non-Jewish group belonged to the labor force in both waves, and almost 60 % were out of the labor force in both waves.

Results of the multinomial logit analysis

Table 2 presents the average marginal effects (AME) of each of the explanatory variables in the estimated models. The AME of any explanatory variable is the average marginal effect calculated separately across all the individuals, and it indicates the change in the probability of the occurrence of an event that defines the dependent variable (the probability of labor-force transition) due to a one-unit change in the explanatory variable, other variables held constant. By multiplying the marginal effect by 100, we obtain the change in percentage points. The advantage of the marginal effects on the estimated coefficients β is that one can compare their absolute values among the multinomial models. The reference group comprises respondents who belonged to the labor force in both waves.

¹ For the purpose of the descriptive statistics, we use the sample weights of Wave 1, whereas the multivariate econometric analysis is carried out with no weighting of the sample.

Fig. 1 Labor-force participation rates, *Wave 1* and *Wave 2* (pct.)

The results of the three specifications are similar, and there are no directional changes in the marginal effects and no meaningful changes in their significance. In the following analysis, we will refer to the results of the main specification.

Withdrawal from the labor force

The findings indicate a positive association between age and the probability of withdrawal from the labor force. Each year increases the probability of withdrawal by 0.7 % points compared with the probability of remaining in the

labor force. Passing the state retirement age (62 for women and 67 for men) increases the probability of exit by 16.8 % points. Taking into account the effects of gender (negative), ethnicity (positive), and of the interaction term between gender and ethnicity (negative), it is found that Jewish men are the least likely to withdraw from the labor force, followed by non-Jewish men. Being Jewish decreases the probability of men exiting the labor force by 11.5 % points (the difference between 0.399 and -0.285). In contrast, non-Jewish women are less likely to withdraw than Jewish women. Education is negatively associated

Table 2 Multinomial logit model of transitions between states of labor-force participation, different specifications, ages 50–67 in Wave 1: marginal effects (reference group: participation in both waves)

Variables	Main specification			Specification 1			Specification 2		
	W1—In labor force; W2—not in labor force	W1—not in labor force; W2—In labor force	W1—not in labor force; W2—not in labor force	W1—In labor force; W2—not in labor force	W1—not in labor force; W2—In labor force	W1—not in labor force; W2—not in labor force	W1—In labor force; W2—not in labor force	W1—not in labor force; W2—In labor force	W1—not in labor force; W2—not in labor force
Age	0.007***	-0.007***	0.017***	0.017***	-0.006**	0.016***	0.016***	-0.006**	0.010***
Passed state retirement age	0.168***	-0.027**	0.062**	0.154***	-0.038**	0.086**	0.161**	-0.031**	0.090**
Gender	-0.285**	-0.028	-0.387***	-0.247**	-0.025	-0.622**	-0.234**	-0.031	-0.581**
Age*Gender	0.010	0.011	0.019**	0.011	0.002	0.015*	0.010	0.002	0.009*
Ethnicity	0.032**	0.009*	-0.298***	0.045*	0.015**	-0.312***	0.053*	0.021**	-0.276**
Ethnicity*gender	-0.146*	0.051*	-0.246**	-0.191**	0.074**	-0.244*	-0.181**	0.075**	-0.218*
Education	-0.001*	0.003**	-0.016***	-0.001*	0.006*	-0.014***	-0.002*	0.003*	-0.016***
Number of children	0.004*	-0.006*	-0.014**	0.003*	-0.007*	-0.006**	0.006*	-0.009*	-0.008**
Chronic Limitations	0.010**	-0.007**	0.029**	0.008*	-0.004***	0.041***	0.012*	-0.005**	0.041***
Spouse in the labor force	0.037**	-0.049***	0.294***	0.051*	-0.028**	0.241***	0.049*	-0.025**	0.258**
Spouse out of the labor force	0.039**	-0.049**	-0.082**						
Spouse passed state retirement age	-0.031	0.038**	0.307***	-0.097***	-0.048*	0.056**	-0.124***	-0.038*	0.073**
Spouse did not pass state retirement age				0.325**	0.066**	-0.040	0.312***	0.076***	-0.045
Net worth-Q2	0.048*	-0.046**	0.027**	0.051*	-0.037*	0.019**			
Net worth-Q3	0.085***	-0.008*	0.017	0.074**	-0.011*	0.013			
Net worth-Q4	0.026**	-0.023	0.004	0.031**	-0.031*	0.008			
Assets							0.042	-0.008**	0.037**
Months Obs.	-0.012**	-0.002	0.007**	-0.010**	-0.002	0.005**	-0.008**	-0.001	0.004**
Log-likelihood	1,156	-957.4		1,156	-908.2		1,156	-898.3	

* $P < 0.1$; ** $P < 0.05$; *** $P < 0.01$

with exiting the labor force, but the marginal effect is relatively small and only significant at the 10 % level. Older people in poor health are more likely to withdraw from the labor force than their healthy peers. As for household composition variables, the number of children is positively correlated with the probability of exiting the labor force. Also, compared with those who do not live with a spouse, those living with a spouse who participates in the labor force are more likely to leave the labor force than to stay in it. However, the marginal effect of living with a spouse who does not participate in the labor force is not significant. The marginal effects of net wealth indicate that wealthier people are more likely to withdraw from the labor force than to continue participating. However, the relationship is not linear. Compared with those in the first quartile of the wealth distribution, the probability of withdrawal among people in the second quartile is 4.8 % higher, those in the third quartile 8.5 % higher, and those in the fourth quartile, 2.6 % higher.

Entering the labor force after being out of it

As expected, age is negatively related to the probability of entering the labor force in Wave 2. The negative marginal effect of being at or above state retirement age is even more pronounced. Jewish men are the most likely to enter the labor force, followed by Jewish women. The effect of the number of children is negatively related to the likelihood to joining the labor force. The marginal effect of education is positive. Poor health is negatively related to the likelihood of entering the labor force. The number of limitations in activity due to health problems is the most influential health variable. As for financial incentives, while living with a spouse who participates in the labor force discourages entering the labor force, living with a non-participating spouse encourages entering the labor force in Wave 2. The probability of entering the labor force decreases with the level of household wealth (although the marginal effect of the wealthiest is not significant).

Remaining out the labor force

In general, the marginal effects of the sociodemographic and health determinants are stronger than those estimated for the two previous transitions. The probability of remaining out of the labor force increases with age and is stronger among men than among women (the interaction term is positive). Those who pass the state retirement age are more likely to stay out of the labor force. Men are much less likely than women to stay out of the labor force than to persist in their participation. Also, Jews are less likely to remain out of the labor force. Since the effect of the interaction term between gender and ethnicity is negative

as well, Jewish men are least likely to remain out the labor force (by 93 % points compared to non-Jewish women). All health variables are significant, and poor health is positively related with being out of the labor force in both waves. The marginal effect of education is negative. The probability of remaining outside the labor force decreases with the number of children in the family. The findings in regard to spouse's labor-force status are consistent with the dominance of complementarity of leisure effect found in the literature. Net wealth has an effect on remaining out the labor force only for the second quartile.

Alternative models and robustness checks

To test the robustness of the findings in this study, we estimate two alternative models as well as alternative specifications of our model (results available on request). First, a multinomial probit model and two separate logit models (the first for leaving the labor force among those who were initially in the labor force, and the second for entering the labor force among those who were initially out of labor force) were estimated. These models produce similar results to the MNL model, and there are no directional changes in the marginal effects and no meaningful changes in their significance. Second, although we are aware that our sample is relatively small, we estimate the MNL model separately for men and women. In general, no significant differences were found. Two findings are worth mentioning: (a) similar to the MNL model, non-Jewish women are less likely to withdraw from the labor force compared to Jewish women; and (b) education is positively related to withdrawal of men from the labor force, but negatively with regard to women. However, these effects are only significant at the 10 % level.

Third, we estimate MNL models on the basis of three additional samples: people aged 50–69 (70 is the eligibility age for old-age benefit independently of earnings), 50–65 (65 is the previous statutory retirement age), 50–67 for men, and 50–62 for women (67 and 62 are the current state retirement ages for men and women, respectively). The results are similar to the main specification. Fourth, in addition to the two alternative specifications to the main model presented in Table 2, we estimate the model using the self-assessment of health status instead of the number of chronic illnesses and limitations in routine activity. No significant differences were found.

Discussion

This paper examined the determinants of labor-force transitions among Israelis aged 50–67. Most of the findings are in line with previous studies. Health and age are strongly

related and both play a significant role in “pushing” older people out of the labor force or keeping them there. The effect of age on participation becomes stronger near or at the state retirement age, particularly in the case of transition from participation to non-participation.

Those in poorer health are more likely to withdraw in the future from the labor force or to remain out of it, and are less likely to join it. From a policy perspective, investment in health in older age is important not only for improving the quality of life, but also for increasing the participation of older people in the labor market—as policymakers expect to achieve through postponing the state retirement age. Education is another significant determinant of the labor-force transitions. The probability of leaving the labor force falls, and the probability of joining it increases as the level of education rises. Having less education is associated with having fewer opportunities in the labor market and having unstable employment and low-paid jobs.

Consistent with the predicted impact of family responsibilities that women face, older men in Israel have a lower tendency to exit from the labor force or to remain out of it. Jewish men have the strongest attachment to the labor force: they are the least likely to exit from the labor force or to remain out of it, and they are most likely to join it. Jewish women are more likely to join the labor force and less likely to stay out of the labor force than are non-Jewish women, but they are more likely to exit from it. This finding is in line with the hypothesis raised in the literature that minorities need employment in their later life to bolster income due to the unfavorable labor market that they face during their work history, and thus are expected to be less likely to retire than the majority group (Cahill et al. 2012). However, in view of the relatively small number of non-Jewish women who belong to the labor force, caution is needed in interpreting this finding. From a policy perspective, the challenges are to encourage Arab women to join the labor market when they are young and to remove obstacles to their integration, and to encourage Arab men to postpone their retirement. The OECD report on the Israeli labor market recommended addressing barriers to work for minorities by greater investment in education and in the capacity of employment and training services (OECD 2010).

We found that spousal labor-force status has a spillover effect on the labor-force behavior of the individual. However, the dominance of the complementarity of leisure effect over the income effect found in the literature is supported only partially by our findings: living with a participating spouse is negatively associated with staying out of the labor force. The marginal effects of the other transitions indicate the dominance of the income effect: living with a partner who participates in the labor force

encourages exit from the labor force and discourages entrance to it, and those living with a non-participating spouse are less likely to exit and more likely to enter. Using the variable on whether the spouse has passed the state retirement age leads to the same conclusions.

Wealth is also considered an economic resource for retirement (Cahill et al. 2012; Quinn et al. 1998). Our findings show that wealthier people are more likely to withdraw from the labor force (albeit the relationship is not linear) and less likely to enter it. Using the ownership of real assets as an alternative economic resource leads to the same findings. Future research can expand the examination of the impact of changes in the level of financial assets and in housing prices on the labor supply of older people. Recent studies for the U.S. found that the 2008 crisis increased the probability of working at the age of 62 (Goda et al. 2011), and that losses in the value of stock and other assets lead people to continue working (Hurd and Rohwedder 2010).

The robustness checks we conducted reinforce our findings. However, the study has a few limitations. We are aware of the potential endogeneity in our main model of a spouse’s participation and of its consequences in terms of biased coefficients. However, we estimated alternative specifications, using the eligibility for basic old-age benefit as a financial incentive and as a variable that is correlated with spouse’s employment but not with the labor status of the agent. We are also aware of the potential endogeneity of wealth in a model that explains labor-force participation, but we maintain that the problem, especially when using only the real assets, is to a certain degree of less concern.

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