Human Capital Investment and Nonparticipation: Evidence from a Sample with Infinite Horizons (Or: Jewish Father Stops Going to Work)

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Abstract

Between 1970 and 1993 labor force participation of prime aged Israeli males dropped from 94% to 86%, the lowest rate in the developed world. Expansion of military service was the main cause in the 1970s but participation continued to fall in the 1980s despite the shrinking population share of the military. Along with causes that are common to other countries — increased disability and discouraged work-seekers — a unique Israeli feature is increased full-time *yeshiva* (ultra-orthodox school) attendance. *Yeshiva* attendance increased through the 1980s despite the low return to investment in *yeshiva* education, especially when compared to the increasing returns to secular education and to labor market experience. We investigate various explanations for these trends.

The Maurice Falk Institute for Economic Research in Israel
Jerusalem: May 1997 ✧ Discussion Paper No. 97.05

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1. Introduction

The total labor force participation rate of Israeli males of prime age (25–54) is low and falling. Between 1970 and 1993 it dropped by 7.8 percentage points, from 93.5% to 85.7% of the population. This decline casts a shadow on the encouraging drop in Israeli unemployment in the first half of the 1990s as a large proportion of the adult male population remains not-employed. Over the 1980s increased unemployment caused great concern in Israel. Yet increased nonparticipation by prime-aged men accounted for a greater increase in non-employment than did increased unemployment.

Figure 1 compares the nonparticipation rate for men aged 35–44 with the male unemployment rate.[1] Unlike unemployment, male nonparticipation in Israel is hardly cyclical and extremely persistent. In the early 1970s nonparticipation increased despite a drop in unemployment. Between 1992 and 1994 the unemployment rate dropped by three percentage points (from 9.2% to 6.2%) while the nonparticipation rate decreased by only 0.7 (from 13.1 to 12.4). Nonparticipation is persistent for individuals as well. Fully 87% of nonparticipants in 1993 had not worked at all in the previous year (CBS, 1995, p. 276).

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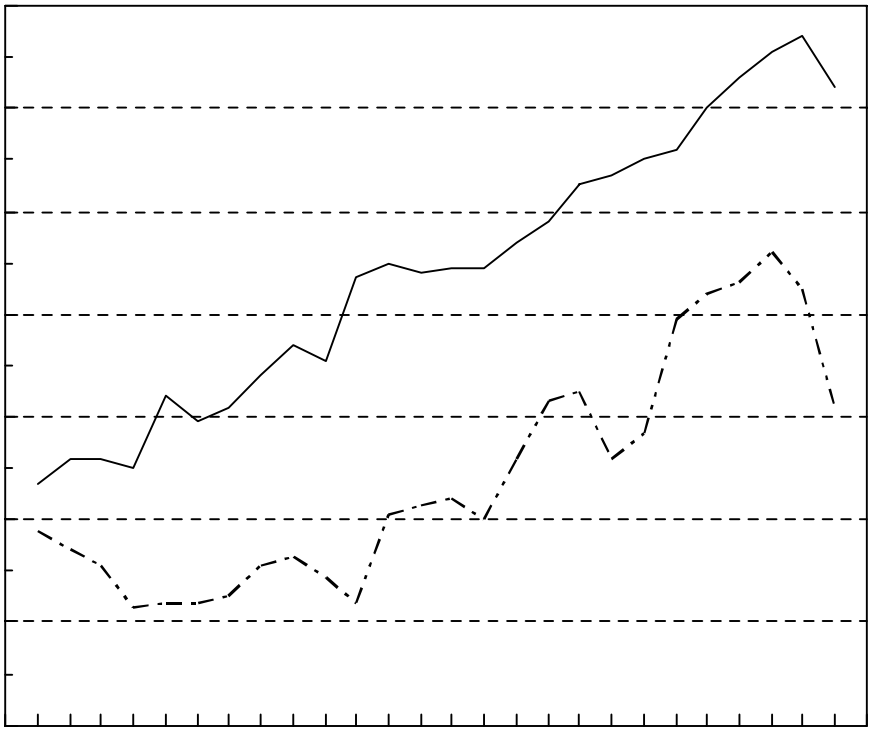
* We paraphrase the title "Jewish Mother Goes to Work," by Yoram Ben-Porath and Reuben Gronau (1985). We thank David Boxenhorn, Menahem Friedman, Kevin Lang and seminar participants at the Hebrew University for helpful conversation and comments, Ze'ev Krisher of the Central Bureau of Statistics for his assistance in providing access to previously classified data and in interpreting LFS data, the Hebrew University Social Sciences Database for data management, and Gil Barzilai for research assistance.

[1] The 35–44 year old group is indicative. They are too old to reflect changes in military or university attendance and too young to reflect trends in retirement.

Figure 1. Nonparticipation and Unemployment Rates, Men Aged 35–44



The Israeli decline in participation of prime aged men in the 1970s and 1980s has been far greater than that in the United States and Western Europe.[2] Table 1 compares Israel's rate with those of other developed countries. For instance, by the early 1990s Israel's civilian participation rate for prime aged males was 5.6 percentage points lower than the American.

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[2] Throughout the text we distinguish between civilian and total participation rates. In most countries, as in Israel, the labor force excludes persons serving in the army, but the comparison countries calculate participation rates by deducting the military from the denominator as well to form *civilian* nonparticipation rates. By contrast, the Israel Central Bureau of Statistics (CBS) participation rates are the ratio of *civilian* labor force to *total* population, and hence are somewhat lower. We call them *total* participation rates. The 1993 civilian rate is 87.8%, compared to a total rate of 85.7%.

Nonparticipation of prime aged men evokes concern for the same reasons that unemployment does: the families of nonparticipants suffer reduced income and often poverty; and nonparticipants produce little tax revenue and often impose large costs on the social welfare system. In 1993, 14.7% of Israeli children lived in the households of nonparticipating prime aged men.[3]

Table 1. Labor Force Participation Rates of Men Aged 25–54, Selected Countries
(civilian labor force *divided by* civilian population)

	Early 1970s	Early 1980s	Early 1990s
Austria	96.4 ('71)		94.1 ('93)
Denmark	95.9 ('70)	95.1 ('81)	92.0 ('94)
Spain	95.7 ('70)	87.1 ('79)[a]	92.7 ('94)
France	95.8 ('68)	95.3 ('81)	95.3 ('94)
Germany[b]	96.2 ('70)	95.5 ('81)	93.8 ('94)
Switzerland	98.0 ('70)	97.7 ('80)	97.3 ('90)
Canada	92.0 ('71)	91.6 ('80)	91.3 ('94)
United States	94.0 ('70)	93.8 ('81)	93.5 ('94)
Israel	93.5[c] ('70)	91.5 ('81)	87.8 ('93)

[a] The drop may be due to the exclusion of Spanish workers who were migrating abroad in the 1970s.
[b] Until 1994 — German Federal Republic.
[c] Civilian labor force *divided by* total population

Source: ILO, *Yearbook of Labor Statistics*, various issues; Table 3 below.

Table 2 shows extremely high nonparticipation rates for men with large families. Men in households with more than 4 children (5% of the population) have a nonparticipation rate of over 25%, compared to an average of 14%. Nonparticipation among the disadvantaged also deserves special attention. The rate for prime-age men with less than 8 years of schooling (12% of the population) is over 20%. Surprisingly, the table also shows high nonparticipation among men with many years of education. We will return to these issues below.

[3] Authors' calculation from LFS micro data. Children are aged 15 or less.

Table 2. Nonparticipation of Prime-Aged Males, by Education and Family Size: 1993

	Frequency in population	Nonparticipation rate
Years of schooling		
0	0.02	0.56
1–4	0.01	0.24
5–8	0.12	0.2
9–10	0.12	0.11
11–12	0.32	0.1
13–15	0.19	0.12
16+	0.21	0.19
Unknown	0.004	0.27
Total	1	0.14
Number of children		
0	0.305	0.19
1	0.223	0.09
2	0.223	0.1
3	0.138	0.12
4	0.059	0.16
5	0.027	0.26
6	0.014	0.32
7	0.006	0.37
8+	0.006	0.56

Source: Authors' calculations from LFS microdata, documented in Appendix Table 1. Number of children is measured as the number of persons aged 15 or less residing in the household.

Possible explanations: Theory and Institutions

Economic theory suggests two groups of explanations for the decline in labor force participation: reasons connected with declining returns to work (higher unemployment and lower wages) and those stemming from increased unearned incomes (higher social or private transfers).[4]

[4] Early retirement is generally regarded as the prime reason for decreased participation of older men and of the male aggregate. In the age group investigated here, men aged 25–54, this factor is negligible (Table 3).

Declining returns to work for low-skilled labor have been found in many OECD countries in the 1980s, where a fall in the demand for less-skilled workers has led to increased unemployment, a drop in the real wage and sometimes both (Freeman and Katz, 1995). Declining labor demand has also been linked to reduced participation by U.S. males in the 1980s (Welch, 1990; Jaynes, 1990; Juhn, 1992).

In Israel, increased social benefits, especially child allowances, have been identified as a cause for the decline in male participation in the 1970s (Amir, 1977). That effect was mostly concentrated in the young, 14–24 age group, while men in the 25–54 age group were hardly affected.

Composition effects provide another potential explanation if a characteristic that increases nonparticipation has become more common in the population. Any characteristic associated with low wage offers or high reservation wages is a candidate. For example, the U.S. witnessed a continuous increase in the percentage of disabled men in the prime-age group since the second world war (Bound and Waidmann, 1992).

Yet another possible explanation for the fall in men's labor force participation is that increased labor market opportunities for women have caused men to substitute women in traditional household activities.

A unique local institution is the large number of full-time *yeshivot* (singular: *yeshiva*). These are ultra-orthodox schools with no secular curriculum, no formal duration of studies and no standard certificate. Here, full-time study is not uncommon, even at very advanced ages. Full-time *yeshiva* study for unmarried adult young men (Greater *yeshiva*) and for married men (*kollel*) was expanded in the 1950s. This expansion reflected an effort by the ultra-orthodox community to preserve its scholarship in the wake of the holocaust of European Jewry. *Yeshiva* education also serves to insulate young men from assimilation into secular Israeli society.[5]

Finally, the largest of the local institutions is the military. Military service is typically completed by age 21 or 22, and therefore not directly reflected in our data. It may reduce

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[5] Friedman (1991), Chapter 4.

participation among 25–54 year old men indirectly, by causing postponement of studies and by raising the incidence of disability.

Our principal findings are the following: Expansion of military service was apparently the main cause of nonparticipation in the 1970s but participation continued to fall in the 1980s despite the shrinking population share of the military. Increased numbers of disabled workers and frustrated work seekers both contribute somewhat to nonparticipation in the 1980s. More important than either of these is nonparticipation due to *yeshiva* attendance, which increased from 1.2 to 2.3% of prime aged males between 1980 and 1993. *Yeshiva* attendance increased despite the low and falling return to investment in *yeshiva* education, especially when compared to the increasing return to secular education.

Plan of the paper

This paper attempts to distinguish between these potential explanations for increased nonparticipation. Section 2 examines nonparticipation by self-reported reason, allowing us to identify the military, *yeshiva* students, other students, the disabled and discouraged workers. In Section 3 we predict wages and unemployment probabilities for different groups of nonparticipants in order to investigate labor demand explanations for decreased participation and in order to evaluate *yeshiva* education as a human-capital investment. Section 4 investigates changes in unearned income by declared category, to determine whether the categories whose participation rates declined experienced an increase in their unearned income. Section 5 concludes.

2. Declared Reasons

Military service

Soldiers in compulsory service and career military personnel are classified as non-participants by the Israel Labor Force Survey (LFS). Almost all prime-aged men in the military are employees (as opposed to draftees) who chose to work in the military and

are fairly well paid. Since they have no more trouble supporting their families than other civil servants, we prefer to treat them as employed than as nonparticipants.[6]

The share of the military in nonparticipation can be calculated from 1980 onwards.[7] Table 3 reports both the conventional (total) nonparticipation rate and the civilian nonparticipation rate for 1980 and 1993, with U.S. figures for comparison.

Table 3. Full-Year Nonparticipants[a] by Reason (% of population)

	U.S. (1980) ages 25–59	U.S. (1993) ages 25–59	Israel (1980) ages 25–54	Israel (1993) ages 25–54
Total	—	—	12.11	14.95
In the army	—	—	3.63	2.79
Total civilian	7.02	8.7	8.48	12.16
Reasons:				
Attend school	0.7	0.66	2.21	3.79
of which, *yeshiva*			1.19	2.32
Ill health, disability	2.97	3.7	3.06	3.75
Home responsibilities	0.16	0.67	0.02	0.1
Retirement, old age	0.41	0.66	0.22	0.27
Think cannot get job	0.25	0.49	0.27	1.05
All other reasons	2.51	3.1	2.7	3.2

[a] U.S. nonparticipation rates are slightly upwards biased, as they are calculated as a proportion of the civilian population, while the Israeli rates are calculated as a proportion of the total population.

Sources: U.S. Dept. of Labor (1993), October, pp. 10, 57; (1981), January, pp. 27, 28, 194. Israel: Calculations from micro data combined with internal CBS estimate of military employment based on a LFS question on activity last week. Unknown and missing category includes all nonparticipants who did not give an answer and those who worked during the previous 42 weeks so that they were not asked to state a reason.

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[6] There is no such problem with reserve duty. Civilians performing reserve duty are classified according to their *civilian* labor market status.

[7] Though military status has always been recorded by the LFS, this information was only declassified for men aged 25 and older in 1984, and then only for aggregates. The CBS made previously confidential figures available to us from 1980 onwards. We thank Mr. Ze'ev Krisher for preserving this data and for allowing access to it.

Once the military nonparticipants are accounted for, the civilian nonparticipation rate is 8.5% in 1980 and 12.2% in 1993. This U.S.–Israel comparison yields two surprises. The first is that the civilian nonparticipation rate in Israel in 1980 is only 1.5 percentage points higher than the comparable American rate. This suggests that a substantial part of the gap that opened between Israel and the U.S. in the 1970s (Table 1) is due to an increase in the size of the Israeli army after the 1973 Yom Kippur war, when Israel found itself vulnerable to a surprise attack on her small standing army. The growth of the standing army in the 1970s is widely discussed but difficult to document as the number of soldiers is classified.[8] The International Institute for Strategic Studies (IISS, various years) estimates that the non-conscript standing army increased in size by 50–60% over the 1970s. This trend is corroborated by Beenstock (1997).

The second surprise is that *the 2.8 percentage point increase in reported (total) nonparticipation between 1980 and 1993 masks a larger, 3.6 percentage point increase in civilian nonparticipation* as the proportion of prime-age males in military service dropped by 0.8 percentage points in the 1980s. Thus, once the effects of the military are accounted for, much of the 12.2% civilian nonparticipation rate of 1993 is due to increased civilian nonparticipation between 1980 and 1993.

Civilian nonparticipation by reason

Since 1979 the Israel Labor Force Survey asks anyone who had not worked in the previous 42 weeks to provide a reason. (Nonparticipation is defined as being out of the labor force in the previous week.) Over 85% of nonparticipants had not worked in the previous 42 weeks or more, giving self-reported reasons for the vast majority of non-participants, and for those with the most persistent status.

The 3.4 percentage point gap between Israeli and American civilian nonparticipation rates in 1993 (Table 3) is entirely accounted for by two self-reported categories: students (3.79% vs. 0.66%) and discouraged work-seekers (1.05% vs. 0.46%). The other major

[8] See, for example, Herzog (1975).

component of increased nonparticipation in both countries is illness and disability, which behaves with remarkable similarity in both countries.[9]

Two hypotheses suggested in the introduction can be classified as marginal. Husband-wife substitution in home responsibilities is rare in Israel. Nonparticipants reporting household responsibilities as a reason account for only 0.10% of prime aged men.[10] Also, nonparticipation due to retirement accounts for only 0.27%. Thus, the main categories of interest are students, the ill or disabled, and those unable to find a job.

Yeshiva students

Further decomposition of nonparticipants by type of study (Table 3) reveals that non-participant *yeshiva* students account for 2.32% of prime aged men in 1993, up 95% from the 1.19% in 1980. They made up 31% of increased nonparticipation in 1980–93.[11]

Full-time adult *yeshiva* and *kollel* students draw their subsistence from three sources: (a) Transfers from the Ministry of Religious Affairs and from other public agencies. The Ministry's support of prime-age men studying in a *yeshiva* is conditional on full-time studies, and on having been a full-time student continuously in the past (for men over 30);[12] (b) Private transfers to *yeshivot*;[13] and (c) Work of other family members, usually

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[9] The latter cannot be attributed to increased generosity of disability payments which decreased during this period in the U.S.. It could be due to relaxing the criteria for eligibility or to increased morbidity resulting from reduced mortality: better treatment techniques which reduce mortality. increase, *pari passu*, morbidity (Bound, 1989; Bound and Waidman, 1992).

[10] The participation rate of women in Israel is at the lower margin among industrialized countries (Klinov, 1993, Table 1).

[11] We construct these figures by counting all nonparticipants who list "studies" as their reason for nonparticipation and list their last (or current) school attended as *yeshiva*.

[12] Ministry of Religious Affairs, *Budget Proposal for the Fiscal Year 1989*, p. 44, and later years' budget proposals. Support for a *yeshiva* is based on its enrollment of qualifying students.

[13] The only reference to the size of outside contributions appears in the Ministry's 1974 budget proposal, p. 27, which refers to 1972. Total *yeshiva* budgets in that year were distributed as follows (in percentages): Total — 100; Ministry of Religious Affairs — 13.2; other ministries — 10.2; local authorities — 5; private contributions (Israel and overseas) — 71.6. The proportion of budgets provided by national and local government is believed to be much higher since 1977.

wives who typically work within the ultra-orthodox community as shopkeepers or teachers. The total of these sources of income still leaves the families of *yeshiva* students among the poorest in the country.

A critical aspect of the incentives provided to *yeshiva* students is that both the stipend and the military exemption are contingent on continuous attendance in *yeshiva*. While studying, *yeshiva* students are exempt from compulsory military service, which otherwise lasts three years. Until 1977 they were allowed to defer service as long as they continued studying. Since 1977 *yeshiva* students who are 28 years old, or have two children, have to serve only four months.[14]

Enrollment in *yeshivot*, only a few hundred students in the 1950s (less than one-half of one percent of the prime-age males), increased dramatically in the 1970s and 1980s. In 1993, fully 3.7% of prime-aged men reported *yeshiva* as their last (or current) school attended (Table 4).

Since ultra-orthodox children generally attend *yeshiva*, the high fertility rate of the ultra-orthodox population alone is one cause of increased *yeshiva* nonparticipation. How much of that increase is due to increased incidence of *yeshiva* attendance and how much is due to increased duration? Table 4 reports nonparticipation rates by last school. Among prime-aged men the proportion of those whose last school was *yeshiva* rose from 2.7% of the population to 3.7%. Their nonparticipation rate increased as well. While 49.6% of individuals who ever attended *yeshiva* were nonparticipants in 1980, that figure rose to 67.1% in 1993.[15] About half the increase in *yeshiva* attendance is due to

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[14] Since there is no official source, this description is based on a weekly newspaper, *Kol Ha'ir*, Dec. 20, 1996. The article (by Y. Sheleg) claims that recently the minimum age for the short service has been lowered to 23, and that the rule of two children is not enforced.

[15] The Ministry of Religious Affairs reports the number of adult male *yeshiva* students as:

	Greater *yeshiva*[a]	*Kollel*[b]	Total
1971	6,028	3,817	9,845
1981	3,670	11,200	14,870
1983	7,769	14,796	22,565
1990	12,406	22,710	35,116
1993	18,202	31,967	50,169

[a] Unmarried adults, 18+.

[Continued on next page.]

increased duration of nonparticipation spells, and about half is due to increased incidence of *yeshiva* attendance.

Table 4. Nonparticipation Rates of Prime-Aged Males, by Type of Last School

	1980		1993	
	Proportion of population	Non-participation rate	Proportion of population	Non-participation rate
Primary	0.272	0.102	0.129	0.197
Intermediate	0.008	0.064	0.018	0.102
Vocational	0.24	0.09	0.25	0.098
Secondary	0.148	0.09	0.171	0.09
Yeshiva	0.027	0.496	0.037	0.671
Teacher training	0.01	0.043	0.009	0.085
Post-secondary technical	0.034	0.094	0.068	0.091
Other post-secondary	0.008	0.053	0.023	0.109
Academic	0.177	0.116	0.244	0.103
Other	0.019	0.106	0.016	0.129
Unknown	0.014	0.127	0.018	0.284

Source: LFS micro data, 1980 and 1993.

The distinction between *yeshiva* and other reasons for nonparticipation is important for two reasons. First, it shows that a relatively small community bore a large decrease in earnings. In the introduction, we motivated concern for nonparticipation by reporting that the fathers of 14.7% of Israeli children were nonparticipant prime-aged males; o*f these, 5.7% are the children of nonparticipant yeshiva students.*[16]

[b] Married adults. Some attend half-day *kollel*s, but are recognized as students only if they attend another half-day *kollel* in the afternoon.
These figures include both students less than 25 years old and non-Israelis, so that they are larger than those reported in Tables 3 and 4.
Source: Ministry of Religious Affairs, *Budget Proposal* (various years).

[16] Authors' calculation from 1993 LFS micro data.

Secondly, *yeshiva* education differs from other human capital investments as it is not designed to provide "tachlis" (material returns) but rather learning for its own sake. How does *yeshiva* compare to other education as an investment in future earnings? In Section 3 we estimate the alternative cost of *yeshiva* education by estimating the market returns to both secular and *yeshiva* education. We then predict earnings and unemployment rates of nonparticipants in general and of *yeshiva* students in particular.

Reason or rationalization?

So far we have accepted reported reasons for nonparticipation at face value, though there may be reason for skepticism. Perhaps nonparticipants simply prefer leisure to work at current market wages but provide some arbitrary rationalization to the LFS. ("I prefer leisure" is not an option on the questionnaire, nor does it ask at what reservation wage nonparticipants would take a job.) To corroborate self-reported reasons we examine whether nonparticipants have characteristics consistent with those reasons for the three main categories: *yeshiva* students, the disabled, and those unable to find a job.

The first panel of Table 5 shows that disabled and ill nonparticipants are older than other nonparticipants, and that students in *yeshiva* have many more years of schooling and much less labor market experience. (*Yeshiva* is not a self-reported reason for nonparticipation, but attending school is.) That is consistent with the reasons given.

The second panel of Table 5 shows the labor force status of nonparticipants in the previous and next quarter (see Beenstock and Klinov, 1996, for a full discussion). Here we see that discouraged work-seekers are much more attached to the labor force than the disabled or the *yeshiva* students. For example, while only 13.5% of nonparticipants pass to employment in the subsequent period, 37.6% of discouraged work-seekers do so. Unlike most nonparticipants, this group is almost as likely as the unemployed to be employed in the subsequent quarter and quite likely to be employed in the previous quarter. In contrast, retention rates in nonparticipation for the disabled and *yeshiva* students are extremely high. While reported reasons may still reflect some rationalization,

these groups clearly have different characteristics, quite consistent with the reasons given.

Table 5. Characteristics of Nonparticipants, by Selected Reason, 1993

a. Demographics

Reason:	Education	Experience	Age	Number of children
Illness or disability	9.2	23.7	40.4	1.7
Sought work, could not find	10.8	17.2	35.8	1.1
Yeshiva	25.8	2.6	34.3	4.2
All nonparticipants	13.9	15.6	36.9	1.8
Participants	12.4	18.5	38.5	1.7

b. Labor-force status in previous/next quarter

	Employed		Unemployed		Nonparticipant	
	Previous	Next	Previous	Next	Previous	Next
Illness or disability	9.7	8.1	4.7	5.1	85.5	86.8
Sought work , could not find	25.2	37.6	28.6	22.2	46.2	40.2
Yeshiva	4.9	4.9	1.1	1.1	94.0	94.0
All nonparticipants	11.5	13.5	5.9	6.0	82.5	80.5
Employed	95.4	95.8	2.5	2.4	2.1	1.8
Unemployed	38.0	39.2	47.6	46.5	14.4	14.3

Notes: Unreported reasons are listed in Table 3. The LFS has a rotation group structure for which a household is sampled for 2 quarters, rests for 2 quarters, and is sampled for another 2 quarters. Two-thirds of the observations had a match in either the previous or the subsequent quarter between 92:IV and 93:I

Predicted participation

Table 2 presented two puzzles: high nonparticipation rates among men with more than twelve years of schooling and among men with more than three children. Family size is associated with nonparticipation among women in the literature (Smith, 1980), but this is a surprising pattern for men. Self-reported reasons provide a possible explanation. Since *yeshiva* students have many years of schooling on average and many children, they are a potential explanation for these puzzles.

Table 6 addresses this question by predicting nonparticipation using the standard human capital variables, an indicator for *yeshiva* (from the "last school attended question") and the number of children. This analysis is made possible by a unique data set that allows separation of military employees from civilian nonparticipants at the individual level.[17] Without that separation, the exercise may have been badly biased.

A human capital approach suggests that offer wages increase with education and experience so that these will be positive predictors of participation. Column (1) reports the opposite: As in Table 2, education predicts less participation. Column (2) reproduces the other unusual result of Table 2, that the number of children is also a predictor of *non*-participation for men. Column (3) of Table 6 shows that the negative relationship between education and participation is entirely due to the strong negative correlation between *yeshiva* education and participation. When education is separated into non-*yeshiva* ("regular") and *yeshiva*, each year of *yeshiva* education predicts a 0.9% lower frequency of participation, while each year of regular education predicts a 1.0% higher frequency. Note that accounting for *yeshiva* education reduces the (negative) coefficient on children to less than one quarter its previous size (in absolute value). Column (4) shows that this pattern is robust to the inclusion of quadratics terms in both *yeshiva* and regular education. Men with over six children participate about as much as men with four or five children, once the other characteristics are accounted for.

Returning to the first panel of Table 5, we now attempt to explain the self-reported reasons. To what extent can we explain the increased nonparticipation of the three main groups (*yeshiva* educated, disabled, unable to find a job) in the 1980s? Candidate explanations are declining labor market opportunities (i.e., declining real wages or increased unemployment) or institutional changes that affect labor supply. Section 3 examines labor demand and Section 4 — labor supply.

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[17] We thank Ze'ev Krisher for facilitating access to these data.

Table 6. Predicted Participation: 1993[a] (standard errors in parentheses)

	–1	–2	–3	–4	–5
Education	–0.0054	–0.0039			
	(0.0005)	(0.0006)			
Regular education			0.010	0.024	0.025
			(0.001)	(0.001)	(0.002)
(Regular education)^2				–0.00059	–0.00059
				(0.00009)	(0.00009)
*Yeshiva**			0.048	0.101	0.101
			(0.020)	(0.015)	(0.014)
Yeshiva education			–0.009	–0.038	–0.038
			(0.001)	(0.006)	(0.005)
(*Yeshiva* education)^2				0.00058	0.00059
				(0.00010)	(0.00011)
Experience	0.019	0.019	0.010	0.008	0.007
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
(Experience)^2	–0.00052	–0.00053	–0.00026	–0.00021	–0.00020
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Number of children		–0.025	–0.0057	–0.0037	
		(0.001)	(0.0015)	(0.0015)	
1–3 children					0.012
					(0.006)
4–5 children					–0.014
					(0.009)
> 6 children					–0.017
					(0.014)
Currently married	0.14	0.23	0.20	0.20	0.17
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Jewish*	0.030	–0.001	0.004	0.001	0.001
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Log likelihood	–5,855	–5,703	–5,169	–5,135	–5,129
Pseudo-R^2	0.13	0.15	0.23	0.24	0.24

[a] All specifications use 18,761 observations for civilian men aged 25–54, weighted by sample weights. See Appendix Table 1 for descriptive statistics of the full (civilian and military) sample. The observed probability of participation is 0.884. Coefficients are calculated as derivatives of the probability with respect to the variable evaluated at the mean of all covariates. For binary indicators (marked with an asterisk) the difference in the probability at the mean is reported.

3. Labor Market Opportunities of Nonparticipants

The high level of civilian nonparticipation in 1993 and its rapid increase is largely due to three categories of nonparticipants: students in *yeshiva*, the disabled or ill, and discouraged work-seekers. Together they account for 59% of civilian nonparticipation and 71% of the 1980–93 increase. The categorization is not entirely satisfying, especially for *yeshiva* students and the ill or disabled. While these reasons suggest high reservation wages, they don't explain whether increased nonparticipation in these categories is due to decreased wage offers, increased reservation wages, or an increase in population share of men with high reservation wages. In this section we predict wages and unemployment rates for nonparticipants in order the examine the labor market opportunities of nonparticipants. These predictions are based on observed characteristics of the nonparticipants and on coefficients from estimation using participants.

Predicted wages

We start by estimating a human capital wage equation for employed prime-aged males. We use the Israel Income Survey in 1979–81 and again in 1991–92 to estimate coefficients at either end of our sample period, pooling years to increase the precision of estimates. New immigrants are excluded (unless otherwise noted) as their 1993 labor force status may be transitory. Table 7 reports descriptive statistics. Note the increase in real wages over the decade, from NIS15 (1992) per hour in 1979–81 to 21.9 in 1991–92 (NIS: New Israeli Shekel). There was also a small increase in average years of education, a decline in marriage and in the proportion of Jews among the employed. The variable "*yeshiva*" indicates that the last school attended was a *yeshiva*. Employed *yeshiva* graduates average 18.4 years of education (with outlying values as high as 45), while graduates of other schools average 12.4, in 1991–92.

Table 8 reports estimates of a human capital wage equation for 1991–92. The first column reports a standard specification, with a "return to schooling" coefficient of 7.7%, concave "returns" to experience, a 20% coefficient on marriage and a 7% coefficient on

being Jewish. The returns to schooling are a little higher than those reported in comparable studies because new immigrants have been excluded.

Table 7. Descriptive Statistics for Earnings Equations: Sample of Employed[a]

	Mean	Std. Dev.	Min.	Max
1979–81				
Hourly wage*	15.03	9.63	0.19	247.88
Log hourly wage	2.55	0.59	–1.65	5.51
Years of education	11.3	3.7	1	25
of which: *yeshiva*	14.75	3.77	8	25
Non-*yeshiva*	11.25	3.67	1	25
Yeshiva	0.01	0.12	0	1
Experience[b]	18.4	9.85	0	45
(Experience)^2	435.49	412.05	0	2,025
Currently married	0.91	0.29	0	1
Jewish	0.96	0.2	0	1
1981	0.33	0.47	0	1
1979	0.31	0.46	0	1
1991–92				
Hourly wage*	21.90	15.90	0.45	262.13
Log hourly wage	2.90	0.61	–0.79	5.56
Years of education	12.5	3.8	0	45
of which: *yeshiva*	18.4	8.3	2	45
Non-*yeshiva*	12.4	3.6	0	41
Yeshiva	0.02	0.14	0	1
Experience[b]	18.5	9.0	0	48
(Experience)^2	424.4	365.9	0	2,304
Currently married	0.86	0.34	0	1
Jewish	0.93	0.26	0	1
1992	0.47	0.50	0	1

[a] 5,505 observations from micro data of the CBS Israel Income Surveys, 1979, 1980 and 1981, of which 88 report *yeshiva* as last school attended; 4,566 observations from the micro data of the CBS Income Surveys, 1991 and 1992 of which 86 report *yeshiva* as last school attended. Includes prime-aged males who worked in the previous week, were not recent immigrants, and reported years of schooling. Hourly wage is measured in 1991 NIS.

[b] Experience was calculated as (age – education – 6) for *yeshiva* graduates and non-Jews and as (age – experience – 8) for Jews. To the extent that *yeshiva* graduates serve in the military their labor market experience will be overestimated.

Table 8. Human Capital Wage Regression: 1991–92

	Log hourly wage			Log monthly earnings
	Regression 1 (1)	Regression 2 (2)	Regression 3 (3)	(4)
Education	0.077	—	—	—
	(0.004)			
Regular education	—	0.088	0.081	0.83
		(0.003)	(0.003)	(0.003)
Yeshiva education	—	0.021	0.019	–0.002
		(0.009)	(0.009)	(0.006)
Yeshiva	—	0.72	0.66	0.88
		(0.18)	(0.18)	(0.15)
Experience	0.049	0.044	0.039	0.057
	(0.004)	(0.004)	(0.004)	(0.004)
(Experience)^2	–0.00079	–0.00064	–0.00057	–0.00098
	(0.00010)	(0.00009)	(0.00009)	(0.00010)
Currently married	0.20	0.21	0.21	0.34
	(0.03)	(0.03)	(0.02)	(0.03)
Jewish	0.07	0.05	0.08	0.11
	(0.02)	(0.02)	(0.03)	(0.03)
New immigrant	—	—	–0.79	—
			(0.03)	
year = 92	0.047	0.040	0.052	0.034
	(0.016)	(0.015)	(0.015)	(0.017)
Constant	1.11	1.02	1.14	6.04
	(0.05)	(0.05)	(0.05)	(0.06)
Observations	4,566	4,566	5,043	4,566
R^2	0.243	0.267	0.310	0.270
Root MSE	0.535	0.526	0.537	0.564
F, α	—	42.57	37.63	165.32
(Regular = *Yeshiva*)		0.0000	0.0000	0.0000

Source: See note a to Table 7.

The return to yeshiva *education*

Since we are particularly interested in predicting the wages of *yeshiva* students, column (2) of Table 8 reports a more general specification that allows years of *yeshiva* education a separate intercept and slope. The result is quite dramatic. The "return" to a year of *yeshiva* education is estimated at only 2.1%, while the coefficient on non-*yeshiva* ("regular") education is 8.8%. The difference (6.9%) is highly significant, as reported in the F test in the bottom row. While the lower return is partially compensated for by a higher intercept, the curves cross at 11 years of schooling, far below the mean for *yeshiva* graduates of 23.1 (reported in Appendix Table 1).

Columns (3) and (4) of Table 8 show the robustness of this finding. The gap between *yeshiva* and regular schooling coefficients remains if we include new immigrants in the sample. The gap widens if we predict earnings rather than hourly wages, as the coefficient on *yeshiva* years of education becomes zero. (This is probably due to a negative correlation of hours worked with years of *yeshiva* education.) The finding is quite robust: interpreted causally, the low coefficient implies that *yeshiva is a relatively poor human capital investment.*[18] That may not come as a surprise to casual observers or to *yeshiva* students who claim that their studying is an end unto itself. It does challenge the standard practice of labor economists trained in the human capital interpretation of the coefficient on years of schooling.

The practice of pooling *yeshiva* and other schooling significantly lowers the estimated returns to education from 8.8 to 7.7 (if it is interpreted as the coefficient that applies to regular schooling for individuals other than new immigrants). 8.8% is a high coefficient on education by international standards. Was it always that high? Table 9 reports estimates for the earlier period 1979–81. The earlier coefficient is 7.9%. The 0.9 percentage point increase is of about the same magnitude as the American increase

[18] The standard *caveat* about the causal interpretation of coefficients is in order. For instance, if years of schooling in *yeshiva* are positively correlated with a preference for work that allows study during work hours, low wages may represent a compensating differential and bias the estimated coefficient downward.

during this period. *It is a remarkable increase in the return to education when we consider that the Israeli labor market had absorbed a large influx of highly educated immigrants by 1992.* Conventional estimates of returns to education have missed the size of that effect because it is masked by the growing tendency of *yeshiva* education to reduce the pooled coefficient (which shows an unremarkable increase from 0.076 to 0.077 in the first columns of the two tables).[19]

Table 9. Human Capital Wage Regression 1979–81

	Log hourly wage			Log monthly
Left-hand variable	Regression 1	Regression 2	Regression 3	earnings
Education	0.076	—	—	—
	(0.002)	—	—	—
Regular education	—	0.079	0.077	0.081
	—	(0.002)	(0.002)	(0.002)
Yeshiva education	—	0.034	0.045	0.010
	—	(0.021)	(0.022)	(0.025)
Yeshiva	—	0.20	0.04	0.48
	—	(0.29)	(0.31)	(0.34)
Experience	0.031	0.031	0.032	0.042
	(0.003)	(0.003)	(0.003)	(0.004)
Experience^2	–0.00047	–0.00045	–0.00049	–0.00072
	(0.00008)	(0.00008)	(0.00007)	(0.00008)
Currently married	0.40	0.40	0.41	0.48
	(0.03)	(0.03)	(0.03)	(0.04)
Jewish	0.20	0.20	0.20	0.24
	(0.03)	(0.03)	(0.03)	(0.03)
New immigrant	—	—	–0.23	
			(0.03)	
Year = 81	0.095	0.095	0.095	0.099
	(0.017)	(0.017)	(0.016)	(0.017)
Year = 79	0.132	0.136	0.133	0.154
	(0.017)	(0.016)	(0.016)	(0.017)
Constant	0.70	0.67	0.68	5.67
	(0.06)	(0.06)	(0.06)	(0.06)
Observations	5,505	5,505	5,981	5,505
R^2	0.256	0.266	0.261	0.284
Root MSE	0.506	0.502	0.509	0.520
F, α	—	4.50	2.02	8.21

[19] Simultaneous changes in the returns to education and experience are evidence for the existence of a common human capital. Mincer (1994), discusses similar American evidence.

(Regular = *Yeshiva*)	—	0.03	0.15	0.004

Source: See note a to Table 7.

The earlier cross-sections reveal a larger coefficient for *yeshiva* education and a smaller (though statistically significant) difference between coefficients on regular and *yeshiva* education. The return to *yeshiva* is low (possibly decreasing) in the 1980s; compared with regular schooling, *yeshiva* has become a very expensive use of time.

Predicted unemployment

To complete the prediction of the labor market outcomes of nonparticipants we predict unemployment for a sample of participants in the same periods using the same set of variables (Table 10). Variables that predict higher wages tend to predict lower frequencies of unemployment. This is particularly true of regular education, which has a coefficient of –0.010 in 1993 (improved from –0.004 in 1980). *Yeshiva* education has a much smaller coefficient, which is statistically zero in most specifications. The only inconsistency is that the coefficients on experience, which are negative but small in 1979–81, seems to become less negative over time.

For an individual contemplating joining the labor force Tables 8, 9 and 10 give a fairly consistent description of predicted outcomes. Education and experience strongly increase predicted wages and reduce predicted unemployment and these coefficients generally increased in absolute value over the 1980s. (As an aside, if interpreted causally, the increased role of education in preventing unemployment only underscores the surprising increase in the return to education in the 1980s in Israel, despite massive immigration of highly educated workers.)

Table 11 reports average predicted wages and unemployment for nonparticipants using the estimates from Tables 8–10. The first four columns of the two bottom rows show that nonparticipants have lower predicted wages and higher predicted unemployment than participants in each period. That is reassuring for our method. The next two columns show that nonparticipants had slower predicted wage growth and a higher increase in predicted unemployment between 1980 and 1993. Declining opportunities are for the most part due to increases in the coefficients of education and experience, rather than to an increased gap in the characteristics of nonparticipants and participants.

Table 10. Predicted Unemployment[a]

	1980		1993	
u	Probit	Linear probability	Probit	Linear probability
education	–0.010	–0.010	–0.0043	–0.0042
	(0.001)	(0.001)	(0.0004)	(0.0004)
*Yeshiva**	–0.046	–0.108	–0.0013	–0.035
	(0.020)	(0.028)	(0.047)	(–0.019)
Yeshiva education	–0.001	–0.001	–0.004	–0.002
	(0.002)	(0.001)	(0.004)	(0.001)
experience	–0.0001	0.0006	–0.0013	–0.0009
	(0.0008)	(0.0009)	(0.0005)	(0.0006)
experience^2	–0.000018	–0.000031	0.000003	–0.000007
	(0.000018)	(0.000024)	(0.000012)	(0.000013)
current married*	–0.07	–0.08	–0.038	–0.049
	(0.01)	(0.01)	(0.004)	(0.007)
jewish*	–0.011	–0.020	0.006	0.009
	(0.004)	(0.007)	(0.003)	(0.005)
constant		0.267		0.131
		(0.014)		(0.010)
Pseudo R^2	0.0748		0.0607	
R^2		0.0347		0.0177
pred. P	0.0492779		0.022672	
Root MSE		0.236734		0.1650
Log likelihood	–3,490.7474		–2,134.4591	

[a] 16,260 observations of male labor force participants aged 25–54 from LFS, 1991–92; 17,540 observations in 1980. Individuals who did not report years of schooling omitted. Probit weighted by sampling weights. Coefficients reported are the derivatives of the probability of unemployment evaluated at the mean of RHS variables. For indicator variables dF/dX is for discrete change of dummy variable from 0 to 1. The linear probability model predicted 1,307 values outside the [0, 1] interval (8% of the sample).

This pattern of decreased opportunities is particularly true for *yeshiva* students, because their calculated potential labor market experience is more accurate. Returns to experience increased sharply in the wage equation so any upward bias in the estimated labor market experience of the non-participants (by the age–education–8 formula) exaggerates their true market opportunities. In that sense, *yeshiva* students provide the best estimates of predicted wages and unemployment for nonparticipants, since their work history is more accurately recorded. That only strengthens the conclusion that decreased participation is consistent with decreased labor market opportunities.

Table 11. Predicted Wages and Unemployment Rates of Nonparticipants, by Reason: Selected Reasons

	1980		1993		Change 1980–1993		
Reason:	Wage[a]	Unemploy-ment (%)	Wage[a]	Unemploy-ment (%)	Wage (%)	Unemploy-ment	Nonparti-cipation
Illness or disability	9.02	4.8	14.79	11.8	63.97	7.00	0.69
Sought work, could not find	9.71	5.7	15	10.9	54.48	5.20	0.88
University	10.3	4.8	15.9	6.3	54.52	1.50	0.21
Yeshiva	10.8	0.6	14.63	4.3	35.59	3.70	1.13
Other studies	11.6	4.8	17.89	7.3	54.89	2.50	0.24
All nonparticipants	10.5	4.1	15.76	9	49.95	4.90	2.79
Participants	12.2	2.9	19.2	6.2	57.89	3.30	–2.79

Notes: Unreported reasons are listed in Table 3. Change in nonparticipation is from Table 3, Column (4).
Prediction is performed using estimated coefficients from Tables 8, 9 and 10.

[a] 1992 New Israeli Shekels.

4. Labor Supply: Institutional Factors

The relative decline in labor market opportunities for nonparticipants leaves us with an ambiguity about the underlying causes of increased nonparticipation. Was it a decrease in labor demand or supply? In this section we examine institutional changes that may have decreased labor supply.

Decreased labor supply due to the income effect of increased transfers is a possible explanation for decreased participation among *yeshiva* students and the disabled. Table 12 reports on two relevant transfers from the National Insurance Institute: child allowances and disability payments. Child allowances as a proportion of the average wage have generally increased since 1970. The average *yeshiva* nonparticipant had 4.2 children (in 1993). For families with 4 or more children, child allowances increased through 1985 and have been steady since, so that increased generosity of child allowances is a possible explanation for decreased participation.

Panel B reports that disability payments as a proportion of the average wage rose and then fell again between 1976 and 1990, then rose again through 1995 (Appendix Table 3 demonstrates that nonparticipation due to disability increased slightly in 1980–90 and then rose quite steeply between 1990 and 1993). Thus, the data are consistent with the hypothesis that increased disability payments reduced labor supply and thus participation through an income effect.

Full-time adult *yeshiva* study is subsidized in two major ways. One is through a stipend from the Ministry of Religious Affairs. That stipend is contingent on not working. The other is through a deferment of military service achieved by declaring oneself a full-time *yeshiva* student ("*Torati Umanuti*"). The deferment is contingent on full time study (i.e., not working) and subject to annual renewal. In order to qualify for both stipend and deferment after the age of thirty an individual must have qualified in each previous year. Support is also provided by charity, mostly from overseas.

Unfortunately the data on transfers and deferments is scanty. The support comes from two sources: The Ministry of Religious Affairs and donations from the Orthodox community overseas, mainly in the United States, about which we have no information.

Per capita support for full-time *kollel* students increased by over 422% between 1976 and 1982 (Ministry of Religious Affairs, 1984, p. 45). There are no comparable subsequent data. Hence, the data suggest a substantial increase in non-wage income of *yeshiva* students and provide another possible explanation of decreased participation.

Table 12. Child Allowances and Disability Payments: 1970–95
(% of average monthly earnings)

A. Child allowance[a]

No. of children	1970	1980	1985	1990	1995
1[b]	2.0	2.8	0.5	—	2.9
2[b]	4.4	5.6	3.6	1.5	5.7
3	6.9	11.3	10.0	6.3	11.4
4	10.6	17.7	24.7	23.7	23.0
5	14.3	24.0	35.1	33.6	32.7
6	18.2	31.1	46.2	44.3	43.4
7	22.1	38.1	57.4	55.0	53.4
8	26.2	45.2	68.5	65.7	63.4
9	30.2	52.3	79.7	76.4	73.3

B. Average disability benefit for disabled persons[c]

	1976	1980	1990	1995
Percent of beneficiaries in the population	0.74	1.1	1.58	1.69
Percent of average wage — all family sizes	28.6	27.2	26.6	29.3
Percent of average wage — with three dependents	39.4	41.2	40.6	50.1

[a] Includes special allowance to army veterans. Equivalent allowances to orthodox Jews exempt from army service are paid by the Ministry for Religious Affairs.
[b] Includes supplementary payments to families on welfare.
[c] Excludes disabilities connected with military service, payments for which are made by the Ministry of Defense.

Sources: Child allowances — National Insurance Institute, *Quarterly Statistics*, 26 (No. 2, April–June 1996): 107; details on changes in eligibility rules: *op. cit.*, "Definitions and Notes to Tables" (no page numbers). Disability benefits — *op. cit.*, pp. 74, 77.

Sources of income

How are the families of nonparticipant prime-aged males supported? Table 13 reports household income, by source, from the 1992 Israel Income Survey. The second column reports the average income of a household headed by a prime aged male. Income (from all sources) averaged NIS 4,721.60 per month (about U.S.$1,850 in 1992), of which

86.6% was earned. In households with prime-aged male nonparticipants average monthly income was NIS 2,672.00, of which only 44% was earned, with 32.8% of that earned by wives and 60.7% earned by other family members. Institutional income, child allowances and survivor and other pensions make up 39.7% of income for this group.

Table 13. Sources of Income for Households with Prime-Aged Males, 1992

	Households with		
	Prime-age male heads	Prime-age nonparticipating men	Prime-age nonparticipating men in *yeshiva*
Household income (NIS)	4,721.6	2,672	2,356.2
Earned income (%)	86.6	44.1	32.6
of which:			
Individual income (%)	69.9	6.5	0.3
Wife's income (%)	23.9	32.8	78.3
Income of other household members (%)	6.3	60.7	21.5
Institutional income(%)	1.7	15	31.3
Child allowance (%)	2.9	8.7	27
Survivor's pension(%)	2.8	16	3.9
Capital income(%)	0.8	1.8	0.6
All other (%)[a]	5.4	14.4	4.7
Number of observations	3,219	483	116

[a] "All other" includes income from pensions, transfers from abroad, private pensions, old-age pensions and residuals. Observations deleted if sum of income components exceeded the reported sum.

Source: Microdata from the CBS, *Israel Income Survey*, 1992.

Households with nonparticipant prime-aged males in *yeshiva* had less then half the average family income (with much larger families). Monthly income averaged NIS 2,356.2 (U.S.$924), with 32.6% coming from earnings, mostly of wives. Another 31.3% came from institutions, presumably stipends, and 27% from child allowances. Recalling

that these families average 4.2 children, the average family with a prime-aged *yeshiva* nonparticipant is in poverty by Israeli standards.[20]

As a measure of income, these figures are low, as they do not include imputed rent for a population that commonly owns its own apartments. It's worth stressing, though, that the practice of conditioning marriage on the provision of an apartment by the parents exists precisely because young ultra-orthodox couples cannot afford to pay rent. Dahan (1996) points out that while this is largely poverty by choice (he speculates on whether poverty by choice should be thought of differently by the welfare system), it is poverty nonetheless. While the ultra-orthodox community is famously successful at supporting itself with intergenerational and inter-family transfers, the large share of families in poverty must be a cause for concern.

6. Conclusions

Labor force participation of prime-aged Israeli males dropped by 8 percentage points between 1970 and 1993. Expansion of military service was the main cause in the 1970s. In the 1980s the military shrunk as a proportion of this population, but civilian participation more than compensated, dropping by 3.6 percentage points. This drop was mostly because of increased *yeshiva* attendance and decreased labor market opportunities for less skilled workers. Returns to education and experience increased in the 1980s, as nonparticipation rose among low skilled workers. For the most part the additional nonparticipants in the 1980s belong to one of two groups: those with a high value of nonmarket activities and those who suffered decreased labor market opportunities.

The debate over *yeshiva* students in Israel is old and controversial, mainly because *yeshiva* students have been allowed to defer and eventually avoid much of their military

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[20] Under-reporting of income would bias the estimates downwards. While we have no specific evidence, *yeshiva* nonparticipants may be more likely to under-report as they face larger potential sanctions for not reporting income than do most taxpayers: they would lose both their stipends and draft deferments, besides facing the usual fines and back-taxes.

service. Our research points out three new aspects of *yeshiva* education that emerged in the 1980s. The first is that *yeshiva* has become a terrible human capital investment. The predicted wage gain associated with an additional year of *yeshiva* attendance is low and perhaps falling, while the return to the alternative human capital investments — regular education and work experience — is increasing substantially. To rationalize the increased duration of *yeshiva* studies we might consider thinking of *yeshiva* as an investment in nonpecuniary human capital with an infinite horizon of returns.

The second finding is that nonparticipants in *yeshiva* almost doubled their share among prime-aged males in 1980–93, from 1.2% to 2.3%. Thirdly, the children of those men make up fully 5.7% of Israel's children. Clearly, the potential for growth in the *yeshiva*-educated community is quite large. A simple extrapolation indicates that at the same rate of increase and number of children per family, 13 years later, in the year 2006, well over 10% of Israel's children will have a nonparticipant father in *yeshiva*.

Yeshiva education has very low monetary returns but the standard *caveat* about non-monetary returns is in order. If years of schooling in *yeshiva* are positively correlated with a preference for work that does not demand much, low wages may represent a compensating differential rather than a low return to education. The actual cause is important for policy design: If returns are low because religious studies yield low market productivity, then by encouraging secular courses within the *yeshiva*'s otherwise religious curriculum, such as computer science or accounting, offer wages and labor force participation can be increased.[21] If, on the other hand, low wages reflect compensating wage differentials, then training may be unpopular among students.

Taken together, these trends represent an ominous situation for the ability of the ultra-orthodox community in Israel to support itself and its children in the future. This

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[21] We do not know whether *yeshiva* students would do well in a more structured, regular school. In all probability they could: almost all ultra-orthodox boys enroll in *yeshivot*, hence they represent a normal cross-section of the population's distribution by ability. The number of "conversions" into and away from the ultra-orthodox community is, according to data from the Ministry of Religious Affairs, rather small.

community is famous for supporting its poorer members by pooling resources both from within and from outside donations. Yet the community is growing much faster than the resources it has at its disposal. The low earnings of young couples have created a custom of parents providing apartments as a condition of marriage. Yet high birth rates have created so much pressure on these parents that inherited wealth and donations[22] are being exhausted by these marriage gifts, forcing parents into debt rather than saving for retirement. The continuing choice of *yeshiva* over work and especially over secular education threatens the carrying capacity of the ultra-orthodox community.

In light of these trends the structure of subsidies to *yeshiva* nonparticipants bears re-examination as it provides strong disincentives for both work and secular education. The conditioning of draft deferment and of stipends on not working is an enormous tax on the first hour of work. The same is true of the requirement that men over the age of 30 have studied full time in *yeshiva* continuously in the past in order to qualify for stipends and deferments. That continuous study requirement discourages *yeshiva* students from even experimenting with work or from working temporarily to provide for their families in a crisis. Furthermore, the conditioning of deferment and stipends on full-time study in *yeshiva* leaves little time for secular, work-oriented studies. If the Jewish State chooses to subsidize full-time *yeshiva* attendance by prime-aged males, it should find a way to do so without pushing their children and parents into poverty.

One reason for the lack of response by the ultra-orthodox community to increased returns to secular schooling seems clear: Secular education may not be a viable option for a child raised in a ultra-orthodox family because of community pressure on children and parents. There is an interesting historical precedent, though: in the late 19th century orthodox parents, especially mothers, asked “Where is the tachlis?” and lobbied to have

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[22] Donations from Jews abroad are sizable but their importance is difficult to estimate. See Landau (1993) p. 253–256, for a discussion. Donations are inherently an unstable source of financial support and the combined wealth of donors is unlikely to grow as fast as the aggregate consumption of the Israeli ultra-orthodox community. Support from abroad can probably only forestall a crisis.

their children sent to regular secondary schools rather than to a *yeshiva* to learn practical skills.

The success of economic measures depends very much on the responsiveness of the religious community to economic incentives. Do the ultra-orthodox respond to economic incentives? The experience of the American ultra-orthodox community, in which non-participation of prime-age males is not nearly as frequent, suggests alternatives: men leave *yeshiva* younger, subsequently combining work with part time study or even attend *yeshiva* and university simultaneously.[23]

[23] Landau (1993), pp. 201–202.

Appendix

THE ISRAEL LABOR FORCE SURVEY

The Israel Central Bureau of Statistics (CBS) Labor Force Survey (LFS) currently samples about 22,000 households per year from the population aged 15 and older.[24]

Data layout and definitions

1. The treatment of military service

Since 1979, individuals who work 40 weeks or less are asked why (survey question #38, column 119). Regular army service, including conscripted (*hova*) and career (*keva*) is one of the options. (For the Border Police only conscripted service counts as regular army service. Career servicemen in the Border Police are included in the civilian labor force.) This answer can be corroborated by comparison to the "activity last week" question, which includes a military service option. The answer was not previously released to researchers.

The answers to question #38 are coded differently on public use individual data files in different years. In 1980–82 the "military service" answer is coded with the missing values (this is true of the CBS original file as well). In 1989–90 military service is coded with "other reasons" on the public use file. In 1988 military service is coded as either a missing value or "other reasons," for compulsory and career service respectively. (Of the years we examined, 1988 is the only year that this occurred.) Thus, the public use

[24] The LFS population is Israel's permanent population aged 15+ (14+ before 1986), including potential immigrants and permanent residents staying abroad for up to one year. Sampling is conducted in two phases: In phase 1, localities are sampled. In phase 2, households are sampled within localities. Probability of inclusion for each household in the population is approximately 1%. The sample is drawn once a year, and divided into four "panels." Panels are interviewed for two consecutive quarters, not interviewed for the next two and then interviewed for another two consecutive quarters. The sample in each quarter is composed of 4 panels from two or three sampling years.

version of the LFS does not allow calculation of changes in the number of civilian non-participants.

Despite the explicit instructions in the survey form, career servicemen are often assigned nonzero weeks worked over the previous year.

For selected years the CBS kindly provided us with unpublished totals on the number of persons working less than 40 weeks listing military service as the reason. These figures were used to construct Table 3.

2. Definition of nonparticipant

A nonparticipant is an individual who in the week previous to the survey was neither employed nor unemployed.[25] We used the LFS code for nonparticipation. (v52 = 6 in 70–72 and v111 = 6 in 1980–82, 1978–90.). Exact matches with published data were achieved for 1970–72 and matches within 2% were achieved for other years.

The institutional population and Bedouins living in tents in the south are considered nonparticipants. They are not sampled by the LFS, but a fixed sample from the 1983 Census is included in the LFS file to represent them.

3. Changes in the LFS Questionnaire

In 1978 the LFS introduced a longer questionnaire, adding questions about reasons for nonparticipation, weeks worked and hours worked, among other things. The old and new questionnaires were distributed simultaneously in 1978 (to different samples) in order to provide a comparison. The new questionnaire produced slightly higher participation rates for men (see below) making the change in questionnaire a source of

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[25] In the previous week an employed person either (a) worked at least one hour for compensation, or (b) worked at least 15 hours in a family business without compensation, or (c) was a resident of an institution and worked at least 15 hours without compensation, or (d) worked on a kibbutz, or (e) was on temporary leave without seeking work. An unemployed person worked less than one hour in the previous week and actively sought work (LFS, 1990, p. 37).

ambiguity which seems to *understate* the drop in male participation rates that is the subject of this study.

1978 Participation Rates for Men: Old and New Survey Forms

	Age:			
	25–34	35–44	45–54	15+
Old form	85.2	92.9	91.7	64.7
New form	87.1	92.9	90.8	65.2

Source: CBS, *LFS 1978*, Internal Document.

Appendix Table 1. Descriptive Statistics for Prime-Aged Males, 1993[a]

Variable	Mean	Std. Dev.	Min.	Max.
Unemployed	0.05	0.22	0	1
Education	12.6	4.4	0	48
of which: *yeshiva*	23.1	7.6	5	48
Regular	12.2	3.5	0	40
Experience	18.0	9.4	0	48
$(\text{Experience})^2$	414.5	377.9	0	2,304
Yeshiva (incl. graduates)	0.04	0.20	0	1
Currently married	0.81	0.39	0	1
Jewish	0.83	0.38	0	1
Number of children	1.68	1.64	0	13

[a] 19,303 observations of men aged 25–54 from the LFS weighted to represent 834,843 in the population. Individuals who did not report years of schooling were omitted. 753 report last school as *yeshiva*, representing 34,232 in the population.

Appendix Table 2. Male Participation Rates by Age Group: 1970–93[a]

	Age group						
	18–24	25–34	35–44	45–54	55–64	65+	Total
Israel							
1970	46	91.1	94.8	95.1	88.5	33.8	69.2
1980	41.3	84.7	91	90.4	82.4	27.9	63.7
1990	40.3	82.6	88	87.7	73.7	20.2	62.3
1993	46.5	84	87.7	90.8	70.2	19.3	64.7
Change 1970–93	0.5	–7.1	–7.1	–4.3	–18.3	–14.5	–4.5
U.S.							
1970	78.6	96.4	96.9	94.3	83.0	26.8	79.7
1980	78.8	95.2	95.5	91.2	72.2	19.0	
1990	78.7	94.2	94.4	90.7	67.7	16.4	
1993	78.3[b]	93.5	93.5	90.1	66.5	15.6	75.2
Change 1970–93	–0.3	–2.9	–3.4	–4.2	–16.5	–11.2	–4.5

[a] Total includes the 15–17 age group in Israel (14–17 age group in 1970) and the 16–17 age group in the United States. Israeli figures include, and the United States data exclude population in institutions and the military. In addition, the Israeli data include an estimate of the Bedouin population and its participation, based on the most recent population census.
[b] 1992.

Sources: Israel — CBS, *Statistical Abstract of Israel*, various years, Table 12/4; U.S. Bureau of Census, *Statistical Abstract of the United States*, 1994, Tables 615 and 622.

Appendix Table 3. Nonparticipants by Reason, 1980–93 (% of the population)

	1980	1990	1993	Change, 1980—93
Temporary absence	0.00	0.05	0.06	0.06
Illness or disability	3.06	3.27	3.75	0.69
Pension	0.22	0.41	0.27	0.05
End work	0.11	0.1	0.07	0.04
Sought work, could not find	0.27	0.75	1.05	0.78
Household responsibilities	0.02	0.08	0.1	0.08
University	0.74	1.13	0.95	0.21
Yeshiva	1.19	2.02	2.32	1.13
Other studies	0.28	0.69	0.52	0.24
Other reason	1.07	1.39	1.11	0.04
Military service	3.63	2.89	2.79	–0.84
Unknown and missing[a]	1.49	1.47	1.48	–0.01
Total nonparticipation	12.10	14.27	14.9	2.80
Civilian nonparticipation	8.47	11.38	12.11	3.64

[a] This category includes all nonparticipants who did not state a reason. These are mostly individuals who were not asked the question as they worked in the previous 40 weeks.

Source: See Appendix Table 1.

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