NBER WORKING PAPER SERIES

MIGRATION AND FISCAL EXTERNALITY:
US VS. EUROPE

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Working Paper 28126
http://www.nber.org/papers/w28126

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
November 2020

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NBER Working Paper No. 28126
November 2020
JEL No. F0,H0

ABSTRACT

The paper compares migration policy and welfare state generosity between America and Europe. There is more selective skill-based migration policy in the US compared to the European Union. Policy coordination among states within the federal system on migration, taxes, and social benefits among states within the US federal system is stronger than among countries within the European Union. Fiscal externality, triggered by migration and tax competition among members of the federal system may explain in part these US-Europe differences in policies.

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On his travel to the US at the beginning of the 19th century Alexis De Tocqueville was attributes the distinct nature of the US regime as related to individualism. He says: "a reflective and tranquil sentiment that disposes each citizen to cut himself off from the mass of his fellow men and withdraw into the circle of family and friends; so that, having created a little society for his own use, he gladly leaves the larger society to take care of itself. When citizens are forced to concern themselves with public affairs, they are inevitably drawn beyond the sphere of their individual interests, and from time to time, their attention is diverted from themselves. ... As soon as common affairs are dealt with in common, each man sees that he is not as independent of his fellow men as he initially imagined, and that in order to obtain their support, he must often lend them his cooperation." At the time of De Tocqueville visit, the US welfare state was non-existent. Recently Angela Merkel claimed: "The European Union (EU) accounts for roughly 7 per cent of the world's population and 25 per cent of its GDP, but over 50 per cent of its welfare spending." The US welfare spending is only a fraction of the EU's.

In a federal setting, lower-level jurisdictions (regions) are inevitably affected by policies introduced at the highest (federal) level. For example, if migrant workers pay local taxes, attractive regions will be 'winners' of any federal policy supporting the free movement of workers. Regions facing labor outflows will be 'losers'. Migration has indeed widened regional disparities (Goldin et al. 2018). Using net contributions of each member state to the overall EU budget, Daniele et al (2020) cluster EU member states in three intuitive groups: main contributors, main recipients, and those in between. For instance, net transfers received from the EU represented 3.53% of GNI for Lithuania, 2.9% for Bulgaria, and 2.11% for Poland (in 2000-2015). The Netherlands and Germany were the main net contributors. They argue that the three clusters based on net transfers capture winning/losing perceptions of EU migration policies significantly. Eurosceptic parties do better in European than in national elections, but only in winning (receiving) or losing (contributing) member states.

Unlike the EU, the US federal system is a fiscal union. Consequently, inter-state conflicts concerning the federal migration policy are less pronounced.

In the following sections we analyze root causes of migration and redistribution policy differences between the EU and the US federal systems.

1. Migration Policy

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 highly -skilled and low-skilled migrants. Reinforcing this migration is the nature of the host country's welfare state: low-skilled migrants find a generous welfare state particularly attractive. Such a welfare state may turn also to be a migration state. Low-skilled migration imposes a fiscal burden on the native-born. In addition, a generous welfare state may deter high-skilled migration because heavy redistributive taxes must perforce 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-skilled migrants. In contrast, at the same period, the US has attracted a major world portion of highly- skilled migrants, boosting its innovative edge. While in the last two decades Europe ended up with 85 percent of all low skilled migrants to developed countries, the US retains its innovative edge by attracting 55 percent of the worldeducated migrants. European migration thus exhibits a bias towards low-skilled workers, whereas the US attracts the majority of the world's skilled migrants. At the same time, the welfare system in Europe is more generous than that in of the US. Whether the group (union) of member states of a union competes or coordinates their policies has an impact on the skill composition of its migrants and the generosity of the welfare system.

The old generally benefit from the generosity of the welfare state (for example, the old -age social security benefits). They are also keen to admitting migrants, in particular highly -skilled migrants ones, as a way to of alleviating its overstretched finances of the welfare state. On the other hand, the working young, who finance the welfare state through payroll taxes, are reluctant to support a generous welfare state. With respect to migration, the young are less keen than the old are on admitting migrants than are the old. Because they young may be concerned about changes in the political balance in the future when they grow old, which 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 US about "the path to citizenship" of the undocumented migrants is centered exactly about on how they may tilt the political balance of power, once they become citizens, concerning the "role of government" (that is, the generosity of the welfare state).

It was migrants from Europe in 19th century that created the US (the New World). Naturally, migration to this new world was not restricted. [2] in the latter part of the twentieth century,

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[2] In 1790, US Congress stated that only free white people could become U.S. citizens. This was reversed in 1870, after the Civil War. In 1864, the Immigration Act encouraged immigration to address labor shortages caused by the Civil War. In 1882, the Chinese Exclusion Act prohibited

however, the US tilted its migration policy, in favor of highly- skilled migrants; The 1990 US Immigration Act increased the number of temporary visas to highly -skilled workers. In addition during those decades, the US universities and research centers—, funded directly and indirectly by the US federal and state governments—, attracted talented researchers from all over the world. Many of them remained in the US after completing their original term of education, training or research. Many became citizens. By the mid- 1990s, 30% of documented immigrants to the US were high-skill. The Blue Card is an approved EU-wide work permit (Council Directive 2009/50/EC)[1] allowing high-skilled non-EU citizens to work and live in any country within the European Union (excluding Denmark and Ireland).

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the immigration of Chinese laborers; this was later expanded to most Asian countries. US Congress established national-origin quotas with the Immigration Act of 1924.31 It awarded immigration visas to just 2% of the total number of people of each nationality in the United States as of the 1890 national census. By 1970, the law had forced immigration down to a low of 4.7% of the population; reduced from a high of 14.7% in 1910. In 1965, the Immigration and Naturalization Act eliminated quotas based on nationality. Instead, it favored those with needed skills or who were joining families in the United States. In 1986, the Immigration Reform and Control Act legalized undocumented immigrants who met certain conditions. Today's percentage of immigrants is similar to the late 19th century when almost 15% of U.S. residents were immigrants.

The birth of the welfare state In Europe took place in Bismarck's Germany, in the late nineteenth century. In the twentieth century, after the two world wars, most European countries—those, that later formed the European Union, — demonstrated their own models of the welfare state. The reconstruction of continental Europe (Germany and France in particular) exhausted the native-born labor force. This induced continental Europe to invite guest workers from labor-rich countries in southern Europe, Turkey and North Africa. Exceptionally, France had introduced from the outset a legal immigration policy that permitted 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 its guest workers to from settling in Germany; see Hollifield (2004). However, the post-war family reunification arrangements throughout the core European countries eventually turned the guest workers into residents, effectively, of their host countries. The removal of barriers to labor mobility within the Schengen Area took place at the same time of increased restrictions by the EU member countries on the immigration from outside the EU. Enabling them to retain their sovereignty over non-EU immigration policy. The collapse of the Soviet Bloc and the extension of the EU to include Central and East eastern European countries brought additional immigrants into the core- EU countries.

Overall, and dissimilar from the US, the European migration exhibited significant bias toward low-skill migrants; see Boeri, Hanson and McCormick (2002) and Boeri (2008).Table 1 compares the stocks of migrants, by educational attendance, between the EU-15 and the US;. Indeed, it is clear that more than 40% of the stock of migrants in the US have undergone tertiary education, whereas the corresponding figure for the EU-15 is less than 25 per cent. Similarly, about as many as 48-–59% of the stock of migrants in the EU-15 have only primary education, whereas the corresponding figures for the US are only 22-–26%.

Table 1: The stocks of migrants, by education -level, as percentages of the total for the EU-15 and the US and the EU-15, 1990 and 2000.

Education Level (%)	EU-15	EU-15		US	US
	1990	2000		1990	2000
Primary	59	48		26	22
Secondary	24	28		31	36
Tertiary	18	24		43	24
Total	100	100		100	100

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

In setting up a migration policy, the skill composition of immigrants is a crucial factor. Naturally, highly- skilled immigrants are more attractive to the destination countries than low skilled for a variety of reasons.[3]

There are significant differences in skill-based migration policies between the EU and the US. US migration policy has a strong high-skilled element. Launched as part of the Immigration Act of 1990, the H-1B visa program is intended to satisfy demand for workers with a bachelor's degree, or higher, in occupations that require specialized technical knowledge. The high-skilled

[3] See chapter 2 in Razin (2021).

visa program is effectively a path to US citizenship. Not to the same extent in the EU, except some outliers.[4]

The 1965 Immigration and Nationality Act gets lost in the lore of the 1960s, but few events outside war and the Depression have done more to change America. By ending the preference for European immigrants, the law expanded the US population over time and made it enormously more ethnically diverse. However, it also led to the build-up of polarizing ethnic angst that broke through half a century later. Indeed, in 2016, 70 per cent of US registered voters told Gallup that immigration was "very important" to them. The Pandemic generated a collapse of immigration as a political issue.

2. Demographics

Ageing of the population is another fundamental factor, inter-related with migration and the generosity of the welfare state. In developed countries, the destination of migration from around the world, populations are ageing dramatically: in 2017, the world population aged 60 years or older was more than twice as large as in 1980, and two-thirds of the world's older persons lived in developed regions (United Nations 2019).

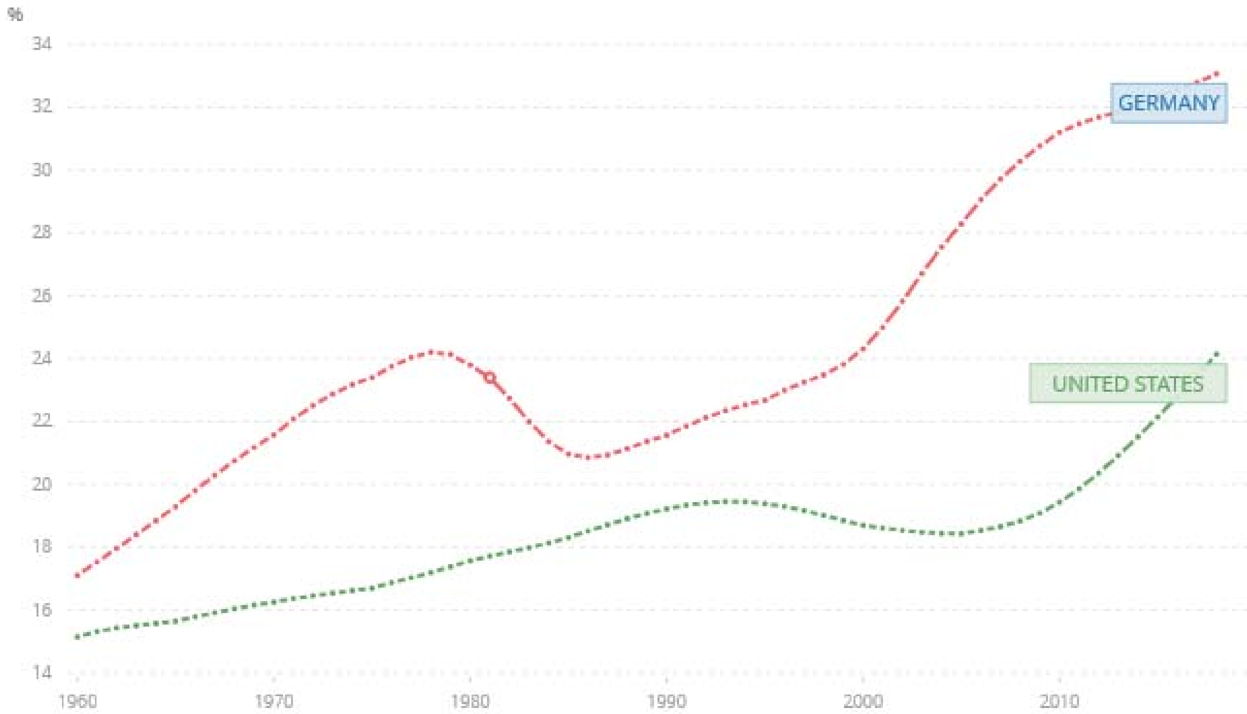
In 2010, the proportion of people aged 65 and older constituted 13.1 percent in the US, whereas in the core EU countries it was significantly larger: 20.8 percent in Germany, 20.3percent in Italy, 16.8 percent in France, and 16.6 percent in the UK (United Nations, 2013). Although the

[4] Various immigration schemes have been developed to attract highly skilled migrants from outside the European Union. The most common scheme is the Dutch highly skilled migrant programme (kennismigrant).

population in the US is getting older, and its numbers are growing more slowly, than in the past, the demographic future for the US is younger than that of the core EU countries. In particular, the US population is projected to grow faster and age more slowly than the populations of its major economic partners in Europe. Figure 1 describes the ageing patterns of the US and Germany (the largest EU economy) in terms of the age dependency ratio.[5]

Figure 1: Age dependency ratio, old (% of working-age population): Germany vs. United States

[5] Useful example for the coordination-competition factor in our analysis is the EU-US skill based visa policy. US migration policy has a strong element of selection of high skilled. Launched as part of the Immigration Act of 1990, the H-1B visa program is intended to satisfy demand for workers with a bachelor's degree, or higher, in occupations that require specialized technical knowledge. The high-skilled visa program is effectively in many cases a path to US citizenship. Various immigration schemes have been developed to attract highly skilled migrants from outside the European Union. The most common scheme is the Dutch highly skilled migrant program (kennismigrant). There are also other types of permits attempting to attract highly skilled migrants. The average EU member high skilled migration policy is much less effective.



Source: The World Bank.

3. Labor mobility

There is also a significant difference degree of labor mobility between the EU and the US. The average response of the population to a local demand shock in Europe turns out to be much more limited and slower than in the US (Beyer and Smets (2015), Arpaia et al. (2016), and Dao et al. (2018)). Beyer and Smets (2015) compare the labor market response to region-specific shocks in Europe and the United States and to national shocks in Europe and investigate changes over time. We employ a multilevel factor model to decompose regional labor market variables and then estimate the dynamic response of the employment level, the employment rate and the participation rate using the region-specific variables and the country factors. They find that both in Europe and in the United States labor mobility accounts for about 50% of the long-run adjustment to region-specific labor demand shocks and only a little more in the United States than in Europe, where adjustment takes twice as long. In Europe, labor mobility is a less important adjustment mechanism in response to country-specific labor demand shocks that cause stronger and more persistent reactions of the employment and the participation rate. However, we detect a convergence of the adjustment processes in Europe and the United States, reflecting both a fall in interstate migration in the United States and a rise in the role of migration in Europe.

4. Fiscal Union

The United States of America has organized its various states as a federation, since gaining independence, over 200 years ago, organized its various states as a federation. The large expenditures incurred by the pre-independence States during the War of Independence, and the consequent inability of those individual states to repay the ensuing debts, triggered both the need and the opportunity to establish an integrated federal fiscal system. Congress then transferred the authority to levy taxes from the states to the federal government; which then bailed out the states and effectively assumed their debts. The 1790 Congress empowered the federal government to raise enough revenues to service the large government debt. Another wave of state fiscal crises in the mid of the nineteenth century strengthened the federal government's ability to take a leading role in financing infrastructure projects, allowing state governments to reduce their role. Following their debt crises, many states introduced some forms of balanced budget rules into their constitutions; see Sargent (2012); this increased the role of the federal government in the fiscal system. In the early 21st century, federal tax revenues constitute well over one-half of all the tax revenues (federal, state and local) in the US. In contrast, at the time the European Union was formed, all the major individual constituent countries have already had well-established solid fiscal systems, and none was at a risk of default. Therefore, 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 the individual countries. However, its restrictions applied merely to several aggregate variables, such as the budget deficit and the public debt. Each country was still free to set its total expenditure budgets 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 enforced, mostly because of the veto power granted to each country on important fiscal policies.

Dolls, Fuest, and Peichl (2012) analyze the effectiveness of the tax and transfer systems in the EU and the US to provide income insurance through automatic stabilization after the Great Financial Crisis. They find that automatic stabilizers absorb 38 percent of a proportional income shock in the EU compared to 34 percent in the US.

5. Welfare-State Generosity

A key difference between the EU and the US concerning the welfare-state generosity happens in the area of health care. The United States spends more per capita on healthcare than any other country in the world, amounting to about one-sixth of the country's economy. However, despite the high price tag, the United States is still the only wealthy, developed nation without universal health coverage. In contrast, the European countries pioneered in providing universal health care system.[6]

[6] Germany has the world's oldest national social health insurance system, with origins dating back to Otto von Bismarck's Sickness Insurance Law of 1883. Employers pay for half of their

In contrast to the US, there are no EU-wide taxes or social programs in the EU—no EU-wide income tax, no health care programs (such as, in the US, Medicare, and Affordable Care) or social security payroll taxes in the EU. The EU social expenditures budget amounts to no more than one 1% percent of the GDP in the EU. However, are significantly lower in the US, relative to the core EU member states. For example, in year 2000, total social expenditures in 2000 amounted to USD 8,618 USD in Denmark, USD 7,583 USD in Germany, USD 8,040 USD in France, and USD 8,668 USD in Sweden, but only USD 5,838 USD in the US (Data: OECD library).

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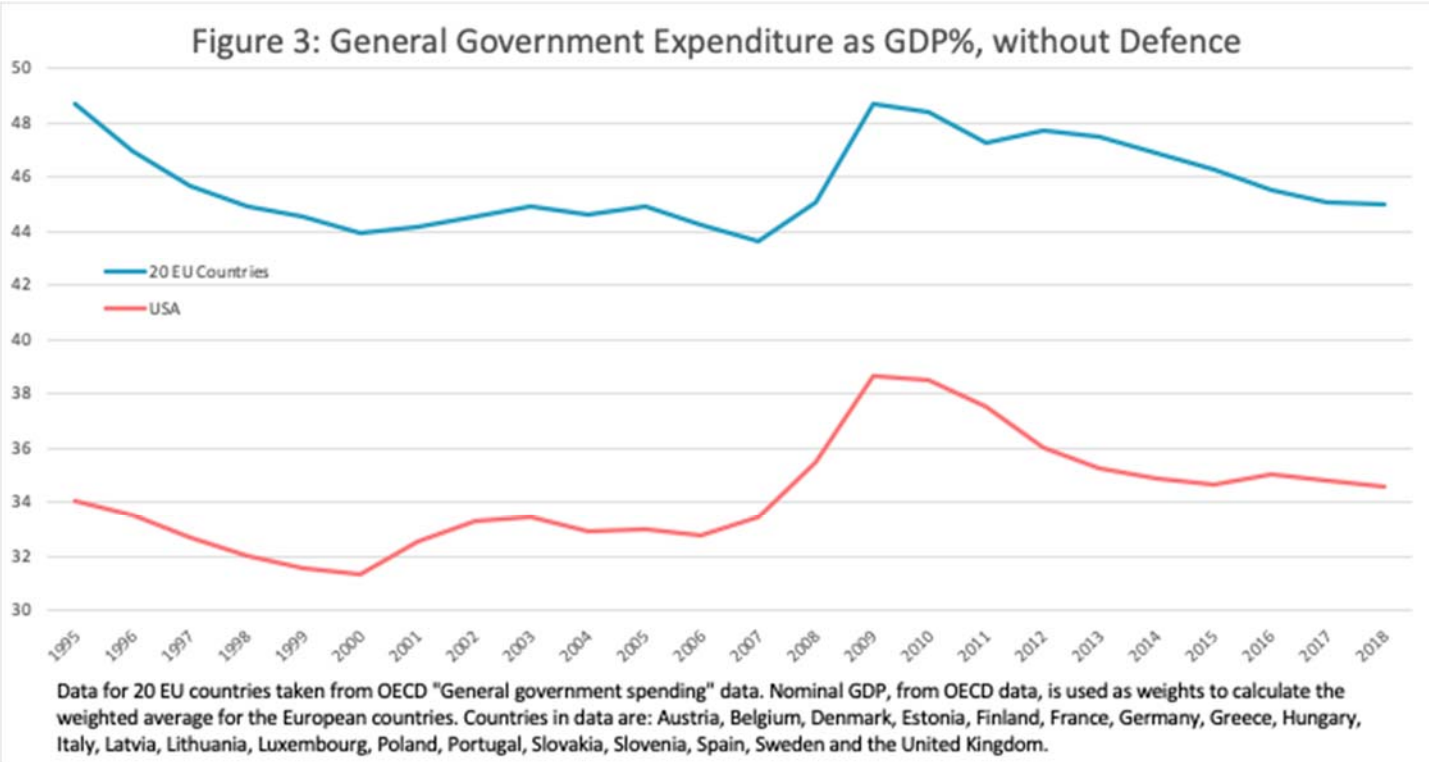
employees' health insurance contributions, while self-employed workers pay the entire contribution themselves. The vast majority of the German population is covered by a statutory health insurance plan, which provides a standardized level of coverage through any one of approximately 100 public sickness funds. The rest are covered by private health insurance. France has a system of health care largely financed by government through a system of national health insurance. Designed by William Beveridge, the United Kingdom's NHS was established in 1948, funded from general taxation and national insurance contributions paid by employees, employers and the self-employed. The Italian version of a National Health Service (Servizio Sanitario Nazionale) includes universal coverage and tax funding. Addressing the issue of why the U.S. doesn't have the generous welfare benefits of advanced countries in Europe, Alesina and Glaeser (2004) note that U.S. institutions -- the Senate, the electoral system, the legal system -- were designed much earlier than their modern European equivalents, and are thus more oriented toward protecting private property. In addition, they find evidence that racial animosity was a source for opponents of redistribution in the United States.

Figure 3 compares the EU 20 non-defense government spending in percents of GDP, with US's per GDP spending, over the years 1995-2018. . EU spending significantly exceeds the US spending, year by year, indicating that the EU welfare state is overwhelmingly more generous.



6. Intra-Union Competition

Razin and Sadka (1991) presented a theoretical framework to demonstrate that, under certain assumptions, e.g. the "residence principle" of international taxation is optimally enforced by member states, there are no gains from tax coordination over the tax competition regime. However, the residence principle is not easily enforced and countries instead resort to source-based taxation of income from capital. In this situation, tax competition among countries, may lead to inefficiently low tax rates and welfare-state benefits because of three mutually reinforcing factors. First, in order to attract mobile factors or prevent their flight, tax rates on them are reduced. Second, the flight of mobile factors from relatively high tax to relatively low tax countries shrinks the tax base in the relatively high tax country. Third, the flight of the mobile factors from relatively high tax to relatively low tax is presumed to reduce the remuneration of the immobile factors, and, consequently, their contribution to the tax revenue. These reinforcing factors tend to reduce tax revenues and, consequently, the generosity of the welfare state, as demonstrated using calibration exercises of tax competition models in the presence of perfect capital mobility for the EU (see Bovenberg et al. 2003, Mendoza and Tesar 2005, and Sorensen 2001). If, however, instead of considering capital mobility, one focuses on labor (of various skills) as the mobile factor, the tax competition leads to a non-conventional outcome. In a recent book (Razin and Sadka2014), we build on Tiebout (1956) framework of competition among localities. However, we allow for the total population in the host country and its skill distribution to be endogenously determined through migration of various skills. We find that in this context tax competition need not be efficient. With this result in mind, we then study the policies that ensue through coordination among the host countries and compare them to the competition policies.

Razin and Sadka (2014) compare the generosity in providing social benefits, and the policy-based share of skilled immigrants in total number of immigrants under the two regimes: US like fiscal-migration federal system and EU like union of fiscal and migration sovereign states (See Appendix). The model features host countries stylistically as members of federal states, with and without coordination of government budgets and migration policies (see Appendix). The rest of the world is the pool of would-be immigrants. We allow competition (through the tax-cum-transfer system) among the several host countries, treated as "perfect competitors". The rest of the world provides exogenously upward sloping supply curves of unskilled and skilled would-be migrants. We address the issue of whether tax competition among host countries is inefficient, relative to tax coordination, in the presence of migration from within – and outside – an economic union.

The number of migrants of each skill type that wishes to emigrate rises with the level of utility they will enjoy in their host countries. A possible interpretation for this upward supply is that for each skill type the migration costs vary according to individual characteristics such as age, family size, portability of pensions, etc... This cost generates heterogeneity in reservation utilities and gives rise to an upward sloping supply of migrants. We assume that would-be migrants are indifferent with respect to the identity of the would-be host country – all they care about is the level of utility that they will enjoy. In equilibrium, the utility enjoyed by migrants of each skill type is the same in all host countries.

Main finding is that coordinating the fiscal and migration policies allows the union-member states to offer less generous social benefits than when they compete with each other. The rationale for this result is rooted in a *fiscal externality* associated with migration. A union-member high-skilled native born has an infra-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. The gain stems from the fact that each migrant (whether skilled or low skilled) 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 (migrants have no capital), because the transfer 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. 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 as given. It 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 to elicit them to migrate. All other union member countries are needed in order to elicit the migrant to come in. as a result, it offers migrants too high level of the social benefit, and admits a too high share of low-skilled migrants- the *fiscal externality*. Indeed, 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 high-skilled and low- skilled types) exploit their market power by admitting smaller numbers of high-skill and low-skill migrants, as compared to the federal regime where they compete with each other. However, the lower inter-state mobility of people in the EU, compared to the US mitigates fiscal *externality* across EU member states.

Appendix: *Fiscal–Externality* within the Union

Assume a continuum of member states within an economic union, with free mobility of goods, capital, and people. A representative union member country produces a single good by employing two labor inputs, skilled and unskilled, and capital according to a Cobb-Douglas production function,

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

where, Y is GDP, A denotes a Hicks-neutral productivity parameter, and L_i denotes the input of labor of skill level i, where $i = s, u$ for skilled and unskilled, respectively, K denotes the input of capital, β denotes the share of capital, and α denotes the share of skilled labor in the total share, 1-β, of labor.

The competitive wages of skilled and unskilled labor are, respectively,

$$\begin{aligned} w_s &= (1-\beta)\alpha \frac{Y}{L_s} \\ w_u &= (1-\beta)(1-\alpha) \frac{Y}{l_u} \end{aligned} \tag{2}$$

Note that the abundance of skilled labor raises the wage of the unskilled, whereas abundance of unskilled labor raises the wage of the skilled.

Total population (native born and migrants) is as follows

$$N = 1 + m_u + m_s \tag{3}$$

Where, N denotes the total population size, the native-born population equals 1, and m_u, m_s stand for the policy-determined number of unskilled and skilled migrants, respectively.

The individual household can rent her capital either at home or at the other host countries. Thus, the total stock of capital owned by residents, $K_s + (1 - S)K_u$, S stands for the relative size of unskilled individuals, and K_s, K_u denote capital endowment of unskilled and skilled individuals respectively. We assume that migrants own no capital. Economy capital endowment, $SK_s + (1 - S)K_u$, does not have to equal domestic capital K, because capital out- and in-flows are permitted. Domestic return to capital is:

$$r = \frac{\beta Y}{K} \tag{4}$$

Domestic return to capital relates through arbitrage to world return $\bar{r}$:

$$(1 - \tau_K)r = \bar{r} \tag{5}$$

Where τ_K is the policy-determined capital-income tax rate. The representative host country determines its fiscal policy by majority voting among the native born. For concreteness, we describe in details the case where the native-born skilled form the majority, that is S > 1/2 .

The two types of individuals, skilled and unskilled, share the same utility function, Where c denotes consumption and ε>0, in the labor supply elasticity.

$$u = c - \frac{\epsilon}{1+\epsilon} l^{\frac{1+\epsilon}{\epsilon}} + \ln(b) \tag{6}$$

Where c denotes consumption spending, l denotes labor supply, and b denotes social benefit, which is distributed uniformly across the population.

The budget constraint of an individual with skill level i is

$$c_i = (1-\tau_L) l_i w_i + (1+\bar{r}) \bar{K}_i \in \{s, u\} \tag{7}$$

Note that an individual earns a net-of-tax rental price of r on all the stock of capital she owns, no matter in which country it is employed.

Individual utility-maximization yields the following labor supply equation

$$l_i = \big((1-\tau_L) w_i\big)^{\epsilon}, i \in \{s, u\} \tag{8}$$

The indirect utility function of an individual of skill level i $\epsilon\{s, u\}$ is given by

$$V_i(\tau, b) = \ln(b) + \frac{1}{1+\epsilon} \big((1-\tau) w_i\big)^{1+\epsilon} + (1+\bar{r}) \bar{K}_\iota, i \in \{s, u\} \tag{9}$$

The revenues from all taxes are redistributed equally to all residents (native born and migrants alike) as a social benefit, b, per capita. The government budget constraint is given by:

$$b = \frac{\tau_K r K + \tau_L (w_s L_s + w_u L_u)}{N} \tag{10}$$

Note that we assume that migrants are fully entitled to the welfare state system. That is, they pay the tax rate τ_L on their labor income (they own no capital) and receive the benefit

b. The social benefit, b, captures not only a cash transfer but also 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. Thus, b is not necessarily a perfect substitute to private consumption.

Presumably, an unskilled median voter opts to admit skilled 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). A high skill median voter may opt for both types of migrants. Unskilled migration raises the wage of the skilled but imposes a fiscal burden on the welfare state. Skilled migration lowers the wage of the skilled but contributes positively to the finances of the welfare state.

Competition Regime

For each skill type there is a heterogeneity of some migration cost (due to some individual characteristics such as age, family size, portability of pensions, etc.). This cost generates a heterogeneity of reservation utilities, giving rise to an upward sloping supply of migrants.

Being small enough, each host country takes these cutoff Reservation Utility levels as given for her. That is, each host country behaves as a "utility - taker", in analogy to the "price taking" behavior of each agent in perfectly competitive market.

A representative host country takes the migrants cutoff utility levels, Vs and Vu, and as given, and also takes the net of tax return to capital, r, as given. Denote by an asterisk (*) the levels of the economic variables that ensue with optimal fiscal policy.

We denote the supply function of skill i ϵ{s,u} by:

$$N_i = f_i(V_i) \tag{11}$$

where $N_i$is the number of migrants of skill type i and V_i is the level of utility enjoyed in the host counties, i ϵ{s,u}.

Each one of the n identical host countries admits ms∗ skilled migrants and mu∗ unskilled migrants. Thus, the aggregate demand for skilled and unskilled migrants is nms∗ and nmu∗. Thus, the fiscal policy variables, τ_L, τ_K and b, and migration rates, are chosen so as to maximize the indirect utility of the skilled (given in equation (9)), subject to the government budget constraint (given in equation (10)), and to the free migration constraints:

$$V_{s(\tau_L,\tau_K,b)} - (1+\bar{r})\overline{K}_s = \bar{V}_s \tag{12}$$

$$V_{u(\tau_L,\tau_K,b)} - (1+\bar{r})\overline{K}_u = \bar{V}_u \tag{13}$$

Therefore, the cutoff utilities enjoyed by migrants, Vs and Vu, are determined in a symmetric Nash-equilibrium, so as to equate supply and demand:

$$nm_s^* = f_s(\bar{V}_s) \tag{14}$$

$$nm_u^* = f_u(\bar{V}_u) \tag{15}$$

Also, the union wide net-of-tax rental price of capital, r, is determined so as to equate world demand for capital, nK∗, to world supply, $n(SK_s + (1-S)K_u)$, that is:

$$K^* = S\bar{K}_s + (1-S)\bar{K}_u \tag{16}$$

Assuming that the migrants have the same preferences as the native-born, and recalling that migrants own no capital.

In determining their policy, the government takes also into account that the competitively-determined variables, w_s, w_u, L_s, L_u,r, K, Y, m_u, m_s , are determined in equilibrium, and indirect utility levels, $\bar{V}_s$ and $\bar{V}_u$ are determined in the world economy.

Coordination Regime

Assume that there exists coordination across states of the union in both fiscal and migration policies. Naturally, this coordination comes at the expense of migrants. In a coordinated-policy regime the cutoff reservation utilities, $\bar{V}_s$ and $\bar{V}_u$, and are also controlled by the host countries, taking into account that migration takes place according to the migration equations (14) and (15). Thus, in the coordination regime each country internalizes the *fiscal externality* which exists within the union in the competitive regime.

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