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"How Migration can change Income Inequality: The case of Israel"

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Abstract

Motivated by the unique experience of Israel of a supply-side shock of skilled migration, and the concurrent rise in disposable income inequality, this paper develops a model which can explain the mechanism through which a supply-side shock of skilled migration can reshape the political- economy balance and the redistributive policies. First, it depresses the incentives for unskilled migrants to flow in, though they are still free to do so. Second, tax-transfer system becomes less progressive. Nonetheless, the unskilled native-born may well become better-off, even though they lose their political clout.

I. Introduction

Immigration has been long known to have far and wide reaching economic and social consequences. These include the labor market, international trade, economic growth, the social and political structure, etc. (see, e.g., Lucas (2014) for a recent treatise). A somewhat under-researched topic is the way immigration may affect policy by reshaping the political balance of powers. In this paper we focus on how this reshaping affects the economic policy of the receiving country on income inequality.[3] Israel is known for the unique ways it absorbs immigrants who tend to arrive in waves. Each one has its unique origin, distribution of skills, and often socio-economic characteristics, etc. Thus, any episode of migration to Israel can serve as a "natural" experiment.

Immigration to the pre-state Palestine and to the state of Israel came in waves, since the late 19th century.[4] During the pre-state era (prior to 1948), immigration was at times controlled by the British rulers.[5] But since the birth of the state in 1948, immigration was free, and even encouraged, under the umbrella of the "Law of Return". Indeed, Table 1 suggests that immigration at times, especially in the nascent statehood and in the last wave from the Former Soviet Union (FSU), amounted to about 20% of the established population.

Table 1: Immigration, 1922

Period	Immigrants as a Percentage of Established Population	Annual Percentage Growth Rate of Population
1922-32	8.2	8.0
1932-47	6.4	8.4
1947-50	19.8	21.9
1950-51	13.2	20.0
1951-64	2.2	4.0
1964-72	1.3	3.0
1972-82	0.9	2.1
1982-89	0.4	1.8
1989-2001	19.0	2.9

Source: Ben-Porath (1985) for the years 1922-1982, Central Bureau of Statistics (1992), Bank of Israel (1991b) for the years 1982-2001.

[3] Ben Habib and Jovanovich (2007) consider world-welfare perspective. Our analysis focuses on an individual state.

[4] See Razin and Sadka (1993)

[5] After World War One the League of Nations granted Great Britain a mandate over the whole of Palestine. It ended in 1948.

Unique to Israel, the Law of Return not only enabled free immigration but also grants these immigrants immediate citizenship and consequently voting rights. Nevertheless, an early study by Avner (1975) finds that the voting turnout rate of new immigrants had been markedly lower than that of the established population. This means that immigrants did not fully exercise their voting rights and did not therefore influence the political economy equilibrium in Israel as much as the established population.

A similar migrant low voting turnout pattern is reported also by Massina (2007) and Bird (2011) for Western Europe. However, a later study about voting turnout pattern of new immigrants to Israel in the 2001 elections, conducted by Arian and Shamir (2002) reverse this finding for 2001. The new immigrants in this study are pre-dominantly from the FSU. Arian and Shamir find no marked difference in the voting turnout rates between these new immigrants and the established population. This is indeed a unique feature of the 1989-2001 immigration waves from the FSU. We therefore focus on this case.

There is yet another unique feature of the 1989-2001 immigration waves that distinguishes it from earlier post-state waves. Immigrants came mostly from urban areas, with fairly advanced education systems. Thus, the skill (education) composition of the immigrants is biased towards high education levels, relative to the skill (education) composition of the established population. This bias is reflected in their relatively higher labor income (see Table 2). Their share in the population was sizable - 14.5%. Their average family size (2.32 standard persons) is lower than the national average (2.64 standard persons). This indicates a fewer number of dependents. Most important is their higher education level and consequently their higher labor income. The average number of schooling years of the new immigrants is 14.0, compared to the national average of only 13.3.

Table 2: The Skill, Age and Income of Immigrants from the FSU and the National Average, 1990-2011

	Immigrants from the FSU	National Average[6]
Share in Total Population (%)	14.5	100
Household Size (numbers of standard persons)	2.32	2.74
Schooling Years Of Head of Household (no.)	14	13.3
Head of household with a bachelor degree (%)	41.1	29.5
gross monthly labor income per standard person (2011 NIS)	4,351	4,139

[6] Including immigrants

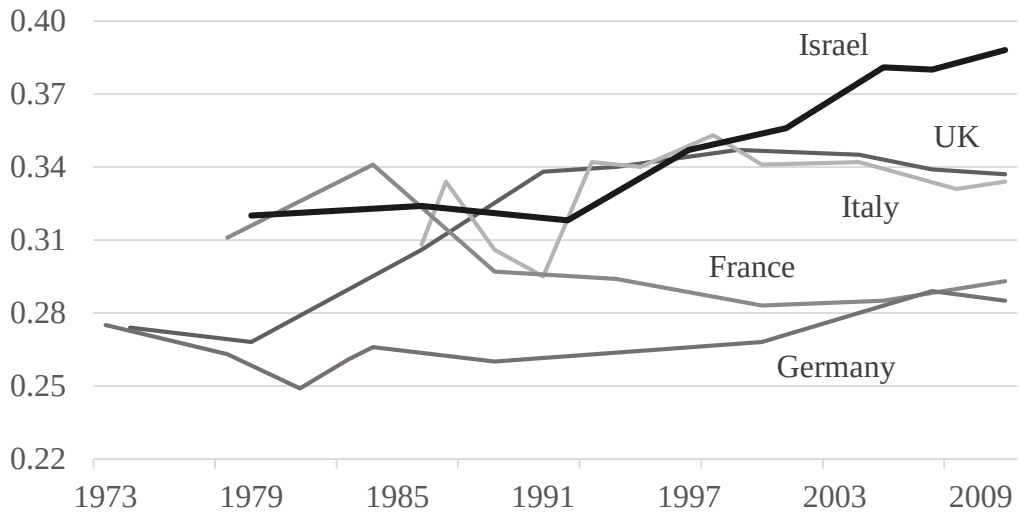
Source: Eilam (2014)

Even more striking is the percentage of the head of the household with a bachelor degree: 41.1% among the new immigrants, compared to a national average of just 29.5%. The higher education level and the lower family size can presumably explain the income gap: the average labor income per standard person of the new immigrants is NIS 4,351, compared to a national average of only NIS 4,139. Noteworthy, this gap exists even though the new immigrants have presumably lower work seniority than the established population.

The educational achievement figures of the immigrants from the FSU are strikingly impressive compared to the EU-15. Relying on data from the International Organization for Migration (IOM) and the OECD, Razin and Sadka (2014) report that only 18% of the stock of immigrants in the EU-15 in 1990 and 24% in 2000 have tertiary education.

Naturally, countries receiving immigrants are typically welfare states, Israel included. Putting it differently, in a typical welfare state disposable income inequality is significantly lower than the market income inequality. That is, transfers and the taxes of a typical welfare state serve to reduce disposable income inequality. Israel is not an outlier in the OECD countries with respect to the market-triggered (pre tax-cum-transfer) income inequality. However, Figure 1 indicates that disposable income inequality in Israel, which was roughly stable until the beginning of the 1990s, took a sharp rising trend thereafter, even though no such change occurs with respect to the market-triggered inequality.

Figure 1: Disposable Income Inequality* in Israel and Several EU-15 Countries, 1973-2013



*Gini Coefficient
Source: Dan Ben-David (2015)

Interestingly, the upward shift in disposable income inequality occurs following the start of the immigration from the FSU. In this paper we provide a political economy explanation of how the immigration can cause such a shift in disposable income inequality.

We endeavor to study analytically the political economy interactions between immigration and the welfare state, through majority voting. Specifically, we have in mind the wave of immigration from the FSU to Israel in 1989-2001.We construct a minimalist model for our analysis. It has a simple redistribution system and human capital accumulation, and production structure. There is heterogeneity of the established and migrant population.

The organization of the paper is as follows. Section II describes the model, and Section III presents the policy setup. In Section IV we discuss the numerical simulations of the model. Section V provides concluding remarks.

II. The Model

We provide a stylized general equilibrium model with free migration, where policy is determined by majority voting.[7]

II. 1. Human Capital Investment

There are just two types of workers: "skilled" (with a symbol$S$) and "unskilled" (with the symbol$U$). The wage per unit of labor of a skilled worker is w, whereas an unskilled worker earns a wage of ρw per unit of labor, where $\rho < 1$. All native-born (with a symbol N) are initially unskilled. But, a native-born can acquire education at some cost (c) and becomes skilled. Individuals differ from one another through their cost of education: there is a continuum of native-born individuals, distinguished only by their cost of education. For notational simplicity, we normalize the number of native-born individuals to 1. An individual is identified by her cost of education, so that an individual with a cost of c is termed a c-individual. We assume for simplicity that the cost of education is uniformly distributed over the interval $[o, \bar{c}]$.

All native-born individuals are endowed with E units of a composite good, the single good in this economy. All individual inelastically supply one unit of labor. If a c-individual acquires education and becomes skilled, her income[8] is (denoted by I_S^N)

$$I_S^N(c) = (1-t)w + b + (E-c)(1+r) \qquad (1)$$

[7] The model is based on Razin, Sadka and Swagel (2002)

[8] Note that this specification assumes that capital does not depreciate at all.

where t is a flat wage tax rate[9]; b is a uniform (lump-sum) per capita social benefit; and r is the interest rate – the return to capital. If a c-individual decides not to acquire education and remain unskilled, her income (denoted by I_U^N) is

$$I_U^N = (1-t)\rho w + b + E(1+r) \tag{2}$$

(Note that $I_S^N(c)$ depends on c, whereas I_U^N does not)

Thus, there is a cutoff level of cost, c^*, so that all c-individuals with $c \leq c^*$ will choose to become skilled, and all the others (with $c \geq c^*$) will remain unskilled. This c^* is defined by

$$(1-t)w + b + (E-c^*)(1+r) \qquad = (1-t)\rho w + b + E(1+r).$$

Upon some re-arrangement, the cutoff level of the cost of education, c^*, becomes:

$$(1-t)(1-\rho)w = c^*(1+r).$$

That is, c^* is solved from the equality between the return to education and its cost. A c^*-individual is just indifferent between acquiring education (and thereby becoming skilled) or staying unskilled. Upon further re-arrangement, c^* is defined by

$$c^* = \frac{(1-t)(1-\rho)w}{(1+r)}. \tag{3}$$

Note that c^* may well exceed$E$, which means that those c-individuals with c below but close to c^* (which is endogenous) actually <u>borrow</u> in order to acquire education. Naturally, the payoff in terms of the higher wage would more than offset the borrowing cost. For those individuals $E - c$ is negative.

Also, note that we are employing a static framework within which all economic and political processes occur simultaneously with no time dimension.[10] For instance, we do not distinguish between the time in which the education is acquired, and the time when the earnings occur. Similarly, capital earns its return r at the same time it is employed.

The number of c-individuals with $c \leq c^*$ is the number of native-born skilled individuals. Denoting this number by n_S, it follows that

$$n_S = \frac{c^*}{\bar{c}}. \tag{4}$$

[9] In an unpublished version we extended the tax to apply to capital income as well.
[10] Such a framework is akin to a steady state in a dynamic model with rational expectations.

Then, the number of native-born unskilled individuals, n_U, is thus given by

$$n_U = 1 - n_S. \tag{5}$$

Aggregate investment in human capital (education), denoted by H, is then given by

$$H = \int_0^{c^*} c \cdot \frac{1}{\bar{c}} dc = \frac{(c^*)^2}{2\bar{c}}. \tag{6}$$

Therefore, the aggregate stock of physical capital, K, is equal to

$$K = E - H. \tag{7}$$

There are also two types of migrants: the skilled who can earn a wage w in the host country, and the unskilled who earn a wage of ρw in the host country. None of them has any initial endowment. The migrants come to the host country after they have already made and implemented the decision whether to acquire or not acquire education. Thus, it is exogenously given who is skilled and who is unskilled. In other words, the economy benefits from the skilled migrants because it does not have to pay for the cost of investment.

II.2. Income Groups

The income of skilled and unskilled migrants, respectively, is:

$$I_S^M = (1 - t)w + b \tag{8}$$

and

$$I_U^M = (1 - t)\rho w + b. \tag{9}$$

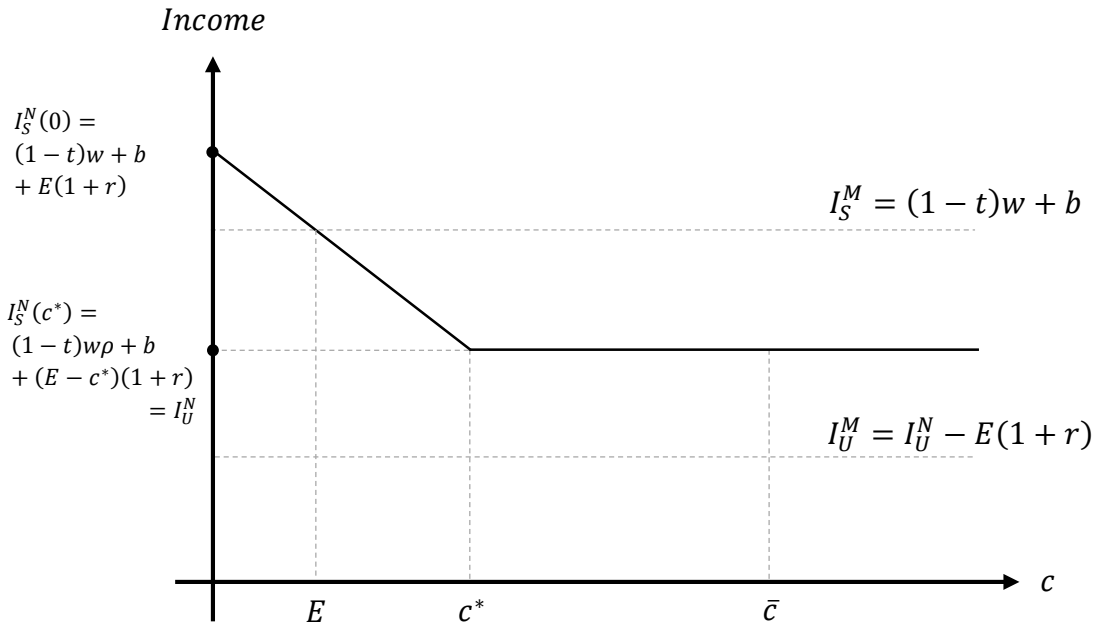
The income of the native-born as a function of c is depicted in Figure 2. Note that $I_S^N(c)$ declines in a straight line until it reaches c^*, where

$$I_S^N(c^*) = (1 - t)w + b + (E - c^*)(1 + r) \qquad = (1 - t)\rho w + b + E(1 + r) = I_U^N.$$

The labor income of the unskilled native-born and the unskilled migrants is the same, but the total income of an unskilled migrant which is $(1 - t)\rho w + b$ is definitely below the income of an unskilled native-born, the difference being the capital income enjoyed by the unskilled native-born, namely $E(1 + r)$. The total income of a skilled migrant is definitely higher than the total income of the unskilled migrant, because of the higher wage earned by the skilled, whereas both have no other income.

The income of the skilled migrants exceeds the income of the skilled native-born with $c > E$, but falls short of the income of the skilled native-born with $c < E$.

Figure 2: Income Groups and Cost of Education



The income of a skilled migrant is $I_S^M = (1-t)w + b$, whereas the income of a skilled c-individual is $(1-t)w + b + (E-c)(1+r)$. Therefore, as long as $E - c$ is positive (i.e. the c-individual does not borrow in order to invest in human capital), then $I_S^N(c) > I_S^M$. But if $E - c < 0$ (i.e. the individual borrows in order to invest in human capital), then the income of the skilled migrant (I_S^M) is greater than the income of the skilled native-born (I_S^N). In sum, we have the following ranking of incomes:

$$I_U^M < I_U^N = I_S^N(c = c^*) < I_S^N(c > E) < I_S^N(c = E) = I_S^M < I_S^N(c < E).$$

II.3. The Supply of Immigrants

Recall that the country employs an unrestricted migration policy. We envisage an economy that allows any migrants to come. Thus, the decision whether to immigrate or no rests solely with the migrant. Each potential migrant has some reservation income, so that she will migrate if and only if she will be accorded a higher income in the destination country.

Due to various factors (such as skill, family ties, age, etc.) this reservation income is not the same, but there is rather a continuum of such reservation incomes. Distinguishing between the two skill groups, we then assume that there is an upward sloping supply function for each skill group, depending

on the income accorded to immigrants in the destination country. Denoting the number of skilled migrants by m_S, the supply function of skilled migrants is given by an iso-elastic function:

$$m_S = B_S(I_S^M)^{\sigma_S} \tag{10}$$

where B_S and σ_S are some positive parameters. Similarly, the supply function of unskilled migrants is given by

$$m_U = B_U(I_U^M)^{\sigma_U} \tag{11}$$

where m_U is the number of unskilled migrants and B_U and σ_U are some positive parameters.

II.4. Production and Factor Prices

We employ a Cobb-Douglas production function

$$Y = AK^{\alpha}L^{1-\alpha}, \quad A > 0, 0 < \alpha < 1 \tag{12}$$

where Y is gross domestic product, A is a total factor productivity (TFP) parameter, and α is the capital-share parameter (and $(1-\alpha)$ is the labor-share parameter). L is the total labor supply in efficiency units and is given by

$$L = n_S + \rho n_U + m_S + \rho m_U \tag{13}$$

The competitive wage per efficiency unit of labor (w) and the competitive interest rate (r) are given by the marginal productivity conditions

$$w = (1-\alpha)A\left(\frac{K}{L}\right)^{\alpha} \tag{14}$$

and

$$r = \alpha A\left(\frac{K}{L}\right)^{1-\alpha}, \tag{15}$$

where we assume for simplicity that capital does not depreciate.

II.4. The Redistribution System

We employ a very simple system of redistribution. Wages are taxed at a flat rate of t. The revenues are distribution by a uniform per-capita transfer b.

We assume that the migrants qualify for all the benefits of the welfare state, and they are naturally subject to the state taxes. Therefore, the government budget constraint is as follows:

$$twL = b(1 + m_S + m_U) \tag{16}$$

assuming that the government has no other revenue needs, except for redistribution.[11] Note that it follows from equation (16) that t and b must be of the same sign. A positive wage tax (t) allows the government to accord a positive transfer (b) to all. A subsidy to wages (namely, a negative$t$) requires the government to impose a lump-sum tax (namely, a negative b) on all. When t and b are positive, the tax-transfer system is progressive. When they are negative, the system is regressive.

III. Policy Setup

With unrestricted migration the flows of migrants m_S and m_U are determined by the migrants themselves according to their reservation incomes (embedded in the supply functions, (11) and (12)), and the income accorded to them in the host country. There are therefore only two policy variables – the tax rate t and the social benefit b. But as the government is constrained by a balanced budget (condition (16)), it follows that there is essentially only one policy variables; once t is chosen, all the other economic variables are determined in equilibrium, including the tax revenue (twL), the number of migrants (m_S and m_U), and b. Or, alternatively, once b is chosen, all the other economic variables are determined in equilibrium.

Choosing t as the single policy variable, we note that there remain 15 endogenous variables –

$$w,\ b,\ r,\ c^*,\ I_S^M,\ I_U^M,\ n_S,\ n_U,\ I_S^N,\ m_S,\ m_U,\ H,\ K,\ Y,\ L.$$

There are also 15 equations in the model – (2)-(9) and (10)-(16) from which the endogenous variables get solved[12].

The policy variable is chosen by some natural and plausible version of a majority voting, as described below.

Start with a benchmark case, and suppose$B_S = B_U = 0$, so that there is no migration. In this case the political equilibrium is rather straight forward. If a c_0-individual would like to raise$t$, then all c-individuals with $c \geq c_0$ (whether skilled or unskilled) would certainly support such a move. This means that the distribution of the voters over the most preferred t is single-peaked. Hence, the t that will be chosen in equilibrium is the median voter's most preferred t.

[11] One may wonder why there is no tax on the initial endowment (E). In a distortive. But in a dynamic setting which we preferred to mimic in a static framework, E represents accumulated savings, and taxing it will be distortive. Furthermore, because all native-born possess the same initial endowment, taxing it in our static model does not distribute income across native-born income groups; but taxing E amounts to transferring income from the native-born to the migrantsstatic model such a tax is not.

[12] In addition, equation (1) defines I_S^N as a function of c.

Case I:

If $c^* < \frac{\bar{c}}{2}$, then the median voter is an unskilled native-born (for ρ sufficiently large, this will indeed be the case), then the equilibrium t will be at the (endogenously determined) Laffer point.

Upon observation, we can see from equations (2) and (3) that the direct effect of the tax-transfer policy on the incomes of the unskilled native-born and the unskilled migrants is the same, and works through the net wage income $(1-t)\rho w + b$. For the unskilled migrant this is the only effect of the tax-transfer system. However, for unskilled native-born, there is also an indirect effect through capital income $I(1+r)$ (note that r depends on t); but this indirect effect is of a second-order magnitude compared to the direct effect.

Similarly, the direct effect of the tax-transfer policy on the incomes of the skilled native-born and the skilled migrants is the same and works through the net wage income $(1-t)w + b$. Here again, there is also and indirect effect on the income of the skilled native-born (but not on the income of the skilled migrants) through the capital income $(E-c)(1+r)$. Here again the indirect effect is of second-order magnitude.

Thus, all unskilled (both native-born and migrants) are affected by the tax-transfer policy mainly through$(1-t)\rho w + b$, whereas all skilled (both native-born and migrants) are affected mainly by $(1-t)w + b$. It is therefore natural that all the unskilled whose wage is only ρw would rather prefer to tax wage income and take advantage of all the skilled whose wage is higher – w. Thus, the most preferred policy of the unskilled entails a positive tax and a positive transfer. Therefore, if the unskilled (both native-born and migrants) constitute a majority, then the political economy equilibrium tax and transfer will be positive – a progressive tax-transfer system. However, due to the indirect effect which applies only to the unskilled native born, the most-preferred tax and transfer policy is not necessarily the same for the unskilled native-born and the unskilled migrants. We then postulate that when the unskilled form a majority, then the tax-transfer policy chosen is the most-preferred policy by the larger of the two sub-groups (the unskilled native-born or the unskilled migrants).

Similarly, the skilled (both native-born and migrants whose wage is higher than the unskilled) would opt to grant a subsidy to the wage, financed by a lump-sum tax. That is, they opt for negative t and b – a regressive tax-transfer policy. In this case too, there is also an indirect effect which applies only the skilled native-born. Thus, the most-preferred tax-transfer policy is not the same for the two sub-groups of skilled native-born and skilled migrants. In this case too we postulate that the political-economy tax-transfer policy is the most-preferred policy of the larger sub-group.

Note that indirect effect of the tax-transfer policy which works through the capital income $(\mathrm{E}-\mathrm{c})(1+r)$ is not the same for all members of the skilled native-born sub-group (because it depends on c). In this case we assume that the median voter within this group prevails.

IV. Results

Our purpose, motivated by the Israeli experience with the wave of skilled migration from the FSU, is to examine the effect of a supply shock of skilled migration on the political economy equilibrium tax-transfer policy.

We start with parameter values that entail the unskilled (both native-born and migrants) as a majority: $x_U + m_U > x_S + m_S$. This case is described in the first row in Table 3. As predicted, the political-economy tax-transfer policy is progressive: t and b are positive. Also, the unskilled native-born form a majority of the unskilled: $x_U > m_U$.

Table 3: The Effect of a Supply Shock of Skilled Migration

	m_U	m_S	x_U	x_U	I_U^N	I_U^M	w	r	t	β
Unskilled Majority (Unskilled Native-Born the Larger Sub-Group) Parameter Value of $B_s = 1.2$	0.89	0.14	0.97	0.03	0.194	0.063	0.312	1.55	0.32	0.03
Skilled Majority (Skilled Migrants the Larger Sub-Group) Parameter Value of $B_s = 8.2$	0	1.11	0.97	0.03	0.202	0	0.228	2.94	-0.41	-0.06

Other (Common) Parameter Values:

$B_U = 56, \quad \rho = 0.18, \quad \bar{c} = 2, \quad E = 0.05, \quad \alpha = 0.33, \quad \sigma_S = \sigma_U = 1.5, \quad A = 1$

The political-economy tax-transfer policy is the most-preferred policy by the unskilled native-born.

We now keep all other parameter values constant and increase the parameter value of B_S. This supply-side sock triggers a wave of skilled migration. The results are shown in the second row of Table 3. The number of migrants (m_S) rose sharply from 0.14 to 1.11. The skilled constitute now the majority: $x_S + m_S > x_U + m_U$. As predicted, the political-economy tax-transfer policy becomes now regressive: t and b are negative. Also, the skilled migrants form the larger of the two skilled sub-groups, (i.e. $m_S > x_S$) and their most-preferred tax-transfer becomes now the political-equilibrium tax-transfer policy. Furthermore, as can be seen from the second row of Table 3, the politically dominant sub-group of skilled migrants drives out all unskilled migrants ($m_U = 0$), by according their zero income ($I_U^M = 0$). Noteworthy, the unskilled native-born were initially the politically dominant sub-group and dictated their most-preferred progressive tax-transfer. Following the supply-side stock of skilled migration, the unskilled native-born lose their dominance to the skilled migrants who are now dictating their most-preferred regressive tax-transfer policy. Nevertheless, the unskilled native-born are better off, because the return to their capital income (namely, r) rises sharply from 1.55 to 2.94 (in unit of the all-purpose composite good).

V. Concluding Remarks

This paper addresses the issue of how migration can reshape the political balance of power, especially between skilled and unskilled and between native-born and migrants, and consequently to political-economic equilibrium redistribution policy of the welfare state. The motivation arose from the unique experience of Israel which within a short time period in the early 1990s received scores of migrants from the Former Soviet Union (FSU). This wave of migrants is uniquely characterized by a large proportion of skilled migrants. Following this wave one could detect a sharp new upward trend of disposable income inequality without a parallel change in market income inequality. That is, the welfare state took a sharp regressive turn.

This paper develops a model which can explain the mechanism through which a supply-side shock of skilled migration can change the political-economy equilibrium policies. First, it depresses the incentives for unskilled migrants to flow in, though they are still free to do so. Second, tax-transfer system becomes less progressive. Nevertheless, the unskilled native-born may well become better off; because of the rise in the rate of return on their savings.

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