MIGRATION AND WELFARE STATE:
WHY IS AMERICA DIFFERENT FROM EUROPE?

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<u>ABSTRACT</u>

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and migration-states. The former has more generous welfare state and more liberal migration policies
than the latter. In this paper we attempt to provide a political-economy explanation for these key
differences, based on the degree of coordination among member states of the economic union, and
the different levels of population aging.

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Abstract

Over the years, there emerged two key policy differences between Europe and America, both welfare and migration-states. The former has more generous welfare state and more liberal migration policies than the latter. In this paper we attempt to provide a political-economy explanation for these key differences, based on the degree of coordination among member states of the economic union, and the different levels of population aging.

1. Introduction

Commodity prices vary across countries due to several reasons: different tax rates, market segmentation, different standards, transportation costs, etc. However, the forces of free trade tend to narrow these differences. These forces are enhanced by multi-lateral trade agreements reached under the auspices of the World Trade Organization (WTO); by regional trade agreements, such as the North America Free Trade Agreement (NAFTA); or by other bilateral trade agreements, such as the one between Switzerland and the European Union (the EU), and the one between Norway and the EU.

In contrast, wages on labor services of individuals with similar labor market traits differ considerably across countries, especially between advanced and developing countries. Such high differences cannot persist under free migration. They exist mostly because sovereign states restrict migration. There exists no WTO-like organization which can coordinate sustainable reductions in the administrative barriers to migration.

Restrictions on the international mobility of labor are arguably the single largest policy distortion that besets the international economy. A variety of studies suggests that even a small reduction in barriers to migration will result in large welfare benefits to the global economy.[1] Unlike international trade in goods, or international financial flows, migration can change the policy of the decision making in the economy. This is because population composition in terms of income, age, etc., can alter the power balance between the native-born and the newcomers in a way that changes the political-economic policy of the state.

Nevertheless, despite the potential big gains from easing restrictions on international labor mobility, countries do not pursue the liberalization of migration flows unilaterally, or through negotiations, in a way that international trade negotiations do[2]. Why is this? Evidently, because politicians face a backlash against immigration. Among several key explanations for this, is the fiscal burden imposed by immigration on the native-born.

In this pivot monograph, we focus on a central tension faced by policy makers in countries that receive migrants from lower wage countries. The former countries are typically highly productive and capital rich. The resulting high wages attract both high-skill and low-skill migrants. Reinforcing this migration is the nature of the host country's welfare state: low-skill migrants

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[1] See Bhagwati and Hanson (2009) for a broad discussion of this issue.
[2] See Razin and Sadka (1997) for a review of the interaction between international trade and migration.

find a generous welfare state particularly attractive. Such a welfare state may turn also to be a migration state. Low-skill migration imposes a fiscal burden on the native-born. In addition, a generous welfare state may deter high-skill migration because heavy redistributive taxes must accompany them. Indeed, over the last half-century, Europe's generous social benefits have encouraged a massive surge of "welfare migration", that is, of low-skill migrants. In contrast, at the same period, the U.S. has attracted a major world portion of high-skill migrants, boosting its innovative edge. While Europe ended up in the last two decades with 85 percent of all low-skill migrants to developed countries, the US retains its innovative edge by attracting 55 percent of the world-educated migrants.

Another fundamental factor which is inter-related with migration and the generosity of the welfare state is the aging of the population. The old generally benefit from the generosity of the welfare state (e.g. through the old-age social security benefits and Medicare in the U.S.). They are also keen to admitting migrants, in particular high-skill migrants, as a way to alleviate the finances of the welfare state. On the other hand, the working young, who finance the welfare state through their payroll tax, are reluctant to support a generous welfare state. With respect to migration, the young are less keen than the old to admitting migrants, because they may be concerned about changes in the political balance in the future when they grow old and that could endanger the old-age benefits they expect to receive. It is interesting to note in this context that the current immigration debate in the U.S. about "the path to citizenship" of the undocumented migrants is centered exactly about how they may tilt the political balance of power, once they become citizens, concerning the "role of government" (i.e., the generosity of the welfare state).

This aging factor is another source of difference between the U.S. and the EU. In 2010, the proportion of people 65 and older constituted 13.1% in the U.S., whereas in the core EU countries it is significantly larger: 20.8% in Germany, 20.3% in Italy, 16.8% in France, and 16.6% in the UK (United Nations, 2013).

Although the population in the U.S. is getting older and growing more slowly than in the past, the demographic future for the U.S. is younger in comparison with the core EU countries. In particular, the U.S. population is projected to grow faster and age slower than the populations of its major economic partners in Europe.

This pivot monograph explains key policy differences between two otherwise similar economic unions, the U.S. and the EU: (i) higher generosity of the welfare-migration system in the EU, relative to the U.S., (ii) the skill and the wealth bias of the migration to the U.S. relative to the migration to EU, with the former receiving a higher portion of the high-skill and rich migrants.

This pivot monograph claims that the looser nature of the economic union in the EU, relative to the U.S., and the relatively more aged population contribute a great deal to our understanding of the two aforementioned policy differences.

2. Welfare State

The United States of America has organized its various states as a federation, since gaining independence, over 200 years ago. The large expenditures incurred by the pre-independence states during the war of independence and the consequent inability of the individual states to repay the ensued debt, triggered the need and opportunity to establish an integrated federal fiscal system. Congress then transferred the authority to levy taxes from the states to the federal government. The federal government bailed out the states and effectively assumed their debts. The 1790 congress empowered the federal government to raise enough revenues to service a big government debt.

Another wave of state fiscal crises in the mid of the nineteenth century enhanced the federal government to take a leading role in financing infrastructure projects, allowing state governments to reduce their role. Following the debt crises, many states introduced some forms of balanced budget rules into their constitutions; see Sargent (2012). This enhanced the role of the federal government in the fiscal system. Nowadays, federal tax revenues constitute well over one-half of all the tax revenues (federal, state and local) in the U.S.

In contrast, at the time the European Union is born, all the major individual countries have already well-established solid fiscal systems and none was at a risk of default. As a result, the individual countries preserved their fiscal independence from the outset. Later on, treaties (such as the Maastricht Treaty of 1992) attempted to restrict the fiscal sovereignty of individual countries. However, restrictions apply merely to several aggregate variables, such as the budget deficit and the public debt. Each country was free to set its total expenditures and their compositions. This effectively means that each country faced no restrictions on the level and composition of its social expenditures and taxes - key components of the welfare state. Furthermore, these treaties were not effectively enforced, mostly because of the veto power granted to each country on important fiscal policies. In contrast to the U.S., there are no EU-wide taxes or social programs in the EU. There is no EU-wide income tax, no health care programs (such as, for instance, Medicare, and Affordable Care in the U.S.), and no social security payroll taxes in the EU. The EU budget amounts to no more than one percent of the GDP in the EU. Indeed, Figure 3.1, which depicts the social expenditures in EU core countries and the U.S, confirms that (i) these expenditures are lower in the U.S., relative to the EU; (ii) there is a sizable difference within the EU countries themselves. For instance, total social expenditures in 2000 amounted to 8,618 USD in Denmark, 7,583 USD in Germany, 8,040 USD in France, 8,668 USD in Sweden, but only 5,838 USD in the U.S. (all figures are expressed in Purchasing Power Parity 2000 USD). These differences vary across the years but the pattern (i) and (ii) above remain.
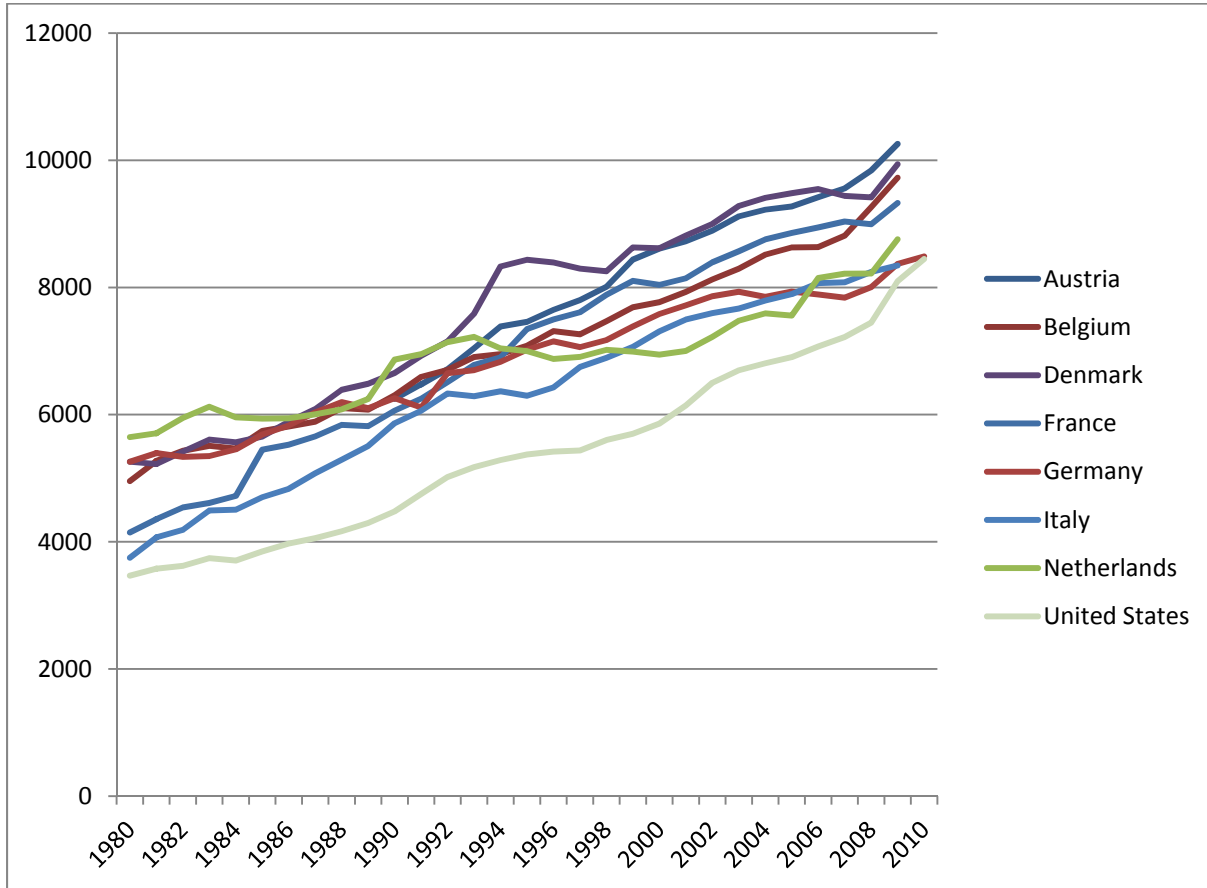
Figure 3.1: Social Expenditures per capita in the U.S. and selected EU countries, 1980-2010

Notes:

(1) Constant PPP 2000 prices

(2) Public and mandatory private social expenditures

(3) Source: OECD library

3. Migration State

In setting up migration policy, one is certainly concerned by the skill composition of immigrants. Naturally, high-skill immigrants are more attractive to the destination countries than low-skill immigrants for a variety of reasons. For instance, high-skill immigrants are expected to pay taxes to the Fisc in excess of what the Fisc provides them with. These immigrants are also expected to boost the technological edge of the destination countries. In contrast, low-skill immigrants tend to depress low-skill wages of the native-born, and they also deemed to impose a burden on the fiscal system.

However, if a migration policy that favors the high-skill is coupled with a generous family-unification policy, then an influx of low-skill migration takes place too.

3.1 The U.S.

Migrants from Europe (the Old World) created the United States (the New World). Naturally, migration to this new world was not restricted. Mass migration to the United States accelerated starting in 1840 and peaked in the eve of World War I. Migration amounted to about 300,000 migrants a year in the mid-nineteenth century. It peaked to about 3,000,000 a year in the years just before WWI.

WWI signaled the end of free migration worldwide. The League of Nations, formed after WWI, failed to provide any support for international migration. Many countries, especially the British Empire, insisted on their rights to limit migration, against the desire of countries such as China, Japan, and India who were all in favor of labor mobility. A series of migration restricting acts were introduced in the U.S. after WWI. Migration to the U.S. fell to mere 50,000 a year in the 1930's, during the Great Depression. The 1917 Immigration Act excluded Asian immigration. The 1921 Emergency Quota Act limited migration to 350,000 a year. The 1924 Johnson-Reed Act cut the quota to 150,000 a year. Following the Great Depression, the U.S. gradually cut the quota to 50,000; see Goldin, Camero and Balarajan (2011). More recently, the U.S. tilted its migration policy in favor of high-skill migrants. The 1990 U.S. Immigration Act increased the number of temporary visas to high-skill workers.

In addition, the U.S. universities and research centers, significantly funded directly and indirectly by the U.S. federal and state governments, attracted talented researchers from all over the world. Many of them remained in the U.S. after completing their original term of education, training or research. Many became citizens. By the mid of 1990s, 30% of documented immigrants to the U.S. were high-skill.

3.2 Europe

The birth of the welfare state is in Bismark Germany in the late nineteenth century. In the twenty century, following two world wars, most of the European countries, that later formed the European Union, provided the world with their own model of the welfare state. The   reconstruction of continental Europe (and, in particular, of Germany and France) exhausted the native-born labor force. This induced continental Europe to opt for guest workers from labor-rich countries

in southern Europe, Turkey and North Africa. Exceptionally, France had from the beginning a legal immigration policy that allowed the settlement of immigrant workers and their families from its colonies in North Africa. Germany, at the other extreme, always attempted to maintain strict rotation policies aimed at not allowing the guest workers to settle in Germany; see Hollifield (2004). However, eventually, family reunification arrangements made the guest workers effectively residents throughout the core European countries.

The removal of barriers to labor mobility within the EU, in the framework of the European Single Market, coincided with increased restrictions by the EU member countries to the immigration from outside the EU. EU member countries were the ones who invoke the latter restrictions, as they enable them to retain their sovereignty on non-EU immigration policy. The collapse of the Soviet Bloc and the following enlargement of the EU to include Central and East European countries brought additional migrants to the core-EU countries.

Overall, and unlike the U.S. migration, the European migration exhibit significant bias toward low-skill migrants; see Boeri, Hanson and McCormick (2002) and Boeri (2008).Table 3.1 compares the stocks of migrants, by educational attendance, between the EU-15 and the U.S. Indeed, we can see that more than 40% of the stock of migrants in the U.S. are with tertiary education, whereas the corresponding figure for the EU-15 is less than 25%. Similarly, about 48-59% of the stock of migrants in the EU-15 have only primary education, whereas the corresponding figures for the U.S. are only 22-26%.

Table 3.1: The Stocks of Migrants, by Education-Level, the U.S. and the EU-15, 1990 and
2000.

Education-Level (By Percentage of Total)	EU-15		U.S.	
	1990	2000	1990	2000
Primary	59	48	26	22
Secondary	24	28	31	36
Tertiary	<u>18</u>	<u>24</u>	<u>43</u>	<u>24</u>
	100	100	100	100

Source: International Organization for Migration (IOM) and OECD.

Data from the European Household Survey Panel reveals that in EU countries with high education and income levels, such as Denmark, France, Germany, and the Netherlands, education levels of non-EU foreigners is significantly below that of the native-born. The average skill-composition of non-EU foreigners is well below that of EU individuals who moved from one EU country to reside in another EU country.

It is worth noting that the effect of migration on the fiscal burden is not that much noticeable at the aggregate level of the fiscal system. The impact rests mainly on the distribution of the burden between the high-skill and the low-skill, between the poor and the rich, between the old and young, among various regions, etc.

4. Free Versus Controlled Migration: Analytics

A union typically has free migration among its member states. For example, the U.S. constitution rules out any impediments to the free passage of goods, capital and people across states. Similarly, a series of agreements dealing with migration, commencing with the 1985 Schengen Agreement, opened intra-union borders to free migration. Nevertheless, a union or its member states may still control immigration from third-party countries. In the U.S. such controls reside with the union itself (the federal government), whereas in the EU the individual members have more control over immigration from non-union countries.

As a prelude to our analysis of the interaction between the welfare state and the migration state in the conjunction of free and controlled migration, we attempt to explain in this chapter the simple analytics of free and controlled migration in the framework of a single representative country. For this purpose, we present a parsimonious model of migration and welfare state.

4.1 A Parsimonious Model of Welfare and Migration State

We consider an economy with a single good and individuals with two skill levels: high-skill (subscripted by "s") and low-skill (subscripted with "u"). We assume that the good is produced

by a Cobb-Douglas technology, exhibiting constant returns to scale, and employing the two types of labor which are not perfect substitutes:

$$Y = AL_s^\alpha L_u^{1-\alpha}, \qquad 0 < \alpha < 1, \tag{4.1}$$

where, Y is GDP, A denotes a Hicks-neutral productivity parameter, and L_i denotes the input of labor of skill level i, where I = s, u stands for high-skill and low-skill, respectively.

By the standard marginal productivity conditions, the competitive wages of high-skill and low-skill labor are:

$$w_s = \alpha Y / L_s$$

$$\tag{4.2}$$

$$w_u = (1 - \alpha)Y / L_u \quad ,$$

where w_i is the wage rate of an individual with a skill level i = s, u.

Aggregate labor supply, for high-skill and low-skill workers, respectively, is:

$$L_s = (S + \sigma\mu)l_s$$

$$\tag{4.3}$$

$$L_u = (1 - S + (1 - \sigma)\mu)l_{u.} \quad .$$

There is a continuum of workers. The number of native-born is normalized to 1; S denotes the share of the native-born high-skill in the total native-born labor supply; σ denotes the share of high-skill migrants in the total number of migrants; μ denotes the total number of migrants; and l_i is the labor supply of an individual with skill level i = s,u.

We assume that the well-beings of high-skill and low-skill migrants in the host country are high enough to generate $\sigma\mu$ and $(1 - \sigma)\mu$ high-skill and low-skill migrants, respectively.

Total population (native-born and migrants) is as follows

$$N = 1 + \mu \ . \tag{4.4}$$

We specify a simple welfare-state system which levies a proportional labor income tax at the rate τ with the revenues redistributed equally to all residents (native-born and migrants alike) as a social benefit, b, per capita. This benefit captures not only a cash transfer, but may also capture outlays on public services such as education, health, and other provisions, that benefit all workers, regardless of their contribution to the finances of the system. Note that this benefit is accorded to all, native-born and migrants alike. This is plausible, as there is a public and political support both in Europe and in the U.S. to grant key components of the social benefits (such as public education) to migrants too. In the U.S. it may also be unconstitutional to exclude migrants from social assistance programs.

The tax-benefit system employed here is progressive in the conventional sense. The net tax liability of an individual, namely the tax, minus the benefit, as a fraction of gross income is:

$$(\tau w_i l_i - b)/w_i l_i \tag{4.5}$$

$$= \tau - b/w_i l_i \quad .$$

Clearly, this average net tax liability is increasing in gross income ($w_i l_i$). That is, the high-skill rich individual pays in net taxes a higher fraction of this gross income, relative to the low-skill individual. In fact, because the government budget must be balanced, the low-skill individual is a net beneficiary of the welfare state, that is, his net tax liability, given in (4.5), is negative, whereas the high-skill individuals is a net contributor to the welfare state, (that is, her net tax liability, given in (4.5), is positive).

Strictly speaking, this model is a one-period model, and the government must therefore balance its budget[3]. More generally, it is a parsimonious model, which may be viewed as a reduced form of a stationary state of a dynamic model. The migrants in the welfare-migration state are entitled to all benefits and are subjected to all its taxes.

The balanced budget constraint is therefore given by

$$b = \frac{\tau(w_u l_u + w_s l_s)}{N} = \frac{\tau Y}{N} \qquad . \qquad (4.6)$$

That is, total benefits are equal to total tax revenues. Recall that GDP (Y) is equal to national income, which consists of wage payments.

All individuals (native-born and migrants) have the same preferences given by

$$u_i = c_i - \frac{\varepsilon}{1+\varepsilon} l_i^{\frac{1+\varepsilon}{\varepsilon}}, \qquad (4.7)$$

where c_i (i = s,u) denotes consumption of all types of goods (private goods, education and health services, etc.), and ε is a positive parameter.

The budget constraint of an individual with skill level i is

$$c_i = b + (1-\tau)l_i w_i, \qquad i = s, u. \qquad (4.8)$$

Individual utility-maximization yields the following individual labor supply equation

$$l_i = ((1-\tau)w_i)^\varepsilon, \qquad i = s, u. \qquad (4.9)$$

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[3] Razin, Sadka and Suwankiri (2011) analyze the dynamic interactions between the welfare and the migration state in an overlapping-generations model.

Note that the labor supply elasticity with respect to the wage rate is constant and is given by $\varepsilon > 0$.

As usual, by substituting c_i and l_i from equations (4.8) and (4.9), respectively, into equation (4.7), we obtain the indirect utility function:

$$V_i = b + \frac{((1-\tau)w_i)^{1+\varepsilon}}{1+\varepsilon}, \qquad i = u, s \qquad (4.10)$$

There are two fiscal policy variables at the hand of the government- the tax rate (τ) and the benefit per capita (b). However, given that the government faces a balanced budget constraint, there is essentially only one policy variable at the hands of the government. That is, once the government chooses, for instance, the benefit b, the tax rate must be determined at a level that balances the budget, and vice versa: choosing the tax rate τ yields, through the budget con-straint, the benefit level b. We henceforth suppress b.

In general, there are three independent policy variables in this model: the tax rate- τ; the share of high-skill migrants - σ; and the total number of migrants - μ. For each of level of these policy triplet, we can find the equilibrium by equating supply and demand in the labor markets (for high-skill and low-skill) indiviuals. This yields the equilibrium wage rates[4]

$$w_s = A(A\delta^\varepsilon \vartheta^{1-\alpha})^{\frac{1}{1+\varepsilon}}$$

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[4] In order to ensure that the high-skill wage always exceeds the low-skill wage (that is, $w_s > w_u$), we assume that

$$\frac{\alpha(1-S+(1-\sigma)\mu)}{(1-\alpha)(S+\sigma\mu)} > 1 \quad .$$

$$w_u = A((1 - \alpha)\delta^\varepsilon \vartheta^{-\alpha})^{\frac{1}{1+\varepsilon}} \quad , \tag{4.11}$$

where $\delta \equiv \alpha^\alpha(1 - \alpha)^{1-\alpha}$ and $\vartheta \equiv \frac{1-S+(1-\sigma)\mu}{S+\sigma\mu}$.

The equilibrium levels of all the other endogenous variables - c_i, l_i, L_i, b, N and Y (where i = s,u), are calculated by substituting the equilibrium wage equation (4.11) into equations (4.1), (4.3), (4.4), (4.6), (4.8) and (4.9).

This general framework leads itself to two types of migration-policy regimes. One is of a controlled migration (analyzed in section 4.3) in which σ and μ are determined endogenously through an explicit upward-slopping supply functions for the two types of migrants. We assume that policy (with respect to fiscal and migration issues) is determined by majority voting. Note that this policy is determined "in advance", before the arrival of migrants. Therefore, the migrants do not participate in the voting process.[5]

Note that there are only two types of identical individuals-voters: high-skill and low skill. Therefore, the outcome of the voting is determined according to the preferences of the type that forms the majority.

4.2 Gains to the Native-born from Migration

Like international trade in goods, there are also gains from opening national borders to labor mobility. A simple figure (Figure 4.1) can serve to illustrate the gains from migration in our model. For concreteness, we illustrate the gains to the native-born from low-skill migration. For simplicity, we assume that there are no taxes and benefits.

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[5]See, for instance, Razin, Sadka and Swagel (2002) for an analysis of the case where migrants do participate in the voting process in a similar model.

The downward slopping curve in this figure is the marginal product of low-skill labor. This curve is also the demand for this type of labor[6].
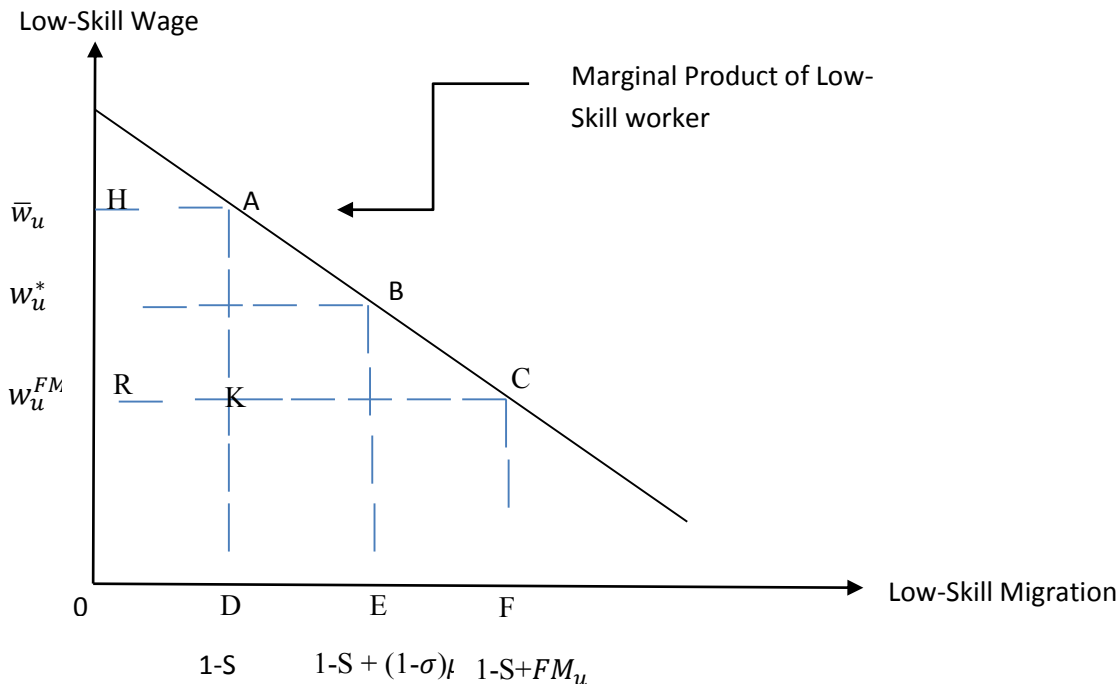
Low-Skill Wage

Marginal Product of Low-Skill worker

$\bar{w}_u$ H   A

w_u^* B

w_u^{FM} R   K   C

0   D   E   F   Low-Skill Migration

1-S   1-S + (1-σ)μ 1-S+FM_u

Figure 4.1: The Gains From Low-Skill Migration

In a closed economy with no migration, the equilibrium low-skill wage is $\overline{w}_u$ (Recall that there are 1- S native-born low-skill individuals.)

GDP is equal to the area OGAD, of which the area HGA accrues to the native-born high-skill and the area OHAD - to the native-born low-skill.

Suppose the low-skill migrants face a reservation wage of w_u^{FM} in their countries of origin, which is below the closed-economy wage rate $\overline{w}_u$. If we allow for a free migration, then FM_u low-skill migrants will come. The equilibrium wage will drop to w_u^{FM}.

GDP (produced by both native-born and migrants) increases to the area of OGCF. The increase is measured by the area DACF. A part of this increase (the area DKCF) accrues to the low-skill migrants, so that the aggregate gains to all the native-born is the area AKC. Note, however, that not all native-born gain. The income of native-born low-skill drops to the area ORKD, so that they lose the area HAKR. On the other hand, the income of the native-born high-skill rises to be the area GRC, so that the increase (the area RHAC) exceeds the loss to the native-born low-skill.

Therefore, with a perfect, non-distortionary system of redistribution (via lump sums), the native-born high-skill can more than compensate the low-skilled native-born low-skill, so that all native-born can gain from migration. In our model, with a distortionary redistribution system (via wage taxation), the compensation possibilities are more limited, so that it is not always the case that all native-born gain from migration. A similar conclusion holds in the case of high-skill migration. Therefore, as we will see in later chapters, the political power balance plays a major role in designing migration policies.

The above analysis referred to free migration. If migration of low-skill individuals is limited to $(1 - \sigma)\mu$ migrants, then similar qualitative conclusions hold, though to a lesser quantitative degree.

We assume that policy (with respect to fiscal and migration issues) is determined by majority voting. Note that policy is determined in advance, before the arrival of migrants. Therefore, the migrants do not participate in the voting process.

4.3 Controlled Migration

Recall that we assume in this case that the host country can receive as many migrants as it wishes of each one of the two skill types, so that the host-country migration policy is the sole determinant of migration flows.

Our focus in this treatise is the skill composition of migration. Therefore, we consider in the controlled migration regime the total volume of migration (μ) as given[7]. We then analyze how the controlled composition of migration responds to the controlled size or generosity of the

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[7] To simplify the notation we suppress the variable μ, when no confusion is thereby created.

welfare state (τ). Recall that once τ and σ are determined, then the benefit b is also determined, and we therefore denote it by b (σ, τ).

Naturally, we assume that individuals vote on policy issues according to their self-interest. That is, they vote to maximize their indirect utilities, as given in equation (4.10).These utilities are also functions of σ and τ:

$$V_i(\sigma, \tau) = b(\sigma, \tau) + \frac{((1-\tau)w_i(\sigma,\tau))^{1+\varepsilon}}{1+\varepsilon}, \qquad i = u, s \ . \qquad (4.12)$$

In order to find the attitude of the native-born regarding the skill composition of migration, we first ask how this composition affects their utilities. For this purpose, we partially differentiate the utility levels given in equation (4.12) with respect to σ to get:

$$\frac{dV_i(\sigma,\tau)}{d\sigma} = \frac{db(\sigma,\tau)}{d\sigma} + (1-\tau)l_i w_i(\sigma, \tau)\frac{dw_i(\sigma,\tau)}{d\sigma}, \qquad i = s, u \ . \qquad (4.13)$$

Equation (4.13) suggests that a change in the share of high-skill migrants in the total number of migrants (σ) affects utility levels through two channels. First, the first term in the right-hand side of equation (4.13) captures the effect of σ on b. Naturally, an increase in the share of the high-skill in the labor force raises total labor productivity and, consequently, tax revenues. This, in turn, raises the benefit b. The second term in the right-hand side of equation (4.13) captures the effect of σ on wages. Naturally, an increase of the share of the high-skill in the labor force depresses the skill-premium in the labor market.

Recall that we plausibly assumed that only the native-born population is eligible to vote on the migration policy, as the would-be migrants are not yet a part of the host country. If the decisive voter is a low-skill individual, both of the above effects increase her utility. Thus, a low-skill voter would like to set the skill composition of migrants at the maximal limit, that is, σ, is set at one. This means that the share of the high-skill migrants preferred by the decisive high-skill voter is typically lower than that preferred by the decisive low-skilled voter. On the

one hand, the high-skill benefit from an increase in σ because it raises b. However, on the other hand, an increase in σ depresses their wage w_s. Therefore, we plausibly assume that the decisive high-skill voter would like to set σ below one.

Defining σ_i^{CM} as the share of skilled immigrants most preferred by an individual with skill level i = s, u in the host country (keeping τ constant), we get:

$$\sigma_s^{CM} < \sigma_u^{CM} = 1 \quad . \tag{4.14}$$

Our goal is to find the effect of the change in the generosity of the welfare state on the migration policy concerning σ. The generosity of the welfare state, captured by the magnitude of the benefit b, depends positively on the tax rate, τ. (We assume that economy is on the "correct side" of the Laffer curve.) We thus look for the effect of τ on the change in the desired skill composition of the migrants, σ. One can show that[8]

$$\frac{d\,\sigma^u}{dt} = 0 \quad ; \quad \frac{d\,\sigma^s}{dt} > 0 \quad . \tag{4.15}$$

This means that if the decisive voter is a low-skill worker, then an exogenous increase in the tax rate ,τ, would leave the skill migration policy unchanged, because it is always set at the maximum possible limit. If, however, the decisive voter is a high-skill worker, an exogenous increase in the tax rate, τ, will change the policy concerning the skill composition of migrants in the direction towards a larger share of high-skill migrants (and a lower share of low-skill migrants). The reason is that when the tax rate is higher, the redistribution burden upon a

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[8] For a proof see Cohen, Razin and Sadka (2009), and Razin, Sadka and Suwankiri (2011, p. 36-39)

high-skilled decisive voter increases. Allowing additional high-skill migrants can ease this rise in the fiscal burden, dominating the adverse effect on the high-skill wage[9].

4.4   Free Migration

We now assume that no restrictions are placed on migration in the origin country. The level of migration depends entirely on the choice of potential migrants. In choosing whether to migrate or not, a potential migrant of skill i compares his prospective utility, V_i , in the migration destination (our host country), to the reservation utility, denoted by $\bar{u}^i$, in the origin country. For each skill level i = s,u , we assume that there is a continuum of would-be migrants, differing with respect to the reservation utility level in the origin country. This heterogeneity of reservation utilities in the origin country could stem from different traits of the potential migrants (e.g., family size, age, moving costs, forms of portable pensions, housing, cultural ties, etc.). Thus, the destination country faces an upward sloping supply curve, $S^i(V_i)$, of potential migrants from the origin country for each skill level i.

To abbreviate notation in this section we let m_s be the number of high-skill migrants, and m_u the number of low-skill migrants. The proportion of high-skill migrants, σ, is therefore given

$$\sigma = \frac{\frac{m_s}{m_u}}{1+\frac{m_s}{m_u}} \qquad . \qquad (4.16)$$

The indirect utility function in the destination country no longer depends on the policy variable σ because σ itself is now an endogenous variable, which depends on τ, and is determined in equilibrium. We thus have to add to the set of equations determining the equilibrium in the preceding section a set of new equations that jointly with the first set determine also the number of migrants of each type (and, consequently, σ). The indirect utility function becomes now:

$$V_i(\tau) = b(\tau) + \frac{((1-\tau)w_i)^{1+\varepsilon}}{1+\varepsilon} \quad . \tag{4.17}$$

The following equation determines, for each τ, the cut-off levels of the reservation utilities, $\bar{u}^s(\tau)$ and $\bar{u}^u(\tau)$, for a would-be migrant of skill i = s,u, respectively:

$$V_i(\tau) = \bar{u}^i(\tau), \qquad i = s, u \quad . \tag{4.18}$$

The number of migrants of each skill level, i = s,u, is then determined by the supply of migrants, that is

$$m_i(\tau) = S^i\left(\bar{u}^i(\tau)\right), \qquad i = s, u \quad . \tag{4.19}$$

Having defined the new, free-migration equilibrium, we can now investigate the effect of an exogenous change in the generosity of the welfare state on the desired skill mixture of the migrants (σ^{FM}). The generosity of the welfare state is again measured by the tax rate τ, as the benefit ,b, depends positively on τ.

One can show that[10]

$$\frac{d\sigma^{FM}}{d\tau} < 0 \qquad . \tag{4.20}$$

That is, the generosity of the welfare state attracts relatively low-skill migrants and discourages high-skill migrants. The literature refers to the first effect as the "magnet effect", see, e.g., Borjas (1999).

The rationale for this result is as follows. An increase in τ raises the benefit, b, but lowers the net wages, $(1-\tau)\,w_i$. For high-skill migrants, the fall in net wage outweighs the increase in the benefit. Thus, an increase in τ reduces the cut-off reservation utility of the high-skill migrants, $\bar{u}^s(\tau)$. As a result, those high-skill migrants with reservation utilities between the old one the new (lower) cutoff levels will choose not to migrate. The opposite holds true for low-skill migrants. Thus, an increase in the generosity of the welfare state under free migration deters high-skill migrants and attracts low-skilled ones, thereby tilting the skill composition of migration towards low-skill migrants.

Note that when comparing equation (4.15) to equation (4.20), we can unambiguously conclude that the generosity of the welfare state attracts relatively more high-skill migrants in the controlled-migration regime than in the free-migration regime.

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[10] For a proof, see Razin, Sadka and Suwankiri (2011, p.39-41).

5. Free versus Controlled Migration: Evidence

We showed in the preceding chapter that the generosity of the welfare attracts a skill composition of migrants, which is tilted in the direction of high-skill migrants when migration is controlled. This is true no matter whether the decisive voter is high-skill or low-skill. However, when migration is free, then the generosity of the welfare state acts as a magnet to low-skill migrants. As a result, the skill composition of migrants tilts in the direction of low-skill migrants. In this chapter, we provide empirical evidence in support of these conclusions.

5.1 Brief Review of Early Literature

There are quite a few studies, which address the issue of how welfare state generosity works as a magnet to migrants- the welfare migration phenomenon.

Khoudour-Castéras (2008), who studied nineteenth-century emigration in Europe, found that the social insurance legislation adopted by Bismark in the 1880s reduced the incentives of risk-averse Germans to emigrate. He estimated that in the absence of social insurance, the German emigration rate from 1886 to 1913 would have been more than double its actual level.

Southwick (1981) showed with U.S. data that the large welfare state benefit gap between origin and destination regions increased the share of welfare-state benefit recipients among migrants. Gramlich and Laren (1984) analyzed a data sample from 1980 U.S. census and found that the high-benefit regions attracted more welfare-recipient migrants than the low-benefit regions. Using the same data, Blank (1988) employed a multinomial logit model to show that welfare benefits have a significant positive effect on the location choice of female-

headed households. Similarly, Enchautegui (1997) found a positive effect of welfare benefits on the migration decisions of women with young children. Meyer (2000) employed a conditional logit model as well as a comparison-group method to analyze the 1980 and 1990 U.S. census data and found significant welfare-induced migration, particularly for high school dropouts. Borjas (1999), using the same data set, found that low-skill migrants are much more heavily clustered in high-benefit states in comparison to other migrants or native-born. Galbach (2000) found strong evidence of welfare migration in 1980, but less in 1990. Mckinnish (2005, 2007) also found evidence for welfare migration, especially for those located close to state borders (where migration costs are lower). Walker (1994), using the 1990 U.S. census data, found strong evidence in support of welfare-induced migration. Levine and Zimmerman (1999) estimated a probit model, using a data set for the period 1979-1992, and found, on the contrary, that welfare benefits had little effect on the probability of female-headed households (the recipients of the benefits) to relocate.

Peridy (2006) studied migration rates in eighteen OECD destination countries from sixty-seven origin countries and found that the destination-origin ratio of welfare state benefits (as measured by total public spending) had a significant positive effect on migration. De Giorgi and Pellizzari (2006) conducted an empirical investigation of migration from outside the EU-15. Using a conditional logit approach, they found that welfare-state benefits attracted migrants. Welfare-state benefits exhibits also a positive effect on the probability of the lowest-education group to migrate, when benefits interact with the education level. In contrast, migration probabilities of the secondary and tertiary education groups were not significantly affected. Docquier and Marfouk (2006) and Docquier, Lohest and Marfouk (2006) studied the determinants of migration stocks in the OECD countries in the year 2000, with migrants from 184 countries classified according to three education levels. They found that social welfare programs encouraged the migration of both high-skill and low-skill workers. However, low-

skill were motivated by social expenditures much more than high-skill migrants. Thus, they concluded that the skill composition of migrants is adversely affected by welfare-state benefits, that is, welfare benefits encourage migration biased toward the low-skill.

Recall that our parsimonious model predicts differential effect of the skill composition of migration, depending on whether migration is free or controlled. Therefore, in order to obtain unbiased estimates of the effects of welfare stare generosity on the skill composition of migration, we must control for the migration regime (free versus controlled). This means that studies of migration among states within the U.S. (e,g., Borjas(1999)), which are evidently confined to a single migration regime (free migration), can produce an unbiased result. Other studies that employ samples confined to controlled migration, but at the same time employ a model of migrants' choice whether to migrate and to which country, are evidently inconsistent. In this case, the estimates convey little information on the migrants' choice (and hence on the welfare state as a magnet for low-skill migrants), but rather information on the migration policy choices of the destination country. Those studies that refer to both migration regimes without controlling for them are not easily interpretable because they convey a mixture of information on migration policies in the destination countries and on the individual migrant's migration choices in the origin countries.

5.2 Recent Literature

Two recent studies do indeed control for the migration regime when analyzing the generosity of the welfare state on the skill composition of migration.

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Razin and Wahba (2014), following Cohen and Razin (2009), decompose a cross-country sample into three categories. Each category has two groups of countries. The first group contains countries which enable free mobility of labor among them. They also prohibit any kind of discrimination between native-born and migrants, regarding labor market accessibility and welfare-state benefits eligibility. These are 16 European countries, 14 of them are a part of the EU (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and UK), and Norway and Switzerland. For notational brevity, we will refer to this group as the EUR group. The second group includes non-European developed countries. These are the U.S., Canada, Japan, Australia, New Zealand, Israel, Taiwan, Hong Kong, Korea and Singapore. The third group consists of 23 developing countries: Argentina, Brazil, Chile, China, Columbia, Ecuador, Egypt, Jordan, India, Indonesia, Iran, Malaysia, Mexico, Morocco, Lebanon, Nigeria, Peru, Philippines, Tunisia, South Africa, Thailand, Turkey and Venezuela.

The first category consists of pairs of destination and origin countries, all form the first group. The second category consists of pairs of origin-destination countries, where the destination countries come from the first group and the origin countries come from the second group. The third category consists of pairs of destination-origin countries, where the destination countries come from the first group and the origin countries come from the third group.

This decomposition enables to plausibly assume that migration is free among the 16 EUR countries. Migration is effectively policy-controlled in the second and third categories. That is, migration from either the second group of 10 non-EUR developed OECD countries or from the third group of 23 developing countries into each one of the 16 EUR countries is effectively policy-controlled by the respective EUR country.

Thus, these studies can identify the differential effect of the generosity of the welfare state on the skill composition of migration in an unbiased way. The first category enables to study the

generosity of the welfare state on the skill composition of migration under a free-migration regime. The second and third categories enable to study the effect of the generosity of the welfare state on the skill composition of migration when the latter is controlled.

The main reason why they distinguish between the second and third groups of countries (and, consequently, between the second and the third category) has to do with differences between the two groups such as cultural, institutional and other factors which are unobservable.

Because our interest is the effect of the generosity of the welfare state on the skill composition of migration rates, controlling for the heterogeneity in the skill (education) measurement is essential. The heterogeneity stems from the raw data, which measures skills by years of schooling, disregarding differences in the quality of schooling. To address this potential problem, all the migration stocks and rates are adjusted for quality of education, using Hanushek and Woessmann's (2009) new measures of international differences of cognitive skills - average international assessment of student achievement in 12 international student achievement tests (ISATs). Hanushek and Woessmann (2009) use their schooling quality measure to provide evidence on the robust association between cognitive skills and economic growth. They also find that home-country cognitive-skill levels strongly affect the earnings of immigrants in the U.S. labor market in a difference-in-differences model that compares home-educated immigrants to US-educated immigrants from the same country of origin. This suggests that controlling for the quality of schooling is important.

Table 5.1 describes the average test score in math and science, primary through end of secondary school (EQ) in the countries in three groups, as calculated by Hanushek and Woessmann (1999). The average score in Taiwan is 5.452, whereas it is only 3.089 in South Africa. The group average is 4.939, 5.132 and 3.999 in the first, second, and third group, respectively.

Table 5.1: Average Test Scores, by Country

EUR (First Group)		DC (Second group)		LDC (Third Group)	
Country	EQ	Country	EQ	Country	EQ
Austria	5.089	Australia	5.094	Argen-tina	3.920

Belgium	5.041	Canada	5.038	Brazil	3.638
Switzer-land	5.142	Hong Kong	5.195	Chile	4.049
Denmark	4.962	Israel	4.686	China	4.939
Spain	4.829	Japan	5.310	Colombia	4.152
Finland	5.126	Korea, Rep.	5.338	Egypt	4.030
France	5.040	New Zea-land	4.978	Indonesia	3.880
United Kingdom	4.950	Singa-pore	5.330	India	4.281
Germany	4.956	Taiwan (Chinese Taipei)	5.452	Iran	4.219
Greece	4.608	United States	4.903	Jordan	4.264
Ireland	4.995			Lebanon	3.950
Italy	4.758			Morocco	3.327
Nether-lands	5.115			Mexico	3.998
Norway	4.83			Malaysia	4.838
Portugal	4.564			Nigeria	4.154
Sweden	5.013			Peru	3.125
				Philip-pines	3.647

				Thailand	4.564
				Tunisia	3.795
				Turkey	4.128
				South Af-rica	3.089
Group averages	4.939		5.132		3.999

Notes: EQ= average test score in mathematics and science, primary through end of secondary school, all years (scaled to PISA scale divided by 100)

Razin and Wahba (2014) employ the EQ data in Table 5.1 in order to adjust the raw data on migration rates of high-skilled individuals. Table 5.2 illustrates the adjustment for two origin-destination pairs (U.K.-Egypt and Italy-Egypt).

Table 5.2: Education Adjustment of High-Skill Migration Rate (Examples)

Immigration Rate of High Skill	UK (Destination) - Egypt (Origin) Immigration	Italy (Origin) - Egypt (Destination) Migration
Unadjusted: DM	0.2435	0.1144

Adjusted: DM^*	0.198	0.0969

The variable DM in table 5.2 is defined by the difference between high-skill and low-skill migration rates as follows

$$DM_{o,d} = \frac{m_{o,d}^s}{P_o^s} - \frac{m_{o,d}^u}{P_o^u} \qquad , \qquad (5.1)$$

where (o,d) stands for the origin-destination pair and and, as usual, s refers to high-skill and u to low-skill. Accordingly, $m_{o,d}^i$ is the stock of migration from origin country o to destination

country d of skill level i = s,u. P_o^i is the total stock of individuals of skill level i = u,s in the origin country o.

DM^* is the DM that is adjusted for the quality of education, as follows.

$$DM_{o,d}^* = DM_{o,d} \, (EQ_o/EQ_d) \quad .$$ (5.2)

In order to study the effect of the generosity of the welfare state on the skill composition of migration under either free or controlled migration regimes, Razin and Wahba (2014) estimated the following equation.

$$DM_{o,d}^* = \beta_0 + \beta_1 I_{o,d} + \beta_2 b_d + \beta_3 I_{o,d} b_d + \beta_4 x + \beta_5 I_{o,d} x + \epsilon_{o,d}$$ (5.3)

The variable b_d is the log average social benefit pre-capita in the destination country d over the period 1974-1990, x_t is a vector of control variables which are listed in Table 5.3, consisting of two groups - returns to skill and immigration policies. These variables refer to the destination country, the origin country, and jointly to both countries. $I_{o,d}$ is an index function which assumes a value of zero when (o,d) belong to the first category (free migration within the EUR countries) and a value of one when (o, d) belongs to the second and third categories (controlled migration). $\epsilon_{o,d}$ is the residual variable. The dependent variable in this equation ($DM_{o,d}^*$) captures the skill composition of migration (a higher value indicates a composition tilted in favor of the high-skill). The value of $DM_{o,d}^*$ in the estimation consists of the changes in the values of the components $m_{o,d}^i$ and P_o^i (i = s,u) defining $DM_{o,d}$ in equation (5.1) between the year 2000 and the year 1990. The explanatory variables consist of the social benefit in the destination country and a bunch of other control variables. In a free migration regime ($I_{o,d} = 0$), the effect of the social benefit on regime skill composition of migrants is given by the parameter β_3. In a controlled migration regime ($I_{o,d} = 1$), this effect is given by the sum $\beta_3 + \beta_4$.

A potential endogeneity problem may arise, in particular between the level of social benefits in the host country,b_d, and the skill difference in the migration rates, because high-skill immigrants can influence the potential economic equilibrium level of benefits. For example, more immigration may lead to lower level of social spending per-capita, if migrants are more likely to become unemployed, or if migrants come with large dependent families.

Therefore, the levels of social benefits that are employed in the estimation are not concurrent levels, but rather those of the pre-sample period 1974-1990. In addition, an instrumental variable method was employed, where the legal origin in the destination country serving as an instrument. The legal system indicates cultural and social features of the destination countries and reflects basic constitutional notion regarding the attitude towards property rights on the other hand and social rights on the other hand. Legal origin traces the different strategies of common and civil law to different ideologies about law and its purpose and how those were incorporated historically into specific legal rules and into the legal system shaping many spheres of law making and regulations on the security of property rights and contract enforcement. Hence, one can argue the legal origin has shaped welfare generosity.

Table 5.3 presents the estimates of the coefficients of a selected group of explanatory variables, which are at the focus of our analysis. The estimates of the coefficients of all the explanatory variables are given in appendix 5A.

First, note that the coefficient b_d is negative. This means, as we hypothesized in the preceding chapter, that the generosity of the welfare state tilts the skill composition of migration in favor of the high-skill in the free migration regime - the magnet effect.

Next, note that $b_d I_{o,d}$ is the <u>additional</u> effect of the generosity of the welfare state on the skill composition of migrants in the controlled-migration regime, over and above the effect that exists in the free-migration regime. Note that the coefficient of $b_d I_{o,d}$ is positive which means,

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as hypothesized in the preceding chapter, that the generosity of the welfare state affects more positively the skill composition of migrants in the direction of the high-skill in the controlled-migration regime, than in the free-migration regime. Furthermore, Table 5.3 shows that Chi-square test for $\beta_2 + \beta_3$ being positively holds. That is, the total effect of the generosity of the welfare on the skill composition of migrants is positive in the controlled migration regime (in both cases-- when the origin country is from the second or the third group). Note that in the preceding chapter we hypothesized that this effect is non-negative; see equation (4.15).

Table 5.3 The Generosity of The Welfare State and the Skill Composition of Migration: Free versus Controlled Migration, Selected Variables

	Category One and Two (EUR & DC to EUR)	Category One and Three (EUR & LDC to EUR)
Benefits per capita (b_d)	-0.170	-0.178

	(0.070)**	(0.064)***
Lagged Benefits ($b_d I_{o,d}$)	0.207	0.194
	(0.077)***	(0.080)*
Chi2(1) $\beta_2 + \beta_3 > 0$	7.72***	7.83***
Observations	360	534
R-squared	0.871	0.835

Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix 5A: The Generosity of the Welfare State and the Skill Composition of Migration: Free versus Controlled Migration

	Category One and Two (EUR & DC TO EUR)	Category One and Three (EUR & LDC to EUR)

Welfare generosity						
Benefits per capita (b_d)	-0.159 (0.075)**	-0.207 (0.087)*	-0.170 (0.070)**	-0.175 (0.076)**	-0.179 (0.079)**	-0.178 (0.064)**
Lagged Benefits ($b_d I_{o,d}$)	0.269 (0.089)***	0.268 (0.098)*	0.207 (0.077)**	0.207 (0.083)**	0.218 (0.102)**	0.194 (0.080)**
Migration rates						
Low-skilled migration 1990xEQ	-0.686 (0.148)***	-0.685 (0.145)***	-0.678 (0.155)***	-0.602 (0.144)***	-0.665 (0.154)***	-0.666 (0.164)***
Low-skilled migration 1990xEQx$I_{o,d}$	1.753 (0.172)***	1.765 (0.170)***	1.732 (0.174)***	0.553 (0.212)***	0.694 (0.290)**	0.686 (0.292)**
High-skilled migration 1990xEQ	1.026 (0.166)***	1.022 (0.163)***	1.014 (0.171)***	0.941 (0.163)***	0.991 (0.173)***	0.989 (0.180)***
High-skilled migration 1990xEQx$I_{o,d}$	-0.698 (0.164)***	-0.693 (0.162)***	-0.684 (0.168)***	-0.632 (0.173)***	-0.566 (0.193)***	-0.564 (0.198)***
Returns to skill						
High-low labor ratio in 1990 (destination)		-1.192 (0.358)***			0.075 (0.386)	

High-low labor ratio in 1990x$I_{o,d}$		0.833 (0.534)			0.027 (0.574)	
High-low wage diff. in 1995 (destination)			0.004 (0.002)*			0.003 (0.002)
High-low wage diff. in 1995 (destination) x$I_{o,d}$			-0.007 (0.003)**			-0.007 (0.005)**
Gini in 1990 (origin)		0.012 (0.004)***	0.013 (0.004)***		0.012 (0.004)***	-0.013 (0.005)***
Gini in 1990 (origin) x$I_{o,d}$		-0.013 (0.005)***	-0.015 (0.005)***		-0.012 (0.004)***	0.012 (0.004)***
High-low un-empl. Rate diff. in 1990 (destination)		0.008 (0.003)*	0.002 (0.003)		0.003 (0.003)	-0.006 (0.004)
High-low un-empl. Rate diff. in 1990 (destination) x$I_{o,d}$		0.005 (0.005)	-0.005 (0.004)		-0.008 (0.005)	-0.012 (0.004)***
Immigration policies						

Total migrants stock in 1990	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.002 (0.001)**	-0.002 (0.001)**	-0.002 (0.001)**
Share of refugees in 1990	-2.592 (3.245)	0.106 (3.535)	-2.809 (3.548)	-1.768 (2.476)	-1.694 (2.571)	-1.315 (2.919)
Chi2(1) $\beta_2 + \beta_3 > 0$	8.26***	7.44***	7.72***	6.28**	5.28**	7.83***
F Statistics First Stage	167.98	148.47	140.94	26.87	25.01	24.79
Cragg-Donald F- statistics	-51.69	58.98	62.65	86.45	92.77	169.49
Kleibergen-Paap rk Wald F statistics	203.13	104.39	291.73	148.23	297.41	450.85
Observations	384	384	360	601	570	534
R-squared	0.863	0.867	0.871	0.805	0.830	0.835

Notes: Regressions include real GDP per capita growth rate in destination, distance, and dummy for same language in destination and origin, and real GDP per capita in destination and in origin countries.

Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

6. Principles of International Taxation

In a world with international flows of capital, labor, finance, etc. there arise two distinct income tax issues that are absent in closed economies[11].

Each tax jurisdiction must decides (i) whether, and at which rate, to tax its citizens/ residents on their foreign-source income (e.g. wages, interests, dividends, etc.); and (ii) whether, and at which rate, to tax foreigners on their income originating from sources within the jurisdiction.

There are two main principles of international taxation. Most countries employ, either statutorily or effectively, some mixture of these two principles. The first principle is known as the residence principle, whereby the country taxes its residents (and in the U.S. both residents and citizens) on their world-wide income. To avoid double taxation, residents usually receive some reliefs (typically, tax credits) on taxes paid to the country where the income was originated. Also, according to this principle, no taxes are levied on income originating in the country that accrued to non-residents. The second principle is known as the source principle, whereby the country taxes all incomes originating within its borders, no matter whether they accrue to residents or non-residents. According to this principle, income of residents from foreign sources is exempt from tax.

No country adheres exclusively to either one of these two principles. The rationale is simple. A country would not like to exempt its residents on their foreign-source incomes in order not to encourage its residents to divert their capital and work efforts away from home. Knowing that foreigners usually receive anyway in their own countries credits against taxes paid in the domestic country, the latter has no incentive to exempt them from domestic taxes. Such an exemption amounts to transferring potential tax revenues from the domestic country to foreign countries. Therefore, most countries tax non-residents on (at least, some of) their incomes

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[11] Similar issues arise in the context of indirect taxes (e.g. excises value added taxes, etc.) with international flows of goods.

originating within their boundaries. Thus, most countries employ some mixture of both principles.[12]

In the following sections we focus on economies employing the source principle, as we study how taxation affects the volume of migration and its skill composition. In this context, it is important and relevant to employ the source principle, as under this principle, the migrants are treated for tax-benefit proposes as residents, whether or not they are indeed full-fledge residents. That is, they are taxed on their income and qualify for welfare benefits.

In a closed economy, the first optimality theorem of welfare economics suggests that competition leads through Adam Smith's "invisible hand" to an efficient allocation of economic resources. That is, there is no other allocation that can beat the competitive allocation in the sense of making at least one individual better-off, without making any other individual worse-off. Thus, the role of government is limited to providing public goods and services, law and order, money, social insurance and redistribution of income, etc. There are several conditions that have to be met in order for the first optimality theorem to hold. One important such a condition is the absence of externalities, a condition which (like other conditions) often fails to hold.

In our context, we deal not only with internal competition (that is, competition within each country), but also with competition among a group of countries in the world economy. The international competition is among governments with respect to tax and migration policies. In this setup one may also expect such international competition to lead an efficient allocation of

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[12] The international tax literature shows that if the residence principle is exclusively employed by all countries, the world private investment in physical capital (machinery, equipment, etc.) is effectively allocated world-wide when international flows of capital are free. That is, the pre-tax marginal productivity of capital is equated accross all countries. Alternatively, if the source principle is emplyed everywhere , then the world private saving is effectively allocated accross all countries. That is, the after-tax intertemporal (between present and future consumption) marginal rate of substitution, governing saving-consumption decisions, is equated world-wide, when international financial flows are free. For a treatise of international taxation, see Frenkel, Razin and Sadka (1991).

resources among this group of countries (as well as an efficient allocation within each country brought about domestic competition). When this is the case, then there can be no gains to these countries from coordinating the tax and migration policies.[13]

However, in this context too, competition fails to bring about efficiency, if there are cross-country externalities within this group of countries. Indeed, we identify in the following chapters such an externality which is built-in in the welfare and migration competition, referred to as a (cross-country) fiscal externality. Furthermore, if the group of countries, as a whole, is big enough, so as to enjoy market power vis-à-vis the rest of the world economy, it may benefit from collectively exploiting this power. In our setup, the rest of the world is a source of migrants to the group. The supply of these migrants to the group of countries is typically upward-slopping.

Therefore, the group can collectively exercise its market power with respect to the economic conditions (wage, social benefits) offered to the migrants. Therefore, there may exist gains from coordination among the countries in the group with respect to their tax/benefit and migration policies.

7. Migration and the Fiscal System: Intra-Union Competition

The pioneering framework for competition among jurisdictions is due to Tiebout (1956), who dealt with localities. Tiebout's model features many "utility-taking" localities, analogous to the perfect competition setup of many "price-taking" agents. His focus was on the allocation of a given population among competing localities.[14]

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[13] See, for instance, Razin and Sadka (1991).
[14] A related issue, fiscal federalism, was first analyzed by Oates (1972).

Adopting a similar approach, we model a stylized economy with a group (union) of n small countries. There is free mobility of goods and capital among them. They are also destination countries for migrants from the rest of the world. These migrants are generally poorer than the native-born residents of these countries. In this chapter we consider a competitive regime in which each country in the union determines its own tax/ benefit and migration policies, in competition with the other countries. The alternative of coordination among the union's members with respect to the fiscal and migration policies (the coordination regime) is dealt with in the next chapter.

We turn now to a description of the union countries. For the sake of simplicity, we assume that all these countries are identical and we specify the characteristics of a representative country.

7.1 Representative Country

A representative country is similar to the representative country of chapter 5, except that we introduce now an additional input capital (K), with an income share of 0<β<1.

7.1 Producers

With a capital input, the constant-returns-to-scale, Cobb-Douglas production function becomes now

$$Y = AK^{\beta}L_s^{(1-\beta)\alpha}L_u^{(1-\beta)(1-\alpha)}, \qquad 0 < \alpha < 1, 0 < \beta < 1. \qquad (7.1)$$

The income shares of the high-skill and low-skill, respectively, are now given by $(1-\beta)\alpha$ and $(1-\beta)(1-\alpha)$, as can be seen from equations (7.2) below.

The competitive wages of high-skill and low-skill labor are equal to their marginal productivities:

$$w_s = (1 - \beta)\alpha Y / L_s$$

$$(7.2)$$

$$w_u = (1 - \beta)(1 - \alpha)Y / L_u \quad .$$

Note that the abundance of high-skill labor raises the wage of the low-skill whereas the abundance of low-skill labor raises the wage of the high-skill.

As before, aggregate labor supply, for high-skill and low-skill workers, respectively, are given by[15]:

$$L_s = (S + \sigma\mu)l_s$$

$$(7.3)$$

$$L_u = (1 - S + (1 - \sigma)\mu)l_u.$$

As before, the size of the native-born population is normalized to one. Also, the total number of workers, native-born and migrants, is given by:

$$N = 1 + \mu \quad . \qquad (7.4)$$

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[15] We also assume that $\frac{\alpha(1 - S + (1 - \sigma)\mu)}{(1 - \alpha)(S + \sigma\mu)} > 1$, which ensures that the wage of the high-skill always exceeds the wage of the low-skill ($w_s > w_u$).

For the sake of simplicity, we assume that physical capital does not depreciate. Firms rent capital from individuals. In a competitive equilibrium the pre-tax rental price of capital (r) will be equal to the marginal productivity of capital, that is

$$r = \frac{\beta Y}{K} \qquad .\qquad\qquad (7.5)$$

7.2 Individuals

Native-born high-skill individuals, and low-skill individuals, and migrants differ from one another in their ownership of capital (wealth). Migrants of both types (high-skill and low-skill) own no capital. The native-born high-skill are endowed with more capital than the native-born low-skill. Denote by $\bar{K}_i$ the stock of capital owned by a native-born individual with skill level I = s,u , where $\bar{K}_s > \bar{K}_u$. Given that the high-skill earn a higher wage rate than the low-skill (that is, $w_s > w_u$), it follows that the native-born high-skill are unambiguously richer than the native-born low-skill and all the migrants. Also, the native-born low-skill are richer than the low-skill migrant. Such heterogeneity in income and wealth is crucial for the analysis below.

An individual can rent her capital either at home or at the other union countries. Thus, the total stock of capital, owned by residents, $S\bar{K}_s+(1$-S$) \bar{K}_u$ does not have to equal K, the total input of capital as would be the case in a closed economy. As explained in the preceding chapter, capital taxation is levied according to the source principle, according to which each country taxes only the capital employed in that country. Denoting the tax rate on capital income by τ_K, the net-of-tax rental price of capital is $(1$-$\tau_K)$r[16].

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[16] Note that due to our constant-returns-to scale assumption, there are no pure profits at the firm's level that can be taxed (as, for example, by a corporate tax).

We specify a simple welfare-state system in which there is a dual tax system: a tax at the rate τ_L on labor income and a tax at the rate τ_K on capital income. We allow for different rates of taxation of labor and capital in order to examine the effects of migration and capital mobility separately on capital and labor taxation. The welfare state provides also a uniform social benefit (b). The latter may capture not only a cash transfer, but also outlays on public services such as education, health, and other provisions. Thus, b is not necessarily a perfect substitute to private consumption.

All individuals (irrespective of skill or national origin) have identical preferences over private consumption (c), work efforts (*l*), and the social benefit (b), given by the following utility function:

$$u_i = c_i - \frac{\varepsilon}{1+\varepsilon} l_i^{\frac{1+\varepsilon}{\varepsilon}} + \ln(b) \qquad , \tag{7.6}$$

where $\epsilon > 0$ is a preference coefficient that will turn out to be the individual labor supply elasticity (see equation (7.8)). Recall that we interpret b not just as a pure cash transfer, but rather as some social benefit that creates a utility of ln(b).[17]

The budget constraint of a native-born individual with skill level I = s,u is given by:

$$c_i = (1 - \tau)l_i w_i + [1 + (1 - \tau_K)\text{r}]\overline{K}_i \quad , i = s, u \tag{7.7}$$

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[17] This quasi-linear utility function is quite common in the tax literature (e.g. Diamond (1998)). It implies that there is no income effect on the labor supply; see equation (7.8) below.

We assume that migrants are fully entitled to the welfare system. That is, they pay the tax rate τ_L on their labor income (they own no capital) and receive the social benefit b. Thus, the budget constraint of a migrant of a skill level i = s,u is given by:

$$c_i = (1 - \tau)l_i w_i \qquad , \tag{7.8}$$

In view of our quasi-linear utility function, capital income does not affect labor supplies. Thus, all individuals (irrespective of skill or national origin) have the same labor supply:

$$l_i = ((1 - \tau)w_i)^\varepsilon, \qquad i = s, u \tag{7.9}$$

Note that the (fixed) coefficient ε is indeed equal to the labor supply elasticity.

In general, the indirect utility function gives the maximum level of utility that an individual can obtain, given her budget constraint and the social benefit provided by the government. In our case the indirect utility function is obtained by substituting the labor supply equation (7.9) and the budget constraint (7.7) or (7.8) into the utility function (7.6). Thus, for a native-born individual, this indirect utility function (V_i) is given by:

$$V_i(\tau_L, \tau_K, b) = \ln(b) + \frac{((1-\tau_L)w_i)^{1+\varepsilon}}{1+\varepsilon} + \left(1 + (1 - \tau_K)\right)\overline{K}_i \qquad , i = u, s \tag{7.10}$$

The indirect utility of a migrant who owns no capital is given by

$$V_i^m(\tau_L, b) = \ln(b) + \frac{((1-\tau_L)w_i)^{1+\varepsilon}}{1+\varepsilon}, \qquad I = s,u$$

(7.11)

7.3 Government

In a static model, like the present one, it is common and natural to employ a balanced-budget rule[18]. That is, the government employs all its revenues, from labor and capital taxation, to finance the uniform social benefit.

The government budget constraint is thus given by:

$$bN = \tau_K rK + \tau_L(w_u l_u + w_s l_s) \qquad . \qquad (7.12)$$

Note that source taxation is employed, so that the government obtains capital tax revenues from the entire input of capital employed in domestic production.

7.4 Migrants

As we have already mentioned, migrants to the union member countries pay their dues to the welfare system, but they also qualify for all the social benefits that the system provides. Therefore, they are not merely driven by better wages, but also by the social benefits. Put differently, migration is driven by the utility-gap rather than by merely the wage-gap. Note that as all the countries of the union are assumed identical, there will be no intra-union migration. Therefore we consider only migration from the rest of the world to union member countries[19].

However, there is, as before, some cost to migration. As we explained in chapter 5, some cost to migration. As we explained in chapter 5, this cost may depend on individual characteristics such as age, family size, ethnicity, whether or not and to what extent pension benefits are portable to the new destination, etc. Thus, the migration cost may vary not only for different

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[18] This is the analogue of an intertemporal balanced budget rule, in present value terms, in a multi-period model.

[19] For an extension to a union with non-identical countries and, consequently, intra-union migration from poor to rich member countries (in addition to migration from the rest of the world), see Razin and Sadka (2013).

skill levels, but also within each skill level. Consequently, the reservation utility - the threshold utility level in the destination country for migration to occur - varies accordingly. We assume that would-be migrants are indifferent with respect to the identity of the would-be destination country. All they care about is the level of utility they will enjoy. Thus, the number of migrants of each skill level who wish to emigrate to the union (as a whole) rises with the level of utility (well-being) that they will enjoy in the union. (Note that utilities are identical across the union member countries.)

Put differently, the union faces an upward-slopping migrant supply function for each skill level:

$$\sigma\mu = f_s(V_S^m)$$

(7.13)

$$(1-\sigma)\mu = f_u(V_u^m) \quad ,$$

where f_i is the supply function of migrants of skill level i and V_i^m denotes the utility level accorded to migrants of skill level i in the union, i=s,u.

7.5 Fiscal and Migration Policy of a Union Member Country

A representative union-member country determines its fiscal and migration policy by majority voting among the native-born. For concreteness, we describe in details the case where the native-born, high-skill form the majority, that is S > 0.5 (the other case is specified similarly).

Being small enough, each union-member country naturally takes union-wide prices as given. In the presence of free capital mobility there will be only one rental price of capital throughout the union. Because source taxation is employed, the relevant price is the net-of-tax rental price of capital[20]. Denote this price (market rate of return) by $\bar{r}$. Therefore:

$$(1 - \tau_K)r = \bar{r} \qquad . \qquad (7.14)$$

Prices in our case include also the utility levels of migrants and native-born, by skill.

Because of intra-union free migration, there are therefore also equal utilities, by skill and origin, throughout the union. Each union-member country takes union-wide utility levels ad given too; that is, each country is also a "utility-taker" (in analogy to being a "price-taker"). Denote the (assumed given) union-wide utility level of a migrant of skill i by $\bar{V}_i^m$ (i = s,u). Then:

$$V_S^m(\tau_L, b) = \bar{V}_S^m$$

$$(7.15)$$

$$V_u^m(\tau_L, b) = \bar{V}_u^m \qquad .$$

(Note that because V_i and V_i^m differ from one another only by the term $(1+\bar{r})\bar{K}_i$ (i = s,u), which is uniform across the union, it follows that the utilities of the native-born, by skill, are also uniform across the union.)

Each union-member country chooses its fiscal and migration policy variables ($\tau_L, \tau_K, b, \mu,$ and σ), so as to maximize the utility of the native-born majority, subject to its budget constraint

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(7.12), the free capital mobility constraint (7.14), and the intra-union free migration constraint (7.15).

We denote by an asterisk (*) the levels of the economic variables that ensue under the fiscal and migration policy chosen by the government.

7.6 Competitive Policy Equilibrium

Each union-member country seeks to admit $\sigma^*\mu^*$ high-skill migrants and $(1-\sigma^*)\mu^*$ low-skill migrants from the rest of the world. The union demands for high-skill and low-skill migrants from the rest of the world are thus $\sigma^*\mu^*n$ and $(1-\sigma^*)\mu^*n$, respectively. Therefore, utility levels that clear the market for migrants from the rest of the world are determined in equilibria by

$$n\sigma^*\mu^* = f_s(V_S^m)$$

(7.16)

$$n(1-\sigma^*)\mu^* = f_u(\bar{V}_u^m) \qquad .$$

These equations determine the utility levels of the migrants that each union member assumed as given. Also, the world wide net-of-tax rental price of capital, $\bar{r}$, is determined so as to equate the union demand for capital, nK^*, to the union supply, $n(S\bar{K}_S + (1-S)\bar{K}_u)$, that is:

$$nK^* = n(S\bar{K}_S + (1-S)\bar{K}_u) \qquad\qquad (7.17)$$

(Note that because all the countries in the union are identical, then in fact there is no movement of capital from one country to another; each country employs the entire capital endowment of its native-born.)

8. Intra-Union Coordination

So far, we assumed that the union-member countries compete with each other in an attempt to provide as high as possible utility level for the majority. They compete in the sense that each country determines its fiscal and migration policy variables (i.e. $\tau_L, , \tau_K, b, \mu, \sigma$) independently of the other union-member countries, taking their policies as given (a Nash-equilibrium).

Presumably, a low-skill majority voter opts to admit high-skill migrants, for two reasons: first, such migrants are net contributors to the finances of the welfare state; that is, the tax that each one pays (namely, $\tau_L w_s l_s$) exceeds the benefit she receives (namely, b). Second, for a given stock of capital (and volume of migration), increasing the share of high-skill migrants raises the wage of the low-skill (native-born and migrants alike), due to the factor-substitution built-in in the Cobb-Douglas production function. Therefore, if the low-skill form the majority they will admit only high-skill migrants[21].

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[21] This result hinges crucially on the assumption that migrants are not entitled to vote. If they were, then a low-skill majority may opt to limit the number of high-skill migrants in order to preserve its majority. For an analytical treatment of this case, see Razin, Sadka and Suwankiri (2011).

On the other hand, the high-skill (who are assumed to form the majority) may opt for both types of migrants. Low-skill migration raises the wage of the high-skill, due to a factor substitution effect, but imposes a fiscal burden on the high-skill, because low-skill migrants are net consumers of the welfare state. High-skill migration lowers the wage of the high-skill, but contributes positively to the finances of the welfare state. All of these reinforcing or conflicting forces are balanced in a competitive equilibrium. The aforementioned setup may capture the gist of the policy competition that takes place among the members of the EU. An alternative institutional regime is for the union-member states to coordinate their fiscal and migration policies to their mutual benefit.

This institutional regime of coordination among union-member states may capture the gist of the federal system of the United States. In particular, the federal government is the governing body that set migration policy and the bulk of the fiscal policy. Naturally, such coordination can come only at the expense of the migrants from the rest of the world.

The very advantage of coordination over competition is that the former allows the union-member countries (states) to take into account the effect of policy on economic variables (prices) that each individual country takes as exogenous under competition. The union-member countries are no longer price (utility) - takers in the coordination regime, as they were in the competitive regime. In our case, there are three such variables: the utility level of the high-skill ($\bar{V}_s^m$), the utility level of the low-skill ($\bar{V}_u^m$), and the net-of-tax rental price of capital ($\bar{r}$). These variables govern the allocation of high-skill labor, low-skill labor and capital in the union.

The coordinating states now jointly determine their fiscal and migration policy variables

$(\tau_L, , \tau_K, b, \mu, \sigma)$, as opposed to independently choosing them. In addition and simultaneously,

the coordinating states choose now also the "prices" - $\bar{V}_s^m$, $\bar{V}_u^m$, and $\bar{r}$ - subject to the market-

clearing conditions (7.16) and (7.17). As before, they are also bound by the budget constraints

(7.12). Note that as all the union-member states are alike, the issue of revenue-sharing among

states does not arise.

9. Competition versus Coordination: The U.S. and the EU

The focus of this monograph is hour coordination among countries (states) in an economic

union affects fiscal and migration policies, as compared to a competition among them. This

comparison may offer some explanation to the differences between the U.S. (coordination)

and the EU (competition) with respect to the size (generosity) of the welfare state and the

share of high-skill migration in total migration.

We consider the social benefit variable (b) as a proxy to the size (generosity) of the welfare

state[22]. As there are in our model economy only two types of workers (high-skill and low-

skill), we are interested only in the share of just one of these two types of migrants in total mi-

gration.

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[22] Recall that with a balanced-budget the social benefit b are equal to (per-capita) tax revenues. Therefore, the social benefit is more appropriate proxy to the size of the welfare state than the two tax parameters τ_L and τ_K, which do not always move in the same direction.

Specifically, we look at the high-skill share σ. We carry out this comparison via numerical simulations[23]. Figure 9.1 depicts the social benefit (b) under the two institutional regimes (competition and coordination) for different levels of total factor productivity (A). Figure 9.2 depicts the share of high-skill migration in total migration (σ) under the two institutional regimes for different levels of total factor productivity (A). As a side result, we note that the social benefit increases under both regimes when total factor productivity rises. This is expected: a richer economy can afford to accord its residents a higher level of social benefits.

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[23] There is no attempt to calibrate the model to the EU and U.S. economies, as they are very stylized, abstracting from many important features that are similar or different between them. Nevertheless, the simulations offer a useful insight into the quantitative differences between the two unions with respect to fiscal and migration policies.
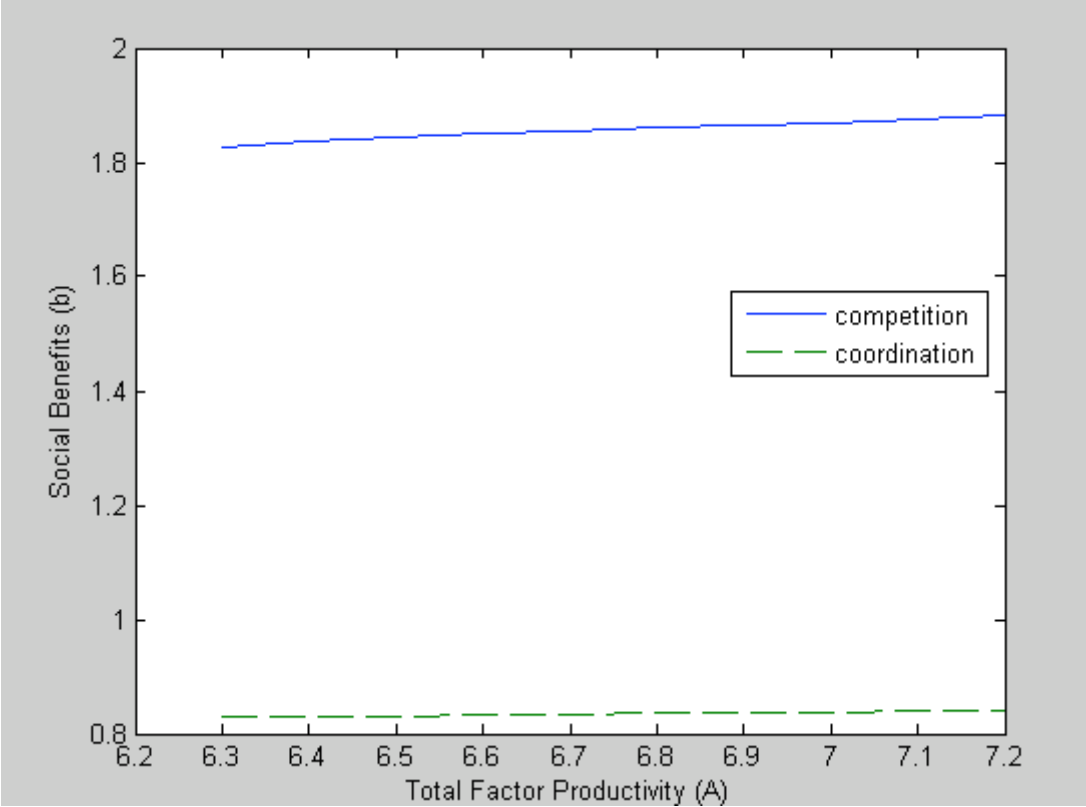
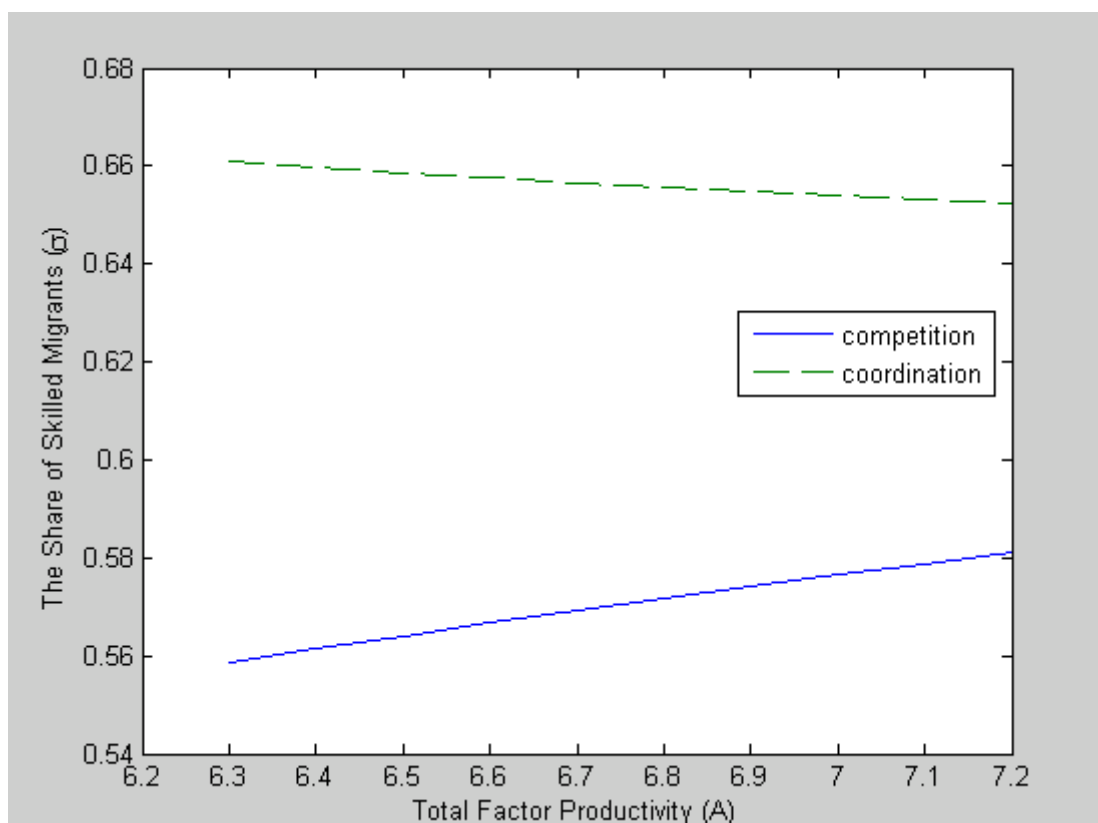Figure 9.1: Social Benefits, by Total Factor Productivity: Competition versus Coordination.

Figure 9.2: High-Skill Composition of Migration, by Total Factor Productivity: Competition versus Coordination

Our main interest is to compare b and σ under the two regimes. Interestingly, coordinating the fiscal and migration policies allows the union-member states to offer less generous social benefits than when they compete with each other; see Figure 9.1. The rationale for this result is rooted in a fiscal externality associated with migration.

There are gains and losses brought about by migration. A union-member country has an intra-marginal gain from either high-skill or low-skill migration stemming, from the diminishing productivity of either type of labor for a fixed stock of capital. This was illustrated in Figure

4.1. The gain stems from the fact that each migrant (whether high-skill or low-skill) is paid according to the productivity of the marginal migrant, which is smaller than the average productivity of the migrants (of the same type). On the other hand, the native-born population shares with migrants the tax collected from capital income (recall that migrants have no capital), because the transfer b that the migrants receive is not financed fully by their labor income tax. That is, the capital tax revenues paid by the native-born population 'leak' also to the migrants[24].

The fiscal burden imposed by migration on the native-born (both high-skill and low-skill) is reinforced when this migration is composed of low-skill migrants. This is because the low-skilled not only possess no capital, they also have low wages and accordingly pay low labor income taxes[25].

Each union-member country in a competitive regime evidently balances at the margin the gains and losses from migration. In doing so, each country (being a "utility-taker") takes the well-being of the migrants, $\bar{V}_s^m$ and $\bar{V}_u^m$, as given (see equation (7.15)). It thus ignores the fact that when it adopts a fiscal-migration policy that admits an extra migrant, it raises the well-being that must be accorded to migrants not only by it but also by all other union member countries, in order to elicit the migrant to come in. as a result, it offers migrants too high level of the social benefit (b), and admits a too high share of low-skilled migrants- a "fiscal leakage" externality. Indeed, Figure 9.2 demonstrates that the union member states admit a higher share of low-skill migrants when they compete with each other than when they cooperate. As expected, the cooperating states, facing an upward-slopping supply of migrants (of both

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[24] Fiscal leakage effects in demographic contexts where first analyzed by Razin, Sadka and Swagel (2002a and 2002b).
[25] High-skill migrants, though bringing no capital still pay relatively high taxes on labor income.

types) exploit their market power by admitting smaller numbers of high-skill and low-skill migrants, as compared to the case when they compete with each other.

10. Aging and Migration: The U.S. and the EU

The aging of the population is another fundamental that set the EU and the U.S. apart. In 2010, the proportion of people 65 and older constituted 13.1% in the U.S., whereas in the core EU countries it is significantly larger: 20.89% in Germany, 20.3% in Italy, 16.8% in France, and 16.6% in the UK (United Nations, 2013).

Although the population in the U.S. is getting older and growing more slowly than in the past, the demographic future for the U.S. is younger in comparison with core EU countries. In particular, the U.S. population is projected in the second-half of the twenty-first century to grow faster and age slower than the populations of its major economic partners in Europe.

Immigrants have turned the U.S. population younger. They come at their working age, whereas the native-born consist of both working-age and retires. Without immigration, U.S. population growth from 2005 to 2050 would be only 8.5%, more on par with that of European nations (pew global, 2014).

In this chapter we consider how the age composition of the population affects the politico-economic choice of the fiscal and migration policies. In particular, we focus on the question how the age composition affects the generosity of the welfare state.

To study the implications of aging population for the generosity of the welfare state, we have to extend the analytical framework employed so far to a dynamic setup. In this case, the political balance of power is no longer exogenous, as assumed so far; that is, fiscal and migration

policies themselves affects the formation of coalitions, which in turn shape up the chosen policies by the electorate. In preceding chapters, the native-born high-skill formed one coalition, and all the native-born low-skill formed another coalition. The new migrants, deprived of voting power, did not therefore affect the formation of coalitions that shaped up policy. It may be perfectly admissible that new migrants are not allowed to vote, when they arrive, but they do however vote when they turn order. Similarly, one should certainly reckon with the fact that the next generations of migrants would be integrated in the society and would participate in the democratic process. In this case, the existing native-born of the time the fiscal and migration policy is shaped (voted for) would take into account the effect that the policy may have on the political power balance in the future. That is, the existing native-born will take into account how the current fiscal and migration policy will affect the outcome of the voting process in the future. In reference to the current political debate in the U.S. about the path to citizenship of the existing undocumented migrants, it is probably affected by current expectations about how these new citizens may affect the composition of the future electorate.

10.1 The demographic framework

We draw upon the model developed in Razin, Sadka and Suwankiri (2011, ch.7; and 2014) to examine the effect of future voting on today's voting. We consider the familiar overlapping-generations model, where the economy lives forever, but each generation lives for finite number of periods. This model has become, since its inception by Samuelson (1958), as the main workhorse for analyzing economic issues that arise in an infinitely lasting world but finitely-lived individuals. Among these issues are the role of money, old-age social security, fiscal imbalances and more.

We assume for simplicity that each generation lives for two periods: in the first period they are "young" and in the second "old". The young work; the old retire. The young brings offspring who mature to be young and working in the next period. The fertility rate of the first generation of migrants is higher than that of the native-born. This is consistent with the migration and demographic data. But the second generation of migrants is fully integrated in the new destination country, and is thus identical in all respects (including fertility) to the native-born from ages. Naturally, only young are allowed to immigrate. Skill is innate and passes from one generation to the next. That is, the offspring of a high-skill are also high-skill, and the offspring of a low-skill are also low-skill. Thus, in each period there may be six groups, each consisting of identical voters: young native-born high-skill, young native-born low-skill, old native-born high-skill, old native-born low-skill, old first-generation high-skill migrants (from the preceding period), and old first-generation low-skill migrants (from the preceding period); recall that the young first-generation migrants do not vote. To simplify, we further assume that there is no physical capital; that the inter-temporal parameters are set so, as to give no incentive to private saving; and that wages are fixed (because the marginal productivity of labor is assumed constant)[26]. In this case, there are no wealth differences among individuals (as there is no wealth at all), whether young or old or whether native-born or migrant (as there is no wealth at all); there are only income differences. Therefore the number of different voting groups reduces from six to just three: young native-born high-skill; young native-born low-skill; and the old native-born and the old first-generation migrants (both high-skill and low-skill).

10.2. Interaction between coalition formation and policy

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[26] There is no evidence that the long-run effects of migration on wages is significant; see Boeri, Hanson and McCormick (2002).

As before, in any given period t people vote on the labor income tax (τ_{Lt}) and the volume (μ_t) and composition (σ_t) of migration. We denote this policy triplet by $P_t = (\tau_{Lt}, \mu_t, \sigma_t)$. Note that the choice of this triplet determines the social benefit b_t through the budget constraint. Denote by S_t the fraction of native-born high-skill young in the total native-born young population (the native-born labor force).

Each voter takes into account how her choice of the policy variables in period t will affect the chosen policy variables in period t+1, which depends on S_{t+1} (recall that the benefit she will get in period t+1, that is b_{t+1}, depends on the policy triplet P_{t+1}). Therefore, each voter will cast her vote on the set of the policy triplet P_t that maximizes her utility, given the value of S_t and taking also into account how this will affect S_{t+1}. Thus, there is a link between the policy chosen in period t and the chosen in period t+1.

We adopt the electoral system studied by Osborne and Silvinsky (1996) and Besley and Coate (1997), known as "political competition with citizens-candidates"[27]. Each of our three voting groups presents a candidate who will implement the most preferred policy of her group, if elected. When one of these groups enjoys an absolute majority (that is, it constitutes more than 50% of the electorate), then it wins the elections and implements her most preferred policy. Note that the current preferred policy (especially with respect to migration) takes into account how migration may change the composition of the electorate and, consequently, the policy that will be implemented in the future. For instance, the current political debate in the U.S about the path to citizenship of the existing illegal migrants is probably affected by current expectations about how these new citizens may affect the composition of the future electorate.

When no group enjoys an absolute majority, there will be a (second-round") runoff between the two largest groups. The third group, the smallest, will vote for the candidate of that one of

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[27] For an alternative approach see Benhabib (1996).

the two largest groups whose most preferred policy is better for the third group, even though this policy is not the most preferred by the third group.

This model is designed to make a three dimensional policy choice ($P_t = (\tau_{Lt}, \mu_t, \sigma_t)$) in such a way that there are a clear "left" group, a "center" group and a "right" group. The left group consists of the old native-born and old first-generation migrants (both high-skill and low-skill) who earn no income and wishes to extend as much as possible the generosity of the welfare state. They vote to admit as much as possible high-skill migrants to help finance the generosity of the welfare state.

The right group consists of the native-born high-skill who bear the lion share of financing the welfare state and wish therefore to downscale its generosity as much as possible. The attitude of this group toward high-skill migrants is subject to two conflicting considerations. On the one hand, they benefit from the contribution of the high-skill migrants to the financing of the welfare state which alleviate the burden on them. On the other hand, they are aware that the offspring of the high-skill migrants will vote to downscale the generosity of the welfare state in the next periods, when the members of this right group turn older and benefit from the generosity of the welfare state. This consideration is amplified by the fact that the fertility rate of migrants is higher than that of the native-born.

The center group consists of the native-born low-skill young. They do like a generous welfare state but not as much as the old, because they also pay for it. They like it more than the native-born, high-skill young because they pay for it less than them. With respect to migration, they (like the native-born high-skill) face two conflicting effects. On the one hand, they would like to admit high-skill migrants who contribute positively towards the finances of the welfare state at the current period. But, on the other hand, they are concerned that the high-skill offspring of these migrants will tilt the political balance of power in favor of the high-skill in the

next period; and, consequently, against the generosity of the welfare state. The center group is less pro high-skill migration than the "left" group, but similar in attitude to the right group.

10.3 Policy Dynamics

The evolution of the fiscal and migration policy of the economy over time depends naturally on the state at which it starts. The state of this stylized economy depends exclusively on the share S_t of the native-born, high-skill young in the total native-born young population.

One can show (See Razin, Sadka and Suwankiri (2014)) that there are several different decisive ranges for this share which determine which of the three groups most preferred policies will be implemented. These ranges are arranged from the lowest values of S_t (starting from 0) to the largest values of S_t (ending at 1). Note also that these ranges depend on the fertility rates of the native-born and the first-generation migrants.

When S_t falls in the lowest range, the most preferred policy that will be implemented is that of the center group (the native-born low-skill young). In this case, this group forms a majority[28] and is able to implement its most preferred policy: moderate welfare-state generosity with a large, but not extreme, influx of high-skill migrants only. Therefore, the share of native-born, high-skill migrants grows over time. Eventually, S_t enters the next range.

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[28] Note that because of positive population growth, the young are always more numerous than the old.

When S_t falls in the next range, the center group is still the largest group, but does not consti-tute a majority. The native-born high-skill is the smallest group in this case. The latter group, being on the right, always prefers the most preferred policy of the center group than the most preferred policy of the old (the left group). Therefore, the most preferred policy of the center will still be a winning one, though by a coalition (with the right) in this case, rather than by a sheer majority of the center group. Note that this policy increases over time the share S_t of the native-born, low-skill; and, eventually, S_t enters the next range.

When S_t falls in the next range, then the left group (the old) is the largest group, but does not constitute a majority. The right group (the native-born high-skill) is the smallest group. In this case, the center group (the native-born low-skill) will join a coalition led by the left. The most preferred policy of the left will be implemented: an extreme generosity of the welfare state and an extreme influx of high-skill migrants. Consequently, S_t continues to rise, and so on. Eventually, when S_t become sufficiently large, the right group (the native-born high-skill) be-comes the largest group and its most preferred policy will be implemented, that is the gener-osity of the welfare state will be severely downscaled. All will be concerned that admitting more high-skill migrants will render the high-skill in the next period an unbeatable majority who will cut severely their benefit in the next period, when they grow old. This future threat on the welfare-state balances the dynamic forces to drop S_t and it stops rising. Only a limited high-skill migration will be allowed, and S_t will enter a steady state.

10.4 The EU and the US: Different Population Growth Rates

Naturally, a higher rate of population growth (that is, younger than aging population) reduces the political clout of the old (the left group). In terms of the ranges of S_t from the preceding subsection, a higher rate of population growth shrinks the ranges in which the most preferred policy of the old is implemented. Thus, the share S_t will enter more quickly to the range in

which the most preferred policy of the right (the native-born high-skill) will be implemented: a downscaled welfare state and controlled migration. Furthermore, a higher population growth rate brings more concern among the young (native-born) voters about possible future cut in their old-age benefits, by the increasing number of next-generation young. This concern applies also to high-skill migrants and is shared by both native-born low-skill and native-born high-skill. As a result, the native-born young are now less keen to migration, and would to like to tighten migration quotes, even for high-skill migrants.

In a nutshell, one can say that the higher population growth rate of the U.S. tilts it ahead of the EU to this political balance range of downscaled welfare state and controlled migration. This is so even though a higher rate of population growth enables the welfare state to be more generous to the old.

11. Is the Net Fiscal Burden a Proper Predictor of the Political Attitude towards Migration?

In Section 4.2 we illustrated how a country can gain not only from high-skill migration, but also from low-skill one. The driving force for the result is the infra-margin gain stemming from the decline of the native-born low-skill (flexible) wage; see Figure 4.1. We also noted that the native-born low-skill actually lose, whereas the native-born, high-skill gain; it is only the net aggregate gain which is positive. We also noted in the preceding chapter that in practice long-term impact of migration on wages is rather small, so that the net aggregate gain is likely to be small too.

We also noted throughout this monograph that there might be a distributive burden of low-skill migration through the net fiscal burden they may impose on the various groups of the economy. In particular, low-skill migration may tilt the political power balance in favor of

"big" government, thereby giving rise to a political backlash. The literature on welfare migration has focused mainly on calculating the net fiscal burden of low-skill migration as a measure of the attitude of the native-born towards low-skill migration; see, for example, Smith and Edmonston (1997), Auerbach and Oreopolus (1999), Barbone, Bontch-Osmolovsky and Zaidi (2009), and Dustman, Frattini and Halls (2009).

Nevertheless, we show in this chapter that the net fiscal burden of low-skill migrants is not always a proper predictor of the political attitude of various groups towards low-skill migration. This is particularly true with respect to an old-age security program, where the old may benefit from an influx of low-skill migrants, even though these migrants impose a net fiscal burden over their lifetime.[29]

11.1 An Overlapping Generations Model of Old-Age Social Security Program

We employ a simplified over-lapping generations model similar to that behind the analysis of the preceding chapter.[30] We continue to assume a fixed labor supply: one unit by each young individual. Individuals are born either high-skill or low-skill and live for two periods. When young, they supply one unit of labor, consume, and save for retirement. When old, they retire and live on their private savings and social security benefits.

The social security system is pay-as-you-go (PAYG), where in every period the government levies a flat tax on the young's wage income (at the rate of τ_t), which fully finances a social security benefit (b_t) paid to the old. With no loss of generality, we maintain τ_t constant over time (and drop the subscript t), and let b_t adjust, so as to keep the period-by-period balance of the PAYG social security system.

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[29] See also Bohn and Rustichini (2000), Bohn (2005), Hainmuller and Hissox (2010), Hanson, Scheve and Slaughter (2009), Lacomba and Lagos (2010), and Lee and Miller (2000).
[30] For a detailed description of the model see Razin and Sadka (1999 and 2004); see also an extension by Aslanyan (2014).

We assume that the utility of the representative young is of the Cobb-Douglas form:

$$U(c_t^y, c_t^o) = \log(c_t^y) + \beta \log(c_t^o) \quad,$$

(11.1)

where c_t^y is the consumpyion of the young in period t, c_t^o is the consumption of the old (born in period t) in period t+1; and β is the subjective discount factor, which is between zero and one.

The transfer payment to the old at period t, b_t , is financed by collecting a wage tax, τ, from the young individual's wage income at the same period, w_{it}, where w_{it} denotes the wage rate in period t of an individual with skill level $= s,u$. The interest rate and savings of a young individual of skill level i in period t are denoted by r and s_{it}, respectively. The budget constraint of a young individual of skill level i in period t are given by:

$$s_{it} + c_t^y = (1 - \tau)w_{it},$$

(11.2)

$$c_t^o = (1 + r)s_{it} + b_{t+1} \quad.$$

(11.3)

These two constraints may be combined into one lifetime constraint, as follows:

$$c_{it}^y + \frac{c_t^o}{1+r} = (1 - \tau)w_{it} + \frac{b_{t+1}}{1+r}, \qquad i = s, u \quad.$$

(11.4)

Maximization of the utility function (11.1) subject to the budget constraint (11.4) gives rise to an indirect utility function of a young individual, $V((1 - \tau)w_{it}, r, b_{t+1})$, which depends on the net wage, the interest rate, and the old-age social security benefit. For an individual in period 0, utility depends only on r and b_0.

As before, we denote the proportion of high-skill individuals in the native-born population by S. With no loss of generality, we normalize to 1 the size of the native-born young population in period 0. We consider just one wave of migrants, μ, in period 0. The migrants are all young, and the proportion of the high-skill among them is denoted by σ. Each migrant bring

1+m offspring, where m>n, which is the birth rate of the native-born. We assume that the off-spring of the migrants are perfectly assimilated into the native-born population, both in terms of birth rates and skill distribution, so the proportion of young skill individuals (including the offspring of the migrants from period 0) in period 1 and onward is S.

We assume free international borrowing and lending, so that the interest rate of interest is ex-ogenously given for this economy in each period; and we further assume that is does not vary over time. We assume that $n < r$, that is our economy is dynamically efficient. That is, we precludes Ponzi games which can yield perverse situations.

A single good is produced each period by two inputs, high-skill and low-skill labor (L_s and L_u, repectively), according to a linear production function (that generates fixed wage)

$$Y = L_s + qL_u \qquad , \qquad (11.5)$$

where

$$L_{st} = \begin{cases} S + \sigma\mu & \text{for } t = 0 \\ S[1 + n + \mu(1 + m)] & \text{for } t = 1 \\ S[1 + n + \mu(1 + m)](1 + n)^{t-1} & \text{for } t \geq 2 \end{cases} \qquad (11.6)$$

$$L_{ut} = \begin{cases} 1 - S + (1 - \sigma)\mu & \text{for } t = 0 \\ (1 - S)[1 + n + \mu(1 + m)] & \text{for } t = 1 \\ (1 - S)[1 + n + \mu(1 + m)](1 + n)^{t-1} & \text{for } t \geq 2 \end{cases} \qquad (11.7)$$

and where $q < 1$. That is, there is perfect substitution between high-skill and low-skill labor, with low-skill labor having a fraction q<1 of the productivity of high-skill labor. In this case, the wages are given by

$$w_s = 1 \text{ and } w_u = q \text{ for all t} \qquad . \qquad (11.8)$$

The old-age PAYG the social security benefit is given by:

$$b_t = \begin{cases} \tau\{(S + \sigma\mu) + [1 - S + (1 - \sigma)\mu]q\}(1 + n) & \text{for } t = 0 \\[2mm] \dfrac{\tau\{S(1 + n + \mu(1 + m)) + (1 - S) + (1 - \sigma)(1 + n + \mu(1 + m))q\}}{1 + \mu} & \text{for } t = 1 \\[2mm] \tau(S + (1 - S)q) & \text{for } t \geq 2 \end{cases}$$

11.2 Gains from Migration

The well-being of the old in period 0 (born in period -1), when the wave of migrants occur, depends only on b_0. As is straightforward to see from equation (11.9), the benefits b_0 depends positively on μ, no matter what is the skill composition (σ) of the migrants. That is, even when all migrants are low-skill (namely σ=0), still the old in period 0 are better off. Naturally, the gain is higher when σ is higher.

Turning to the individual born in period 0, when the migrants arrive, his well-being is affected only by b_1. It follows from equation (11.9) that b_1 depends positively on m. That is, the higher the birth trace of the first generation of migrants, the better off is the generation born in period 0. Because m > n, it also follows from equation (11.9) that b_1 depends positively on μ. That is, the generation born in period 0 (both its high-skill and low-skill members) benefits from migration. It also follows from equation (11.9) that for t ≥ 2, b_t is unaffected by the migration wave of period 0. That is, generations born in period 1 and onward are unaffected by migration. Naturally, if migration waves repeat themselves, then all future generations gain too.

11.3 Net Fiscal Burden

We have shown that migration, whether high-skill or low-skill, makes the native-born better off. However, we now show that focusing the welfare implications of migration on its net fiscal burden is misleading. Specifically, we demonstrate that the gains that were shown to accrue to the native-born hold even though there may be a net fiscal burden of migration, when the latter is biased to the low-skill.

A migrant pays a social security tax in period 0, when she arrives and receives an old-age benefit of b_1, when she retires in the next period. The net fiscal burden of a low-skill migrant is therefore equal to

$$NFB_u = -\tau q + \frac{b_1}{1+r} \qquad .\qquad (11.10)$$

Substituting for b_1 from equation (11.9) yields

$$NFB_u = \frac{\tau(1+\mu)}{1+r}w_u\left\{(1+g_0)\frac{\bar{w}}{w_u} - (1+r)\right\}, \qquad (11.11)$$

where

$$g_0 = \frac{n + \mu m}{1 + \mu}$$

is the population growth rate from period 0 to period 1, and

$$\bar{w} = S + (1 - S)q = Sw_s + (1 - S)w_u$$

is the average wage in period 1. Now, if m or μ are large enough (so that g_0 is large enough) and/or $\frac{\bar{w}}{w_u}$ is large enough, then the net fiscal burden of a low-skill migrant is positive. Neverthe less,the native-born gain from migration, even if purely low-skill.

The rationale of this result is as follows. The young migrants (whether high-skill or low-skill) work when they arrive (in period 0) and pay the payroll tax. They receive the old-age social

security benefit only in the next period, when they grow old. Therefore, the PAYG social security system has more revenues that allow it to pay a higher old-age benefit to the current old (in period 0). Thus, the current old clearly gain. If the birth rate of the migrants in period 0 is larger than that of the native-born, there will be more young in the next period (period 1), and thereby also a higher old-age benefit. Therefore, the young at period 0 will get a higher old-age benefit in period 1, when they grow older. Thus, they gain too. In period 2 and on, there is no trace of the migration wave in period 0 and all variables return to their pre-migration levels.

As expected, being low-skill, the migrants pay in payroll taxes in period 0 less than the discounted value of the old-age benefit they receive in period 1. Thus, they do impose a net fiscal burden. Nevertheless, this burden is postponed indefinitely; because the PAYG social security lives indefinitely.[31]

12. Conclusion

In the era of the welfare state one can no longer envisage a world of free migration. Indeed, for example, the U.S. has gradually ceased to freely admit migrants after World War I, when it also started to gradually develop the institutions of the welfare state (e.g., the federal in-

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[31] If this system is to be terminated at one point in the future, then the young at that time will lose, because there will be no one to finance their old-age benefit in the next period when they grow old. Note that each young will lose the same amount as if there were no migration in period 0, but there will be a larger number of young due to the migration in period 0. Thus, the total loss is larger because of the migration, reflecting the net fiscal burden of the migration in period 0.

come tax, the old-age security, etc.), culminating with the great social institutions in the sixties of the last century (e.g. Medicare) and more recently, in the affordable health care (known as Obama Care). A welfare state is a magnet for migrants, especially the low-skill, the poor, and the old. Therefore, there will arise a political backlash of the native-born against the "free-riders"- the migrants. This does not mean that migration will be altogether banned

There are, after all, also some significant gains from migration. First, high-skill migration does not impose a fiscal burden on the welfare state. To the contrary, the taxes paid by high-skill migrants generally exceed the benefits they receive. Second, high-skill migration enhances the technological edge of the destination country. Furthermore, even low-skill migrants may still alleviate the finances of a welfare state, which allocates a great deal of its resources to old-age security. [32]This led us to explore how migrating and fiscal (welfare) policies are jointly determined in a political-economic setup.

Evidently, both the U.S. and the E.U. from an economic union: There is a single market for goods, capital, finance, and labor. That is, there is free mobility of goods, physical and financial capital, and labor among the member countries of the union. Nevertheless, there is much higher degree of economic policy coordination among the member states of the U.S than of the EU. For instance, the U.S. has a common (federal) income tax system which constitutes the major source of revenues in the union. Similarly, the social security system is more or less uniform across the U.S. There is also a single migration policy set up and enforced by the federal government. In contrast, there is very little coordination on these issues among the member countries of the EU. In essence, they compete with each other on these issues.

 Aging of the population is another key factor affecting the power balance among different interest groups which shapes the generosity of the welfare state and thereby migration policy. A

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[32] See Storesletten (2000) for a calibrated over-lapping generations model which analyzes this issue.

more aged society would naturally entail more political clout to the old who opt for a more generous welfare state. But, on the other hand, the working young, who finance the welfare state, are more reluctant to increase its generosity. Also, the old are keen to admit young migrants, whereas the young are more reluctant to allow this. We note in this respect that the U.S. population is younger than the EU population.

We argue that these two aforementioned differences between the U.S. and the EU - the degree of coordination among the member states and the aging of the population - contribute a great deal to our understanding of observed policy differences between the two unions: the generosity of the welfare state and the skill composition of migration.

It is worth noting that the U.S. welfare system has undergone some reforms that gave the states some more leeway in designing the structure and magnitude of public assistance. In particular, the 1996 welfare reform[33]. Substituted open-ended federal funds with block grants, leaving the states some autonomy over individual eligibility criteria; see Blank (1997) for a review of this reform. The reform somewhat weakened the degree of coordination among the states of the U.S. with respect to public assistance programs, making a small step towards the way the EU operates on these issues.

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[33] Specifically: the Personal Responsibility and Work Opportunity Reconciliation Act (RRWORA)

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