

## POVERTY AND EMPLOYMENT, AND THE GULF BETWEEN THEM

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In this paper we characterize the population of the poor in Israel, analyzing the main determinants of poverty as well as the changes in its incidence from 1987 to 2001. We pay particular attention to the factors that cause individuals to work and affect the level of their labor income, as these are the main reasons for a household being above or below the poverty line. We also analyze the effect of various policy instruments—particularly the system of transfers and changes in it over time, as well as the minimum wage—on the incidence of poverty. In addition, our investigation seeks to ascertain why certain groups have particularly high poverty rates.

Our research indicates that it is possible to identify the non-employment (whether due to non-participation or unemployment) of the head of the household as the main determinant of poverty. The existence of more than one wage earner in a household is almost certain to guarantee that a family will not fall below the poverty line, however. In general, groups with high poverty rates have no or few wage earners. ‘Dealing with’ groups with no wage earner by providing transfers considerably reduces the incidence of poverty. Thus, for example, old-age pensions substantially reduce poverty among the elderly, and the income supplement cuts poverty among single-parent families; the extent to which these groups manage to emerge from poverty is closely connected with the size of transfers. Similarly, child allowances substantially diminish poverty in large families, but since in the long run family size is also endogenous, it is not clear whether this policy does in fact serve to reduce poverty in the long run. Our empirical analysis shows that the probability of not being employed (and of not participating in the labor force) is far greater among individuals whose families receive large transfers. Hence, in the short run the key to dealing with the problem of poverty rests with the correct mix of transfers and incentives to work—for those capable of working.

Education plays an important role in reducing poverty, operating by increasing both wages and the employment rate. The relation between educational level and poverty has intensified with time. The strong negative correlation we found between education and the probability of being below the poverty line indicates that the education system is the key to solving the problem of poverty in the long run.

Another finding is that there is a relatively high incidence of poverty among the Arab population in Israel, even when such factors as education, family size, and

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The authors would like to thank Itai Pinto and Gili Fernandez for their efficient data analysis, and Eran Yashiv, Victor Lavy, and participants in the Sapir Forum for their comments.

the number of wage earners are held constant. This implies that there is discrimination in the labor market, and possibly also that the quality of education provided for this group is inferior to that of the general population.

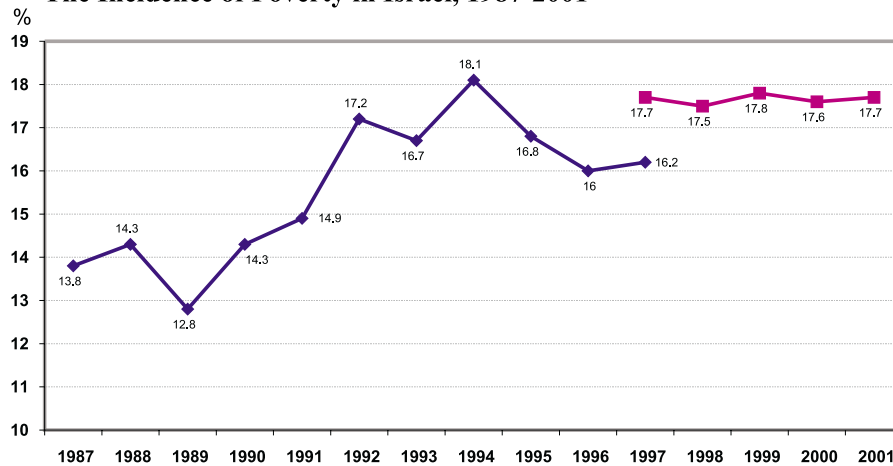
## 1. INTRODUCTION

In this study we characterize the segment of the population in Israel that can be identified as poor, examining the main determinants of poverty and the changes in it between 1987 and 2001. We pay particular attention to the factors determining whether an individual works or not as well as to the level of labor income, as these constitute the main factors determining if a household will be above or below the poverty line. We also focus on the effect of various policy factors—chief among them being the system of transfers and changes in it over time, as well as the minimum wage—on the incidence of poverty (the proportion of all families defined as poor). In addition, we examine what factors cause some groups to have particularly high poverty rates.

Several recent studies have focused on poverty and the inequality of income distribution in Israel. Some of the studies have concentrated on populations where the incidence of poverty is particularly high: non-Jews (Gharrah and Cohen, 2001), children (Klein, 2000), women (El-Or, 2001), and the ultra-orthodox (Berman, 1998; Berman and Klinov, 1997, and Dahan, 1998). Other studies deal with the level of permanence of poverty and movement into and out of poverty (Shayo and Vaknin, 2000; Romanov and Zussman, 2003; and Justman and Spivak, 2001).

An examination of the incidence of poverty in Israel in the last decade shows that it has been stable in the last few years (1997–2001). This follows a decline in the two preceding years, and a rise in the early 1990s (Figure 1). A comparison using data from the Luxembourg

**Figure 1**  
**The Incidence of Poverty in Israel, 1987-2001\***



\* The analysis for 1987-97 is based on the Income Surveys. The series is interrupted in 1997, after which it is based on the combined Income and Expenditure Surveys.  
SOURCE: National Insurance Institute.

Income Study and the National Insurance Institute shows that the poverty rate (i.e., persons whose income is less than half the standardized median disposable income) is significantly higher in Israel than in other developed countries, and lower only than in the US, even though the inequality of net income distribution in Israel is close to the median of inequality in the developed countries.

The paper consists of five sections. The following section contains a characterization of the poor population. Section 3 contains a brief account of our methodology. The main findings are presented in Section 4, and our concluding remarks are given in Section 5.

## 2. CHARACTERIZING THE POOR IN ISRAEL

In this section we examine the segment of Israel's population defined as poor. In order to characterize the poor we have divided households into those that are above or below the poverty line on the basis of disposable income and family size, drawing on data from the Income Survey. We review poverty rates in various groups—employed/unemployed, Jews/non-Jews, educated/uneducated—as well as by family size, type of education (religious seminary or other institution), number of wage earners, etc. We consider the composition of the poor population on the basis of those variables for the period from 1987 to 2001.

In examining the population of Israel with reference to the poverty line, defined as the level of financial income that is equivalent to half the median disposable income, adjusted for family size (assuming economies of scale in consumption), and in analyzing the inequality of income distribution, it is important to stress several points:

- The poverty line represents 'relative poverty,' not 'absolute poverty,' in the sense of the ability to afford a basic basket of goods and services that provides essential needs.
- Addressing only financial income with respect to both the poverty line and indices of income inequality does not reflect welfare. In particular, the decision not to participate in the work force, and the resulting imputed income, has not been taken into account (e.g., families where the mother takes care of the children are liable to be considered poor, whereas those where the mother works but hands most of her wages over to nursemaids are liable to be defined on the basis of income as being above the poverty line; it is not clear which family enjoys greater welfare).
- Defining the poverty line and inequality on the basis of financial income alone does not take into account the public services provided differentially and at different prices to the various groups (housing services, education, health, etc.). The exclusion of an imputed income equivalent to these benefits increases estimated poverty. This bias means that a welfare policy that focuses on providing education services for low-income groups, for example, will not show up in the measurement of the rates of poverty based on the poverty line.
- The poverty line relates solely to financial income, and does not include imputed income from property.
- Israel's equivalence scale, which was estimated over thirty years ago utilizing the Engel method, reflects far lower economies of scale in household consumption than are generally in evidence in the west (Barnea and Dvir, 2000).

**Table 1**  
**Data on Poverty in Families, Based on Income Survey, 2001**

(weighted observations)

	Poor	Not poor	Poverty rate (%)
<b>Total</b>	<b>311,543</b>	<b>1,480,648</b>	<b>17.4</b>
Families with wage earners	114,977	1,172,181	8.9
Single wage earner	101,546	498,289	16.9
Two or more wage earners	13,431	673,892	2.0
Families with no wage earner	196,566	308,467	38.9
Poverty rate in families where head is:			
Jewish	220,573	1,352,528	14.0
Arab	90,969	128,120	41.5
Educated <sup>a</sup>	88,712	730,197	10.8
Not educated	222,831	750,451	22.9
Not elderly <sup>b</sup>	230,937	1,203,878	16.1
Elderly	80,605	276,770	22.6
Number of children:			
None	137,819	797,223	14.7
1–3	114,630	608,054	15.9
4+	59,094	75,371	44.0
Poverty rate in families where head is not elderly: <sup>c</sup>			
No wage earner	116,795	82,061	58.7
Single wage earner	100,960	457,553	18.1
Two or more wage earners	13,181	664,263	2.0
Poverty rate in ultra-orthodox families where head is not elderly:			
No wage earner	20,916	3,789	84.7
Single wage earner	10,761	13,557	44.3
Two or more wage earners	841	9,366	8.2
Two-parent families	283,842	1,393,642	16.9
Single-parent families	27,701	87,005	24.2
Not in development region A	296,703	1,417,759	17.3
Development region A	14,840	62,889	19.1

<sup>a</sup> With at least 12 years of schooling.

<sup>b</sup> Defined as male head of household aged 65 or over, or female head of household aged 60 or over.

<sup>c</sup> An ultra-orthodox family is one where at least one member attends or attended a religious seminary (*yeshiva*).

Despite the drawbacks of the poverty line as customarily defined, we adopt that definition here because of its relative simplicity, the availability of data, and the fact that this is the definition that is accepted in the west and in the literature.

### The incidence of poverty and the composition of Israel's poor population<sup>1</sup>

In 2001 the poverty rate in Israel was 17.4 percent. Some 63 percent of those defined as poor were households with no wage earner, 71 percent were Jewish, in 72 percent the head of the household had less than twelve years of schooling, and 26 percent were elderly.

Poverty rates varied between groups, being particularly high in households that had no wage earner, were Arab, or had four or more children, while the poverty rate was only 2 percent in households with more than one wage earner. The poverty rate was particularly high in households whose heads were not employed, and reached 85 percent among those defined as ultra-orthodox with no wage earner (Table 1).<sup>2</sup>

Similar results regarding the frequency of poverty in various groups were found for previous years.<sup>3</sup> In previous Income Surveys (up to 1997) it was possible to identify the disabled, half of whom were defined as poor.

### 3. THE METHODOLOGY

Underlying the methodological approach is the family utility function (normalized for a standard person), which is affected by the amount of leisure and consumption. The family determines the amount of leisure in order to maximize its utility function.

Thus, the problem of family  $i$  is:

$$(3.1) \quad \begin{aligned} & \underset{L^i}{\text{Max}} U^i(L^i(x^i), C^i) \\ & \text{s.t. } C^i = I^i + T^i(x^i, L_i) \end{aligned}$$

where:

$U^i(x^i)$  = the utility function of family  $i$

$L^i$  = the amount of family leisure,

$X^i$  = the family's characteristics (e.g., size, education, religion),

$C^i$  = family consumption,

$I^i$  = the family's labor income,

$T^i$  = the transfer payments received by the family.

(all the variables refer, as stated, to a standard person).

The assumption underlying the model is that anyone who wants to work can do so as much as desired, so that no distinction is made between employment and labor-force participation.

<sup>1</sup> The empirical analysis in this study is based on the Central Bureau of Statistics' annual Income Surveys. For details, see appendix.

<sup>2</sup> A report on the composition and incidence of poverty in various groups appears annually in the reports of the National Insurance Institute.

<sup>3</sup> Until 1997 the analysis is based on the Income Surveys; since 1998 the Income and Expenditure Surveys have been combined, and the analysis is based on that. The combined survey contains groups which were not included in previous surveys, i.e., residents of East Jerusalem, self-employed persons, and members of rural and agricultural settlements.

For the sake of simplicity, we assume that the full amount of income is consumed.

$$(3.2) \quad I^i = (N^i - L^i(x^i))W^i(x^i)$$

where:

$N^i$  = the maximum possible amount of work,

$W^i(x^i)$  = the wage per unit of labor. For the sake of simplicity we assume in the model that the family's units of labor are homogeneous, and the decision to go to work is made at the family level. Under conditions of competition the wage will be determined by the characteristics of the employed persons, chief among them being their education and occupation.

We assume:

$$\frac{\partial^2 U^i}{\partial C^2} < 0, \quad \frac{\partial^2 U^i}{\partial L^2} < 0, \quad \frac{\partial^2 U^i}{\partial L \partial C} < 0, \quad \frac{\partial U^i}{\partial C} > 0, \quad \frac{\partial U^i}{\partial L} < 0.$$

In reality, continuity does not exist in some of the variables, such as  $L^i$ . Nevertheless, for the sake of simplicity we assume that there is continuity in all the variables.

From first-order conditions, we get:

$$(3.3) \quad \frac{U_L^i}{U_C^i} = W^i(x^i) - \frac{\partial T^i}{\partial L^i}$$

where:  $U_C^i$  and  $U_L^i$  are the partial derivatives of the utility function relative to  $C$  and  $L$  respectively. It can easily be seen that  $\frac{U_L^i}{U_C^i}$  is a declining function of  $L$ , assuming the declining marginal utility of leisure and consumption (because  $U_L(\bar{L})$  and  $U_C^+(L)$ ).

Solving equation (3.3) gives the optimal  $L$  and from this equation we find that it depends on the utility function, on the parameters defining the marginal utility function from leisure and consumption, on wages, on the system of transfers, and on the effect of the quantity of work on the value of transfers:  $T_L$ , when  $T_L > 0$ , for example when there is a means test. In other words, income from transfers rises when leisure increases and labor income falls. From this equation we derive that the smaller is  $T_L$ , i.e., when the effective tax on the various transfers is relatively low (e.g., when benefits such as tax credits are given to employees), the lower is the disincentive to work implicit in the transfers.

$U_L$  is the marginal utility of leisure, which for each household is contingent on the parameters of its utility function. These parameters are affected by the characteristics of the individuals, such as family size, ultra-orthodox affiliation, and age.

$U_p$  is the marginal utility of income, which declines as income rises and is affected by the level of transfers and wages (the income effect).

$W$  is affected by human capital, discrimination in the labor market, age, and age squared (according to the theory of human capital). Hence, the supply of family work is a function of the following variables:

$$L = f(\underbrace{\text{elderly, ultra-orthodox, family size}}_{\text{Factors affecting the parameters of the utility function}}, T(x^i), W(x^i), T_L(x^i))$$

Determining  $L$  together with the wage equation sets total wage income at  $W(N - L)$ .

These, together with  $T$  (which is a function of the household's characteristics) determine the family's total financial income.

All these, together with the household's characteristics determine income per standard person, and hence whether a family is above or below the poverty line:

$$(3.5) \quad Pov = f(L, W, T, x^i)$$

Poverty is determined unilaterally when the variables  $L$ ,  $T$  and  $W$  and the composition of the household are given, i.e., when the median income, which defines the position of the poverty line, is given for a household. Each of these variables can be estimated as follows:  $L(x^i)$ ,  $T(x^i)$ ,  $W(L, x^i)$ . The 'reduced' form of equation (3.5) is:

$$(3.6) \quad Pov = f(x^i) + \varepsilon$$

The empirical analysis below refers to the relation between the factors affecting  $L$ ,  $T$  and  $W$ , and the relation between family composition and poverty, by estimating the reduced form of the equation. We also estimate the wage and employment equations separately.

#### 4. THE EMPIRICAL ANALYSIS

In the spirit of the methodological approach described above, the empirical analysis estimates the reduced form presented in equation (3.6). Thus:

The poverty line relates, as stated, to income per standard person.

For every household  $i$  a  $P_i$  variable is defined as follows:

If the household is below the poverty line  $P_i = 1$ , otherwise  $P_i = 0$ .

Hence:

$$P_i = p(\text{labor income, non-labor income, family size})$$

Where:

Non-labor income =  $h$ (labor income, factors affecting transfers: age, single parent, etc.)

Labor income =  $g$ (human capital, number of wage earners etc.)

For the sake of simplicity we assumed that for each individual in the household,  $L$  takes the values of 0 or 1.

At the second stage we also estimated the  $L(x^i, T(x^i))$  and  $W(x^i)$  equations, while the  $T(L, x^i)$  relation is given on the basis of the system of government transfers and in accordance with the characteristics of the family. This stage serves to deepen the analysis of the effect of a household's characteristics on its performance in the labor market—participation and wages—which in turn affect its probability of being poor. One can view this as looking at the channels via which, in the context of a given transfer system, a family's characteristics determine the probability that it will fall below the poverty line.

### **Determinants of the probability of being poor, 2001**

The findings presented in section 2 regarding the incidence of poverty in various groups do not by themselves indicate the causes of poverty, *inter alia* because of the high correlation between affiliation with several groups. For example, among the ultra-orthodox there is a high incidence of families with four or more children, as well as of those with only one or no wage earner; this explains, at least in part, the large proportion of the group defined as poor.

In this part of the paper we examine the quantitative effects of various characteristics on the probability of being defined as poor. We do this by running a Logit regression, which reviews the influence of each characteristic on the probability of being poor. The odds ratio from the regression answers the question as to how much greater is the probability that a household will be poor if it has certain features (given its other characteristics). The importance of the probability analysis lies in the fact that it examines the *marginal contribution* of each feature to the probability of being poor. The results of the equation are given in Table 2.<sup>4</sup>

As years of (non-ultra-orthodox) schooling rise, there is a clear decline in the probability of being poor. In the equation with years of schooling as a continuous variable, the coefficient of years of schooling is  $-0.3$ . When this variable is introduced as groups of years of schooling (those with 0, 1–4, 5–8, 9–10, 11–12, 13–15, and 16 or more years of schooling), the probability of being poor declines monotonically as the number of years of schooling rises. Thus, for example, the probability that a household in which the head has 0–8 years of schooling will be poor is greater by a factor of three than in a household where the head has 11–12 years of schooling, and almost 1.5 times greater in a household where the head has 9–10 years of schooling.

If the head of the household has 13 years or more of ultra-orthodox education the family is six times more likely to be below the poverty line than a family where the head of household has 11–12 years of schooling in the regular school system. This reflects both the lower probability that the head of household will be employed (due to the low rate of participation

<sup>4</sup> Qualitatively similar results were obtained from the regression when the dependent variable referred to individuals rather than households, and also when a Probit function was used.



**Table 2**  
**Probability of Being Poor as Function of Various Variables,<sup>a</sup> 2001**

(Logit model; above poverty line = 0, below poverty line = 1)

	Regression coefficient	Probability ratio
Arab	1.1461	3.146
Continent of birth of (Jewish) household head		
Asia/Africa (compared with Israeli-born)	-0.0074*	0.993*
Europe/America (compared with Israeli-born)	-0.2878	0.750
New immigrants (since 1990)	0.5991	1.820
Years of schooling of household head:		
0–8	1.0285	2.797
9–10	0.4660	1.594
13–15 non-ultra-orthodox <sup>b</sup>	-0.3189	0.727
16+ non-ultra-orthodox <sup>b</sup>	-0.8272	0.437
13–15 ultra-orthodox <sup>b</sup>	1.8777	6.539
16+ ultra-orthodox <sup>b</sup>	1.7992	6.045
Number of children (compared with childless families):		
1–3	0.2897	1.336
4–5	1.1127	3.042
6–7	1.2455	3.475
8+	1.2347	3.437
Single-parent families	0.4311	1.539
Age of household head	-0.0489	0.952
Age of household head (squared)	0.0004	1.000
Elderly household head <sup>c</sup>	0.6945	2.003
Residence in development region A	0.2534	1.288
Residence in development region B	0.3454	1.413

<sup>a</sup>The regression was run on data from the Consolidated Household Survey: Income and Expenditure.

<sup>b</sup>An ultra-orthodox family is one where at least one member attends or attended a religious seminary (*yeshiva*).

<sup>c</sup>Defined as male head of household aged 65 or over, or female head of household aged 60 or over.

by the ultra-orthodox in the labor force) as well as the low wage, as this type of education has very low returns, if any, in the labor market (see the employment and wage regressions below).

As expected, the probability of being below the poverty line is greater for Arabs than for Jews. The 3.1 odds ratio of this variable is lower than that implied by the relative frequencies of poverty within these groups because of the high correlation between affiliation to this group and other variables (number of wage earners, years of schooling, number of children, etc.) which also tend to increase the probability of being poor. The greater probability that Arabs will be below the poverty line, even accounting for education, and family size, indicates that there is discrimination in the labor market, whether with regard to wages or the employment options available to this group. Note, however, that the regressions cannot express the quality of education. This finding may also be consistent with the lower quality of education found in Arab-dominated areas (Adler and Balas, 1996; Lavy et al., 2000).

The results with regard to the single-parent families indicate that when other characteristics are taken into account, the probability that a household headed by a single parent will be below the poverty line is higher than it would be otherwise. This is the case in spite of the fact that they are entitled to transfer payments (income supplements and other benefits for single-parent families), which are insufficient to offset the lower probability of being employed.

**Table 3**  
**Number of Children, Child Allowances, and the Poverty Line, 2001**

Number of children	Poverty line <sup>a</sup>	Change in poverty line	Level of child allowance	Change in level of child allowance <sup>b</sup>	Change in allowance <i>less</i> change in poverty line
1	3,667	899	171	171	-728
2	4,428	761	342	171	-590
3	5,189	761	685	343	-418
4	5,881	692	1,379	694	2
5	6,573	692	2,235	856	164
6	7,196	623	3,091	856	233
7	7,749	553	3,947	856	303

<sup>a</sup> Calculated for a family including two adults.

<sup>b</sup> According to increased allowances from the fifth child on; under the Large Families Law that came into force in 2001, the incremental income for fifth and subsequent children is NIS 855.

SOURCE: National Insurance Institute.

The regressions also point to the marked effect of the number of children on the probability of being below the poverty line, because the larger the family the greater the income required to provide a reasonable standard of living (i.e., to be above the poverty line). Note that the incidence of poverty is almost three times as high in large families (i.e., families with four or more children) as in smaller ones. Nonetheless, a closer examination of the effect of the number of children, by sub-dividing family size into several groups (1-3, 4-5, 6-7, and 8 or more children) indicates that the probability of being poor does not rise monotonically with the number of children. In each of these groups the probability of being poor is greater than it is for families without children (other factors being equal). Contrary to expectations, however, among large families the probability of being poor is almost as high in families with 4-5 children, as in larger families, i.e., those with 6-7 children and it does not rise further for even larger families. The main reason for this is the structure of the child allowance system (Table 3). The transfer for each additional child from the fourth child on exceeds the incremental income required in order to remain above the poverty line.<sup>5</sup> The increased probability of

<sup>5</sup> Increasing the child allowance from the fifth child on, in accordance with the amendment to the law that went into effect in 2001, means that the financial compensation for these children will be significantly more than the required incremental income, thereby significantly reducing the poverty rate among large families. In mid 2002, in the context of a package of measures aimed at containing the budget deficit, child allowances were also temporarily reduced.

being below the poverty line when the number of children rises (for families with more than four children), despite the structure of the transfer system, reflects employment of a more part-time nature, mainly of the second wage earner (if she is employed) in large families, which is not captured in the regression.<sup>6</sup>

Additional variables affecting the probability of being poor are continent of origin (with persons of European-American origin having a lower probability of being poor), and immigration since 1990—which also increases the probability of being poor and apparently reflects the low return on education measured by years of schooling (*inter alia* because of language difficulties and a lack of other country-specific human capital). The effect of the age of the head of the household (and age squared), reflecting seniority in the labor market (as is customary in wage equations), goes in the expected direction through wages. Residence in a development region also has an effect in the expected direction, increasing the probability of being below the poverty line, although the influence of development region A is smaller, apparently because of benefits such as tax concessions extended to residents. Defining development regions as south, north, and center did not yield significant differences between them.

Although participation in the labor force is determined endogenously, in a second regression we have included a dummy variable for the employment status of the head of household, his occupation, as well as a variable for the number of wage earners in the household. The inclusion of these variables creates a bias in some of the coefficients for the other variables that affect the tendency to be employed. It does allow us, however, to examine the other effects of occupation (which go in the expected direction) and the number of wage earners in reducing the probability of being poor.

As stated, in previous Income Surveys (until 1997) disabled persons were identified within the group in part-time employment. As expected, when this variable is added to the regression we find that a household headed by such a person has a greater probability of being below the poverty line (the details of this regression are reported in Flug and Kasir (Kalinin), 2001).

In order to examine the extent to which variables that influence the probability of being poor within the general population affect groups with a high incidence of poverty, we also ran a Logit regression for each group separately. The findings are given in Table 4. Most of the principal variables affect the probability of being below the poverty line in a similar direction for all the groups, albeit with differing intensities. The modest effect of the number of years of schooling (other than those with only 0-8 years of schooling) among ultra-orthodox families on the probability of being poor, as explained by their low employment rate, is noteworthy. The decline in the odds ratio for these families when the number of children increases to 8 or more, is also noteworthy, and is explained by the structure of the child allowance.

The high odds ratio of being poor for exceptionally large Arab families is apparently because some of the households with a large number of children include two or more wives, so that the children are from two different mothers, and hence the child allowance is smaller than it would be for the same number of children from one mother. Another outstanding feature of large Jewish and Arab families, but especially among the ultra-orthodox Jewish ones, is that residence in development region A significantly reduces the probability of being poor, apparently due to the benefits extended to residents of these regions.

<sup>6</sup> For large families there is an upward bias to the probability of being below the poverty line, as a child born during a quarter is counted for the calculation of family size, while only part of the income from the child allowance for that child is imputed.

**Table 4**  
**Probability of Being Poor as Function of Various Variables in Different Groups, 2001**

	(probability ratio; logit model)						
	Total population	Ultra-orthodox	Arab	Single parent	Large family	Elderly	No wage-earner
<b>Arabs</b>	<b>3.146</b>			<b>2.329</b>	<b>2.592</b>	<b>4.507</b>	<b>2.765</b>
<b>Jews</b>							
Continent of birth of household head							
Asia/Africa (compared with Israeli-born)	0.993*	1.496	1.626	1.646	0.982*	0.956*	1.053
Europe/America (compared with Israeli-born)	0.750	1.523	0.501	0.976*	0.988*	0.513	0.789
New immigrants (since 1990)	1.820	1.555	0.408	1.025*	2.076	3.917	2.065
Years of schooling of household head:							
0-8	2.797	5.145	3.165	3.734	2.937	2.488	2.403
9-10	1.594	1.323	1.841	1.427	1.427	1.468	1.370
13-15 non ultra-orthodox <sup>a</sup>	0.727		0.661	0.761	0.325	1.309	0.756
16+ non ultra-orthodox <sup>a</sup>	0.437		0.337	0.233	0.168	1.014*	0.510
13-15 ultra-orthodox <sup>a</sup>	6.539	1.108		3.449	2.955	1.272	3.966
16+ ultra-orthodox <sup>a</sup>	6.045	1.301			2.611	4.145	4.513
Number of children (compared with childless families):							
1-3	1.336	3.731	3.130	0.430		1.826	2.128
4-5	3.042	4.000	5.016	1.988	0.731	0.860	3.672
6-7	3.475	6.217	5.561	0.622	0.936*		3.515
8+	3.437	3.922	9.662				4.178
Single-parent families	1.539	0.067	0.675		1.055*	2.152	0.986*
Age of household head	0.952	0.915	0.957	1.047	0.838	0.866	0.964
Age of household head (squared)	1.000	1.000	1.000	1.000	1.002	1.001	1.000
Elderly household head <sup>b</sup>	2.003	3.697	3.219	1.908	0.054		1.131
Residence in development region A	1.288	0.335	1.943	1.144	1.142	1.189	1.280
Residence in development region B	1.413	1.127	1.006*	2.107	1.712	1.170	1.399

<sup>a</sup> An ultra-orthodox family is one where at least one member attends or attended a religious seminary (*yeshiva*).

<sup>b</sup> Defined as male head of household aged 65 or over, or female head of household aged 60 or over.

<sup>c</sup> Not significant at 5 percent level.

<sup>d</sup> In large families the omitted group is families with 4-5 children.

**Wage and employment equations**

In this section we look at the channels through which the main demographic variables, characteristics of individuals, and transfers affect employment and wages—and hence poverty. The results of the wage equation are given in Table 5.

**Table 5**  
**Wage Equation, 2001**

	Coefficient	Significance
Intercept	6.3014	0.0001
Age	0.0703	0.0001
Age squared	-0.0006	0.0001
Gender	-0.2419	0.0001
Veteran immigrants	-0.2082	0.0001
New immigrants	-0.2369	0.0001
Arabs	-0.1135	0.0001
Hours worked	0.0062	0.0001
Years of schooling <sup>a</sup> (excl. ultra-orthodox):		
0–8	-0.2187	0.0001
9–10	-0.1543	0.0001
13–15	0.0864	0.0001
16+	0.2649	0.0001
Years of schooling (ultra-orthodox):		
0–8	0.8108	0.1283
9–10	0.2176	0.1980
11–12	-0.1371	0.0464
13–15	-0.1796	0.0005
16+	-0.0632	0.3027
Industry <sup>b</sup>		
Agriculture and construction	-0.0820	0.0009
Electricity and water	0.3350	0.0001
Services and commerce	-0.0826	0.0001
Catering and hotels	-0.3182	0.0001
Banks	0.1604	0.0001
Public services	-0.0894	0.0001
Occupation <sup>c</sup>		
Professional/technical/managerial	-0.0517	0.0055
Clerical/sales/services	-0.4235	0.0001
Skilled workers	-0.5283	0.0001
Unskilled workers	-0.5848	0.0001
Residence in development region A	-0.0780	0.0019

<sup>a</sup> The omitted group is persons with 10–11 years of schooling (excluding ultra-orthodox).

<sup>b</sup> The omitted group is manufacturing.

<sup>c</sup> The omitted group is graduates.

The wage equation shows that the influence of most of the variables goes in the expected direction: age has a positive effect, while age squared has a (marginally) negative one; being a woman reduces wages, and the same applies to being an immigrant, the gap narrowing as the number of years since immigration rises. The effect of education is positive and significant for the non-ultra-orthodox, and not significant for the ultra-orthodox, i.e., there is no return in the labor market on ultra-orthodox education. The effect of industry also works in the expected direction; wages in the banking, electricity, and water industries are relatively high, and in the services and commerce, public services, agriculture, and construction industries they are relatively low. However, as employment in a given industry may be an endogenous outcome of the accessibility of employment in it for certain workers, we also ran the equations excluding the industry dummies—and obtained similar results. The wages of Arabs are relatively low, indicating the existence of discrimination, possibly via their limited employment opportunities to attain positions with higher wages.

**Table 6**  
**Probability of Not Being Employed, 2001 (over 25s)**

(Logit model; employed = 0, unemployed = 1)

	Men		Women	
	Coefficient	Probability ratio	Coefficient	Probability ratio
Intercept	-2.4800	–	-1.5930	–
Arabs	0.2977	1.347	1.0935	2.985
Continent of birth:				
Asia/Africa	0.0928	1.097	-0.3444	0.709
Europe/America	-0.0358	0.965	-0.2115	0.809
Veteran immigrants	0.0059*	1.006*	0.1014	1.107
New immigrants	0.0907	1.095	0.0269	1.027
Years of schooling:				
None	2.0760	7.973	2.6505	14.160
1–4	1.8648	6.455	2.6942	14.793
5–8	1.5086	4.520	2.1612	8.682
9–10	0.7819	2.186	1.5537	4.729
11–12	0.2932	1.341	1.1148	3.049
13–15	0.2661	1.305	0.5329	1.704
Ultra-orthodox	2.0214	7.549	0.6676	1.950
Large families	-0.7996	0.450	0.4920	1.636
Single parent	0.9806	2.666	-0.0335	0.967
Age	0.2351	1.265	0.0596	1.061
Elderly	1.9405	6.962	2.4029	11.055
Labor income of rest of household	-0.4091	0.664	-0.1477	0.863
Transfers	0.5588	1.748	0.2288	1.257
Residence in development region A	0.2342	1.264	0.2752	1.317
Residence in development region B	0.2898	1.336	0.2449	1.277

\* Significant at 5 percent level.

The employment regression (Table 6) refers to persons aged 25 or over, as we wanted to focus on the question of employment in such a way as to eliminate the influence of military service and undergraduate studies for 1999 (the regression for the working-age population—15 and over—[in Appendix 2] appears in Flug and Kasir (Kaliner), 2001).

The main results of the employment regression go in the expected direction, and are also evident with regard to differences between men and women. Arab men (aged 25 and over) tend to have a higher employment rate than Jewish men because they have a higher participation rate, which is only partly offset by their higher unemployment rate. The probability of not being employed is three times as high for Arab women as it is for Jewish women, expressing the combination of a lower participation rate and higher unemployment rate. The probability that new immigrants will be employed is lower than it is for veterans, but rises with the number of years since immigration. Men in large families have a greater tendency to work (taking transfers into account), while women in large families have a lower participation rate. The various transfers reduce the tendency to work, especially among men.<sup>7</sup> There is a very high probability that ultra-orthodox men will not work, while the probability that ultra-orthodox women will not work is higher than that of their counterparts, but the effect for women is not quite as great.

The influence of the labor income of the other members of the household on the probability that an individual will not work embodies the income effect, on the one hand, and the effect of the correlation with the spouse's education, on the other, so that *ex ante* the direction of the effect is not clear. The results of the regression indicate that the effect of the correlation with education predominates. This may also apply to other characteristics that affect the earning capacity of both men and women, including the positive correlation between spouses' probability of being employed.

The strong and monotonic relation between employment and education is noteworthy. Note that this relation is particularly high for women, and although their average participation rate is lower than men's, that of women with 16 or more years of schooling is higher than that of men with the same number of years of schooling.

Although the major variable affecting the probability of being poor is employment, the behavioral variable is labor-force participation, namely, whether the individual chooses to work or not. Consequently, we also ran a regression on the probability of labor-force participation for those variables, and the sizes of the coefficients are similar to those in the employment equation<sup>8</sup> (these results are reported in Flug and Kasir (Kaliner), 2001).<sup>9</sup>

<sup>7</sup> Only the transfers exogenous to the individual's decision to participate in the labor force should have been included in this variable. However, since the data do not distinguish between the work-dependent transfer income (unemployment benefit) of individuals and households, we included in transfers only those not connected with the individual's decision to work. Similar results were obtained in another regression that incorporated all the transfers.

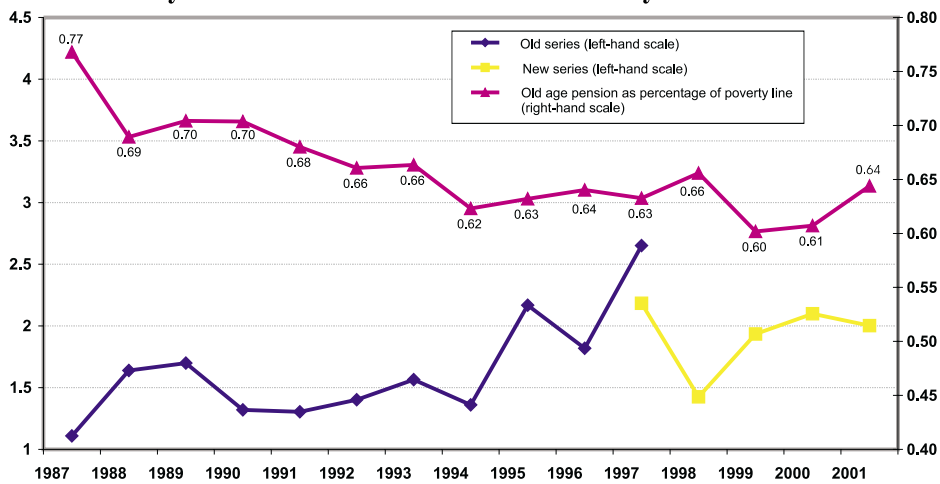
<sup>8</sup> The combined income and expenditure survey for 1998-2001 does not include data on labor-force participation. Consequently the participation equations are based on the Income Survey for 1997 (see Flug and Kasir (Kaliner), 2001).

<sup>9</sup> Similar results were also reported in Brender, Peled-Levi and Kasir (Kaliner), (2002).

### Changes over time in the probability of being poor

Below we examine changes in the probability of being poor by analyzing the evolution of the odds ratio for the principal variables during the period reviewed, derived from the regression estimated from consecutive Income Surveys.<sup>10</sup> The probability of being elderly and poor (*ceteris paribus*) rose steeply in the 1990s with the erosion of old-age pensions relative to poverty-line income (per individual, for a standard person, see Figure 2). In 2001, with an

**Figure 2**  
**Probability Ratio<sup>a</sup> for Households with an Elderly Head\***



\* The analysis for 1987-2001 is based on the Income Surveys. The series is interrupted in 1997, after which it is based on the combined Income and Expenditure Surveys. An elderly head is defined as a male head of household aged 65 or over or a female head of household aged 60 or over

<sup>a</sup> The probability ratio is equivalent to the odds ratio.

SOURCE: National Insurance Institute.

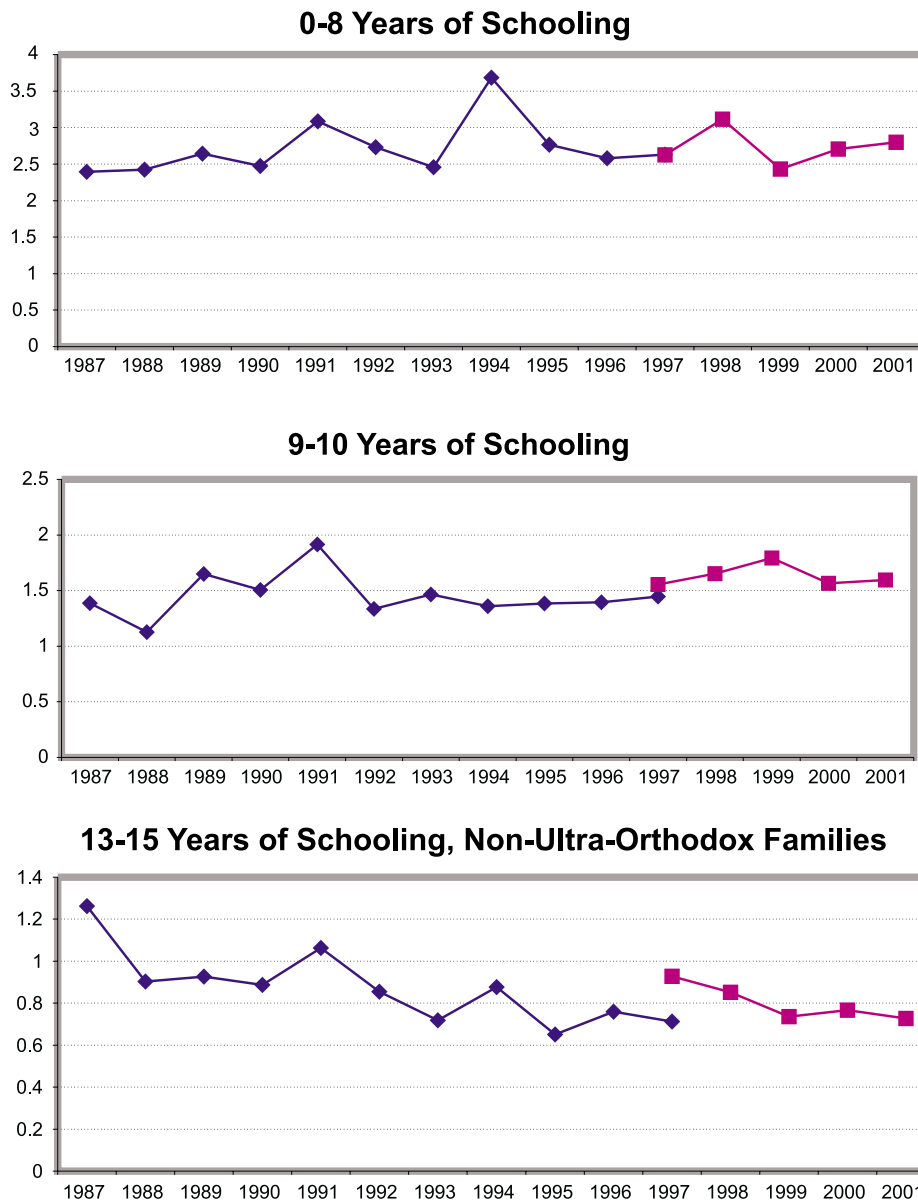
increase in the relative pension, the odds ratio of being elderly and poor declined. The probability of being poor for households whose head is not educated (less than 12 years of schooling) rises throughout the period reviewed. Similar results are obtained for all groups with up to 12 years of schooling, with a decline in poverty as the level of education rises (see Figure 3). This finding is consistent with the widening wage gaps between groups with and without higher education as well as with the relative deterioration in employment possibilities for persons with little education (see *inter alia*, Flug, Kasir (Kalinier), and Ribon, 2000; and Muallam and Frish, 1999).

The change during the period studied in the probability of being poor for all families with children (relative to families without children) went in the reverse direction to that of the change in child allowances relative to poverty-line income (see Figure 4). In 1999 there was an increase in the probability of being poor for all families because of the erosion of transfers

<sup>10</sup> In 1997 the sample was enlarged (after being combined with the Family Expenditure Survey) to include groups not identified in previous years (e.g., residents of East Jerusalem), so that comparisons before and after that year may be flawed.



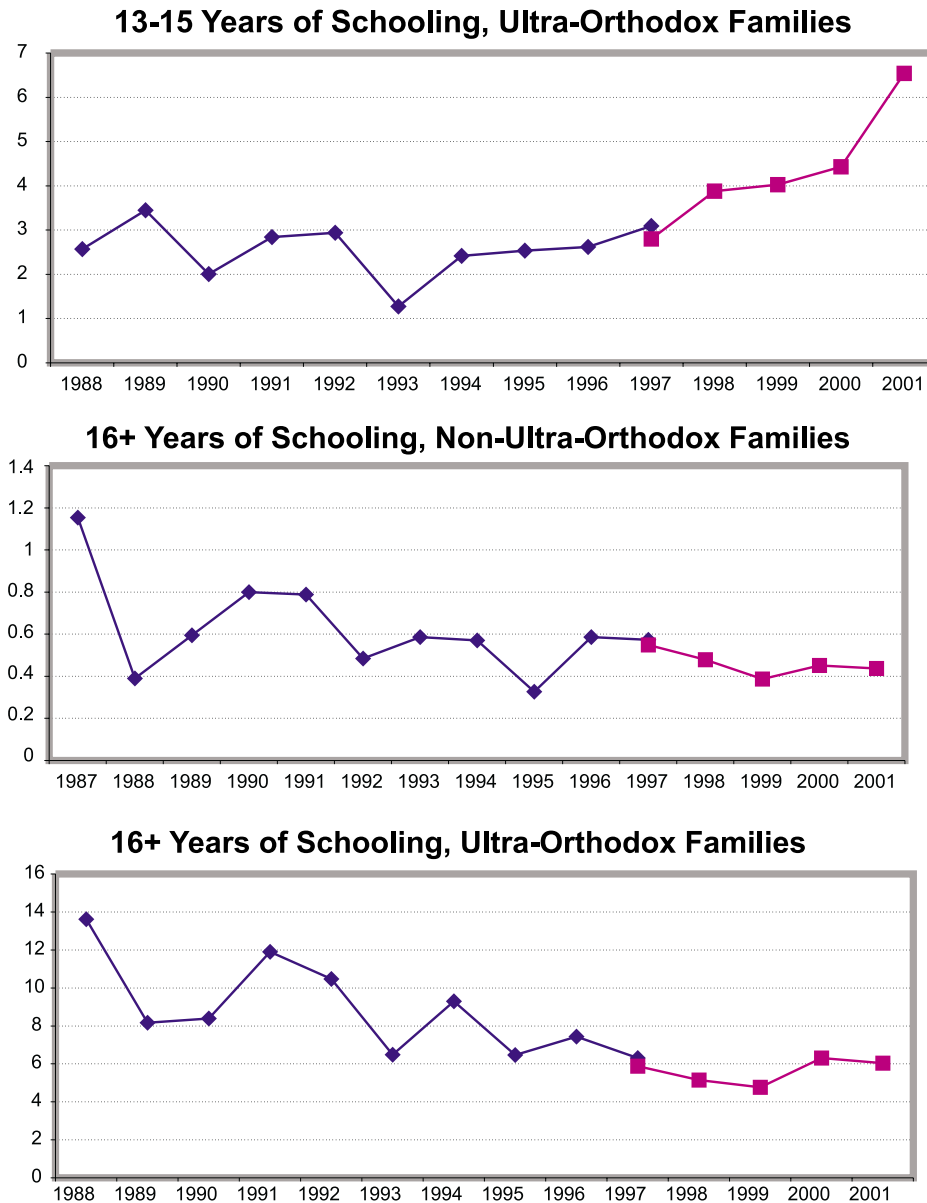
**Figure 3**  
**Probability Ratio<sup>a</sup> for Households, by Education Level, 1987-2001\***



\* The analysis for 1987-97 is based on the Income Surveys. The series is interrupted in 1997, after which it is based on the combined Income and Expenditure Surveys. The probability ratio is calculated relative to a household whose head has 16+ years of schooling.

<sup>a</sup> The probability ratio is equivalent to the odds ratio.

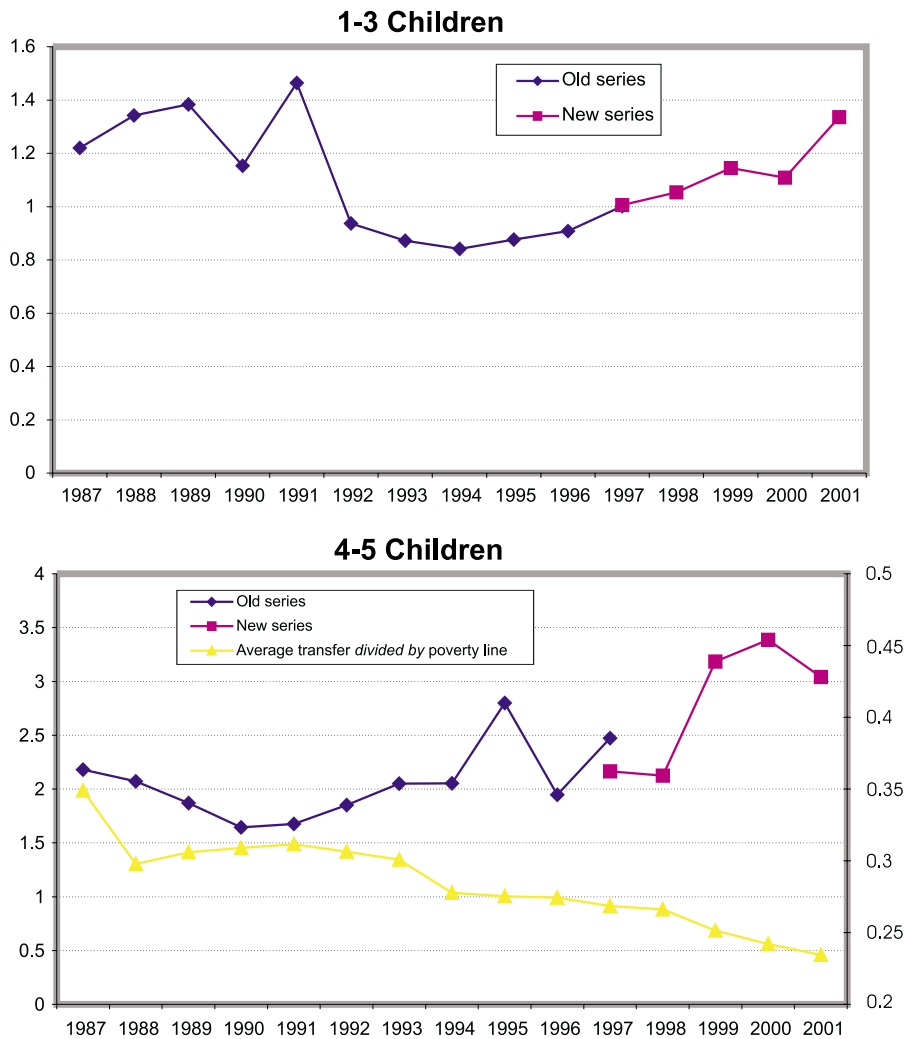
**Figure 3 (continued)**  
**Probability Ratio<sup>a</sup> for Households, by Education Level, 1987-2001\***



\* The analysis for 1987-97 is based on the Income Surveys. The series is interrupted in 1997, after which it is based on the combined Income and Expenditure Surveys. The probability ratio is calculated relative to a household whose head has 16+ years of schooling.

<sup>a</sup> The probability ratio is equivalent to the odds ratio.

**Figure 4**  
**Probability Ratio<sup>a</sup> for Families, 1987-2001\***

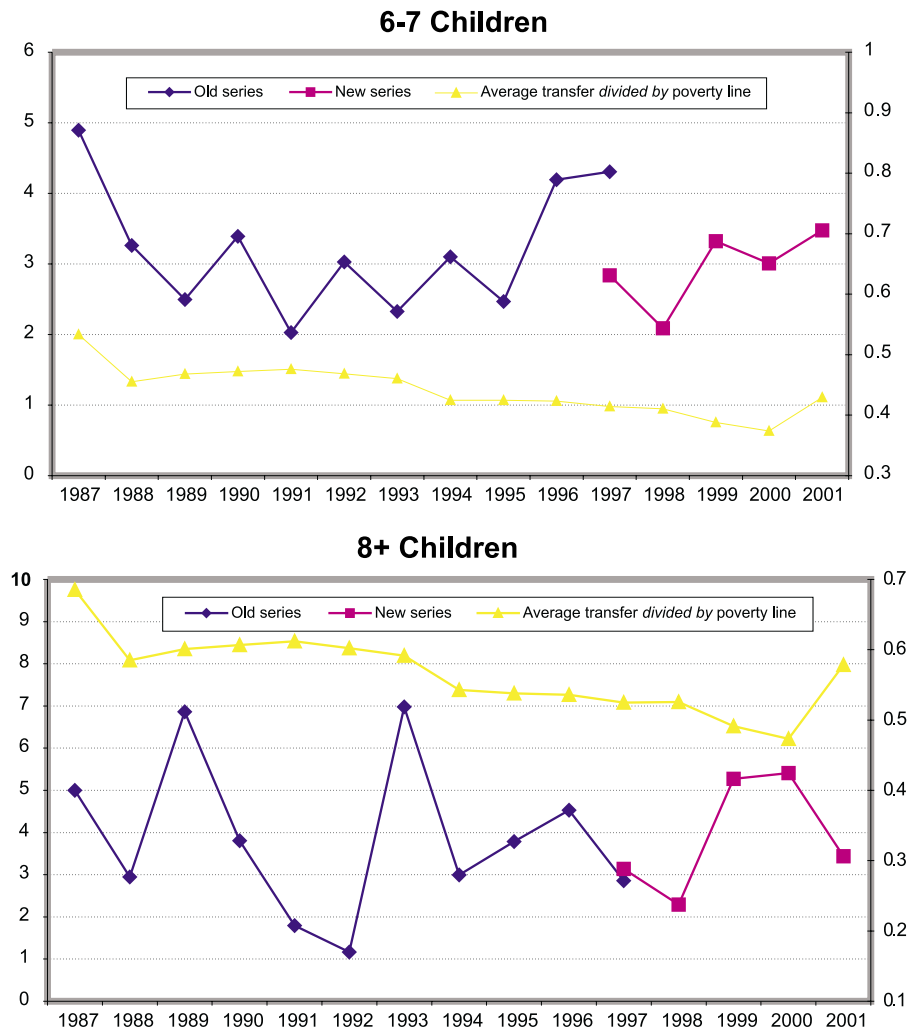


\* The analysis for 1987-97 is based on the Income Surveys. The series is interrupted in 1997, after which it is based on the combined Income and Expenditure Surveys. The probability ratio is calculated relative to a household whose head has 16+ years of schooling.

<sup>a</sup>The probability ratio is equivalent to the odds ratio.

in that year relative to the median income. The marked rise in transfers from the fifth child on at the beginning of 2001 caused the reversal of this trend for large families in 2001. A notable finding is the decline in the probability of being poor for small families (with up to 3 children) in 1988-94, and this is consistent with the increase in value and reversion to the universal

**Figure 4 (continued)**  
**Probability Ratio<sup>a</sup> for Families, 1987-2001\***



\* The analysis for 1987-97 is based on the Income Surveys. The series is interrupted in 1997, after which it is based on the combined Income and Expenditure Surveys. The probability ratio is calculated relative to a household whose head has 16+ years of schooling.

<sup>a</sup>The probability ratio is equivalent to the odds ratio.

character of child allowances for the first two children. In 1985 the allowance for the first child was made contingent on a means test, and in 1990 this was also applied to the allowance for the second child. In 1993 the universal nature of these allowances was restored. Despite the fact that making allowances contingent on a means test was not supposed to have an

adverse effect on low-income families, in effect the utilization of child allowances by these families was only partial (Gabbay and Lavon, 1996). As can be seen from the declining odds ratio of the variable of children in small families, when the universal principle was restored poor families with few children were able to benefit from these allowances. The implication of this finding is that there was a problem of implementation in using this instrument to address the problem of poverty when it was contingent on a means test.<sup>11</sup>

The odds ratio for single-parent families has been declining since 1988, and the trend has become more pronounced in the last few years, apparently reflecting easier access to income support benefit for this population. The odds ratio for the Arab population has exhibited an upward trend, suggesting greater difficulties in the labor market, possibly due to tough competition from the increasing population of foreign workers in some sectors, as well as increased discrimination.

### The minimum wage and poverty

Another policy variable which could influence the incidence of poverty is the minimum wage. The current public debate focuses on whether the level of the minimum wage provides an income that enables subsistence above the poverty line, and if raising it will serve to reduce poverty. Below we compare the income of families with a single wage earner and two wage earners earning the minimum wage with that of poverty-line income in 2001 (Table 7).

**Table 7**  
**Comparison of Poverty Line by Family Size with**  
**Income from Minimum Wage,<sup>a</sup> 2001**

Family size <sup>b</sup>	Poverty line for family	Child allowance	(NIS)	
			Income with 1 wage earner at minimum wage	Income with 2 wage earners at minimum wage
1	1,730	0	3,266.58	6,533.16
2	2,768	0	3,266.58	6,533.16
3	3,667	171	3,437.58	6,704.16
4	4,428	342	3,608.58	6,875.16
5	5,189	685	3,951.58	7,218.16
6	5,881	1,379	4,645.58	7,912.16
7	6,573	2,235	5,501.58	8,768.16
8	7,196	3,091	6,357.58	9,624.16
9	7,749	3,947	7,213.58	10,480.16

<sup>a</sup> As of 1.4.2001 the minimum wage was NIS 3,266.58.

<sup>b</sup> From 3 upwards the reference is to two parents with children under 18.

The table shows that a single wage earner earning the minimum wage provides income above the poverty line only for a family of two. For a larger family the minimum wage

<sup>11</sup> In 1985–92, when receipt of these transfers was dependent on a means test, the transfers may not have been recorded in full in the Income Survey.

supplemented by child allowances provides an income that is below the poverty line. On the other hand, a family with two wage earners earning the minimum wage supplemented by child allowances provides an income that is above the poverty line even for a large family.

If the minimum wage is paid within the framework of a collective agreement granting some wage components that are not included in the wage paid under the minimum wage law, e.g., premiums for seniority as well as additional annual bonuses and payments (these are widespread in manufacturing and the public services where they account for some 33 percent—and sometimes more—of the statutory minimum wage), coupled with the income provided by child allowances, the family income is sufficient to bring even large families with a single wage earner above the poverty line.<sup>12</sup>

## 5. CONCLUDING REMARKS

On the basis of our findings, it is possible to identify the main variables which, by causing the non-employment of the household head, are the main factors affecting the probability that a household will fall below the poverty line. The existence of more than one wage earner is almost certain to guarantee remaining above the poverty line. In general, groups with a high poverty rate are characterized by an absence or shortage of wage earners. Transfers considerably reduce the incidence of poverty in these groups. Thus, for example, old-age pensions alleviate poverty among the elderly, and income supplements minimize poverty among single-parent families; the extent to which these groups are able to remain above the poverty line is closely connected with the size of the transfers. Similarly, child allowances significantly reduce poverty in large families; since family size is ultimately endogenous (Manski and Maysher, 2000), however, it is not clear whether this policy does indeed serve to reduce poverty in the long run. Note the decline in the probability of being poor for small families with children when the means test for eligibility for allowances for the first and second child was canceled—a result that is consistent with only partial take-up of this benefit by poor families when a means test is in place.

The existence of a wage earner, as well as the number of wage earners in a household, as a central determinant of whether a family is above or below the poverty line, underlines the importance of a policy of withholding incentives for non-participation in the labor force. Thus, for example, the complete denial of benefits to someone whose income exceeds a certain minimum implies an effective income tax of 100 percent or more, and constitutes a disincentive to work. In addition, omitting to make benefits contingent on labor-force participation (for those capable of working) is also a strong disincentive to work. Our empirical analysis indicates that there is a far higher probability of not being employed (and not participating in the work force) for persons who receive large transfers. In the short run, therefore, the key to resolving the problem of poverty lies in the correct mix of transfers and incentives to work for those capable of doing so. In recent years the resort to programs that combine transfers and incentives

<sup>12</sup> This analysis does not take into account compliance with the minimum wage law and its possible effect on the reduction of employment. The relatively low rate of compliance in Israel limits the capacity of legislation to enable families to emerge from poverty, on the one hand, and reduces its influence on employment, on the other (Eckstein, 1998; Yaniv, 1986, 1994; Yaniv, Cohen, Awad and Shaul, 1997; Flug and Kasir (Kaliner), 1994).

has become widespread in many western countries, with a concomitant rise in the literature on the economic effects of such programs.<sup>13</sup>

A pivotal factor in reducing the poverty rate is education, which operates by increasing both wages and the employment rate. This relation between the level of education and poverty has intensified over time. The strong association we found between a low level of education and the probability of being below the poverty line indicates that in the long run the solution to the problem of poverty lies with the education system, which must continue to work to raise the level of education of children from low-income groups and reduce differences in levels of achievement. Improving the education system will enable children from low-income families to take their place in the labor market, thereby helping to narrow the economic gap and bring them out of the cycle of poverty.

The empirical analysis also points to the relatively high incidence of poverty among the Arab population, even when other characteristics such as education, family size, and the number of wage earners are taken into account. The implication of this finding is that there is discrimination in the labor market, and possibly also that the quality of education is inferior to that of the rest of the population. It would seem that for this group an improvement in the quality of education, and especially the elimination of discrimination in the labor market as regards access to jobs, will serve to reduce the incidence of poverty.

<sup>13</sup> Studies of the effect of programs combining transfers with incentives to work among poor and single-parent families include those by Blank, Card, and Robins (1999), Schoeni and Blank (2000), and Neumark and Wascher (2000).

## APPENDIX

### THE SOURCES OF THE DATA AND THE MAIN VARIABLES

The database used in this study consists of the Income Surveys (families and individuals) undertaken between 1987 and 2001. Every year since 1965 the Central Bureau of Statistics (CBS) has undertaken a survey of incomes. This includes information about the sources of families' income, at the center of which is their labor income, as well as data about various characteristics, e.g., number of children, area of residence, age, education, country of origin, religion, work patterns, etc. Up to and including 1997 the survey was based on a partial sample of the Labor Force Survey (one quarter of the persons participating in the Labor Force Survey were also asked about their incomes). The survey contains data about the incomes of employed and unemployed persons (there are no data for self-employed persons because of the relatively small size of this group) living in towns (Jewish, Arab, and mixed) with at least 10,000 inhabitants. Until 1994 the sample covered about 80 percent of the households in Israel (84 percent of individuals). In 1995–97 the sample grew to cover 84 percent of the households in Israel, as smaller areas of settlement (with between 2,000 and 10,000 inhabitants) were included. The share of the Arab population in the sample also rose. The size of the sample varies slightly from year to year, the average being about 5,500 families, representing 18,000 persons aged 15 or over.

The unit of study is the household, defined as a group of people living together most of the week sharing a food budget. Up to and including 1994 the oldest male wage earner was defined as the head of the household, and if there was no such male, the oldest female wage earner was defined as the head of the household. If there was no wage earner, the oldest male was considered the head (or the oldest female if there was no male). Since 1995 the head of the household is defined as someone who works at least 35 hours a week, and he takes precedence over someone who works 34 hours or less a week, who takes precedence over someone who is unemployed. If more than one person in the household fits the definition of a head, this is defined in accordance with priorities set by the person interviewed. If there is no wage earner in the household the head is defined in accordance with priorities set by the person interviewed.

Until 1984 each household reported its income in the year preceding the month in which the interview was held, so that income is presented in annual terms. Since 1985 income is reported for the three months prior to the interview, so that income is presented in monthly terms. For each year (since 1985) income is presented in accordance with the average of the Consumer Price Index (CPI) for that year.

Since 1988 the survey has included data on the last school attended, and also enables a family to be defined as ultra-orthodox if at least one of its members has attended or is attending a religious seminary (*yeshiva*) which is not also a high school.

In 1997 the CBS began to publish the combined survey, based on the Income Survey and the Survey of Family Expenditure. The combined survey is based on a larger sample (1.8 times as large as the previous one) and covers almost the entire population of Israel and most



forms of settlement, including the self-employed, those in agricultural (*moshavim*), rural and communal settlements, and the residents of East Jerusalem. The groups that are not yet included in the survey are mainly members of collective settlements (*kibbutzim*) and Beduin Arabs who have no permanent place of residence (note that some features that used to appear, such as characteristics of labor-force affiliation, do not appear in the combined survey).

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