# INCOME MAINTENANCE ALLOWANCES
# IN ISRAEL—IDEAL VS. ACTUAL

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At the end of 2002 more than 150,000 families in Israel were receiving income maintenance allowances, about ten percent of the number of families of working age; twenty years ago about one percent of families received such support. Annual income maintenance payments amount to about 0.7 percent of Israel's GDP.

The structure of income maintenance has hardly changed since the introduction of the system in 1982, with high offset rates against labor income and with a low income-disregard level. This structure had a negative effect on the rate of participation in the labor force and on the propensity to cheat. A reform was introduced in 2003 which among other things sharply reduced the allowances, the offset rates and the disregard-income level. In addition various programs were introduced to facilitate wider participation in the labor market by income maintenance recipients.

This paper presents a simulation of the optimal structure of the income maintenance allowances taking into consideration social preferences regarding the inequality of income distribution, labor supply elasticity and the propensity to cheat. The results of the simulation indicate that the optimal maintenance payment is higher than that determined in the reform and that the optimal offset rates against labor income are far below the current rates, and there is even room for a wage subsidy for recipients of income maintenance.

## 1. INTRODUCTION

Since the introduction of the Income Maintenance Law at the beginning of 1982, the number of recipients of income maintenance allowances has risen steeply, faster than the rates of increase of the population and of recipients of other National Insurance Institute transfer payments. Initially about ten thousand families received income maintenance, these families — constituting about one percent of working-age families — having hitherto been covered by welfare programs. Their number trebled by the beginning of the 1990s, and the influx of immigrants from the former Soviet Union gave another major boost to their number, and at the end of 2002 some 150,000 families were in receipt of income maintenance allowances, about ten percent of working-age families. Income maintenance allowances totaled NIS 3.6 billion in 2002,[1] about 0.7 percent of GDP, and about one third of wage-substitute allowances.

[1] The average exchange rate in 2002 was NIS 4.74 to the dollar.

As there were no significant changes in the structure of income maintenance allowances or their value over the years, demographic elements (such as mass immigration) and economic elements (such as unemployment rates) cannot explain the huge surge in the share of the population in receipt of these payments. The reason for this development lies in the reduction of employment opportunities open to unskilled workers, who constitute the lion's share of income-maintenance clientele, a rise in the purchasing power of the allowance, which is indexed to the average wage in the economy, the less effective functioning of the Employment Service responsible for the employment test, and apparently the rise in allowances in cash and in kind for services and goods supplied by the public sector to recipients of income maintenance (henceforth, secondary benefits) that constitute a significant part of their imputed income.

The existence of a large section of the population that is dependent on state support for many years despite the fact that most of those families, under certain circumstances, could be absorbed in the labor market presents an undesirable economic and social factor that warrants comprehensive attention, particularly if similar findings apply in other support systems (such as disability allowances and alimony). It also turns out that the incidence of fraud through non-declaration of labor income, to avoid a reduction in the allowance or even the loss of eligibility to receive it, is widespread among recipients of income maintenance.

The effect of the structure of income maintenance in Israel on the labor supply and on the non-declaration of income has been discussed in detail (Romanov and Zussman, 2002), and the current paper therefore focuses on the optimal structure. The authors are of the opinion that a change in the structure of maintenance allowances alone will not result in a marked rise in the rate of participation in the labor market among maintenance recipients, and hence additional measures are required, namely scaling down of secondary benefits and their inclusion in the overall means test to determine eligibility to income maintenance and those benefits, and an improvement in the employment services system and stricter enforcement of the rules of eligibility for maintenance allowances. The latter change is conditional on the establishment of Integrative Employment Support Centers for recipients of the allowance.

In 2003 several far-reaching changes were made to the income maintenance system: payments were slashed by about 20 percent; offset rates against labor income were reduced; and the disregard-income level was lowered. In addition, many recipients of income maintenance allowances who had previously been exempt from an employment test to establish their eligibility to receive the payment now had to undergo the test, and their secondary benefits were included in a comprehensive means test.

The paper is divided as follows: Section 2 describes the increase of the population in receipt of income maintenance allowances from the enactment of the Income Maintenance Law in 1982 until the end of 2002; Section 3 details the structure of income maintenance allowances. Section 4 extends the model formulated by Saez (2002) that investigates the optimality of transfer payments given recipients' intensive and extensive labor-supply response and their propensity to cheat. After calibration of the model according to the system of income maintenance allowances in Israel, a simulation is performed to determine the optimal parameters for that system. Finally, the results of the simulation are compared with the structure prevailing prior to the 2003 reform, and with the post-reform structure.

## 2. THE CHANGE IN THE POPULATION OF RECIPIENTS OF INCOME MAINTENANCE ALLOWANCES

The Income Maintenance Law came into effect in January 1982. Its purpose was to provide a single basis for the program of the National Insurance Institute guaranteeing a minimum living income for recipients of the various National Insurance transfer payments to the needy, mainly those who were unable to obtain a subsistence level of income in the labor market.

Initially the number of families in receipt of income maintenance allowances totaled almost a thousand (Figure 1), 1.1 percent of working-age families. In the course of the 1980s the number trebled. In the 1990s the number was further augmented by about 44,000 families of new immigrant, and the number of "veteran" recipients doubled, so that in 2002 an average of about 151,000 families were in receipt of income maintenance, some 9.6 percent of working-age families. Until the reform in 2003, about half of the recipients (for example the unemployable or single-parent families with young children) were exempt from the employment test carried out by the Employment Service.

**Figure 1**
**Recipients of Income Maintenance Allowance**
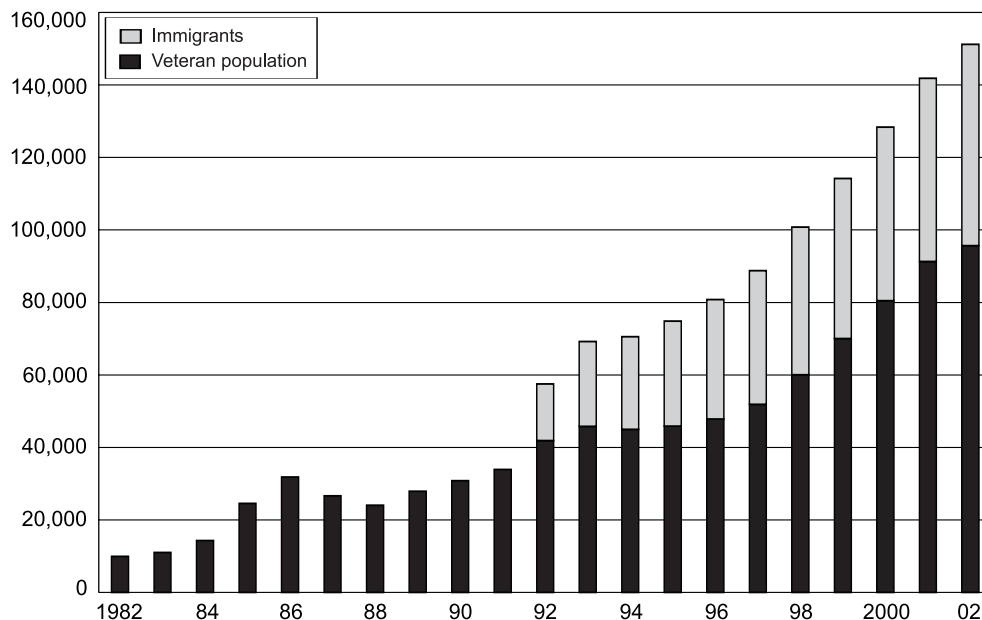


The influx of immigrants from the former Soviet Union (of whom about a million arrived in the 1990s, with about half a million arriving in 1990–91) affected the composition of the recipients of income maintenance allowances. In the period prior to the influx of the immigrants the share of single-parent families had fallen, and that of couples with children had risen. These trends reversed with the rise in the share of immigrants receiving the allowances, among

whom there was a high proportion of single-parent families and of working-age adults who could not find employment.[2]

Figure 2 shows the rates of unemployment and the share of recipients of income main-tenance allowances among working-age families, i.e., adjusted for demographic effects in general and the effects of the influx of immigrants in particular. During the first ten years of operation of the income maintenance system, changes in the unemployment rate and in the number of recipients of income maintenance were correlated, although an upward trend in the number of recipients can be discerned throughout the period. The rate of unemployment peaked in 1992, and fell rapidly thereafter. Nevertheless, the proportion of families receiv-ing income maintenance increased. In 1993–95, when the unemployment rate went down, the sharp upward trend of maintenance recipients among the veteran population halted, but many new immigrants joined their ranks as immigration continued at a high level. A rise in unemployment partly leads to an increase in the number of new claimants for the income maintenance allowance, originally as work seekers, but who after failing to find employment remain in the system long term.

**Figure 2**
**Share of Recipients of the Allowance and Unemployment Rate**
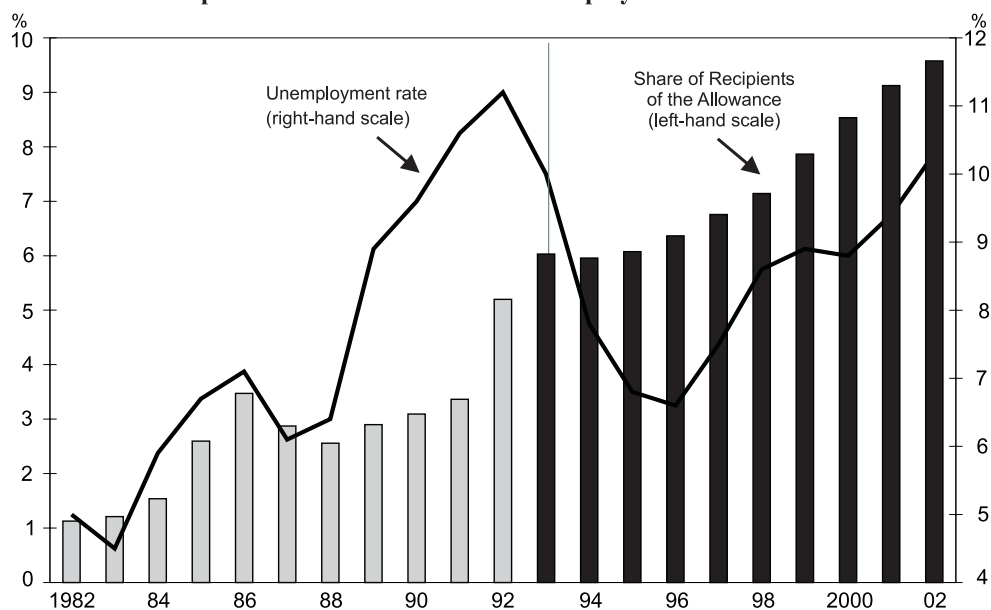


The process described above is fraught with danger, as the hard core of income maintenance recipients who stay in the system over a long period and fall into the poverty trap has been growing non-stop, in complete contrast to the original purpose of the Law. The Law considered income maintenance allowance as a temporary measure to tide the recipient over until he was

[2] The share of single-parent families among the total number of recipients of income maintenance allowances rose from 29 percent in 1990 to 37 percent in 1999. In the 55–64 year age group 3.3 percent of the veteran population and 25 percent of immigrants received these allowances in 1998.

rescued from hardship or became a recipient of other allowances (such as invalidity). The average length of time that families received income maintenance rose from twenty-one months in 1989 to thirty-two months in 1999, with all types of recipient families following this trend.

From the introduction of the Income Maintenance Law until 2002 neither the structure of the maintenance payments nor the eligibility conditions have changed to any significant extent, so that it is not at all clear why the number of recipients of these payments has risen constantly and rapidly, far exceeding the rate of population increase, even taking into consideration the new immigrants who join the income maintenance system.

One of the main reasons for the rise in the number of those receiving income maintenance is the relative deterioration in the wage offered for jobs that do not require a high degree of professional expertise. Since 1985 the wage of unskilled workers has risen more slowly than that of employees with at least secondary education (Flug et al., 2000), and in the 1990s it even fell in real terms. The rise in the share of high-tech industries reduced the demand for unskilled workers. Moreover, the entry of a huge number of foreign workers into the labor market, the exposure of Israel's economy to cheap competing imports, and the reduction in the extent of unionization all helped to reduce the chances of employment and the wage of the unskilled. These developments increased the rate of unemployment among the latter, and led to a lower rate of participation in the labor force.

Another reason for the rapid increase in the number of recipients of income maintenance was the rise in the purchasing power of the payments. The allowances are indexed to the average wage. This indexation ensures that the standard of living of recipients of the allowances does not suffer over time, but the price level of the consumption basket of the lowest quintile declined relative to the price level of the average basket. On the other hand, in relation to the poverty line the value of income maintenance allowances declined somewhat. While in the second half of the 1980s the payment to a single recipient was more than 90 percent of the poverty-line income, in the second half of the 1990s it was down to about 80 percent, so that the situation of single recipients of the allowances deteriorated relative to the situation of the poorest sectors of the population; in other words, the poverty gap between them widened. A similar picture emerges with regard to other recipients.

A third reason for the increase in the incidence of income maintenance allowances is the decline in labor input in the Employment Service which is responsible inter alia for employment testing of recipients of income maintenance. Until the 1990s labor input in the Employment Service increased in step with the rise in the number of work seekers in general and with the rise in the number of recipients of the income maintenance allowances (Figure 3). Thereafter, although the number of work seekers grew quickly, the staffing level of the Service declined.[3]

In 1991 employers' obligation to fill the vacancies exclusively through the Employment Service was abolished. As a result, the trend of the declining share of the Employment Service in the supply of jobs was reinforced.[4] The quality of the jobs they offer may also have deteriorated. Recipients of income maintenance allowances are dependent on the Employment

[3] Although computerization did not pass by the Employment Service, so that it should have enabled some cutback in staffing, it should be borne in mind that dealing with recipients of income maintenance allowances is a labor-intensive procedure.

[4] In the early 1980s the Employment Service had 1.2 vacancies for every job offer published in the press; by the end of the 1990s the ratio had fallen to 0.8.

Service in their search for work, so that these developments reduce their chances of breaking out of the dependence on those allowances.

**Figure 3**
**Number of Employees in Employment Service and Recipients of the Allowance**
**(right-hand scale)**
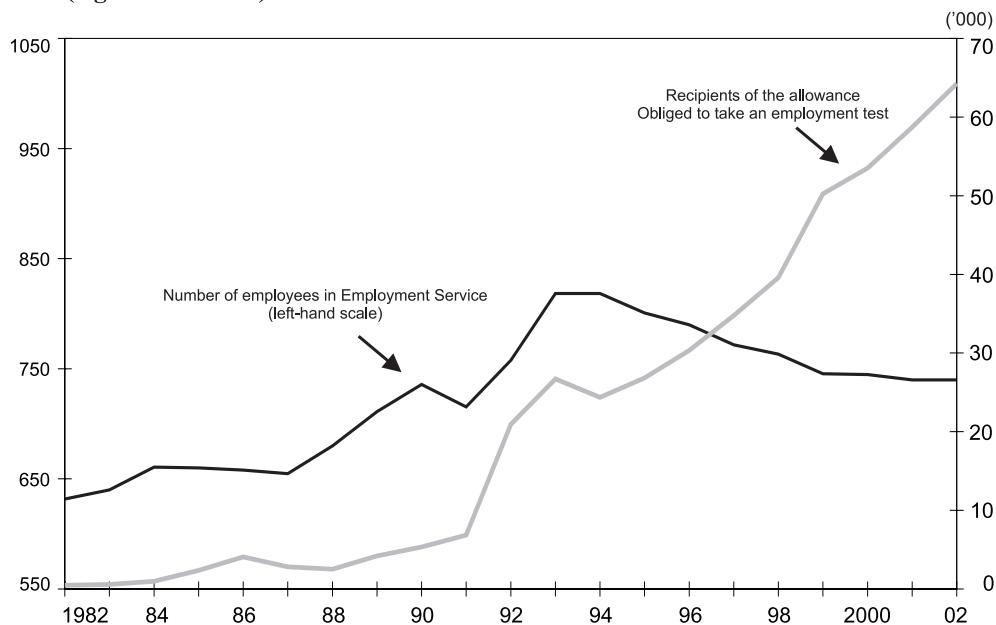


## 3. THE STRUCTURE OF THE INCOME MAINTENANCE ALLOWANCE

Income maintenance allowance is paid by the National Insurance Institute to working-age families whose income is very low, and is given if family members undergo the employment test or are exempt from it. The allowance is conditional on a means test.

Figure 4 shows a typical budget constraint for a family in receipt of income maintenance allowance (for a detailed description of the allowance see Figure 5 and Appendix 1). When there is no breadwinner in the family, it has disposable non-labor income OB, which includes the income maintenance allowance of AB and other non-labor income OA. When one member of the family is employed and his wage is below the disregard level he receives his full wage ($w$ per hour) without offsetting the wage against the allowance—the section of the line BC. When his wage exceeds the disregard level, the wage is offset against the allowance at a rate of $t_{im}$, until it is offset completely (section CD). Between this level of income and point E, the individual earns $w$ per hour and does not pay income tax because his income is below the tax threshold. Income above point E is subject to a starting marginal tax rate of $t_i$ ($t_i < t_{im}$). Thus the budget constraint of a recipient of income maintenance is OBCDE, and that of a non-recipient, OADE.

**Figure 4**
**Budget Line of a Recipient of the Allowance**
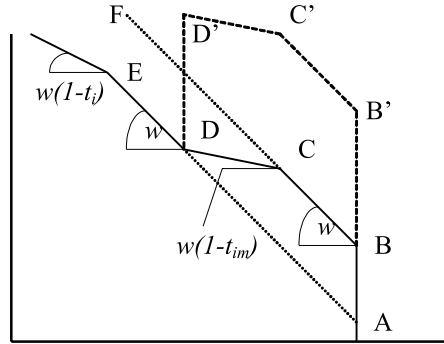


Until recently the fact that a family was in receipt of income maintenance allowance entitled it to many secondary benefits: reductions in municipal taxes and rent for public-sector housing, and assistance towards rent for private-sector apartments; subsidies on the purchase of medication and on payments for visits to a doctor; reductions in fares on public transport, etc. Receipt of income maintenance constitutes a sufficient condition for receipt of these secondary benefits; in some cases where universal means tests were applied, income maintenance allowances were not taken into account in calculating the family's income.

Figure 4 also shows the budget constraint of a family in receipt of income maintenance that also receives the secondary benefits—AB′C′D′D, whose sectionѕ B′C′ and C′D′ are parallel to sections BC and CD respectively. Loss of the eligibility to income maintenance entails loss of the secondary benefits, so that at point D′ the marginal tax rate greatly exceeds 100 percent. The assessed value of the secondary benefits is about NIS 1,500 per month,[5] so that the effective marginal tax rate on the additional shekel which led to the loss of eligibility for income maintenance soars. Note that the underlying assumption is that recipients of the allowance are aware of their rights and avail themselves of them to the full, although clearly this is not necessarily the case (Doron and Gal, 2000).

## 4. THE SIMULATION

Dissatisfaction with the former system of income maintenance and its negative effects on the participation of recipients of the allowance in the labor market and the labor supply of the employed among them, combined with the comprehensive reform of the system introduced in 2003 make a review of the ideal structure necessary. Moreover, an extensive field trial (similar

[5] For a nuclear family with three children (living in a private rented apartment). The father is the only breadwinner, and his wage is exactly the amount above which he would lose the eligibility to income maintenance, so that the total allowance is offset and the family receives only the secondary benefits.

**Figure 5**
**Labor Income and Disposable Income of**
**Income Maintenance Recipients, by Family**
**Types, Before and After Reform, in**
**Terms of the National Average Wage\***

**a. Single recipient**

**b. Single-parent family**

**c. Couple with 2 children**
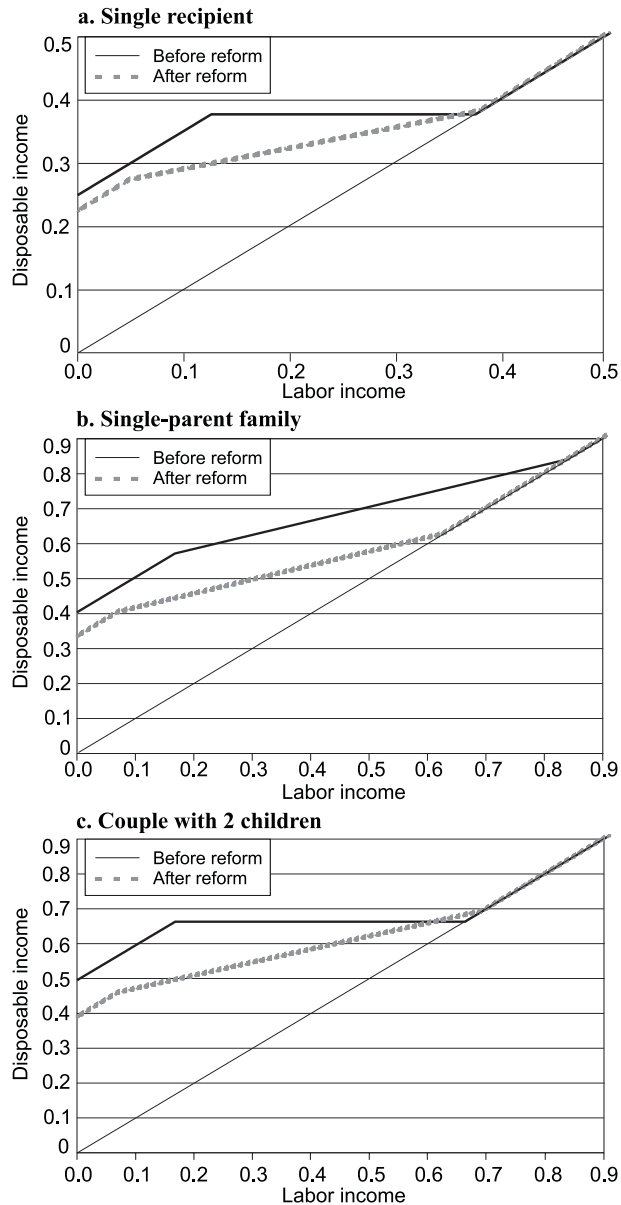
\* Computations made for a recipient entitled to the enlarged allowance rate (see Table A1 for allowance structure). For simplicity, contributions to National Insurance and Health Insurance are omitted.

to the famous Wisconsin welfare experiment in the US) is due to be held in 2004, in which several integrative employment support centers will be established for recipients of income maintenance where they will be offered comprehensive assistance intended to lead to their absorption in the labor market. A welcome side effect of the proposed support centers will be the reduction in the extent of undeclared employment of recipients of income maintenance due to the obligation to sign in frequently at the centers and spend time either in make-work projects or on a retraining course. This section of the paper presents a simulation of changes in the structure of income system under the assumption that they take place concurrently with the operation of the support centers.

Saez (2002) proposed a comprehensive theoretical model for analysis of income tax and transfer payments given the social utility function and the government's budget constraint, taking into consideration individuals' behavioral response to marginal tax rates via two channels. One is participation in the labor market — the extensive margin of response — and the other is the number of hours worked — the intensive margin. The optimal changes in the structure of the transfer payments system therefore depend on the participation elasticity and the extent of employees' labor input, the distribution of income, and the degree of the government's aversion to inequality in the distribution of income.

One of the assumptions of the above model is that no cheating occurs with regard to income maintenance, an unrealistic assumption, at least in Israel (Romanov and Zussman, 2001). The current paper presents a model based essentially on the work of Saez (2002) adjusted to the structure of income maintenance allowances in Israel, and incorporating changes in the extent of undeclared employment as a result of changes in various parameters of the income maintenance system, for instance the offset rate and the probability of fraud being detected.

Assume that there are $I + 1$ groups of labor income among recipients of income maintenance, and the wage rises with a group's rating. The wage of the group reporting to the National Insurance Institute that they are unemployed, i.e., those in the lowest rated group ($i = 0$), is $w_0^1 = 0$, where the superscript 1 indicates undeclared employment, and the superscript 0 indicates declared employment. The reported wage for recipients of income maintenance in group $i$ ($i \in \{1, \dots, I\}$) is $w_i^1$, and the unreported wage of those in the group with a reported wage of $i$ is $w_i^0$. The size of the net income maintenance allowance in group $i$, i.e., after offsetting $T_i$ of labor income against the allowance, is $G_i$, determined in accordance with the reported wage (in declared employment). The disposable income of a member of the group with reported income $i$ will thus be $c_i^1 = w_i^1 + G_i$.

Let $h_i$ denote the share of individuals in the group with a reported wage of $i$ ($0 \le h_i \le 1$). The government's budget constraint is

$$(1) \qquad \sum_{i=0}^{I} h_i G_i = G,$$

where G is the average income maintenance allowance in the current system.

Keeping total income maintenance allowance fixed removes the need to examine the optimal taxation of all taxpayers who finance the system.

Social preferences are given as the weighted average (normalized) of social utility $g_i$ ascribed by the government to the marginal shekel given to individuals in group with income $i$.

(2)     $\sum\limits_{i=0}^{I} h_i g_i = 1,$

where $g_i \equiv 1/[\ \tilde{}\ (p_i\, b_i)\ \tilde{}\ (c_i^1)^v\ ]$. Here $v$ is a parameter such that the higher its value, the greater the government's preference for income equality ($v = \infty$ is Rawls' maxmin criterion, and $v = 0$ indicates indifference to inequality). Since the $(c_i^1)^v$ component relates only to reported income, but the government is aware of cheating by income maintenance recipients, the utility of individuals who have undeclared income is afforded a lower weight in the social utility function. Define $p_i b_i$ as the expected unreported income in the group with reported income $i$.[6] The probability of detection of a recipient of income maintenance is $p_i$. Assuming a negative relationship between the amount of declared and undeclared income, this probability can be defined for $i = 0,\ldots, I$ as $p_i = (w_I^1 - w_i^1)/w_I^1$. Recipients of income maintenance who report that they are not employed are definitely included in the investigated sample, while none of those in the group with the highest reported income are scrutinized.[7]

The average cost of operating integrative support centers (O) per recipient of income maintenance depends implicitly on the resources allocated to them that reduce the incidence of cheating. For example, increasing the frequency of attendance at a center (for assignation, or retraining, etc.) reduces the chances for undeclared employment. Define the average cost restraint per recipient of the income maintenance allowance (normalized by $\theta$ which is the average cost per unit of detection probability):

(3)     $\sum\limits_{i=0}^{I} \dfrac{h_i p_i \theta}{O} = 1.$

As stated, the behavioral response to changes in the income maintenance system takes two forms; one is recipients' participation in the labor market, and the other is the number of hours worked by recipients who are employed. Each of these will be addressed separately.

*The participation response*

The changes in the participation rate arising from changes in the offset rate of the allowance may be divided into two components: those deriving from recipients' entry into or exit from declared employment, and those deriving from changes in their reporting of such, in other words, a reduction or increase in undeclared employment, involving the fraudulent receipt of the allowance. This division is based on the assumption that the decision on actual participation in the labor market (declared or concealed) is made prior to the decision about the extent of undeclared employment.

Assume that the decision by recipients of income maintenance whether to participate in the official labor market depends on the difference between their disposable income when they report that they are unemployed, $(c_0^1)$, and their disposable income when they report a labor income of $c_i^1$. Thus the participation elasticity of an individual in income group $i$ with respect to reported disposable income is

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[6] Although unreported income is known only to the individuals involved, the government's activity via the support centers etc. enables it to estimate the overall extent of the practice, for instance by investigating the ownership of assets and the consumption patterns of families receiving income maintenance.

[7] The professional literature on the subject of tax enforcement indicates that the optimal detection probability declines as reported income rises (Andreoni et al., 1998). In any event, $p_I$ is greater than zero.

(4)       $\eta_i = \dfrac{c_i^1 - c_0^1}{h_i} \cdot \dfrac{\partial h_i}{\partial(c_i^1 - c_0^1)}$ .

The decision to work in declared employment depends also on the chances of finding undeclared employment and the expected gain from the latter, so that there is substitution between the two types of employment. It is assumed that the rate of participation in the former also depends on the difference between the expected unreported income when the participant declares that he is unemployed, $E(c_0^0)$, and the expected unreported income when he declares an income that places him in group $i$, $E(c_i^0)$. Assuming that any investigation to discover undeclared income reveals such income in its entirety,[8] that rules of payment of income maintenance apply to them fully and that no fines are involved, similar to the situation prevailing in the income maintenance system until recently, then expected undeclared income will be $E(c_i^0) = c_i^0 - p_i T_i^0$, where $T_i^0$ is the compulsory offset of the allowance against discovered undeclared income, calculated as follows:

For $i = 0$:        $T_0^0 = [(T_1 - T_0)/(w_1^1 - w_0^1)] \cdot w_0^0$       ,

and for all $i > 0$:  $T_i^0 = [(T_i - T_{i-1})/(w_i^1 - w_{i-1}^1)] \cdot w_i^0$   .

The participation elasticity of an individual in reported-income group $i$ with respect to his expected undeclared income is defined as follows:

(5)       $\mu_i = \dfrac{E(c_i^0) - E(c_0^0)}{h_i} \cdot \dfrac{\partial h_i}{\partial\left(E(c_i^0) - E(c_0^0)\right)}$   .

If the assumption that there is a negative correlation between $w_i^1$ and $w_i^0$, in other words the higher the declared income in group i, the lower the undeclared income in that group (due to the effective constraint of the total number of hours of employment), then $E(c_i^0) - E(c_0^0) < 0$ for all i, and therefore $\mu_i > 0$.

*The number of hours worked*
Similar to the division of the participation decision into separate (declared and undeclared) components, the change in the number of hours worked can also be divided into the change in declared employment and the change in reporting it.

Assume that the marginal change in employees' labor input in income group $i$ is affected by changes in the difference between their declared disposable income and that of members of the adjacent groups.[9] The elasticity of the hours worked in declared employment with respect to declared disposable income is

(6)       $\zeta_i = \dfrac{c_i^1 - c_{i-1}^1}{h_i} \cdot \dfrac{\partial h_i}{\partial(c_i^1 - c_{i-1}^1)}$.

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[8] If investigation involves reporting daily at the support centers (during normal working hours), this significantly reduces the possibility of concealing employment, and it may then be assumed that would-be concealers will have to give up their undeclared employment.

The elasticity of the hours worked in declared employment with respect to expected undeclared disposable income is

$$(7) \qquad \rho_i = \frac{E(c_i^0) - E(c_{i-1}^0)}{h_i} \cdot \frac{\partial h_i}{\partial \left( E(c_i^0) - E(c_{i-1}^0) \right)}.$$

*The optimal changes in taxation*
This section develops the rule for determining the tax rates (in this case the allowance and its offset rates), which — taking into account the starting point of a system of income maintenance, the budget constraint, the system of social preferences, and individuals' behavioral responses — can increase the labor supply. Note that this approach does not solve the problem of optimal taxation in the normally accepted sense of the term, i.e., optimization of social welfare under certain constraints, or even optimal measures (at the margin) aimed at maximum improvement in welfare (Ahmad and Stern, 1984). An approach similar to the current one was adopted by Slemrod and Yitzhaki (1996), who formulated a rule for calculating the efficiency cost of a marginal change in the tax system, taking tax evasion into consideration.

To calculate the optimal changes in the allowance structure, assume that the declared labor income offset against the allowance increased by $dT$, which applies to recipients in the declared income groups from $i$ to $I$, where $T_1$ is the total allowance offset. In a static situation the saving in payments of the allowance is $[h_i + \dots + h_I]dT$, and it is assessed by the government as follows:

$$(8) \qquad [(1 - g_i)h_i + \dots + (1 - g_I)h_I]dT.$$

Let us now turn to the extensive-margin behavioral response related to the participation rate in declared employment and its effect on allowance payments. As a result of the reduction in declared disposable income in each of the groups from $i$ to $I$ compared to that in group 0 (those reporting that they are unemployed), $c_i^1 - c_0^1, \dots, c_I^1 - c_0^1$, allowance recipients in declared income group $j$ ($i \le j \le I$) drop out of the labor market. In accordance with equation (4), the decline in participation is $h_i \eta_i dT / (c_j^1 - c_0^1)$, and it leads to a rise in total income maintenance payments

$$(9) \qquad dT \cdot \sum_{j=i}^{1} (T_j - T_0)h_{j\,j} / (c_j^1 - c_0^1).$$

Furthermore, the differences between expected undeclared income $E(c_i^0) - E(c_0^0), \dots, E(c_I^0) - E(c_0^0)$ also rise. In accordance with equation (5), the extra allowance offset liability results in a decline in reported participation in declared employment by the amount of $h_{j\,j} dT / \left[ E(c_j^0) - E(c_0^0) \right]$ by individuals in group j and a rise in total income maintenance payments

$$(10) \qquad dT \cdot \sum_{j=i}^{I} (T_j - T_0)h_{j\,j} / \left[ E(c_j^0) - E(c_0^0) \right].$$

[9] Under the assumption that there is no income effect, i.e., a uniform change in disposable income will not lead to a change in the distribution in employees' labor supply (for details see Saez, 2002).

We now turn to the intensive-margin behavioral response related to the labor supply in declared employment, and its effect on payments of the allowance. As a result of the reduction in the difference between the declared disposable income of the two adjacent income groups, $c_i^1 - c_{i-1}^1$, the declared labor input in group $i$ changes by $dh_i = -h_i \zeta_i dT / (c_i^1 - c_{i-1}^1)$, in accordance with equation (6), and there is a rise in the payments of the allowances

(11)     $(T_i - T_{i-1}) h_i \zeta_i dT / (c_i^1 - c_{i-1}^1)$.

According to equation (7), the increase in the difference in expected undeclared disposable income leads to a decline in the labor supply in declared employment and to a rise in payments of the allowance in the amount of

(12)     $-(T_i - T_{i-1}) h_i \rho_i dT / \left( E(c_i^0) - E(c_{i-1}^0) \right)$.

The optimal changes in taxation exist when the marginal increase in the level of the offset $dT$ does not result in a change in total income maintenance payments: on the one hand in a static situation there is a reduction in the payments, and on the other, there is an equivalent rise in payments due to the behavioral response that leads to a reduction in recipients' participation in declared employment and a reduction in the labor supply of the employed among them. This behavioral response arises as the direct result of the increased burden of the offset rate and the indirect effect of undeclared employment becoming more worthwhile, and the lower reporting level:

(13)
$$h_i(T_i - T_{i-1}) \left[ \frac{\rho_i}{E(c_i^0) - E(c_{i-1}^0)} - \frac{\zeta_i}{c_i^1 - c_{i-1}^1} \right] =$$
$$\sum_{j=i}^{1} h_j \left[ (1 - g_j) + \frac{T_j - T_0}{c_j^1 - c_0^1} \eta_j - \frac{T_j - T_0}{E(c_j^0) - E(c_0^0)} \mu_j \right] .$$

As condition (13) is defined in terms of labor supply elasticity with respect to disposable income, $\zeta$, elasticity which is not normally estimated, we define wage elasticity in declared employment of an individual in declared income group $i$ with respect to the disposable offset rate, which is the share of a marginal NIS 1 of income maintenance remaining after offsetting the declared wage at a rate of $t_i = (T_i - T_{i-1}) / (w_i^1 - w_{i-1}^1)$. The disposable offset rate is therefore $1 - t_i = (c_i^1 - c_{i-1}^1) / (w_i^1 - w_{i-1}^1)$, and the elasticity is

(14)     $\varepsilon_i = \frac{1 - t_i}{w_i^1} \cdot \frac{\partial w_i^1}{\partial (1 - t_i)}$.

Then the relationship between $\zeta$ and $\varepsilon$ is:

(15)     $\zeta_i(w_i^1 - w_{i-1}^1) = \varepsilon_i w_i^1$.

Putting (15) into (13) yields a different equation for the optimal changes in taxation on the income maintenance allowance:

$$(16) \quad h_i(T_i - T_{i-1}) \left[ \frac{\rho_i}{E(c_i^0) - E(c_{i-1}^0)} - \varepsilon_i \frac{w_i^1}{(w_i^1 - w_{i-1}^1)(c_i^1 - c_{i-1}^1)} \right] =$$

$$\sum_{j=i}^{1} h_j \left[ (1 - g_j) + \frac{T_j - T_0}{c_j^1 - c_0^1} \eta_j - \frac{T_j - T_0}{E(c_j^0) - E(c_0^0)} \mu_j \right].$$

The outcome of the above is that the optimal changes in the system of income maintenance can be derived by solving I + 3 simultaneous equations that include the social preferences (2), the average budget constraint (net allowance) for a recipient (1), the constraint of the average operational expenditure per recipient at a support center (3) and the conditions for optimal taxation changes (16) (for $i = 1, \ldots, I$), in an equal number of unknowns: $T_0, \ldots, T_I$ plus two normalization variables $\pi$ and $\theta$.

*Calibrating the system*

To perform the simulation, first the values of certain parameters have to be set, and others have to be calibrated (see Table A2 in the Appendix). The simulation itself is based on the families of recipients of income maintenance allowances who were included in the Household Expenditure Surveys for the years 1997 and 1998, a total of 446 observations covering about 77,000 families receiving income maintenance out of a total of some 95,000 actual recipients of the allowance (two-year average).

The share of recipients of the allowance by group of declared income, $h_i$, is endogenous to the system and is determined simultaneously with the tax rates. It must rise with the various elasticities and with the current distribution of recipients' income. In practice these conditions cannot be met simultaneously, so that following Saez (2002) the function of the response of the labor supply to changes in the participation rate in declared employment is defined as

$$h_i = (h_i)_0 \cdot \left[ \frac{c_i^1 - c_0^1}{(c_i^1)_0 - (c_0^1)_0} \right]^{\eta_i} \quad \text{for } i = 1, \ldots, I, \text{ where } (\cdot)_0 \text{ represents the value at the starting point}$$

of the simulation, i.e., prior to the reform in the income maintenance system and $h_0 = 1 - \sum_{j=1}^{I} h_j$.

It thus turns out that changes in the distribution of the income groups resulting from changes in labor input and the extent of income concealment are not taken into consideration. Since the most serious problem of the income maintenance system was the poor participation rate of recipients in the labor market, the response function selected meets the requirements. In addition, empirical findings indicate that the elasticity of the participation rate is much higher than that of the labor supply.

For purposes of the simulation the population of recipients of income maintenance was divided into four groups of income per standard individual (Table A2 in the Appendix). The switch to a standard individual was made because in Israel the variation of family size of recipients of income maintenance is very high, and the allowance (together with child allowance) is intended to raise the families above the poverty line, which is calculated for a standard individual.[10]

The authors are of the opinion that a fair income-maintenance system must satisfy the requirement that the full allowance (including child allowance) per standard individual must be at least at the level of the poverty line. To examine whether the results of the simulation

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[10] In 1997 the poverty line stood at NIS 1,052 a month ($ 305).

fulfill this requirement, the $h_i$ were defined in terms of standard individuals. This definition accordingly changes the meanings of other variables. For example, average allowances per recipient ($G$) become average payments per standard individual.[11]

The average net monthly allowance per standard individual ($G$) in 1997–98 was NIS 723 (at 1997 prices). Average operational expenditure per standard individual ($O$) in support centers to be set up in the country-wide experiment is estimated at NIS 295 (at 1997 prices).

For the parameter $v$, denoting the government's aversion to inequality of income distribution, the following values were chosen: $v = 0.5$, signifying a low position in the scale of priorities, and v = 1 and v = 1.5 indicating stronger preference for more equal income distribution.[12]

The distribution of labor income of recipients of income maintenance comes within a narrower band than that of all households. Hence for the simulation the same labor supply elasticities were chosen for all income groups, which is consistent with the findings of empirical research in this field. Participation elasticity in declared employment with respect to declared disposable income ($\eta$) is 0, 0.5 or 1. Wage elasticity in the such employment with respect to the after-tax rate ($\varepsilon$) is 0, 0.25 or 0.5.[13] No parallel estimates of elasticities with respect to expected undeclared income are available. It is assumed that those elasticities are likely to be slightly higher than the ones mentioned above. Thus the participation elasticity in declared employment with respect to undeclared disposable income ($\mu$) is 0.5 or 1, and the wage elasticity in that market with respect to undeclared disposable income ($\rho$) is 0.5 or 1.[14]

**Results of the simulation**

This section presents and analyses the results of the simulation of the structure of income maintenance under various assumptions about elasticities of participation, labor supply and social preferences regarding inequality of income distribution. The results provide just a general indication of the desired structure, and caution must be exercised not to invest the results with too great significance.

The starting point is that there is no behavioral response with respect to income concealment ($\mu = 0$ and $\rho = 0$) (Table 1).When the wage is inelastic with respect to the disposable tax rate ($\varepsilon = 0$, see the upper part of the table), the full allowance for the unemployed is similar to that which was applicable prior to the reform in the income maintenance system, but the offset rates in the simulation are lower in the lowest income group (up to NIS 772 per month per standard individual), which includes about 90 percent of working recipients of the maintenance allowance. The allowance after the reform is at least one-third lower than the optimal allowance, but the offset rates are similar (between 60 percent and 70 percent). The similarity between the results of the simulation and the structure of income maintenance before and after the reform is not surprising because the slack in the labor market in the last few years makes it difficult for recipients of the allowance (as it does for all employees) to freely choose the extent of work

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[11] Average operational expenditure in a support center per recipient of income maintenance ($O$) depends mainly on the recipient himself, but nonetheless expenses such as child minders—that depend on the composition of the family—can be considered.

[12] When $v = 1.5$ the government, in the social welfare function, assigns a weight to an individual's disposable income 2.25 higher than the weight it ascribes to an individual whose disposable income is twice as large.

[13] Romanov and Zussman (2001) found elasticity of labor input with respect to the disposable tax rate (referred to there as the "elasticity of the disposable wage") of 0.27 among single-parent families and 0.35 among individuals, childless couples, and couples with children where the mother worked.

[14] In equation (15) $\zeta_l$ may be eliminated, and the size of $\rho$ may be estimated.

(full-time, part-time) (Romanov and Zussman, 2001), as does wage inelasticity with respect to the disposable tax rate, in line with the conditions of the simulation above ($\varepsilon = 0$).

**Table 1**
**Optimal Structure of Income Maintenance Allowance, with No Concealment of Income**

| Elasticity of participation | Full allowance (NIS/month per standard individual) | Marginal tax rates (%) by groups of declared income per standard individual (NIS month) | | |
|---|---|---|---|---|
| | | Up to 772 | 773–1,554 | Over 1,555 |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0$ | | | | |
| 0.5 | 820 | 70 | 32 | 185 |
| 1 | 810 | 58 | 16 | 209 |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.25$ | | | | |
| 0 | 540 | −44 | 61 | 98 |
| 0.5 | 600 | −12 | 39 | 98 |
| 1 | 670 | 12 | 23 | 98 |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.5$ | | | | |
| 0 | 610 | −49 | 34 | 93 |
| 0.5 | 700 | 5 | 31 | 95 |
| 1 | 745 | 14 | 23 | 96 |
| Other assumptions: $v = 1$; $\mu = 0$; $\rho = 0$ | | | | |

We now turn to a detailed analysis of the other findings shown in Table 1. It turns out that proposed allowance per standard individual is below the poverty line per standard individual (excluding child allowance, about NIS 916 per month). This is not a surprising result, given that the response function in the simulation takes into account only the participation rate in the labor market (see the section on the calibration of the system above), and a high basic allowance is an obstacle to increasing the participation of unemployed recipients, who constituted about two-thirds of total recipients in the period of the research. Given the budget constraint in the income maintenance system, and bearing in mind the reduced offset rate (detailed below), this result is inevitable.

With regard to tax rates (the allowance offset rates), these are quite low in the lowest income group, and in some cases are negative (i.e., there is a wage subsidy). Although in the system of income maintenance there is a zero offset rate (on disregard income), it applies to a narrow income band: prior to the reform 13 percent or 17 percent of the average wage (no more than NIS 400 per standard individual per month), and after the introduction of the reform 5 percent or 7 percent (see Appendix Table A1). In the proposed system the tax rates rise with income level, with the rates on the medium income group (from NIS 773 to NIS 1,554 per month per standard individual) generally below 40 percent, in contrast to an offset rate of 100 percent (or 60 percent for a single-parent family) in the pre-reform system, or 60–70 percent post-reform. Only in the highest income group does the offset rate approach 100 percent. It should be borne in mind that this applies to a relatively high labor income, about NIS 3,580 for the

breadwinner of an average family, far in excess of the maximum income that gives entitlement to the allowance, so that in effect this means that most of those in that income group leave the system of income maintenance. A rising offset rate of the income maintenance allowance is thus optimal, whereas prior to the reform and after it there was a uniform offset rate.

**Table 2**
**Optimal Structure of Income Maintenance Allowance, with Concealment of Income via Elasticity of Participation**

| Elasticity of participation | Full allowance (NIS/month per standard individual) | Marginal tax rates (%) by groups of declared income per standard individual (NIS month) | | |
|---|---|---|---|---|
| | | Up to 772 | 773–1,554 | Over 1,555 |
| Elasticity of participation with respect to undeclared income: $\mu = 0.5$ | | | | |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.25$ | | | | |
| 0 | 700 | –5 | 35 | 97 |
| 0.5 | 720 | 12 | 23 | 98 |
| 1 | 750 | 16 | 18 | 98 |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.5$ | | | | |
| 0 | 730 | 12 | 26 | 95 |
| 0.5 | 740 | 16 | 21 | 95 |
| 1 | 720 | 14 | 10 | 95 |
| Elasticity of participation with respect to undeclared income: $\mu = 1$ | | | | |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.25$ | | | | |
| 0 | 730 | 14 | 21 | 98 |
| 0.5 | 750 | 21 | 15 | 100 |
| 1 | 770 | 23 | 10 | 100 |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.5$ | | | | |
| 0 | 740 | 21 | 18 | 96 |
| 0.5 | 760 | 23 | 15 | 98 |
| 1 | 745 | 19 | 8 | 96 |
| Other assumptions: $v = 1$; $\rho = 0$ | | | | |

The higher the participation elasticity, the higher the proposed full allowance. This result derives from the fact that people who have high participation elasticity have a strong tendency to enter the labor market, and there is little concern that a generous allowance will dissuade them from doing so.[15] As participation elasticities rise, so do the offset rates in the lowest income group, which contains most working recipients of the allowance. This result arises from the desire to encourage recipients of income maintenance with low participation elasticity to

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[15] It may be thought that the smaller the gap between net labor income plus the offset allowance on the one hand and the full allowance received by the unemployed on the other, the weaker would be the tendency to go out to work. It should be borne in mind that the allowance is determined endogenously, whereas the elasticities of participation are exogenous and depend on basic behavior patterns that are not subject to real fluctuations resulting from changes of a few sheqel in the amount of the allowance.

enter the labor market, even by means of heavily subsidizing their wage. Table 1 shows that the offset rates in the medium income groups also decline as participation elasticity rises.

In general, the more wage elasticity with respect to the disposable tax rate rises, the smaller the offset rates of the allowance. This result is expected, and is consistent with the findings of Saez (2002).

**Table 3**
**Optimal Structure of Income Maintenance Allowance, With Concealment of Income via Elasticity of Hours worked in Declared Employment with Respect to Undeclared Income**

| Elasticity of participation | Full allowance (NIS/month per standard individual) | Marginal tax rates (%) by groups of declared income per standard individual (NIS month) | | |
|---|---|---|---|---|
| | | Up to 772 | 773–1,554 | Over 1,555 |
| Elasticity of hours worked with respect to expected undeclared income: $\rho = 0.5$ | | | | |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.25$ | | | | |
| 0 | 720 | 19 | −9 | 97 |
| 0.5 | 740 | 26 | −15 | 98 |
| 1 | 750 | 23 | −12 | 99 |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.5$ | | | | |
| 0 | 710 | 14 | −5 | 92 |
| 0.5 | 720 | 19 | −7 | 93 |
| 1 | 710 | 18 | −4 | 93 |
| Elasticity of hours worked with respect to expected undeclared income: $\rho = 1$ | | | | |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.25$ | | | | |
| 0 | 730 | 23 | −7 | 96 |
| 0.5 | 740 | 25 | −8 | 99 |
| 1 | 750 | 23 | −8 | 99 |
| Wage elasticity with respect to disposable tax rate: $\varepsilon = 0.5$ | | | | |
| 0 | 710 | 13 | −1 | 88 |
| 0.5 | 720 | 15 | −2 | 91 |
| 1 | 750 | 21 | −7 | 96 |
| Other assumptions: $v = 1$; $\rho = 0$ | | | | |

Table 2 shows the results of the simulation of the income maintenance allowance under the assumption of income concealment, expressed via participation elasticity with respect to expected undeclared income ($\mu$). The findings indicate that the values obtained for both the full allowance and the offset rates are similar to those presented in Table 1 in the case of unitary participation elasticity. This reflects the fact that participation elasticity with respect to expected undeclared income plays a similar role to that played by participation elasticity with respect to expected declared income (see Equation (16)). Table 1 has shown this similarity for participation and labor supply elasticities of 0.5 and 1.0 with respect to declared income, so that the addition of undeclared elasticities reveals the same convergence. Table 2 shows

that the need to subsidize the lowest income group no longer exists, and the offset rates in the medium income groups are lower than those obtained from Table 1.

The structure of income maintenance allowances when income concealment is incorporated via the elasticity of the number of hours worked in declared employment with respect to expected undeclared income ($\rho$) gives rise to the following findings (Table 3): a relatively high full allowance (of more than NIS 700 per month per standard individual); positive low offset rates in the lowest income group; a small subsidy for the medium income group; and almost complete offset in the top income group. This derives from the high weighting ascribed in the simulation to labor supply elasticity with respect to both declared income and expected undeclared income, compared with the weighting ascribed to participation elasticity, all relative to previous simulations. For this very reason too a wage subsidy is given in the medium income group to encourage recipients of income maintenance in the lowest income group — who comprise about two-thirds of total working recipients in the research sample — to increase their labor input.

The stronger the social aversion to income inequality, the higher the full income maintenance allowance paid to the unemployed and the more the offset rates to other beneficiaries rise (Table 4). The reform in the income maintenance system and in other transfer payments reflects changes in social preferences, which is seen in the massive cutback in the welfare state and the extent of income redistribution. The results of the simulation are thus consistent with the structural changes following the reform in the system, i.e., lower allowances and offset rates.

**Table 4**
**Proposed Structure of Income Maintenance Allowance, With Various Assumptions About Social Preferences Regarding Inequality of Income Distribution**

| Elasticity of participation | Full allowance (NIS/month per standard individual) | Marginal tax rates (%) by groups of declared income per standard individual (NIS month) | | |
|---|---|---|---|---|
| | | Up to 772 | 773–1,554 | Over 1,555 |
| Low aversion to income inequality: $\upsilon = 0.5$ | | | | |
| 0.5 | 500 | –21 | 45 | 98 |
| 1 | 520 | 16 | 19 | 98 |
| Medium aversion to income inequality: $\upsilon = 1$ | | | | |
| 0.5 | 600 | –12 | 39 | 98 |
| 1 | 670 | 12 | 23 | 98 |
| High aversion to income inequality: $\upsilon = 1.5$ | | | | |
| 0.5 | 830 | 56 | 96 | 101 |
| 1 | 820 | 42 | 65 | 100 |
| Other assumptions: $\varepsilon = 0.25$; $\mu = 0$; $\rho = 0$ | | | | |

5. SUMMARY

The system of income maintenance in Israel that prevailed until the reform introduced in 2003 constituted negative incentives to participate in the labor market and to increase the labor supply of working income maintenance recipients: the allowance was generous and labor-income offset rates were very high. Together these contributed to the rates of concealment of income from the social security authority, which are high by any standards. In addition to these factors, the reform sharply reduced both the allowance and the offset rates (although the disregard income level was also lowered), and the number of recipients subject to the employment test was extended.

This paper performed a simulation of the optimal structure of the income maintenance allowance taking into consideration social preferences regarding the inequality of the distribution of income and labor supply elasticity (the extensive and intensive margin of response). The basis is similar to the model in Saez (2002), with an extension that takes into account the operation of Integrative Employment Support Centers and the possibility of fraud by income maintenance recipients. The assumptions underlying the simulation are that total outlay on income maintenance allowances will remain unchanged, and that support centers for recipients of the allowances will play a pivotal role in enforcement of the employment test. The simulation was calibrated to the data of the Household Expenditure Surveys for 1997 and 1998 and the elasticities reported in the economics literature.

The results of the simulation indicate that an allowance that encourages an increase in the labor supply must be relatively low, as must be the offset rates. The optimal allowance is close to that prevailing prior to the 2003 reform and far higher than that after the reform. The optimal offset rates rise with labor income, and low-earning recipients of income maintenance may be subsidized. Both before and even after the reform the rates were/are higher than the optimal and are flat throughout the whole range of relevant labor income. Moreover, contrary to what should have happened, the disregard level was reduced. Nevertheless, in 2003 a special program was instituted to subsidize the wage of single parents who receive income maintenance.

The simulation indicates that the reform is consistent with a decrease in aversion to income inequality. As a result the allowance was lowered to below the poverty line, among other reasons because the reform was introduced as part of a fiscal consolidation package.

APENDIX

**Table A1**
**Structure of Income Maintenance Allowance by Family Composition, Prior to the Reform of 2003 and Following the Reform**[a]

| Family composition | Disregard[b] Before | Disregard[b] After | Normal rate Allowance[b] Before | Normal rate Allowance[b] After | Normal rate Offset rate (%) Before | Normal rate Offset rate (%) After | Special rate[c] Allowance[b] Before | Special rate[c] Allowance[b] After | Special rate[c] Offset rate (%) Before | Special rate[c] Offset rate (%) After |
|---|---|---|---|---|---|---|---|---|---|---|
| Single | 13 | 5 | 20.0 | 20.0 | 100.0 | 70.0 | 25.0 | 22.5 | 100.0 | 67.5 |
| Single parent and child | 17 | 7 | | | | | 42.5 | 33.5 | 60.0 | 60.0 |
| Single parent and at least two children | 17 | 7 | | | | | 52.5 | 37.5 | 60.0 | 60.0 |
| Couple | 17 | 7 | 30.0 | 27.5 | 100.0 | 70.0 | 37.5 | 30.0 | 100.0 | 67.5 |
| Couple and one child | 17 | 7 | 36.0 | 30.0 | 100.0 | 67.5 | 43.5 | 33.5 | 100.0 | 67.5 |
| Couple and at least two children | 17 | 7 | 42.0 | 33.5 | 100.0 | 62.5 | 49.5 | 39.0 | 100.0 | 62.5 |

[a] The reform does not apply to those aged 55 and over.

[b] The average wage in 2002 was about NIS 7,000 (or $ 1,500).

[c] Until the reform, a higher allowance was paid those aged 46 or over, to new immigrants under certain conditions and to anyone who had been receiving the allowance for 24 months. With the reform, the special rate allowance was abolished for new recipients of income maintenance. Single parents are entitled to a special, higher allowance.

SOURCE: National Insurance Institute.

**Table A2**
**Monthly Income for Standard Individual Among Recipients of Income Maintenance, by Groups of Declared Labor Income per Standard Individual**

(NIS)

| Income group | Frequency (%) | Average declared income | Average undeclared income[a] | Average allowance | Average number of standard individuals |
|---|---|---|---|---|---|
| Unemployed | 68.4 | 0 | 350 | 815 | 2.37 |
| Up to 772 | 22.8 | 438 | 150 | 557 | 2.68 |
| 773–1,544 | 8.3 | 1,039 | 176 | 455 | 1.88 |
| Above 1,545 | 0.5 | 1,672 | 78 | 221 | 2.00 |

[a] For the method of calculating the estimates of undeclared income see Romanov and Zussman (2001). The estimate for unemployed recipients of income maintenance is an informed guesstimate.

SOURCE: Based on Houshold Expenditure Survey 1997 and 1998.

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