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WHY HAS THE LABOR-FORCE PARTICIPATION RATE OF ISRAELI MEN FALLEN?

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This study presents three complementary approaches exploring the main factors behind the steep decline in the participation rate of Israeli men in the past three decades. Two factors stand out in explaining the decline in participation rate: increases in the share of Orthodox Jews along with stronger dissociation of that group from the labor market and unfavorable labor market conditions for poorly educated people and especially for persons with disabilities.

1. INTRODUCTION

According the Israel Central Bureau of Statistics, 83.5% of Israeli men in the main working-age cohorts (25–54) participated in the labor force in 2001, as against 92.3% of men in this cohort in the OECD countries (Table 1).[1] In view of the disparity, the question is why Israeli men have one of the lowest participation rates in Western countries.[2] Investigation of the years between 1980 and 2001 shows a steep decrease in the participation rate of Israeli men. Men's participation also declined in many Western countries but the downturn was steeper in Israel than in the member countries of the OECD. Why is this so?

The falling participation rate of Israeli men has led to an attempt to understand why their participation rate is so low. Berman and Klinov (1997) and Dahan (1998) explain the decline in men's participation in part by citing the growth of the ultra-Orthodox population. Berman and Klinov (1997) show that the share of non-participants climbed from 8.5% in 1980 to 12.2% in 1993, while the share of ultra-Orthodox non-participants rose from 1.2%

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[1] The Israeli participation rate was calculated for a population including inmates of institutions. The study shows that the resulting rate is not comparable with that in the OECD countries and proposes a way to correct it.

[2] This study examines the behavior of men aged 25–54 only. Amir and Klinov (2003), who investigated the participation patterns of older men, show that the decline in the participation rate of men of advanced age is largely a reflection of an upturn in labor-force dropout rates at early ages, whereas the dropout rates of those aged 61+ hardly changed.

to 2.3%. In other words, the growth of the ultra-Orthodox population explains 30% of the decline in men's participation rate.

The low and falling participation rate also stimulated public interest that has mounted steadily in recent years. The noticeable growth of income-maintenance recipients, especially in the 1990s, created a circumstantial link to the welfare state as the factor responsible for the downturn in men's participation rate.

Several recent studies investigated the effect of the welfare state and, especially, the income-maintenance benefits, on participation in the labor market. Zussman and Romanov (2001) found that income maintenance has a negative effect on labor supply, especially among single-parent households. Their research, however, did not compare the intensity of the effect of Israel's income-maintenance benefit (or its generosity) with that in other countries; therefore, it cannot teach us about differences in the participation rates of Israeli men as against counterparts elsewhere.

Brander, Peled-Levi, and Kasir (2002) found that men's potential eligibility for income maintenance had no effect on the likelihood of their working in 1988–1996 and had a negative effect in 1997–2000. In contrast, potential eligibility had a mitigating effect on the likelihood of women's leaving the labor market during the 1990s.[3] The authors concluded that the benefit is being awarded more generously than before. However, they do not explain why this generosity has the reported effect on men only. Since their study does not present the quantitative contribution of this factor to the decline in men's labor-force participation, it cannot enlighten us about the importance of this phenomenon relative to other factors.

Gottlieb (2002) traces the perceptible upturn in the number of income-maintenance recipients to two factors. The first is the Employment Service's inability to put the jobless to work, as reflected in a sizable increase in the issue of "unplaceable" certifications – a phenomenon that worsened in 1998 due to the addition of the category of "permanently unplaceable."[4] Second, the value of the income-maintenance benefit relative to the alternative wage, measured in terms of the wages of persons with 0–12 years of schooling, increased. However, Gottlieb does not provide an answer to whether these factors are important quantitatively or not. Furthermore, the use of a wage equation to measure the alternative wage shows that the ratio of the income-maintenance benefit to the alternative wage did not rise (Brander et al., 2002). Finally, since Gottlieb draws no distinction between men and women, one cannot estimate the effect of the foregoing factors on the labor-force participation of men only.

A popular hypothesis often expressed by representatives of the Ministry of Finance is that the visible increase in the income-maintenance recipients reflects the learning curve of Israel citizens as to the benefits that the welfare state offers. According to this claim, it took

[3] The definition of potential eligibility is based on two conditions: that the individual is not working and that h/her non-labor income does not exceed a certain threshold (is disregarded). However, non-labor income has the disadvantage of poor statistical reliability, making the study at issue hard to use as a basis for unequivocal conclusions.

[4] In contrast, Zussman and Romanov (2002) show that the Employment Service staff decreased in absolute terms and, *a fortiori*, relative to the number of applicants; therefore, one would also expect the Employment Service's output to decline.

time for people to realize the advantages that the welfare state offers individuals who choose to avoid working. However, observation of working patterns after the enactment of the Income Maintenance Law in 1982 shows that the participation rate of men held steady in 1983–1986.

In the absence of an increase in the generosity of the benefit for men we are left with explanations such as an upturn in bureaucratic generosity, a learning curve, and incompetence on the part of the Employment Service.[5] The standard personal income-maintenance benefit stayed at the same rate (20% of the national average wage) from the passage of the Income-Maintenance Law until 2002. The regular benefit for a couple with two children was constant at 40% of the national average wage until 1995, when it was raised to 42% under legislation designed to fight poverty and income gaps. This rate remained in effect until 2002.[6] This legislation also made families headed by persons aged 46+ immediately eligible for the higher-benefit rate. Obviously, this results in an effective increase in benefits, chiefly for men aged 46+.

There were also significant changes in the income-maintenance benefit, but they had a limited effect on men's labor-force participation because they pertained to single-parent households, most of which are headed by women.[7] In October 1990, single parents who had a child under age seven (instead of age five as in the previous policy) and mothers of several children (of whom the youngest was under age ten) were exempted from the employment test. A more meaningful change took place in April 1992, when single-parent households were declared eligible for the higher rate of income maintenance even if they had not spent two years in the system. In August 1994, the group of eligibles for the higher rate was expanded again to include single-parent households that had not been defined as such in the Single-Parent Households Law (which went into effect in April 1992).

It is surprising to find that research in Israel about the factors behind the decrease in men's labor-force participation has hardly covered the role of the labor market.[8] Activity in the labor market competes with other activities, such as home production and leisure. The less attractive the labor market is, the more one would expect the labor-force participation to decline. By and large, one may focus on two aspects that make activity in the labor market worthwhile: the return on labor and the likelihood of finding work. In both respects, significant changes in the past three decades have acted to the disadvantage of the poorly

[5] When a household is entitled to income maintenance, it is also entitled to additional pecuniary benefits, e.g., rent subsidy and relief in taxes and fees such as National Insurance contributions, health tax, municipal property tax, and television license fee. Over the years, the generosity of the system may have increased via the related benefits but research has not investigated the long-term trend.

[6] Over the years, changes in the income-maintenance system have been made but do not seem to have had a quantitatively important effect on men's behavior. In March 1983, for example, persons found to be unable to work or to be placed in work, women who receive disability benefits as homemakers, and prisoners who work "on the outside" as part of their sentence were added to the list of eligibles. In July 1984, the determining sum was raised by 2% of the national average wage for an individual and 3% for households of other composition at the regular rate. The determining sum for the higher rate was raised to 5% and 7.5%, respectively. In 1987, the rate of excluded income of a household with more than one person was raised to 17% of the national average wage.

[7] Men may have abandoned the labor market after their family unit dissolved in order to evade alimony.

[8] Gottlieb (2002) is an exception.

educated. The widening of wage gaps in Israel has been documented in several studies and the increase in the unemployment rate is universally known.

Wages and the likelihood of finding work play an important role in explaining the falling participation rate of men in the United States. Juhn, Murphy, and Topel (1991), as well as Juhn (1992).[9]

A glance at Israeli research in this field yields another surprise from a different angle. By and large, the Israeli research fails to stress (and sometimes ignores) severe problems in measuring the participation rate of Israeli males. Due to these measurement problems, the reported participation rate of Israeli men is exaggeratedly low compared with that in the OECD countries. Members of the standing army and the other security services, a large proportion of whom are men, are included in the working-age population but not in the civilian labor force.

Our study proposes to tackle two basic questions. First, why do Israeli men have a low participation rate? We focus especially on four measurement problems that corrupt the comparison of the participation rate of Israeli men with that of their foreign counterparts. Second, why has the participation rate of Israeli men fallen steeply in the past three decades?

2. WHY IS THE PARTICIPATION RATE OF ISRAELI MEN SO LOW?

One of the main underlying motives of this study was the doubt that scholars entertain whenever they encounter (repeatedly) the fantastic statistical notion that more than 16% of Israeli men of main working age (25–54) do not participate in the labor force – twice the 8% share of non-participants in the member countries of the OECD in 2001.

The natural way to answer the question in the subtitle is by doing research with the help of a database on the participation rates of men in various countries including Israel, plus a series of variables that serve as explanatory factors for the differences among the countries. Thus far, however, no way has been found to surmount the obstacle of constructing a database with comparable data from different countries for the main variables such as welfare benefits, relative wage of the poorly educated, and the proportion of students in the population.

[9] Juhn, Murphy, and Topel repeated their study eleven years later, this time to determine the importance of labor-market softness in explaining the decline in men's employment rate. This study also found that the decrease in the participation rate in the 1990s was connected with greater generosity toward persons with disabilities. Over the years, a fierce debate evolved about the validity of this finding in respect of a correspondence between the proportional upturn in persons reporting disability and the decline in labor-force participation. On the one hand, Parsons (1980) attributes the falling participation rate shortly after World War II to the possibilities that the welfare state makes available, especially the development of the disability benefit. In contrast, Bound (1989) points to econometric problems in Parsons' work that caused Parsons to overstate the effect of the disability benefit. Bound used a "natural experiment" technique to elicit an estimate showing that the disability benefit is of rather limited quantitative importance. Recently, Autor and Duggan (2003) joined this debate and showed that the increase in disability claims traced to the interactive effect of greater generosity and a lower return on labor for the poorly educated.

This paper takes the first step toward research of this kind. It asks whether Israel's low ranking on the international scale of men's labor-force participation rates reflects a discrepancy in the way Israel handles its statistics relative to the OECD countries. This exploration uncovers four measurement problems of quantitative importance in the differences between Israeli men's participation rate and those of men in OECD countries.

a. Four measurement problems

The first step in an attempt to track down the reasons for a relatively high rate of non-participation is to ask men who chose or were forced to remain outside the labor force to explain why. Table 2 presents a breakdown of the three main reasons for men's non-participation: illness or retirement, studies, and other. The most conspicuous statistic in the table is the high proportion of respondents whose answers to the CBS canvassers we do not know. In other words, the reasons for the non-participation of 5.6% of men of main working age – more than one-third of all non-participants – are unknown.

a.1 Classification of members of the standing army as non-participants

The large share of non-participants whose reasons for non-participation are not reported is partly explained by the classification of members of the security forces (mostly members of the standing army) as non-participants. We realize that this classification is meant for the purpose of estimating the size of the civilian labor force, but because this group is proportionally larger in Israel than in other countries, this classification artificially depresses the participation rate of Israeli men

The OECD countries define their labor force by the conventional criteria of the International Labor Organization (ILO), which classify servicemen and women as participants.[10] In practice, quite a few labor surveys in the OECD countries, performed by the statistical authorities of each country individually, exclude military personnel from the sample. Consequently, these people are included neither in the labor force nor in the working-age population.

Israel's labor survey, in contrast, includes military personnel in the working-age population but classifies them as non-participants in the labor force. This unique statistical treatment distorts Israel's participation rate relative to countries that include military personnel in their labor surveys *and* countries that do not. The twenty countries that include military personnel in their labor surveys classify them as participants (Table 3) whereas ten countries' surveys exclude military personnel.

By classifying members of the standing forces as participants, we raise the participation rate of men aged 25–54 in 2001 from 83.5% to 85.4% (Table 4). The relatively large proportion of men among members of the standing forces is one of the factors that explain the substantial differences between Israel and the OECD countries in men's labor-force

[10] Pursuant to a resolution adopted at the Thirteenth Conference of the International Conference of Labor Statisticians, October 1982.

participation rates. Indeed, a comparison of Israeli women with women in Western countries elicits relatively small differences.

By classifying standing-army personnel as participants, we also find that the decline in the participation rate of Israeli men was even more precipitous than we had known thus far. The decrease in participation rate between 1980 and 2001 was 5.1 percentage points when standing-army personnel were classified as non-participants and 6.5 percentage points when standing-army members were classified correctly (Table 4). These differences reflect the abrupt downturn in defense expenditure during these years, which prompted the IDF to downsize its order of forces. Thus, correcting the systematic measuring error improves our ability to analyze the factors that are responsible for the falling participation rate of men during the past quarter-century.

a.2 Inclusion of inmates of institutions in the working-age population

How relevant is a definition of the working-age population if it includes people who live in closed psychiatric hospitals or prisons? Obviously, inmates of such institutions cannot participate in the labor market even if they want to. Thus, this population should be given the same statistical treatment as babies or children, i.e., they should be excluded from the working-age population.

The participation rate of men aged 25–54 in 2001 rises to 86.3% if we make two corrections: classifying standing-army personnel as participants and excluding inmates of institutions from the working-age population (Table 4). The decline in the participation rate becomes more intense: from 5.8 percentage points in 1980–2001 if inmates of institutions are excluded to 6.5 percentage points if they are included (Table 4).

The share of inmates of institutions among men aged 25–54 climbed from a negligible 0.3% in 1980 to 1.4% in 2001. This population includes prisoners and exhibits especially low participation rates as a matter of course. The share of this group surged dramatically in 1985, when the weight was raised pursuant to census findings indicating that inmates of institutions had been underrepresented in the Labor Survey. This statistical change contributed about 1 percentage point to the decline in the total participation rate.

Unlike Israel, the Current Population Survey (CPS) excludes inmates of institutions from the working-age population, as do most OECD countries (Table 3). Comparison of the participation rates of Israeli men with those of their counterparts in the OECD countries must take this into account.

a.3 The wandering Israeli

Given the size of the group that did not explain why it does not participate in the labor force, we asked the Central Bureau of Statistics to furnish a rough list of reasons that interviewees reported to its canvassers.[11] This raw material, some of which appears in Table 6, may suggest another answer to the question of why the share of the non-participant group that falls into the category of "other reason" is so large. The table presents a range of

[11] I thank Ruth Sehayek of the CBS for providing me with this important information.

reasons that interviewees offered when asked why they chose or were forced to stay outside the labor market. One of the most conspicuous reasons related to having been out of the country. According to this information, Israelis who had been abroad are categorized as non-participants in Israel. Obviously, classifying people who study abroad as non-participants in Israel artificially inflates the proportion of non-participants (men and women). According to data for two quarters (III and IV) of 2002, 110 interviewees (men and women of all ages) from a list of 358 interviewees cited "abroad" as the reason for their non-participation in the labor force. In CBS publications, persons staying abroad appear under the category of "other reason." The raw material that the CBS furnished sheds no light on the purpose of their stay abroad. It may be a time-limited visit for purposes such as leisure, study, or research (sabbatical) or it may be for emigration. The aforementioned list of reasons for non-participation should not include a leave of absence from one's job for a trip abroad, because such people continue to be employed in Israel.

The proportion of men who are abroad and are classified as non-participants is estimated at 0.5%–1% However, the importance of this factor in explaining discrepancies between Israel and the OECD countries cannot be estimated because we do not have data on the frequency of this phenomenon in other countries.

a.4 Students

In most OECD countries, men finish Bachelor degree studies and, in many cases, Master degree studies before age 25. In Israel, military service among Jewish men occupies much of the 18–21 cohort and some of the population up to age 22. Those who complete their military service often feel an acute need to recharge their batteries by spending several months or more abroad immediately after discharge. Consequently, the combination of military service and the "recovery period" defers the onset and the completion of academic studies to a later age.

The 8% proportion of students in Israel among men aged 25–54 is anomalous by OECD standards and reflects the indirect effect of conscript military service. Importantly, the problem in this case is not of measurement but of interpreting the measurement. By and large, however, comparisons of Israeli men with counterparts abroad in terms of participation rate aim to answer the question of whether Israelis are lazy or are exploiting the welfare state. If this is the purpose of the comparison, one must take into account the anomalous share of higher-education students. A simple way of doing this is to calculate the participation rate net of students.

a.5 Adjusted estimate of the participation rate

The adjusted measurement of the participation rate of Israeli men aged 25–54 (i.e., one that classifies standing-army personnel as participants and excludes inmates of institutions from the working-age population) elicits a rate of 86.3% in 2001 as against 92.2% in the OECD countries (Table 4).[12] A more comprehensive comparison should also take account of

[12] According to the same calculation, the participation rate of Israeli men in 1980 was 93.8%.

differences in the proportion of students (and of those staying abroad). Thus far, however, I have not found reliable data for OECD countries on the proportion of students in the relevant age group, sorted by working patterns.

Correction of the measurement problems in the proposed manner narrows the gap between the participation rates of Israeli men and those of their OECD counterparts but does not ease, and actually exacerbates, the intensity of the decline in the participation rate of Israeli men over time. In the following sections, we attempt to identify the main factors behind the steep decrease.

3. WHY HAS THE PARTICIPATION RATE OF ISRAELI MEN FALLEN?[13]

Falling labor-force participation rates among men are not unique to Israel; as stated, they are shared by many Western countries. The participation rate of American men aged 25–54, for example, declined from 94.2% in 1980 to 91.6% in 2001. The decrease in Israel, however, was steeper than that in the OECD countries. Below, we use three approaches to investigate the factors behind the decline in Israeli men's participation rate over the two past decades.

a. Approach I: What the interviewees say[14]

Here, the factors behind the decline in participation rated are examined based on reasons offered by interviewees in the Labor survey for their non-participation market. The drawbacks of this approach are well known. First, there is no guarantee that the self-reportage is true. Second, the list of reasons that appears in the labor surveys is limited. In particular, it omits the entire array of economic incentives, including welfare-state benefits on the one hand and labor market conditions on the other. Economic incentives often underlie the reason that appears on the CBS list. Finally, the decision may trace to a combination of factors and not one single reason.

Despite these limitations, self-reportage of reasons might reveal important factors behind the decline in the participation rate of working-age men.

Increase in the share of students: Table 6 presents the four main reasons for non-participation and identifies one of the factors behind the decline in participation: an increase in the share of men who take up studies. In 2001, 4.5% of men aged 25–54 reported that they did not belong to the labor force for this reason, as against 3.9% in 1990 (Table 7) and 2.1% in 1980 (Table 8). The population of students who do not belong to the labor force is

[13] Throughout this study, we exclude inmates of institutions and temporary settlements from the population examined due to changes in definitions over time and concern about the reliability of the information about labor patterns of inhabitants of temporary settlements.

[14] We compare 2001 with 1980 instead of 1974 due to lack of information about the reasons for non-participation and the type of last school attended by the interviewee, by which the ultra-Orthodox population is identified.

composed of two groups that display different characteristics: higher education and *yeshiva* study.

The share of non-ultra-Orthodox students who attributed their non-participation to study was 2.1% of all Israeli men in 2001 as against 0.9% in 1980. This factor explains 21% of the decrease in the participation rate over the past two decades. Presumably, these men consider human capital an investment that generates a worthy enough return to justify their non-participation in the labor force for a limited period of time. Since investment in human capital does generate a high return, a decline in the participation rate occasioned by an increase in the proportion of students would latter lead to an increase in per-worker product. Note that the population of students is larger, but some students combine work with study and are classified as participants in the labor force.

As stated, a group within the student population of Israeli men has singular preferences (a strong preference for leisure) and remains in an ultra-Orthodox scholastic setting. Ultra-Orthodox men spend rather lengthy periods of time in *yeshiva* even if this type of education does not give them a financial return in the labor market. In other words, not every increase in the share of students has a positive effect on the expected GDP per-capita. Obviously, so lengthy an absence from the labor market requires alternative sources of income, such as government support. In 2001, 2.4% of all men (Jewish and non-Jewish), half of the students, attributed their non-participation in the labor force to *yeshiva* study, as against 1.2% in 1980. Thus, 1.2 percentage points of the 5.7 percentage-point decrease in the overall participation rate should be charged to the increase in the population of ultra-Orthodox students.

Increase in the population of disabled and ill: Generally speaking, the proportion of persons who report themselves as being disabled depends on quality of health services, the generosity of the welfare state to persons with disabilities, the state of the labor market, and the extent of voluntary insurance coverage for disability.[15] Regrettably only interviewees who do not belong to the labor force are asked about their state of health. For this reason, the Labor survey sheds no light on the participation patterns of the disabled, changes in these patterns, the share of persons with disabilities in the population, and how this proportion has been changing over time.[16]

One of the most conspicuous phenomena that we encountered when comparing the reported reasons for non-participation in the labor force in 2001 with the reasons reported

[15] In the past two decades, more and more Israeli employees have been taking out voluntary insurance against loss of earning capacity. Coverage of this kind allows individuals to maintain a standard of living approximating that preceding their disability without having to participate in the labor force. Support for this may be found in the increase in the share of men aged 25–54 who reported retirement as the reason for their non-participation in the labor force.

[16] The CBS Social Survey (2002) allows us to estimate the proportion of persons with disabilities in the male population aged 25–54 according to self-reported degrees of disability: the share of men in this age cohort who have difficulty or inability to eat on their own (1.1%), to get dressed (2.9%), to bathe (2.9%), and to ambulate at home (3.1%). Some 3.7% of men in this age cohort defined their state of health as "not good at all." However, the Social Survey does not allow us to examine long-term developments.

in 1980 was an appreciable increase in the share of interviewees who attributed their non-participation to illness or disability: 4.9% in 2001 as against 3.1% in 1980.

Our study finds a considerable difference between Jews and non-Jews in the share of disabled in the population. In 2001, 10% of non-Jewish men aged 25–54 reported disability (or illness) as the factor that kept them out of the labor force, as against 3.7% of Jewish men. This considerable difference, however, reflects differences in population characteristics and, especially, in levels of schooling. The discrepancy narrows considerably when we compare the share of disabled among Jews and non-Jews who have the same level of schooling.

A plausible explanation is that the rate of disabled non-participants has increased because some disabled persons who used to fit into the labor market easily find this hard to do in the modern labor market. Conditions in the labor market have changed in two contrasting directions. On the one hand, modern economic growth is manifested in a broadening of the range of jobs that entail intellectual capacity as against those requiring physical capacity; this makes the labor market more accessible to persons with physical disabilities (assuming that they do not have intellectual disabilities as well). On the other hand, the unbalanced growth process over the past two decades has worsened the plight of persons with poor schooling and limited qualifications. In this respect, persons with disabilities who are also poorly educated are the worst off.

Deteriorating conditions in the labor market, manifested in falling wages or declining likelihood of finding work, will likely to induce the poorly educated disabled in particular to seek aid from the welfare state; in certain cases they may even overstate the severity of their disabilities in order to secure an alternative source of income.

Classification of the disabled by levels of schooling reveals a strong correlation between years of schooling and disability (according to self-reportage). Among those with 0–9 years of schooling, 20% reported disability as the reason for non-participation, as against 1.2% of those with 16+ years of schooling. This suggests that the phenomenon of non-participation and self-reported disability might be affected by the decline in demand for uneducated people. A moot question is whether the disability that kept them out of the labor force is also the factor that kept them from acquiring more advanced schooling.

Increase in the population of discouraged workers: An important macroeconomic phenomenon that distinguishes between the first years of the twenty-first century and the early 1980s is deep unemployment. Israel's unemployment rate climbed from around 3% in the late 1970s to a double-digit level at the beginning of the 2000s. High unemployment rates over a relatively lengthy period of time prompt individuals to despair of finding work and to disengage from the labor market.

The list of reasons that the interviewees reported includes "looked for work and did not find it." Apparently, such people should be classified as participants. However, one must meet an additional condition to be defined as a participant: having sought work in the four weeks preceding the week of the CBS canvasser's visit. These men had looked for work during the period preceding those four last weeks, the determining period for defining the participation patterns, but stopped looking during the determining period. They had probably despaired of finding work.

In 2001, 1.7% of men aged 25–54 did not participate in the labor force and reported that they had looked for work but had not found it, as against 0.3% in 1980 (Tables 7 and 9). Thus, the discouraged-worker phenomenon became meaningful if one may judge it on the basis of interviewees' self-reportage. This phenomenon is consistent with a decline in the likelihood of finding work that is implicit in an increase in the unemployment rate.

The increase in the share of discouraged workers is especially dramatic among the Arab population. In 1980, a negligible share of non-Jewish men attributed their non-participation in the labor market on unrequited searching. In contrast, in 2001, 4.4% of non-Jewish men cited "looked for work and did not find it" as the reason for their non-participation.[17]

b. Approach II: What do the interviewees do?[18]

Another way to answer the question of why men's participation rate has fallen is by using micro-regression analysis. This approach expands the list of reasons for disengagement from work to include factors not stated by the interviewees. It does not replace the previously examined approach but rather complements it by shedding some light on the factors behind the reasons that the interviewees noted.

In Approach II, we estimate the effect of selected personal characteristics (marked as vector X) such as schooling, age, and marital status on the probability of participating in the labor force (P). We can decompose the change in participation rate between two points in time into two contributing factors: that of the change in personal characteristics (given the "prices" of the characteristics) and the change in the prices of the personal characteristics (given the personal characteristics), and less the product of the changes, which usually has a negligible quantitative effect. An algebraic formula of the equation of this differential follows:

$$\hat{P}_t - \hat{P}_{t-1} = \hat{\alpha}_t - \hat{\alpha}_{t-1} + (X_t - X_{t-1})\hat{\beta}_t + (\hat{\beta}_t - \hat{\beta}_{t-1})X_t - (\hat{\beta}_t - \hat{\beta}_{t-1})(X_t - X_{t-1}) .$$

The second expression represents the effect of the change in personal characteristics; the third expression reflects the change in the "price." The participation estimate was performed on the basis of regression coefficients that were estimated using the OLS method, which allows us to factor the decline in participation rate.[19]

To factor the decline in participation rate between the two periods of time, a regression for 2001 and 1980 was estimated. The list of explanatory factors included five schooling groups by years of study, four age groups, three possibilities of marital status, five groups of number of children in household, five groups of religion, ultra-Orthodox, immigrant, student, and parent for head of household. Table 9 lists all the regression coefficients that

[17] The proportion of discouraged workers was also checked in 1999 in order to neutralize the possible effect of the October 2000 Arab riots on the participation rate. In 1999, it was found that 2.8% of non-Jewish men reported despair, i.e., "looked for work and did not find it," as the reason for their absence from the labor force.

[18] We compare 2001 with 1980 instead of 1974 due to lack of information about the last type of school that the interviewee attended, by which the ultra-Orthodox population is identified.

[19] Table 9-A presents a Probit estimate for 2001 and 1980.

were estimated, shows the extent of their statistical significance, and records the mean value of the variables. (Note that all the variables are proportions of the relevant population in the sample.) The regression estimate disregards the weight that are attributed to each observation in the sample, unlike the descriptive tables in the previous section.[20]

Growth of the ultra-Orthodox sector: This study further confirms the anomalous working patterns of the ultra-Orthodox population. The participation rate of the ultra-Orthodox in 2001 was some 60 percentage points lower than that of non-ultra-Orthodox who had similar personal characteristics. The ultra-Orthodox participation rate was also extraordinarily low in 1980, but only by around 30 percentage points. The combined effect of the growth of the ultra-Orthodox sector and the sector's greater propensity to disengage from the labor market brought down the average participation rate of men aged 25–54 by 1.5 percentage point. This finding corresponds to the results elicited by Approach I.

Decrease in the population of married men: unmarried men (single, divorced, widowed) typically have lower participation rates than married men. Notably, the share of this group has been rising and was found to have contributed 3 percentage points to the decline in men's average participation rate in a comparison between 2001 and 1980. The contribution of this factor is not especially sensitive to the choice of year.

The falling proportion of married men is the combined outcome of later marriage age (deferral of marriage) and a rising divorce rate. Some of these men, who as noted are at least 25 years old, continue to live with family members and do not establish households of their own. In other words, they remain economically and socially dependent on relatives even at relatively advanced age.

The propensity of married men to have a higher participation rate than unmarried men reflects two different effects on labor patterns. The first effect, household status, might indicate on the individual's social integration. We do not know whether a particular unmarried man chooses to be unmarried or is forced to be so although he would prefer to be married. Remaining outside the marriage cycle due to a constraint of some kind may suggest difficulties in social integration. The source of one's difficulties in social integration would also affect one's ability to integrate economically. For example, the marriage rate of persons with disabilities, whose integration into the labor market is limited, is significantly low. The causality may also operate in the opposite direction: men who find it difficult to integrate economically may encounter difficulties in social integration, including finding a spouse.

Table 10 presents additional regressions, including a more direct examination of the effect of social credentials on the participation rate. The variable to bear in mind is whether the individual lives in a household of his own (value 0) or does not (1). This variable largely but not totally overlaps that of "married." With the other variables held constant, the

[20] Disregarding the weights does create a bias, but keeping them in mind may also involve a bias. The weights are suitable for the co-distribution of the population according to the variables chosen by the designers of the Labor survey, but these coefficients are not necessarily suited to distribution of the population by the variables included in the regression.

participation rate of men who do not live in their own households is 27 percentage points lower. Interestingly, the proportion of men who did not live in their own households increased significantly during the research period.

The second effect of marriage is that it makes one's income more necessary. (The utility curve at the level of leisure and goods becomes steeper.) The burden of responsibility makes their income more essential and whets their motivation to participate in the labor force. This effect is largely captured by the "number of children" variable in the regression. Accordingly, this coefficient reflects mainly the first effect.

Disparities between Jews and Muslims: The most salient change in the regression coefficients occurs in the coefficient of Jewish men as against Muslim men. In 2001, the participation rate of Jewish men was 6.6 percentage points higher than that of Muslim men who had identical characteristics (schooling, age, etc.). This marks a dramatic change since 1980, when the participation rates of Jewish and Muslim men were identical net of differences in characteristics. The specific contribution of this factor is *positive* (6 percentage points) because technically the variable of "Jewish" appears in the regression equation and the omitted variable is "Muslim." This estimate is highly sensitive to the choice of year of comparison. If we choose 1999 as the comparison year, the contribution of this factor falls perceptibly although it does not disappear.

Disparities by schooling: The participation-rate regressions in Table 9 show that in 2001 the likelihood of labor-force participation rose with schooling. The disparities in participation rate between well educated and poorly educated individuals widened considerably when we compared the schooling coefficients of 2001 with those of 1980. In fact, in 1980 there were no significant differences in participation rates by levels of schooling, except for men with 0–9 years of schooling. The disparities in participation rates widened with the decline in the participation rates of men at all levels of schooling.

The steep decrease in the participation rate of the poorly educated outweighed the positive effect of the downturn in the share in that group in the past two decades. The contribution of this factor to the decline in the total participation rate was estimated at around 3 percentage points. This approach, however, tells us nothing about the factors that brought on such a steep decline in the participation rate of the poorly educated. This population's participation patterns are affected by the generosity of the welfare state and the attractiveness of the labor market for the poorly educated. We attempt to deal with this question in the next section.

c. Approach III: Aggregate analysis

The foregoing approaches revealed factors that might have eluded us otherwise. However, by using only self-reportage and personal characteristics to analyze the reasons for the declining participation rate, we cannot directly check hypotheses about the effect of factors such as the generosity of the welfare state and the attractiveness of the labor market.

c.1 Conceptual framework[21]

To gauge the size of the population that chooses to remain outside the labor market, one has to examine the factors that affect utility in each of the two possibilities that the individual faces: to participate or not. It is easy to show that an increase in welfare-state benefits or the probability of obtaining them would cause the group of non-participants to grow.

The participation rate is also affected by the environment of the labor market. An increase in the probability of losing one's job raises the proportion of non-participants, whereas an increase in the probability of finding work does not change the number of non-participants but reduces the number of employed persons who become non-participants. Labor-market conditions also affect the trend of the aggregate participation rate by changing the distribution of earning capabilities. If wage inequality in the labor market worsens, more individuals will choose to refrain from participating. Earning skills in the labor market are also influenced by the population's social capabilities. A proportional increase in the population that has poor working credentials may cause the share of non-participants to rise as well.

c.2 Empirical application

Most time series such as GDP and consumption, are characterized by a time trend and, in turn, by a unit root. If two time series share the same trend, they may exhibit an ostensible economic relationship even though they are not really related (spurious correlation). Series such as participation rate and unemployment rate are foreknown to be bounded by between 0 and 1. A time trend in the participation rate and the unemployment rate is highly unlikely to exist if the sample is infinite; therefore, these series is by definition are not typified by a unit root. However, the participation rate over a limited period of time may create the appearance of a time trend.

OLS regressions are used, with the participation rate as the dependent variable and the explanatory variables determined in the spirit of the conceptual framework described above. The research period is 1974–2001. The conceptual framework elicits three groups of variables that affect the participation rate: a welfare-state variable (the level of benefit and the probability of receiving it), the attractiveness of the labor market (the probability of finding and losing a job), wage distribution, and the distribution of labor-force qualifications. Naturally, the empirical variable is always an approximation of the theoretical one.

The proxy for the welfare-state variable in this study is the individual income-maintenance benefit at the regular rate (we also used the income-maintenance benefit for a couple with two children) relative to the average wage. The proxy for the wage-distribution variable is ratio of gross wage per labor hour of persons with ten years or less of schooling to average gross wage per labor hour of men aged 25–54.

[21] The conceptual framework is borrowed from Autor and Duggan (2003) and is fully described in the previous version of this study (discussion paper).

The advantage of separating this ratio into two variables (benefit relative to average wage, wage of persons with ten years of schooling to average wage) is its ability to trace directly the origin of variation in the ratio. Does the variation originate in policy changes or in changes in return on labor for the poorly educated? Another advantage is that the benefit coefficient may be different from the alternative-wage coefficient (the wage of the poorly educated). There are good reasons to think that these coefficients will not be identical.

It is immensely difficult to find an adequate proxy for the probability of receiving a benefit in the case of men aged 25–54. Application for income maintenance on the grounds of being unplaceable in work is sometimes viewed as an indicator of the extent of strictness in screening of applicants by the Employment Service (Gottlieb, March 2002). The extent of the validity of this indicator in reflecting the probability of obtaining a benefit is doubtful because it correlates with economic variables such as unemployment rate and wage. Changes in the proportion of members of the labor force who claim income maintenance may reflect an increase in job-finding difficulties of which the Employment Service officials are aware.

We computed the proportion of men who claimed income maintenance on the grounds of unplaceability among all men aged 25–54 in 1974–2001 as a proxy for the extent of strictness on the part of the Employment Service.[22] This variable affects the probability of receiving a benefit; the variable that represents the probabilities of finding and losing a job is the unemployment rate among the relevant population group.[23]

The variable that represents the distribution of labor-force qualifications is the share of men who do not live in their own household among men aged 25–54. These men are defined neither as heads of household nor as spouses as heads of household. This subset of the 25–54 age cohort includes sons of heads of household (about half of all men who do not live in their own households) or other degrees of kinship such as nephews, brothers-in-law, sons-in-law, or parents of head of household. If a man of relatively advanced age lives with his parents or relies on relatives for shelter, s/he may have social integration difficulties that prevent her/him from establishing a household of his own.

This variable, used for the first time in this study, is not as conventional as an unemployment rate or a level of benefit. Nevertheless, the changes that occurred in the extent of this phenomenon and the correlation that we found between its growth and the decline in participation rate deserve more research attention.

The explained variable is the participation rate of the population. The ultra-Orthodox and students were excluded because the standard conceptual framework fails to reflect the singular considerations that determine their behavior patterns.

Table 11 shows that the coefficient of wage of the poorly educated relative to the national average wage is positive, as the theory predicts. The qualitative results also remain unchanged when the wage of the poorly educated is replaced by the median wage of men aged 25–54. The negative coefficient of the unemployment rate is also consistent with the

[22] We thank Tamar Haroun and Miriam Schmelzer of the National Insurance Institute for their assistance in preparing these data.

[23] Beenstock and Klinov (1998) show that the upturn in Israel's unemployment rate reflects both an increase in the probability of losing a job and, more so, a decrease in the probability of finding one.

hypothesis that emerges from the conceptual framework. These results recur in a regression that presents the explanatory variables at a one-year lag.

The variable of personal income-maintenance benefit as a share of the average wage is a constant ratio that has been in effect since 1982, i.e., there has been no change in policy since the law was enacted. This variable serves as a dummy variable for years before and after 1982. Notably, the Income Maintenance Law replaced the welfare payments that had been offered until then. Thus, the empirical test is based on examining the effect of the introduction of this statute on the participation rate. The effects of policy changes cannot be examined because none took place during the research period. This estimation makes it clear that the changes in men's participation rate cannot be attributed to changes in income-maintenance policy, because none occurred.

The variable that represents the proportion of persons who have poor labor-force qualifications (do not live in a household of their own) carries a negative sign, as expected. Note that the addition of this variable reduces the statistical significance of the wage-ratio and unemployment-rate coefficients, but these still carry the correct sign and it is significant at an accepted level.

We also found that the coefficient of the percentage of men who received income maintenance due to unplaceability in work carries a sign that is consistent with the conceptual framework. The inclusion of this variable does not change the sign of the coefficients of the other variables but it makes them less significant. The decline in significance, however, reflects the correlation that exists between this variable and the wage and unemployment ratio. This correlation shows that the probability of receiving a benefit, measured here by the proxy of the proportion of unplaceables, is not exogenous.

Table 12, which may also be regarded as a sensitivity analysis of the foregoing results, estimates the effect of the wage ratio, the unemployment rate sorted by four schooling groups, and the income-maintenance benefit on the participation rate of four schooling groups. The table shows that the coefficient of the unemployment rate is negative and significant at all levels of schooling. In contrast, the coefficient of the wage of the poorly educated relative to the average is positive and significant for both low schooling levels and has no influence (is not significantly different from 0) at levels of schooling beyond 12 years. The coefficient of the income-maintenance benefit continues to be an outlier, not behaving as expected.

4. CONCLUSION

This study presented three complementary approaches exploring the main factors behind the steep decline in the participation rate of Israeli men in the past three decades. The first approach, based on the list of reasons that the interviewees reported, holds four factors responsible for the decline in participation rate between 1980 and 2001: increases in the population of students (21%), the ultra-Orthodox (21%), the disabled (32%), and discouraged workers (25%). This approach, however, does not explain why the share of the disabled rose and, in particular, whether this should be traced to labor-market factors or welfare policy.

The second approach, based on a regression analysis, attributes the decrease to lower attachment of the poorly educated to the labor force, a steep decrease in the proportion of married men, and growth of the ultra-Orthodox sector (and greater disconnect of this sector from the labor market). This approach complements the first one in that the proportion of the poorly educated among the disabled and among discouraged workers is high and because the rate of married men is especially low among those who reported themselves as being disabled. This approach, however, does not reflect the effect of the labor market or the welfare policy.

The third approach, based on an aggregate analysis of the labor patterns of men who are neither ultra-Orthodox nor students, explains the decline in the participation rate by tracing it to the deterioration of conditions that the labor market offers while income-maintenance benefits remained stable relative to the national average wage.

Table 1
Labor-Force Participation Rate of Men Aged 25–54

	Labor-force participation rate (men aged 25–54)		
Country	1980	1990	2000
Japan	0.970	0.975	0.971
Switzerland			0.967
Mexico			0.963
Iceland			0.961
Germany	0.947	0.921	0.958
Czech Republic			0.949
Greece		0.943	0.943
France	0.965	0.954	0.942
Luxembourg		0.950	0.942
Slovakia			0.939
Netherlands	0.931	0.934	0.935
Austria			0.931
Spain	0.952	0.943	0.930
Portugal	0.942	0.942	0.928
Belgium		0.922	0.921
Ireland		0.918	0.920
Korea	0.956	0.946	0.920
U.K.		0.948	0.919
U.S.	0.942	0.934	0.916
Denmark		0.945	0.915
Norway	0.930	0.923	0.914
New Zealand		0.934	0.913
Canada	0.944	0.931	0.911
Finland	0.922	0.929	0.908
Italy	0.931	0.909	0.906
Sweden	0.955	0.947	0.906
Australia	0.945	0.931	0.903
Turkey		0.942	0.894
Poland			0.883
Israel, adjusted (1)	**0.920**	**0.892**	**0.869**
Hungary			0.845
Israel, CBS (2)	**0.886**	**0.857**	**0.835**
Avg.	**0.945**	**0.935**	**0.92**3

1. Standing army personnel are classified as participants and the population excludes inmates of institutions and residents of temporary settlements.
2. Standing army personnel are classified as non-participants and the population includes inmates of institutions.

Table 2
Non-Participation of Men according to Self-Reported Reasons, 2001

	Thousands	Share of population
Men aged 25–54	1,182,400	100.0
Civilian labor force	996,900	84.3
Non-participants	185,600	15.7
Reasons for non-participation, by self-reportage		
Retirement or illness	64,600	5.5
Studies	53,600	4.5
Other reason	66,400	5.6

Source: Labor surveys 2001, Central Bureau of Statistics, Publication 1199, April 2003.
Note: the population of men does not include inmates of institutions and residents of temporary settlements (e.g., Bedouin in Israel's south).

Table 3
Statistical Treatment of Military Personnel and Inmates of Institutions, International Comparison

Country	Are military personnel included?	Are inmates of institutions included?
Australia	No	Yes
Austria	Yes	Yes
Belgium	Yes, evidently ("civilian" is not noted but the inclusion of military forces is also not noted)	Evidently not (the survey includes members of private households only)
Canada	No	No
Czech Republic	No, apart from students in pre-military programs	No
Denmark		Evidently not (the survey includes members of private households only)
Finland	No	Evidently not. Private and collective households are noted; "non-institutional" is not noted
France	Yes	In part
Germany	Yes	Yes
Greece	Yes, evidently ("civilian" is not noted but the inclusion of military forces is also not noted)	No
Hungary	Yes	No
Iceland	Yes	Yes
Ireland	Standing army personnel living in private homes	No
Italy	Yes	No
Japan	Yes	Yes
Korea	No	No
Luxembourg	Yes, evidently ("civilian" is not noted but the inclusion of military forces is also not noted)	No
Mexico	No	No
Netherlands	Yes	No
New Zealand	No	No
Norway	Yes	Yes, evidently ("non-institutional" is not noted and the inclusion of collective households is noted)
Poland	Only military personnel living in private homes	No
Portugal	Yes	No
Slovakia	Only from 1997 on	No
Spain	Yes	Survey includes private households only and prisoners are not included. Exclusion of inmates of institutions other than prisons is not clear.
Sweden	Yes	Yes, evidently. Neither "excl. institutions" nor "private households" is noted, but rather all inhabitants
Switzerland	Yes	No
Turkey	No	No
U.K.	Yes, excl. Standing army	No
U.S.	No	No

Source: OECD]

Table 4
Labor-Force Participation Rate of Men in Main Working-Age Cohorts (25–54), 1974–2001

Year	Participation rate by years of schooling				
	(1)	(2)	(3)	(4)	(5)
	Standing forces do not participate; population includes inmates of institutions	Standing forces participate; population includes inmates of institutions	Standing forces participate; population excludes inmates of institutions	(3) excl. ultra-Orthodox	(4) excl. students
1974	0.913	0.934	0.945	Unknown	0.956
1975	0.905	0.930	0.940	Unknown	0.953
1976	0.902	0.925	0.934	Unknown	0.946
1977	0.898	0.924	0.933	Unknown	0.947
1978	0.893	0.924	0.933	Unknown	0.947
1979	0.891	0.923	0.924	0.933	0.939
1980	0.886	0.919	0.920	0.931	0.938
1981	0.885	0.919	0.919	0.934	0.941
1982	0.882	0.913	0.914	0.927	0.935
1983	0.882	0.915	0.917	0.930	0.939
1984	0.883	0.916	0.917	0.930	0.938
1985	0.868	0.900	0.911	0.926	0.935
1986	0.864	0.895	0.904	0.920	0.931
1987	0.861	0.887	0.896	0.916	0.928
1988	0.864	0.891	0.899	0.918	0.930
1989	0.867	0.895	0.904	0.924	0.935
1990	0.857	0.883	0.892	0.911	0.921
1991	0.853	0.878	0.886	0.906	0.915
1992	0.851	0.877	0.885	0.906	0.916
1993	0.857	0.880	0.888	0.910	0.919
1994	0.859	0.876	0.884	0.905	0.916
1995	0.860	0.883	0.891	0.912	0.920
1996	0.852	0.874	0.882	0.904	0.913
1997	0.848	0.871	0.879	0.901	0.911
1998	0.845	0.867	0.875	0.896	0.906
1999	0.840	0.862	0.871	0.890	0.899
2000	0.840	0.860	0.869	0.887	0.893
2001	0.835	0.854	0.863	0.883	0.892

Table 5
Selection of Reasons for Non-Participation in Labor Force, by Self-Reporting

Traveling abroad	Don't know; ran away from	Arrested a month ago
Fired due to cutbacks	home yesterday and don't	Returned to Israel two months
Sought work, found none	want to report	ago
Moved to Bet Shemesh	Was abroad	About to begin studies abroad
Was abroad	On income maintenance, soon	Trip abroad
Was abroad for wife's medical	to go on pension	Not interested
care	No work due to security	Induction next week
Was abroad	situation, tour guide	Returned from abroad
Stayed abroad	Not interested	Teacher; undecided about
Stayed abroad (fem.)	Don't want to work	whether to work
Resigned	About to give birth	Not interested
Trip abroad	Personal reasons	At home
Fired due to recession	Not interested in working for	Not interested in working
Termination of service	the time being	Not interested (pl.), just want
Recent immigrant	Awaiting induction	to volunteer
Fired due to the situation	Awaiting induction	Not interested (fem.)
Resigned	On a trip abroad	On a trip abroad
Fired	Before induction	Not interested
Recession, no work	Began national service last	Personal reason
Fired due to recession-induced	week	Addiction treatment, on
cutbacks	Bum	benefits
Caregiver of grandchild	Doing community service on a	Personal problems
Fired	farm	Wasn't interested
Fired (fem.) due to cutbacks	Not interested in working	Trip abroad
Fired (fem.) due to recession-	Not interested (fem.)	Looked for work but not
induced cutbacks	Spent the past year abroad	aggressively
Abroad	Doing year of unpaid	Awaiting induction
On a trip abroad	volunteer service	Personal reasons – don't want
Awaiting induction	Wandering around	to give details
In prison	Trip abroad	Before induction
Waiting national service	Wandering around	Due to unfair payment of
Awaiting (fem.) induction	Trip abroad	wage, unwilling
Discipline problems	No reason	Trip abroad
Went abroad	No economic necessity	Don't want to work
Before military service	Not interested in working	Abroad
Recent immigrant	Stopped working, moving to	Recent immigrant (fem.)
Went abroad for study and	other school	Dropped out of school
work	Replaced by personnel	Dropped out of studies
Not interested (fem.)	company	Not interested (fem.)
Not interested	Not interested in working and	Don't need to work
Addiction treatment	also studying	Year of unpaid service
Awaiting induction	Fired	Not interested in working
Young age	Not studying, not working –	Recently fired, not yet hunting
Waiting induction	not looking for work	Not interested
Boy, employers unwilling to	Before national service	Despaired of finding work
hire	Trip abroad	Pregnant
Boy	Hasn't found work	Before induction
Prison	On a stay abroad	On a trip
Awaiting induction	Working for a nonresident	Not interested in working
Not interested	Norwegian company, lives	Wants to join the army
National service	permanently in Israel	Don't want to work
Not interested in working	Abroad for 2 years	Not interested in working
Abroad	Young	Awaiting induction

Table 6
Men's Labor-Force Participation and Non-Participation, by Self-Reporting of Reasons, 2001

	Total population		Jews		Non-Jews	
	N	%	N	%	N	%
Men aged 25–54	1,182,412	100.0	945,815	100.0	236,538	100.0
Participants[1]	1,019,984	86.3	828,662	87.6	191,322	80.9
Non-participants	162,428	13.7	117,153	12.4	45,276	19.1
Non-participants, by reasons:						
Studies	53,600	4.5	49,400	5.2	4,100	1.8
Thereof: ultra-Orthodox	27,800	2.4	27,800	2.9		
Disability or illness	58,200	4.9	34,800	3.7	23,400	9.9
Looked for work but did not find it	20,300	1.7	10,000	1.1	10,300	4.4
Pension	5,800	0.5	4,600	0.5	1,300	0.5
Other	24,500	2.1	18,400	1.9	6,200	2.6
Thereof: abroad	7,500	0.6				

1. Standing army personnel are classified as participants and the population does not include inmates of institutions and residents of temporary settlements.
Source: processed from Central Bureau of Statistics, Labor Survey 2001.

Table 7
Men's Labor-Force Participation and Non-Participation, by Self-Reporting of Reasons, 1990

	Total population		Jews		Non-Jews	
	N	%	N	%	N	%
Men aged 25–54	804,098	100.0	679,571	100.0	124,527	100.0
Participants[1]	717,147	89.2	606,127	89.2	111,020	89.2
Non-participants	86,951	10.8	73,444	10.8	13,507	10.8
Non-participants, by reasons:						
Studies	31,300	3.9	30,000	4.4	1,300	1.0
Thereof: ultra-Orthodox	16,600	2.1	16,000	2.4		
Disability or illness	26,700	3.3	17,200	2.5	9,500	7.6
Looked for work but did not find it	6,200	0.8	5,800	0.9	400	0.3
Pension	3,200	0.4	2,800	0.4	400	0.3
Other	19,600	2.4	17,700	2.6	2,000	1.6

1. Standing army personnel are classified as participants and the population does not include inmates of institutions and residents of temporary settlements.
Source: processed from Central Bureau of Statistics, Labor Survey 1990.

Table 8
Men's Labor-Force Participation and Non-Participation, by Self-Reporting of Reasons, 1980

	Total population		Jews		Non-Jews	
	N	%	N	%	N	%
Men aged 25–54	627,890	100.0	554,947	100.0	72,943	100.0
Participants[1]	577,790	92.0	512,241	92.3	65,549	89.9
Non-participants	50,100	8.0	42,706	7.7	7,394	10.1
Non-participants, by reasons:						
Studies	13,300	2.1	12,900	2.3	460	0.6
Thereof: ultra-Orthodox	7,600	1.2	7,600	1.4		
Disability or illness	19,300	3.1	14,800	2.7	4,500	6.1
Looked for work but did not find it	1,700	0.3	1,600	0.3	100	0.2
Pension	1,400	0.2	1,300	0.2	100	0.2
Other	14,400	2.3	12,200	2.2	2,200	3.0

1. Standing army personnel are classified as participants and the population does not include inmates of institutions and residents of temporary settlements.
Source: processed from Central Bureau of Statistics, Labor Survey 1980.

Table 9
Decline in Participation Rate,[a] OLS Regression Analysis

	2001			1980		
	Coefficient	t value	Avg. of explanatory variables	Coefficient	t value	Avg. of explanatory variables
Constant	0.811	84.09		0.836	87.66	
0–9 years of schooling	–0.181	–22.17	11.60%	–0.053	–9.57	34.37%
10–11 years of schooling	–0.088	–12.09	13.02%	–0.007	–1.12	18.85%
12 years of schooling	–0.042	–6.98	27.33%	0.006	1.05	19.32%
13–15 years of schooling	–0.019	–3.21	23.76%	0.020	3.09	11.90%
Age 30–34	0.007	0.92	16.88%	0.004	0.72	21.30%
Age 35–44	–0.001	–0.19	31.53%	0.002	0.41	29.89%
Age 45–54	–0.033	–4.55	31.87%	0.002	0.34	25.69%
Married	0.126	17.08	77.43%	0.144	21.31	88.00%
Divorced, separated, or widowed	0.017	1.51	4.45%	0.038	2.7	1.63%
1–2 children up to age 14	0.006	1.14	40.70%	0.010	2.03	47.31%
3 children up to age 14	–0.013	–1.63	11.35%	0.008	1.22	15.55%
4–5 children up to age 14	–0.052	–5.32	7.41%	0.014	1.83	9.27%
6+ children up to age 14	–0.105	–7.06	2.57%	–0.020	–1.77	3.05%
Jewish	0.066	9.14	80.87%	–0.005	–0.78	89.05%
Christian	0.060	4.49	3.15%	–0.033	–2.5	2.07%
Druze	0.019	1.09	1.69%	0.008	0.44	0.98%
Other religion (non-Muslim)	0.059	3.24	1.59%	0.057	0.34	0.01%
Student	–0.130	–15.45	7.82%	–0.280	–31.84	4.72%
Parent of head of household	–0.454	–28.63	1.85%	–0.826	–46.19	0.88%
Immigrated this year or previous year	–0.146	–7.46	1.18%	–0.165	–8.38	0.71%
Ultra-Orthodox (by last school attended)	–0.592	–48.73	3.60%	–0.297	–26.48	2.66%
Adjusted R^2	0.2035			0.2282		
Observations (N)	22,370			20,610		

a. For men aged 25–54, excl. inmates of institutions and residents of temporary settlements. Standing army personnel are classified as labor-force participants.

Table 9a
Decline in Participation Rate,[a] Probit Analysis

	2001			1980		
	Coefficient	z value	Avg. of explanatory variables	Coefficient	z value	Avg. of explanatory variables
Constant						
0–9 years of schooling	–0.228	–20.39	11.60%	–0.060	–9.69	34.37%
10–11 years of schooling	–0.132	–13.63	13.02%	–0.012	–1.8	18.85%
12 years of schooling	–0.064	–8.52	27.33%	0.002	0.28	19.32%
13–15 years of schooling	–0.024	–3.43	23.76%	0.013	2.26	11.90%
Age 30–34	0.010	1.45	16.88%	0.006	1.25	21.30%
Age 35–44	0.004	0.58	31.53%	0.005	1.11	29.89%
Age 45–54	–0.035	–4.65	31.87%	0.003	0.59	25.69%
Married	0.141	16.14	77.43%	0.135	16.3	88.00%
Divorced, separated, or widowed	0.013	1.29	4.45%	0.014	1.57	1.63%
1–2 children up to age 14	0.013	2.29	40.70%	0.011	2.6	47.31%
3 children up to age 14	–0.012	–1.34	11.35%	0.009	1.61	15.55%
4–5 children up to age 14	–0.057	–5.44	7.41%	0.011	1.82	9.27%
6+ children up to age 14	–0.097	–6.09	2.57%	–0.014	–1.41	3.05%
Jewish	0.068	9.18	80.87%	–0.002	–0.29	89.05%
Christian	0.041	3.72	3.15%	–0.028	–2.24	2.07%
Druze	0.011	0.79	1.69%	0.005	0.33	0.98%
Other religion (non-Muslim)	0.039	2.47	1.59%			0.01%
Student	–0.159	–15.18	7.82%	–0.278	–21.38	4.72%
Parent of head of household	–0.432	–19.49	1.85%	–0.836	–21.47	0.88%
Immigrated this year or previous year	–0.184	–7.91	1.18%	–0.177	–7.07	0.71%
Ultra-Orthodox (by last school attended)	–0.668	–36.77	3.60%	–0.284	–17.4	2.66%
Pseudo R^2	0.205			0.2474		
Observations (N)	22,370			20,680		

Population: men aged 25–54, excl. inmates of institutions and residents of temporary settlements. Standing army personnel are classified as labor-force participants.

Table 10
Decline in Participation Rate,[a] OLS Regression Analysis
Effect of persons with poor labor-force qualifications

	2001			1980		
	Coefficient	t value	Avg. of explanatory variables	Coefficient	t value	Avg. of explanatory variables
Constant	0.952	100.0		0.979	105.0	
0–9 years of schooling	–0.178	–22.5	0.116	–0.056	–10.7	0.344
10–11 years of schooling	–0.066	–10.2	0.130	–0.007	–1.4	0.188
12 years of schooling	–0.031	–5.8	0.327	0.007	1.5	0.268
13–15 years of schooling	–0.013	–2.3	0.238	0.022	3.5	0.119
Age 30–34	–0.026	–3.6	0.169	–0.016	–3.0	0.213
Age 35–44	–0.042	–6.1	0.315	–0.023	–4.6	0.299
Age 45–54	–0.080	–12.2	0.319	–0.034	–6.6	0.257
Not living in own household	–0.271	–40.0	0.131	–0.285	41.2	0.076
1–2 children up to age 14	0.020	4.0	0.407	0.020	4.5	0.473
3 children up to age 14	0.000	–0.1	0.114	0.021	3.4	0.155
4–5 children up to age 14	–0.037	–4.0	0.074	0.029	4.0	0.093
6+ children up to age 14	–0.083	–5.7	0.026	0.000	0.0	0.030
Jewish	0.070	9.7	0.809	0.007	1.0	0.890
Christian	0.062	4.6	0.032	–0.017	–1.2	0.021
Druze	0.018	1.1	0.017	0.031	1.7	0.010
Other religion (non-Muslim)	0.066	3.7	0.016	0.071	0.4	0.000
Student	–0.122	–14.7	0.078	–0.281	–31.6	0.047
Immigrated this year or previous year	–0.140	–7.2	0.012	–0.165	–8.2	0.007
Ultra-Orthodox (by last school attended)	–0.596	–49.7	0.036	–0.302	–26.4	0.027
Adjusted R^2	**0.218**			**0.197**		
Observations (N)	22,370			20,610		

a. For men aged 25–54, excl. inmates of institutions and residents of temporary settlements. Standing army personnel are classified as labor-force participants.

Table 11
Determining Factors of Participation Rate – Regression Analysis
Explained variable: participation rate among men aged 25–54, with standing army personnel defined as participants and inmates of institutions and students (incl. ultra-Orthodox) excluded from the population

Explanatory variables	(a)	(b) Explanatory variables lagged	(c)	(d)	(e)
Period	1974–2001	1974–2001	1974–2001	1974–2001	1974–2001
Constant	0.83	0.83	0.92	0.90	0.81
	(40.25)	(50.45)	(28.15)	(33.2)	(23.3)
Unemployment rate[1]	–0.49	–0.57	–0.33	–0.23	–0.62
	(5.02)	(7.29)	(3.37)	(1.96)	(5.62)
Wage ratio[2]	0.15	0.16	0.07	0.06	
	(6.00)	(7.89)	(2.33)	(1.75)	
Personal income-maintenance benefit[3]	0.03	0.05	0.01	0.01	0.03
	(1.21)	(2.80)	(0.34)	(0.51)	(1.07)
Poor labor-force qualifications[4]			–0.38		
			(3.18)		
Share of unplaceables				–1.94	
				(3.19)	
Median wage ratio					0.16
					(4.42)
D.W.	1.95	2.02	1.73	1.70	1.51
Adjusted R^2	0.88	0.92	0.92	0.92	0.84
Observations (N)	26	25	26	26	26

The number in parentheses below the coefficient is the t-statistic.
Definitions:
1. Unemployment rates of men aged 25–54, with standing army personnel defined as labor-force participants and inmates of institutions, residents of temporary settlements, students, and ultra-Orthodox excluded from the population.
2. Gross wage per labor hour of men aged 25–54 with up to 10 years of schooling, relative to average wage of men aged 25–54.
3. Share of personal income-maintenance benefit in national average wage.
4. Share of men aged 25–54 in population that does not live in its own household.

Table 12
Determining Factors of Participation Rate by Level of Schooling – Regression Analysis

Explained variable: participation rate among men aged 25–54, with standing army personnel defined as participants and inmates of institutions and students (incl. ultra-Orthodox) excluded from the population, by levels of schooling

Explanatory variables	Explained variable			
	(a) Participation rate of persons with 10 years of schooling or less	(b) Participation rate of persons with 11–12 years of schooling	(c) Participation rate of persons with 13–15 years of schooling	(d) Participation rate of persons with 16+ years of schooling
Period	1974–2001	1974–2001	1974–2001	1974–2001
Constant	0.55	0.83	0.95	0.98
	(8.89)	(29.83)	(41.89)	(35.08)
Unemployment rate[1]	–0.69	–0.56	–0.63	–0.95
	(4.40)	(4.47)	(5.97)	(4.58)
Wage ratio[2]	0.50	0.19	0.03	–0.00
	(6.64)	(5.49)	(1.03)	(0.04)
Personal income-maintenance benefit[3]	0.09	0.04	0.02	0.07
	(1.54)	(1.46)	(0.86)	(2.47)
D.W.	1.33	1.74	1.87	2.32
Adjusted R^2	0.89	0.88	0.77	0.49
Observations (N)	26	26	26	26

The number in parentheses below the coefficient is the t-statistic.
Definitions:
1. Unemployment rates of men aged 25–54, with standing army personnel defined as labor-force participants and inmates of institutions, residents of temporary settlements, students, and ultra-Orthodox excluded from the population.
2. Gross wage per labor hour of men aged 25–54 with up to 10 years of schooling, relative to average wage of men aged 25–54.
3. Share of personal income-maintenance benefit in national average wage.

Appendix
Table 1
Share of Military Personnel in Population

Country	Order of Forces (all ages)	Population aged 15+ ('000)	Thereof: men ('000)	Men aged 25–54 ('000)	Share of military personnel among men aged 25–54[1]
Israel	**161,500**	**4,605**	**2,237**	**1,204**	**0.134**
Greece	177,600	6,860	3,325	2,051	0.087
Korea	686,000	32,994	16,334	11,309	0.061
Turkey	514,850	41,953	21,046	12,977	0.040
Finland	31,850	3,471	1,754	1,133	0.028
Norway	26,600	2,888	1,467	985	0.027
U.S.	1,414,000	181,421	89,127	59,686	0.024
Czech	49,450	7,192	3,602	2,291	0.022
Slovakia	26,200	3,724	1,839	1,179	0.022
France	260,400	38,110	18,888	12,285	0.021
Spain	177,950	26,984	13,539	8,989	0.020
Poland	163,000	25,896	12,797	8,339	0.020
Portugal	43,600	6,969	3,423	2,143	0.020
Austria	34,600	5,524	2,782	1,843	0.019
Denmark	22,700	3,533	1,789	1,181	0.019
Belgium	39,260	6,729	3,388	2,243	0.018
Sweden	33,900	5,632	2,861	1,857	0.018
Germany	296,000	54,972	27,715	17,757	0.017
Italy	216,800	38,765	19,377	12,764	0.017
Switzerland	27,610	4,848	2,427	1,611	0.017
U.K.	210,450	38,215	19,280	12,938	0.016
Hungary	33,400	6,851	3,340	2,122	0.016
Netherlands	49,580	10,800	5,468	3,695	0.013
Ireland	10,460	2,588	1,300	796	0.013
Australia	50,920	13,038	6,553	4,238	0.012
New Zealand	8,710	2,490	1,228	785	0.011
Japan	239,900	86,250	43,290	27,360	0.009
Luxembourg	900	294	148	102	0.009
Canada	52,300	20,959	10,499	6,987	0.007
Mexico		60,897	28,686	16,863	0.000
Iceland	0	180	92	59	0.000

Sources:
Country population data (thousands) – OECD, Corporate Data Environment, http://www1.oecd.org/scripts/cde/members/LFSDATAAuthenticate.asp
Israel population data – Central Bureau of Statistics, Labor Surveys, various years.
Military population data: The International Institute for Strategic Studies, *The Military Balance 2002,* London, www.iiss.org

Appendix
Table 2
Labor-Force Participation Rate of Men in Main Working-Age Cohorts (25–54), 1974–2001

Year	Participation rate by years of schooling				
	Total	Up to 10	11–12	13–15	16+
1974	0.957	0.946	0.975	0.969	0.968
1975	0.953	0.941	0.973	0.977	0.963
1976	0.946	0.927	0.970	0.974	0.965
1977	0.947	0.929	0.971	0.975	0.956
1978	0.947	0.933	0.971	0.969	0.960
1979	0.940	0.922	0.966	0.969	0.977
1980	0.939	0.923	0.962	0.968	0.971
1981	0.941	0.920	0.969	0.971	0.973
1982	0.936	0.915	0.957	0.965	0.974
1983	0.939	0.914	0.962	0.968	0.977
1984	0.938	0.913	0.961	0.976	0.969
1985	0.935	0.902	0.960	0.971	0.977
1986	0.932	0.899	0.956	0.974	0.970
1987	0.928	0.890	0.958	0.961	0.966
1988	0.931	0.889	0.956	0.966	0.973
1989	0.937	0.895	0.960	0.965	0.981
1990	0.932	0.891	0.950	0.968	0.972
1991	0.929	0.892	0.944	0.964	0.966
1992	0.922	0.871	0.941	0.961	0.971
1993	0.922	0.863	0.943	0.959	0.971
1994	0.918	0.864	0.928	0.951	0.964
1995	0.923	0.851	0.934	0.960	0.968
1996	0.915	0.827	0.935	0.957	0.957
1997	0.913	0.818	0.930	0.954	0.962
1998	0.907	0.805	0.921	0.950	0.962
1999	0.902	0.799	0.913	0.945	0.959
2000	0.896	0.776	0.911	0.942	0.954
2001	0.893	0.769	0.902	0.943	0.953

Note: The population does not include inmates of institutions, ultra-Orthodox, students, and immigrants. Standing army personnel are classified as labor-force participants.

Appendix
Table 3
Groups of Men in Main Working-Age Cohorts (25–54), 1974–2001

Year	Pct. immigrants	Pct. ultra-Orthodox	Pct. standing army	Pct. students	Pct. inmates of institutions
1974	0.011	Unknown	0.021	0.035	0.035
1975	0.010	Unknown	0.025	0.038	0.038
1976	0.005	Unknown	0.022	0.036	0.036
1977	0.004	Unknown	0.025	0.043	0.043
1978	0.002	Unknown	0.030	0.048	0.048
1979	0.005	0.025	0.033	0.036	0.036
1980	0.007	0.027	0.033	0.037	0.037
1981	0.004	0.031	0.034	0.041	0.041
1982	0.002	0.030	0.031	0.037	0.037
1983	0.002	0.028	0.032	0.039	0.039
1984	0.001	0.030	0.033	0.041	0.041
1985	0.002	0.032	0.032	0.044	0.044
1986	0.004	0.032	0.032	0.050	0.050
1987	0.004	0.034	0.027	0.051	0.051
1988	0.004	0.036	0.027	0.051	0.051
1989	0.005	0.038	0.028	0.049	0.049
1990	0.022	0.038	0.026	0.046	0.046
1991	0.067	0.038	0.025	0.044	0.044
1992	0.044	0.038	0.026	0.041	0.041
1993	0.023	0.037	0.024	0.047	0.047
1994	0.020	0.038	0.017	0.052	0.052
1995	0.021	0.038	0.024	0.055	0.055
1996	0.019	0.040	0.023	0.061	0.061
1997	0.018	0.037	0.024	0.063	0.063
1998	0.015	0.037	0.022	0.069	0.069
1999	0.017	0.034	0.023	0.073	0.073
2000	0.018	0.033	0.021	0.077	0.077
2001	0.013	0.036	0.020	0.077	0.077

Note: Standing army personnel are classified as labor-force participants according to the broad definition in 1995–1998 and according to the narrow definition in other years.

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