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EARNED INCOME TAX CREDIT IN ISRAEL: DESIGNING THE SYSTEM TO REFLECT THE CHARACTERISTICS OF LABOR SUPPLY AND POVERTY

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This study examines the desired parameters for the institution of an earned income tax credit (EITC) – a subsidy for low wage earners – in Israel. The goal of the system would be to encourage individuals with low earning potential to enter the labor market and to reduce poverty among households that include wage earners. The combination of data from consecutive Labor Force and Household Incomes Surveys (using the repeated sampling feature of the Labor Force Surveys) enabled us to evaluate the sensitivity of entry into the labor force and employment, and of exit from employment to wage changes among individuals in various income groups. The estimated elasticities of entry and exit with respect to the wage were used to evaluate the effect of various policy scenarios on employment and poverty. The institution of an EITC system in the basic policy scenario, which grants benefits at income levels of 1,000–5,000 shekels, increases the number of participants in the labor force by about 13,000 which represents 0.5 percent of the working age population. At the same time, it was found that the cost of attracting a new worker was high, that most of the effect on employment was achieved in households not within the weaker segments of the population and that the program's effectiveness in reducing poverty was relatively low. A more focused policy, which conditions benefits on family composition and household income, is less effective in increasing employment but much more efficient in reducing poverty. This policy would raise 18 percent of poor working families above the poverty line. The budgetary cost of the basic program is NIS 2.7 billion per-annum while the cost of the focused program is NIS 1.3 billion.

1. INTRODUCTION

Labor force participation rates among men and women with low levels of education in Israel is low relative to the developed countries, even after taking into account the effect of military service and the low participation rates among the ultra-Orthodox population. The rate of poverty among these groups is also particularly high. One of the claims often heard recently is that the return to sustained growth, which has been occurring during the last two

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years, will contribute to the integration of these individuals within the labor force. However, an analysis of the patterns of growth in Israel over the last 15 years indicates that growth did not improve the relative situation of low-income individuals who entered the labor market.[1] The analysis shows that growth did not significantly increase employment among the weaker segments of the population and neither did it significantly raise their wages. Furthermore, one of the main channels through which growth influenced weaker populations was in fact the indexation of transfer payments to the average wage (which has been abolished over the last two years). Therefore, to the extent that the same growth patterns continue in the future, it can be assumed that the return to growth will not benefit the weaker segments of the population to any great extent.[2]

In view of the low participation rates and the shortage of budget resources, transfer payments to unemployed individuals of working age have been reduced during the last three years in order to increase the relative gain from employment. However, measures to directly encourage participation in the labor market were few. This contrasts with the situation in many of the developed countries which have implemented programs to directly encourage the employment of individuals with low earning power.[3]

Against this background, various proposals have recently been put forward to institute an EITC in Israel. According to these proposals, low income individuals would receive a wage subsidy from the government. This measure would increase the potential wage of many of those who have chosen to remain outside the labor force and would likely encourage them to seek employment. In addition, it could serve as a measure to reduce poverty among those earning low wages in the labor market.

The tax system in Israel grants numerous benefits to the employed, including a tax credit based on family status for women, a tax exemption on employer contributions to employee training programs (which also serve for medium-term savings) and tax deductions and credits for pension contributions. However, only those with high incomes can take advantage of these benefits since low income earners, including part time workers, are below the tax threshold. On the other hand, these individuals do in fact pay National Insurance premiums and the health tax. The result is a violation of the principle of horizontal equity for low income groups, which puts many families of low income workers under the poverty line. In particular, most working mothers are not able to take advantage of the tax credits given for children. This is true for more than 90 percent of mothers with up to 10 years of education and about 80 percent of mothers with 11–12 years of education. In addition, low-salaried workers who save for the medium term or towards their pensions are not enjoying tax benefits on their savings. Furthermore, it was recently decided to raise welfare payments to large families, a benefit that the vast majority of working households will not be eligible to. This measure reduces the incentive to work for parents with low potential earning power. An EITC system can rectify many of these distortions by reducing poverty among low wage earners or at least increasing the incentive to work among the relevant groups relative to the existing system of credits and deductions.

[1] See the document written by the macroeconomic group of the Caesarea Forum, June 2005.

[2] The only change during this period relative to the 90s was the policy to reduce the number of foreign workers. Of course, if this policy is adhered to, the effect of growth on the weaker populations is likely to be greater than it was during the last 15 years.

[3] Comparative data on participation rates among individuals with low levels of education and on the programs for encouraging employment in the OECD countries can be found in Brender, Peled-Levy and Kasir (Kaliner) (2002).

There are two alternative types of tax credit regimes which are currently used by the countries that adopted such systems: a) Systems that guarantee a minimum income to anyone who is working (beyond a minimum number of hours) with a gradual reduction of assistance as the wage level increases. Countries that have adopted this regime include Ireland,[4] New Zealand (OECD, 2003) and Britain (OECD, 2002). b) Systems that provide assistance as a percentage of labor income with a gradual reduction above a threshold level. Countries with this regime include the US[5] (the EITC – Earned Income Tax Credit) and France[6] (Prime pur l'emploi).

In this paper, we will attempt to present a framework for analyzing the characteristics of an EITC system for Israel. This will involve an analysis of the effect of the various traits of the system on employment, poverty and the budget. According to Saez (2002), the choice of an optimal system is dependent on the elasticity of entry into the labor market with respect to the wage level and on the elasticity of the supply of hours worked relative to changes in the wage. When the elasticity of participation is high, the optimal system should ensure a large income gap in favor of those who work along with rapid phasing-out in order to reduce the cost of the program. When the elasticity of hours worked with respect to the wage is high, an optimal system should set the incentive as a function of total hours worked, which will allow relatively slow phasing-out. Therefore, an assessment of the elasticities of participation and work hours of the relevant groups is required for the design of a negative income tax system.

2. REVIEW OF THE LITERATURE

Saez (2002) presents an analytical framework for the analysis of the influence of government employment incentives. As mentioned above, he distinguishes between the elasticity of participation and the elasticity of the supply of work hours and through simulations finds that the welfare system in the US is close to optimal only for one-parent families.[7]

At the empirical level, a number of studies in recent years have tried to estimate the influence of implementing an EITC system on the supply of labor among individuals with low earning capacity. Blundell and Hoynes (2001) estimate the effect of such systems on employment and work hours among individuals with a low level of education. They found that a large proportion of the increase in labor force participation among one-parent families in the US during the 1990s is explained by the generosity of the EITC system. In contrast, the effect of the implementation of an EITC in Britain was more moderate. Brewer (2000) describes the various systems in the US and Britain (for the latter, it describes the

[4] For more details, go to: www.welfare.ie/publications/sw22.html

[5] For more details, go to: www.irs.gov/publications/p596/ar01.html

[6] This system was first adopted in September 2001 and has been extended each year through a temporary directive (as of 2004). The premium for employment is paid to wage earners who earn from 30 to 100 percent of the minimum wage. The premium gradually declines to zero at a level of 140 percent of the minimum wage. The base of calculation is per family and the premium is paid if at least one of the spouses is working. In the means test, part time employment is taken into account.

[7] This literature is based on the elasticities in the short run while in the long run there are also dynamic influences. For elaboration on the literature that takes into consideration dynamic effects, see Eckstein and van den Berg (2003).

system prevailing at the end of the 1990s following several changes in the system) and points to the importance of the design of the system in determining its effect on employment. Brewer and Clark (2002) points to the differential effect of policy measures implemented in Britain on various population groups, particularly with respect to labor supply and labor force participation rates among households with differing structures. In the US, Eissa and Hoynes (2004) found that when the tax unit is the family and the condition for eligibility is that at least one of the couple is working, a negative work incentive is liable to result. Thus, they found that while the EITC increased employment among men with low earning capacity by 0.2 percent, the rate of employment among women declined by one percent and therefore the net effect was a decline in household employment. The authors suggest that in order to deal with this, a minimum threshold should be applied to the number of hours worked in the household or alternatively the tax unit should be changed to the individual (as is currently the case in Israel).

Several studies have also examined the effect of an EITC on poverty. Hotz and Scholz (2003) show that growth in the US has led to a decline in the share of the poor in national income, a trend that was partly offset as a result of the EITC which raised 4.3 million individuals above the poverty line. Liebman (1998) shows that this effect could have been larger if the system had dealt with all the individuals in this population which is characterized by a high rate of non-reporting.

Studies in Israel have found indications of a connection between the level of labor income and the decision to participate in the labor force. Berman and Klinov (1997) analyzed the relation between changes in the potential wage and changes in the participation rate, according to the reason for non-participation, during the years 1980–1993. They found that the expected wage of participants in the labor force rose by a larger percentage than the potential wage of those who don't participate. Beenstock and Klinov (1998) examined the factors influencing the exit from the labor force in a more general framework. Among other things, they characterized the influence of the personal characteristics of the individual on the probability of moving from employment to unemployment and to non-participation in the labor force. However, they did not estimate the factors influencing entry into the labor force and the influence of the potential wage on the participation rate. Klinov and Amir (2003) examined the elasticities of participation with respect to income for the 60+ age group and found it to be about 0.4. In other words, there is a significant link between income and the decision to participate in the labor force in this age group. On the basis of these findings, it appears that the level of potential income does in fact significantly influence the participation rate.

To summarize, research in Israel and worldwide shows that there is a great deal of variation in the magnitude of the effect of changes in potential income on the various groups in the non-employed population. Therefore, in order to design an EITC policy, the elasticities of participation must be directly estimated for groups that are expected to be most affected by it, alongside the estimation of the elasticity of the supply of work hours. This is in addition to the assessment of the cost of the various policy configurations. In this study, we present an analysis of the elasticity of participation and of the issue of full time vs. part time employment for those entering the labor market. However, a full analysis of the policy's effect on labor supply in the economy would also require that the possible negative effect on the hours worked by already employed individuals be taken into effect.

The British experience

A draft report recently prepared for the British government (Myck et al., 2004) examines the effect of various policy measures implemented in Britain (minimum wage, reduction of National Insurance premiums, reduction of tax rates at low levels of income and a negative income tax) on the supply of labor. In contrast to our research, the authors of the report had access to data on the actual wage at the time of entry into the labor market. It is of interest, therefore, to compare their findings and those of this research. Following are some of the results of the British research:

- The distribution of entry wages in the labor market was more concentrated and had a lower average than the general distribution of wages.
- The median entry wage is about 69 percent of the median wage of those already working.
- The sensitivity of entry into the labor market is larger for women than for men.
- Wage changes influenced the entry into the labor market among all the types of family units examined by the study.
- The elasticity of participation relative to the wage is higher for men and women with lower earning potential.
- The cost per additional position achieved through the policy varies widely among the programs.

3. METHODOLOGY

The design of an EITC system that will significantly reduce poverty at a reasonable cost requires focusing on policies that target households below the poverty line and populations with relatively low earning potential. On the other hand, in order to increase employment at a relatively low cost, the policy must focus on populations with the most elastic labor supply relative to wages. These groups are not necessarily comprised of households in the weakest sectors of the population. Therefore, policy design requires first of all a definition of objectives. Apart from that, it is important to identify the elasticity of employment with respect to wages in the various segments of the population and to identify those groups that will benefit from the program in its various possible configurations. The design of policy needs to take into account that, if the policy covers too wide a range of incomes and grants overly generous benefits, its cost will be prohibitive although it will have a substantial effect on employment and poverty reduction. In order to evaluate the various considerations, the following methodology was used:

1) We estimated a wage equation for workers using the Incomes Survey.[8] 2) Using the coefficients of the equation, we estimated the potential wage of all the individuals in the Labor Force Survey. 3) Using the questionnaires of the Labor Force Survey, we separated between individuals who were not working/participating in the labor force at the time of the first two surveys in which they were interviewed (out of four) and individuals who were working/participating. 4) For those individuals who were not employed/outside the labor force, we checked whether they had entered employment/the work force at the time of one

[8] The wage equation is estimated for each year separately and was used for estimating potential wages in that year.

of the subsequent surveys. 5) For existing workers, we determined whether they had stopped working at the time of one of the subsequent surveys.[9] 6) Equations that characterized the factors that influence the transition from unemployment/non-participation to employment/participation and vice versa were estimated, including the elasticity of participation/employment/exit from employment with respect to changes in the potential wage. 7) On the basis of these equations, we ran simulations of the effect of the various configurations of the EITC system on employment and participation in the labor force and at the same time, examined the cost of the various configurations on the basis of the distribution of income in the Incomes Survey. 8) Using the data from the Incomes Survey, we examined the influence of the program on poverty by first calculating the wage subsidy for each individual according to his wage, then calculating the total additional income for each household and finally dividing the additional income by the number of "standard individuals" in the household.

In order to exclude individuals serving in the military from the data, the research considered only men aged 23 to 70[10] and women aged 22 to 65.[11] The relevant population for the sample includes individuals who were interviewed in three consecutive Labor Force Surveys carried out by the Central Bureau of Statistics. These individuals were surveyed during two consecutive quarters and, following a break of two quarters, were surveyed again for an additional two quarters (for a total of four surveys). Table 1 shows the breakdown

Table 1
The number of individuals surveyed for the first time each year and included again in subsequent surveys

	Surveyed for the first time	Number of individuals who were surveyed for at least a third time	Those surveyed at least three times as a percentage of those surveyed for the first time
1988	13,723	9,341	68.1
1989	14,188	9,846	69.4
1990	14,626	10,352	70.8
1991	14,506	10,121	69.8
1992	13,954	9,289	66.6
1993	14,069	8,464	60.2
1994	14,968	6,436	43.0
1995	15,497	11,415	73.7
1996	15,634	11,410	73.0
1997	15,057	11,160	74.1
1998	15,708	11,856	75.5
1999	15,733	11,551	73.4
2000	15,627	11,730	75.1
2001	15,477	11,549	74.6
2002	15,262	11,587	75.9
Total	224,029	156,107	69.7

[9] The study by Beenstock and Klinov (1998) discussed the influence of the wage on exiting the labor force.

[10] During the years 1988 and 1994, the sample includes men aged 25 to 70 and women aged 25 to 64 since the population cannot be divided into annual cohorts in the younger age groups.

[11] In the US, only the population aged 25 to 64 is eligible for EITC benefits.

of 156,000 individuals who were surveyed at least 3 times during the sample period. This is equivalent to about 70 percent of the individuals surveyed (the others were excluded because they were surveyed less than 3 times). Table 2 shows that the characteristics of the excluded individuals were not substantially different from those of the surveyed population except that the proportion of young people (those under the age of 30) and immigrants was higher and the proportion of married individuals was lower.[12] These characteristics are reflected in the fact that the proportion of those employed in the observations that were excluded is lower by some 5 percentage points than the average among the "surviving" observations and the average salary of these individuals is lower by about 7 percent than the

Table 2
Comparison of characteristics of those surveyed at least three times to those eliminated because they were surveyed less than three times
(in percent of the entire group)

Characteristics	Surveyed at least 3 times	Eliminated (surveyed less than three times)
Arabs	14.8	11.1
Aged 22–30	18.9	26.3
Aged 31–40	27.6	25.4
Aged 41–50	26.3	22.9
Aged 51–60	18.7	14.8
Aged 61–70	8.5	10.5
0–8 years of education	19.0	15.1
9–10 years of education	11.1	10.0
11–12 years of education	30.6	34.4
13–15 years of education	19.0	22.0
16 years of education or more	17.4	16.2
Immigrants (up to 10 years in Israel)	9.7	15.1
Ultra-Orthodox	4.0	3.5
Married	81.0	63.8
Single Parents	1.7	1.9
Women without children	22.4	25.0
Mothers with 1–2 children	17.2	16.0
Mothers with 3–4 children	9.1	7.2
Mothers with 5+ children	2.5	1.7
Employed	65.0	60.4
Average real potential wage	5,247	4,896
Total observations (annual average)	40,805	7,955

[12] These characteristics are apparently due to the fact that we could not follow in the survey individuals who moved from one household to another.

average wage in the sample. On the basis of the comparison between the groups, it does not appear that the exclusion of these individuals significantly biased the sample.[13]

We estimated the gross potential wage per hour for non-employed individuals for each of the years using a wage function that was based on the income data taken from the Incomes Survey during the years 1988–2003.[14] This estimation took into account the characteristics of the individual (education, family status, age, sex, ethnic group, whether he is an immigrant, place of residence and whether he or she is a member of an ultra-Orthodox family).

Table 3 presents a comparison of the (calculated) potential wage of the non-employed to the actual wage of the employed by period. The dominant trend in the data is the stability of the ratio of the potential wage of the non-employed to the wage of the employed over time at a level of about two thirds. This ratio is similar to that found in the British study which was, as mentioned above, based on the actual wages of individuals entering employment. As in the British study, we found that the ratio of the potential wage of the non-employed to the wage of the employed was higher for groups with lower earning potential (lower level of education and immigrants). In a similar manner, we calculated the potential hourly wage of workers that appear in the Labor Force Survey.[15]

The potential monthly wage for a full time position for the non-employed was calculated by multiplying the projected hourly wage by 173.2 hours. For the employed, the projected hourly wage was multiplied by the actual number of hours worked. The statutory rates of income tax and National Insurance premiums, including the tax credits, which are based on family status and date of immigration, were applied to the calculated wages in order to move from gross to net income. Using the net potential wage data, we calculated the change between the first and the last interview which was in turn used to calculate the elasticities of entering employment/the labor force and exit from employment for individuals with various characteristics (see Section e). Identifying the relevant populations (such as families of various sizes, single parent families and families with only one wage earner) allowed us to analyze the cost/benefit of alternative configurations of EITC in Israel. This was done by estimating the size of the government subsidy on the basis of the various policy configurations, both with respect to the newly employed and with respect to existing workers, and at the same time evaluating the size of the expected addition to employment and the extent of the reduction in poverty.

[13] In all the equations, binary variables for immigrants, the young and married individuals were included and the possibility that the sensitivity of these groups to wage and output changes differed from that of other groups in the sample was examined.

[14] The method of estimation of the potential wage is explained in Appendix 1. An analysis using a similar technique is presented in Brender, Peled-Levy and Kasir (Kaliner) (op.cit.). It also contains a discussion of the possible upward bias of wage estimates of non-employed individuals as a result of the erosion of human capital that had been accumulated in past periods of employment (and which is meant to be captured by the age coefficient) and due to the inferior unobserved characteristics in comparison to those of the employed individuals.

[15] The Labor Force Survey contains data on the employment situation and personal characteristics of workers and their families but does not contain information on their wages.

Table 3
Comparison of potential to actual wage data by group

Group	1988–1992			1993–1997			1998–2002		
	Average hourly wage before tax (according to the Incomes Survey) - employed	Average potential hourly wage before tax (according to the Labor Force Survey) - non-employed	Ratio of the wage of the non-employed to that of the employed (%)	Average hourly wage before tax (according to the Incomes Survey) - employed	Average potential hourly wage before tax (according to the Labor Force Survey) - non-employed	Ratio of the wage of the non-employed to that of the employed (%)	Average hourly wage before tax (according to the Incomes Survey) - employed	Average potential hourly wage before tax (according to the Labor Force Survey) - non-employed	Ratio of the wage of the non-employed to that of the employed (%)
Total	35.2	23.8	67.5	35.9	23.8	66.4	42.3	27.0	63.8
Men	39.0	28.4	72.8	39.3	28.0	71.2	46.9	31.4	67.0
Women	30.2	21.4	70.6	31.9	21.5	67.5	37.4	24.2	64.7
Aged 25–30	26.6	20.7	77.9	26.9	21.2	78.8	32.2	24.1	74.9
Aged 31–40	34.8	23.8	68.4	34.1	24.0	70.4	40.3	26.9	66.7
Aged 41–50	39.7	25.6	64.5	40.3	26.2	65.0	45.7	29.3	64.1
Aged 51–60	37.4	23.7	63.5	39.1	24.8	63.6	49.9	29.2	58.5
Arabs	27.5	19.4	70.6	27.9	19.3	68.9	30.2	20.4	67.4
Immigrants less than 10 years	25.6	18.0	70.5	22.3	16.4	73.8	26.1	20.2	77.4
Immigrants 10 years or more	36.3	24.5	67.6	39.8	26.3	66.0	47.0	30.1	64.2
0–8 years of education	24.7	18.7	75.8	22.9	18.2	79.4	25.5	20.0	78.5
Not ultra-Orthodox with 13–15 years of education	39.4	30.6	77.6	37.4	27.9	74.8	42.2	31.1	73.6
Not ultra-Orthodox with 16 years of education or more	49.4	37.3	75.4	51.3	37.2	72.5	60.5	44.1	72.8
Ultra-Orthodox	34.5	27.8	80.7	34.7	27.3	78.6	40.6	29.5	72.6
Ultra-Orthodox women	30.5	25.4	83.3	34.6	26.4	76.4	40.6	29.9	73.8
Residents of development towns	35.1	22.6	64.4	30.3	21.2	70.1	35.0	24.6	70.4
Not ultra-Orthodox and not immigrants with more than 16 years of education	51.5	40.7	79.1	57.7	43.5	75.4	65.7	49.2	74.8

4. CHARACTERISTICS OF THE SAMPLE

Table 4 presents the characteristics of the sample relating to participation and employment. On average, about one quarter of the sample (about 41,000 individuals) were not part of the labor force in the first two interviews. The number of non-employed was higher at about 49,000 which represents about one third of the sample.[16] The data also indicate that the proportion of individuals outside the labor force or not working in the first two surveys was quite stable over the period of the sample. The data clearly show the small proportion (only 6%) of the unemployed in the two consecutive interviews among the non-employed.

Table 5 shows the composition of the participants and non-participants over time. While the absolute majority of men (about 80 percent) participated in the labor force, the decrease in the participation rate of men between the two periods is evident from the Table. In contrast, among women, about 57 percent participated in the labor force in the first period with a significant increase in participation over time to 63 percent during the later period. There was a significant decline in participation rates among individuals with a low level of education (0–8 years) while participation rates among women in ultra-Orthodox households and residents of development towns increased.

Table 4
Characteristics of the sample according to employment status and participation in the labor force
(Percentage of total number surveyed: in brackets)

	Surveyed for the first time 1988–1990	Surveyed for the first time 1991–1994	Surveyed for the first time 1995–1998	Surveyed for the first time 1999–2002	Total
Total surveyed	29,539	34,310	45,841	46,417	156,107
Non-employed in surveys 1 & 2	9,579 (32.4)	10,923 (31.8)	13,809 (30.1)	14,394 (31.0)	48,705 (31.2)
Of those: unemployed in surveys 1 & 2	518 (1.8)	719 (2.1)	788 (1.7)	1,156 (2.5)	3,181 (2.0)
Outside the labor force in surveys 1 & 2	8,297 (28.1)	9,049 (26.4)	11,710 (25.5)	11,677 (25.2)	40,733 (26.1)
Employed in surveys 1 & 2	19,960 (67.6)	23,387 (68.2)	32,032 (69.9)	32,023 (69.0)	107,402 (68.8)
In the labor force in surveys 1 & 2	21,242 (71.9)	25,261 (73.6)	34,131 (74.5)	34,740 (74.8)	115,374 (73.9)

[16] In addition to individuals who were unemployed or were outside the labor force in the first two interviews, there are individuals who were unemployed in the first interview and outside the labor force in the second or vice versa.

Table 5
Characteristics of surveyed individuals by period according to participation/non-participation in the labor force

	Surveyed for the first time during the period 1988–1994		Surveyed for the first time in the period 1995–2002	
	Proportion of the group	Proportion of all participants/non-participants in the labor force	Proportion of the group	Proportion of all participants/non-participants in the labor force
Total				
Participants	69.3	100	70.5	100
Non-participants	30.7	100	29.5	100
Men				
Participants	82.3	58.9	79.0	54.3
Non-participants	17.7	28.6	21.0	34.6
Women				
Participants	56.6	41.1	62.6	45.7
Non-participants	43.4	71.4	37.4	65.4
Aged 26–30				
Participants	69.9	13.7	72.2	12.4
Non-participants	30.1	13.4	27.8	11.4
Aged 31–40				
Participants	74.4	33.1	75.9	27.3
Non-participants	25.6	25.8	24.1	20.7
Aged 41–50				
Participants	77.6	28.8	78.8	29.8
Non-participants	22.4	18.8	21.2	19.2
Aged 51–60				
Participants	63.1	17.2	67.4	17.7
Non-participants	36.9	22.8	32.6	20.4
Arabs				
Participants	46.8	9.0	46.8	10.5
Non-participants	53.2	23.1	53.2	28.5
Immigrants less than 10 years				
Participants	72.0	5.7	73.5	13.2
Non-participants	28.0	5.0	26.5	11.4
0–8 years of education				
Participants	46.9	16.6	39.6	8.5
Non-participants	53.1	42.5	60.4	31.0

Table 5 (cont.)

Not ultra-Orthodox with 13–15 years of education				
Participants	82.7	18.5	78.1	23.6
Non-participants	17.3	8.8	21.9	15.8
Not ultra-Orthodox with 16 years of education or more				
Participants	87.0	18.7	86.2	23.5
Non-participants	13.0	6.3	13.8	9.0
Ultra-Orthodox				
Participants	46.9	2.8	44.6	2.5
Non-participants	53.1	7.3	55.4	7.3
Of those: ultra-Orthodox women				
Participants	44.9	1.3	51.7	1.4
Non-participants	55.1	3.5	48.3	3.1
Residents of development towns				
Participants	66.8	5.6	71.4	6.2
Non-participants	33.2	6.3	28.6	6.0
Not ultra-Orthodox and not immigrants with 16 years of education or more				
Participants	88.0	16.8	87.4	19.7
Non-participants	12.0	5.2	12.6	6.8
Married with employed spouse				
Participants	72.2	54.6	76.7	52.7
Non-participants	27.8	47.5	23.3	38.3
Married with non-employed spouse				
Participants	65.6	31.7	62.2	25.8
Non-participants	34.4	37.6	37.8	37.5
Single				
Participants	67.6	13.7	68.1	21.6
Non-participants	32.4	14.9	31.9	24.1

Table 6 shows the movements into and out of the labor force and employment. The data indicate a significant degree of mobility. Thus, about 14 percent of individuals who were outside the labor force in 1998–2002 decided to enter the labor market, of whom some 9 percent started working and about 5 percent became unemployed. About 15 percent of the individuals who had not been employed began working. These figures are similar to those found in Britain where some 17 percent of individuals who had not been employed at the beginning of the period began working, with 12 percent employed in full time positions. The Table clearly shows the temporary nature of unemployment. Thus, some 80 percent of those who were unemployed during the first period were no longer unemployed in the subsequent surveys, with about two thirds of them finding employment and about one third leaving the labor force.

Table 6
Movements into the labor force and employment

	1988–1992	1993–1997	1998–2002
Number of individuals entering the labor force	1,657	1,764	2,104
Proportion of total who were outside the labor force	12.2	14.2	14.3
Of those: found employment	7.6	10.1	8.9
Of those: became unemployed	4.6	4.1	5.4
Number of non-employed individuals who became employed	2,002	2,193	2,678
Percentage of total non-employed	12.5	15.0	14.8
Percentage of unemployed who found employment	50.6	54.5	49.1
Percentage of unemployed who left the labor force	29.8	31.1	28.9

Table 7 shows the breakdown of individuals entering the labor force by group. Similar to other countries, most of the new entrants (about two thirds) were women. This proportion reflects their relative share in the population outside the labor force so that their rate of entry into the labor force is similar to that of men. Of the women entering the labor force, about one half are mothers (comprising about one third of the total entrants) and one third of them (about 12 percent of the total entrants) are mothers of children born within the previous two years who apparently left the labor force temporarily following the birth. The rates of entry are quite stable over the last decade and are similar between men and women at a level of about 14 percent. Of the population outside the labor force, there are particularly high rates of entry among immigrants, individuals with higher education and the young while among the ultra-Orthodox (men and women) and adults with 0–8 years of education rates of entry are low. Another characteristic of those entering the labor force is the level of education where 35 percent of entrants have 13 years of education or more (not including Jewish religious education). The high proportion of this group among the entrants reflects their high rate of entry (about 24 percent), which is a result of their high potential

Table 7
Distribution of individuals entering the labor force

	Percentage of individuals entering the labor force			Percentage of individuals outside the labor force who entered the labor force		
	1992–1988	1997–1993	2002–1998	1992–1988	1997–1993	2002–1998
Total	100.0	100.0	100.0	12.2	14.2	14.3
Men	26.3	32.1	35.4	11.9	14.6	14.5
Women	73.7	67.9	64.6	12.3	14.0	14.1
Immigrants	7.1	14.1	14.4	24.1	20.0	19.0
Ultra-Orthodox	4.2	4.5	4.9	7.2	7.9	8.6
Ultra-Orthodox women	2.1	2.5	1.9	7.5	9.7	8.6
Arab men	3.6	4.4	7.5	10.1	13.8	15.5
Arab women	3.8	7.0	9.4	2.1	4.6	5.4
Mothers	42.4	35.9	30.8	16.4	16.9	15.9
0–8 years of education	24.0	16.0	15.5	6.3	6.3	6.9
13–15 years of education	14.7	22.6	26.6	23.8	25.8	25.2
16 years of education or more[a]	11.6	13.0	12.8	27.4	25.7	21.9
Aged 26–30	20.6	16.0	15.5	19.6	20.7	20.2
Aged 31–40	35.2	25.1	23.1	16.9	16.3	16.2
Aged 41–50	20.0	22.6	19.7	13.6	16.7	14.9
Aged 51–60	14.8	13.0	13.9	7.6	8.6	9.1
Aged 61–65	5.1	4.4	4.6	4.7	4.7	5.1
Women with 0–8 years of education	16.9	10.0	8.9	2.4	5.4	5.7
New mothers	16.7	13.9	11.8	6.3	17.8	16.9
Married with employed spouse	57.5	46.7	37.4	14.6	15.4	14.6
Married with non-employed spouse	26.7	24.0	26.8	8.6	9.1	9.4
Single	15.8	29.4	35.8	13.7	21.3	22.7

[a] Not including Yeshiva (religious) education

wages. The Table also clearly shows the increase over time in the proportion of this group among entrants which reflects the increase of its share of the population in general and among the non-employed in particular (Table 5).

A large part of the cost of implementing negative income tax systems is a result of the fact that the subsidy is generally given to all individuals at a certain income level without determining which individuals would have remained outside the labor force without it. Therefore, in order to determine the optimal structure of the subsidy, it is important to

assess the expected wage levels of individuals when they enter the labor force relative to the wages of individuals who are already in the labor force. This analysis enables the identification of the wage levels at which the effect on potential entrants into the labor market will be maximized and the relative cost of the program minimized.

Table 8 shows the distribution of participation in the labor force according to the potential wages in 2003. It is evident from the data that the potential wage of those outside the labor force is lower than the wage of those in the labor force. Crowding around low wage levels was also a finding of the study in Britain. This distribution is critical in characterizing the income levels at which the optimal negative income tax is initiated as well as the method of phasing-out. Thus, the data indicate that the potential wage of some 68 percent of the individuals outside of the labor force is lower than 5,000 shekels while the estimated wage is lower than this level for only about 42 percent of individuals within the labor force.[17] Twenty-seven percent of the non-employed and only 10 percent of the employed can be found at potential wage levels of up to 3,500 shekels per month. Based on these data (the gap between the two columns in Table 8), it appears that the phasing-out range for a negative income tax system in Israel should be established at wage levels of up to about 5,000 shekels.

Table 8
Distribution of participants/non-participants in the labor force according to potential wage in 2003[a]
(Potential monthly wage for a full time position before tax, in 2002 prices)

Potential wage group	Percentage of those surveyed outside the labor force	Percentage of those surveyed within the labor force
Up to 2500 shekels	2.8	1.3
2501–3000	7.8	2.7
3001–3500	16.5	6.3
3501–4000	14.0	8.2
4001–4500	14.8	11.3
4501–5000	12.2	12.1
5001–5500	8.5	10.7
5501–6000	6.5	10.1
6001–7000	7.8	13.1
7001+	8.9	24.3
Total	100	100

[a] The potential wage was calculated according to the first interview of each individual.

[17] The actual monthly wage in the Incomes Survey is lower than the monthly wage that appears in Table 8, which is calculated by multiplying the hourly wage by 173.2, since many of the employed work part time.

5. RESULTS

Entry into the labor force and employment

Tables 9 and 10 present the results of the basic regressions which were used in the simulations of the effect of an EITC on entry into the labor force and employment. All the coefficients had the expected signs and a significant effect was found for the changes in the potential wage on the rates of participation and employment. The elasticity of entry into the labor force with respect to changes in the wage was found to be 0.07 (in other words, every increase of one percent in the potential wage increases the probability of entry into the labor market by 0.07 percent) and the elasticity of entry into employment was 0.06. Also included in the equations was a variable which is meant to determine whether the elasticity

Table 9
Factors influencing the entry into employment

	Elasticity	p.value
Economic Variables		
Rate of change in real GDP in the relevant quarter relative to that quarter in the previous year	0.274	0.000
Rate of change in the real wage	0.063	0.000
The potential wage which is ¼ of a standard deviation below the minimum wage	-0.028	0.001
Real potential wage higher than 6,000 shekels per month	-0.022	0.092
Slope dummies for changes in the wage		
For individuals whose potential wage is lower than the minimum wage by at least ¼ of a standard deviation	-0.092	0.098
For immigrants in Israel for more than 10 years	0.045	0.040
For individuals prior to retirement	-0.092	0.010
For parents of a new child	-0.078	0.075
For individuals with an employed spouse	-0.027	0.185
For individuals with real potential wage higher than 6,000 shekels per month	-0.054	0.000
Slope dummies for changes in output		
For students who have completed their studies	-0.287	0.084
For immigrants in Israel for more than 10 years	-0.141	0.007
For the number of wage earners in the household	-0.079	0.009
Change in characteristics between surveys		
A child was born between the first and last survey	-0.054	0.000
Reached retirement age during the sample period	-0.046	0.000
Moved into the group with 13–15 years of education	-0.019	0.010
Student who completed his studies	0.096	0.000
Men who married during the sample period	-0.060	0.017

Table 9 (cont.)	Elasticity	p.value
Family status characteristics		
Mother of a child less than one year old	-0.012	0.008
Mother of a child 2–5 years old	-0.016	0.000
Mother of a child 6–9 years old	-0.008	0.029
Mother of 1 or 2 children	0.013	0.004
Mother of 5 or more children	-0.028	0.002
Father of a child less than one year old	-0.015	0.012
Father of a child 14–17 years old	0.020	0.000
Number of adults in the household	-0.012	0.000
Number of wage earners in the household	0.036	0.000
Single parents from 1994	-0.028	0.022
Characteristics of the individual		
Women	0.017	0.019
Married women	-0.020	0.000
Arab women	-0.113	0.000
Arab women from 1995	0.030	0.007
Men in an ultra-Orthodox household	-0.076	0.000
Women in an ultra-Orthodox household	-0.040	0.000
Immigrants	0.041	0.000
Men with 0–8 years of education	-0.040	0.000
Men with 16 years of education or more	0.038	0.000
Unknown level of education	-0.022	0.053
Women with 0–8 years of education	-0.039	0.000
Women with 9–10 years of education	-0.026	0.000
Women with 13–15 years of education	0.034	0.000
Women with 16 years of education or more	0.078	0.000
Men in the 26–30 age group	0.034	0.000
Men in the 56–60 age group	0.034	0.000
Men in the 61–65 age group	-0.055	0.000
Men in the 65–70 age group	-0.076	0.000
Men in the 66–70 age group	-0.089	0.000
Women in the 20–25 age group	0.037	0.000
Women in the 26–30 age group	0.024	0.000
Women in the 41–50 age group	-0.037	0.000
Women in the 51–55 age group	-0.071	0.000
Women in the 56–60 age group	-0.086	0.000
Women in the 61–65 age group	-0.099	0.000

is greater for large changes in the wage (of 10 to 50 percent).[18] It was found that the coefficient of this variable was not significant, i.e. the elasticities of participation in the labor force and entry into employment do not change when there are large changes in the wage. In contrast, it was found that the elasticity of entry into employment with respect to the wage among individuals close to retirement age (55–60 for women and 60–65 for men) is negligible, as it was for parents of children born during the previous two years (Table 9). The elasticity of employment with respect to the wage was also close to zero for individuals with a relatively high potential wage (above 6,000 shekels per month). The findings for the elasticity of entry into the labor market are similar, except that the elasticity also drops to zero for women in ultra-Orthodox households. The elasticities of other groups in the population were not found to be significantly different from the population average.

Table 10
Factors influencing entry into the labor force

	Elasticity	p.value
Economic variables		
Rate of change in real GDP in relevant quarter relative to the same quarter in the previous year	0.116	0.008
Rate of change in real wage	0.072	0.000
The potential wage which is ¼ of a standard deviation below the minimum wage	-0.029	0.001
Real potential wage greater than 6,000 shekels per month	-0.021	0.002
Slope dummies for changes in the wage		
For women in ultra-Orthodox households	-0.094	0.053
For individuals whose potential wage is at least ¼ of a standard deviation below the minimum wage	-0.103	0.069
For individuals prior to retirement	-0.057	0.097
For individuals with real potential wage greater than 6,000 shekels per month	-0.072	0.048
Slope dummies for changes in output		
For a student who has completed his studies	-0.339	0.065
For an immigrant with more than 10 years in Israel	-0.260	0.000
For individuals prior to retirement	0.191	0.096
For individuals with real potential wage greater than 6,000 shekels per month	0.193	0.073
Changes in characteristics between surveys		
A child is born between the first and last survey	-0.050	0.000
Divorce during the sample period	0.051	0.004
Marriage during the sample period	-0.050	0.035

[18] This variable was calculated by the creation of a binary variable (that received the value of 1 for large changes in the wage level and 0 otherwise) and its multiplication by the rate of change in the potential wage.

Table 10 (cont.)	Elasticity	p.value
Reached retirement age during the sample period	-0.046	0.000
Moved into the group with 13–15 years of education	-0.020	0.016
Student who completed his studies	0.183	0.000
Characteristics of family status		
Father of a child less than one year old	-0.031	0.000
Father of a child aged 14–17	0.015	0.020
Mother of a child less than one year old	-0.010	0.027
Mother of a child aged 2–5	-0.011	0.000
Mother of a child aged 6–9	-0.013	0.000
Mother of 1 or 2 children	0.016	0.002
Mother of 3 or 4 children	0.012	0.066
Mother of 5 children or more	-0.023	0.014
Employed spouse	0.018	0.000
Number of adults in the household	0.010	0.000
Number of wage earners in the household	-0.008	0.000
Characteristics of the individual		
Women	0.056	0.000
Married men	-0.026	0.000
Married women	-0.031	0.000
Arab men	-0.018	0.014
Arab women	-0.135	0.000
Arab women from 1995	0.044	0.000
Arab women with 13 years of education or more	0.034	0.057
Men from an ultra-Orthodox household	-0.068	0.000
Women from an ultra-Orthodox household	-0.059	0.000
Immigrant	0.020	0.002
Men with 0–8 years of education	-0.036	0.000
Women with 0–8 years of education	-0.040	0.000
Women with 9–10 years of education	-0.021	0.000
Women with 13–15 years of education	0.021	0.001
Women with 16 years of education or more	0.039	0.000
Men in the 20–25 age group	0.059	0.000
Men in the 26–30 age group	0.043	0.000
Men in the 41–50 age group	0.024	0.008
Men in the 56–60 age group	-0.042	0.000
Men in the 61–65 age group	-0.060	0.000
Men in the 66–70 age group	-0.078	0.000
Women in the 20–25 age group	0.042	0.000
Women in the 26–30 age group	0.019	0.003
Women in the 41–50 age group	-0.047	0.000
Women in the 51–55 age group	-0.073	0.000
Women in the 56–60 age group	-0.093	0.000
Women in the 61–65 age group	-0.104	0.000

Another variable that was found to be significant was the change in GDP which is meant to capture the developments of the demand for labor. Its presence in the regression enables us to treat the wage coefficient as primarily reflecting the supply side or, in other words, whether individuals decide to enter the labor market/employment as a result of an increase in the relative compensation for work. An increase of one percent in real GDP increases the probability of entry into employment by 0.27 percent and the probability of entry into the labor force by 0.12 percent. The elasticity of entry into employment with respect to output was smaller by one half for immigrants residing in Israel for less than 10 years (who are not working) and by one quarter in households where there is another worker.

There are significant differences in the rates of entry into employment and the labor force among the various groups in the population, in addition to differences in the elasticities with respect to the wage and output. In order to test these differences, dummy variables were included for the various groups. While "slope dummy variables" reflect the excess/under elasticity (relative to the overall elasticity) of the groups with respect to changes in the wage, "level variables" reflect the tendency of a group to enter the labor market. The main findings relating to the rates of entry into the labor market are as follows:

- Among the groups with a negative "level" coefficient, which means that the group has a lower tendency to enter the labor market, are Arab women, men and women from ultra-Orthodox households,[19] men and women with 0–8 years of education, older men and women, mothers of 5 or more children and single parents starting from 1994.[20]
- Among the groups with a positive "level" coefficient, which means that the group has a higher probability of entering the labor market, are women, mothers with 1 or 2 children, immigrants up to 10 years in Israel, men and women with higher education, men and women under the age of 30 and individuals belonging to households which already include wage earners.
- Changes in family status also affect the entry into the labor force and employment. Thus, men who married during the sample period have less of a tendency to enter employment while men and women who divorced during the sample period have a greater tendency to enter the labor force (though not necessarily to find employment).

Minimum wage

On the assumption that the minimum wage is enforced, individuals whose potential wage is under the minimum wage will not be able to work at that wage level because it is illegal.

[19] The identification of the ultra-Orthodox population in this research was done in the conventional manner by means of the education variable. Individuals in a household in which the last educational institution that one of members studied in was a Jewish religious institution (Yeshiva) are defined as ultra-Orthodox. However, as pointed out by Brender, Peled and Kasir (op.cit.), this definition does not include all of the ultra-Orthodox population and is biased in such a way that among the population defined as ultra-Orthodox a higher weight is given to those who are outside the labor force.

[20] The negative influence of being a single parent is significant only from 1994 onward, apparently because of the improvement in the conditions for receiving government support paid to this group during the years 1992-1994. For elaboration, see Flug and Kasir (2005).

Therefore, it can be expected that changes in the potential wage at levels below the minimum wage will be characterized by a lower sensitivity to the potential wage. This hypothesis can be tested using a "slope" dummy variable for individuals whose potential wage is less than the minimum wage (by a quarter of the standard deviation of the wage in that year, in order to compensate for estimation errors).

Tables 9 and 10 show that the coefficients of this variable are indeed negative and significant and totally offset the effect of changes of the potential wage on the entry into employment or the labor force. These findings are an indication that individuals with a low potential wage do not in fact react to changes in the potential wage in the search for work since in any case they cannot find employment as a result of the minimum wage constraint. This result demonstrates how important it is that the implementation of the negative income tax be discussed from the overall viewpoint of the components of the government policy while taking into consideration other policy factors that influence the labor market.

Part-time employment

One of the main persistent differences between those entering employment and the already employed is part-time vs. full-time employment. While 72 percent of those who were employed during the first two interviews worked in full-time positions, only one half of the newly employed, i.e., those who were not employed for the first two interviews but were employed for one of the two subsequent ones, worked in part-time positions (Table 11).[21] Furthermore, the number of work hours of full-time or part-time workers is lower among new workers as compared to existing workers: a new worker with a part-time position worked an average of 19 hours per week while those who had been employed in a part-time position in the first survey worked an average of 23 weekly hours. Weighting the proportions of the positions by the hours worked shows that the contribution of the newly employed to the economy's labor input is about 79 percent that of existing workers.

Table 11
Part-time vs. full-time positions among existing and new workers[a]

	Full-time position	Part-time position
Part-time position		
	(Proportion of group)	
Existing workers	72.4	27.6
New workers	49.6	50.4
	(Hours per week)	
Existing workers	48.0	22.9
New workers	45.4	19.5

[a] Existing workers are individuals who worked during the first and second surveys. New employees are individuals who were not working in the first and second surveys but were working in the third and fourth surveys.

[21] A full time position is defined as one involving more than 35 hours per week, excluding teachers for whom a full time position is defined as more than 28 hours per week.

A comparison of the characteristics of the newly employed who entered full-time positions to those who entered part-time positions shows that the tendency to enter a part-time position is especially strong among women, particularly women with young children, single mothers, women from ultra-Orthodox households and educated Arab women (Table 12). In contrast, Arab women with up to 12 years of education that start to work tend to do so in a full-time position. It was also found that the tendency to enter full-time employment

Table 12
Factors influencing the entry into full-time employment[a]

	Elasticity	p.value
Characteristics of the individual		
Women	-0.223	0.000
Birth of a child during the last year (men and women)	-0.083	0.009
Arab women	0.112	0.001
Arab women with 13 years of education or more	-0.282	0.000
Arab men starting from 1995	0.156	0.000
Men in an ultra-Orthodox household	-0.167	0.000
Women in a ultra-Orthodox household	-0.131	0.019
Immigrant	0.112	0.000
Individual of Asian/African descent	-0.049	0.009
Men in the 20–25 age group	-0.058	0.069
Men in the 56–60 age group	-0.175	0.000
Men in the 61–65 age group	-0.328	0.000
Men in the 66–70 age group	-0.413	0.000
Women in the 26–30 age group	0.088	0.000
Women in the 41–50 age group	-0.053	0.016
Women in the 51–55 age group	-0.139	0.000
Women in the 56–60 age group	-0.297	0.000
Women in the 61–65 age group	-0.322	0.000
Mother	-0.040	0.034
Mothers of children aged 2–5	-0.079	0.000
Mothers of children aged 6–9	-0.048	0.004
Single parent from 1994	-0.096	0.100
Father	0.041	0.076
Student that who completed/interrupted his studies	0.370	0.000
Number of wage earners in a household	0.035	0.000
Income of a household excluding the wages of the worker himself (in thousands of shekels)	0.004	0.053
Student	-0.281	0.000
Holder of a teaching certificate	-0.148	0.000

[a] The elasticities reflect the influence of the variable on the probability that an individual who was not working at the beginning of the period will begin working in a full-time position (at least 35 hours per week). For teachers, a full-time position is defined as at least 28 hours per week.

declines sharply in older age groups (over 50), both among men and among women. Other groups which tend to enter part-time employment are men with religious education and individuals of North African or Asian descent. In contrast, Arab men, immigrants and fathers of children tend to enter full-time employment. In addition, it was found that the presence of additional wage earners in the household (in most cases a spouse) increased the probability of entry into full-time employment, though given the number of other employed persons in the household, the higher their income, the lower the probability of entry into full-time employment.

Exit from employment

One of the ways in which a wage subsidy can lead to an increase in employment is through its effect on the decisions of individuals to continue working. In order to test this effect, we estimated an equation in which the dependent variable was exit from employment and the explanatory variables were changes in output and potential wage, dummy variables for determining whether the elasticities with respect to the wage and output differ across groups in the population and dummy variables for testing the differences among groups in the population in the rates of exit. The full equation is presented in Table 13.

The Table indicates that the elasticity of exit from employment relative to changes in the wage is negative, as expected, and has a magnitude of about 0.05. A particularly large elasticity was found among working men with 0–8 years of education during the years after 1995. In contrast, the elasticity in the development towns is close to zero. The elasticity of the exit from employment with respect to output is also negative and of a particularly high magnitude among relatively high wage earners.

The probability of exit from employment is especially high among men and women with low levels of education, particularly among Arab women with 0–8 years of education. In other words, not only are participation rates particularly low in this group, but there is also a strong tendency of working Arab women to exit employment. Immigrants and the young also have a higher probability of exiting employment, apparently due to the process of adjustment to places of work during their initial periods in the labor market. At the same time, there is a high probability of exiting employment, as expected, among older men and women. The probability of exiting employment is also lower among individuals who married during the course of the year, while those who ended their marriages have a greater tendency to exit employment.

A lower probability of exiting employment can be found among married men (not including those who married during the past year), among individuals with higher education, among individuals working full time and especially among individuals who worked full time in the first two interviews. In addition, it was found that the higher the (hourly) wage is (taking into account the effect of the worker's other characteristics), the smaller the probability of exiting employment. The implication of this finding is that the payment of a negative income tax to a worker can be expected to have the effect of preventing his exit from employment, not only during the first year in which there was a change in the wage, but also in subsequent years when the worker's wage remains at a higher level.

Table 13
Factors influencing exit from employment

	Elasticity	p.value
Economic variables		
Rate of change in real GDP in the relevant quarter relative to the same quarter in the previous year.	-0.067	0.010
Rate of change in the real wage	-0.054	0.000
Real hourly potential wage	-0.001	0.000
Real potential wage of 3,000–3,500 shekels per month	0.009	0.017
Employed in a full-time position in the first survey	-0.017	0.000
Employed in a full-time position in the first two surveys	-0.026	0.000
Slope dummies for changes in the wage		
For women in an ultra-Orthodox household	-0.081	0.106
For residents of development areas	0.050	0.057
For men with 0–8 years of education	0.107	0.003
For men with 0–8 years of education since 1995	-0.161	0.002
Slope dummies for changes in output		
For individuals prior to retirement	0.112	0.160
For individuals whose real potential wage is greater than 6,000 shekels per month	-0.093	0.045
Change in characteristics between surveys		
Birth of a child between the first and the last survey	0.063	0.000
Divorce during the sample period	0.031	0.034
Marriage during the sample period	-0.033	0.009
Reached retirement age during the sample period	0.133	0.000
Moved into the group with 13–15 years of education	0.014	0.016
Family status characteristics		
Mother of a child in the 6–9 age group	0.006	0.035
Mother of 1 or 2 children	-0.007	0.037
Mother of 3 or 4 children	-0.011	0.010
Father of a child aged 14–17	0.005	0.064
Employed spouse	-0.015	0.000
Single parent	-0.018	0.011
Number of wage earners in the household	0.005	0.000
Married men	-0.044	0.000
Arab men from 1995	0.029	0.000
Arab women	0.027	0.013
Arab women with 13 years of education	-0.035	0.004
Arab women with 0–8 years of education	0.091	0.000
Men from an ultra-Orthodox household from 1995	0.041	0.002
Women from an ultra-Orthodox household	-0.022	0.004

Table 13 (cont.)	Elasticity	p.value
Immigrant	0.028	0.000
Immigrant during his first two years in Israel	0.035	0.000
Men with 0–8 years of education	0.032	0.000
Men with 0–8 years of education since 1995	0.020	0.006
Men with 9–10 years of education	0.017	0.000
Men with 16 years of education or more	-0.017	0.000
Women with 0–8 years of education	0.048	0.000
Women with 9–10 years of education	0.022	0.000
Women with 13–15 years of education	-0.018	0.000
Women with 16 years of education or more	-0.034	0.000
Level of education unknown	0.039	0.016
Men in the 20–25 age group	0.045	0.000
Men in the 26–30 age group	0.014	0.001
Men in the 51–55 age group	0.018	0.000
Men in the 56–60 age group	0.023	0.000
Men in the 61–65 age group	0.090	0.000
Men in the 66–70 age group	0.153	0.000
Women in the 20–25 age group	0.089	0.000
Women in the 26–30 age group	0.028	0.000
Women in the 41–50 age group	-0.014	0.000
Women in the 46–60 age group	0.019	0.008
Women in the 61–65 age group	0.081	0.000
Holder of a teaching certificate	-0.015	0.004
Student	0.008	0.088

Policy scenarios

Table 14 presents the effects of three different EITC policies on employment, both through the entry into employment and the reduction of exits. The additional number of employed was calculated relative to the number of expected entries and exits from employment in a basic scenario in which the potential wages of all workers remain the same. The number of entries in each scenario was calculated by multiplying the probability of entry for each population group by the size of the non-employed population in that group. In a similar manner, an estimate was calculated for the reduction in exits from employment on the basis of the population of employees. The addition that we calculated does not include an estimate of the effect of the policy on wages in the labor market due to the subsidization element and the increased supply of labor at low wage levels.[22] In addition, the effect of the policy on individuals under the threshold age (22 for women and 23 for men) was not taken into account.

[22] A policy that succeeds in significantly increasing the supply of labor at low wage levels is liable to reduce the wage of those workers and therefore the net wage gain will be smaller than the wage subsidy granted by the program.

Table 14
Effect of the general policy option and the focused policy option on employment

	Payment of benefits to all workers in the household			Payment of benefits to the higher wage earner in the household					
				In all households with children			Larger benefit for households with more than 2 children		
	Additional entries into employment	Reduction of exits from employment	Total	Additional entries into employment	Reduction of exits from employment	Total	Additional entries into employment	Reduction of exits from employment	Total
Total	5,938	6,540	12,478	1,234	1,411	2,645	2,333	2,410	4,743
As percentage Of the employed	0.28	0.30	0.58	0.06	0.07	0.12	0.11	0.11	0.22
From households below the poverty line[a]	2,912	450	3,362	883	210	1,093	1,627	279	1,906
From households above the poverty line[a]	3,026	6,090	9,116	351	1,201	1,552	705	2,131	2,836
From households without children	2,567	3,104	5,671	0	0	0	0	0	0
From households with 1 or 2 children	2,313	2,394	4,707	734	887	1,621	734	887	1,621
From households with 3 or 4 children	791	779	1,570	383	377	760	1,201	1,124	2,325
From households with more than 4 children	265	264	529	117	147	264	398	339	737
"Cost per additional employee" (thousands of shekels)[b]		214			301			286	

[a] The division of households above and below the poverty line is only an approximation based on the estimated labor income of the household and child allowance payments.
[b] Cost of the program divided by the additional employees.

The first scenario is based on a subsidy of 20 percent for wage levels of 1,000–3,500 shekels per month and its phasing-out in the range of 3,500–5,000 shekels. This policy adds a total of some 12,500 new workers, about half of them through the decrease in exits from employment. The overall effect of the policy is an increase of the rate of employment in the economy by 0.6 percent[23] at a total cost of 2.7 billion shekels.[24] In other words, the cost

[23] The effect on work hours (labor input) in the economy is smaller since, as mentioned above, new entrants into the labor market – which comprise about one half of the additional employment – have a tendency to work less hours than existing workers.

[24] The cost of the policy primarily consists of the payment of a wage subsidy to existing workers, which is calculated directly from the Incomes Survey, and also includes the cost of the subsidy due to the increased number of employed (which is very small compared to the payment to existing workers).

amounts to some 210 thousand shekels per employee per year. This cost is one third less than that calculated in the research done in Britain for a similar policy configuration, though the British study did not include an estimate of the reduction in exits from employment. One of the main characteristics of this policy option is the large proportion of individuals affected by the policy which are not from households within the weaker segments of the population. In fact, most of the effect (about three quarters) is achieved through the addition to employment from these households.[25] About half of the addition to employment in this scenario is achieved through households without children (singles or couples without children). At the same time, this scenario succeeds in reducing poverty among households in which there is one worker by at least 9.2 percent, a reduction which is concentrated in small households (Table 15). Added to this is an estimated 2,300 additional households which rise above the poverty line as a result of the entry into employment.

In the second scenario, the benefit paid was identical but was restricted to families with at least one child and, when there was more than one worker in the household, was only paid to the spouse with the higher income.[26] One of the advantages of providing the subsidy to the higher wage earner is the preservation of the work incentive of the other spouse. The cost of the policy in this scenario is about 800 million shekels per year. In this scenario, the effect on employment is significantly lower with only 2,600 additional employees. This is because all the households without children, which constituted about one half of the increase in employment in the first scenario, do not receive any subsidy. In families with one or two children, the effect on employment declines by about two thirds since in most of these families there are two earners or at least one earner with a high wage. In contrast, among families with more than two children, the effect on employment declines by only one half and among the families at the lowest income levels by two thirds. Although the cost of the policy in this scenario is significantly lower than the general scenario, the cost per additional employed individual is larger at 300 thousand shekels per year. Thus, from a cost-benefit point of view, the increase in employment is achieved less efficiently than in the first scenario. This result reflects the non-eligibility for the subsidy among the "easily" affected groups in the population. Nonetheless, from the point of view of reducing poverty, this policy achieves a better ratio of cost to benefit than the policy in the first scenario: about two thirds of the reduction in poverty achieved in the first scenario at only 30 percent of the cost.[27] Nonetheless, this policy option is not effective in reducing poverty among relatively large families since the addition to income does not significantly increase the income per standard individual in these families.

[25] Since the poverty line cannot be directly calculated from the Labor Force Survey, we calculated the "potential" income of the household per standardized member based on the potential wage data of workers in the household (according to their work hours) and on the children's allowance. We defined the population in the lowest 20 percent of the distribution as "weak segments".

[26] In other words, if the wage of one of the spouses is above 5,000 shekels per month, the family would not be eligible for the benefit.

[27] Added to this are the estimated 800 households that will rise above the poverty line as a result of the increase in employment.

Table 15
Estimate of the effect of the programs on poverty in households with at least one worker

	Payment of benefits to all workers in the household		Payment of benefits to the higher wage earner in the household			
			In all households with children		Larger benefit for households with more than 2 children	
	Households that rise above the poverty line as a result of the policy	Percentage of households that rise above the poverty line[a]	Households that rise above the poverty line as a result of the policy	Percentage of households that rise above the poverty line[a]	Households that rise above the poverty line as a result of the policy	Percentage of households that rise above the poverty line[a]
Total[b]	13,712	9.2	10,091	6.8	24,832	16.7
Of those:						
Jews	9,589	10.8	7,037	7.9	12,818	14.4
Arabs	4,123	6.9	3,054	5.1	12,014	20.0
At least two workers	3,478	18.0	2,418	12.5	3,170	16.4
Households without children	3,022	9.0	0	0	0	0
Households with 1 or 2 children	6,591	13.5	6,302	12.9	6,302	12.9
Households with 3 or 4 children	2,732	5.8	2,422	5.1	13,063	27.7
Households with more than 5 children	1,367	7.1	1,367	7.1	5,467	28.2
Total effect including addition to employment[c]	16,015	10.7	10,801	7.3	26,415	17.8
Cost of policy (millions of shekels)[d]	2,675		797		1,355	

[a] Of those households under the poverty line with at least one worker.
[b] Not including the effect of the increase in employment.
[c] Including an estimate of the influence of the increase in employment, according to its composition, on poverty.
[d] Including the attributed cost of the addition to employment.

The third scenario examines the implications of a policy with increased support for larger families that include employed persons. This scenario is identical to the second for households with less than three children while families with three or more children receive a subsidy of 30 percent at wage levels of 1,000–4,000 shekels with phasing-out in the range up to 7,000 shekels. This approach is similar to the tax credit systems in Ireland and Britain

in providing higher support to families with a larger number of children. However, even in the tax credit system in France and the EITC in the US, benefits to families with children are larger and spread over a larger range of income than benefits to small families, and the range of the benefits is larger for families with two or more children. In this scenario, the addition to employment is larger by 80 percent than in the second scenario and for households with three children or more is three times larger. The cost of the program is also higher at 1.35 billion shekels and therefore the cost per added worker is only somewhat lower than in the second scenario and one third higher than in the first. In contrast, this policy option is much more effective in reducing poverty: among families with wage earners, it reduces poverty by 16.7 percent and it is particularly effective among households with three children or more. This policy option achieves double the effect of the first option in reducing poverty and at half the cost. Taking into consideration the effect of the addition to employment (some 1,600 new workers) on poverty increases the effect to 17.8 percent.

6. CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

In this study, we estimated the parameters for a cost/benefit analysis of an EITC system for Israel. It was found that the institution of an EITC could contribute to a significant reduction in poverty among families with at least one wage earner. We also found that, as in the rest of the world, the various groups in the population with low earning potential react to changes in the potential wage and therefore the institution of an EITC system in Israel is likely to also contribute to a certain increase in employment.

The main finding of the analysis of the various policy scenarios was that the configuration of the policy has a critical effect on results in terms of employment and poverty reduction. A system that offers benefits to all individuals at low wage levels, without taking into consideration family composition or the spouse's income, will have a relatively large effect on employment but at a high cost. In addition, most of its influence on employment will not be felt in households in the weak segments of the population and its efficiency in reducing poverty will be relatively low. In contrast, a focused policy which conditions the payment of benefits on the composition of the family and takes into account the income of the household, is less effective in increasing employment but is highly efficient in reducing poverty.

A problem that arises in the institution of an EITC system is the method of implementation. In most countries with a negative income tax, the government generally transfers the subsidy directly to the workers. This creates the need for an appropriate administrative infrastructure. Alternatively, one can think of methods of implementation that substitute for taxation; however, a simulated policy scenario based on reducing National Insurance premiums was quite inefficient.

An important component in the institution of an EITC is the system for enforcement and punishment of those who try to manipulate, or plainly cheat, the system. In particular, one must ensure that individuals who receive the wage subsidy are in fact working. In some of the countries with a negative income tax system, a heavy fine is imposed on individuals who receive, or attempt to receive, the wage subsidy even though they are not working. For example, in the US, someone who tries to obtain an EITC grant illegally is prohibited from requesting the benefit for a period of ten years. An efficient system of enforcement will also enable the conditioning of payments on the total income of the household and, in particular, can restrict the payment of the benefit to only one wage earner in each household. This

measure can reduce the cost of the program and can increase its effectiveness in reducing poverty.

We would point out that because not all variables that may influence participation can be included in a regression, some of the findings may be biased. Thus, for example, data on groups in the population of potential entrants who do not have the same possibilities of entering the labor market, such as the handicapped, the chronically ill, etc. were not available to us.

One avenue for future research is the calculation of the elasticity of work hours with respect to changes in the wage. In particular, wage subsidization is likely to contribute to an increase in the number of work hours among workers at wage levels just below the maximum threshold of the benefit and to a reduction in the number of work hours of workers at wage levels in the phasing-out range. As explained above (according to Saez's model) this sensitivity is an important factor in the design of an optimal EITC system and in the calculation of its effects on the economy's labor supply.

APPENDIX 1

Calculation of the potential wage

Since the Labor Force Survey does not report on the wages of those surveyed, we used an estimate of the potential wage for each individual based on the wage equation estimated in the Incomes Survey.[1] In the first stage, the nominal hourly wage was calculated for each worker who appeared in the Incomes Survey. This wage was then used in the estimation of the wage equation for each year based on the characteristics of the individuals. These characteristics included gender, age, nationality, an indicator of whether the individual was a new immigrant (less than 10 years in Israel) or a veteran immigrant (more than 10 years in Israel), education, whether the individual belonged to an ultra-Orthodox household, the number of years of education of the members of an ultra-Orthodox household, an indicator for residence in a development town, age of marriage and an interactive variable of age of marriage and gender. Other variables that were tested did not have a consistently significant influence on the wage over the sample period. The average coefficients of the variables (over periods of 5 years) appear in Table A–1 and have the expected signs. The coefficients of age and age squared together indicate that at around the age of 50, the influence of age becomes negative.

On the basis of the wage equation, we estimated the hourly "potential wage" for each of the individuals in the Labor Force Surveys. The potential wage is an estimate of the individual's wage based on his/her characteristics. The potential wage was estimated for each year separately so that the potential wage of those first surveyed during a particular year is calculated according to the wage equation for that same year and similarly for the last interview. For those who are not employed, the extra year of seniority is not included in the later survey since this variable is meant to reflect a premium for work experience. The changes in the other characteristics of the individual which are included in the wage equation have an effect on the change in the potential wage but at the same time control variables for the changes in these characteristics were included in the calculations of elasticity.

[1] A similar calcuation of wage estimates appears in Brender, Peled-Levy and Kasir (Kleiner) (2002).

Table A–1
Average coefficients of the wage equation for 1988–2003[a]

Coefficient	1992–1988	1997–1993	2003–1998
Constant	0.691	1.457	2.113
Women	-0.121	-0.133	-0.152
Age in current year	0.071	0.064	0.053
Age in current year squared	-0.001	-0.001	-0.001
Arab	-0.086	-0.114	-0.227
Immigrant up to 10 years in Israel	-0.523	-0.646	-0.562
Immigrant more than 10 years in Israel	-0.058	-0.039	-0.091
0–8 years of education	-0.328	-0.350	-0.285
9–10 years of education	-0.153	-0.171	-0.152
13–15 years of education	0.250	0.267	0.257
16 years of education or more	0.435	0.499	0.542
Belongs to an ultra-Orthodox household	-0.129	-0.315	-0.307
Women in an ultra-Orthodox household	0.175	0.360	0.391
Men in an ultra-Orthodox household: 13–15 years of education	0.213	0.212	0.197
Men in an ultra-Orthodox household: 16+ years of education	0.187	0.340	0.333
Resident of development town	-0.027	-0.092	-0.085
Interaction between age and marital status	0.005	0.005	0.005
Interaction between gender (women=1), age and marital status	-0.004	-0.003	-0.002

[a] Simple average of coefficients in the annual regression with the log of the hourly wage as the dependent variable.

We then multiplied the hourly potential wage derived from the estimation by 173.2 hours in order to obtain the potential (gross) wage for a full time position. On the basis of this wage, tax deductions (income and health tax and National Insurance) were calculated according to the tax rates that apply to each individual. Also calculated were the tax credits that each individual would be eligible for according to his/her family status (including credits for a non-working spouse, for women, for children, for single parents, for immigrants and for the divorced, as well as the personal credits). The calculation was carried out for each year according to the tax rules that were valid during that year. The taxes were then deducted in order to obtain the net potential full-time wage of each individual for each year which was then translated into fixed prices using the average Consumer Price Index for each year. Using these results, the change in the potential wage for each individual was calculated between his first interview and his last.

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