Optimal Policy of Minimum Wage and Earned Income Tax Credit

Abstract

The main purpose of this study is to explore the effects of MW and EITC on the learning and training, employment, and income of younger (18-50) and older (50-65) workers. We present a theoretical framework as well as a simulation of the impact of MW and EITC on training, employment and equality. The results reveal that the optimal social policy would be to use both MW and EITC, with a high level of the MW for the younger group and a low MW rate for the older group, with EITC being applied only to the older group.

Key words: minimum wage (MW), earned income tax credit (EITC), learning, training.

1. Introduction

Policies of minimum wage (MW) and earned income tax credit (EITC) not only affect wage rates and employment but also have a considerable impact on learning and training. Ability to learn and to be trained depends on various individual properties, one of the crucial ones being age. It is well known that younger people have a greater ability to learn than older people, and that younger people can derive higher benefits from this learning. Therefore, the impact of social policy such as MW and EITC on younger workers may be completely different than the impact on older ones. However, a universal social policy that is applied to the entire population may have a serious adverse impact on one of these groups. These considerations lead us to propose a selective social policy where each age group is subject to a different combination of MW and EITC.

Our study presents a theoretical framework of the impact of MW and EITC on training and learning, and its impact on employment, production, and income distribution. We emphasize in the paper that the results of each policy differ significantly between two possible groups of people: younger and older. Hence, we show that the optimal social policy is to use both MW and EITC such that the level of the MW rate for the younger group is high, while the rate for the older group is low, with EITC being applied only to the older group. This policy is optimal as it raises the level of learning and training, minimizes the negative effect of MW on employment, and secures fair income for the entire population without an unreasonable burden on the government budget.

Following Agell and Lommerud (1997), we assume that each individual faces a problematic decision on two main issues: how much learning and training to acquire, and whether to join the workforce. The decision depends on individual factors (such as ability to learn, age, etc.) and labor market conditions (such as wage rates for various jobs and requirements in terms of level of education). Both MW policy and EITC policy affect the labor market conditions and therefore may change individual decisions regarding learning and employment. As the individual decision varies according to his/her age, it turns out that MW and EITC have different effects on each age group. This difference leads us to propose a different combination of MW and EITC for each age group.

In our model we assume that the labor market is not perfectly competitive, and actual wage rates are the result of a bargaining process. MW policy may affect the bargaining power of the players and the equilibrium wage rates. In addition, we deal with learning and professional training which stems from long-term considerations; therefore, we necessarily emphasize the impact of MW and EITC in the long run.

Many studies have dealt with MW, where the main issue is its impact on several economic variables such as employment, inequality in income distribution, learning and

professional training, and accumulation of human capital. However, it turns out that there is a great deal of disagreement on the direction of the impact as well as its magnitude.

One of the important factors that is considered in these studies is the impact of MW on employment, and one of the main arguments against the imposition of MW is its negative impact on employment (see Deer, Murphy, & Welch, 1995; Neumark & Wascher, 1992). Their argument is that MW raises employers' wage expenditure on labor, and that decreasing the number of employees may be essential for the firm. The decrease in employment would be especially high in the tradable industries where the production facilities can be transferred to other countries with lower wages. However, there are other studies that found positive relation between MW and employment. The most prominent one is by Card and Krueger (1994) who investigated youth employment in the fast food industry. The OECD employment outlook (1998) finds no significant relation between the MW and employment in various EU countries. It is important to note that all of the above studies considered the short-run impact upon employment. Our paper emphasizes the long-run impact of MW on employment, where the labor force may change its professional level by learning and training.

The impact of MW on income inequality is also ambiguous. For example, OECD (1998) and Freeman (1996) found that MW law may reduce the disparity in income distribution. However, Neumark and Wascher (1997) found that MW may raise the incidence of poverty, and that it would also make the disparity in income distribution greater.

Imposition of MW may affect the individual's decision regard training and learning. Arulampalam et al. (2004) and Pischke (2004) considered the impact of MW on on-the-job training, and found it to be positive. The impact of MW on learning was considered by Mattila (1978) and Cahuc and Michel (1996)**,** who found a positive correlation between education and MW. However, Neumark and Wascher (2003) found that higher MW would increase the probability of school dropout among younger individuals.

EITC is an alternative policy to reduce poverty and unemployment. Although most of the studies found that EITC increases employment (see, for example, Blundel & Hoynes, 2001), other studies (for example, Eissa & Hoynes, 2004) found that the impact of EITC on employment depends on the specific rules of this law. For example, if a family is eligible for EITC when just one of its members is employed, then EITC may create a negative incentive to work.

This paper has been organized into four sections. The next section introduces a theoretical model of MW and EITC. Section three presents a simulation and its results. Concluding remarks and policy recommendations are presented in the final section.

2. The Model

Each individual has to make two decisions: the first is whether to be employed or to stay out of the work force, and the second regards his/her desired professional level and how much to invest in learning and training. These decisions are not independent; the individual's optimal decision is affected by personal factors as well as by the situation in the labor market. One of the more important factors is his/her age; it is well known that younger people can learn more easily than older people, and that younger people will receive their reward from education for a longer period of time than older people. Therefore, learning and training is relevant for younger people and almost not relevant for older people. Thus, we divide the entire population into two groups: younger individuals (those who are under 50 years of age) and older individuals (who are older than 50 but have not reached retirement age). The distinction between the two groups is according to their ability to learn and to be trained: younger workers are able to raise their professional level by learning and training, while older workers cannot change their professional level. From now on we will consider each group separately.

2.1 The labor market model: assumptions and notations

The professional level of an individual (e_i) is determined by his/her investment in learning and training. Younger workers can raise it by investing time and money in training and learning, but older people can not change their professional level. The value of worker's output (y_i) is a function of his/her professional level. For simplicity, we assume that: $y_i = e_i$.

e^l denotes a threshold of professional level such that only workers with a professional level higher than that threshold can be employed. w_i denotes the worker wage. The ratio between the wage and the worker's output is determined by the level of competitiveness in the labor market. We assume that the labor market is not perfectly competitive and that the wage rate is determined in a bargaining process between the employer and his/her employee. The outcome of the bargaining process is a ratio λ such that the wage rate satisfies $w_i = \lambda e_i$ (we assume that λ equal for all the workers and $\lambda \leq 1$).

The assumptions and notations regarding training and learning are as follows: each individual has a different characteristic μ_i which determines is ability to learn and to be trained. Younger individuals can achieve a professional level e_i by investing $0.5\frac{1}{\mu_i}e_i^2$. Older individuals have their own professional level e_i which cannot be changed by training.
B denotes the utility of the unemployed individual and it contains the value of leisure and income from other sources (such as unemployment benefits, savings, etc.). The utility of unemployed older workers (B_S) may differ from that of younger people (B). The variables $w_i, B, y_{i,}$ are actually the present value of income from wages, utility of the unemployed person, and output.

2.2 Individuals' decisions regarding working and training

2.2.1 Older workers

The professional level of older people is given and fixed, and bounds between two values: $[e_0, e_1]$. An older individual maximizes his/her utility by choosing either to work or to stay out of the work force. That is:

(1) $\max_{L} U_i = Lw_i + (1-L)B_S$

The value of L is 1 if the individual decides to work and 0 otherwise. By assumption, the labor market is not perfectly competitive and $w_i = \lambda e_i$ where $\lambda \leq 1$. Thus the older individual decides to work if $\lambda e_i \geq B_S$, which is satisfied when his/her professional level satisfies $\frac{B_S}{\lambda} \leq e_i$ (subject to the condition $e^l \leq e_i$).

2.2.2 Younger workers

Following Agell and Lommerud (1997), we assume that in order to maximize utility a younger individual first sets the level of training that maximizes his/her returns from work, and then compares it to the alternative option of not working. Each individual determines his or her professional level e_i by investing in training. The cost of training to achieve a professional level of e_i is $0.5\frac{1}{\mu_i}e_i^2$ where μ_i is the individual's ability to learn and train. The individual maximizes the following utility function:

(2) $\max_{e_i, L} U = L(w_i - 0.5 * \frac{1}{\mu_i} e_i^2) + (1-L)B$

The value of the utility of an individual who works (L=1) is: $0.5 * \lambda^2 \mu_i$ while one who stays out of work receives a utility level of B. Therefore, an individual works if his/her

parameter of ability satisfies $\mu_i \geq \frac{2B}{\lambda^2}$. An individual whose ability satisfies $\mu_i < \frac{2B}{\lambda^2}$ does not work and chooses the lowest possible professional level ($e_i = 0$).

2.3 The impact of MW on individual decisions

First, let us consider the impact of MW upon the gap between the worker product and his/her wage rate (λ). As mentioned earlier, λ is determined by a bargaining process between the employee and the employer, and the outcome of this process depends on the worker's alternatives (such as alternative employment possibilities and availability of other sources of income) on one hand and the employer's alternatives (such as moving production to other countries) on the other hand. Fewer alternatives for workers and more possibilities for the employer lead to a smaller ratio λ . Imposition of MW changes the alternatives of the two sides and may change the outcome of the bargaining as well. Let w_m be the level of the newly imposed MW.

There is no change in wage rates which are above the new MW rate (no change in w_i if $w_i = \lambda e_i > w_m$). Workers with wage rate w_i that satisfies $\lambda w_m < w_i = \lambda e_i < w_m$ continue to be employed and will receive the minimum wage (λ becomes smaller). This outcome is based on the impact of MW on the equilibrium wage rate according to the Nash bargaining model, where setting a MW increases the bargaining power of the workers in the vicinity of the MW (see Flinn, 2002).

2.3.1 The impact of MW on older workers

The scope of employment would decreases for a MW level which satisfies $w_m > \frac{B_S}{\lambda}$. Only workers with a professional level that satisfies $e_i > w_m$ are employed. Workers with a professional level in the following range $\frac{B_S}{\lambda} < e_i < w_m$ will be laid off.

Setting the MW level so that $B_S < w_m < \frac{B_S}{\lambda}$ raises the rate of employment; therefore, any worker with a professional level $\frac{B_S}{\lambda} > e_i > w_m$ will be employed, while previously – before the imposition of the MW – he/she preferred to be unemployed. This result stems from the fact that the MW increases the bargaining power of the workers and thus some individuals with a professional level in the relevant vicinity of the MW can achieve a higher wage rate which increase the incentive to go to work. Actually, the wage rate of workers in that vicinity is equal to the MW rate.

2.3.2 *The impact of MW on younger workers*

Introduction of MW may change the decision of younger individuals regarding training. A younger worker who faces possible lay off may raise his/her professional level by increasing investment in learning and training in order to avoid the layoff. A younger worker maximizes the following utility function:

$$\max_{e_i, L} U = L(\max(\lambda\, e_i - 0.5\frac{1}{\mu_i} e_i^{\,2}), (w_m - \frac{1}{2\mu_i} w_m^{\,2})) + (1-L)B \quad (3)$$

A MW regime changes the structure of the utility function because now, in addition to the previous decision problem (the choice between employment and unemployment), the individual faces an additional problem: whether to stick to the MW rate or to aim at a higher wage rate. The first expression $(\lambda\, e_i - 0.5\frac{1}{\mu_i} e_i^{\,2})$ is the utility of a younger worker who chooses a high wage rate relative to the MW rate.

The second expression $(w_m - \frac{1}{2\mu_i} w_m^{\,2})$ is the utility for a younger worker who chooses to work and to receive the MW rate. The third expression (B) is the utility of an individual who stays out of the work force.

Maximization of the above utility function gives us the following results:

a. Individuals whose ability satisfies $\mu_i > \bar{\mu}$ where $\bar{\mu} = \frac{w_m(1+\sqrt{1-\lambda^2})}{\lambda^2})$ do not change their behavior as a result of imposed MW.

b. Individuals whose that satisfies $\mu_i < \underline{\mu}$ where $\underline{\mu} = \frac{{w_m}^2}{2(w_m - B)}$ choose to be unemployed.

c. Individuals whose ability satisfies $\frac{w_m^2}{2(w_m - B)} \le \mu_i \le \frac{w_m(1+\sqrt{1-\lambda^2})}{\lambda^2})$ choose to work and to receive the MW rate, and to invest in learning the minimal amount required in order to be employable. Their cost of training would be $\frac{1}{2\mu_i}{w_m}^2$ and their professional level is $e_m = w_m$.

d. Individuals whose ability is $\mu_m = \frac{w_m}{\lambda}$ do not change their pre WM professional level.

Previously, they chose the following professional level: $e_i = \lambda\ \mu_i$ (and thus $e_m = w_m$) and their wage rate is: $w_m * \lambda$. After imposing the MW their wage rate rises to the MW rate while their professional level is unchanged.

Imposing MW law causes the following changes in the professional level of the public:

I. For a MW rate such that $w_m > \frac{2B(1+\sqrt{1-\lambda^2})}{\lambda^2}$:

Note that in this case $\frac{2B}{\lambda^2} < \frac{{w_m}^2}{2(w_m - B)}$

Therefore, employment decreases as any individual that his/her ability satisfies $\frac{2B}{\lambda^2} < \mu_i < \frac{{w_m}^2}{2(w_m - B)}$ is laid off.

The change in the scope of training is affected by several factors: workers whose ability is in the following range $\frac{w_m^2}{2(w_m - B)} < \mu_i < \frac{w_m}{\lambda}$ increase their training so that their professional level will be equal to the MW rate in order to be employable. But, workers whose ability is in the range: $\frac{w_m}{\lambda} < \mu_i < \frac{w_m(1+\sqrt{1-\lambda^2})}{\lambda^2}$ decrease their training so that their professional level is w_m (this stems from the fact that a marginal addition of training does not increase their wage).

II. For a MW rate that fulfills $w_m < \frac{2B(1+\sqrt{1-\lambda^2})}{\lambda^2}$

In this case $\frac{2B}{\lambda^2} > \frac{w_m{}^2}{2(w_m - B)}$ and imposing MW increases employment as any individual with ability in the range: $\frac{2B}{\lambda^2} > \mu_i > \frac{w_m{}^2}{2(w_m - B)}$ joins the working group. These workers increase their training as well (in the pre MW period their training was minimal). Workers whose ability satisfies $\frac{2B}{\lambda^2} < \mu_i < \frac{w_{\min}}{\lambda}$ increase their training level as well (in order to stay at work they should increase their professional level). Workers whose ability satisfies $\frac{w_{\min}}{\lambda} < \mu_i < \frac{w_{\min}(1+\sqrt{1-\lambda^2})}{\lambda^2})$ decrease their training, as they are not compensated for additional training.

In summary, employment of younger individuals also increases the number of those who seek training. However the direction of the change in the total scope of training depends on the specific parameters of the model.

2.3.3 The impact of raising the MW rate on employment and professional level

In most of the western countries MW policy already exists, and the debate concentrates upon changing its rate. In this section we emphasize the impact of raising the MW rate on an employment and professional level.

Let m_1 be the current level of MW and the government considers raising it to m_2 $(m_2 > m_1)$.

Raising the MW rate causes the following changes:

$\bar{\mu}_{m2} > \bar{\mu}_{m1}$

$e_{m2} > e_{m1}$

However, the change in $\underline{\mu}_{m2}$ depends upon the new level of the MW. For MW that is higher then 2B we get: $\underline{\mu}_{m2} > \underline{\mu}_{m1}$ but for MW that is lower than 2B we get: $\underline{\mu}_{m2} < \underline{\mu}_{m1}$.

In the light of those results we can see that the impact upon the number of employees depends upon the initial level of the MW rate.

If $w_{m1} > 2B$ then a small increase in the MW rate reduces employment, as any individual with ability in this range: $\underline{\mu}_{m2} \geq \mu_i \geq \underline{\mu}_{m1}$ will be laid off.

The changes in the total training for a small rise of the MW rate are:

1. Workers with abilities $\underline{\mu}_{m1} \leq \mu_i \leq \underline{\mu}_{m2}$ decrease their training to minimum.
2. Workers with abilities $\underline{\mu}_{m2} \leq \mu_i \leq \bar{\mu}_{m1}$ increase their training level from w_{m1} to w_{m2}.
3. Workers with abilities $\bar{\mu}_{m1} \leq \mu_i \leq \bar{\mu}_{m2}$ decrease their training level from $e_i = \lambda\ \mu_i$ to w_{m2}.

For $w_{m2} < 2B$ a marginal increase in the MW raises employment, as workers whose level of training satisfies $\underline{\mu}_{m1} \geq \mu_i \geq \underline{\mu}_{m2}$ join the labor market (previously, they preferred to be unemployed).

The changes in the total training are as follows:

1. Individuals with abilities $\underline{\mu}_{m2} \le \mu_i \le \underline{\mu}_{m1}$ increase their training from 0 to w_{m2}.
2. Individuals with abilities $\underline{\mu}_{m1} \le \mu_i \le \overline{\mu}_{m1}$ increase their training from w_{m1} to w_{m2}.
3. Individual with abilities $\overline{\mu}_{m1} \le \mu_i \le \overline{\mu}_{m2}$ decrease their training level from $e_i = \lambda\ \mu_i$ to w_{m2}.
4. Those with ability higher than $\overline{\mu}_{m2}$ are not affected by the change in the MW rate.

In summary, the impact of a MW rate rise on employment, training, and professional level depends on the initial level of the MW rate, the distribution of individuals' ability, and other parameters as well.

2.4 EITC

In this section we investigate the impact of EITC, which is assumed to be identical to a subsidy to a worker. For simplicity, we assume that the method of EITC is as follows: when the wage rate paid by a employee is less than w_m the government pays the worker an amount which is equal to the difference between the MW rate and the actual wage[1] $(w_m - w_i)$, such that the worker's total income is equal to the MW rate w_m.

2.4.1 The impact of EITC on older workers

Older individual decide to work if $e_i > e^l$, where e^l is the lowest professional level that is required by employers. Implementation of EITC increases the number of older employees due to our assumption that the MW rate is higher than the lowest wage that previously prevailed.

[1] The basic important results would be in the same direction even if we choose a complex EITC system.

2.4.2 The impact of EITC on younger workers

Now each younger worker should choose whether to stick to the same professional level, or to prefer a lower professional level, a lower wage rate, and supplemental income from the EITC. The latter alternative saves part of the individual's cost of training.

Mathematically, the worker maximizes the following utility function:

$$\max_{e_i, L} U = L(\max(\lambda\ e_i - 0.5\frac{1}{\mu_i}e_i^{\,2}), (\lambda e_i + w_{\min} - \lambda e_i - \frac{1}{2\mu_i}e_i^{\,2})) + (1-L)B$$

An individual who prefers to receive the supplement from the EITC chooses the minimal level of professional training (e^l). Therefore, we can rewrite the maximization problem as follows:

$$\max_{e_i, L} U = L(\max(0.5 * \lambda^2 \mu_i), (w_m - \frac{1}{2\mu_i}(e^l)^2)) + (1-L)B \quad (4)$$

Solving the maximization problem gives us the following results:

I. Workers whose ability is $\mu_i > \overline{\mu}$ where $\overline{\mu} = \frac{w_m + \sqrt{w_m^2 - \lambda^2 (e^l)^2}}{\lambda^2}$ do not change their decision as a consequence of imposing the EITC.

II. Workers whose ability is $\underline{\mu} > \mu_i$ where $\underline{\mu} = \frac{(e^l)^2}{2(w_m - B)}$ choose to stay out of the labor force. Therefore, the number of employees increases, so that all individuals with ability that satisfies $\mu_i > \underline{\mu}$ are employed.

III. Workers with ability that fulfill $\underline{\mu} \le \mu_i \le \overline{\mu}$ prefer to work in the lowest professional level (e^l) necessary to get a job.

In summary, implementation of an effective EITC policy leads to the following changes:

a. Employment increases as individuals with ability $\underline{\mu} \le \mu_i \le \frac{2B}{\lambda^2}$ join the work force.

b. The change in the professional level consists of two factors: individuals who join the working group must raise their professional level; there is a decrease in the professional level for workers who choose the minimal level (workers whose ability satisfies $\frac{2B}{\lambda^2} \le \mu_i \le \overline{\mu}$).

The total change in the professional level of the workers depends on the values of the parameters of the model. For parameters with reasonable value, EITC leads to a decrease in the total professional training, and even to a decrease in the total product of the economy.[2]

2.5 *Interim conclusions*

Social and economic policies are assessed according to three main criteria: level of total output, employment and poverty and income distribution. A serious drawback of universal MW policy is that it causes high unemployment rate among the older group, while universal EITC has a serious drawbacks because it reduces investment in learning and training. An optimal policy consists of differential MW and EITC, such that MW is applied to the younger group and EITC is relevant for the older group. This mix of MW and EITC may achieve the three goals mentioned above. MW in a certain margin for the younger workers increases employment, training, and output growth on one hand, and reduces inequality on the other hand. EITC for the older workers increases employment among those workers and contributes to economic growth and a reduction of poverty incidence in this age group. A universal MW policy is inefficient and can severely harm the employment among older workers as they are not able to adjust their professional level to the new situation. EITC

[2] We ignore the tax burden of EITC, and it is reasonable to assume that the positive impact of EITC on production will be offset by the negative effect of the tax burden on the economy.

for younger workers diminishes the incentive for training and therefore may reduce the rate of economic growth.

3. A Simulation

We performed a simulation in order to present the outcome of various possible social policies. The theoretical model of Section 2 shows that some policies create complex results regarding the impact on employment, training and income distribution. The simulation gives us insight on the direction and magnitude of these changes, as well as provides sensitivity analysis regarding the parameters of the economy.

In this simulation, we applied various combinations of social policy (MW and EITC) to a set of individuals, based on the Israel Income Survey of 2004 (Central Bureau of Statistics, 2006). In 2004 a MW policy was effective with a MW rate of IS 3,300. The simulation was performed by applying the results from the previous section to the data set, and for various values of B (the level of utility of an unemployed person) and λ (the outcome of the bargaining process). We set the number of individuals in each group according to the Income Survey. In addition, we assumed that the younger individuals' ability (μ_i) and the older individuals' professional level (e_i), are uniformly distributed. We tested the following policies: several levels of MW and EITC and several cases of a mixture of MW and EITC. All results were compared to the base situation where no social policy was imposed in the labor market. Table 1 presents some of the simulation results.

Insert Table 1 here

The main consequences of these simulations are as follow (see Table 1):

1. Raising the MW rate up to certain level increases employment among younger workers. Raising the rate above that level reduces employment of younger workers (see also Figure 1).

Insert Figure 1 here

2. MW policy severely cuts employment of older workers. It should be kept in mind that it is difficult for older unemployed individuals to find a job (see, for example, Toledano 1988). Therefore, imposition of MW on older workers causes a severe loss of output as well.
3. Raising the MW rate up to certain level increases the professional level of younger workers. An additional rise of the rate lowers the professional level of those workers (see also Figure 2).

Insert Figure 2 here

4. EITC policy increases employment, but hurts the professional level of younger workers. It turns out that this policy may reduce the total product of the economy. Moreover, the financial burden EITC as a ratio of the total product is very high and can cause severe economic drawbacks.
5. A social policy which includes MW for the younger population and EITC for the older population may achieve important positive results: high employment and a higher professional level in younger workers, a low rate of unemployment among the older population, and a reasonable financial burden of the EITC (see Figures 1 and 2). This burden can be lower than the one presented in Table 1 when the expected reduction in the transfer payments to the older population is included.
6. A very high MW rate hurts economic performance by lowering the professional level and decreasing total product (see Figures 1, 2 and 3).

Insert Figure 3 here

7. The impact of MW and EITC on income distribution can be detected by considering the Gini index. The Gini index is estimated by using only income from wages, and ignoring income from other sources (we assume zero income for the unemployed). It can be seen

in Table 1 that when universal MW is applied, raising its rate up to a certain level reduces the Gini index, which means less inequality in income distribution. The direction of the effect is reversed when the MW rate is higher than this level. EITC policy effectively improves the income distribution, but the very high financial burden is dangerous to the economy. A policy which is a mix of MW for younger people and EITC for older people is very effective in inequality reduction, while keeping the financial burden of the policy at a reasonable level.

4. Concluding Remarks

This paper presented an innovative approach to assessing social policies of MW and EITC, by allowing differentiation between younger and older workers. Our model emphasizes the importance of learning and training. We consider it as endogenous variable, and utilize it to distinguish between older and younger individuals. The model analyzes policies of MW and EITC by considering their impact on employment, product, and inequality in income distribution of the two groups. The model leads us to the conclusion that imposing MW on older workers severely reduces their employment rate and their product as well. However, the model indicates that imposing MW on younger workers can increase training and learning, employment, and total product of these workers. Imposing a MW sets a threshold of professional training that is required to get a job. Increasing the MW rate is an incentive for younger workers who have a low level of productivity to increase their investment in learning and training. On one hand the return on education increases in the relevant range, and on the other hand the alternative cost of training is reduced for the low productivity workers, because without the additional training the worker will be unemployed. In addition, raising the MW rate actually raises the wage rate for workers at a low professional level. This higher wage rate attracts some individuals who were out of work to

change their decision and to choose employment over unemployment. In summary, imposing MW on younger workers can lead to desirable results in terms of training, employment and income distribution. However, it can severely harm the older workers – not only from the worker's point of view but also from the point of view of the economy.

EITC policy was found to be an efficient tool for increasing employment; however, it has a severe negative impact on learning and training, causing the rate of growth of the economy to decline. In addition, the financial burden of EITC policy can be devastating: the cost of a universal EITC can amount to about 40% of the total product of the workers.

EITC reduces the incentive to training of younger workers and some workers may choose a low level of training and a low professional level, and also to count on the additional income to be provided by the government. Therefore, our recommendation is that EITC policy should not be applied to younger workers. EITC policy has no such negative impact on older workers' training, as their professional level is fixed. Thus, the main impact of EITC is to increase employment of older workers. We recommend that EITC policy be complemented by a low MW rate which will limit the possibility of wage reduction by employers.

Taking into account the various positive and negative effects of MW and EITC policies have led us to the conclusion that the optimal social policy to achieve the preferred objectives in employment, growth, training, and equality of income distribution is to apply EITC to older workers only, and to apply MW to younger workers. Our simulations showed that this policy achieved the best results in terms of employment, training, growth and equality, and that its financial burden is reasonable.

This social policy may compel the substitution of younger workers (who have a higher MW) with older workers (whose MW is lower), making it possible for traditional factories to continue their domestic production. Subsidizing older workers can be efficient

from the point of view of the economy, as it motivates unemployed older workers to join the work force and thus to increase the total product of the economy. In addition, the move from unemployment into employment saves the government the cost of unemployment benefits and other payments to the poor.

A necessary condition for the validity of our conclusions is the availability of efficient systems of learning and training. Due to the present lack of such systems, we urge the government to intervene in the area of training and education.

Summary of policy recommendations:

1. To impose a MW policy on younger workers only.
2. To impose EITC policy on older workers, to be supplemented by a low MW rate.
3. To adjust the rates of the MW and EITC so that the minimal income of younger workers and older workers will be equal. For example, if the MW rate for younger worker is $1000 and for older worker $700 the EITC should supplement the older worker by $300.
4. The government should set up a system of unemployment benefits that encourages the unemployed to invest in learning and training.
5. The government should take care of failures and inefficiencies in the industry of learning and professional training, and ensure its greater availability and accessibility.

Recommendations for further research:

In our model an individual changes his/her status from "young" into "old" in a very abrupt way. It is reasonable to propose a gradual transition from the younger group into the older group. In addition, we performed the simulation for a couple of values of λ (the outcome of the bargaining process) which are crucial for our analysis. Further research is

required to obtain more reliable estimations of λ. Finally, a more profound suggestion would be to extend the model to a general equilibrium model in which two additional impacts are endogenized: the first one is the substitution of younger workers for older workers in low skilled jobs, and the second is the tax burden of financing the EITC .

References

Agell, J., & Lommerud, K.E., (1997). Minimum wages and the incentives for skill formation. *Journal of Public Economics, 64, 25-40.*

Arulampalam, W., Booth, A.L., & Bryan, M.L., (2004). Training and The New Minimum Wage. *The Economic Journal, 114, 87-94.*

Blundel, R., & Hoynes, H., (2001). Has "in-work" benefit reform helped the labor market?, *NBER Working Paper No. 8546.*

Card, D. & Krueger, A.B., (1994). Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *American Economic Review*, 84(4), 772-793.

Cahuc, P., & Michel, P., (1996). Minimum Wage Unemployment and Growth. *European Economic Review, 40,* 1463-1482.

Central Bureau of Statistics, (2006). *Income Survey 2004*, Jerusalem.

Deer, D., Murphy, K.M., & Welch, F., (1995). Reexamining Methods of Estimating Minimum-Wage Effects Employment and the 1990-1991 Minimum-Wage Hike. *The American Economic Review, 85(2), Papers and Proceedings of the Hundredth and Seventh Annual Meeting of the American Economic Association Washington, DC, January 6-8, 1995, 232-237.*

Eissa, N., & Hoynes, H.W., (1999). The Earned Income Tax Credit and The Labor Supply of Married Couples. *Institute of Research on Poverty*. *Discussion Paper no.1194.*

Flinn, C.J., (2002). Interpreting Minimum Wage Effects on Wage Distributions: A Cautionary Tale. *Annales d'Économie et de Statistique,* 67-68, 309-355.

Freeman, R.B., (1996). Policy Forum: Economic Aspects of Minimum Wages The Minimum Wage as a Redistributive Tool. *The Economic Journal*, 106(436), 639-649.

Israel central bureau of statistics, Income Survey 2004.

Mattila, J.P., (1978). Youth Labor Markets, Enrolments, and Minimum Wages. *Proceedings of the Thirty-First Annual Meeting, Industrial Relations Research Association Series, 134-40.*

Neumark, D., & Wascher, N., (1992). Employment Effects of Minimum and Subminimum Wages: Panel Data on State Minimum Wage Laws. *Industrial and Labor Relations Review,* 46(1), 55-81.

Neumark, D., and Wascher, W., (1997). Do Minimum Wages Fight Poverty?. *NBER Working Paper No. W6127. Available at SSRN: http://ssrn.com/abstract=225892*

Neumark, D., & Wascher, W., (2003). Minimum Wages and Skill Acquisition: Another Look At Schooling Effects. *Economic of Education Review, 22, 1-10.*

OECD Employment Outlook (1998). Towards an employment-centered social policy, Chapter 2.

Toledano, E., (1988). Receivers of unemployment allowances. *The National Insurance Institution, Jerusalem (in Hebrew).*

Figure 1: MW and Total Employment[3]

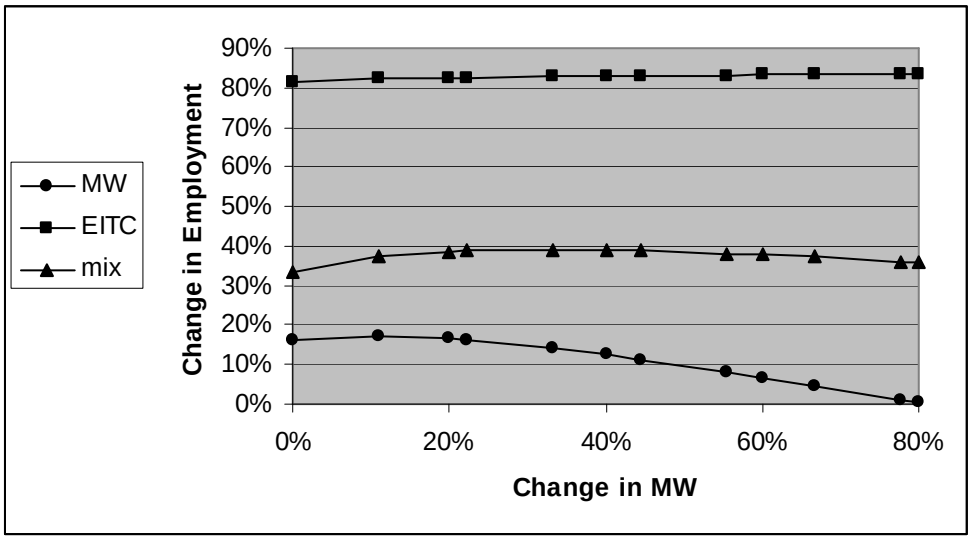
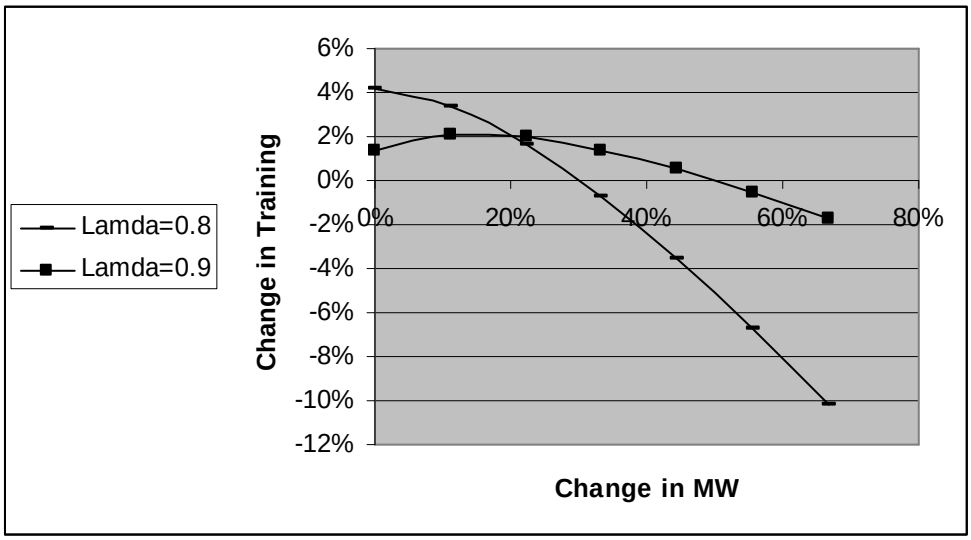


Figure 2: MW and Training



[3] The negative impact of the financial burden on employment is ignored.

Figure 3: MW and Total Product

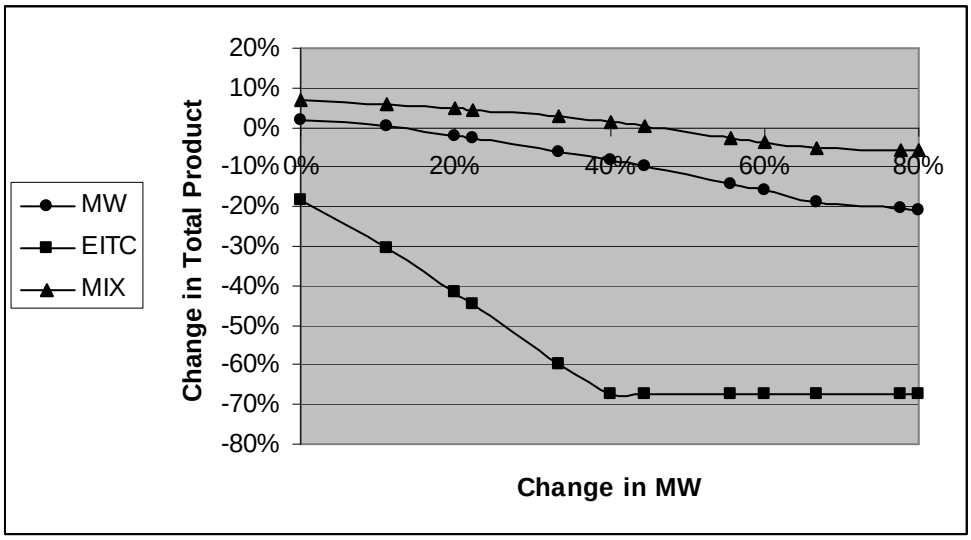


Table 1: Different policies results for: $\lambda = 0.8,\ \ B = 30,\ \ e^{l} = 10$ and initial level of MW= 45.

Minimum Wage	**EITC**	Change in MW rate	**Younger workers**		**Older workers**		**Total**		Financial burden of EITC	Change in Gini index
			Change in employment	Change in total product	Change in employment	Change in total product	Change in employment	Change in total product		
Base situation no MW	Base situation, no EITC	—	—	—	—	—	—	—	—	—
Universal MW		Initial level	26.3%	4.2%	-15.0%	-9.9%	16.0%	2.3%	—	-9.0%
Universal MW		20%	33.0%	2.0%	-33.1%	-24.2%	16.5%	-1.9%	—	-12.7%
Universal MW		40%	33.6%	-3.4%	-51.1%	-41.2%	12.4%	-8.3%	—	-15.1%
Universal MW		60%	32.0%	-8.1%	-69.2%	-60.7%	6.8%	-16.1%	—	-17.4%
Universal MW		80%	29.4%	-8.9%	-87.2%	-82.7%	0.3%	-20.2%		-16.8%
non	Universal EITC	Initial level	90.4%	-25.5%	55.1%	21.0%	81.6%	-18.9%	46.7%	-59.1%
Younger workers only	Older workers only	Initial level	26.3%	4.2%	55.1%	21.0%	33.5%	6.7%	3.9%	-22.1%
Younger workers only	Older workers only	20%	33.0%	2.0%	55.1%	21.0%	38.5%	4.9%	6.2%	-30.5%
Younger workers only	Older workers only	40%	33.6%	-3.4%	55.1%	21.0%	39.0%	1.2%	9.1%	-37.9%
Younger workers only	Older workers only	60%	32.0%	-8.1%	55.1%	21.0%	37.8%	-3.6%	13.0%	-45.8%
Younger workers only	Older workers only	80%	29.4%	-8.9%	55.1%	21.0%	35.8%	-4.3%	14.7%	-49.9%