Evaluating Active Labor Market Policies for Female Immigrants

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1.   Introduction

In this paper we analyze alternative policies regarding government-sponsored training programs and enhancing employment opportunities in high-skilled occupations. The analysis is based on expansion of the structural dynamic model that was originally solved and estimated by Cohen-Goldner and Eckstein(2004) using a panel of Russian female immigrants during their first five years in Israel and on additional data that was collected on these immigrants and allow us to follow them for a period of up to 10 years since their arrival.

The main question of this research is related to a wide literature on evaluating Active Labor Market Policies (ALMP) and in particular the question: Does government provided training programs benefit the participants and the society? Heckman, LaLonde and Smith (1999) answer this in their recent survey of the topic by saying: "As currently constituted, these programs are often ineffective on both counts". We addressed these questions (Cohen-Goldner and Eckstein(2004)) in the context of female immigrants, who first learn the new language and then have to choose between two states of employment or attending government provided training, where the availability of these options is uncertain and the job-offer rate and the associated wage depend on the occupation and the participation in the training program. Within this framework, we measured the private gain from training and the social return to the existence of these government training programs.[1]

The embedded link between training, work and occupational choice enables us to estimate the impact of alternative government training interventions on subsequent work and occupational choice. The existence of structural estimated based on five year data together with the additional five years of data provide an interesting case for cost-benefit analysis of alternative training policies as well as for evaluation of the social and the private gain from training.

The benefit from ALMP stems from the effect of training on employment opportunities and on wages. Yet, the individual preferences for training and the potential loss of earnings during training attendance affect the expected lifetime utility. Therefore, the individual benefit from the availability of training is measured by the increase in expected lifetime utility from the existence of the training programs which takes into account all these effects. The social return from training is measured

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[1] We consider here government sponsored vocational classroom training (CT) programs.

by the expected increase in actual accepted wages minus the cost of the program. The assumption is that the wage increase reflects the increase in output due to training attendance. Our measure of the social gain differs slightly from the conventional measures in the literature as our model produces a flow/stream of accepted wage over time and wages change between periods, whereas in the training literature it is often assumed that the wage increase due to training is fixed (once and for all).

The estimated benefits depend on both the estimated parameters of the model and the individual predicted decisions conditional on these parameters. In estimating the effect of training on the mean wage, the dynamic programming (DP) model provides a conditional probability for both the selection to the training program and the selection of jobs after attending training. Furthermore, these estimated conditional probabilities directly determine the predicted individual and social benefits from the training programs. Based on the existing literature on recent immigration to Israel (see, e.g., Cohen-Goldner and Paserman(2004)) we assume that the active labor market policies that are directed towards female immigrants do not reduce the employment of native Israelis.

According to the estimated model, training has no impact on wage in blue-collar (BC) jobs (this finding is consistent with the prevalent finding in the U.S. that the return to government-sponsored training is close to zero), but has a high and significant return in white-collar (WC) jobs. In addition, we find that training increases not only wages in WC jobs, but also the probability to receive WC job offers.

The three policy interventions we consider in this paper are: no training is available; training is available with probability 1 during the first 5 years in Israel (and during the subsequent five years no training is available) and double WC job-offers probability for the duration of five years since arrival. We find that all these policies have a substantial effect on the employment quality as defined by blue-collar vs. white-collar employment, while the impact on long-run unemployment is relatively minor.

The net benefit of the no training policy is negative, and according to our assumptions the return to the training provided in the benchmark economy is 20 percent. Free training is estimated to increase the net benefit by additional 9 percent. The policy where the offer rate of jobs in WC is doubled increases the benefit by 40 percent. However, here we do not have a measure for the cost of implementing the

program. Assuming that employers would offer more WC jobs if they would be given a proper subsidy per WC worker, we calculate the subsidy that equates the costs and benefit of the WC double job offer rate policy. We find that this subsidy is 10 NIS per hour and given that the initial wage in WC jobs is about 15 NIS per hour, it seems that this subsidy would indeed motivate employers to offer more WC jobs to female immigrants.

2.   Data

This paper is based on several panels and cross sectional data collected in Israel. The model was estimated based on a quarterly panel data from two retrospective surveys of the same sample (hereafter '*employment survey*').[2] The first survey was conducted during the summer of 1992 on a random sample of 1,200 male and female immigrants from the former USSR who entered Israel between October 1989 and January 1992. The second survey was done in 1995 and only 901 of these immigrants were re-sampled. The original sample consists of immigrants between working-ages (25-65) residing in 31 different locations in Israel at the time of the first survey. We used the two surveys to construct a panel of 502 female immigrants who were 25-55 years old at arrival and who have actively searched for a job in Israel since their arrival. We followed these immigrants for, at most, their first 20 quarters in Israel and build their jobs-profile from arrival until the last interview.

In addition to the employment survey, The Brookdale institute conducted during 1995 a survey among 824 men and 608 women who had emigrated from Russia during 1989-1994, and reported that they have an engineering diploma when entering Israel. The data collected in this survey is retrospective data from the date of arrival until the interview (hereafter '*engineers survey*').

During 2001-2002 we collected additional data on the immigrants who were sampled in the employment survey and the engineers survey.[3] We were able to interview 413 individuals (178 males and 235 females) from the original employment survey and 750 individuals from the original engineers survey (446 males and 304 females). The additional data allows us to construct immigrants' job history from the

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[2] The surveys were conducted by the JDC - Brookdale Institute of Gerontology and Human Development, Jerusalem- Israel.
[3] The 2001-2 survey was conducted by the PORI survey company under the supervision of Sarit Cohen-Goldner and Zvi Eckstein.

date of arrival in Israel and up to ten years later. The additional data serves in this study as a comparison to the out-of-sample predictions of our model.

Table 1 presents summary statistics on female immigrants based on 1) the engineers survey; 2) the original employment survey on which the model was estimated (502 immigrants); and 3) the 235 females from the employment survey that were surveyed during 2001-2002. The 502 immigrants from the original employment surveys and the sub-sample of 235 immigrants of the 2001-2002 data have very similar demographic characteristics. The average age at arrival, years of schooling, number of children, knowledge of Hebrew before migration and after migration and occupation in Russia are almost identical. In addition, the share of immigrants who participated in training and the differences in observables conditional on training attendance are very similar.

The characteristics of the immigrants in the engineers survey are slightly different from those of the immigrants in the employment survey. Immigrant engineers are, on average, older at arrival, more educated and have a longer duration until participation in training.

Labor market States

Figure 1 plots the patterns of labor market states from Employment Survey. The number of observations declines from 502 immigrants during the first quarter in Israel to 183 after 40 quarters. The main observation here is that the integration to the new labor market is stabilized after 5 years. In particular, unemployment declines sharply and monotonically during the first 16 quarters in Israel and simultaneously employment in BC jobs rises rapidly while employment in WC jobs rises at a moderate rate. However, during the next 20 quarters, the share of unemployed immigrants and the share of employment in BC and WC jobs are almost constant. Unemployment is stabilized at a rate of 20% while employment in BC (WC) jobs is set on 47% (30%).

It should be noted that unemployment in these surveys is different than the standard definition as here the question "have you been looking for a job?" has been asked once for the entire period. In a standard survey the question is referred only to the last week. Hence, it is the case that our figure of unemployment reflects more the notion of non-employment rather than the standard measure of unemployment.

Figure 2 describes the labor market patterns from the Engineers survey. The general picture is similar to that obtained from the employment survey (Figure 1), though here although unemployment is stabilized after 60 months (5 years), there is some additional dynamics in immigrants' employment by occupation. During the 5th-10th years in Israel, engineers are still able to upgrade their occupation and move from BC jobs to WC jobs, such that after 10 years (120 months) the share of employed in WC jobs is identical to the share of employed in BC jobs- 40%.

It is important to compare the panel data to the similar labor state description using the large annual cross-sectional Labor Force Survey (LFS) of 1990-2003. The LFS is conducted by the Central Bureau of Statistics (CBS) and provides a very good aggregate description of the labor force distribution by occupation, industry, years since arrival, gender and age. This comparison is even more important as we have a large attrition in the last survey of the panel data for the years 1995 to 2000, in addition to the low number of observations that were in Israel for the entire ten years. Figure 3 shows the labor market states based on the annual LFS of 1990-2003. It is remarkable to note how similar are to the patterns obtained from the Engineers survey and quite close to the Employment survey. There is a gradual movement to WC jobs all through the 10-year period, such that the share of WC workers is 40% after 10 years.

In Figure 3 unemployment is only 10% from the 5th year on, much lower than the figures in the panel data. As noted above the panel data (Employment survey and Engineers survey) the definition of participation in the LF is different than that in the LFS. In the panel data we only know if the person was actively searching for a job since arrival. In the LFS, on the other hand, only individuals who actively searched for a job in the previous week (before the survey) are considered as participants in the LF. Therefore, in Figures 1 and 2 we excluded only those immigrants who never looked for a job since their arrival. However, it is possible that some immigrants did not search continuously since arrival and, therefore, while we treated them as unemployed they were actually out of the LF.

3.   The Dynamic Discrete-Choice Model

In this section we briefly describe the model estimated in Cohen-Goldner and Eckstein (2004) and discuss the estimated parameters. The ALMP analysis we present

in next sections is based on the estimated model. We used the Employment survey of 502 observations for the first 20 quarters in Israel to estimate the model. The model is directly presented with the values of the estimated parameters.

Let the choice variable, d_{at}, equals 1 if activity a was chosen in period t, and 0 otherwise.[4] At each period t the female immigrant can choose between (at most) four activities: work in a White Collar job (WC) $a=1$, work in a Blue Collar job (BC) $a=2$. Attending training (TR) $a=3$ and unemployment (UE) $a=4$.

The objective of the female immigrant is to maximize the expected utility over her life-cycle:

$$(1) \quad E\left[\sum_{t=1}^{T} \beta^t \sum_{a=1}^{4} U_{at} d_{at} I_{at} \mid S(0) \right]$$

where U_{at} is the periodical utility associated with choosing activity a at time t and I_{at} is an indicator function that is equal to one if alternative a is available at time t

The periodic utility is written as $U_t = \sum_{a=1}^{4} U_{at} d_{at}$ and is specified by:

$$(2) \quad U_t = (\gamma_{1m}M + \gamma_{1c}N)(d_{1t} + d_{2t}) + (\gamma_{2m}M + \gamma_{2c}N + \gamma_{3l} + \varepsilon_{3t})d_{3t} + (\gamma_{3m}M + \gamma_{3c}N + \gamma_{4l} + \varepsilon_{4t})d_{3t} + C_t$$

where $M = 1$ if married, N is the number of children and C_t is the consumption at time t. This is a simple linear utility function where there is disutility of work that depends on marriage status, number of children and consumption.

The periodical household budget constrain is given by,

$$(3) \quad d_{1t}w_{1t} + d_{2t}w_{2t} + d_{3t}TW + d_{4t}UB + AI_t = C_t + g_1N(d_{1t} + d_{2t}) + g_2N\,d_{3t} + g_3N\,d_{4t}$$

where w_{1t} (w_{2t}) is the wage in WC(BC), TW is the training subsidy, UB is unemployment benefit and AI_t represents additional sources of income of the household at time t.

The estimated utility parameters (see, Cohen-Goldner and Eckstein, 2004) are given by,

$$U_{1t} = w_{1t} + 124.96\,M - 29.51\,N$$
$$(4) \quad U_{2t} = w_{2t} + 124.96\,M - 29.51\,N$$
$$U_{3t} = -15.96 - 12.62\,M - 2.76\,N + \varepsilon_{3t}$$
$$U_{4t} = -591.65 + 40.46\,M - 1.36\,N + \varepsilon_{4t}$$

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[4] For notation simplicity we omit the index for the individual.

The estimated wage parameters in WC *(j=1)* or BC *(j=2)* are given by,

(5a) $w_{1t} = exp(1.76 + 0.02\ SC + 0.04\ k_{1t\text{-}1} + 0.0006\ k_{2t\text{-}1} + 0.20\ DT_t + 0.005\ AGE$
$+ 0.062\ HEB_t + \varepsilon_{jt})$

(5b) $w_{2t} = exp(1.84 + 0.003\ SC + 0.03\ k_{1t\text{-}1} + 0.005\ k_{2t\text{-}1} - 0.01\ DT_t + 0.002\ AGE$
$+ 0.08\ HEB_t + \varepsilon_{jt})$

where *SC* is years of schooling, $k_{1t\text{-}1}$ $(k_{2t\text{-}1})$ is the local experience accumulated in WC (BC) until the beginning of time *t*, $DT_t=1$ if the immigrant participated in training before time *t*, *AGE* is the immigrant's age at arrival and Heb_t is the Hebrew knowledge at time *t* which is assumed to be exogenous and is based on Hebrew knowledge prior to migration, participation in Ulpan, length of Ulpan and time in Israel.

Job and Training offer probabilities

The endogeneity of the training status, DT_t, and the occupational experience variables k_{1t}, k_{2t}. are explicitly taken into account in this forward-looking model. The occupation-specific experience evolves according to: $k_{1t} = k_{1t\text{-}1} + d_{1t}$, $k_{2t} = k_{2t\text{-}1} + d_{2t}$. The transitions are limited by job- and training-offer probabilities per quarter, which are given by,

(6) $\lambda_{jt} = \dfrac{exp(Q_{jt})}{1 + exp(Q_{jt})}, j = 1,2,$

where,

(7) $Q_{1t} = -5.86\ d_{3t\text{-}1} - 6.63\ d_{4t\text{-}1} - 9.24\ d_{2t\text{-}1} + 0.16\ SC + 0.002\ AGE + 1.08\ DT_t$
$+ 0.87\ UOC + 0.19\ k_{1t\text{-}1} + 0.24\ HEB_t$

$Q_{2t} = -1.50\ d_{3t\text{-}1} - 2.26\ d_{4t\text{-}1} - 4.33\ d_{1t\text{-}1} + 0.002\ SC + 0.008\ AGE + 0.79\ DT_t$
$- 0.27\ UOC + 0.04\ k_{2t\text{-}1} + 0.03\ HEB_t,$

and where *UOC*=1 if the immigrant worked in WC in the former USSR.

The estimated training offer probability per quarter is *0.14* if AGE < 40 and *0.06* if AGE $\geq$ 40

The Maximization problem

The maximization problem can be written as a set of Bellman equations of the form:

(8) $V_a(S(t), t) = U_{at} +$
$+ \beta E \left\{ \max_{x \in A} (V_x(S(t+1), t+1) \mid S(t), d_{at} = 1) \right\}, \qquad a \in A$

The state-space at time t ($S(t)$) includes all the variables that affect the immigrant's current and future choices:

$$(9) \qquad S(t) = \left\{ \begin{array}{l} d_{1t-1}, d_{2t-1}, d_{3t-1}, d_{4t-1}, k_{1t-1}, k_{2t-1}, DT_t, SC, \\ AGE, N, M, UOC, Heb_t, \varepsilon_t \end{array} \right\}$$

Terminal Value

To avoid computational burden in estimation, after 5 years (21 quarters), we use a linear terminal value, which depends on the state space at the 20th quarter and summarizes the value of each option from the 21st quarter until retirement:

(10) $V_a(S(21), 21) = 633.34\ k_{1,20} + 520.46\ k_{2,20} - 65.14\ (60\text{-}AGE) + 1399.97\ DT_{20}$

$+ 1426.68 + 379.18\ d_{1,20} - 0.09\ d_{2,20} + 150.2\ SC + 100.06\ N$

$+ 99.98\ M + 99.36\ UOC + 35.99\ HEB_{20..}$

4.   In and out of Sample Fit

As stated above the model was originally estimated using the available data on immigrants' choices and wages during, at most, the first 20 quarters in Israel. During 2001-2 we collected additional data on immigrants' choices and wages for up to the duration of 10 years (40 quarters) in Israel. The additional data and the expansion of the model solution to 10 years, allow us to compare the out-of-sample predictive power of the model to actual data during the 5th to 10th year of residence in Israel.

The first task is to extend the model for a ten years solution rather than the five years of the sample where an ad-hoc linear function of the terminal period (the 21st quarter) is estimated (see equation (10)). The task is to adjust the coefficients of the terminal value such that each coefficient reaches a value of zero at the age of retirement. That is, we seek an estimate of the terminal value at the 41st quarter in Israel that is consistent with the implication that the terminal value decreases as the individual approaches retirement and at retirement, the terminal value is equal to zero and the value that is estimated at the 21st quarter is consistent with the adjustment. Based on the above assumptions we approximate the value function after ten years. That is, if the estimated coefficient of a certain attribute was v for the effect of a particular state variable after 21 quarters (5 years) in the terminal value, this

coefficient has to 'depreciate' over time and, therefore, its value after 10 years in Israel is given by v-(v/(65-(age at arrival+5))*5.

The expansion of the solution of the model to 10 years allows us to simulate immigrants' choices and wages during 40 quarters based on the individual's state variables at arrival to Israel. We first simulate the estimated model assuming that all 502 immigrants are present during these 40 quarters and, in addition, we simulate it assuming that only 235 immigrants are present 40 quarters (235 is the number of observations that we have in the survey of 2001-2). The simulated predicted choices are presented in Figure 4. The prediction during the first 20 quarters are based on the simulated choices of the 502 immigrants and the prediction during quarters 21-40 are based on the simulated choices of the 235 immigrants assuming that the sample is of 235 females only.

Figure 4 demonstrates that the model is able to produce the rapid decline in unemployment during the first five years in Israel and, respectively, the fast increase in the share of blue-collar workers and the moderate increase in the share of workers in white-collar jobs. Participation in training is peaking during the third to sixth quarters in Israel and is later declining quite monotonically. During the next five years (quarters 20-40) the proportion of females in WC, BC and unemployment almost stabilized on level close to the data (Figures 1-3). Unemployment is almost fixed at 10% level and there are slight movements from blue-collar jobs to white collar jobs.

Overall, the model captures the main trends of the data, and, surprisingly, the stabilization of the labor states at the out of sample predictions (quarters 21 to 40). It is interesting to note that the predicted unemployment is very close in its level to data from the LFS (Figure 3) and less to the level in the employment and the engineers surveys.

5.   Active Labor Market Policies (ALMP)

The main goal for estimating the model is to quantitatively evaluate the individual and the social benefit from training as well as evaluating alternative economic policies that are potentially important but have not been actually implemented. We quantitatively evaluate, by counterfactual experiments using the estimated model, the predicted outcomes of Active Labor Market Policies (ALMP), that are often considered by the government. Specifically, we study the effect of three alternative policies on several predicted outcomes: employment by occupation; unemployment

dynamics; participation in training programs; the expected present value of utility (individual benefit) and the expected earnings over the first ten years after migration (gross social benefit). The three policy experiments that we consider are:

Policy experiment A: No training program is offered to female immigrants. We model it by setting the quarterly probability to receive a training offer to be equal to zero regardless of age. This is compared to the estimated offer rates ("benchmark economy") that are 0.136 for females younger than 40 at arrival and 0.056 for a females older than 40 at arrival.

Policy experiment B: Each immigrant has free access to training. Free access to training means that the government offers many courses all the time. We model it by setting the quarterly probability to receive a training offer to be equal to one regardless of age.

Policy experiment C: White-collar job offer probability is doubled for immigrants who had no prior experience in WC jobs for five years since arrival and stays the same for all others and for immigrants after five years in Israel.[5] Here we assume that the government is able to directly subsidize employers who hire immigrants without prior experience in WC jobs. This subsidy is paid for five years of employment and is assumed to be set such that employers would increase the efforts to find these individuals. We assume that the increase in these efforts imply that the offer probability is doubled only for these immigrants.[6]

Each of these policies emphasizes different aspects by which one can affect the employment and welfare of female immigrants. To evaluate the effect of each policy we simulate each "economy" using our random sample of 502 female immigrants assuming that all immigrants stay in the sample for 40 quarters (ten years). The "benchmark economy" consists of the simulation using the estimated parameters of the model reported above. Figures 5-9 reports the predicted policy effect on labor market outcomes and wages, and Table 2 presents the Cost-Benefit analysis of the three Policy Experiments.

Particular attention should be given to the calculation of the private and the social benefits estimated for each case. The absolute value of expected utility is the

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[5] This holds except for the first two quarters in Israel where only immigrants with prior knowledge of Hebrew are allowed to enter the training programs as is the standard prerequisite.

[6] For example, for an unemployed immigrant with the following specification; no prior training, worked in WC job in the USSR, age at arrival is 38, 14 years of schooling and Hebrew index of 3, the probability of a WC job offer in Israel increases from 5.7% to 11.4% (based on equations 6 and 7 above). This holds for 20 quarters since arrival to Israel.

present value of an hour of leisure in 1995 NIS. The private benefit of each policy is measured by the change in this average expected present value of utility at arrival, over the sample of 502 immigrants, due to the policy relative to the benchmark. The social benefit should measure the increase in output minus the cost of the program for the sample. We use the present value of earnings of each immigrant as the measure for her output and we describe below how we calculate the cost of the implemented policy.

To demonstrate the effect of the considered policies on the partition of immigrants between the different labor market states (training, blue-collar, white-collar and unemployment) we present in Figures 5- 8 the share of immigrants in each state by policy. Figure 5 presents the share of immigrants in training by policy experiment. Participation in training in the benchmark economy and under the double white-collar job offer policy is almost similar and is very close to the data observations. However, in the case of free-training policy we observe two peaks in training participation. Now, training is always available and, hence, as soon as training is available most of the female immigrants that do not have a job (unemployed) attend training during the third quarter. Almost half of the immigrants are expected to attend training during this period, as there are no capacity limitations in these programs, the gain is high at the white-collar jobs and the opportunity cost is low. The second peak occurs in the 18th quarter where, by construction of the model following the policy actual restrictions, after this period no training programs are available. Both peaks reflect the forward-looking nature of our model. For example, unemployed immigrants who have not yet participated in training may choose to do so in this period and this behavior is consistent with the standard predictions from human capital theory.

Figure 6 presents the share of immigrants in blue-collar jobs by policy experiment. The share of blue-collar workers is the lowest when the offer rate for white-collar jobs is doubled. The BC employment never goes above 40 percent and it decreases to 30% after 10 years in Israel. Not surprisingly, the rate of employment in blue-collar jobs is above the benchmark for the entire time and stays above 50 percent after ten years. The dynamics of the employment in blue-collar jobs when training is free is somewhat surprising. Initially, as many attend training at the third to the sixth quarters the rate of blue-collar employment is low. However, due to the impact of training on BC jobs offers the employment there is increasing to be above the

benchmark and the case of no-training policy. It is only the large training participation at the fifth year (Figure 5 above), due to the end of training eligibility, that the employment in BC jobs becomes somewhat lower than that of the other two cases for the years later.

In Figure 7 we present the share of white-collar workers by policy experiment. Here we clearly see the effect of training availability. When no training is available, the expected share of white-collar workers is slightly more than 30% after 10 years in Israel. Under the benchmark economy and free training policy, this share reaches almost 50 percent. These figures suggest that the benchmark economy is closer to free training than to no-training, in terms of training availability to female immigrants. The long-run effect of double white-collar offers on the share of immigrants in these occupations is significant and substantial. The share of immigrants is above 60% after 10 years.

Figure 8 presents the share of unemployed immigrants by policy experiment. In the benchmark economy, no training and free training policies unemployment converges to almost 10% after 6 years in Israel. In the no training policy, unemployment is a bit higher all through the 10-year period. To summarize, it seems that the policies we consider have a substantial effect on the employment quality as defined by blue-collar vs. white-collar employment, while the impact on the quantitative measures of employment (long-run unemployment) is not as much.

Figure 9 demonstrates the effect of the policy interventions on immigrants mean accepted wage by occupation. The wage profile of immigrants in blue-collar jobs is flat and is not affected at all from these policies. In contrast, the wage in white-collar is tripled during their first 10 years in Israel, both due to the high return to training and the high return to experience in white-collar occupations. It should be noted that the accepted wage in white-collar jobs is highest for the case of free training for most of the ten years. Furthermore, the wages are much lower if no training is available and the gap become larger due to the fact that as time pass more trained immigrants move from blue-collar to white-collar jobs.

Cost-Benefit of the Policy Experiments

Table 2 presents our calculations of the costs and benefits from each of the policy cases. We first calculate for each year the total government expenses in each policy. The total expenses can be divided to three components: transfer payments to trainees,

transfers to unemployed and direct training costs. The costs for unemployment provide an upper bound since our definition of unemployed female is closer to non-employment and not all of these non-employed are eligible for government transfers.

To compare the impact of each policy on the costs and benefit, we calculate the present value of the costs and benefits for the ten years horizon using 4 percent (annual) discount rate. We divide the present value by ten to get an annual average level and we express it per-immigrant by dividing each number/figure by the 502 female immigrants (employment survey) that are used for the estimation and the simulations. The present value of earnings is presented in annual terms (1995 NIS) such that in each of the 40 quarters in Israel the immigrant works 500 hours. Table 2 summarizes these calculations.

Using figures from Eyal (2005), the per-immigrant annual cost of the transfers for trainees, unemployed and direct training costs in the benchmark economy are 4818 NIS in 1995 prices. The policy of no training reduces these costs by 7 percent, free training policy increases these costs by 2 percent and if we double the job offers in WC these costs are reduced by 12 percent to 4225 NIS.

As discussed above, the benefit from the policy is measured by the average annual wage increases in each case and the change in net-benefit relative to the benchmark economy is the change in benefit minus the change in costs. The net benefit of the no training policy is negative, and according to our assumptions the return to the training provided in the benchmark economy is 20 percent. Free training is estimated to increase the net benefit by additional 9 percent.

The policy where the offer rate of jobs in WC is doubled increases the benefit by 40 percent. However, here we do not have a measure for the cost of implementing the program. We do not have any direct method to find the cost of implementing the policy that *doubles the rate of white-collar job offers*. To evaluate this policy we considered the level of wage subsidy that would equate the benefit from the *double WC probability* policy to the *benchmark* economy. Specifically, we look for a "*fixed wage subsidy per hour*" for all immigrants in white-collar jobs that equate the present value of potential benefits to the present value of costs that include the subsidy. The present value benefit is equal to the present value of additional wage, relative to the benchmark, for ten years. Since there is uncertainty related to these benefits we discount the figures by 15 percent (annually) to capture risk associated with it. The present value of the cost includes the change in training and unemployment costs and

the cost of the subsidy calculated in present value for the ten years.[7] [8] We calculate the upper bound of the subsidy by solving for the value of the subsidy that equates the additional benefits to the costs. The result is a subsidy of 10.5 NIS per hour where the hourly wage (see Figure 9) in white-collar jobs starts at 15 NIS and is about 25 NIS after 20 quarters. Hence, it seems that a subsidy of 10 NIS might increase substantially the potential number of job offers for immigrants and that this policy is potentially feasible with positive social rate of return.

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[7] This is calculated as follows: The extra benefit = present value of [(additional annual earnings per immigrant) * (number of immigrants = 502) * (number of years = 10) / (risk preium = 1.15)]. The extra cost = present value of sum for 40 quarters of (subsidy per-hour)* (number of hours per quarter =500). The subsidy cost = (fixed subsidy for hourly wage) * (number of relevant WC workers). The subsidy is paid for each new worker in WC for 20 quarters. The *fixed subsidy per hourly wage*" is the number that equates the benefits to the costs.

[8] We assume that implementing this policy will not affect native Israeli workers in WC jobs. That is, employers will not substitute natives with immigrants, but rather increase the number of employees in WC jobs. This assumption is consistent with CRS production function which is supported by various papers on recent immigration to Israel as Cohen and Hsieh (2001), Eckstein and Weiss (2002,2004) and Cohen-Goldner and Paserman(2004)).

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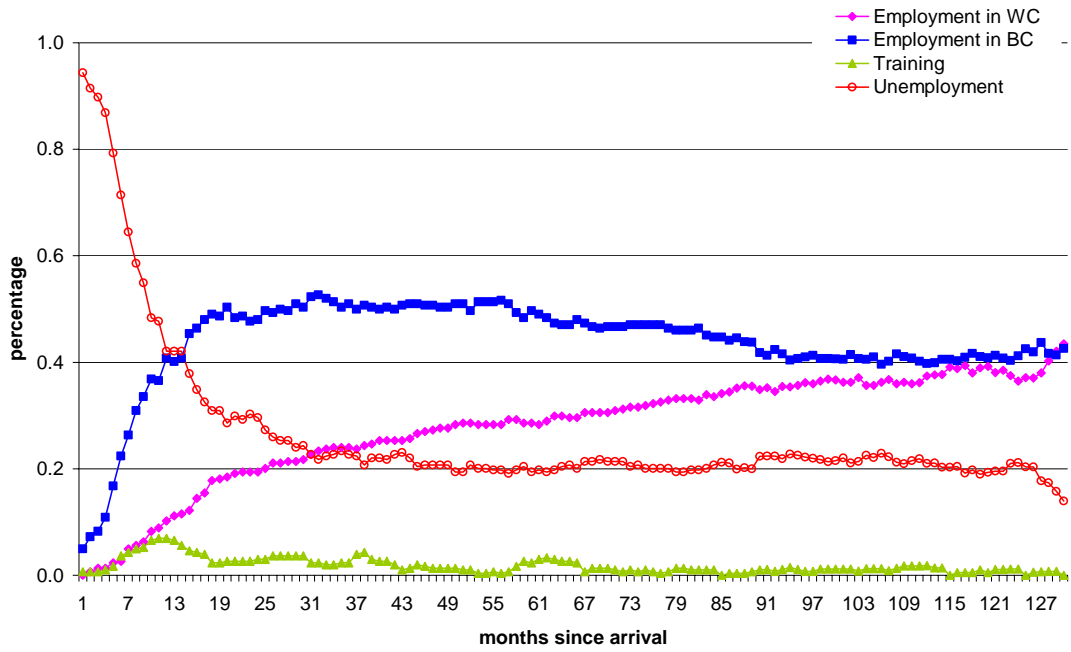
Figure 1 - Labor Market States of Females - Employment Survey
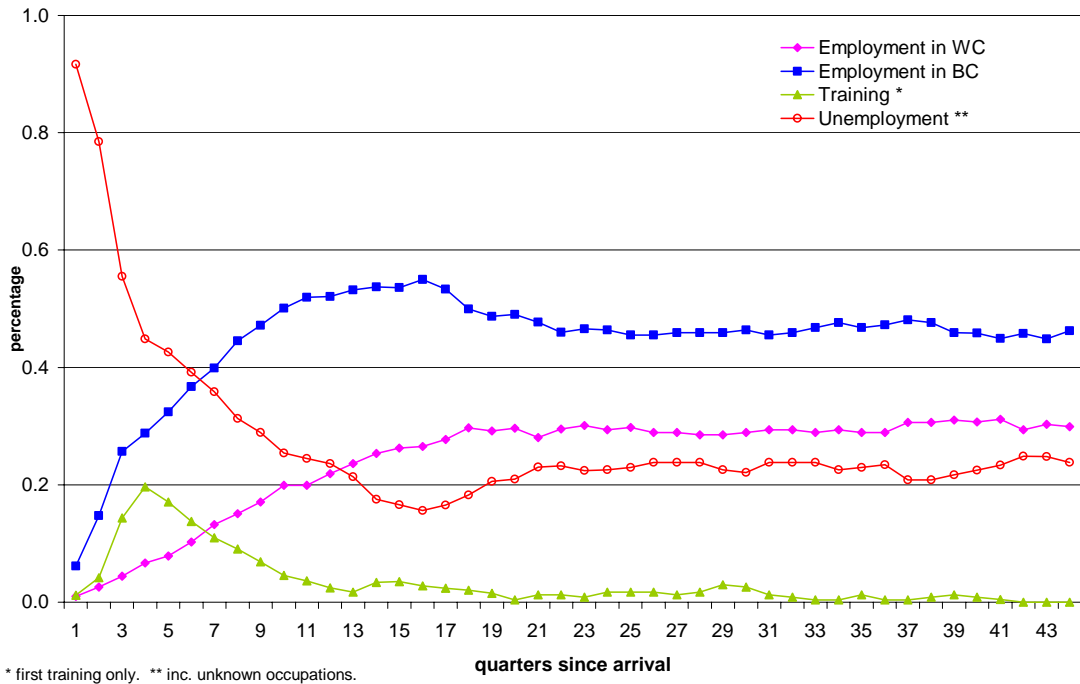
* first training only. ** inc. unknown occupations.

| quarters since arrival	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	41-44
number of observations	495	451	416	380	287	237	235	235	235	234	183

Figure 2 - Labor Market States of Females - Engineers Survey

quarters since arrival	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	41-44
number of observations	304	304	304	304	304	304	304	286	249	209	151

Figure 3 - Labor Market States of Females - Labor Force Survey 1990-2003
(Immig. Years 1989-1992)
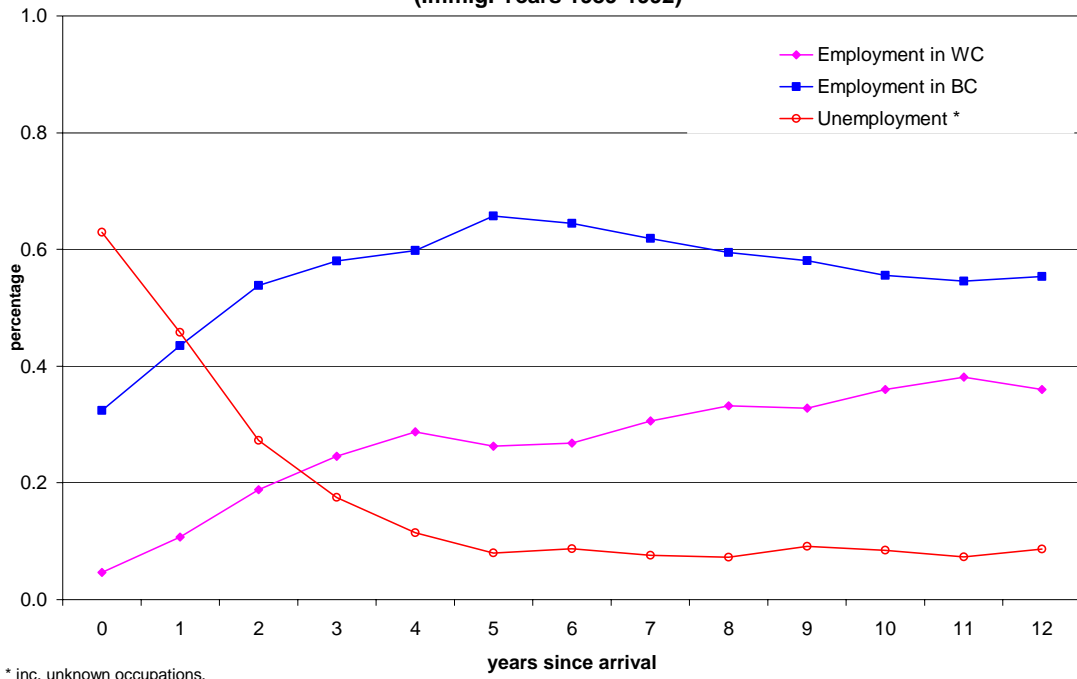
* inc. unknown occupations.

years since arrival	0	1	2	3	4	5	6	7	8	9	10	11	12
number of observations	278	1567	1666	1797	1761	1837	1897	1827	1704	1717	1716	1652	1364

Figure 4 - Simulated Predicted Choices- Benchmark
first 20 quarters based on full sample, next 20 quarters based on partial sample
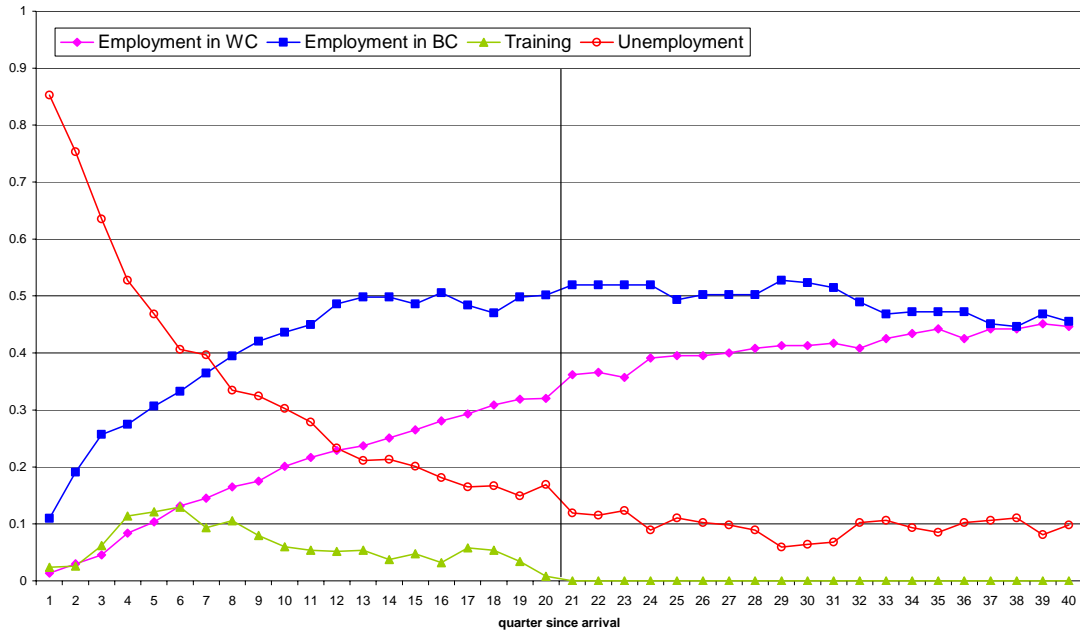
Legend: Employment in WC — Employment in BC — Training — Unemployment

x-axis: quarter since arrival

Figure 5 - Training Choice by Policy Experiment
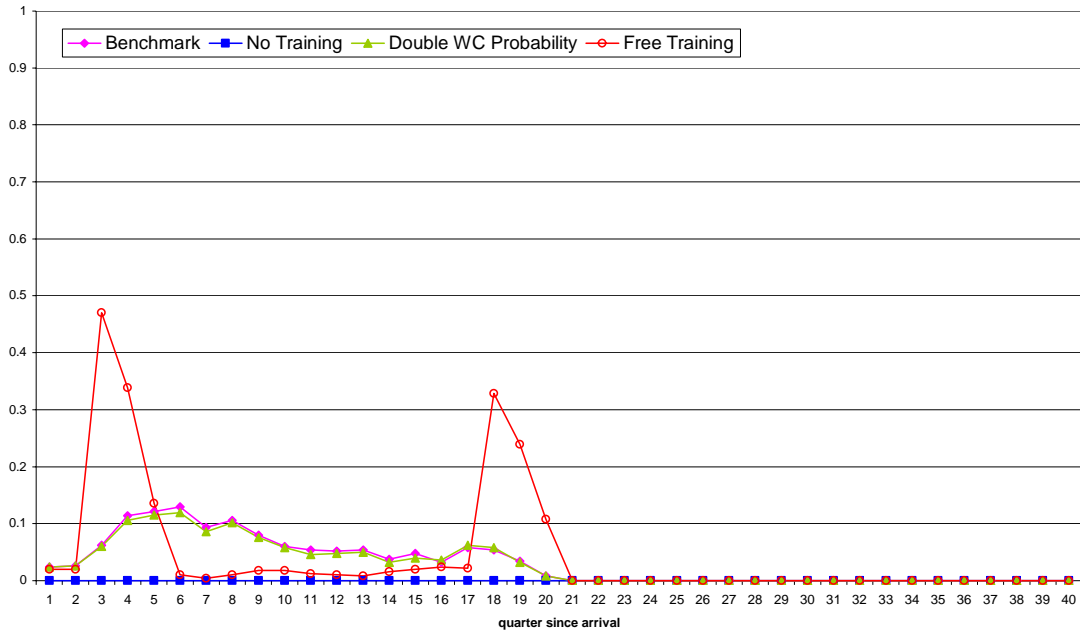

quarter since arrival
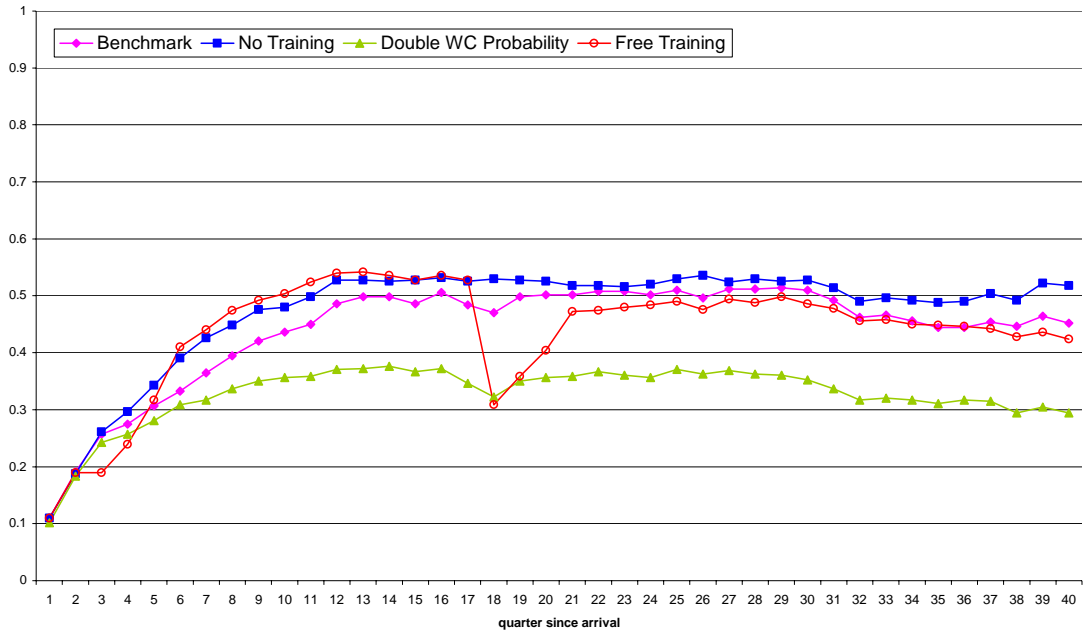
Figure 6 - Blue Collar Choice by Policy Experiment

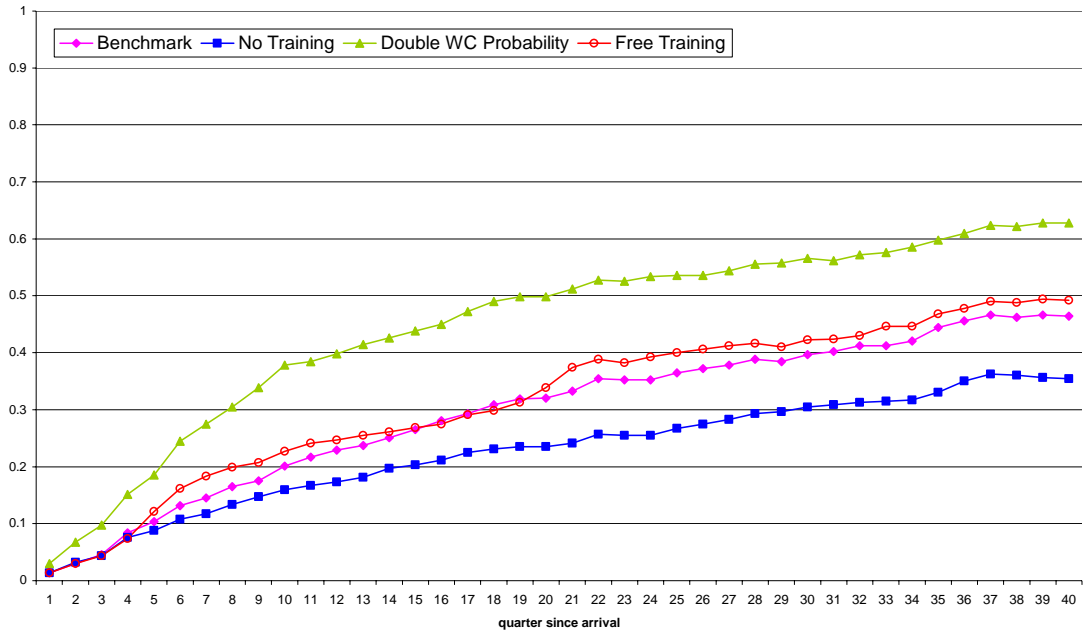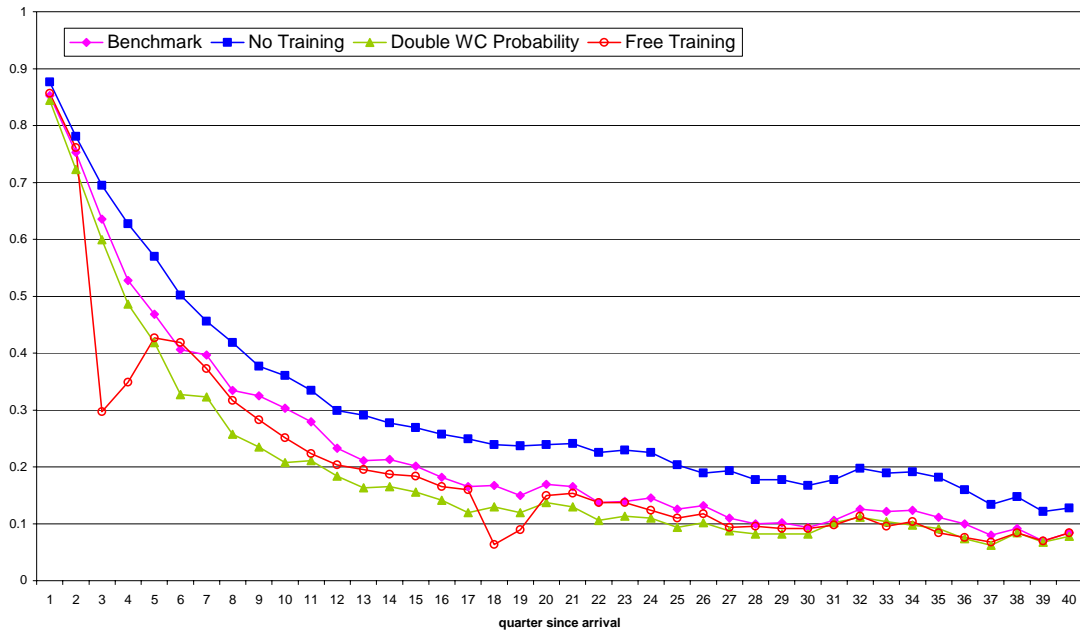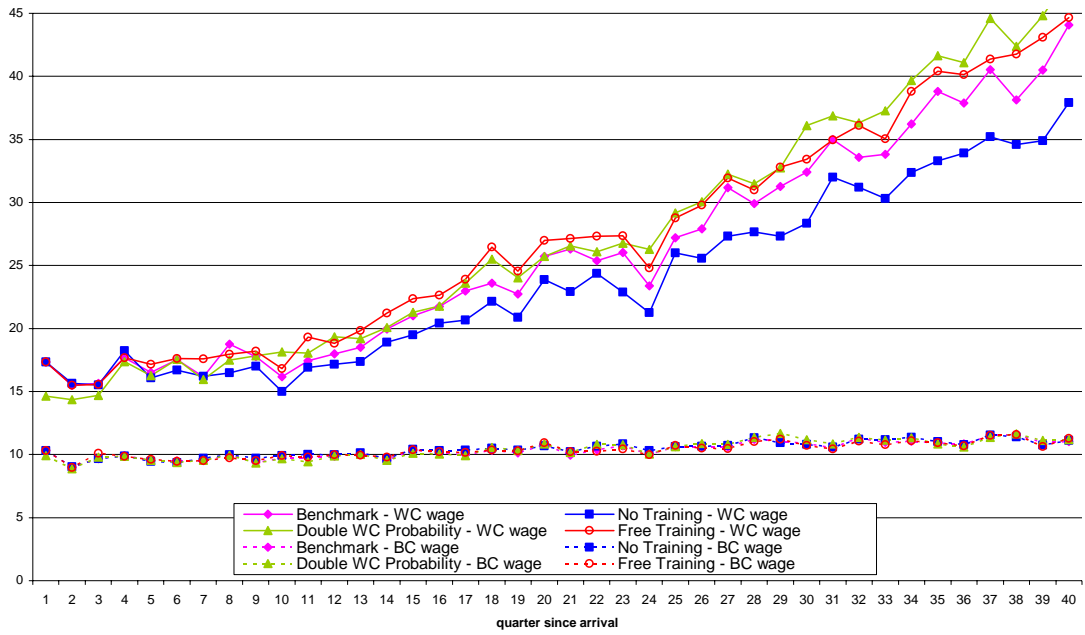# Figure 7 - White Collar Choice by Policy Experiment

Figure 8 - Unemployment Choice by Policy Experiment

Figure 9 - White Collar and Blue Collar Accepted Wages by Policy Experiment

Table 1 - Summary Statistics - Females

Variables	Engineers Survey			Full Employment Survey			Partial Employment Survey*		
	All	Trained	Not Trained	All	Trained	Not Trained	All	Trained	Not Trained
Number of observations	304	116	188	502	263	239	235	141	94
Age at arrival (years)	41.3	39.77	42.24	37.12	35.51	38.88	38	36.03	40.97
	(8.6)	(8)	(8.8)	(8.5)	(7.7)	(8.9)	(8)	(8)	(7.3)
Years of Schooling (years)	16.04	15.93	16.11	14.47	15.16	13.72	14.69	15.23	13.89
	(1.4)	(1.4)	(1.4)	(2.4)	(2.1)	(2.4)	(2.4)	(2.1)	(2.5)
Number of children - first survey				1.05	1.11	0.99	1.08	1.11	1.03
				(0.8)	(0.8)	(0.9)	(0.8)	(0.8)	(0.9)
Number of children - last survey	0.46	0.59	0.38	0.66	0.82	0.4	0.66	0.82	0.4
	(0.7)	(0.8)	(0.7)	(0.8)	(0.9)	(0.6)	(0.8)	(0.9)	(0.6)
Number of jobs in Israel since arrival	2.38	3.02	1.99	1.95	2.37	1.49	2.55	2.94	1.96
	(1.4)	(1.5)	(1.1)	(1.4)	(1.5)	(1.2)	(1.5)	(1.6)	(1.1)
Time in Israel at latest survey (months)	120.9	120.74	121.01	82.02	90.55	72.64	131.54	131.87	131.05
	(16.5)	(17.2)	(16.2)	(48.3)	(45.8)	(49.3)	(6.4)	(6.6)	(6.1)
Knew Hebrew before migrating				15.7%	20.2%	10.9%	17.4%	21.3%	11.7%
Employed in WC in CIS before migrating				75.7%	84.0%	66.5%	78.3%	87.2%	64.9%
Married - first survey	75.7%	77.6%	74.5%	76.5%	76.8%	76.2%	79.6%	78.7%	80.9%
Married - last survey	74.7%	76.7%	73.4%	76.6%	78.0%	74.5%	76.6%	78.0%	74.5%
Hebrew fluency index - first survey**				2.99	3.29	2.66	2.99	3.22	2.64
				(0.8)	(0.6)	(0.8)	(0.7)	(0.7)	(0.7)
Hebrew fluency index - second survey	3.24	3.44	3.12	3.3	3.56	2.95	3.25	3.5	2.88
	(0.7)	(0.6)	(0.8)	(0.8)	(0.5)	(0.9)	(0.7)	(0.6)	(0.8)
Hebrew fluency index - third survey	3.32	3.59	3.15	3.4	3.69	2.97	3.4	3.69	2.97
	(0.7)	(0.5)	(0.8)	(0.7)	(0.5)	(0.8)	(0.7)	(0.5)	(0.8)
Time from arrival to first job (months)	15.24	15.1	15.33	14.91	16.15	13.33	16.03	15.9	16.23
	(15.2)	(14.2)	(15.9)	(12.9)	(11.6)	(14.1)	(14.6)	(12.3)	(17.7)
Time from arrival to start of training course (months)		43.74			21.69			27.68	
		(33.9)			(22.3)			(27.7)	

* Only participants in survey 3.
** 1 - bad, 4 - excellent.
Standard Deviation in parentheses.

Table 2 - Cost-Benefit of the Policy Experiments[1]

Years since arrival	Benchmark			No Training			Free Training			Double WC Probability		
	transfer payments - trainees[2]	transfer payments - unemployed[3]	direct training cost[4]	transfer payments - trainees	transfer payments - unemployed	direct training cost	transfer payments - trainees	transfer payments - unemployed	direct training cost	transfer payments - trainees	transfer payments - unemployed	direct training cost
1	491,498	6,046,011	377,021	0	6,506,940	0	1,852,669	4,941,179	709,158	469,881	5,793,603	359,068
2	982,995	3,505,769	140,635	0	4,249,457	0	348,262	3,348,997	59,845	922,077	2,892,434	140,635
3	535,167	2,488,057	215,441	0	2,992,655	0	126,204	2,096,562	38,899	495,865	1,827,123	200,479
4	374,027	1,761,619	155,596	0	2,387,836	0	147,820	1,596,330	520,648	343,677	1,365,538	158,588
5	335,162	1,422,090	59,845	0	2,105,077	0	1,522,311	1,008,979	23,938	348,262	1,104,833	50,868
6	0	1,283,003	0	0	2,009,442	0	0	1,205,054	0	0	1,000,463	0
7	0	1,017,931	0	0	1,665,765	0	0	908,976	0	0	795,873	0
8	0	930,811	0	0	1,570,129	0	0	860,940	0	0	822,292	0
9	0	996,096	0	0	1,574,496	0	0	782,990	0	0	800,239	0
10	0	708,971	0	0	1,157,017	0	0	665,520	0	0	635,170	0
PV of costs for 10 years	2,448,691	17,553,671	865,117	0	22,457,584	0	3,587,659	15,147,417	1,234,911	2,321,636	14,904,404	829,782
PV of annual costs per imm.[5]	976	3,497	345	0	4474 (28)	0	1429 (46)	3017 (-14)	492 (43)	925 (-5)	2969 (-15)	331 (-4)
PV of total annual costs per imm.[6]	4818			4474 (-7)			4938 (2)			4225 (-12)		
PV of annual earnings per imm.[7]	20608			17107 (-17)			22133 (7)			26303 (28)		
Benefit - cost[8]	15,790			12,633			17,195			22,078		
Change in benefit-cost[9]				-3157 (-20)			1405 (9)			6288 (40)		
Expected present value	9438			6433 (-32)			12095 (28)			11019 (17)		

1. Costs and wages in July 1995 prices (NIS).
2. No. of trainees in 4 quarters * transfer payments per person per quarter.
3. No. of unemployed in 4 quarters * transfer payments per person per quarter.
4. No. of new trainees in 4 quarters * direct cost per trainer.
Transfer payments per person are 1450 NIS per month or 4350 NIS per quarter, assuming each trainee recieves them for 6 months. Direct training cost per trainer is 2992 NIS for the entire training time. Costs are based on Yonatan Eyal, "The Effect of Vocational Training on Unemployment Duration" (footnote 1).
5. Costs for 10 years / no. of immigrants (502) / no. of years (5 or 10).
6. Transfer payments for trainees and unemployed + direct training cost.
7. Present value of sum for 40 quarters of (no. of workers * hourly wage) / no. of immigrants (502) / no. of years (10) * no. of hours per quarter (500).
8. PV of annual earnings per imm. - PV of total annual costs per imm.
9. Relative to the benchmark.

Percentage change relative to the benchmark in parenthesis.