

POOR WORKERS OR WORKING POOR?¹

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Abstract

Over the past two decades, policy designed to reduce poverty has focused on various means of promoting employment. However, along with a significant increase in employment rates, an increased incidence of poverty has also been seen. The increased incidence of poverty was particularly evident among households that include persons who work.

The current research aims to identify the reasons for the increased incidence of poverty among households that include workers (hereinafter, "in-work poverty"). In particular, the research aims to answer the question: to what extent is the increased incidence of in-work poverty a reflection of a deterioration in the (relative or absolute) position of workers, and to what extent is it a reflection of change in the composition of employment in terms of workers' earning capacity? Using a unique data panel allows us to monitor the employment status of individuals and households and their income from wages.

The findings show that the increase in in-work poverty was probably due to a combination of these two forces: Some deterioration in the status of persistent workers (those who are employed now and were continuously employed previously as well), along with the increased entry of nonworking poor into the labor market. Wages of heads of households, who worked at the beginning and end of the period, increased at a similar or faster pace than that of the poverty line, as did the aggregate household income from wages. This means that developments in the labor market *per se* did not push existing persistent workers into poverty. However, households with income around the poverty line had to extend their labor supply to compensate for the decrease in allowances. Furthermore, in half of the vulnerable households—those who managed to stay above the poverty line only due to allowances, wage income decreased over the

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period. Only a third of such households enjoyed wage-income increases that were faster than the increase of the poverty line. That is, such households saw their relative standing deteriorate, despite being continuously employed. Throughout the period, poor households increased their labor supply more than non-poor households did. In other words, a growing share of those employed were previously poor. The increase in employment was indeed reflected in a decrease in average probability of poverty, but we have no data that would allow us to say with certainty whether a decrease in the predicted probability of poverty for a specific household means that the specific household's income was indeed above the poverty line. At the end of the period, employment tenure of the working poor was lower on average than that of non-poor workers. That is, a larger share of working poor entered the labor market at a relatively late stage. However, we found that a significant share of the working poor was continuously employed for at least several years.

1. INTRODUCTION

Poverty rates in Israel are among the highest in OECD countries. In Israel, similar to other countries, household labor supply is highly (negatively) correlated with poverty. Thus, many studies and policy reports had focused on increasing labor supply as the main policy measure when trying to combat poverty and inequality.

Indeed, over the past two decades, policy in Israel and worldwide has focused on providing incentives for employment. Such incentives, along with demographic trends and global developments, have in fact resulted in significantly higher employment rates, especially in groups that were previously under-represented in the labor market. However, concurrently with this increase in employment rates, we saw a significant increase in in-work poverty. Furthermore, most poor households in fact have one or more wage earners. That is, increasing labor supply helps in reducing the risk of poverty, but it cannot guarantee an escape from poverty.

The increased incidence of in-work poverty has brought about increased research interest in these households and in the question of why work does not extricate them from poverty. This was covered extensively in the literature (see Marx and Nolan, 2012, Lohmann and Marx, 2018, for a comprehensive overview). In Israel, this phenomenon received attention from researchers and policy makers (such as Stier, 2011; Levanon-Saburov, 2018; Bank of Israel, 2010).

Discussions of the working poor generally first cite low wage as a potential cause. For example, there is a claim that globalization and technology-oriented structural changes contribute to wage polarization, and therefore to significantly lower relative wage of those with low education or skills, and consequently—to their household income dropping below the poverty line (e.g., Andress and Lohmann, 2008). However, while there is a positive

correlation between poverty and earning a low wage (typically defined as two-thirds of the median wage), most research has found that this correlation is far from being perfect (see, for example, Marx and Nolan, 2012).

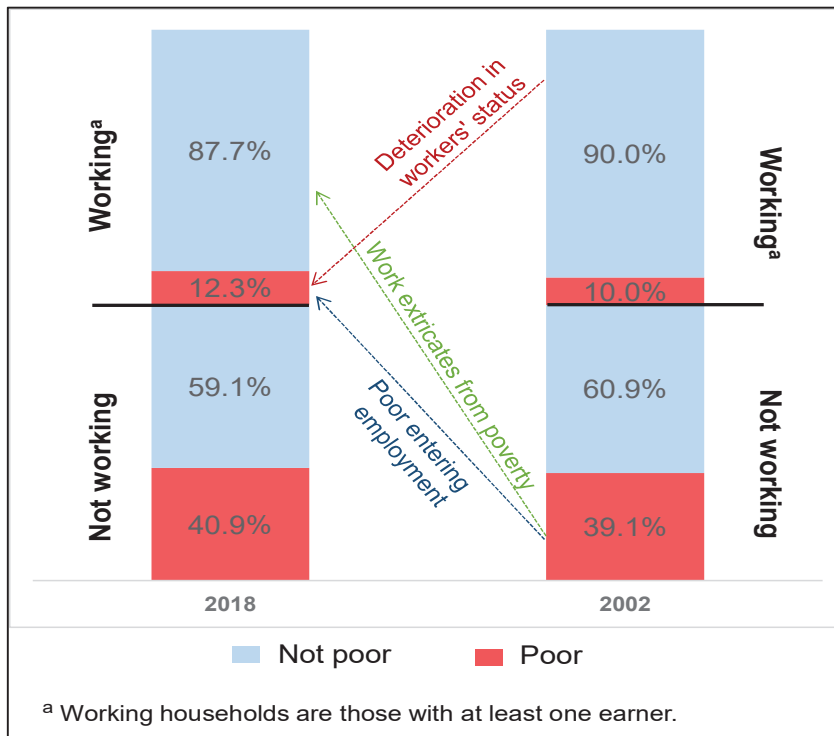
Stier (2011) and Levanon and Saburov (2018) addressed the issue of the working poor in Israel. Both of these studies used data from income surveys, which ended in 2011, and therefore limited their analysis to until that year. Both linked the working poor phenomenon to evident changes in economic policy early in the decade, to demographic changes, and to the relatively low labor supply of poor households. During the period analyzed in these two articles, the working poor phenomenon was indeed mostly applicable to large households with a single wage earner.

However, in the past decade, reference to in-work poverty has changed. In particular, although the probability of poverty in single wage earner households is still significantly higher than that of households with multiple wage earners, it was actually the incidence of poverty in two wage earner households that increased most significantly. Policy measures that encouraged households to increase their labor supply as a way to escape poverty were reflected in higher rates of participation and employment among such households. As shown below, the increase in their labor supply was, indeed, reflected in some decrease in the probability of poverty for some households, but the aggregate incidence of poverty for households with two wage earners has increased.

This study aims to analyze the reasons for the increased incidence of in-work poverty from a slightly different angle. In particular, the research aims to answer the question: to what extent is the increased incidence of in-work poverty a reflection of deterioration in the (relative or absolute) position of workers, and to what extent is it a reflection of change in the composition of employment, in terms of the earning capacity of workers? Figure 1.1 presents the key changes/flows that may increase the incidence of in-work poverty. First, the relative status of persistent, non-poor workers may deteriorate, such that they become poor (a movement represented by the red line in the figure). Three main reasons may cause such movement: first, reduced allowances decrease household net income, and may therefore result in those households dropping below the poverty line, even if the poverty line and their income from salaried work (wages) remain unchanged. Furthermore, increased labor supply, especially among workers with low earning capacity, may result in a decrease in wages at the bottom of the pay scale, for both new and continuously employed workers. Another possibility is that the rapid employment growth was reflected in a higher median income and, consequently, in a higher (relative) poverty line, such that more households with persistent workers found themselves below the poverty line, even if there was no absolute change in their income. Concurrently, employment composition may also have a significant impact on in-work poverty. To the extent that decreased allowances provided incentive to persons from poor households, with low earning capacity, to join the labor market, and to the extent that the resulting increase in wage income was insufficient to extricate them from poverty, these households will become working poor (instead of non-working poor) as represented by the blue line in the figure. Thus, the incidence of in-work poverty would increase, even if there

were no changes to the status of persistent workers. In contrast, some of the previously non-working poor were extricated from poverty by joining the labor market (as represented by the green line), and became non-poor workers. This movement partially offset the impact of the other changes that were mentioned before, and thus contributed to a reduction in the incidence of in-work poverty².

Figure 1.1
Potential Explanations for Increased Incidence of In-Work Poverty



Source: Household Expenditure Surveys, Central Bureau of Statistics.

In view of data availability, most research on in-work poverty has focused on cross-section analysis. Such analysis may provide a general indication of the effect of one factor or another, but it does not allow the separation of the composition effect from the effect of other developments. One exception is Vandecasteele and Giesselmann (2018), who analyzed the working poor phenomenon using panel data.

² There are some other flows/changes in the employment status and poverty status that may offset the increase of in-work poverty. For simplicity, they are not presented in the figure.

The current research uses a unique data panel, which allows us to monitor the wage income of individuals and households over time. This panel also allows us to monitor changes in employment status, at both individual and household levels. These data allow us to understand the composition effect better, as will be explained in details below.

Our findings indicate that the increase in the incidence of in-work poverty may be attributed to the impact of the two forces that were previously mentioned: A deterioration in the relative position of persistent workers and a change in the composition of workers. We found that in most households the income from wages of the head of the household increased by a rate similar to the rate of increase in the poverty line. However, when we focused our analysis on households that are vulnerable to poverty, i.e., households that relied on allowances to escape poverty, we found that in half of these households, the wages of the head of the household decreased, and only in a third of these households did the wage of the head of the household increase by a higher rate than the rate of increase in the poverty line. That is, it may be deduced that those vulnerable households saw a deterioration in their relative position. We found that households that were poor at the start of the period increased the scope of their employment more than non-poor households. That is to say, a growing share of those employed were previously poor. Households that used to be poor may have some (observable or non-observable) attributes that are correlated with higher risk of poverty. Thus, an increase in their share of employment (due to their increased rate of employment) may contribute to increased incidence of measured in-work poverty. Hence, this finding supports the claim that the change in employment composition may explain part of the increased incidence of in-work poverty. The increase in employment scope (of previously poor households as well as of previously non-poor households) was reflected in a decrease in their probability of poverty. However, we have no data that would allow us to say with certainty whether the lower probability of being poor reflected a large enough increase in their income to place their total income above the poverty line. In other words, our data show that increased employment rate was correlated with lower probability of being poor, but do not allow us to assess with certainty the poverty status of a specific household in every point in time. We further found that employment tenure of the working poor was lower on average than that of non-poor workers. That is, a larger share of them entered the labor market at a relatively late stage. This fact supports the claim that the change in employment composition contributed to increased in-work poverty. However, we found that a significant share of the working poor at the end of the period were not new workers, i.e., they were continuously employed for at least several years. That is, joining the labor market and working continuously for several years was not enough to guarantee incomes above the poverty line.

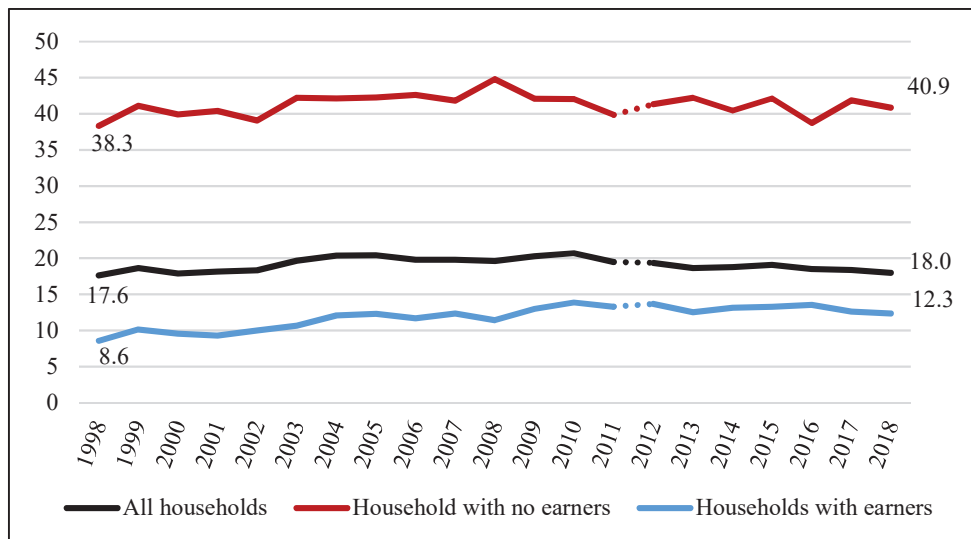
The rest of this paper is organized as follows. Section 2 gives an overview of in-work poverty and the relevant literature. Section 3 describes the data and methodology. Section 4 contains the results, and concluding comments are given in Section 5. Additional details regarding the data are given in the Appendices.

2. BACKGROUND

Two trends came to the fore in Israel over the past two decades: a significant increase in employment and an increased incidence of poverty. These two developments were largely affected by changes in government policy, along with domestic demographic trends and global developments. As with most advanced economies, welfare policy in Israel over these past two decades has focused on promoting employment. This was done by providing disincentives for not working (such as reducing wage-replacement allowances) and incentives for employment, such as active labor market policy, reduction of income tax rates, and wage subsidies in the form of the earned income tax credit (EITC, also termed negative income tax).

These long-ranging changes in public policy had a significant positive impact on employment rates, in particular among groups that were previously under-represented in the labor market (such as Arabs, ultra-Orthodox and those with low education). However, concurrent with the increased employment rates, income inequality and poverty also increased (Figure 2.1).

Figure 2.1
Incidence of Poverty among Households, 1998–2018, percent



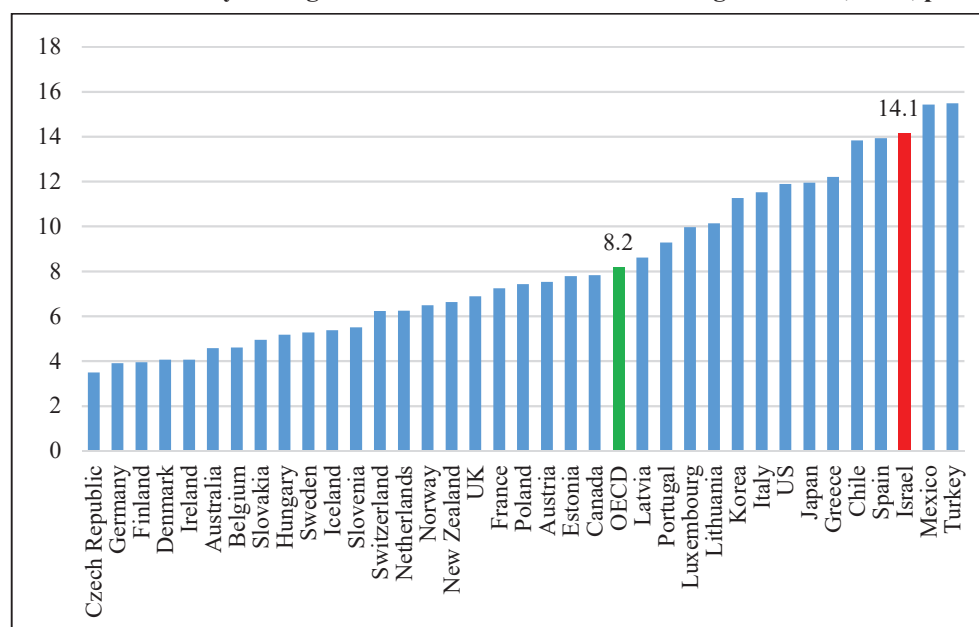
Source: Household Expenditure Surveys, Central Bureau of Statistics.

The increased incidence of poverty was most evident among working households. Between 1998 and 2018, the incidence of poverty in households with two or more wage earners increased continuously, growing by more than three-fold (from 1.6 percent to 5.3 percent). At the same time, the incidence of poverty among all households only increased by

2 percent (from 17.6 percent in 1998 to 18 percent in 2018), while the incidence of poverty in households with one wage earner increased by 60 percent (from 15.1 percent to 24 percent). These changes in the incidence of poverty and in employment rates were also reflected in a change in the employment scope of poor households. While at the start of the period, the great majority of these were households with no wage earners, and having two wage earners was almost a guarantee of being above the poverty line, two decades later (in 2018), most poor households had one or more wage earners, and 15 percent of poor households had two or more wage earners.

The incidence of in-work poverty in Israel is high not only when compared to the past, but also when compared to advanced economies: In 2017, the incidence of in-work poverty in Israel was 70 percent higher than the average incidence of in-work poverty in OECD countries (Figure 2.2).

Figure 2.2
Incidence of Poverty among Households with One or More Wage Earners¹, 2017, percent

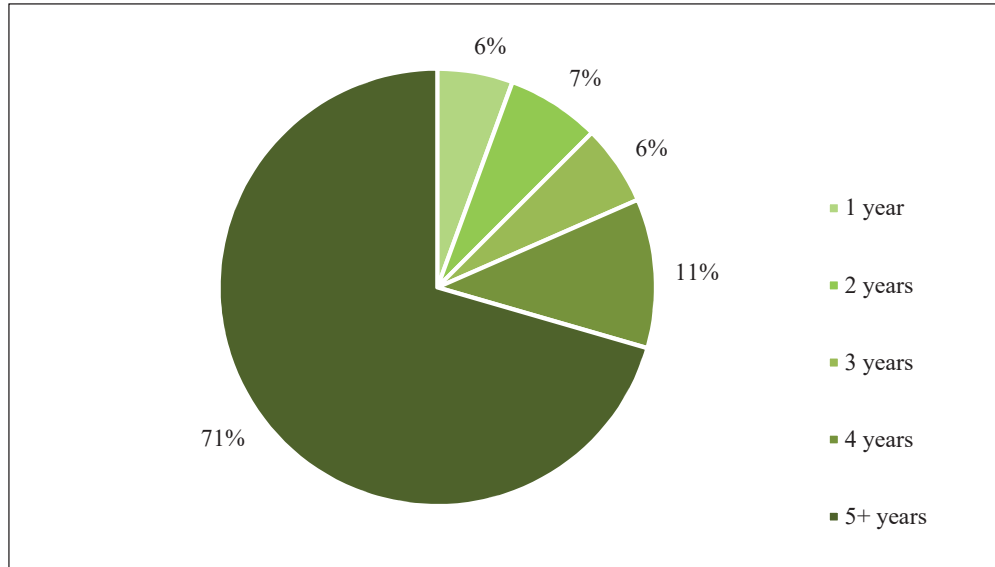


¹ Data for 2017, or latest available year. Data refer to the total population and are based on equivalized household disposable income, i.e., income after taxes and transfers adjusted for household size, according to the OECD equivalence scale. The OECD equivalence scale (which divides household income by the square root of the household size) differs from the one used in Israel, hence the data for Israel do not match some of the data presented in other charts and tables. The incidence of poverty is calculated based on a relative poverty line (50 percent of the median income).

Source: OECD Income Distribution Database (IDD).

As noted, the incidence of in-work poverty increased along with the increase in employment rates, and in particular—employment rates among groups that were under-represented in the labor market. One could hope that entering the labor market would be accompanied by gradual adjustment and improvement processes, such that after a few years, new workers would accumulate human capital and earning capacity that would suffice to extricate them from poverty. However, we found that at the end of the reviewed period, in 2016, most poor workers had employment tenure of five years or longer (Figure 2.3).

Figure 2.3
Seniority in Labor Market of the Working Poor in 2016



Source: Household Expenditure Surveys and employee-employer file

3. METHODOLOGY AND DATABASE

As noted, the research objective is to identify the key factors contributing to increased incidence of in-work poverty. Prior research focused on describing the features of the working poor and changes thereto over the years, in an attempt to study the key factors that impact the probability of households with wage earners of being poor (e.g., Stier, 2011 and Levanon and Saburov, 2018). This paper is focused on studying the impact of labor force composition on the change in incidence of in-work poverty. In particular, we aim to answer the question of whether the increased incidence of in-work poverty reflects deterioration in the status of persistent workers or, alternatively, an increase in the share of non-working poor who joined the labor market. That is, we wish to study whether (and to what extent) persistent workers became poor, or whether non-working poor became workers. Another question was

whether (and to what extent) entering the labor market and increased labor supply by the poor helped extricate them from poverty (see Figure 1.1).

The research questions are examined in three ways: First, we test whether and to what extent persistent workers become poorer. We then test the impact of higher employment rates among the poor on the incidence of in-work poverty. Finally, we check to what extent changes in employment patterns of the poor affected their probability of extrication from poverty. Answering each of these questions requires monitoring the employment status and probability of poverty for households and individuals, hence this analysis is based on a data panel.

a. Database

In order to carry out this research, we commissioned a file from the Central Bureau of Statistics, including a panel of a representative sample of the Israeli population in 2000–16.³ The sample includes all those sampled in Household Expenditure Surveys in each year. Survey data were matched with administrative data from employer reports to the tax authority (employee-employer file). The final research file includes various variables for income, expenses and demographic variables from the Household Expenditure Surveys (in the year in which the individual was sampled) and data for income and employment in each of the years, based on administrative data. We add variables of demographic attributes (such as number of children, marital status and place of residence) for each of the years from administrative files of the population registry.

Household Expenditure Surveys include detailed demographic data (gender, age, nationality, ethnicity, marital status, number of children, education, place of residence and so forth), data on employment attributes (including sector, occupation, work hours, total wage income, and income from being self-employed) and data about other income and expenses (income from allowances, pension or capital, multi-level details of household expenses, tax payments and so forth). The sample of those surveyed in each year is representative of the general population. Employee-employer files include detailed data by job, for salaried employees only (wage, work months and various details of the employer). Thus, when an individual works multiple jobs with different employers (concurrently or sequentially, within the same year) there may be multiple observations for such employee—one for each

³ Household Expenditure Surveys similar to their current format are available beginning from 1997. However, prior to 2000 individuals surveyed in these expenditure surveys were not asked for their ID number, and therefore data from those years cannot be matched with administrative data or data from other sources. In 2000 and thereafter, as well, there are numerous observations in the expenditure surveys, which do not contain a valid ID to allow them to be matched with administrative (employee-employer) files. We excluded these observations from our sample (see Table 3.1 below and Appendices A and B). Due to a relatively high number of excluded observations in 2000 and 2001, most of our analysis refers to the period starting from 2002.

employer. Note that the employee-employer file does not contain data about work hours, occupation or demographic attributes of the employee. Moreover, it does not contain details about self-employed work.

Merging the data from the expenditure surveys with data from the employee-employer file results in 17 distinct panels. Each panel includes the sample of those surveyed in the expenditure survey for a particular year, as well as monitoring of the development of their wages and household income from wages across all 17 years—before and after the year in which they were sampled for the survey. After merging the data, we tested how representative the sample in the matched file was, and compared the range of resulting variables in the matched file to those variables in the source files (expenditure surveys and employee-employer files). For a description of the data merger and improvement process, see Appendices A and B.

To eliminate to the extent possible volatility in income and in employment patterns around the age of entering the labor market and the age of retiring from work, most of our analysis focused on households whose head was aged 25–44 in 2000, the first year in our sample. Individuals in these households account for one-fifth of the individuals in the original sample, without the age limitation. Table 3.1 describes the general composition of the limited sample: The sample consists of 68,000 observations of individuals, including 49,000 observations of individuals with positive wage income, between 1,900–4,100 such observations in each survey year. The expenditure surveys also include data on income from self-employed work: Approximately 7–13 percent of all those employed in the survey reported such income. The employee-employer file contains no data about income from self-employed work. Thus, any information about self-employed work only exists for the year in which the household was sampled in the expenditure survey, while all other years only include information about income exclusively from salaried work. Therefore, our analysis of the evolution of income over time is focused only on the evolution of wages. For a description of the database in the overall sample, without the age limitation, see Appendix A.

Table 3.1
Database structure—subsample panel^a

Survey year	Total observations (1)	Observations deleted due to invalid ID number, duplicate recording, or missing alignment with the employee-employer file (2)	Total surveyed people in the file sample (1)-(2)=(3)	Surveyed people who worked in the survey year		
				By Household Expenditure Survey wage-earners + self-employed	By employee-employer file (only wage-earners)	The difference between the number of employed people in the employee-employer file and the Household Expenditure Survey
2000	5,372	2,792	2,580	2,048	1,904	8%
2001	5,010	1,686	3,324	2,619	2,390	10%
2002	5,388	1,711	3,677	2,919	2,668	9%
2003	5,222	1,812	3,410	2,652	2,369	12%
2004	5,116	1,798	3,318	2,558	2,288	12%
2005	5,143	1,755	3,388	2,651	2,370	12%
2006	5,045	980	4,065	3,172	2,822	12%
2007	4,962	1,014	3,948	3,162	2,821	12%
2008	4,614	887	3,727	3,033	2,701	12%
2009	4,910	993	3,917	3,203	2,830	13%
2010	4,683	878	3,805	3,081	2,731	13%
2011	4,498	840	3,658	3,014	2,637	14%
2012	6,472	1,279	5,193	4,232	3,719	14%
2013	6,933	1,318	5,615	4,585	4,075	13%
2014	6,043	1,169	4,874	3,956	3,491	13%
2015	6,271	1,346	4,925	4,052	3,614	12%
2016	6,297	1,287	5,010	4,091	3,615	13%
Total	91,979	23,545	68,434	55,028	49,045	12%

^a The subsample population includes individuals from households in which the head of the household is 25–44 years old in 2000. For a description of the full data file, see Appendix A.

b. Key definitions

We use the formal definition of relative poverty in Israel: A poor household is a household with equivalized disposable income below the relative poverty line (50 percent of the median disposable income). The working poor are members of poor households with at least one wage earner⁴. Equivalized income is calculated using the Israeli equivalence scale, unless otherwise indicated.

⁴ For a review of the various definitions of in-work poverty, see Pena-Casas and Latta (2004).

Disposable income includes household income from all sources, including transfer payments, salaried work, self-employment and other income, net of taxes. As described below, the database includes the household disposable income only for the year in which the individual was sampled in the expenditure survey. For all other years, we have no data about transfer payments, income from self-employment and other income. As noted, in the absence of these data, we are unable to calculate the disposable income, and therefore we are unable to identify the poverty status of the individual or household—hence, we focus on analysis of wage income.

We would like to distinguish between new entrants to the labor market and workers who worked continuously over a significant period—we use the term “persistent workers”. The exact operative definition (how many years a worker would have to be continuously employed to be classified as a persistent worker) varies.

c. Methodology

As noted, the research questions were examined in three ways: First, we test whether persistent workers became “poorer”. The best way to answer this question would be to monitor employees’ poverty status, and how it changed over the years. However, because we are unable to identify with certainty the poverty status of employees in every year (but rather, only in the year in which they were sampled in the Household Expenditure Survey), we use instead their predicted probability to be poor.

To estimate the predicted probability of a given individual or household to be poor, in years when they were not sampled in the expenditure survey, we estimated a regression of the probability of poverty—a Probit regression with the dependent variable being the poverty status, a dummy variable equal to 1 if the individual is poor. We ran this regression for each year on the people in the expenditure survey sample that year (which is a representative sample of the population for that year). Next, we calculated the predicted probability of poverty based on the regression coefficients, for all individuals not sampled in the expenditure survey in that year. In order to do so, the independent variables in the regression are taken from the employee-employer file, which are available for all individuals in each of the years. This means that we only use data in the expenditure survey to identify the poverty status, and we use the administrative data as independent variables for the probability to be poor. Estimation results of the regression of probability of poverty are listed in Appendix C.

Another way to test the change in status of persistent workers, and whether their probability of poverty has increased, is to test whether the rate of increase in their wage surpassed the rate of increase of the poverty line. This, of course, is a partial test, since household income—which determines whether the household is considered poor—includes other income components, the evolution of which we are unable to monitor at the level of the individual or of the household. However, comparing the evolution of wage to evolution of the poverty line may provide an indication of the relative position of workers, and may answer the question of whether developments in the labor market *per se* increased or

decreased the probability of workers being poor. We compared the evolution of wages to the evolution of the poverty line for employees by their proximity to the poverty line in the base year, as the comparison result would be more meaningful for employees whose household income was close to the poverty line.

Next, we tested to what extent the increased incidence of in-work poverty reflects the change in composition. That is, what part of this increase may be explained by the relatively rapid entry of poor persons into the labor market, rather than by deterioration in the status of current workers. First, we show that households that were poor indeed increased their labor supply more than households that were not poor. Thus, the claim that those in employment increasingly include new workers who were previously poor is substantiated. If entering the labor market did not sufficiently reduce their probability of being poor and did not extricate them from poverty, merely including them among workers would contribute to increased incidence of in-work poverty, even if the status of persistent workers did not deteriorate.

Another way of learning the impact of change in employment composition is to see who the working poor are, and when they started working. How many of the working poor are persistent workers (who have remained employed continuously), and how many of them entered the labor market in recent years? The data currently at our disposal does not allow us to identify whether those late entrants to the labor market were poor upon entering the labor market, but we found their predicted risk of being poor was higher. This finding is in line with the finding whereby more poor persons have entered the labor market. Based on conclusions from previous research and from the current one, we may assume that the sharp cuts of transfer payments early in the previous decade increased the incentive for employment among those who relied on such payments. That is, the cuts had greater impact on the poor's labor supply, so even if we are unable to say with certainty that those entering the labor market in the years following this reform were poor upon entering the labor market, we may assume that a relatively higher share of new workers were poor. Under this assumption, we may conclude that at least part of the increased incidence of in-work poverty is due to non-working poor entering the labor market (and become working poor), rather than to deterioration in the status of persistent workers (poor workers).

In the final stage of our analysis, we tested the extent to which increased labor supply of non-working poor did indeed extricate them from poverty. That is, did those poor households that increased the scope of their work actually extricate themselves from poverty (or, more accurately—to what extent did their predicted probability of poverty decrease?) To this end, we compared the change in predicted probability of poverty across several groups. First, we divided the sample for each survey year⁵ into poor and non-poor. We then subdivided each group (poor and non-poor) into three subgroups: Households with increased employment scope, households with unchanged employment scope, and households with decreased

⁵ As noted, the sample for each survey year includes those individuals aged 25–44 in 2000 who were sampled in the expenditure survey in the base year. We monitor the income and likelihood of poverty for those individuals across all years, based on the administrative data.

employment scope. For each group, we tested what happened to the predicted probability of poverty, which we calculated previously.

In summary, we try to evaluate three complementary explanations for the increased incidence of in-work poverty. To what extent did the probability of poverty increase for persistent workers? To what extent did the poor entering the labor market affect the average incidence of in-work poverty? Finally, to what extent did increasing the employment scope of the working poor affect their probability of poverty?

4. RESULTS

a. Descriptive statistics

Table 4.1 presents key characteristics of individuals aged 25–64 who were sampled in the 2016 expenditure survey. We can see that the young and the middle-aged are over-represented among the working poor—compared to their share in the general population, to their share in employment and to their share of the poor. Also over-represented are larger

Table 4.1
Demographic attributes of the working poor in 2016

Individuals aged 25–64

	Total population	Workers	Working poor	Poor
Age group				
25-35	29	31	40	35
35-44	28	29	37	33
45-54	22	22	16	16
55-60	13	12	5	10
60+	8	6	2	7
Marital status				
Single	19	19	12	14
Single parent	6	6	10	8
Married, no children	23	21	4	9
Married with 1-3 children	42	45	41	38
Married with 4+ children	10	9	34	32
Education (years of schooling)				
0-10	10	7	22	26
11-12	30	28	33	35
13-15	24	26	22	17
16+	35	38	21	19
Share of low wage earners (%)	19	25	63	29
Share of Arabs (%)	18	14	46	49
Share of ultra-Orthodox (%)	5	4	18	18

households and, therefore, ultra-Orthodox and Arab households. We should note that although the share of low wage earners⁶ out of the working poor is significantly higher than their share of the general population and their share of employment, not all of the working poor are low wage earners.

b. Poor workers? Are those working continuously at increased risk of poverty?

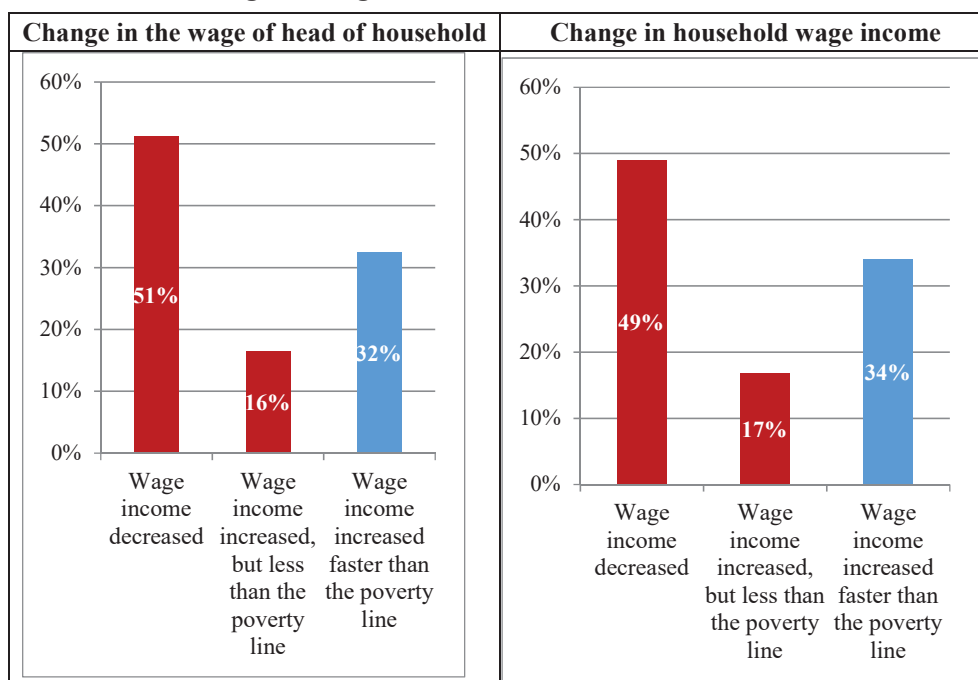
As noted, the best way to test whether expansion in the ranks of the working poor reflects deterioration in the status of persistent workers would be to test directly what happened to the poverty status of those employees. However, since we are unable to identify the poverty status of employees in years when they were not sampled for the expenditure surveys, we tried to answer this question by indirect means. First, we tested whether the rate of change in wages of the head of the household was sufficient to surpass the rate of increase of the poverty line. We found, indeed, that the average increase in wages of heads of households was higher than the increase in the poverty line, hence apparently the standing of those households did not deteriorate, and the increase in their wages should have sufficed to keep them above the poverty line.

However, when focusing on those households that are relatively vulnerable, those whose wages at the start of the period did not suffice to place them above the poverty line, and thus they relied on allowances, we see that for more than 50 percent of those households, the wages of the head of household decreased in real terms (Figure 4.2.1). In only about one-third of households, the wages of the head of household increased more than the increase in the poverty line. This means that for two-thirds of those households that relied on allowances at the start of the period, an increase in allowances or in other income was required in order to keep them above the poverty line.

We see a similar picture when looking at the change in total income from wages in those households (that relied on allowances at the start of the period). There are slightly more households whose income from wages increased at a faster pace than the increase in the poverty line, but still in some two-thirds of those households, the pace of wage increase failed to surpass the pace of increase in the poverty line—i.e., without increase in their other income (including allowances), their probability of poverty increased.

⁶ Low wage earners are those earning less than two-thirds of the median wage.

Figure 4.2.1

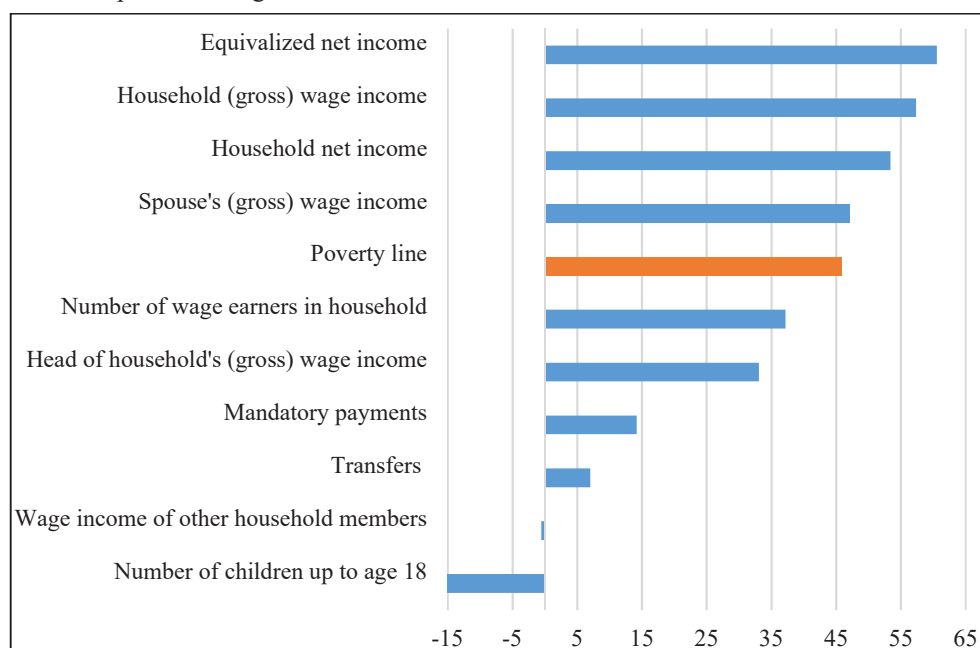
Distribution of Changes in Wage Incomes of Vulnerable^a Households

^a Vulnerable households are households that were not poor in 2002, but excluding allowances, their equivalized disposable income would have been below the poverty line.

* From 2002 to 2016, the poverty line increased by 45.8 percent in real terms.

How can we explain the notable increase in the poverty line? In order to answer this question, we looked at the evolution of income components of households around the median (Figure 4.2.2). Total household income from wages increased at the fastest pace out of all income components, due to the increase in number of wage earners and the rapid increase in income from wages of secondary wage earners. The support for increased household income came from the relatively slow increase in mandatory payments, which in fact reflects a decrease in the effective tax rate on income from wages. The average number of children decreased, hence equivalized net income increased at a faster pace than the net household income. We can see that the poverty line increased less than the net equivalized income around the median, because the rate of income increase on either side of the median was more rapid than for the median itself.

Figure 4.2.2
Evolution of Income Components of Households whose Income is around the Median^a
 2002–16, percent change



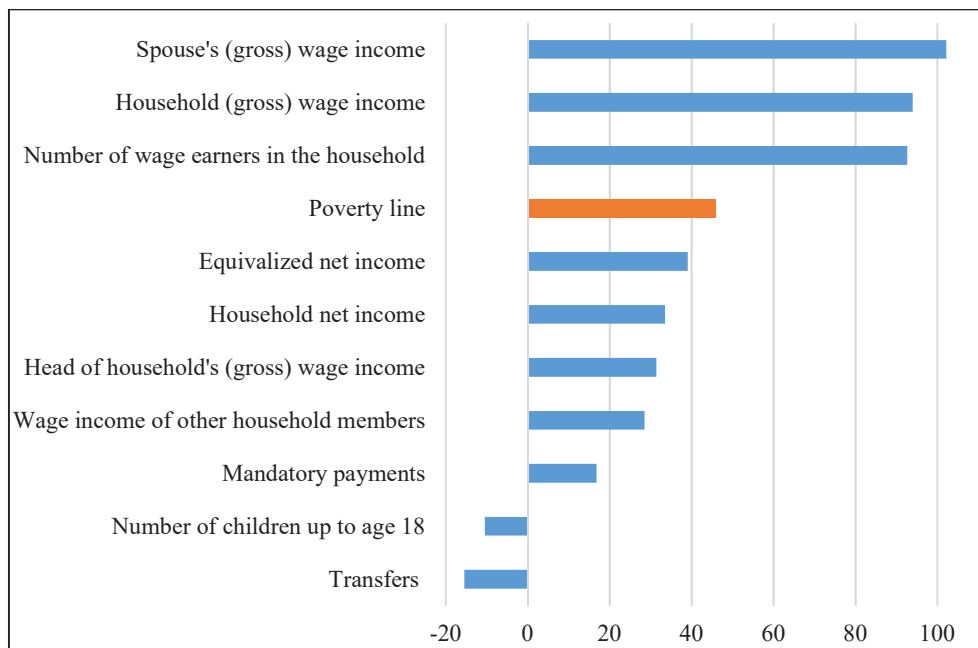
¹ This figure shows the rate of change in variables that affect the median of household equivalized disposable income. For each variable, we calculated the average among households around the median, i.e., households whose equivalized disposable income places them in the middle quintile (percentiles 41–60).

Figure 4.2.3 presents the evolution of income components of poor households over the entire period, highlighting some prominent developments: The bottom line is that equivalized net household income, the income used to determine the poverty status, increased less than the poverty line, i.e., the average poverty gap increased slightly. Income from wages for the head of household also increased at a slower pace compared to the poverty line.⁷ Conversely, we see a very rapid increase in household income from wages, mostly reflecting the rapid increase in number of wage earners per household and in income from wages of secondary wage earners. Mandatory payments of poor households decreased at the start of the period and then resumed their increase, such that their impact on the overall increase in income, from start to end of the period, was neutral.

⁷ The calculation below is based on comparing averages for cross-section data, rather than on monitoring of specific households and individuals, and is therefore not perfectly matched with numbers in Figure 4.2.1.

In summary, it would appear that we may credit most of the increase in household income to increase in their scope of employment—both in number of wage earners and in hours worked by secondary wage earners. The wages of heads of households increased at a slower pace than did the poverty line, i.e., households that relied on wages of a single wage earner probably saw their relative position deteriorate.

Figure 4.2.3
Change in income components of all poor households^a
 2002–16, percent change



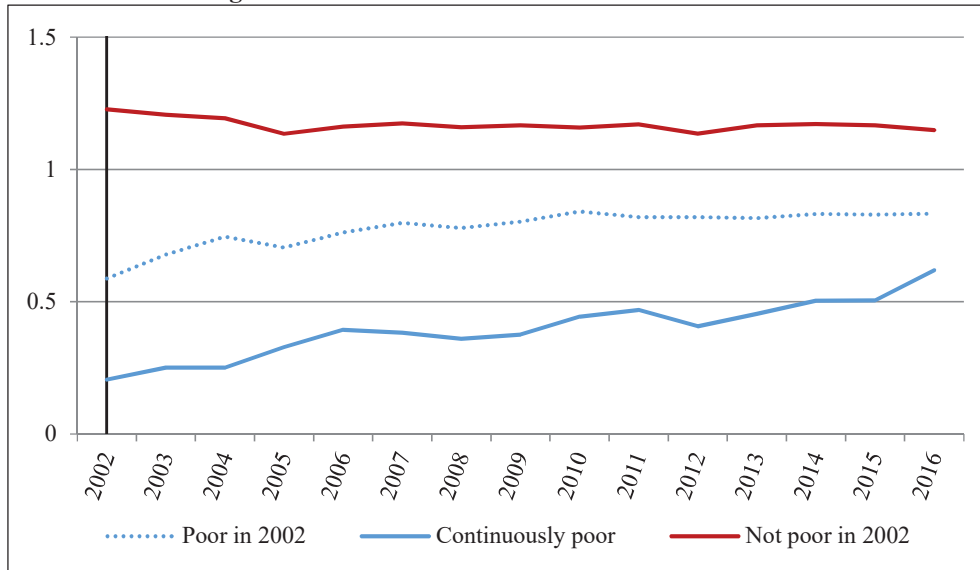
¹ Households sampled in the Household Expenditure Survey in each year of the comparison years (2002 or 2016) and ranked below the poverty threshold for this year. This means that the data represent a change in the average income of poor households, based on cross-section data, rather than a change in the income of a specific group of households, based on panel data.

c. Working poor? How did the change in employment patterns of poor households affect the incidence of in-work poverty?

Increased employment scope in poor households, by additional wage earners entering the labor market, may be reflected in increased incidence of poverty among all workers even if there was no change in the status of persistent workers. If entering the labor market does not increase household income beyond the poverty line (i.e., does not extricate the poor household from poverty), then the number of poor workers would increase and, consequently,

so would the incidence of poverty. In order to accurately and directly estimate the impact of changes in employment patterns among the poor on the incidence of in-work poverty, we would need to concurrently identify the change in work status and the change in poverty status of the household. This way we could separate the change in incidence of in-work poverty into the component due to poor persons entering the labor market without extricating themselves from poverty, and the component due to change in poverty status of persistent workers. Unfortunately, at this stage we are unable to accurately identify the change in poverty status of households and individuals, as we are only able to identify the poverty status at one point in time—the year when the individual or household were sampled for the expenditure survey.

Therefore, we apply an indirect method to obtain an indication of the impact of change in employment patterns on the incidence of poverty. First, we describe the change in employment patterns of the poor, compared to non-poor households. Figure 4.3.1 shows the change in employment patterns of poor households, compared to non-poor households. We can clearly see that poor households in 2002 increased their labor supply, whereas non-poor households saw their employment scope decrease slightly or remain essentially unchanged. We obtained similar findings when other years were selected as the base year, hence we are of the view that the share of employment of workers from poor households increased over this period. It is reasonable to assume that poor households at a certain point in time have attributes, some of which are non-observable, that increase their probability of poverty later on. If this assumption holds true, then the increase in their share of total employment would increase the average incidence of in-work poverty. We repeated the test for a smaller group of workers who were continuously poor—workers who were poor in each of the two years preceding the base year (the year when they were sampled in the expenditure survey). In order to determine the poverty status in those years, we used the predicted probability of poverty, as calculated based on data from the employee-employer file. We define a household as poor if its probability of poverty is higher than the average probability of poverty among the poor households sampled. In this case, the findings are even more pronounced: This group of continuously poor households was the group that most significantly increased its labor supply.

Figure 4.3.1**The Number of Wage Earners in Households: Poor vs. Non-Poor^a**

¹ The findings refer to the households sample surveyed in the 2002 Household Expenditure Survey, where the head of household was aged 25–44 in 2000. The poverty status is determined based on data from the Household Expenditure Survey. Continuously poor households are those whose predicted probability to be poor is higher than the average probability of the poor household in 2000 and in 2001 (i.e., we identify the poor households in each of the years 2000 and 2001. We calculate the predicted probability to be poor for each poor household. The average for each year is the benchmark). The number of wage earners is calculated based on data from the employee-employer file. Similar analyses for other basis years (other than 2002) yield similar results.

Another indication of the impact of employment composition on the incidence of in-work poverty may be obtained by reviewing the attributes of the working poor near the end of the period. Are the working poor mostly persistent workers, whose income declined to below the poverty line, or are they poor persons who joined the labor market without improving their poverty status? As noted, we cannot answer these questions directly; however, by testing the year of entry into the labor market, together with the percentage of poor among new entrants into the labor market in each year, we can obtain further indication of the impact of composition. Tables 4.3.1 and 4.3.2 and Figure 4.3.2 shed some light on this question.

Table 4.3.1
Employment continuity, 2000–16 (percent)

	Entire population	Non-poor	Poor
Persistent workers who started being employed in 2000 or previously	53	58	20
Persistent workers who started being employed after 2000	11	11	12
Did not work continuously	26	24	41
Did not work at all	9	7	27
Total	100	100	100

Based on sample of Household Expenditure Survey, 2016. The poverty status is determined in this year.

Persistent workers are those who have worked continuously since the year they entered the labor market. The year of entering the labor market is defined as the latest year after which the individual is continuously employed, with no break longer than one year between employment periods.

Table 4.3.1 shows the employment continuity of individuals in the 2016 Household Expenditure Survey sample, along with their poverty status for that year. For each individual, we define their year of entry into the labor market as the latest year after which they were continuously employed, with breaks in employment of up to one year. Most of those sampled in 2016 entered the labor market in 2000 or earlier, and worked continuously through 2016. This finding is not a surprising one, given that the age range was limited to those aged 25–44 in 2000. As expected, among the poor, the share of workers who worked continuously since 2000, or who worked continuously before 2016, is significantly lower than that share among the general population and among non-poor workers. About one-third of poor individuals (heads of household or spouses thereof) had not worked at all since 2000. A further 40 percent worked but not continuously. In contrast, among the non-poor only 7 percent did not work at all throughout the period, and 25 percent worked but not continuously. As expected, we can deduce that employment continuity is highly negatively correlated with the poverty status.

Table 4.3.2 focuses on persistent workers, who were employed continuously through 2016. Most of the persistent workers—both poor and non-poor—started working prior to 2000. However, among poor workers, we see a higher share of persistent workers who started working continuously later.

Table 4.3.2
Year when persistent workers¹ started working

	Total	Non-poor in 2016	Poor in 2016
Persistent workers, who have worked continuously since entering the labor market:			
Worked continuously since 2000, percent	83	84	62
Started working after 2000, percent	17	16	38
Total, percent	100	100	100
Workers who started working after 2000, by year they started working:			
2001–02	7	6	12
2003–04	3	3	4
2005–06	2	2	6
2007–08	2	1	6
2009–10	1	1	2
2011–12	1	1	2
2013–14	1	1	3
2015–16	1	1	2
Total, percent	17	16	38

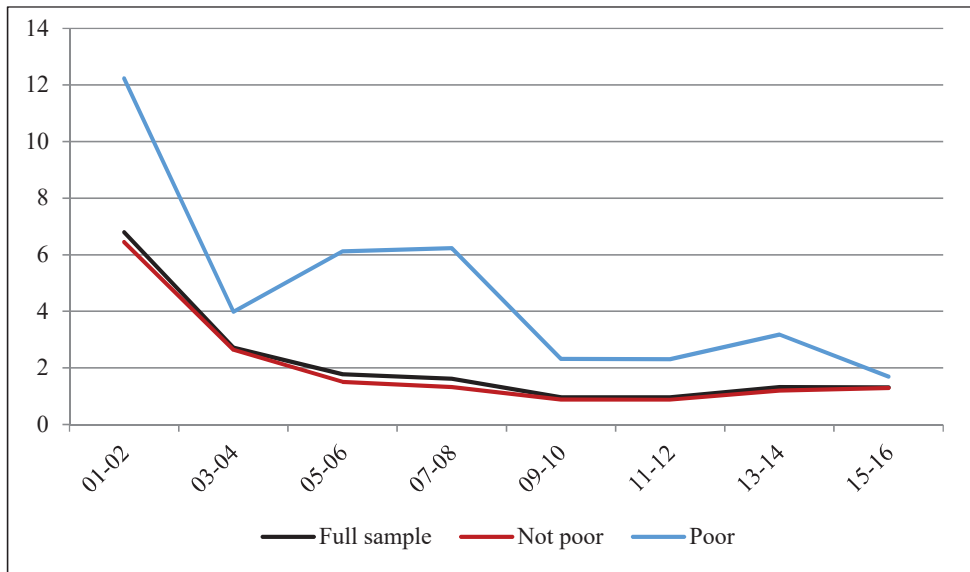
Based on a sample of the Household Expenditure Survey, 2016.

Data in percent out of all persistent workers.

¹ The year of entering the labor market is defined as the latest year after which the individual is continuously employed, with no break longer than one year between employment periods.

Figure 4.3.2 shows a graphical representation of the findings in Table 4.3.2 and highlights the difference between the poor and the non-poor. The share of poor people (in 2016) who entered the labor market in the early 2000s following the reduction in transfer payments is significantly higher than the share of non-poor persons who entered the labor market in the same years. Similar analysis for other years (for expenditure survey samples in years other than 2016) yields similar findings. Despite slightly different trends in each sample, it is clear that the share of poor persons who entered the labor market in later years is significantly higher than the share of non-poor persons.

Figure 4.3.2
Year of Entry into Labor Market, by Poverty Status in 2016



¹ The year of entering the job market is defined based on the administrative data panel, as the most recent year after which they were continuously employed, with breaks in employment of up to one year. The share of individuals who started working in 2000 or earlier is very high, hence the year 2000 is not shown in this chart. Similar analysis for other years yields similar findings.

Analysis of attributes of late entrants (Table 4.3.3) indicates that most of the poor who entered the labor market later than 2000 were male, had non-academic education, were part of disadvantaged populations—Arabs and ultra-Orthodox (some 60 percent of new workers) and were aged over 35. Entry into the labor market was gradual, with a few months of work in the first year and in part-time jobs. Of those who were poor in 2016, the number of work months of new workers who worked continuously grew by 70 percent over the period, and their real wages grew by 63 percent. Despite this growth in work months and real wages, the gaps between those who were poor and non-poor in 2016 did not decrease—but rather even increased. The average predicted probability of poverty among those workers was higher than 50 percent, significantly higher than the predicted probability of poverty among new workers who were not poor at the end of the period. That is, these findings indicate that at least some of the poor who entered the labor market during the period remained poor, and therefore their entry contributed to higher incidence of poverty among all workers on average.

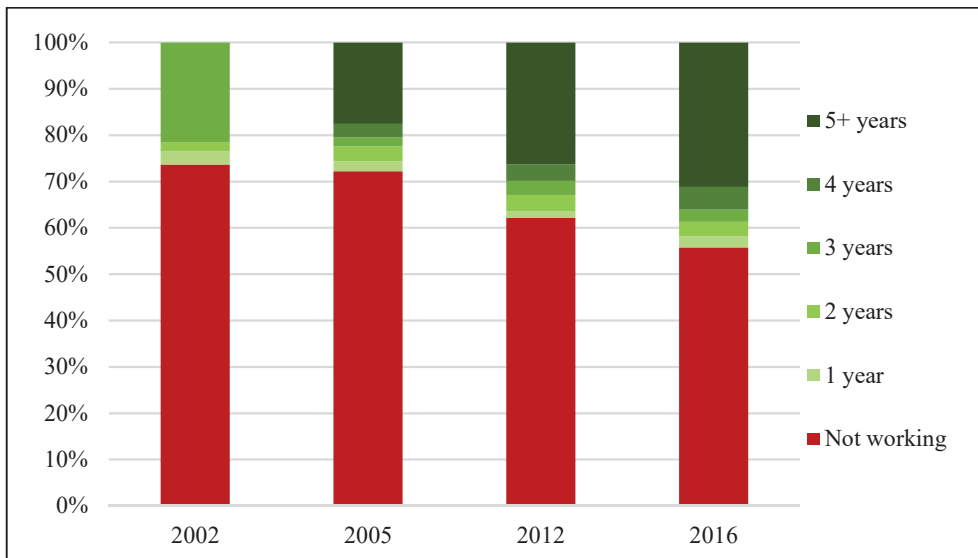
Table 4.3.3

Demographic attributes of persistent workers who entered the labor market after 2000

Properties	Non-poor in 2016	Poor in 2016
Demographic attributes (percent of sample population):		
Men	43	61
Age when entering the labor market:		
25–34	28	47
35–44	46	35
45–54	21	17
55–60	5	1
Married in the year when entered the labor market	81	82
Number of children aged 18 or under in the year when entered the labor market	1.9	3.4
Arab	12	37
Ultra-Orthodox	6	22
Academic education	34	10
Non-academic education	66	90
Monthly wages (NIS, in 2016 prices):		
In 2016	11,242	5,556
In the year when entered the labor market	5,905	3,396
Number of months worked in 2016	11	10
Number of months worked in the year when entered the labor market	7	6
Average predicted probability of poverty in the year when entered the labor market	19	53
Number of observations	463	87

Our analysis to this point indicates that the change in employment composition, with increased entry of persons from disadvantaged populations into the labor market, had a significant contribution to increased incidence of in-work poverty. However, the largest changes in policy, and in particular the cuts in allowances, took place some two decades ago. One might have expected gradual improvement in the status of new entrants into the labor market, so that even if working does not immediately extricate them from poverty, they would be extricated from poverty as they continue to work and to improve their human capital. However, analysis of seniority of poor workers (Figure 4.3.3) shows that a growing share of the poor work, and a significant share of those have accumulated significant seniority and employment continuity. For example, in 2016, nearly one-half of the poor worked, and one third of those had employment tenure of four years or longer. These troubling findings lead us to the final research question: Does working extricate you from poverty?

Figure 4.3.3
Seniority in Labor Market of the Poor, Selected Years



Poverty status is determined based on data from the Household Expenditure Survey in that year, at the household level. Monitoring of seniority is based on data from the employee-employer file, at the employee/individual level. Unlike previous analyses, which referred to the composition of employment attributes of households, the analysis in this chart refers to the composition of employment attributes of individuals. In many cases, a poor individual who does not work is part of a household with at least one wage earner, i.e., the percentage of poor individuals who do not work is significantly higher than the percentage of households with no wage earners.

d. Does working extricate you from poverty? Change in probability of poverty vs. change in number of wage earners.

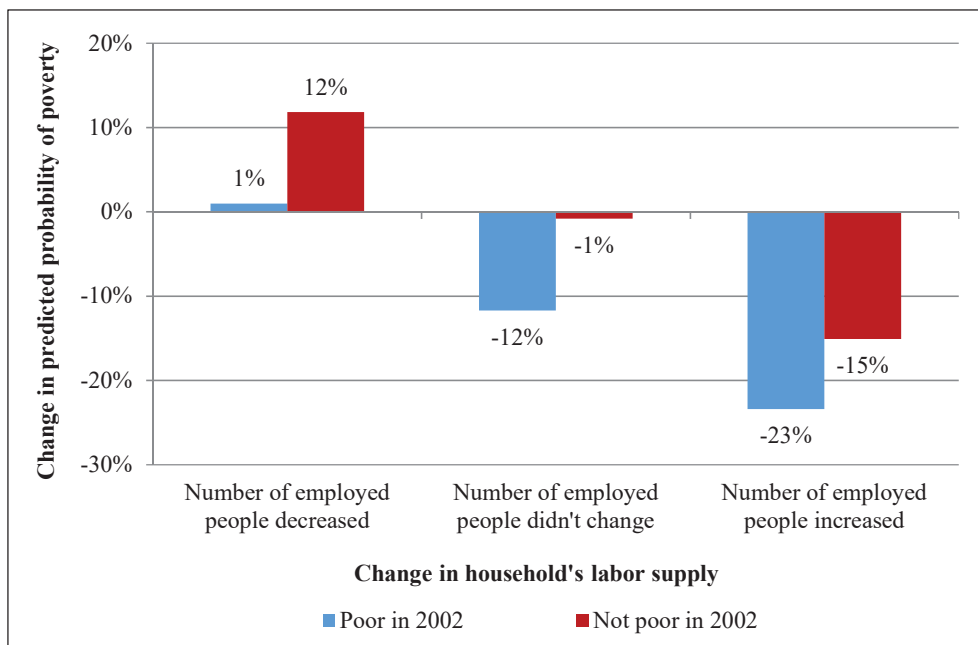
We saw above that poor households have increased their employment scope more than non-poor households have. Furthermore, we saw that among poor households, the percentage of new workers, who entered the labor market in the years following the allowance cuts, is higher. Finally, we saw that quite a few poor workers have significant employment continuity. At this point, we will explore whether these developments did indeed contribute to extrication of the working poor from poverty. As noted, we are unable to test this change directly, since our data only allow us to identify the poverty status at one point in time (the year when the household was sampled for the expenditure survey). As a proxy for the poverty status, we use the predicted probability of poverty (calculated for all those sampled in all panel years, based on administrative wage data).⁸

⁸ See estimation results of the regression of probability of poverty in Appendix C.

For each sample in the expenditure surveys (in each survey year, the head of household and their spouse, aged 25–44 in 2000), we identify the poor households and non-poor households in the survey year. As we did in the previous stage, we can follow the employment patterns of the household over time, thus dividing each of these two groups (poor and non-poor) into three sub-groups, by the change in their employment scope: Households that increased their employment scope; households that decreased it; and households where the employment scope remained unchanged. For each of these six sub-groups, we calculated the average predicted probability of poverty.

Figure 4.4.1 presents the test findings for the entire period, from 2002 to 2016. It is apparent that the probability of poverty for poor households decreased over this period, even if the number of wage earners in the household did not increase. Of course, it may be that poor households increased their employment scope by increasing the number of weekly work hours, but we have no data that would allow us to test this.

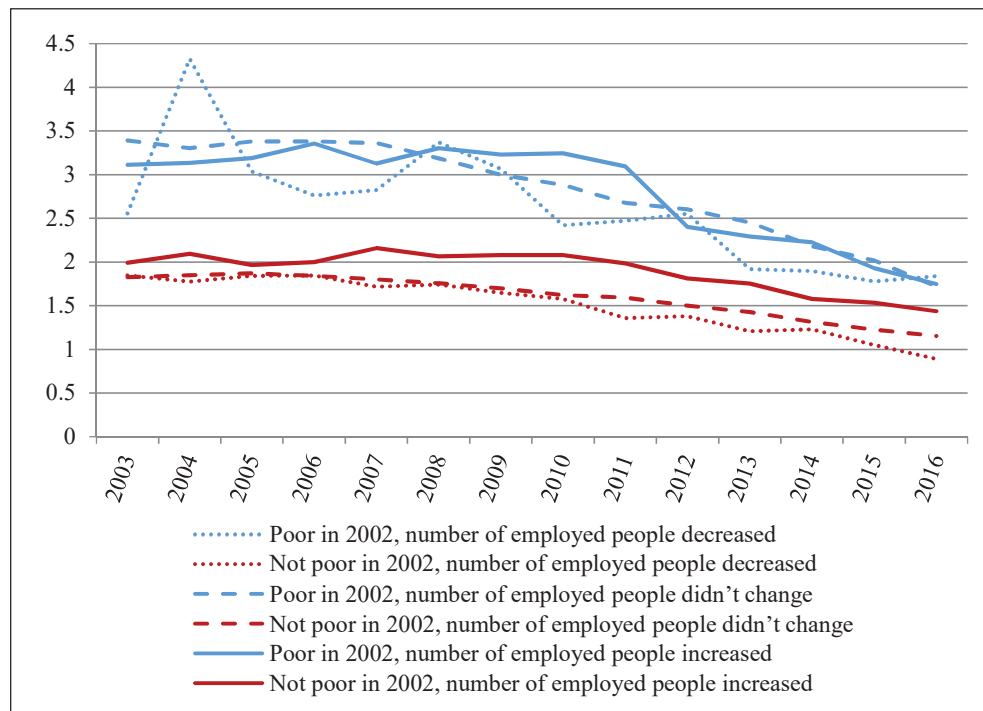
Figure 4.4.1
Change in Predicted Probability of Poverty, 2016 vs. 2002



Several key factors may contribute to a decrease in the predicted probability of poverty. For example—if the average incidence of poverty decreased due to policy changes, if workers' income increased, or if the number of persons in the household decreased. We have seen that the first two factors did not contribute to reducing the predicted probability of poverty. That is, we have seen that workers' income did not increase at a higher pace than the

increase in the poverty line, and most policy changes contributed to increasing the incidence of poverty. However, since we focused on workers in the prime working ages, and given the extended period during which we have monitored them, in quite a few households the children have grown up and left the household. The Children variable in the employee-employer file denotes the number of children of the employee, but does not provide information as to whether these children are still living in the parents' household. Indeed, when calculating the number of children aged 18 or younger in each household in each year (based on their age in the base year, 2002) we see a significant decrease in their number (Figure 4.4.2)⁹, which was most prominent in poor households. As parents grow older, the difference between the number of children in poor households and their number in non-poor households decreases.

Figure 4.4.2
Number of Children in Household^a, 2003–16



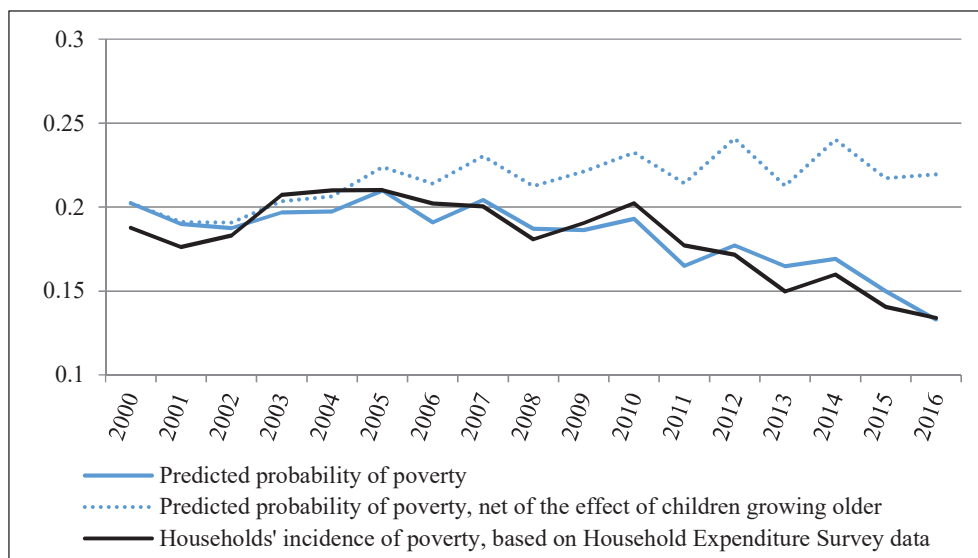
^a Sample of Household Expenditure Survey, 2002. The poverty status is determined in this year.

⁹ Figure 4.4.2 is based on calculation of the number of children in households sampled in the 2002 Household Expenditure survey. We can identify a similar pattern in samples from other years.

To estimate the impact of children growing up (and leaving the household) on the predicted probability of poverty, we recalculated the probability of poverty assuming that children have not left the house (i.e., we "interrupted the children's growing up" at age 17). With this calculation, the probability of poverty is not impacted by the change in number of children in the household, and only reflects the impact of change in work-related income. Figure 4.4.3 presents the actual incidence of poverty, based on expenditure surveys in each year, against the predicted probability of poverty for those sampled in the 2016 survey, with and without the impact of children growing up.¹⁰ After an increase early in the period, the probability of poverty gradually decreases, with a more pronounced decrease late in the period. Conversely, the probability of poverty excluding the impact of children growing up increased consistently over most of the period.

Given the significant impact of children growing up on the predicted probability of poverty, the question arises of whether the increase in labor supply is what brought about the extrication of the poor from poverty, or whether it was mostly the children growing up and the decrease in number of persons in the household. To answer this question, we repeated the test previously depicted in Figure 4.4.1, but excluding the impact of children growing up.

Figure 4.4.3
Incidence of Poverty and Predicted Probability of Poverty



Based on sample of those surveyed in 2016. We obtained essentially similar results for samples based on other survey years.

¹⁰ Appendix D presents the development of predicted probability of poverty for poor households and non-poor households, with and without adjustment for the impact of children growing up.

Figure 4.4.4 shows that throughout the period 2002–16, in households that did not change their employment scope (as measured by the number of wage earners), the predicted probability of poverty increased. The increase in probability of poverty was greater among households that were poor at the start of the period. This may reflect, *inter alia*, the effect of cuts in welfare budgets in the early 2000s and the slow increase in wages of persistent employees, and in particular among the poor families. As expected, the predicted probability of poverty for households that decreased their employment scope increased even more. Conversely, in households that increased their employment scope, the predicted probability of poverty decreased, by 5 percent for poor households and by 6 percent for non-poor households. In addition, we have a basis for our assumption in which, concurrent with increase in the number of wage earners, households also increased their labor supply by increasing the number of work hours, but we do not have the data to show this directly.

Figure 4.4.4
Change in Predicted Probability of Poverty Excluding Impact of Children Growing Up

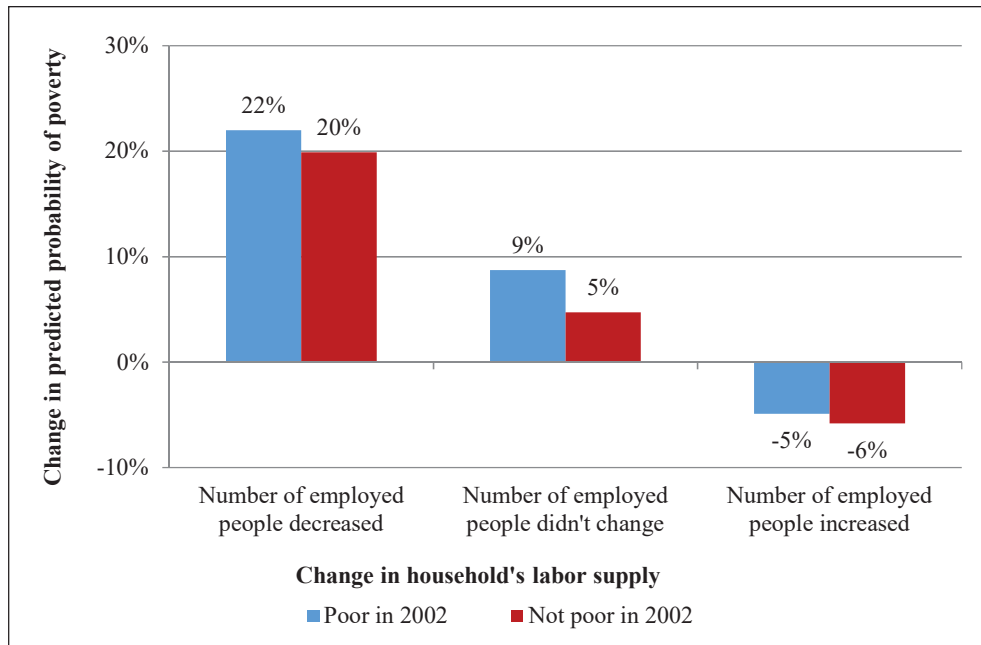


Figure 4.4.5 presents the cumulative change in predicted probability of poverty for each of the subgroups across the period. As expected, due to children growing up and to a decrease in the number of persons in households, the predicted probability of poverty also decreased. However, excluding the effect of children growing up (Figure 4.4.6), the predicted probability of poverty increased for all households that did not increase their labor supply. In

non-poor households that increased their employment scope, the predicted probability of poverty decreased, but this decrease was eroded over time. In poor households, the probability of poverty indeed decreased significantly early in the period, but increased later in the period, thus offsetting the decrease. In fact, the decrease in predicted probability of poverty measured across the entire period reflects the decrease in predicted probability of poverty over the final 3 years of the period.

Figure 4.4.5
Cumulative change in predicted probability of poverty

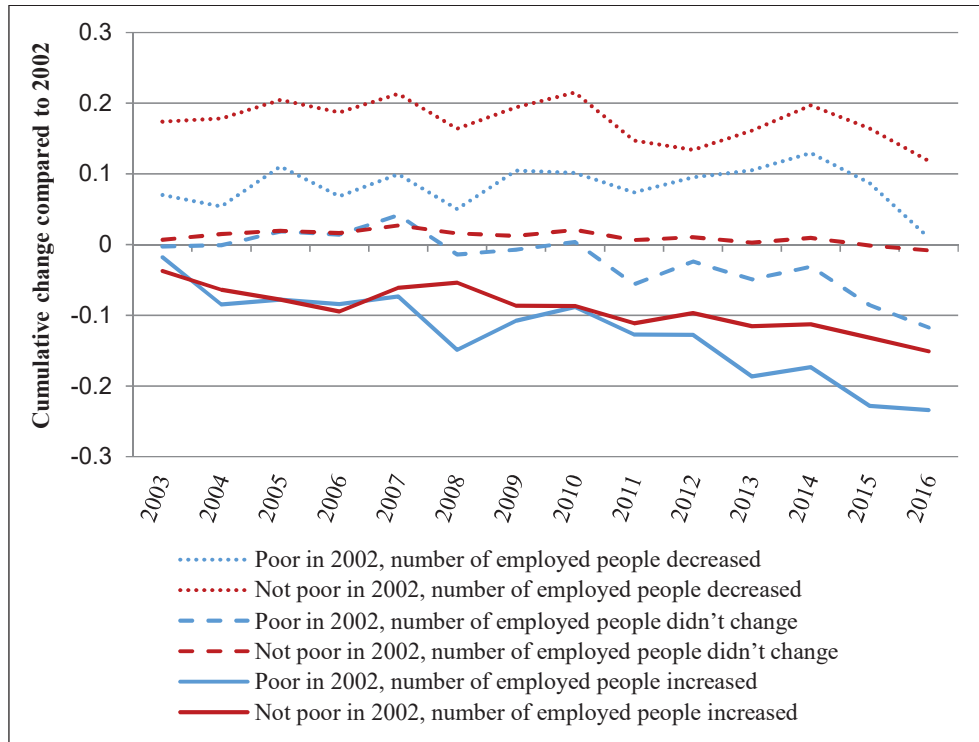
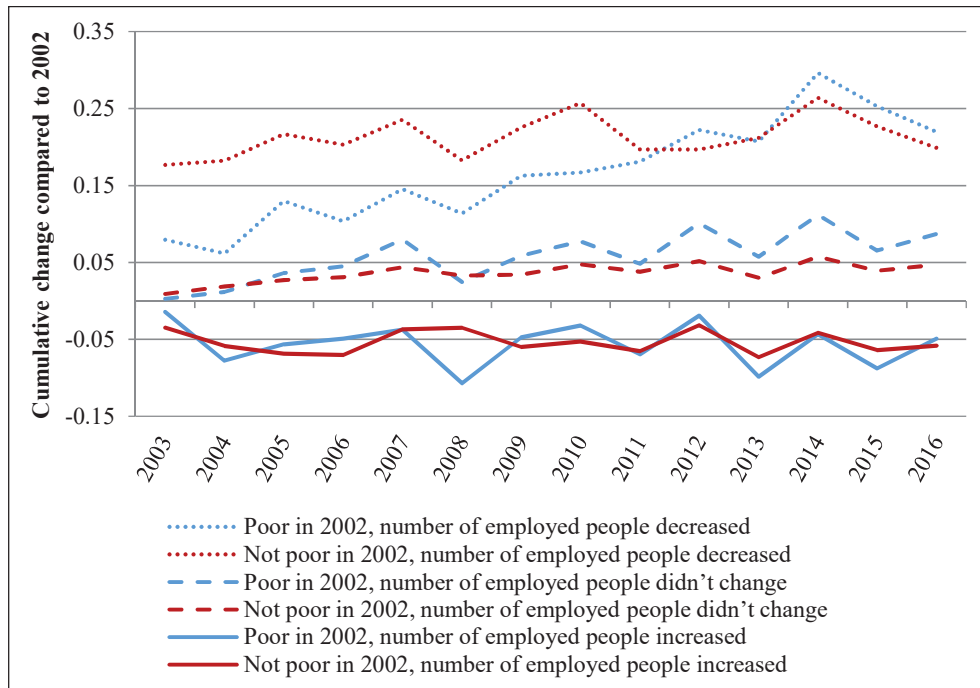


Figure 4.4.6
Cumulative Change in Predicted Probability of Poverty Excluding Impact of Children Growing Up



Data currently available to us do not allow us to answer with certainty and accuracy the question of whether entering the labor market does indeed extricate from poverty. We see that the risk of poverty is reduced by another person entering the labor market, but the increased incidence of in-work poverty, despite the increase in employment scope of poor households, may imply that the reduction in risk of poverty was insufficient to bring those poor households above the poverty line. Furthermore, we see that the decrease in predicted probability of poverty primarily reflects, for most households, the effect of children growing up.

5. SUMMARY AND CONCLUSIONS

Research findings indicate that the increased incidence of in-work poverty reflects the impact of two forces—deterioration in the relative position of persistent workers and change in composition of workers. We found that income from wages of heads of households increased in most households by a rate similar to the rate of increase in the poverty line. However, when

we focused our analysis on households that are vulnerable to poverty, i.e., households that relied on allowances to escape poverty, we found that in half of these households, the wages of the head of household decreased, and only in one-third of households did the wages of the head of household increase by a higher rate than the increase in the poverty line. That is, we may deduce that those vulnerable households saw deterioration in their relative position. We found that households that were poor at the start of the period increased the scope of their employment more than non-poor households. That is, the share of employment of those who were previously poor (and who may be more likely to be poor at present as well) increased during the period, thereby contributing to the increased incidence of in-work poverty on average. In terms of workers' employment continuity, it appears that among poor workers at the end of the period there are, indeed, more new workers—but most workers, both poor and non-poor, worked continuously over many years. Moreover, analysis of the employment continuity of individuals shows that a growing share of the poor have significant employment continuity—longer than 4 years. Finally, we can see that increasing the employment scope was indeed reflected in a decrease in average risk of poverty, but currently we have no data that would allow us to say with certainty whether reduction of the predicted probability of poverty did indeed increase the income of poor households beyond the poverty line.

APPENDICES

Appendix A**Database generation process**

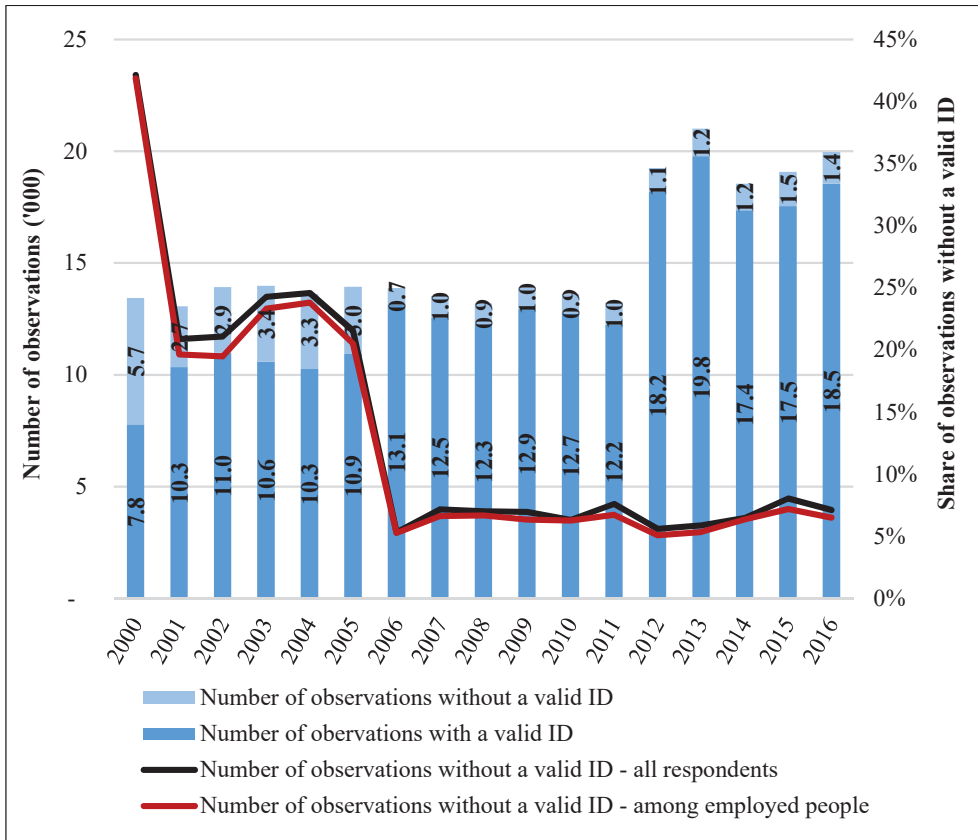
Generating the data file for this research consisted of 4 stages:

- a. Consolidation of files of Household Expenditure Surveys, 2000–16: Unified sample;
- b. Processing and improvement of employee-employer files;
- c. Matching employee-employer panel with sample data of Household Expenditure Surveys, based on ID;
- d. Test of how representative the sample in the matched file was.

a. Creating the unified sample:

In 2000, the Central Bureau of Statistics started collecting IDs of those sampled in the Household Expenditure Survey. Therefore, matching Household Expenditure Surveys with administrative data (employee-employer file) is only possible as of that year. However, prior to 2006, IDs were not fully matched against Ministry of Interior data. Consequently, between 2000 and 2005, a considerable percentage of the observations in the Household Expenditure Surveys contain erroneous IDs that preclude us from identifying the administrative data for these individuals. Such observations cannot be included in the final data panel. Figure A-1 presents the total number of observations for each survey year and the number of effective observations, i.e., with valid ID. Also presented is the percentage of observations without a valid ID—for those employed and for the general population. We can see that these percentages are nearly identical. Since the expenditure surveys and their weightings are a representative sample, such a high percentage of excluded observations requires us to test whether these excluded observations are random and whether the reduced sample is still representative.

Figure A-1
Number of observations with invalid ID



b. Processing of employee-employer files and matching them with unified sample of Household Expenditure surveys:

Employee-employer files were received for 2000–16. These include data for all individual samples in each of the years in the Household Expenditure Survey. We found two issues with the employee-employer files: Records with invalid ID, precluding them from being matched against the unified sample, and multiple records for some of the sampled individuals in the same year.

Duplicate records may be classified into one of three types:

1. Data duplication (identical records):
 - Processing: Exclude one of the records.
2. Records from different employers, due to working multiple jobs during the reported year:
 - Processing: The records were consolidated while creating variables for wage, work months and employer information for each place of work (first employer, second employer, and so forth), as well as total income from all jobs.
3. Records that include reported income other than from work (e.g., pension payments received from pension fund)
 - Processing: This information was added to the record including the wage report, by defining an additional variable – "Non-wage income".

c. Matching employee-employer panel with data of unified sample of Household Expenditure Surveys

The data panel generated from employee-employer files was matched with the unified sample of Household Expenditure Surveys. For a negligible number of individuals in the Household Expenditure Surveys, we found no match in the data panel from the employee-employer files. We also excluded from our sample observations where we found inconsistency in gender (in this case, too, the number of such observations is negligible—less than one percent). Table A-1 lists the number of observations before and after file improvement. The final panel of the unified sample in employee-employer files includes about 184,000 individuals. Of these, 119,000 work in each year.¹¹

Next, we compared the employment status (salaried employee/non-salaried employee) and income from wages according to data from the household expenditure survey (in the year when the individual was sampled for this survey) and data from the employee-employer files. Table A-2 shows the results of this comparison.

¹¹ Naturally for such panel data (with a panel created by file consolidation, rather than by creating a representative sample followed by monitoring over time), individuals are older on average as time goes by. This means that at the end of the period, on average, there would be more adults in work ages and fewer children. This is one of the reasons for the increase in percentage of those employed (above and beyond the upward trend in employment rates across the general population).

Table A-1
Number of observations in Household Expenditure Surveys and in employee-employer file

Survey year	Total observations (1)	Observations deleted due to invalid ID number, duplicate recording, or missing alignment with the employee-employer file (2)	Total surveyed people in the file sample (1)-(2)=(3)	Surveyed people who worked in the survey year		
				By Household Expenditure Survey wage-earners + self-employed	By employee-employer file (only wage-earners)	The difference between the number of employed people in the employee-employer file and the Household Expenditure Survey
2000	13,432	7,272	6,160	3,798	3,450	-9%
2001	13,059	4,835	8,224	5,031	4,572	-9%
2002	13,920	5,051	8,869	5,493	4,989	-9%
2003	13,970	5,337	8,633	5,132	4,627	-10%
2004	13,602	5,277	8,325	4,951	4,446	-10%
2005	13,934	5,190	8,744	5,199	4,654	-10%
2006	13,872	3,191	10,681	6,504	5,800	-11%
2007	13,514	3,333	10,181	6,388	5,741	-10%
2008	13,182	3,163	10,019	6,347	5,717	-10%
2009	13,905	3,432	10,473	6,659	5,972	-10%
2010	13,600	3,239	10,361	6,631	5,953	-10%
2011	13,229	3,324	9,905	6,523	5,817	-11%
2012	19,244	4,795	14,449	9,654	8,671	-10%
2013	21,011	4,988	16,023	10,813	9,746	-10%
2014	18,550	4,576	13,974	9,574	8,629	-10%
2015	19,072	5,001	14,071	9,837	8,922	-9%
2016	19,958	4,975	14,983	10,342	9,370	-9%
Total	261,054	76,979	184,075	118,876	107,076	-10%

*Before 2000, people surveyed in the Household Expenditure Surveys were not asked about ID number.

Table A-2
Comparison of wage reported in the Household Expenditure Survey and wage in the employee-employer file

Year	The number of observations in which the gap exceeds NIS 500	Cases in which the wage in the employee-employer file is higher than that reported in the Household Expenditure Survey			Cases in which the wage in the employee-employer file is lower than that reported in the Household Expenditure Survey		
		The share of observations that do not match	The average gap	The average gap among poor workers	The share of observations that do not match	The average gap	The average gap among poor workers
2002	2,797	67%	2,737	1,403	33%	1,734	650
2003	2,470	66%	1,900	1,149	34%	1,427	665
2004	2,467	65%	2,276	1,294	35%	1,438	695
2005	2,629	66%	2,341	1,254	34%	1,755	833
2006	3,237	69%	2,502	1,468	31%	1,625	828
2007	3,329	66%	2,765	1,599	34%	1,718	969
2008	3,364	69%	2,748	1,410	31%	2,092	717
2009	3,497	69%	3,464	1,726	31%	1,677	702
2010	3,459	70%	2,718	1,638	30%	1,794	967
2011	3,499	72%	3,148	1,537	28%	1,652	1,098
2012	5,124	73%	2,919	1,697	27%	2,133	1,062
2013	5,698	72%	3,011	1,740	28%	1,827	870
2014	4,999	72%	3,238	1,930	28%	1,979	991
2015	5,246	72%	3,146	1,899	28%	1,865	1,194
2016	5,547	72%	3,613	1,956	28%	2,022	1,048

One of the explanations for differences in wage data is the different reporting of wages in the two data sources. In the Household Expenditure Survey, individuals report their wages for the previous three months, whereas wages in the employee-employer files are calculated as the annual wage divided by the reported number of work months. In the employee-employer files, wage includes a wide range of additional payments, not always reported by individuals in the expenditure survey—in particular with regard to periodic payments such as vacation pay, clothing allowance and so forth. Finally, we should note that reports by individuals are not always matched and verified against administrative documents. Thus, for example, in many cases the pay slip is not presented to the person conducting the survey and is not verified by them. Therefore, data in the Household Expenditure Surveys may contain some inaccuracies due to omission or misunderstanding.

As noted above, in order to eliminate as much as possible volatility in income and in employment patterns around the age of entering the labor market and the age of retiring from work, our analysis at this stage focused on households whose head was aged 25–44 in 2000, the first year in our sample. Table A-3 lists the key attributes of sampled individuals in the entire sample, with no age limitation, compared to sampled individuals in the reduced sample.

Table A-3

Characteristics of households sampled in the expenditure surveys, selected years

Characteristics	Heads of households who were 25–44 in 2000			All heads of households		
	Surveyed 2002	Surveyed 2008	Surveyed 2016	Surveyed 2002	Surveyed 2008	Surveyed 2016
Employment characteristics						
Head of household is a wage-earner (%)	77	78	79	60	62	67
Number of wage-earners	1.4	1.6	2.1	1.2	1.3	1.5
Wage income (NIS, in 2016 prices)						
Head of household	11,918	13,130	14,753	11,762	12,013	13,065
Spouse	6,944	7,424	8,608	7,107	7,105	7,920
Self-employed income (NIS, in 2016 prices)						
Head of household	12,465	13,926	14,240	12,310	12,260	12,929
Spouse	5,922	6,425	8,041	5,564	6,359	7,006
Hours of work:						
Head of household	45	45	44	43	43	43
Spouse	36	37	38	37	36	37
Demographic characteristics (% of the population)						
Arab	17	21	18	13	15	16
Ultra-Orthodox	3	4	3	3	4	5
Age of head of household (% of the population)						
25–34	40	12	0	21	20	16
35–44	50	51	23	22	22	22
45–55	10	38	47	22	20	18
55+	0	0	30	32	36	41
Family status (% of the population)						
Married	79	80	73	72	71	69
Married with children	71	70	49	45	43	40
Unmarried with children	8	8	8	5	5	5
Number of children	2	2	1	1.2	1.1	1.1
Children age 4 and older	15	16	9	8	8	8
Years of study of head of household (% of the population)						
0-10	15	16	15	25	22	16
11-12	33	31	29	28	27	27
13-15	22	21	24	22	22	23
16+	29	32	33	25	29	34

Appendix B**Testing the extent to which the unified database is representative**

As noted, the database was created by matching two databases: Household Expenditure Surveys and employee-employer files from the Israel Tax Authority for the years 2000–16. The sample in each household expenditure survey should be a representative sample of the general population. However, as described in Appendix A, when matching data from Household Expenditure Surveys and data from employee-employer files, we excluded from our sample observations for households that could not be matched, due to invalid ID or due to material mismatch between data from these two sources. Thus, if such exclusion of observations is not random (i.e., if attributes that affect such exclusion are correlated with key household attributes that may also affect their poverty status), the final sample may be less representative.

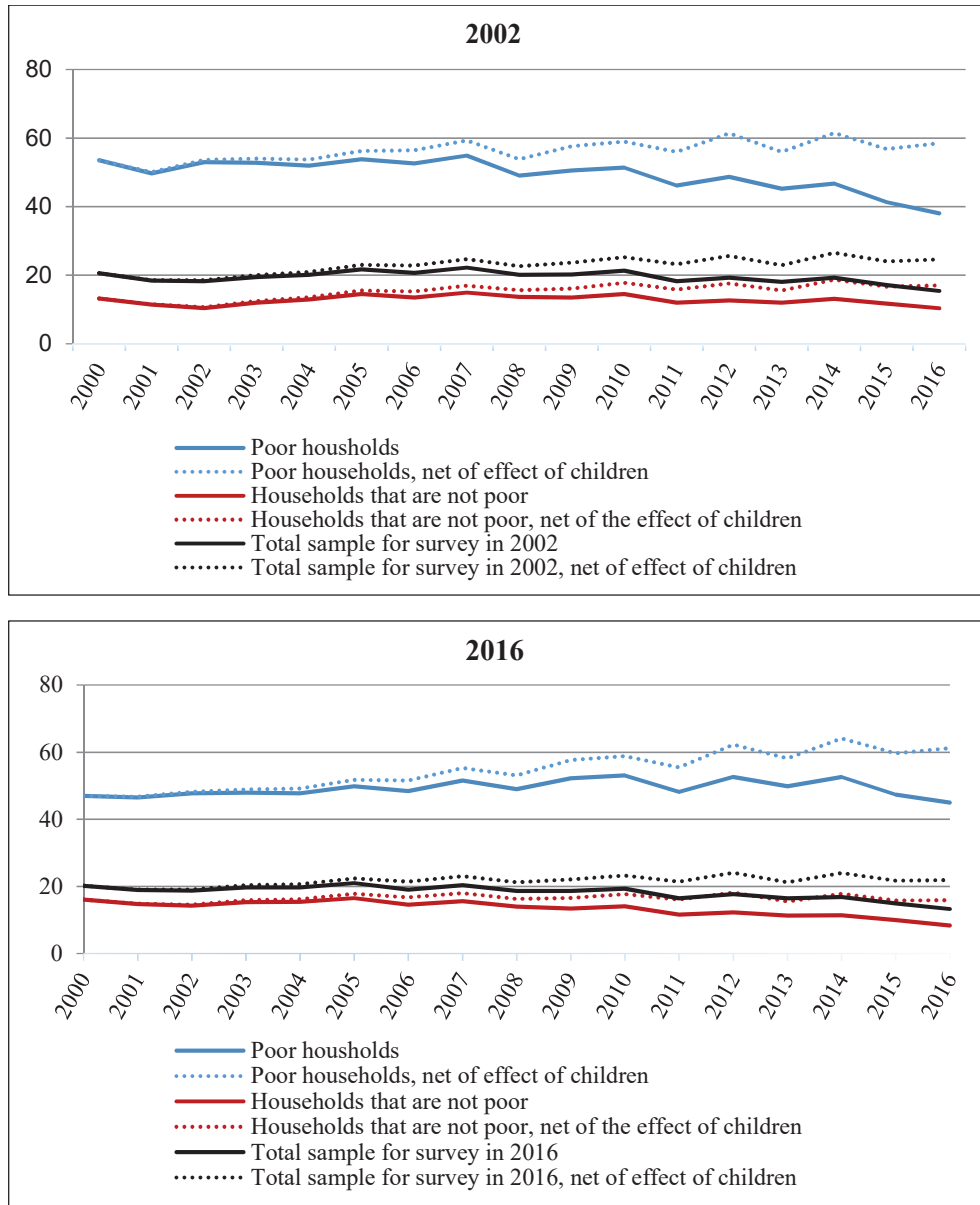
In order to test how representative the unified sample is, we estimated the probability of households to be excluded from this sample. Table B-1 presents the results of log regression with those excluded from the sample assigned the value 1. We found that exclusion from the sample due to ID is primarily correlated with marital status of those sampled, with unmarried individuals more likely to be excluded from the sample. Consequently, married individuals are over-represented in the final sample.

Table C-2**Predicted probability of being poor: Testing the quality of fit of the prediction, 2016**

The predicted probability of poverty	Poor (%)	Not poor (%)
0–30	5.6%	94.4%
30–40	27.7%	72.3%
40–50	46.2%	53.8%
50–60	56.0%	44.0%
60–70	65.8%	34.2%
70–100	85.8%	14.2%
Observations	3,020	
Pseudo R-squared	0.41	

Appendix D

Figure D-1
The Predicted Probability of Poverty—Before and After Excluding the Effect of Children Growing Up
 Ages 25–44 in 2000



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