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Robert Schuman Centre for Advanced Studies
Migration Policy Centre

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Abstract

The twentieth century is commonly acknowledged as the "age of migration". During the last 100 years population movements have intensified and, more importantly, their structure changed significantly. In terms of the geographical distribution of immigrants the European Union and traditional immigration countries became the most important target regions. In these countries immigration is commonly presented as a threat to host economies and societies. Along with this the fiscal impact of immigration are ones of the most controversial topics in recent debates on migration. Against this background this paper aims at discussing and synthesizing both theoretical and empirical literature on the fiscal impact of immigration. We hypothesize that the fiscal impacts of immigration are complex and dynamic and thus a proper assessment demands a careful empirical strategy. There is no clear or coherent theoretical framework to explain the fiscal effects of migration. The outcomes of empirical studies are mixed and they are not unequivocal. Notwithstanding, they show that, generally speaking, the fiscal impact of immigration is small. Moreover, there is no clear impact of skill level on the fiscal position of foreigners. What really matters is, instead, the type of migration, labor market incorporation (absorption) and the institutional framework at destination (the structure of the welfare state). In terms of empirical strategies we would recommend dynamic approaches, which account for the effects resulting from demographic ageing.

Keywords

Welfare system, distributional and fiscal impacts of immigration, welfare magnet.

JEL classification numbers: F22, H55, H61, J11, J61, J68

Introduction[*]

The last decades have seen a significant increase in the number of international migrants worldwide. Even if the share of migrants in the total population has remained relatively stable since early 1960s the global picture of migration is changing (UNDP 2009). Most migrants today target well developed economies with strong immigrant traditions (e.g. Australia, Canada and the United States) as well as the European Union. In these countries/regions immigration is often presented (and perceived) as a threat to host economies and societies. We refer here not just to social, cultural and religious issues. There is also an ongoing debate on the impact of immigration on the well-being of domestic populations. This discussion concerns primarily the labor market (wage impact, displacement effects and the risk of unemployment) and the fiscal effects of immigration.

The latter subject became one of the most controversial topics in recent migration debates. Immigrants are commonly blamed for burdening state and local budgets of host countries and for negatively affecting the welfare services enjoyed by non-migrants. This discussion (and the passion with which it is carried out) is perfectly understandable when considering the very nature of both migration and the welfare system. While analyzing the fiscal implications of immigration Freeman (1986) emphasizes the very logic of the national welfare systems which – by their nature – were developed as closed systems. This is due to the fact that the principle of distributive justice departs from the distributive principles of the free market: it does not, in fact, replace the logic of market but significantly alters it[1]. At the same time, however, the idea of membership, something which is crucial for systems of distribution, implies the existence of non-members, and agents excluded from sharing[2]. Thus the main challenges to the welfare system result from the fact that national welfare states exist in a global economy and that they become increasingly dependent on other players in the system. In other words, the openness of the welfare state creates extraordinary challenges to its viability and sustainability. Both international trade and capital flows can be expected to have indirect or direct impacts on the welfare system. The impact of migration, on the other hand, is direct and critical. Freeman's (1986) assessment of the process is clear and strong: there is a tension between closed welfare states and open economies (including migration). As a consequence, national welfare states are not able to coexist with the free mobility of labor. This seems to be a typical exemplary statement, one of many in the recent literature on immigration and welfare.

Given this background to the debate, an aim of this paper is to review and synthesize existing literature on both the theoretical and the empirical aspects of immigrants in the welfare systems and their impacts on the contributory (taxes paid) and the beneficiary (benefits and goods obtained) side. Following Nannestad (2007) welfare system will be defined as a system that comprises both income transfers (cash payments); and in kind benefits (public services including health, education, child care, elderly care etc.). Here we refer not only to participation in the welfare system, but also to related payments (direct and indirect taxes). Importantly, we will not consider, with some very few exceptions, any externalities related to the presence of immigrants in the host society (labour market impacts, impacts on housing, consumption etc.).

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[1] He refers to Walzer (1983) while arguing that the idea of distributive justice (and welfare state) presupposes a bounded world within which any distribution takes place.

[2] Moreover, in historical terms the welfare state emerged in a very particular context: the context of the national state that granted and protected welfare arrangements. Thus, the system entails limited access to its benefits and this access is usually bounded to citizenship.

The paper will follow the typology of approaches to migration and welfare systems proposed by Nannestad (2007). According to that author the analysis of *mutual* relations between immigration and the welfare systems focus on four main issues: 1) the role of welfare systems as potential pull factors (*welfare magnets hypothesis*); 2) the impact of welfare systems on immigrant behavior at destination, i.e. a question about to what extent the architecture and rules of the welfare system act as factors creating incentives and disincentives for successful immigrant integration; 3) the impacts of immigration on the welfare system at destination, i.e. the distributional and fiscal impacts of immigration; 4) the impact of immigration on the future of welfare systems, namely an analysis in which welfare systems are treated endogenously (*political economics of migration*). This list can be extended by adding 5) relations between immigration and the welfare system as a base for the assessment (and creation) of migration policies.

The paper will focus, above all, on the fiscal impacts of migration but it seems reasonable – or even necessary – to refer to other approaches as long as these are connected to the main way of reasoning. We hypothesize that the fiscal impacts of immigration are complex and dynamic and thus a proper assessment demands a careful empirical strategy and should refer to both static and dynamic approaches. The analysis presented will be subordinated to the following research questions:

Q1: Is there a theoretical consensus regarding the fiscal effects of migration?

Q2: Is it possible – in theoretical and practical terms – to explain the patterns and dynamics of migration by referring to (the generosity) of welfare systems?

Q3: Is there a consensus regarding empirical assessments of the fiscal effects of migration?

Q4: What are the most important factors influencing the fiscal position of immigrants at destination?

Q5: Can fiscal arguments be used in the process of evaluation and the formulation of migration policies?

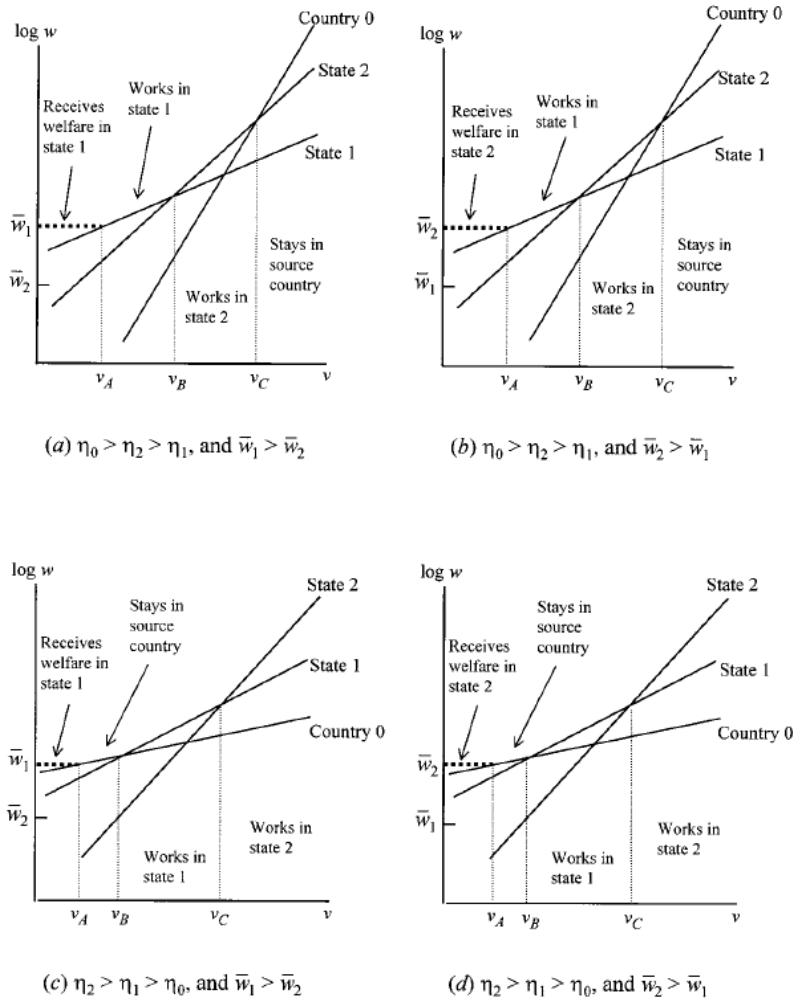
The structure of the paper is as follows. The next section discusses the most important theoretical models, which attempt to explain the welfare impact of migration. The second section summarizes the empirical evidence available so as to obtain a general picture of the recent understanding of the fiscal impact of immigration. The studies presented are critically evaluated in the third section, which aims to define possible empirical strategies, which can be applied in studies on the welfare impacts of migration. The last section stands as our conclusion.

The Impact of Migration on Welfare: Theoretical Considerations

Welfare magnet hypothesis

There is a broad literature devoted to both theoretical and empirical studies on of the impact of welfare regimes on migration patterns. There is a general consensus that redistributive policies will explicitly or implicitly induce adverse selection mechanisms in the sense that (potential) net beneficiaries are expected to be attracted by generous systems and in the sense that (potential) net contributors will be repelled (Musgrave 1969; Wildasin 1994; Chiswick 1988; and first of all a seminal article by Borjas 1999). Borjas (1999) begins his work with an observation that immigrants and natives differ with respect to their sensitivity to the level of welfare benefits and this is mainly due to costs of internal migration within the US: immigrants are assumed to have free choice in terms of the state in which they settle. Thus immigrants are expected to be clustered in states that offer the most generous welfare provisions. Figure 1 describes the model in graphic terms, whereas the panels differ with respect to the level of welfare offered and the return to skills (with an assumption that migration is costly).

Figure 1. The model of geographic sorting of immigrants (fixed costs of immigration assumed)



Source: Borjas 1999: 613.

In the model proposed (the geographical sorting of immigrants) the decision to migrate and the selectivity of migration depend on two factors: the rate of return on human capital and the welfare benefits available. All the panels portray the relations between skills and wage level (wage-skills curve). Panels a and b present a theoretical situation where the host country (country 0) offers a lower return on human capital than the return that can be achieved in the source country ($\eta 0 > \eta 2 > \eta 1$). In the case of panel A state 1 offers more generous welfare provision than state 2 ($\overline{w_1} > \overline{w_2}$). In the case of panel B the opposite holds (the same with panel C and D). Given these conditions (panel A) persons with skills lower than v_A are supposed to move from country 0 and settle in state 1 (with higher benefits) and receive welfare there. Persons skilled between v_A and v_B will also migrate and join the labor force in state 1. Those with skills between v_B and v_C will work in state 2. Finally, highly-skilled persons (over v_C) will remain immobile: though (in panel b the opposite holds in terms of targeting particular states. Panels c and d refer to a situation where returns on human capital abroad are higher ($\eta 2 > \eta 1 > \eta 0$). Given the conditions described in panel c (higher welfare provision in state 1) the less-skilled migrants will end in state 1. There they will rely on welfare. Persons skilled between v_A and v_B will stay in the country of origin. Those with skills between v_B and v_C will work in state 1. And the best skilled will choose state 2 with lower welfare provision and, we assume, lower taxation: the same applies to panel d.

In both cases the outcome of the theoretical analysis are similar: the "magnetic" effect of welfare is supposed to lead to a different geographic sorting of immigrant and native welfare recipients. Migrants are expected to be clustered in states that offer relatively generous welfare provision: and additionally, *the welfare magnet* acts more strongly on the least skilled immigrants assumed to be welfare recipients. There are, according to Borjas (1999), crucially at least two channels of relations between migration and welfare states: 1) the impact on would-be immigrants who otherwise would not consider a move and 2) the impact on those who might have returned to their countries of origin.

Following this way of reasoning Razin and Cohen (2009) develop a parsimonious model to show that the generosity of welfare state will negatively affect the skill composition of immigrants (under free migration regime). This effect can change, however, when the inflow is controlled by the host country. The reasoning is straightforward: when mobility is free, the migration process is driven by the expectations and considerations of migrants; in a world of controlled mobility, the immigrant equilibrium rates are determined by the host country. Obviously, the extent of this "determination" depends on the efficiency of migration policies.

Hassler *et al.* (2002) attempt to explain cross-country differences in geographical mobility, unemployment and labor market behavior on the basis of a dynamic general equilibrium model: including the decisions of voters on unemployment insurance. They show that unemployment insurance, as a social security measure, reduces the incentives to move and leads to the differentiation of agents depending on their attachment in a given location. Moreover, such a mechanism is supposed to lead to multiple steady-states, whereas the most interesting ones are: the European one (with high unemployment insurance, low geographical mobility, high unemployment) and the American one (with low unemployment insurance, high geographical mobility and low unemployment).

Razin, Sadka and Suwankiri (2011) propose a parsimonious model of migration and attempt to assess the impacts of welfare regime in terms of the skill composition of newcomers. The model is based on standard assumptions concerning production function, utility function etc. The welfare system is basic in the sense that it is based on proportional labor income tax and the idea that its revenues are distributed equally to all residents (including immigrants)[3]. The policy decisions on the tax rate and the total volume of migration are assumed to be exogenous, while the only endogenous policy variable is the skill level of immigrants[4]. According to the model, if there are no restrictions in place (*free migration regime*) the generosity of the welfare system will attract unskilled immigrants and will discourage skilled ones. Unfortunately, the rationale for this outcome is rather naïve and certainly very simplistic: given the model it follows that the change in taxation raises *the demogrant* (capturing benefits), but lowers the net wage (due to increase in taxation). This, in turn, reduces the well-being of highly-skilled workers due to the fact that the fall in net wage outweighs the increase in benefits. In the case of low-skilled would-be immigrants the opposite holds true and this is why the same are expected to be attracted. Razin and Wahba (2011) extend the model in such a way that they claim that the potential impact on the welfare system on the scale and structure of immigration will depend on the type of adopted immigration policy. Under free migration regimes countries with generous welfare systems will attract predominantly low-skilled immigrants (net beneficiaries of the system according to the authors). In the case of restricted migration policies voters are able (to some extent) to influence the skill structure of immigration and they will favor highly-skilled net contributors. This model is strictly conditional on the assumption that immigration policy can impact the structure of the inflow.

The *welfare magnet hypothesis* has been tested in many ways over the last decades. In empirical terms the Borjas model was tested on a sample of American states to show significant interstate differences in terms of immigrant shares attributed to welfare benefits dispersion across the US, as

[3] As a so-called *demogrant* capturing both transfers as well as provision of public goods and services

[4] Additionally, there were several assumptions devoted to premises of voting behavior in presence of immigration.

opposed to natives (Borjas 1999). Gelbach (2004) looks at the mobility of young women (single mothers) within the US to assess the location choices in terms of welfare generosity. The author also, meanwhile, measures the impact of welfare migration on optimal state level benefits. With regard to the first issue, the evidence suggests that welfare migration varies over the life cycle (with some problems with the interpretation of results). Regarding the second issue, the impact of mobility depends on the generosity of the welfare system: no effect for the most generous states, possible effects in those with a lower scale of benefits. Also, in the American context, McKinnish (2007) assesses the importance of the welfare magnet hypothesis with reference to short-distance intestate mobility: as opposed to those residing in the inner parts of the state. She finds clear signs of welfare magnet effects, but most of the estimates are not statistically significant. Razin, Sadka and Suwankiri (2011) test their model (as discussed above) on a cross-sectional data on source-host country pairs broken down into two groups: the first one includes 16 European countries and is meant to represent a free migration regime; the second one includes 16 European countries as host countries and 10 well developed non-European countries (U.S., Canada, Japan, Australia, New Zealand etc.) to represent *policy-restricted migration* group)[5]. The outcomes of an empirical analysis show that the generosity of the welfare state (measured by benefits *per capita*) adversely affects the skill composition of migrants under the free migration regime. In the case of controlled migration those impacts are even more pronounced.

The literature on Europe is far more limited. De Giorgi and Pelizzari (2009) discuss the question whether welfare induced migration might be a threat to the post-enlargement EU. Based on experience of pre-enlargement migration flows (analysis encompass the years 1994-2001) they conclude that the impact of the welfare system (its generosity) on the scale of immigration is small but significant in statistical terms. They also point to possible negative distributive impacts of post-enlargement migration. Notwithstanding, the potential impact of the welfare regime is assessed as being much smaller in terms of side effects, namely labor market conditions (wages, level of unemployment). Dustmann *et al.* (2009) analyzes the impacts of EU8 immigration to the UK and did not find any evidence of welfare-driven migration.

In general terms, having reviewed broad theoretical and empirical literature on that issue Giulietti and Wahba (2012) conclude that economic theory may suggests that generous welfare systems are supposed to act as welfare magnets. However, they also note that the empirical support for the welfare magnet hypothesis is inconclusive. One possible explanations could be that most theoretical approaches are based on rather general non-evidence-based assumptions: for example, the notion that low skilled immigrants rely on welfare.

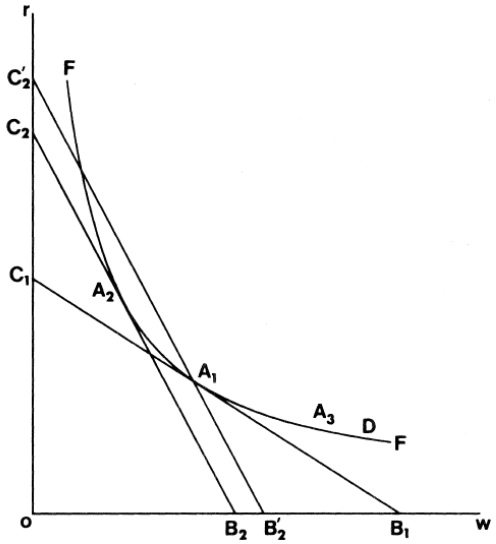
Migration impact on the welfare state (and welfare)

While analyzing the literature devoted to the welfare impacts of migration one needs to distinguish between studies looking at the welfare in general terms (effects on *social welfare*) and those assessing fiscal impacts of migration (effects on the *welfare state*). We will focus predominantly on the latter, but the former is worth noting due to the fact that it significantly influences the economic perception of immigration. What is more, in several cases there are clear links to the literature discussed below and purely fiscal considerations. Most of the papers are based on the neo-classical economic literature on trade and mobility of factors of production: this is why this strand of literature is often referred to as neoclassical trade literature. As such they see migration as beneficial to host country nationals and detrimental to those inhabitants of the source country who are not mobile. In one of the first studies of this kind Berry and Soligo (1969) note that due to price changes migration is expected to incur a "deadweight" loss in the case of those left behind and a "surplus" in the case of the population at

[5] The choice of countries in the sample seems controversial due to the fact that citizens of all included source countries can enjoy relatively easy admission to the EU. This is one of the reasons why the results are rather controversial.

destination ("brain drain" type of migration being assumed). This simple model is extended to a *m* x *n* framework (*m*-good, *n*-factor) to assess the impact of factors of production mobility on the welfare by Wong (1985)[6]. He assumes that a necessary and sufficient condition for a (marginal) increase in national welfare is a (marginal) change (improvement) in the factor terms of trade. The proposition was illustrated graphically in the following form:

Figure 2. The impact of immigration on welfare: a graphic presentation of the Factor Price Frontier curve



Source: Wong 1985: 361.

Figure 2 illustrates the factor price frontier (FPF) of a given economy scheduled as FF (downward slopping and convex). We have two equilibrium points: A_1 representing the pre-migration autarkic point (point of tangency between *FF* and budget line $C_1A_1B_1$, such as $I=wL+rK$; and A_2 related to post-migration autarkic point in a case when emigrants possess more capital than non-migrants ($K_e/L_e > K_n/L_n$). From the graphic above it follows that the welfare of non-migrants have been hurt because the C_2B_2 curve lies below hypothetical $B'_2C'_2$ representing an adjusted welfare function.

Consequently, according to Wong's model (1985) finite international migration is beneficial to the nationals of a destination country and detrimental to non-migrants and marginal migration will not have such effects. The mathematical approach presented by Wong (1985) has been challenged by Quibria (1988) whose results, however, support the previous results: i.e. in the general context of movements of *n*-factors the inflow of foreign factors of production is beneficial to nationals.
It is well acknowledged, however, that this result should be treated with caution. First, there are possible losses in the case of those host country nationals who are substitutes for the newcomers. Second, an assessment of immigration and emigration can be reversed in the case of additional factors, e.g. remittances (Djajic 1996), or with the inclusion of non-tradables and foreign capital (Diajic 1998[7]).

Fuest and Thum (1999) look at the welfare impact of immigration (defined in terms of wages and return to capital only) in a specific (but empirically common) context where a dual labor market exists

6 Most of the studies presented refer to the "classical" set of assumptions, i.e. production functions are linear homogenous and convex, preferences are represented by homothetic, quasi- or concave functions, etc.

7 Model assumes both tradables and non-tradables with capital mobility and looks particularly on the welfare impacts per sending country. In this case the assumption related to mobility of capital can reverse intuitive outcomes (welfare costs of emigration).

and there is wage bargaining between trade unions and employers. In doing so they challenge the typical assumption over the perfectly competitive structure of labor markets. Interestingly, authors show that one of the benefits of immigration is the impact on trade unions: if immigration reduces the wage rate in the competitive (i.e. non-unionized sector) it may force trade unions to re-consider their demands in other sectors and thus immigration may lead to the more efficient allocation of labor. In such a framework the most important characteristics of the labor market becomes the elasticity of labor demand in the unionized and competitive sector. The main conclusion here is that if wage elasticity in the competitive sector is smaller than in the unionized sector immigration is beneficial (due to the re-allocation of labor from the competitive to the unionized sector). Otherwise, the welfare effects of immigration depend on its scale: large scale immigration is supposed to enhance the welfare for natives due to redistribution of welfare from immigrant workers to native firm owners. Moreover, one of the conclusions was that immigration is always beneficial when immigrants have inferior chances of finding jobs in the unionized sector.

Michael (2003) examines the impact of immigration on the welfare of native populations and also on class, i.e. capital owners and workers. The outcome of the model is that immigration reduces the social welfare of those residing in the country, but this effect can be reversed in the presence of capital mobility (immigration causes capital inflow). This outcome is based, however, on a few assumptions, which are almost certainly far too simplistic. Above all, there is the idea that since immigrants possess only labor (and not capital) their income is lower than average in a host country and thus they are net fiscal beneficiaries. The problem is, however, that these are empirical questions rather than well founded facts or obvious assumptions.

Djajic (2009) assesses a two-sector model of an economy (assuming full employment, production of both traded and non-traded goods) with an aim to examine the welfare impacts of temporary and permanent immigration. The interesting part of the paper refers to assumed differences between permanent and temporary immigrants. This lies in their patterns of consumption (temporary migrants are assumed to take into account international differences in prices while adjusting their recent consumption); the factors of production they bring (whereas permanent immigrants are expected to bring their capital along); and remittance behavior (supposed to send more money abroad)[8]. In a purely static approach (no population growth, no capital accumulation except for those changes induced by inflow of immigrants) Djajic (2009) shows that the admission of temporary workers will lead to changes in relation between labor and capital. Temporary workers will raise the relative price of traded goods (temporary immigrants are net sellers of non-traded goods). They will bring welfare gains for the natives and welfare losses for those temporary migrants who were already in the country[9]. Djajic and Michael (2009) introduce temporary migration policies into the model. They show that a model of quest-worker immigration, aimed at low-cost legal labor for the economy can bring welfare gains. Those gains can be increased by setting a time limit on workers (the main focus of the article was the optimal duration of a guest-worker permit).

Unfortunately, part of above quoted models suffers (in terms of welfare assessment) from a rather simplified understanding / defining of welfare and welfare function and a denial of the impact of migrants' remittances (save several papers by Djajjic) and fiscal policies. Against this background Michael and Hatzipanayotou (2000) propose a general equilibrium model: two-class small open economies – internationally immobile natives and immigrant workers. They assess the impact of migration on both countries **assuming the presence of indirect taxes, income transfers and public goods**. Thus the crucial question is whether the gains from trade and mobility of factors of production

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8 Importantly, the analysis denies the differences between permanent and temporary migrants in terms of welfare eligibility and welfare usage. A few such effects were noted in the concluding part only.

9 This way of reasoning is often far too simplistic. For example, Djajic (2009) argues that the positive impact on the welfare of natives due to remittances results from the pure fact that a cut in immigrant spending will lower the demand and that, in that way, it will affect the price level.

are high enough to overcome an (expected) increase in the costs of redistributive policies, i.e. the transfer of income from high-income natives to low-income immigrants or the provision of congestible public services[10]. The novelty of the approach lies in the introduction of consumption taxes (on the one hand), and the non-congestible consumption of public goods and services (on the other)[11]. Migration is assumed to be permanent in the sense that their utility becomes part of the utility function of the host country and they do not remit. Important here is the marginal utility of the initial residents of the host country, i.e. change in social welfare: once more there is no change in fiscal terms. In this framework immigration affects welfare through wage effect and so-called net revenue change public good effect (changes in the level of public good provision). When the consumption of public goods is financed through lump-sum taxes (no tariff, no consumption tax) immigration increases the welfare of natives and the social welfare (including settled immigrants). It has, however, an ambiguous effect on the welfare of immigrants[12]. When the benefits and provision of public goods are financed through consumption tax immigration positively affects the welfare of natives, it affects the welfare of immigrants negatively and it has an ambiguous impact on social welfare: depending on the marginal propensity to consume the taxed goods. In this case consumption propensities and tax rates are important: in most cases higher tax rates refer to luxury goods and those goods are more often consumed by the natives (immobile owners of the capital). Effects on natives are ambiguous in the absence of public goods and negative in the presence of public goods through *income change-induced-public good effect*. The outcomes of the paper can be summarized in one simple statement: the welfare effects of migration depend greatly on the way of financing income transfers and/or public goods (income taxes, consumption taxes and tariffs).

The model can be developed in many ways. For example Hatzipanayotou and Michael (2005) analyze the welfare impact of migration in the presence of tied foreign aid (tied in the sense that it demands co-financing). They show that in their framework the best strategy for the well developed country and for the donor country is to increase the aid to such a point that it equals the gain in its welfare due to a reduction in immigration. The outcome is problematic because, first, it is based on previous modeling exercises showing the negative welfare impacts of immigration and, second, because it assumes that an increase in aid will reduce the scale of immigration; something that is controversial. Michael (2011) analyzes the effects of skilled and unskilled immigration in the presence of capital mobility and he finds that the effects on the social welfare are negative in both cases. The problem is, however, that the author assumes that unskilled workers are net fiscal beneficiaries and skilled workers are net fiscal contributors. Moreover, he assumes – rationally – that unskilled and skilled workers are complimentary. If this is so, according to Michael (2011) an inflow of skilled workers would raise the level of wages of unskilled workers and thus lead to subsequent inflow of unskilled persons and detrimental effects in terms of social welfare. In this framework the inflow of unskilled workers may paradoxically have a positive impact on social welfare.[13]

To sum up, outcomes of the theoretical considerations presented above should be treated with caution for a number of reasons. First, outcomes are very sensitive to assumptions taken: in fact they play a decisive role in the assessment of the welfare impacts of migration. Second, a number of the assumptions are detached from socio-economic reality. Low skilled migrants, for example, are commonly assumed to be net beneficiaries. It is also commonly assumed that migration policies are efficient in the sense that they can impact both the size and structure of incoming flows.

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[10] The paper draws on Michael (1999) who applies a two-class model with tradables and non-tradables and fiscal effects to show that immigration will be detrimental to the welfare of natives and the paper by Michael and Hatzipanayotou (1998) shows that when income taxes finance the provision of pure public good immigration will benefit natives.

[11] Again, there is a critical assumption that all individuals in the country are treated in the same way, something which does not seem to be very realistic (due to eligibility etc.).

[12] This is due to the fact that when the lump-sum tax revenue is equally distributed (and this is the assumption) then immigration induces only the wage effect.

[13] Additionally, those effects can be reversed if capital is internationally mobile.

The second strand of literature departs from the purely welfare oriented approach and focuses more on the impact of immigration in a country with redistributive policies. Thus the fiscal impacts of immigration are addressed theoretically in a direct or an indirect way. Wildasin (1994) characterizes the set of income distribution policies in the presence of labor mobility. The analyzed model departs from the classic H-O framework and focuses on the impact of migration on available redistributive policies. Wildasin (1994) emphasizes that the effects of immigration are far broader than pure fiscal effects. In fact, migration may affect the distribution of income in the society through changes in factor supplies, factor productivity and their prices. For this reason he applies a simple general equilibrium model. The analysis shows that immigration can theoretically lead to higher net incomes for all members of society, i.e. Pareto-improvement as compared to a non-migration scenario (a portion of the income distribution frontier assuming free migration lies above the no-migration frontier). However, the fact that another portion of the migration related frontier lies below the no-migration frontier implies losses to the host society. From the theoretical model presented it follows that this is the case where immigrants are net beneficiaries of redistributive policies. Moreover, according to the model immigration can be Pareto-improving if mobile workers and native workers are taxed to provide additional transfer payment to the (immobile) owners of the capital or other immobile factors. This presents two important outcomes: first, countries may wish to attract *fiscal contributors* and to discourage *fiscal beneficiaries*, and secondly, welfare impacts of immigration are strictly conditional on the net fiscal position of immigrants, which is to be modeled in a different way (see Storesletten 2000, 2002; Chand and Paldam 2004)[14].

Similar conclusion can be drawn from Wellisch and Wildasin (1996). These authors apply the comparative-statics analysis of a model of Nash non-cooperative equilibriums in tax/transfer policies to assess the net fiscal effects of immigration. The analyzed system implies common labor market, mobile capital and also the presence of redistributive policies. They follow the literature on decentralized income redistribution and assume that there is a system of jurisdictions and the choice of particular tax and transfer policies is being made optimally for a given jurisdiction: in other words, they assume that that choice is not made in an arbitrary way[15]. A change in the scale of immigration poses a shock to the system and affects its equilibrium in several respects. According to Wellisch and Wildasin (1996), the first effect is related to the fact that an increase in competition will affect the wage level at destination and, in turn, the equilibrium utilization of capital and the return to immobile factors. The second effect is related to **the direct fiscal impact of immigration**, depending on the net fiscal transfer from the side of newcomers. The third effect implies that the change in the level of immigration transforms not only the market equilibrium (as described above), but also the Nash equilibrium policies chosen by the two countries involved (the endogenous response of redistributive fiscal policies determined by the interactions of both jurisdictions). They find that if either country/region liberalizes its admission policy, the real incomes of those workers, who are in competition with immigrant workers, will fall (in both countries/regions). The change of social welfare depends then on whether immigrants are net fiscal contributors of net fiscal beneficiaries. Importantly, as the authors point out, any actions related to redistribution and immigration policy will generate fiscal externalities for other jurisdictions and then can (or need to) be internalized by appropriate redistribution policies.

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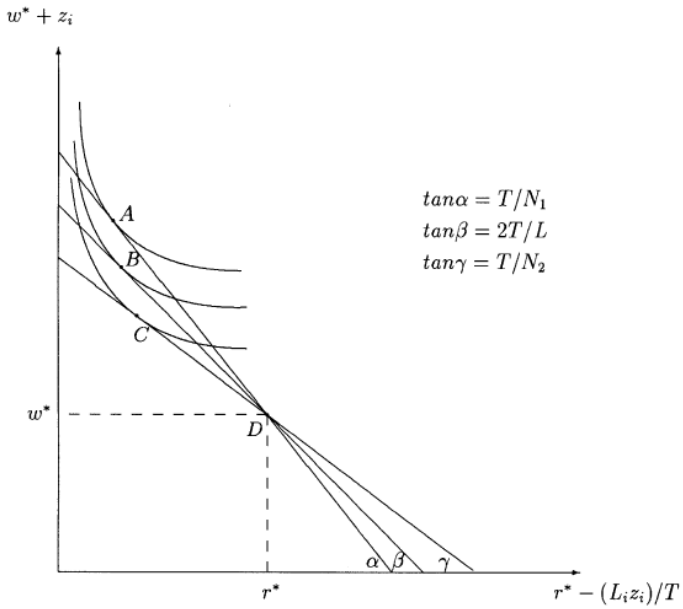
[14] Wildasin (1994) also discusses another question, namely whether it is possible for one country (rich or target country) to gain, in welfare terms, from transferring resources to another country. The author shows that theoretically such a payment in favour of (potentially) mobile workers may reduce the level of immigration and thus impact the welfare of the residence of the donor (the "gains from giving" argument). This way of reasoning is far too simplistic. The recent migration literature illustrates many cases where changes in the income distribution of a sending country may induce additional migration and not the opposite (see among others the *relative deprivation approach* (Stark and Bloom 1985; Stark 1984) and the *migration hump hypothesis* (Martin and Taylor 1996)).

[15] There is an important assumption which says that tax and transfer policies in each jurisdiction treat all workers equally, regardless of their origin. This assumption may hold true in several cases (internal mobility in the US), but in most cases it simply does not stand up (even with respect to internal EU mobility).

Importantly, Wellisch and Wildasin (1996) state explicitly that the measuring of the net fiscal contribution of immigrants is critical for any evaluation of immigration (and redistribution) policies. This status tends to change over the life cycle: this is due to changes in consumption patterns, savings, labor market performance, health status and also factors related to migration, e.g. return migration, remittances etc. Status change is also related to demographic structure of newcomers. Additionally, a proper assessment should go beyond static analyses: immigrants may change their status, they can settle and be joined by families etc. Thus they suggest interpreting the critical variable z_i (net fiscal contribution of immigrants) as the present value assessed across the span of a life. In fact, they would include the fiscal position of any descendants.

Wellisch and Walz (1998) start from a traditional neoclassical approach to migration (H-O framework) showing that both trade and migration are equivalent measures of economic integration and that they both lead to a divergence in factors of production. Notwithstanding this, there is a clear preference observed around the globe for free trade to be preferred over free migration: e.g. most free trade areas are reluctant to open borders for the free movement of labor[16]. The proposed explanation for this "paradox" lies in the presence of redistributive policies and their linkages to immigration: put in other terms the existence of the modern welfare state is one of the main factors hindering free mobility[17]. The authors propose a model assuming and the absence of or the presence of deliberate redistribution policies: this means two countries, unskilled labor as a mobile factor, and equal endowment in the case of immobility. In such a model, if we assume that the income of owners of the immobile factors is higher than the income of potentially mobile workers and that migration is free, the country with smaller unskilled native labor force loses as compared to the free trade regime (assuming no immigration), Figure 3.

Figure 3. Social welfare, free trade and free migration – model approach



Source: Wellisch and Walz 1998: 1606.

[16] Wellisch and Walz (1998) give as examples the relations between EU and Turkey and mobility within NAFTA. As an additional example EU enlargement may serve when even EU citizens from the new member states of the EU were prohibited from moving freely to other EU countries.

[17] It is worth noting that there are other explanations possible, e.g. due to certain factors (market structure, differences in technologies, tradable and non-tradable goods) price equalization is unlikely, and immigration may affect native workers in many ways. Moreover, according to the Ricardian trade model or the new economic geography immigration and trade are complements and not substitutes (Wong 1995; Krugman 1991).

Figure 3 represents the costs and benefits related to free migration and a free trade regime in the model described above. Equilibrium factor prices are equal to *w** and *r** for labor and capital respectively. If government policies are absent the net incomes are thus equal to those prices (point *D*). The situation changes when redistribution takes place (depending on redistribution policies)[18]. In such a case the redistribution cost line of a well-developed country with a free trade has a slope of $-T/N_1$ and the less developed country $-T/N_2$. If free migration is possible the redistribution curves in both countries will have the same slope ($-(2T)/L$): this is in line with the outcomes of the H-O framework. Then, when we assume that all households have identical homothetic utility functions as described above at the equilibrium point the well-developed country will choose the net income distribution *A*, less developed country *C* (in the case of free trade), i.e. the well-developed country attains a higher level of social welfare than in the cases of less developed countries; in the case of free migration and with coordinated redistribution policies both countries will opt for *B*. This would result in an improvement in the social welfare position of less developed countries and this would be worse in the case of well-developed countries[19].

The general result is as follows: in the case of free migration redistribution policies may lead to higher social welfare levels than in the absence of coordination; moreover, the welfare effects of migration depend on the size of the workforce (in relation to capital). Free migration makes countries with larger native work force richer, whereas, in the case of a smaller native work force, the opposite holds true. The study by Wellisch and Walz (1998) differs from the models presented by Wildasin (1994) and by Wildasin and Wellisch (1996) as more than "one good" world is considered. In such a framework it is definitely preferable for labor force scarce countries ("rich countries") to prefer free trade over free migration and to avoid the welfare decreasing effects of redistribution policies.

There are several models dealing with welfare as a pull factor and, indeed, the political economics of immigration. However, theoretical considerations related directly to fiscal impacts of migration are scarce. One of the most commonly quoted is by Boeri (2010). Boeri applies a simple static model of migration to quantify the impact of immigration on the welfare of native populations. The aim is to identify the main channels by which immigration can affect both the generosity and the desirability of redistributive policies.

The model distinguishes two types of workers whose welfare functions are given by:

$$W^s = w_s(1-t)$$

for skilled workers[20] and

$$W^u = w_u(1-t)(1-u_u) + u_u b$$

for unskilled ones. In both formulas w_i denote wages, u_i the unemployment rate specific for particular skill levels, *b* the level of benefits, and *t* the proportional tax rate paying the unemployment benefits: assumed to be the only redistributive transfer in this economy. Further, the number of immigrants related to the receiving population is denoted by *m* and the share of unskilled workers among natives γ and among immigrants γ_m (in both cases these hold $0<\gamma<1$). Unemployment rates are assumed to reflect only differences in the skill composition of both immigrants and native workers.

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[18] Functions are linear due to the fact that the equilibrium prices of factors and prices as well as the international labor allocation are independent of redistributive measures. Note that the last condition does not necessarily hold (see the welfare magnet hypothesis).

[19] In a similar context Razin and Sadka (1995) refer to a model of international migration assuming two-class workers (highly skilled with high productivity and unskilled with lower productivity) and discuss the effect of redistribution policies (income tax and lump-sum benefits) aimed at maintaining the pre-immigration level of disposable income or consumption of natives (or precisely: native born unskilled workers). In such a framework, immigration leads to Pareto-inferior outcomes in terms of the welfare of the receiving society.

[20] The model assumes that there is no unemployment among highly-skilled workers. Thus in their case taxes are to be treated as a pure transfer to unskilled workers.

The level of benefits is assumed to clear the government budget (for any given tax rate) and is given by:

$$b = t\frac{w_s[(1-\gamma)+m(1-\gamma_m)]+w_u[(1-u)(\gamma+\gamma_m m)]}{u(\gamma+\gamma_m m)+\phi m}$$

Where ϕ denotes the "residual dependency" term capturing extreme levels of transfers usage by migrants: $-\gamma_m < \phi < (1-\gamma_m$. When it is negative it refers to the low take-up of transfers or abuse when it is positive. The impact of immigration on the welfare of natives can be expressed as follows:

$$\frac{dW}{dm} = u\gamma\frac{db}{dm} - \left(w_s(1-\gamma)+w_u\gamma(1-u)\right)\frac{dt}{dm}$$

If yes, then the effect of immigration on the welfare of natives is determined by the way transfers and taxes react in the case of inflows: Boeri refers to those effects as to benefit and fiscal externalities.
In such a framework it is possible to show that the *benefit externality* $\frac{db}{dm}$ will depend on the net fiscal position of immigrants (i.e. whether taxes paid are higher than benefits received) and that the presence of migrants can lead to decrease in *b* (level of benefits). Obviously, given the set of assumptions taken this will refer to unskilled natives only (they are the only ones at risk of unemployment). Moreover, when the net fiscal position of immigrants is negative and the government attempts to keep the level of benefits constant, the necessary increase in social spending is to be matched by higher taxation (*fiscal externality:* $\frac{dt}{dm}$). Due to the fact that the tax base is larger than the "benefit base" (due to assumptions taken) the fiscal externality will be spread over the larger population. This externality will not, then, be as significant as in the previously analysed cases.

Generally, in the Boeri (2010) model there are two variables crucial for the determination of the welfare impacts of immigration – the share of unskilled workers among immigrants (γ_m) and the residual dependency term (ϕ). If yes, then, the model can be easily extended by referring to Borjas's (1999) model of migrants' self-selection. In such a case (i.e. when the skill level of immigrants is treated endogenously) any increase in taxation in the host country will negatively affect the skill composition of newcomers and thus deepen the effects suggested above. In such a case, migration may negatively affect the welfare of natives even if the net fiscal position of migrants is positive[21]. Nonetheless, the net fiscal position of immigrants remains the key factor in the analysis because it affects not only the short-term outcomes of the inflow, but also the long-term impacts related to (possible) changes in the immigrants' skill structure.

The model can be extended by allowing for preferences for redistribution (Alesina and Giuliano, 2009) and altruism with respect to persons belonging to the same community (Akerlof and Kranton, 2005). The author shows that even if migration does not affect taxes or the generosity of unemployment benefits, it will still negatively affect the welfare of natives to the extent that natives perceive some migrants as less deserving of redistributive policies than natives. This model is also extended by taking into account the issue of self-selection of low-skilled immigrants into the countries that have more generous welfare systems[22].

[21] Again, this is mainly due to a particular set of assumptions taken (e.g. the risk of unemployment, welfare regime).

[22] In empirical terms Boeri (2010) shows that the negative attitudes of EU citizens towards immigrants are affected by both fiscal and benefit externalities whereas those effects can hardly find unequivocal support in empirical evidence. He suggests that this paradox can be explained in terms of political economic models (groups, representation and leadership) or altruistic behavior driven by identification with people belonging to the same community (in the case of redistributive policies).

In an approach combining pure analysis of welfare impacts and the political economics of immigration Razin, Sadka and Suwankiri (2011) study the gains from migration on a basis of a simplified version of the overlapping-generations model (not including the labor-leisure choices of agents). Individuals are assumed to live for two periods: when young they work, consume and save for retirement, in the second period they retire and live on their private savings and pension. They are also assumed to be either skilled or unskilled migrants. Analysis refers to the PAYG pension system ("pay-as-you-go"), which is based on a flat tax on income which fully finances the benefits to be paid to the old agents in the system. Only one wave of immigration is considered, all the immigrants are young and are expected to bring offspring[23]. Additionally, second-generation immigrants are assumed to be perfectly assimilated into the receiving society in terms of fertility and in terms too of the skill level reflecting the structure of the host country.

The welfare effects of migration are supposed to result both from the impact on the fiscal balance as well as from the effect on relative wages. However, if wages are fixed (no externalities) immigration impacts the welfare of natives in a positive way no matter what the skill structure of newcomers: though it is higher with a higher share of the highly-skilled. If wages are variable the impact would depend on the skill structure of immigration. The model presented is very simplistic and cannot be said to reflect economic reality, particularly in European countries with their markets structure and labor market rigidities. In terms of the fiscal effects of immigration the total effect is positive, even if immigration comprises unskilled individuals (contrary to the results presented above).

As with the above discussed models on social welfare, the models assessing the fiscal impacts of immigration suffer from the application of very strict and not necessarily realistic assumptions. For obvious reasons those assumptions are important in being able to present a relatively simple economic model. However, in fact, they very often seriously depart from socio-economic reality. The process of the socio-economic integration of immigrants is a complex one and this is the case with any assessment of their fiscal effects (see Figure 9).

Even if there is no solid or robust theoretical basis for the assessment of immigration effects on the welfare state, there are several attempts to provide at least a theoretically well founded framework of analysis. Two attempts discussed below include at least a number of the factors indicated below, Figure 9.

When starting his analysis, Storesletten (2000) points out how the typical sequence of welfare effects related to the presence of particular immigrant works as follows: a short period of net costs directly after arrival (i.e. prior to employment); a long period of tax revenues and retirement with related net benefits. Additionally, a proper analysis should encompass more than one generation (and include at least offspring of the most recent generation). In such a framework, immigration (the admission of foreign nationals) can be viewed as a public investment Storesletten 2002:2): see also following section and approach proposed by Simon (1984, 1989) and DeVoretz (2006). At the same time, this approach is notably different from the theoretical attempts proposed by Michael, Djajic and others. First, Storesletten does not attempt to provide a welfare analysis but rather a *"*dynamic accounting exercise of government revenues and expenditures" (Storesletten 2002:2). Second, even if this approach seems far less ambitious it allows for such issues as gender, age at time of migration and other characteristics of a given cohort[24] and thus provides a more reliable assessment of the welfare impacts of immigration.

In his paper Storesletten (2000) attempts to test whether change in immigration policy could resolve the fiscal problems faced by the US. To test it a general equilibrium overlapping generations model is employed in both theoretical as well as empirical terms. Additionally, general equilibrium analysis is introduced to control for the effects related to changes in interest rates and wages due to

[23] The fertility rate of immigrants is assumed to be higher than the fertility of natives.

[24] In the theoretical models discussed before those issues are assumed or taken as granted.

changes in the labour/capital ratio resulting from the supply shock. The analysis of immigrants includes their main socio-demographic characteristics as well as their age at the time of immigration and their legal status. In the case of this particular model only the first-order effects of immigration are captured, i.e. effects related to particular cohort of immigrants since their admission to retirement (with respective costs and benefits). In the next paper Storesletten (2002) assesses the fiscal impact of migration for a European country with a specific migration regime, Sweden (with its welfare state) and the intergenerational part of the model is extended. The novelty of his approach is also in the fact of the introduction of a break-even analysis: in terms of expected employment rates of immigrants necessary to keep the positive net fiscal contribution.

The proposed framework – the *overlapping generations model* – takes the following form. It is assumed that agents in the economy live up to 100 years, they differ in gender, labour market status, place of birth[25] and age (age at immigration; equals 0 in the case of natives), whereas future immigrants resemble those already in the country, and children of immigrants are identical to natives[26]. It is also assumed that immigration policy determines not only the annual inflow of immigrants but also their structure in terms of age, gender and national origin. Fertility and mortality rates are assumed to be fixed over time but they may vary in terms of place of birth (immigrants vs. natives but not between particular countries of origin which presents a controversial assumption) and gender. Additionally, immigrants are assumed to be settlers, i.e. return migration rate equals 0[27]. Governments choose a selective immigration policy targeting not only skills, but also the age distribution of (new legal) immigrants[28].

The evolution of population is is as follows: with a given level of immigration the number of births depend on the size of female cohorts and assumed fertility, the number of deaths follows the assumed mortality for agents with particular age and gender[29]. Individuals may participate in the labour market or they may not. If they do, they may work (actually work or take work leave) or they may stay unemployed. There are fixed group specific unemployment and participation rates (u and p) assumed (do not change over time). There is a random variable which imposes a labour market status with probability u for unemployment, p for work leave and w for work in a given year:

$$w = (1 - u - p)$$

Thus, wages or output of an agent of type m aged i is linear and given by:

$$W_t e_{i,m}(1 - u_{i,m} - p_{i,m})$$

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25 Immigrants are defined as persons born abroad and currently residing in the host country.

26 This is a tricky assumption, particularly if it is assumed (as Storesletten (2000) does) that the skills of second-generation immigrants are independent of the skills of their parents.

27 In the model tested in the case of the US (Storesletten 2000) a non-zero return migration probability function is assumed depending on the length of time spent in the host country. In this case, however, an additional assumption is made to ensure that immigrants do not consider return when making decisions on the move, i.e. that after return all agents will face the same prices, transfers and taxes as in the US. This assumption is obviously implausible.

28 Storesletten (2000) suggests presenting the immigration policy as a function of the state of the economy. This may remind the reader of the proposition made by Simon (1989) or DeVoretz (2006). Importantly, it is assumed that migration policies are effective and efficient (!).

29 Thus population dynamics is given by following formula (Storesletten 2000):
$$no\ of\ newborn_t = \sum \varphi_{i,s}\,\mu_{i,s,t} + y_t$$
where $\mu_{i,s,t}$ is the number of agents (type i,s) in period t, $\varphi_{i,s}$ are fertility rates (age and type-specific) averaged over time and y_t is a deterministic process.

which is to be interpreted as an economy-wide wage per "efficiency unit" at time *t*, and $e_{i,m}$ is the number of efficiency units for a particular type of agent[30].

The government formulates the fiscal policy (and immigration policy) while trying to balance the budget[31]. Fiscal policy consists of a consumption rule, a tax system and a transfer system (including pensions). In the Storesletten model government purchases of goods and services are a function of output *per capita* and population and those include both "variable" costs attributable to specific groups and "fixed" costs understood as classic public goods. In the following section we refer to Storesletten (2002) analysing the Swedish welfare system with constant tax rate on consumption (t_c), constant tax rate on return to capital (t_k), a payroll tax (t_w), a pension contributions tax rate (t_p) and tax rate on taxable non-capital earnings (net of t_p; t_e). Last but not least, transfers from government to agents participating in the system include: welfare payments (lump sum, not taxable); general transfers (lump sum, taxable); work-related transfers (compensation for parental leave, rehabilitation, sick leave and unemployment benefits; proportional to wages, paid only to those participating in the labour market); and pension benefits (according to the Swedish version of the system where benefits are a function of the "pension stock" based on the pension contributions $t_{p,}$ and with a minimum pension benefit guaranteed).

Then the model projects consumption and wealth for each individual[32]. By assumption, the consumption profile remains unchanged and if yes the consumption of an agent aged *i* (and type *m* referring to immigration) who immigrated at time *t=I* is given by following equation:

$$c_{i,m} = \frac{\varsigma_{i,m}}{(1+\tau_c)} \sum_{i=I}^{1} \left\{ (1-\tau_e)(1-\tau_p)(W_0 (1+z)^i c_{i,m} + (1+z)^i h_{i,m}) + (1+z)^i b_{i,m} \right\}$$

Where: $we_{i,m}$ is labour compensation ($e_{i,m} = 0$ for those who are not participating in the labour market), $h_{i,m}$ is taxable non-wage compensation, $b_{i,m}$ is non-taxable now-wage compensation[33]. The asset holding is determined as a residual of net wealth considering consumption[34].

As noted above, there is an assumption that the budget must be balanced in the long run (but that it is acceptable to have a deficit in the short run). The intertemporal budget constraint is given by following formula:

$$B_0 = \sum_{t=0}^{\infty} R^{-t}(T_t - G_t - P_t)$$

Where B_0 is the initial government debt, G_t refers to government consumption in period *t*, T_t to total tax revenues, P_t to transfer payments and *R* is the interest rate[35].

Finally, the net present value of getting (admitting) one extra agent of type *m* of age *I* (with the assumption that the life span is as long as 100 years) NPV(*I*,*m*) is given by:

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30 Importantly, Storesletten (2002) assumes that there is no substitution effect on the labor market, i.e. there is no crowding out of jobs and no changes in the equilibrium wage due to migration (new jobs being created in a deterministic way).

31 It is explicitly assumed that the government budget is balanced in the long run (i.e. expenditures and taxation polices are adjusted to an initial debt level).

32 The production aspects of the economy have been extensively discussed in Storesletten (2000).

33 When analyzing the impacts of immigration on the US economy Storesletten assumes that illegal immigrants differ from legal migration in the way that they pay no taxes, receive no benefits but they still participate in the consumption of public goods.

34 For simplicity's sake we will skip the assumptions related to asset markets and relations between asset holdings and pension stocks which are important in any empirical analysis.

35 Note that this assumption is highly implausible given the recent fiscal situation in Europe.

$$NPV(I,m) = \sum_{i=I}^{100} \frac{\pi_{i,m}}{\pi_{I,m}} R^{I-i}\left(s_{i,m,t+i-I} + \varphi_{i,m}(1+z)^{i-I} NPV(0,M)\right)$$

Where:
- $s_{i,m,t}$ denotes the weighted average[36] of fiscal position (taxes minus transfers and marginal government expenditures) of individuals of type *m* and age *i* in period *t* for $s^{p}{}_{i,m,t}$ and $s^{n}{}_{i,m,t}$ (superscript *p* for participants in the labor market and *n* for non-participants);

- $\sum_{i=I}^{100} \frac{\pi_{i,m}}{\pi_{I,m}} R^{I-i} s_{i,m,t+i-I}$ is the expected net present value of future tax payments minus government expenditures for a type *m* agent of age *I* at time *t* and where π is the unconditional probability of surviving until age *I*;

- $\varphi_{i,m}$ denote the annual fertility for a particular type of an agent of ages *i*;

- and the net government gain of a native newborn in the initial period (NPV(0,*M*) is given by:

$$NPV(0,M) = \sum_{i=0}^{100} \pi_{i,M} R^{-i} s_{i,M,i} \Big/ \left(1 - \sum_{i=0}^{100} \pi_{i,M} \varphi_{i,M} R^{-i} (1+z)^{i}\right)$$

Additionally, a break-even analysis is proposed to assess the employment rates necessary to obtain positive welfare effects. The break-even rate is defined as the participation rate such as the NPV for a newly admitted immigrant equals 0.

This type of analysis can be extended while assessing the institutional framework at destination. Chand and Paldam (2004) provide an interesting exercise while suggesting how the impact of immigration is assessed in the case of three stylized types of societies: a guest worker society ("Dubai type"); an immigrant society ("US type"); and a tax-based welfare state ("Nordic type"). In that way it is possible to assess the effects of inflow in relation to the institution of receiving economy – crucial as emphasised by Wildasin (1994), Wellish and Wildasin (1996) and deVoretz (2006). The analytical framework employed is relatively simple, but it is still very useful for empirical analysis and, at the same time, it addresses at least some of the problems noted above (see Wildasin 1994).

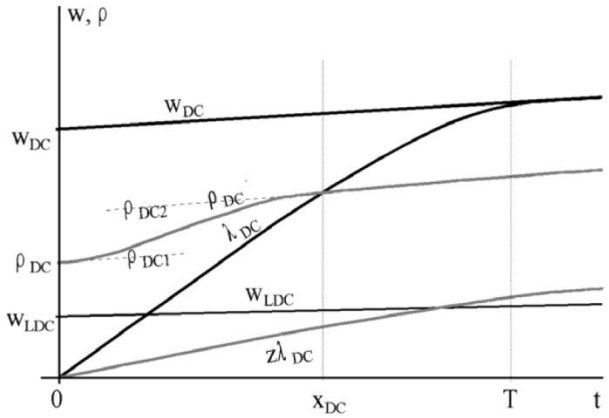
The overlapping generations framework is applied with the following assumptions:

- The immigrant (outsider) enters (legally) the well-developed country in *t = 0* and then establishes a family and lives there permanently through the succeeding generations;
- Instead of using the term integration (not precise in labour market terms) authors refer to labour market absorption, i.e. an immigrant is fully absorbed when he receives the salary w_{DC} (the same as insiders; as compared to w_{LDC}). He has the same unemployment rate and receives the same welfare benefits;
- Difference between w_{DC} and λ_{DC} measures the absorption process;
- Directly upon arrival the immigrant is unemployed (*w = 0*), then starts working with salary rising over time – this process is depicted by a labour absorption function λ_{DC} rising from 0 to 1;
- When $\lambda_{DC} < \lambda(x)$ there is an excess subsidy paid to the immigrant (depending on time spent in a given country and welfare state institutions) – $\rho(t,\ldots)$;
- There is a ratio of surplus production of immigrants *z* (with a benchmark set as *z = 0.25*);
- *X* denotes the time of social break even, i.e. the time when the excess subsidy equals zero (this is the intersection of λ and ρ curves)[37].

[36] Participation rate used as weight.

The standard model can be presented in a following way, Figure 4:

Figure 4. Process of immigrants' absorption: standard case



Source: Chand and Paldam 2004: 7.

As shown above, the wage to be paid at destination is much higher than at origin. However it takes time to reach it (*T*). The subsidy ρ_{DC} consists of two parts - subsistence payment paid at the level of ρ_{DC1} and the insurance part paid until reaching ρ_{DC2}; x_{DC} denotes the break-even point, i.e. the time when the immigrant ceases to be a net beneficiary for the host country.

The authors considered changes of utility in the case of three actors (agents), for immigrants (micro level) and for both countries involved (macro level):

1. In the case of the immigrant the change in utility is a function of the *NPV* of changes in income and two additional factors – *S* (increase in personal security thanks to moving) and *D* (non-economic loss before full absorption); additionally, it is assumed that $S > D$ (which explains the rationality of the migration decision).
2. In the case of the sending country it is assumed that there will be a net gain due to remittances in the presence of low opportunity costs (overemployment): this case is not analysed in further details.
3. For the host country utility is a function of the *NPV* related to presence of the immigrant and variable *Q* indicating (possible) social tensions resulting from his presence. *NPV* is a discounted value of two flows: *z* – corresponding to the surplus produced by the immigrant in excess to his salary and the excess social expenditure paid before full labour market absorption[38].

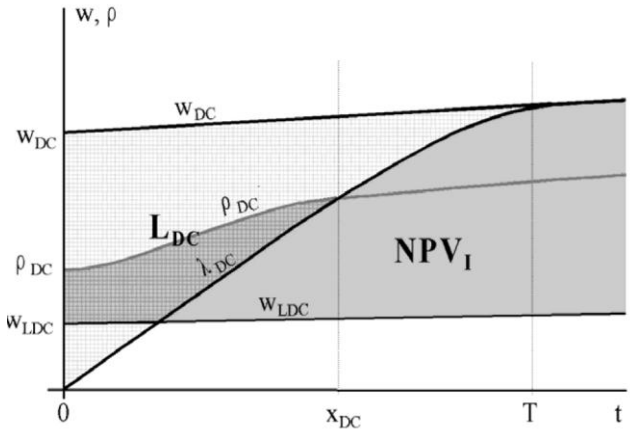
Regarding point 1), the authors assess the individual gains of immigration as highly positive (over 0.66 million USD under plausible assumptions): based on simple microeconomic model of migration. However, they also note that they may be lower due to such problems as: barriers to entry; commission to agents; and skills depreciation during long period of absorption. Under such a framework it is possible to depict the production loss and the redistribution from natives to the immigrant as shown below, Figure 5.

(Contd.)

[37] Except for the set of classical assumptions, e.g. each country grows at equilibrium rate.

[38] The authors noted that the NPVDC is divided between all citizens and this is why some tensions are possible between social and individual costs/benefits of immigration.

Figure 5. Process of immigrants' absorption – NPV of the immigrant in the standard case[39]



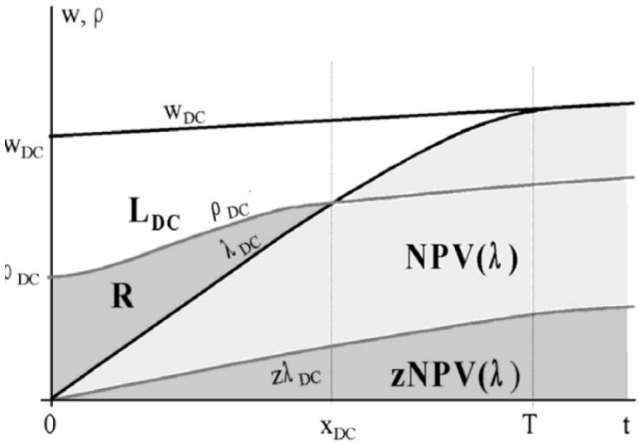
Source: Chand and Paldam 2004: 8.

In the case of the receiving country (point 3) the potential gain is to be measured with the NPV of the surplus of production[40]. This can be expressed in the following way:

$$NPV_{DC}{}^{*} = NPV(zw_{DC}) = z\frac{\alpha}{r-\alpha} = z(NPV^{*} + NPV(w_{LDC})) \approx z\left(\frac{\alpha}{\alpha-\beta}\right)NPV^{*}$$

Where α and β are variables related to individual utility (resulting from wage comparison) and NPV^{*} refers to the individual NPV[41]. In the case of the host country it is assumed that the net benefits depend not only on the absorption process but also on the z factor (unfortunately, set in an arbitrary fashion). As shown below, the net gains are much lower than in the case of the individual immigrant but they are still positive. However, the outcome may change with slow absorption and with the extent of welfare support, Figure 6.

Figure 6. Process of immigrants' absorption – NPV of the host country in the standard case[42]



Source: Chand and Paldam 2004: 8.

[39] Note: Light grid – production loss, dark grid – redistribution.

[40] With an assumption that when fully absorbed the immigrant does not create any excessive social costs.

[41] Under plausible assumptions the sum of NPV_I^{*} and NPV_{DC}^{*} was estimated at around 1 million USD, which was treated as a proxy of potentially high gains from immigration.

[42] Note: Light grid – production loss, dark grid – redistribution.

Clearly, the shape of the λ curve (describing the absorption process) can be modelled in an empirical way because it reflects factors related to a particular economy. Channd and Paldam (2004) suggest that we consider two factors shaping the process of immigrants' absorption:

1) the selection process, and

2) the incentives offered by the institutional framework in a given country.

Regarding the first case they argue that the immigrants of diverse "labour market values" will be absorbed in a different way. Put in simple terms, the immigrants with a high labour market value (not necessarily highly skilled!) will try do get to those countries where there are best chanced to be absorbed fully and quickly. On the other hand, the immigrants with a low labour market value will rather prefer countries with generous social support (and they will not necessarily offer a clear path towards full absorption). This approach can be easily extended by referring to the immigration market model presented by Borjas (1999).

On the other hand, the shape of the ρ curve is determined by the organization of social security in the host country (and the tradition of immigration, e.g. non-discrimination rule). It will depend particularly on the extent of social welfare, the value of social benefits, the extent of insurance based system etc.

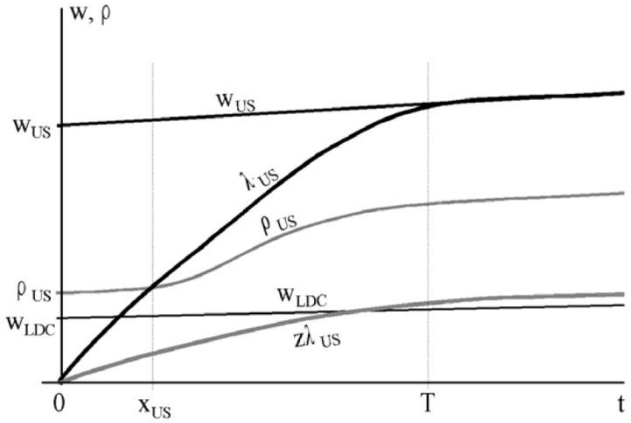
In fact, the shape of both curves resulting from welfare and labour market institutions impacts dramatically on the welfare of immigration (and, interestingly, they were completely omitted by analyses presented in the previous section). According to Chand and Paldam (2004) the amount of social support received by immigrants may differ by about 20 times when comparing the maximum and minimum values of particular variables. Additionally, this structural framework creates particular incentives for the immigrants themselves to integrate or not to integrate: as authors argue, in practice the incentive effect and the adverse selection effect are hardly distinguishable and will reinforce each other[43].

The most interesting part of the analysis depends on their observation that the potential gains are only reached occasionally. This is mostly due to the fact that it takes time before the immigrant (eventually) reaches w_{DC} and does not receive special transfers (which imposes cost on the NPV_{DC}). Thus, according to Chand and Paldam (2004) it is critical to assess the shape of two curves - λ and ρ representing the absorption process and the excess subsidy being paid to immigrant respectively. Thus the above described framework can be used for the analysis of the performance of immigrants under particular institutional conditions and it can also be used to assess their impacts on the welfare state. Two contrasting cases are the U.S. and "Nordic type" typical welfare states presented below[44], Figure 7.

[43] Chand and Paldam (2004) introduce different outcomes for two types of competition between immigrants and natives. Under certain conditions immigrants may displace natives (e.g. when they are keener to work and when they accept harsh working conditions, they are more enterprising or there are differences in social security provision) which may lead to social tensions. This perspective seems too simplistic. Particularly, as shown by Piore (1980) and other there are motivational issues which are responsible for the segmented labor structures present in most well developed countries.

[44] In the guest-worker type of receiving country ("Dubai-type") migration is highly beneficial for both parties involved, due to the very nature of contracts, mutually beneficial and participation of immigrants in the tax system.

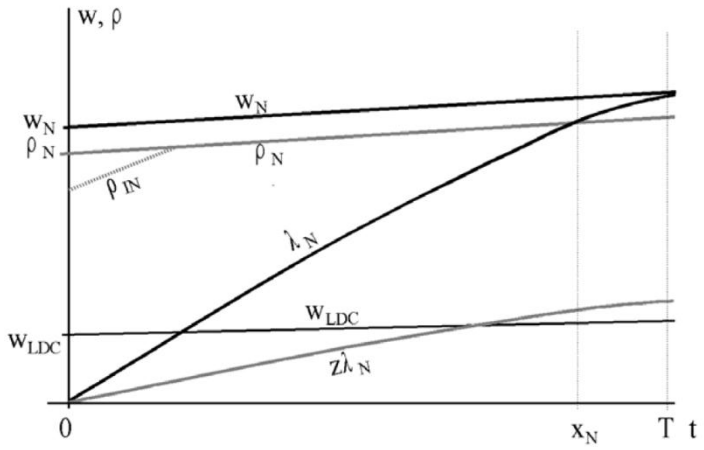
Figure 7. Process of immigrants' absorption – the US case



Source: Chand and Paldam 2004: 14.

The specificity of the US system lies in the relatively low value of basic social security payment and the insurance principle (the ρ_{US} curve starts very low but then it rises along with the accumulation process of insurance capital). Thus there are clear incentives to find a job as quickly as possible. Additionally, absorption in a multicultural society is relatively easy (λ_{US} curve rises fast). As a consequence the loss L_{DC} as well as the transfer R is relatively small, and immigration can be beneficial for natives.

Figure 8. Process of immigrants' absorption – the Nordic case



Source: Chand and Paldam 2004: 14.

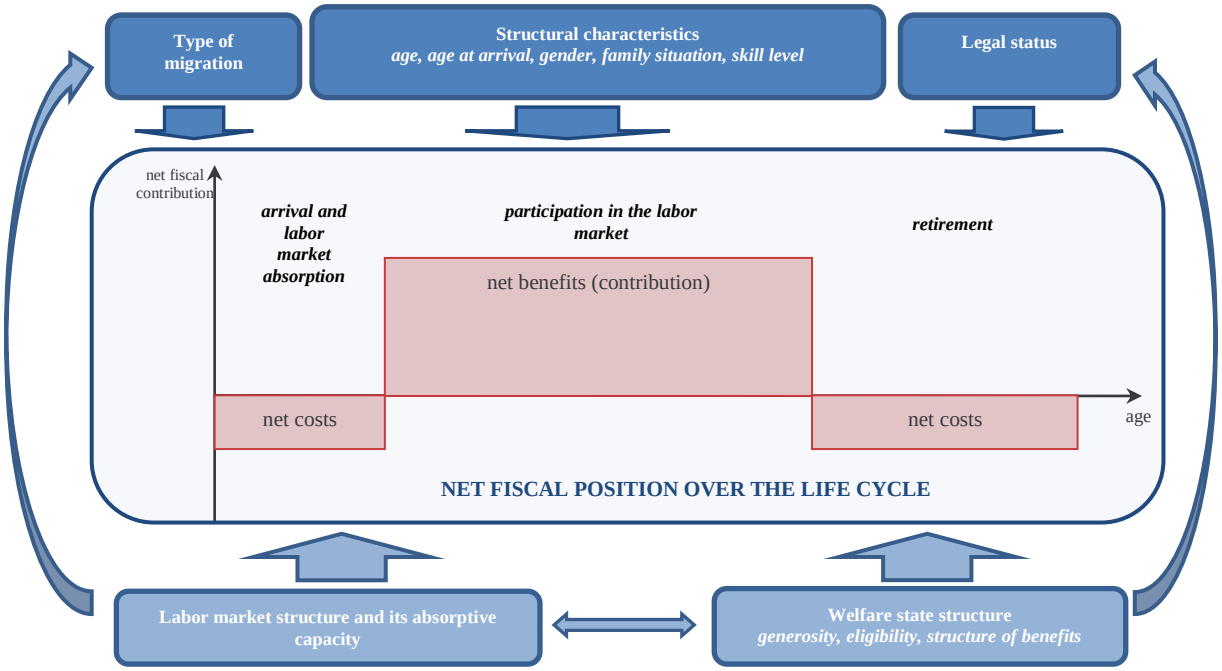
On the contrary, the situation of the generous welfare state ("Nordic type") is not that beneficial, Figure 8. Benefits are designed to equalize incomes and thus the transfer payments start relatively early (once the immigrant is accepted) and are very generous (the ρ_N curve is very high). On the other hand, access to the labour market is relatively difficult[45] – thus the λ_N curve rises only extremely slowly. As a consequence the loss triangle is unusually large and the transfers are very high. In such a framework immigration is very costly for the host society (as has been shown by several empirical studies – see next section). The main point is that this situation is predominantly the consequence of

[45] Chand and Paldam (2004) point to the importance of language barriers, but it is also worth noting the adverse selection of immigrants as suggested above.

the institutions framework in the host country and not immigration alone[46]. In terms of recommendations it would then be extremely important to work on the absorption side of the immigration story and to create incentives and not disincentives to work (role of transfers). Chand and Paldam (2004) note clearly that immigration is the most problematic in case of the Nordic type welfare states. In this case the point is that the full package of institutions in force was a result of a long process of political interplay between many actors, but it evolved when immigration was close to zero. Thus the question arises about the impacts of this "package" on immigrant behaviour, and the consequences of the inflow for the sustainability of the system. However, it needs to be stated very clearly that this general outcome is not the consequence of immigration alone, but rather of a given institutional framework.

To sum up, Figure 9 shows – in a schematic way – the set of factors (potentially) influencing the fiscal position of immigrants and their contribution to the public treasury.

Figure 9. Factors influencing the net fiscal position of immigrants



Source: Own elaboration.

From the theoretical literature it follows – and this is crucial – that the net outcome of the process presented from the life-cycle perspective is not only attributable to structural characteristics of immigrants or the type of migration. It also depends on structural conditions in the host country, particularly characteristics of its labor market and welfare state organization. Moreover, those structural features are expected to shape both the scale and structure of immigrant flows via direct incentives or the selection process: for example, according to the welfare magnet hypothesis.

[46] The analysis presented by Chand and Paldam (2004) is also extended in that way that they introduce such issues as human rights rationale, the issue of non-absorbed immigrants who have already settled in a country (including second generation), agents and related costs and the multiplier related to the presence of family (family reunification process). None of these change the reasoning in a drastic way.

Political economics of immigration policy

One of the main concerns in most European societies has been the sustainability of welfare systems. This issue is closely related to immigration not only in the sense discussed in previous sections. The fraction of immigrants in Western European societies has increased rapidly over the last few decades; in Southern European countries the rise has been both dramatic and dynamic. Against this background a question arises about what may be the role of the immigrant vote and their descendants in recent and future politics. Ortega (2004, 2005) suggests that one of the reasons why immigration policy is such a heavily debated and politically controversial issue is the fact that immigrants may obtain the right to vote and that they might affect future policies, including redistributive policies. Thus an aim of this section is to assess (primarily in theoretical terms) two questions: first, how immigration relates to voting behavior and consequent changes in welfare policies and second, whether the way that welfare affects migration can be used in assessing immigration policies.

The political economics of immigration policy has been debated in theoretical terms over last two decades. Papers discussed below reason in two different ways. The first approach, created recently by economists (Hanson *et al.* 2002; Razin *et al.* 2002) treats immigration policy as a decision to admit particular agents to a political community and impose their voting rights on future policies. The second approach can be attributed to Hassler *et al.* (2002) and followers who challenged the sustainability of the welfare state not in purely economic, but also political sense, where the income and skill distribution of the electorate plays a critical role.

Dolmas and Huffman (2004) propose a general equilibrium model in which agents are to decide on the immigration policy and redistributive tax policy. In such a framework natives' preferences towards immigration are influenced not only by the way they affect welfare systems, but also by expectations concerning future voting behavior of immigrants. It is plausible to assume that immigrants are generally poorer than natives. If so, they will prefer higher taxation and higher benefits once they gain voting rights (as suggested by Borjas 1999 and many others). Thus, the equilibrium of the model depends on such factors as the wealth of immigrant pool, the dynamics of the process of political incorporation, the entitlements of immigrants *etc*. One of the most interesting results is that if immigrants are poorer than natives (and eligible for benefits and for voting) the inflow will not necessarily lead to higher taxation in the future: Dolmas and Huffman (2004) show that if the initial income inequality is low, the subsequent tax rate can be even lower than before. Interestingly, a case study refers to a situation where immigrants enter a country in a legal way (pay taxes), but where they do not have the right to vote and where they are not eligible for social transfers. In this case all natives will favor the maximum level of immigration available. This suggests that the common negative attitude towards immigration is not necessarily opposition to immigration *per se*. Rather, it is a result of concern over particular institutional arrangements, for example, concern over the effect of migration on welfare benefits.

Benhabib (1996) proposes a model assuming that agents are heterogeneous with respect to skills and capital holding and chooses immigration policy (by majority vote). In this framework, if natives vote for policies aimed at the improvement of their well-being (irrespective of non-economic factors cultural homogeneity *etc.*) the immigration policy will behave in a cyclical way. It will swing from periods of relatively low but selective immigration (targeting rich newcomers) to periods of more extensive inflows of poorer immigrants. This is due to the fact that the native population will be polarized with groups who would like to maximize or minimize the capital-labor ratio through immigration policy.

In his general equilibrium model of immigration policy Ortega (2009) assumes that voters will be able to anticipate that inflow of immigrants. They may in turn change the skill composition of the electorate and the skill premium in the economy. If so the model suggests that there is a trade-off between (skill complementary) immigration and shifts in political power, i.e. immigrants with complementary skills will vote against the interests of a particular agent in the future and thus

negatively affect the skill premium. In such a case immigration quotas (or other restrictions) are endogenous. This way of thinking is further explored by Ortega (2005) who asks the question about the political sustainability of the welfare state in a model with endogenous immigration policy. In the model the skill distribution of natives is matched by the skills of incoming migrants and this has important consequences for the well-being of both groups. The idea is the following: natives decide on immigration and redistributive policies (in majority voting) and take into consideration that the inflow of immigrants affects labor market outcomes and the skill structure of the next period's electorate. The assumed welfare effects are simple in that sense that the admission of immigrants with complementary skills is expected to increase the wages of native worker. Then, if we assume that immigrants will gain voting rights in the future there is a trade-off between the impact of immigration on wages and the future impact of immigration on policies. Ortega (2005) shows that in this framework the long-run sustainability of redistribution is closely related to immigration policy in terms of both skill and quantity quotas. If we assume that unskilled workers are always poorer than the skilled workers, an unskilled majority may use the immigration policy to offset the impact of the well skilled workers, i.e. number of unskilled immigrants will grow (also in relation to skill accumulation). The model may be useful in shading light on the paradox of recent immigration policies: emphasis on the highly-skilled migration accompanied by (still) limited inflows. Ortega (2005) suggests that if voters are concerned about the effects of recent immigration on future levels of redistribution the unskilled majority is not willing to admit more skilled immigrants because it may lead to an unwanted shift in redistributive policies[47] (and *vice versa* when skilled voters dominate, the number of unskilled immigrants should not rise if you want to keep redistribution low in the future)[48].

According to Ortega (2005) his findings may help us to understand why immigration policies in Europe are, generally, more restrictive than in traditional settlement countries, including the US. Reasons for these differences include degree of redistribution (at a starting point), differences in skill composition and accumulation, as well as in political participation of immigrants (not least in terms of skill levels).

Razin, Sadka and Swagell (2002) claim that, even if immigrants tend to join the pro-transfer coalition, low-skill immigration will lead to a lower level of taxation and redistribution. This paradox can be explained while referring to two conflicting effects: migrants are (usually) net beneficiaries and thus they will join the low-skilled native voters and favor a generous welfare state; on the other hand, however, redistribution will become more costly because of immigrants and thus not as favorable for natives. In a similar model Sand and Razin (2007) assess the political-economy setup where immigration policy and the social security system (PAYG) are jointly determined through majority voting. Immigration is treated as a positive factor in ageing societies due to the assumption that fertility rates for immigrants are higher than for natives and thus there is the idea that immigration can boost the age structure of the host economy[49]. Both immigration policy and social security policy are endogenous[50]. Only inter-generational aspects of welfare policies are considered. An interesting feature of the model is that immigrants are highly desirable and important for the sustainability of the welfare system because they are supposed to join every coalition supporting high social benefits. As a

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47 This way of reasoning is not fully realistic, however.

48 Interestingly, the proposed model can be reduced to a simpler one if we assume that immigrants are only temporary workers or that they are not able to gain rights to vote. In such a case immigration policy at equilibrium is characterized by skill restrictions only, i.e. an unskilled majority admits all available skilled immigrants and a skilled majority accepts inflow of all available unskilled workers (Ortega 2005).

49 However, the authors clearly acknowledge that immigration can rescue the PAYG systems in the short run only. In the long run it is to be perceived as only one out of many tools within a policy mix targeting population ageing.

50 If only migration policy is treated as an endogenous variable one may expect a "demographic switching" strategy (admission of immigrants in order to change the structure of voters in the next period) or a "demographic steady" strategy (decisive young voters admit maximum number of immigrants available to obtain a "young" structure of voters in every period).

consequence, the age structure of the receiving population will impact the shape of immigration policy so that the older the population at destination the more liberal the immigration policy: and thus there will be a better chance of sustaining the system.

Following this way of reasoning Razin, Sadka and Suwankiri (2010) develop a model including three groups of agents (skilled workers, unskilled ones and retirees) to assess the dynamics of a political system assuming inter- and intra-generational redistribution of a welfare system. The system is constructed in such a way that it includes both inter-generational redistribution (pension system – PAYG type) and intra-generational redistribution (income maintenance programs) (contrary to the previously discussed model). A model is constructed to follow the dynamics of the political process and to find political economy equilibriums in the case of strategic voting and sincere voting. Similarly as in many other papers (and not fully realistic, unfortunately), authors assume that the skilled workers are net contributors to the treasury whereas the unskilled ones pose a fiscal burden, much as with retirees[51]. In such a framework the tax rate in a given economy will be strongly tied to the question of which group proves to be the decisive one: in the case of skilled workers, – the minimal one, for retirees – and the revenue-maximizing one with unskilled workers somewhere in between. Both unskilled and skilled workers prefer higher number of immigrants as both groups can benefit from the arrival of immigrants. The way in which immigrants will affect the welfare state depends, then, strongly on their composition: unskilled immigrants are expected to prefer a more generous system. One of conditions for sustaining the welfare system is to counter balance the size of the skilled group and one of possible solutions, in that respect, is the admission of unskilled immigrants. Last but not least, Razin, Sadka and Suwankiri (2010) suggest that in such a framework one should expect political coalitions among skilled and unskilled voters or among unskilled and retired voters. As a consequence, in any political equilibrium there will be a place for policies favorable for unskilled voters.

Looking at the issue from a different angle Epstein and Hillman (2003) analyze *the adverse voter sentiment* (negative attitudes towards immigration) arising when immigrants are unemployed and rely on tax-financed social benefits. Such a situation is complicated from the economic and political point of view because the mutual benefit would require: first, to offer jobs to immigrants (from the side of the receiving population); and, second, for immigrants to accept jobs. The acceptance of jobs, however, can result in the displacement of national workers and this can thus undermine well-being[52]. Epstein and Hillman (2003) refer to a *wage efficiency framework* to analyze the choices of natives and immigrants regarding the exertion of effort in the workplace (it is assumed that welfare payments are the same for nationals and legal immigrants and have an impact on the effort paid)[53]. In such a model the number of employed workers cannot increase proportionately more than an increase in the total potential workforce (as an effect of immigration). An increase in the number of immigrants, therefore, increases unemployment, enhances labor-market discipline, and the efficiency wage falls.

Crucially, when unemployment can be explained by the efficiency wage (this is not always the case) the presence of unemployed immigrants, who rely on social benefits, can, paradoxically, be

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[51] This seems to be a controversial assumption in both cases. Particularly interesting is the case of retirees who **may be net contributors over their lifetime.**

[52] If benefits allocated to immigrants are significantly lower than in the case of natives (or if they are not eligible at all), then immigrants can be ready to accept any wage offered. This is not the case for national workers, who – when receiving higher unemployment or welfare benefits – do not mind being unemployed as much as immigrants.

[53] Epstein and Hillman (2003) consider two countervailing effects on the willingness of workers to exert effort. More immigrants increase the tax levied on employed workers, which reduces the willingness-to-exert effort. However, as the number of immigrants increases, the threat of dismissal increases for local workers, which eventually can increase employed workers' willingness to make an effort. Thus the model shows that the willingness to exert effort depends on taxes paid in order to finance income benefits for the unemployed. If benefits are in the range determined by the equation above, immigration increases discipline on employed workers. At the same time, if income benefits to the unemployed are sufficiently high, or the number of immigrants is sufficiently large, immigrants displace national workers from employment.

beneficial both for the immigrants, as well as for natives: this is due to the possible displacement effect leading to anti-immigrant sentiment[54]. In other words: if benefits for unemployed immigrants are discriminately low and immigrants displace local workers in employment, national workers cannot gain from immigration; the gains from immigration appear only if the immigrants receive tax-financed income transfers.

All models discussed above have several common features. They show the very tension between working population (taxed one) and the welfare beneficiaries. They emphasize that immigrants in liberal democracies become an important group player. As a consequence paradoxical solutions in terms of migration policies are to be expected. Unfortunately, the political economics of immigration policy remains a domain of theoretical considerations and the empirical evidence is very limited. Gaston and Rajaguru (2013) tested the impact of immigration on redistributive policies for 25 OECD countries for the years 1980-2008 (dynamic panel data model) against the above presented framework: particularly the exposure/insurance effect where those exposed to risk of being unemployed will prefer more generous welfare system; and the redistribution/tax effect where persons who perform well in labor market terms will prefer lower taxation and limited welfare benefits. Contrary to the hypotheses drawn from theoretical analyses they argue that an increase in migration leads to higher social spending. Thus the conclusion would be that in the case of immigration the redistribution effect is dominated by the exposure effect[55].

Second important strand of literature on linkages between migration policies and the welfare impacts of immigration are attributable to Simon and followers. Simon (1984, 1989) assesses empirically the fiscal position of immigrants in the United States (see next section) and asks a critical question whether there are any "good" reasons for countries like the U.S. (traditional immigration countries) to limit immigration. The question, however, is understood in a particular way, it means: reasons to deny entrance to persons who wish to come. This is important because Simon assumes that "individuals have the right to life, liberty and property in the traditional Anglo-Saxon sense of freedom from coercion by the state or other persons (unless a criminal act has been committed)" (Simon 1998: 137). Note that outcomes of this libertarian approach are similar to the proposition expressed explicitly with *the human capabilities approach* (Sen 1999, de Haas 2010).

In ideological terms Simon (1998) suggests three possible bases for the evaluation of immigration and immigration policies: natural law, contract law, and the consequences of immigration. Due to the fact that – according to him – the first two are not useful in this respect he proposes to assess the third one and looks carefully at the effects of migration as an evaluation criterion. At the heart of the Simon's principle (1989, 1998) there is a proposition that potential immigrants, who are supposed to be burden for the public budget, should have no claim to be admitted to a given country: *"*no one has a legitimate claim to enter a society and freeload upon others by using more welfare services than taxes paid" (Simon 1998: 138)[56]. Or in DeVoretz's words: "If the marginal immigrant makes a non-negative

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[54] As assumed in the model. In reality anti-immigrant sentiments are to be explained by a broad range of factors, including non-economic ones.

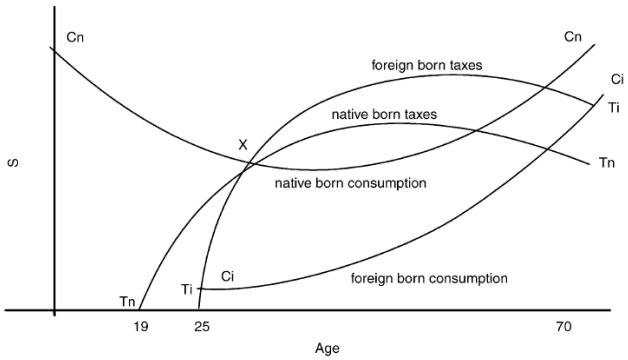
[55] Note, however, that authors themselves point to low robustness of the model in terms of sample selection and clear signs of immigrants' self-selection.

[56] It is important to note that while assessing the autonomy of immigrants in the context of their possible duties and obligations Simon (1989, 1998) refers to Nozick's (1974) arguments related to emigration (whether a person should be prohibited from emigrating in light of possible obligations). He concludes that the state should definitely have the right to require payments of contractual debts before leaving (or after entering). In that way, he understands the regulation of immigration in a narrow way – as measures necessary to protect the basic rights of citizens (the idea of the "night watchman" state). Simon (1998) acknowledges indirect burdens of immigration or effects on particular groups in the society (congestion effects) and clearly states that it is impossible for any immigration to continue without doing damage to some individuals or groups. According to him this reason should not be used as basic grounds for automatic disqualification of immigration. On the other hand, he challenges the economic assumption that there is a fixed number of possible claimants to scarce resources and clearly suggests that when the number of claimants is variable (as the stock of resources shows) conventional economics is hardly useful.

contribution to the treasury you continue to admit immigrants until the contribution goes to zero" (2006: 392)[57].

An expanded version of the Simon's financial transfer model (1984) was presented by DeVoretz (2004, 2006) who includes two types of externalities, related to labor market and capital market. The idea is similar: to understand how the formulation of immigration policies' objectives is related to the performance of immigrants in the receiving country and to assess the immigration policy from the host country's resident's point of view. The whole model is based on an observation (assumption?) that the natives and immigrants life-cycle net taxation and consumption of public services are different but are respectively concave (tax payments) and convex (consumption) over the lifetime. If this is the case, then the assessment of fiscal impacts of immigration will depend on the shape of both curves and their relations.

Figure 10. Tax-Consumption profiles by age and birth status – an optimistic case

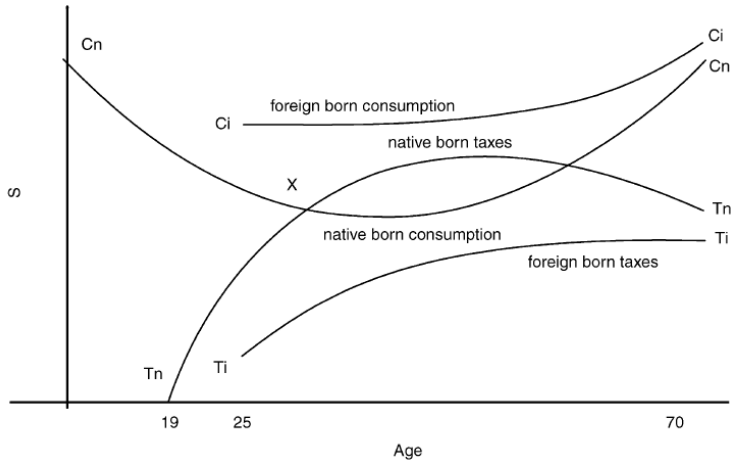


Source: DeVoretz 2006: 393.

In the optimistic case, Figure 10, the net contribution is positive for both immigrants and natives. The contribution to the treasury is expected to be higher in the case of immigrants for – at least – two reasons: foreign born consumption starts later (immigrants usually arrive as adults) and is smaller than for natives (which compensates for the late catch-up): "Intensive foreign-born consumption of public goods occurs at the end of the immigrant's economic life while there exists intensive consumption of public goods at both ends of the life cycle for the native-born population" (DeVoretz 2006: 393). Such a case implies a net financial transfer from immigrants to the natives.

[57] DeVoretz (2006) points to the fact that despite Simon's famous principle being perceived as a very controversial assessment criterion it has been used in the past in an implicit way (limits to immigrants' benefits in the US, rules governing Canadian immigration policy).

Figure 11. Tax-Consumption profiles by age and birth status – a pessimistic case



Source: DeVoretz 2006: 394.

In the pessimistic case, however, the situation looks quite different, Figure 11. First, the catch-up process (in terms of earnings) is very slow and thus the tax curve of immigrants lies far below the respective curve for the natives. Second, the low absorption (low earning capacity) results in a high rate of public goods consumption by immigrants. In that case there will be an obvious transfer from the native population to immigrants[58].

DeVoretz (2006) attempts to test the proposed hypotheses in empirical terms. In his analysis he refers to four countries representing both typical immigrant-receiving countries (Canada and the United States) and two European countries with a different immigration history, and different welfare regimes (Sweden and Germany). This allows him to assess the welfare impacts of immigration from various angles. From the presented data it follows that in the case of the US and Canada one may claim a positive model to be the case with a positive contribution of immigration in fiscal terms (see also Smith and Edmonston 1997). In the case of the two European countries the situation is far more complicated, whereas in Germany the net fiscal impact is very low and slightly negative (as for beginnings of 2000s) and in Sweden the situation is the worst (not least due to the particular structure of immigration in terms of education, skills and type of inflow) – see also the next section.

In order to make the analysis more realistic DeVoretz (2006) suggests going beyond the purely pecuniary effects of fiscal transfers and assessing the role of externalities as well. He focuses on three externalities: labour market effects, capital effects, and demographic effects. Regarding the first point he refers to the neoclassical framework and reassumes that there will be no negative displacement effect[59]. Regarding the capital market he notes that immigrants can augment the stock of capital in the host country and thus be more beneficial. Those effects can be more important if immigrants – e.g. due to entrepreneurial spirit – are able to create wealth upon the return. In terms of demography he acknowledges possible positive impacts on the age structures but shares the skepticism expressed clearly in the report on the replacement impacts of migration (UN 2000).

Both Simon and DeVoretz share an essentially optimistic view of migration and its impacts on the host economies and fiscal balances. While providing a historical overview of migration models and

[58] DeVoretz (2006) clearly states that they are several problems with such a simplistic approach. First, there are significant difficulties with the assignment of the costs of public goods. Second, the phenomenon is dynamic in its nature and thus demands a more complicated overlapping generations approach: see Dynamic Approaches and Generational Accounting.

[59] However, with a possible *churning effect* resulting from the fact that the initial displacement can be offset only in the long run by demand related effects.

related effects Simon (1998) emphasizes one surprising fact that immigration has created more benefits recently, i.e. with the existence of the welfare system. He argues, in fact, that benefits were less dramatic when there were no such extensive programs. It might be an indirect proof that the impact of immigration on the welfare state is positive.

Empirical Evidence – Review of Existing Literature

Generally, studies looking at the fiscal impacts of immigration are few and limited: given the very extensive literature on migration. This is mostly due to lack of accurate data needed to estimate both the supply as well as the demand side of the process. As a consequence, significant (critical) assumptions need to be made and, in most cases, the outcomes of the presented studies depend strongly on the set of assumptions made. The most important empirical studies are presented below.

United States and Canada

A pioneer study on the fiscal and welfare impacts of immigration to the United States was presented by Simon (1984). He clearly refers to the life cycle framework as introduced by Neisser, Modigliani and Samuelson to assess the differences between demographic structures for natives and for newcomers, who are usually young and arrive without children or elderly dependents. A static approach is applied to investigate the net transfers in the case of both natives and the immigrant population. Simon (1984) shows that up to 12 years after arrival immigrants tend to consume less public services than natives and then become similar in terms of welfare usage. On the tax side, only shortly after arrival immigrant pay less in taxes than natives (3 to 5 years), then their contribution can be even higher. Consequently, the contribution of immigrants to the public coffers is assessed as positive.[60]

Akbari (1989) applies a similar approach to the proposed by Simon (1984) to assess the net benefits (costs) of immigrants living in Canada under the life-cycle framework. Microdata from the 1981 census are used to compare the position of natives and immigrants with respect to public services and welfare benefits (including government transfer payments, education and health services and selected pure public goods) as well as taxes paid. On the consumption side alone immigrants who were residing in Canada for up to 15 years consumed fewer public services as compared to natives (this gap afterward narrowed). On the taxation side alone immigrants staying in Canada longer than 3 years are found to pay more in taxes. Altogether, immigrants who resided in Canada for up to 35 years benefitted the native population in a clear way[61].

Borjas and Trejo (1991) analyze the participation of immigrants in the US welfare system between 1970 and 1980 and use these two cross-section data bases to identify potential cohort and assimilation effects[62]. The main conclusion of their paper is that in 1980 immigrants used the welfare system in a more intensive way than a decade before (both in absolute terms and relative to natives), e.g. in 1970 the likelihood of receiving welfare was 0.8 percentage points higher for male-headed immigrant household as compared to male-headed native households: in 1980 this difference grew to 1.7 percentage points. Nonetheless, this effect is attributed mainly to the change in ethnic mix of the immigrants (very high participation in welfare by Vietnamese and Dominican households or generally higher rates of the welfare use in the case of immigrants from Latin America and Asia)[63].

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60 This study paved the way for a large number of papers both challenging and supporting the outcomes presented by Simon (see Simon 1989, Borjas 1991).

61 The issues related to self-selection *etc.* were not considered.

62 One of the main problems of previous studies was the lack of distinction between effects resulting from the assimilation of particular migrant or group of migrants (ageing effect) and those resulting from structure of particular cohort (cohort effect).

63 And this has led authors to a practical conclusion that efficient migration policy may change the welfare effects of the inflow to the United States.

Additionally, the authors estimated the costs of welfare participation by a typical immigrant household in two cohorts under study: expected costs over the life cycle for a typical immigrant households are as high as 2,683 USD (1997 USD) for households who arrived before 1950, 7,109 for years 1965-1969 and 7,925 for 1975-1980 (as compared to 4,624 in the case of natives). The total effect of the structural change on the migration mix is estimated at 3 billion USD. This way of reasoning is further explored in Borjas and Trejo (1993) looking at differences in welfare use by the country of origin (and its characteristics). The paper utilizes an extended version of the classical model of immigrant self-selection (Borjas 1987). In addition to previously commented results the analysis reveals that the structural characteristics (including GNP *per capita*, income inequality, distance to the US and share of forced migrants) that can be attributed to the country of origin explains around 2/3 of the variance in the dependent variable (welfare use rate).

Huddle (1993) assesses the net (annual) fiscal impacts of immigration at USD -40 billion (-0.4 percent of the GDP). This outcome was critically commented upon by Borjas (1994) because it was based on too simplistic assumptions, including a flat rate of taxation (only 7 percent) and a displacement effect: every sixth immigrant was supposed to displace a native worker who, in turn, joined the welfare program. As a comment or response on the study by Huddle, Passel and Clark (1994) estimate the net fiscal surplus of immigration at USD 27 billion (0.4 percent of the GDP) with USD 70 billion being paid in taxes and USD 43 billion value of welfare programs and public goods being provided. The problem is, however, that they assumed that the marginal costs of providing welfare programs to immigrants equal zero which apparently is not the case.

Borjas (1994) assesses the broad range of issues related to the economic effects of immigrants' presence in the US economy (participation in the level market, displacement, selectivity) and among others the fiscal impacts of immigration. Back-of-the-envelope calculations provide the net deficit of the presence of immigrants in the United States at USD 16 billion (-0.2 per cent of GDP) (but the results were highly sensitive to the assumptions made).

In a short note Simon (1996) refers to the discussion started by his paper published in 1984 and presents more recent empirical evidence for the US. With regard to the first point, he even strengthened previous conclusions (including though previously omitted categories of migrants and welfare measures). Regarding the second point, he provides evidence that in the early 1990s government expenditure per immigrant was significantly lower than per native (mostly due to differences in social security expenditures) whereas there were no arguments showing change in tax payments (as compared to those reported below). Thus he concludes that the new data support conclusions from the mid-1980s and that immigrants' relative contribution might even have increased since then. The main problem, however, lies in the way the outcomes were obtained, mostly through the division of aggregate data and not through reference to individual data.

Borjas and Hilton (1996) test the participation of immigrants in various programs making the welfare system in the United States. They conclude that in the case of cash benefits the difference between immigrants and natives (households) is negligible, but it gets much wider after inclusion of other programs: means-tested ones, including Medicaid, vouchers or housing subsidies. Generally, over 20 percent of immigrant households received some kind of assistance as compared to 14 per cent in the case of natives. The most interesting result refers to the possible network effect: authors find some evidence that information on particular types of benefits is transmitted via migrant networks within ethnic communities.

Lee and Miller (1998) look at the group encompassing immigrants and their descendants residing in the United States in 1994 (over 15 per cent of the total population). On the basis of the static approach they assess their overall fiscal impact at USD 23 billion (0.35 percent of the GDP), but with an assumption that costs of public goods are not allocated to immigrants (national defense, R & D, etc). In the next study (Lee and Miller 2000) assess the effect of a change in immigration policy: 100,000 immigrants annually, assuming that the composition will remain unchanged. Considering all

level taxes the net contribution of immigrants turn out to be negative upon arrival but becomes positive after around 20 years (when their children enter the labor market). The total effect is rather small and amounted to 0.4 percent of the total tax revenue: with the impact on the federal treasury being positive from the very beginning and the impact on local and state treasury remaining negative, but smaller than the first mentioned effect.

Auerbach and Oreopoulos (1999) differ from traditional studies applied to assess the fiscal impacts of immigration mostly based on static, cross-section approach (e.g. Smith and Edmonston 1997). They argue, instead, that they are not capable of presenting the long-term effects of short-term changes in the scale and structure of the inflow. Thus a dynamic model is applied to assess the economic effects of an immigration policy resulting in the end of immigration to the United States (after 2000). In technical terms authors refer to the technique of Generational Accounting (see below), which was particularly important in terms of judging the changes in immigration policy[64]. In the negative scenario (fiscal policy changes immediately as a response to the debt position of the government, i.e. lower burden on future generations is assumed) the lack of future inflow is supposed to produce a benefit equaled to reduction in taxes by 3.8 per cent and an increase in all transfer by the same amount: 1.5 percent of the GDP. In the positive scenario the burden of the fiscal debt falls entirely on future generations and the stop of immigration is supposed to lead to higher taxation (by 1.9 percent) and limited transfers (0.8 per cent of the GDP). As a consequence, even a massive change in immigration policy is found to have only small effect on the fiscal situation in the US. Moreover, the strength of this effect would depend on fiscal policy itself, i.e. the extent to which the existing fiscal imbalance will be divided between recent and future generations.[65]

In the US Storesletten (2000) applies the NPV approach (see previous section) and finds that one feasible policy for fiscal problems, given the ageing population, would be to admit 1.6 million immigrants annually (0.62 percent of the population). Additionally, to reach the assumed goals those migrants should be highly-skilled and between 40 and 44 years old[66]. Thus he concludes that selective immigration policies are able to remove the need for fiscal reforms – the number quoted above would mean a change from 0.44 percent, i.e. by roughly 0.20 percentage points.[67]

This result follows directly from the outcome of the model applied showing that the net present value of an additional immigrant reaches a maximum of 177,000 USD for highly-skilled immigrant arriving at age 40-44 (including the cost of future descendants) and a minimum in the case of an infant immigrant who will remain low-skilled during the entire period of professional life (-94,000 USD). In the case of representative high-, medium- and low-skilled immigrant the respective values were 96,000 USD, -2,000 USD and -36,000 USD. It is also important to compare this data with a NPV counted for the newborn native as high as -88,000 USD. As shown by Storesletten (2000) all the NPV age profiles are hump-shaped with maximum between 35 and 44 years[68], Figure 12.

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64 In fact, the main contribution of the paper is to accommodate the immigration phenomenon into the generational accounting framework.

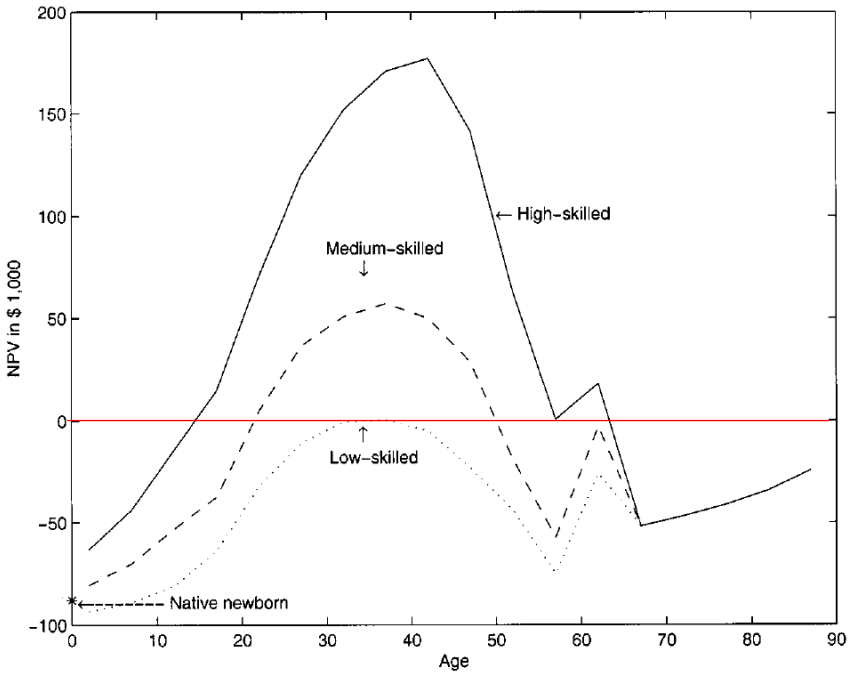
65 Note, however, that the outcomes of the model are highly sensitive with respect to the set of assumptions taken (e.g. discount rate, growth rate). Generally, the authors concluded that the overall fiscal impact of immigration is unclear and depends, to a large extent, on the assumptions concerning immigrants' participation in transfers as well as public goods and services.

66 This result is particularly interesting in the context of existing policies based on the point system approach. Most of them favour persons aged 20-40 (and with particular skills). According to Storesletten the net fiscal gain for those aged 40-49 exceeds the NPVs of persons aged 20-24. Thus, if the objective of migration policy would be to maximize the public gain from immigration the criteria should be revised.

67 The critical point refers to the parameterization of the model economy.

68 The age of the maximum NPV depends strongly on such factors as the inclusion of future descendants or allowing family reunification.

Figure 12. Discounted net public gain of admitting additional immigrant (conditional on age and skill level)

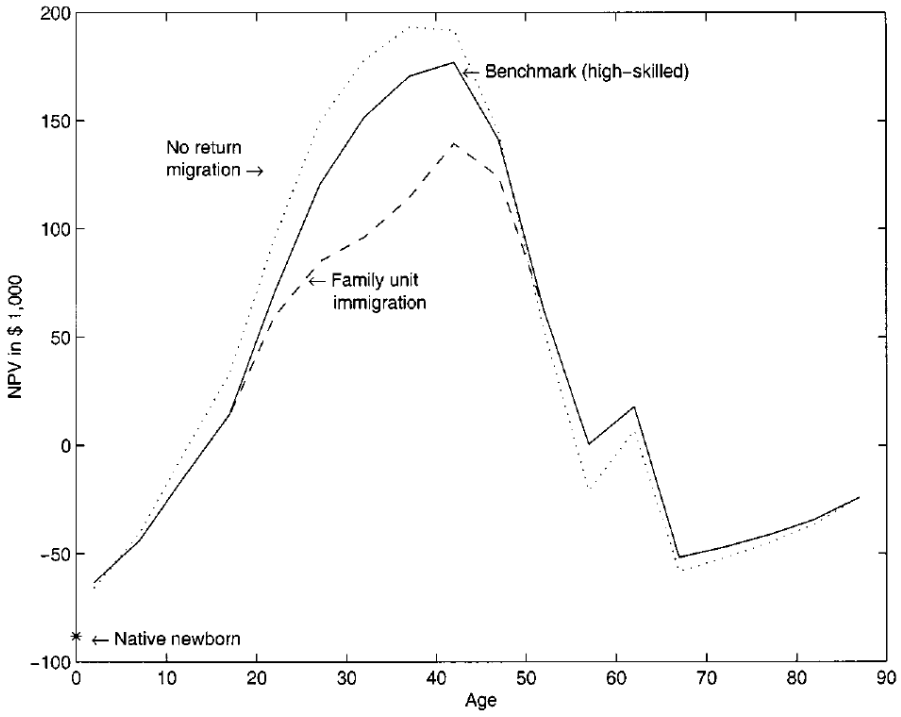


Source: Storesletten 2000: 316.

The problem is, however, that only very selective immigration policy works in this context: e.g. it should be based on a rule that only adult immigrants are admitted and not their children; something that does not seem politically feasible, Figure 13. Under the assumption that all family members are allowed to come the minimum number of immigrants would rise to 1.08 percent of the population annually[69]. Moreover, there are significant net costs of illegal immigration estimated at -54,000 USD. It suggests that all efficient naturalization actions can significantly improve the fiscal position of immigrants in the US. Similarly, public finances can be improved via policies that lower the probability of return migration (e.g. rules for allocating visas and permits for those already residing in the country).

[69] Interestingly, Storesletten (2000) compares this result with an alternative fiscal policy reform to show that it should involve the increase in taxes by around 4.5 percentage points. This leads him to the clear conclusion that against this background even marginal immigration reform should be consider as an integral part of the fiscal reform package.

Figure 13. Discounted net public gain of admitting additional immigrants including return migration and family reunification



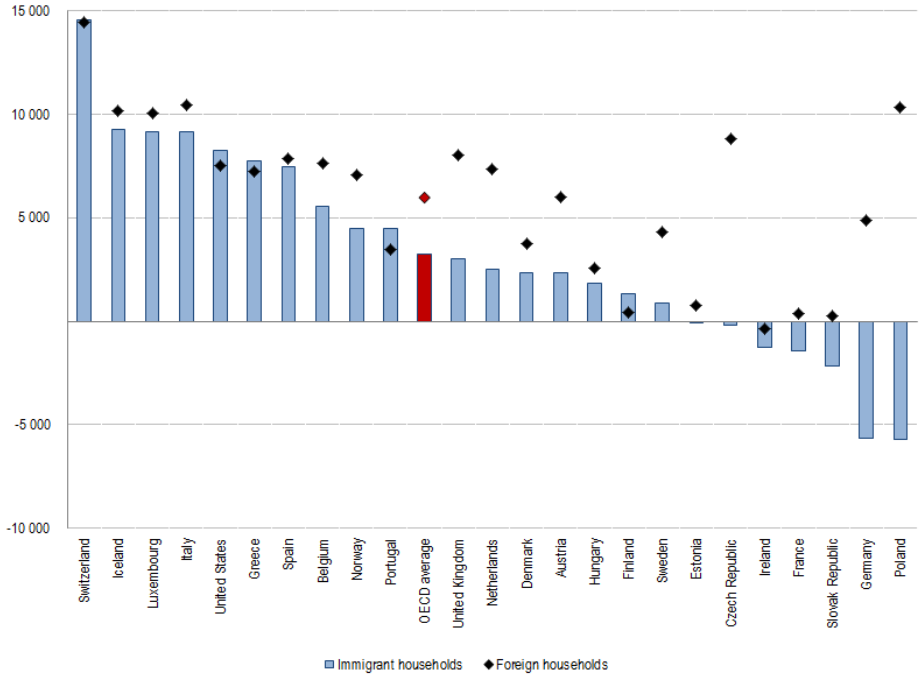
Source: Storesletten 2000: 318.

Last but not least, Storesletten (2000) shows that the results presented are very sensitive to the income level of immigrants. In the sensitivity analysis a change in the wages of -10 percent (as compared to the benchmark) significantly reduces expected the net benefits of immigration. In the case of a highly skilled 40-44 years old immigrants the NPV is expected to fall by one-sixth. Therefore, the minimum number of new immigrants expected to balance the budget increases to 0.80 percent of the population.
Griswold (2012) presents an overview of the more recent studies assessing the fiscal impacts of the immigration for the US. He refers particularly to Smith and Edmonston's study (1997) showing that immigrants and their descendants create a net fiscal gain for the US economy (80,000 USD in terms of NPV). In the case of highly-skilled immigrants this gain rises to 198.000 USD. As in previous studies the potential uneven impact on different levels of government is emphasized: with federal government gaining the most and state and local governments taking most of the costs related to the presence of immigrants.

OECD countries

A very broad and comprehensive overview of theories and empirical evidence related to the fiscal impact of migration was presented recently by the OECD (2013). This is by far the most detailed analysis of this issue done on a cross-country basis, even if the survey was limited to OECD countries. The first important outcome of the study was the international comparison of the net fiscal position of foreigners and the foreign-born, Figure 14.

Figure 14. Net fiscal contribution of immigrant (foreign-born) and foreign households, 2007-2009 average (in EUR PPP adjusted)



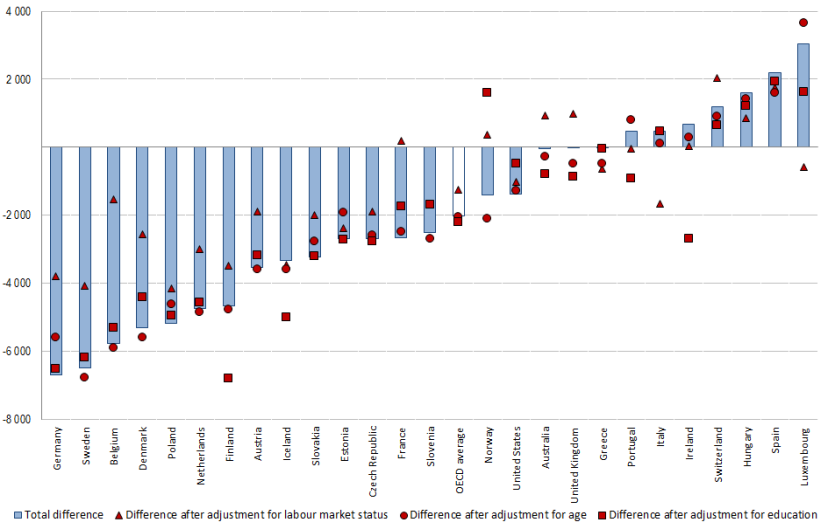
Source: OECD 2013: 149.

As shown above the net direct fiscal position of immigrants varies between OECD countries but in most cases it is positive: this holds true not only for traditional immigration countries but also for welfare states like Iceland and Norway. Authors state clearly that even if estimates for the fiscal position of immigrants can vary, these estimates tend to be small in terms of GDP: the impact is rarely larger than 0.5 percent of GDP per year. Note also significant differences between immigrant and foreign households. OECD (2013) suggests referring rather to country of birth than citizenship – and this due to significant cross-country differences regarding citizenship legislation. The picture can be biased in the case of those countries with large numbers born outside recent territories (and not necessarily immigrants). The countries of Eastern Europe can serve here with Poland as the most prominent instance[70].

Second, immigrants tend generally to have a less favorable net fiscal position than natives, Figure 15. Interestingly, according to the analysis provided this is not due to higher welfare dependency, but rather due to lower revenues (lower taxation and social security contributions). Figure 15 includes the decomposition of the difference in net fiscal position between immigrant households and native-born households. It points to three important characteristics responsible for different position in terms of the state budget: age, education and labor market status. Interestingly, first two characteristics can explain a relatively small part of the difference in the net fiscal position, while labor market status is generally the single most important explanatory factor. This allows Authors to conclude that cross-country differences in terms of welfare impacts of migration are due not only to the structural characteristics of immigrants. They are also due to the design of the tax and welfare system as well as the type of immigration. Generally, those countries with a relatively higher share of labor migrants tend to have a far more favorable position in terms of fiscal impacts (see also discussion in the previous section).

[70] Analysis provided by OECD (2013) reveals striking differences in age structures between immigrant (foreign-born) and foreign households showing clearly that the first category encompasses many people born outside the recent territory of Poland (i.e. born before 1945). This also explains the clear negative sign of fiscal impact in this particular category.

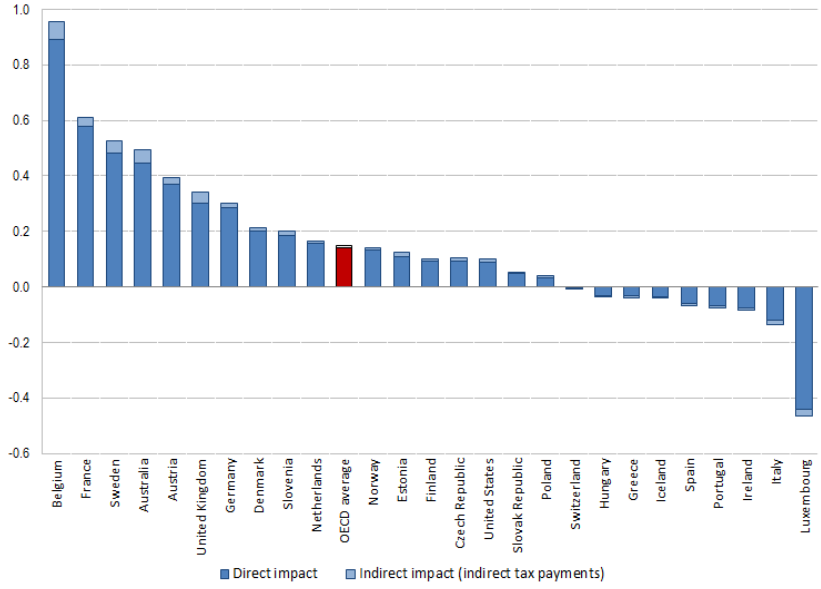
Figure 15. Differences between net fiscal contributions of immigrant and native-born households and their decomposition, 2007-2009 average (in EUR PPP adjusted)



Source: OECD 2013: 151.

The importance of labor market absorption – as suggested by Chand and Paldam (2004) and many others – can be proven by the data presented below. Figure 16 shows that assuming the same employment rates as the native-born in a given country the direct net fiscal impact of immigration would be predominantly positive, but still relatively low in terms of GDP.

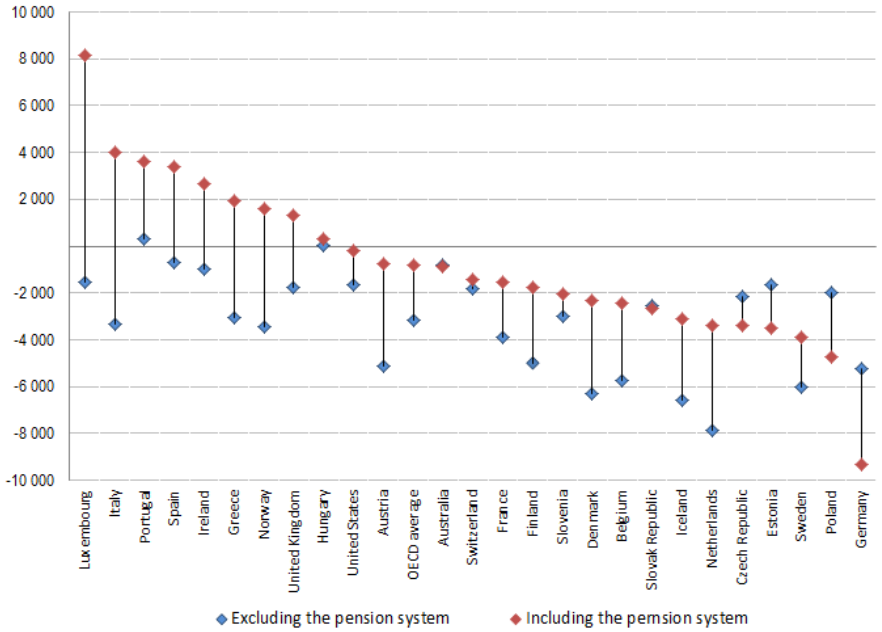
Figure 16. Estimated net fiscal impacts of immigrants assuming the same employment rates as the native-born, 2007-2009 average (percentage of GDP)



Source: OECD 2013: 153.

Last but not least, analyses presented in the International Migration Outlook 2013 point to the importance of a dynamic approach to the fiscal impacts of immigration, Figure 17.

Figure 17. Differences in the average net direct contributions between immigrant and native-born households, 2007-2009 averages (percentage of GDP)



Source: Own elaboration based on OECD 2013.

The data presented above shows clearly that in most OECD countries under analysis, the inclusion of a pension system contribution (i.e. dynamic accounting exercise) changes the assessment of immigrants' presence significantly in well developed countries. In fact, it does so in a very positive way.. This point is particularly well made in those countries which already suffer population ageing and where, at the same time, immigrant populations are significantly younger than native populations (e.g. Southern European countries).

European Union

Brücker *et al.* (2002) depart from the classical economic model showing that more generous welfare systems are expected to attract migrants who are more prone to rely on welfare: due to self-selection migrants' characteristics are more elastic in terms of fiscal measures than natives' characteristics. Authors use the ECHP data (1994-1996) to assess relative welfare dependency in 11 EU countries of non-EU migrants: Germany, the UK, Greece, Spain and Portugal, Denmark, Netherlands, Belgium, France, Austria and Finland. In the case of raw data comparison, there are large differences between EU countries with respect to migrant welfare dependency. This is true in terms both of the structure of a given welfare system as well as the characteristics of immigrants. Nonetheless, there are two clusters of countries easily identifiable: the first group comprises Germany, Greece, Portugal, Spain and the UK and, in this case, the welfare dependency rates are similar for natives and for the non-EU migrants; in the second group (Nordic countries, Austria, Belgium, France and the Netherlands) welfare receipt among immigrants is significantly higher than in the case of natives. Those differences are similar, and this is true irrespective of the type of welfare benefit / services considered. The general conclusion is that in the mid-1990s immigrants residing in most Western European countries generated relatively large – although transitory – contributions to the pension system-. This contribution could not be fully offset by dependency over other kinds of transfers (e.g. unemployment benefits).

The critical point refers, however, to the question of how far those differences depend on the structural characteristics (differences) of the immigrant population. Based on a set of probit models Brücker *et al.* (2002) conclude that when controlling for structural characteristics a statistically significant difference in welfare dependency is to be found in the case of the Nordic countries, Austria, France and the Netherlands[71]. Importantly, Brücker *et al.* (2002) point to several reasons why differences in welfare dependency may still arise, even when controlling for structural characteristics (*residual welfare dependency*). Those reasons include: self-selection (according to *the welfare magnet hypothesis*), migration-specific effects (e.g. psychological trauma in the case of forced migrants or pure linguistic barriers); discriminatory practices (problems with finding and securing jobs); network effects (leading to exclusion from the mainstream society but also impacting positively access to welfare); non-portability of entitlements (legislative issues); and relatively lower wages (important in the case of income maintenance programs). Moreover, the residual effect is found to grow where the generosity of the welfare system is higher (but where there is no clear correlation observable).
Boeri (2010) depart from the commonly shared belief that immigrants tend to abuse the welfare state. He refers to previously discussed study (Brücker *et al.* 2002) to show that immigrants are overrepresented when we consider non-contributory transfers[72]. Nevertheless, there is no empirical evidence supporting the presence of "residual dependency" when controlling for their socio-demographic characteristics: this is particularly true in terms of educational attainment and the presence of dependent family members.

Last but not least, Boeri (2010) points to potential risk of moral hazard observed in the case of the most generous welfare regimes in the EU. This results in self-selection patterns. Additionally, he discusses possible strategies to flag up the vicious circle of dependence between welfare state concerns and migration policies: not least concerns over public support for more restrictive immigration policies, which leads to irregular flows and thus negatively impacts welfare systems. Out of three presented strategies (limiting access to welfare, introducing points-based immigration policies, harmonizing welfare regimes across Europe) he supports the change in immigration policy and the introduction of the points-based system. This was expected to address the self-selection of low skilled migrants in EU countries with generous welfare systems. This limits access to welfare and harmonization becomes neither efficient nor reliable: they would affect integration in a negative fashion and affect too labor market conditions (particularly in relatively poor countries).

In a recent paper Barrett and Maitre (2011) use the 2007 EU-SILC data to compare immigrant welfare receipts across Europe: in both unadjusted and adjusted terms, while looking at both EU adult immigrants and non-EU adult immigrants. They conclude that there is very little evidence that immigrants are more likely to receive welfare benefits (when considered in an aggregate way). In the case of all types of support only in Poland, France, Finland, Sweden and Denmark was the ratio of the proportion of immigrants in receipt of support slightly higher than the proportion of natives: with Poland as an outlier, due to the low reliability of data used. When controlling for observable characteristics (gender, age, education, number of children) the impact of immigrant status on welfare receipt was negative in most countries considered (except for Sweden, Finland and Denmark). At the same time, however, the share of immigrants at risk of poverty is much higher than for natives in most EU countries (except for Poland and Portugal). This outcome in turn turns on the question of the effectiveness of recent welfare systems in the EU countries.[73]

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[71] There is no such effect in such important immigration countries like Germany, Greece, Spain and the UK.

[72] These programs are usually relatively small, but they are not self-financed by the potential beneficiaries (or their employers) and thus they are perceived as pure burden for the rest of society.

[73] The main problem with the study lies in low reliability of the data used (at least in case of a few countries, e.g. Poland).

European countries

Germany

Bird *et al.* (1999) and Castronova *et al.* (2001) refer to the classical analysis of the welfare participation of the US immigrants (as discussed above) and test both the eligibility and actual participation in welfare programs: Social Assistance as the main means-tested program in Germany. Employing the GSOEP data (as for 1996) they find that almost 15 percent of immigrant households are eligible for social assistance as compared to 5 percent in the case of natives. As a consequence the take-up rates are also much higher: respectively 9 percent and 2 percent . There is, then, a much higher difference in the case of the US studies but similar to previous German studies. Thus the conclusion is that immigrants are more likely to receive welfare benefits than native Germans. But regression analysis (controlling for observable socio-demographic characteristics) shows that higher welfare participation rates among immigrants are not related to immigrant status. Rather, they result from structural characteristics (incomes and household structures).

Sinn (2002) analyzes the welfare impacts of migration in the context of expected EU Enlargement. He argues that migration makes economic sense only if it is driven by wage differentials and only then as long as the labor market is flexible enough. Likewise migration only "works" if the main driver is not the welfare system: though he fails to back this up with scientifically-based arguments. Moreover, according to Sinn such mobility is expected to create tensions between western European countries (interested in frightening off potential "abusers") and the erosion of traditional social welfare. Unfortunately neither data nor rough estimates on the welfare impacts of immigration are presented. Sinn (2002) concludes by recommending that the scale of migration should be dampened down or at least the access of migrants to Western welfare systems should be limited[74].

As a point of departure Riphan (2004) takes the empirical fact that the share of immigrants in the German social assistance programs (*Sozialhilfe*) is higher than among natives[75]. Thus the main question is whether immigrants assimilate in or out of welfare and what factors were responsible for assimilation over the period 1984-1996[76]. Generally, the sample of foreigners is characterized by more than 24 percent higher welfare dependency than in the case of native households. The main idea is to assess the relevance of following effects on welfare dependence: cohort, assimilation, age at migration and country of origin effect. At the same time the author controls for unobserved heterogeneity (household specific), endogenous panel attrition (a serious methodological problem in the case of panel data) and labor force status. The outcomes of the analysis confirms that the cohort effect was negligible and the same holds true for the country of origin. On the contrary, the assimilation effect turns out to be significant (and positive in terms of welfare dependency), and the same is true of the age effect (higher age results and higher probability of welfare dependency). The most important explanatory factors (except household size and city size) is labor market status and age at immigration.

Büchel and Frick (2004) compare the economic performance of migrants residing in two EU countries – (West) Germany and the UK. In terms of relative income position they find that immigrants in the UK fare much better than those residing in Germany. However, they also show that the variance is much higher in the case of the UK, which could be partially attributable to a larger ethnic mix in this country or to stronger redistributive effects in the German welfare state. On that

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[74] Generally, Sinn's study represents a common way of thinking about migration and welfare state. It can be summarized while referring to following quote: *In the competition for the lowest possible standards, the European social welfare state will be exposed to strong erosive forces which threaten its very substance* (Sinn 2002: 108).

[75] Thus the analysis was limited to two forms of social assistance as foreseen by the program: general income support and support for special circumstances.

[76] Most of the immigrants in the sample originated from the recruitment countries but it seems to be highly controversial to refer to the whole group as to "guest workers" (as stated in the title of the paper).

basis they argue that low income immigrants in Germany benefit more from the welfare system than persons with comparable characteristics residing in the UK.

Riphahn *et al.* (2010) analyze the welfare[77] use of immigrants in Germany with a focus on one particular ethnic group: persons of Turkish origin (including second generation immigrants). According to the GSOEP data for 2003-2007 immigrants of Turkish origin had a significantly higher propensity to be welfare claimants than natives: two times higher in the case of social assistance and almost five times higher in the case of unemployment assistance. Similarly to previously discussed studies, these differences disappear when controlling for individual and household level characteristics (save in the second generation[78]). Additionally, authors conclude that the welfare dependence is a result of different set of factors in the case of natives and immigrants: marital status and age are important for the natives and a broad range of human capital characteristics for immigrants.

Bonin (2002; 2006) applies the generational account to assess the overall fiscal impact of immigrants coming to Germany. Complete life-cycle taxes paid and benefits received are considered, as well as the provision of public goods. The general conclusion of both studies is similar: immigration has a positive impact on the fiscal position of Germany (even if their income position lies behind those of natives. In the first study (Bonin 2002) 1996 data is used to calculate the generational accounts for the years 2000-2050. Comparison of generational accounts for 1996 reveals that the highest point is to be expected at 20-30 years of age and that then the fiscal position of both groups is worsens (after 50-55 individuals become net beneficiaries). This change, however, is more dramatic for natives than it is for immigrants (due to lower pensions). In general terms, immigrants pay less into the public coffers but their net position remains positive. When considering the ageing effects and including public goods provision the net effect of an average immigrant is estimated at over 53,000 EUR (positive). This is mostly due to favorable age structure of immigrant cohorts at departure. The net effect depends strongly on the efficiency of integration – when two years integration is assumed this value goes down to 44,300 EUR, with six years 27,000 EUR and with 12 years it may even become negative. Additionally, the net effect of immigration can be even higher when assuming efficient selective immigration policy (with respect to age and skills).

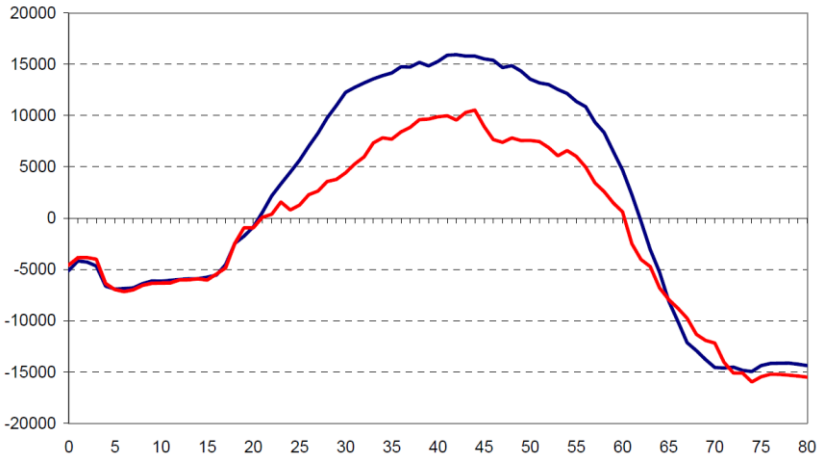
The second study (Bonin 2006) presents both static analysis as for 2004 (fiscal year) and dynamic analysis (GA) accounting for demographic ageing in the future. In the case of static comparison the net fiscal position of the average foreigner is assessed as positive (2,000 EUR), but slightly lower than for natives (3,400 EUR). The net fiscal contribution is though significantly lower than in the case of natives, mostly due to lower level incomes[79], Figure 18. Thus, problems with efficient labor market absorption are clearly visible.

[77] According to the new rules introduced in 2005.

[78] i.e. persons who were born in Germany with Turkish nationality or descendants of first-generation immigrants.

[79] Also, the account for immigrants becomes negative earlier than for natives – mostly due to relatively higher unemployment rate in the case of persons aged 50 years and more.

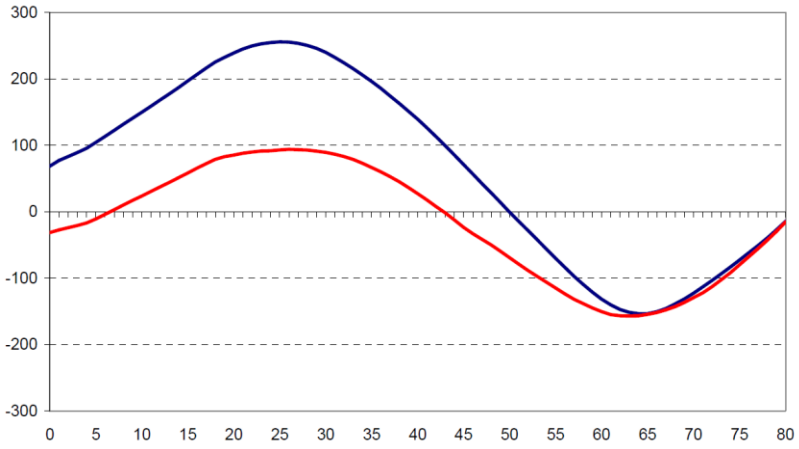
Figure 18. Net fiscal contribution by age, Germany, 2004 (natives – blue, foreigners – red)



Source: Bonin 2006: 6.

The net fiscal position of foreigners residing in Germany remains positive also when accounting for demographic ageing. The generational accounts for both Germans and foreigners are presented below, Figure 19.

Figure 19. Generational accounts by age, Germany, 2004 (natives – blue, foreigners – red), in thous. EUR



Source: Bonin 2006: 9.

Figure 19 suggests that for immigrants in Germany the discounted future net gain is to be expected for persons aged 7-42 years: in fact, in the case of 26 year-old-individuals it is as high as 94,000 EUR, but at the same time it is much lower than for natives at the same age, 255,000 EUR. Thus, the net present value of recent and future net payments is as high as 11,600 EUR per average immigrant. This is an important outcome because it shows that in total over 7 million immigrants in Germany are expected to bring a positive fiscal effect of around 84 billion EUR (Bonin 2006).

Bruecker *et al.* (2002) clearly state that all German studies found that when controlling for observable characteristics immigrants are equally or less likely to be dependent on social welfare than

natives. Additionally, contrary to the situation observed in Nordic countries foreigners in Germany tend to assimilate out of welfare assistance (but it is a long process).[80]

France

Monso (2008) assesses the impact of incoming immigrants on French public finances and refers to the dynamic approach comparing tax payments and social benefits over the life cycle. The general conclusion is that the impact of immigration is difficult to determine but nonetheless small. It results from the fact that short-term positive impacts are offset in the long term by costs related to an ageing immigrant population. Notwithstanding a possible positive contribution in the case of young and well qualified migrants is noted.

Similar results are provided by Chojnicki (2004) and Chojnicki and Ragot (2011). The first paper departs from the theoretical models and emphasizes the role of skills composition on migration outcomes. The latter employs dynamic general equilibrium (Applied General Equilibrium Model) model to assess the impact of migration on the future tax burden. This results from population ageing in France, 2000-2100[81]. Three scenarios are considered and compared to the baseline scenario based on the official demographic projection for France (assuming zero net flows). All of the alternative scenarios assume large immigrant intakes (comparable to those noted in 1950s and 1960s) varying between 100,000 and 230,000 annually. The first scenario assumes skill structure as observed in late 1990s (no selective immigration policy).In the second scenario the skill distribution of immigrants is assumed to reflect the skill level for natives (neutral immigration).I In the last scenario (selective immigration) it is assumed that the structure of immigrants is similar to the generation of the most skilled natives aged 25 and 34. The results obtained suggest that the most affected pillars of the economy are those which are highly sensitive to the changes in age distribution, i.e. pensions and health expenditures. Independent of the selectivity of immigration and the skill structure of immigrants the impact of inflows on public finance is expected to be positive: there will be an obvious strong effect in the beginning of the process with this gradually declining along with population ageing. In the most positive version (selective immigration policy) immigration causes a very small reduction in social transfers (0.1 percent of the GDP) but also lower tax rates (around 2 percent by 2050). Selective immigration policies would reduce the tax burden resulting from ageing to 30 percent in 2050 (or to 20 percent assuming neutral immigration scenario). Thus the general conclusion is that, in the case of France, immigration could not solve demographic problems, but that immigration would significantly improve the fiscal position of the country.

United Kingdom

According to Gott and Johnston (2002) the net fiscal contribution of immigrants is as high as 2.5 billion GBP or 0.27 percent of the GDP (1994). The authors suggest that we consider the net annual fiscal contribution (NAFI) defined as a ratio of immigrants' net contributions to their consumption of public goods and services. For the period considered, NAFI is as high as 1.09 as compared to 1.06 for non-immigrants. Those outcomes proposed by Gott and Johnston (2002) were then questioned by Coleman and Rowthorn (2004) who suggest adjusting for additional administrative costs related to presence of immigrants (e.g. immigration programs as "immigration and citizenship") or those categories which were not influenced by migrant inflows (e.g. defense or debt interest).

[80] In the case of Switzerland, Weber and Straubhaar (1999) assess that the stock of immigrants is as high as 9.5 percent of the total population and that this stock makes a positive annual fiscal contribution of USD 460 million (0.2 percent of the GDP). The analysis is done while excluding asylum seekers or quest workers (a further 7 per cent of the population).

[81] As suggested by authors a general equilibrium model is required to assess all possible impacts of immigration on natives' level of utility: this includes potential redistribution effects resulting from labor market displacement, pressure on wages, impacts on taxes, interest rates, productivity etc.

Updated version of the analysis presented above have been written up by Sriskandarajah, Cooley and Reed (2005) who – where possible – use the same data sources and a similar approach: data sources included LFS and Tax and National Insurance data. The authors refer to the criticism expressed after the publication of the Gott and Johnston paper (2002). Among others things they question the rationale to apportion the costs related to the immigration system to immigrants:[82] this had been proposed by Coleman and Rowthorn 2004. Another point of criticism is related to the failure to account for congestion effects in the case of public services. The authors point out – in a convincing way – that any potential competition related effects should be juxtaposed with the fact that a large part of the services is provided by the immigrants themselves (e.g. health services). The most important change implies the extension of the timeframe of the analysis to 5 years and the inclusion of the period with the relatively poorer budgetary position of the UK government. The analysis presented suggests that the fiscal impact of immigration on UK finances is positive (and growing). The relative net fiscal position of immigrants is higher for newcomers (1.06) than for natives (1.01). Interestingly, this difference is more or less stable even in time of budget deficit: in respectively 2003-2004 0.99 and 0.88.

Coleman and Rowthorn (2004: 579) conclude that, in general, the economic impacts of immigration are

> "[…] trivial, negative, or transient […] and any small fiscal or economic benefits are unlikely to bear comparison with immigration's substantial and permanent demographic and environmental impact".

They emphasize that the fiscal effect of immigration is strongly structure-dependent. In most receiving countries the composition of immigration is very diverse and thus the aggregate fiscal effects are usually small or negligible: typically they are within the range of +/- 1 per cent of the GDP.

Rowthorn (2008) assumes that while low skilled immigrants are likely to create net fiscal costs the highly-skilled ones are usually beneficial for the receiving country in fiscal terms: the former group can be beneficial if we make the assumption that they will not settle. Importantly, Rowthorn emphasizes the costs of public goods to be apportioned to both natives as well as to immigrants. Rowthorn assess the net fiscal contribution of immigrants, employing mainly secondary data, for example, for the 2003-2004 tax year as being as high as GBP 0.6 billion. In other words immigrants bring a small but positive sum to the public treasury.[83].

Dustmann, Frattini and Halls (2010) present one of the most interesting studies looking at the effects of EU8 (A8 countries) immigration to the UK, putting this in a fiscal context. In general terms, according to the study, A8 immigrants make a positive fiscal contribution to UK public finances for 2005 to 2009. This is irrespective of the way that the net fiscal contribution of immigrants were defined. It was possible mostly due to very high participation rates and employment rates (and despite employment mostly in low skilled and low wage occupations) and relatively higher contribution via indirect taxes[84]. In 2007-2008 the relevant immigrants constituted 0.87 percent of the total UK population and their participation in government revenues was as high as 0.81 percent (in 2008-2009, respectively, 0.91 and 0.96). At the same time in all the years considered the share of immigrants in government spending is lower than their share in the population. On the basis of the individual data authors show that even those migrants who have resided in the UK for more than one year (and who were thus eligible for welfare benefits) were 59 percent less likely than natives to receive state benefits

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[82] In an absurd case the costs related to implementation of zero-immigration policy would be extremely high with no single person to assign these costs to.

[83] The migrants' contribution was calculated under the assumption that the budget is balanced and adjusted for additional factors including asylum support, excess medical costs, ethnic relations support etc.

[84] Any general equilibrium effects were not considered based on empirical evidence showing little support for significant effects in the case of the analyzed migration process.

or tax credits and they were 57 percent less likely to claim for social housing. Those differences decrease (to 13 and 29 percent) but disappear when accounting for socio-demographic characteristics. Additionally, A8 immigrants are less likely to claim welfare benefits irrespective of the time spent in the UK.[85]

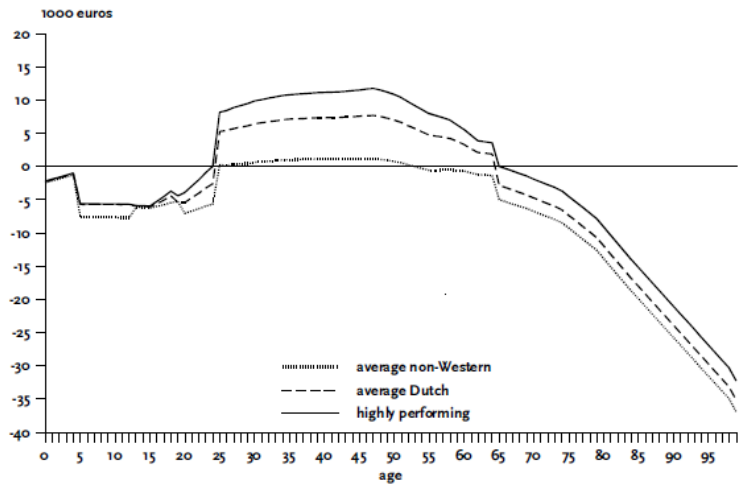
Ireland

Barrett and McCarthy (2008) compare the welfare usage of the natives and immigrants and find that if we refer to the raw data there is a significant difference in welfare receipts: 18 percent of the natives received welfare payments as compared to about 11 percent of immigrants (over the previous 12 months). In order to control for structural characteristics they ran a multivariate probit regression and found that welfare reception is significantly associated with several structural characteristics including level of education (negative impact), marital status (positive impact in the case of singles), etc. All in all, immigrants are less likely than natives to take welfare even when controlling for the most conventional variables (4 percent less likely). Additionally, the value of welfare payments received is on average lower in the case of immigrants than in the case of natives.

Netherlands

Roodenburg *et al.* (2003) analyze the net fiscal position of immigrants in the context of a general assessment of the effect of immigration on the Dutch economy. The net lifetime contributions of immigrants and the effects on the budgetary situation are calculated to assess the effects of recent immigration to the Netherlands (based on a methodology derived from the GA approach[86]). As for 2001 the net contributions are the following, Figure 20.

Figure 20. Net contributions by age, the Netherlands, 2001



Source: Roodenburg *et al*. 2003: 61.

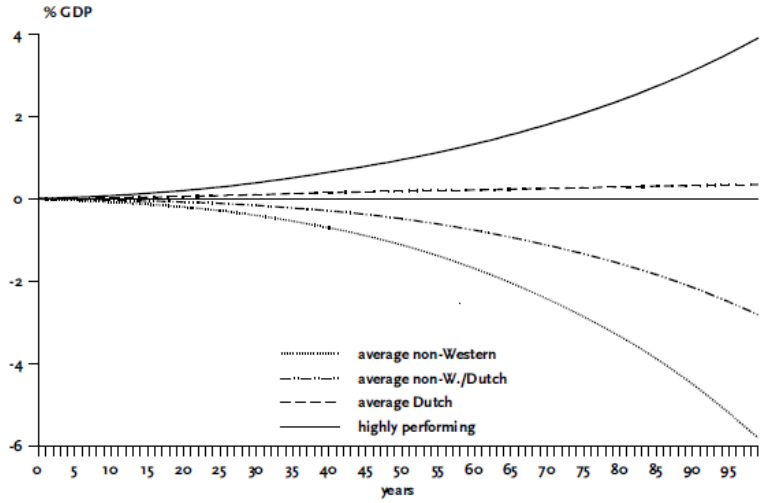
As shown above, the shape of the net contribution function is similar for all groups considered but clearly negative for non-Western immigrants. Authors conclude that the fiscal impact of immigration depends strongly on the socio-economic variables of given persons and age of entry (in the case of immigrants): the most favorable effects are found for those who are 25 when entering the Netherlands

85 Importantly, most of the analysis presented for the UK did not consider dynamic effects, i.e. the fact that immigrants will retire in the future (Vargas-Silva 2013).

86 In methodological terms the analysis was based on an assessment of lifetime net contributions attributed to particular age brackets. Authors compared native Dutchmen, non-Western immigrants and "highly performing" immigrants.

and who are able to obtain a favorable position on the labor market. Notwithstanding, non-Western immigrants become a burden to the budget when their characteristics are close to the average profile. "highly performing" immigrants bring highly positive net contributions .

Figure 21. Effect of immigration on the Dutch budget balance



Source: Roodenburg et al. 2003: 72.

Nevertheless, authors conclude that the negative fiscal contribution of immigrants should not be attributed solely to immigrants and their relatively poor performance. It should also be attributed to the generosity of the Dutch welfare system. The general conclusion of the paper is that due to the structural characteristics of immigration and the fact that immigrants tend to bring their families and become native-like the positive fiscal effect disappears and becomes, indeed, negligible. Thus immigration is not able to solve the budgetary problems of the Netherlands: nor, indeed, the problems of other well developed countries.

Denmark

In a paper by Wadensjö (1999) a fiscal contribution to the Danish treasury is considered for two groups of immigrants: persons from well developed countries (e.g. the EU, the USA, Australia and Canada) and immigrants from the rest of the world. The empirical analysis reveals that , for the first group the average net contribution was as high as 12,300 kroner: for the second, on the other hand, the contribution was as low as -63,700 kroner (as of 1996). The figure is also negative for second-generation immigrants whose parents originated from countries included in the second group (-10,700 kroner).

The analysis of Nannestad (2004) provides similar results. Based mostly on the data presented by Wadensjö and Orrje (2002) he points to how immigrants from non-western countries (as a group) are net beneficiaries of Denmark's universalistic and tax-financed welfare state and this position tend to continue even after several years spent in the country. Nannestad (2004) concludes that according to the Danish experience unlimited (uncontrolled) immigration creates irresolvable challenges for the Nordic type redistributive welfare regime. The problem lies, however, not necessary in immigration but rather in the construction of the welfare system. This system is responsible for weak incentives to be economically active and also for the creation of entry barriers of immigrants into the labor market through upward pressure on minimum wages ("immigrants between the welfare state and the labor market")[87].

[87] One should consider also the unique structure of migrants incoming to the Nordic countries, including Denmark.

Blume and Verner (2007) refer to studies presented for both European countries (Hansen and Lofstrom 2003; Riphahn 2004) and for the United States (Borjas and Trejo 1991) while assessing the welfare position of immigrants in Denmark between 1984 and 1999. The main question is whether the time spent in the country of destination can impact welfare usage. They find that welfare dependence depends significantly on the country of origin: no significant difference was noted between natives and immigrants from well developed countries. In the case of less developed countries the rate of welfare take-up is much higher than for natives and the difference is a decreasing function of time spent in Denmark: this is stronger for male than for female migrants. Finally, they conclude then when taking the fiscal criterion into consideration only those migrants who arrive in Denmark at a relatively young age can be "beneficial" in an economic sense.

Finally, Wadensjö (2007) examines the impact of immigration on the public finance in Denmark but differentiates between government levels: the state sector, the municipalities, the counties and the unemployment insurance scheme. This is an interesting perspective due the fact that both the gains and costs of immigration are shared in a non equal manner between the various level of administrative organization. He finds that, for the period 1996-2001, there is a large and positive net transfer from all groups analyzed to the state sector, whereas it is much lower for non-western immigrants than for other countries. On the contrary, the net transfer to municipalities is positive in the case of natives but negative (and relatively large) in the case of non-western immigrants. The same situation is observed in the case of counties and the unemployment insurance scheme. The net transfers from the local administrative bodies to immigrants declined between 1996 and 2001. However, they are still significant and they do not disappear in the case of persons residing in Denmark on a long-term basis: this effect is observable only for the second-generation. It is shown that these results are mostly due to the unfavorable shapes of the wage curves of immigrants: low positive net transfers for persons of mobile age[88].

Sweden

Ekberg (1999) assesses the fiscal position of Swedish immigrants over a very long time span (1950s-1990s) and concludes that, while the net contribution of immigrants coming to Sweden was positive in the 1950s, the 1960s and the 1970s it became negative afterwards. As for 1994 the net fiscal contribution of immigrants is assessed at -0.9 percent of the GNP: while being as high as 1-2 percent of the GNP in previous decades. Importantly, according to Ekberg this change is attributable primarily to a significant worsening employment situation among immigrants. In a previous study Ekberg (1994) finds only small differences in earnings between immigrants and their native "twins". However, these differences become larger when immigrants are distinguished by their country of origin.

Storesletten (2002) applies net present value approach to assess the potential "gains" of immigration to Sweden: both tax system and government expenditures are considered in this respect. The outcomes of the model are very sensitive to underlying assumptions (conditions on the labour market, migration strategies, and macroeconomic variables) and the age structure of newcomers. In the case of immigrants aged between 20 and 30 significant gains are expected (0.2 million SEK per immigrant). In the case of persons aged over 50, meanwhile, these gains turns into net costs (1.1 million SEK per immigrant). Considering the 1990 age distribution of immigrants the average net cost of new immigrant is assessed at 175,000 SEK (26,500 USD).

In a commonly quoted article Hansen and Lofstrom (2003) analyze the welfare position of immigrants and natives in the early 1990s and ask whether immigrants assimilate into or out of welfare. They find that immigrants use welfare to a higher extent than natives. These differences are: 1) very high directly upon arrival and then tend to decrease with time spent in Sweden (being less than

[88] Moreover, these differences are still present even if controlled for the set of traditional socio-demographic characteristics.

10 percent higher for those who are in the country for over 10 years) and 2) dramatically higher for persons coming from refugee countries as compared to the rest of the world (50 percent as compared to 10 percent difference directly upon arrival). Additionally these differences cannot be explained by observable characteristics alone. Authors argue that immigrants – including refugee immigrants are likely to assimilate out of welfare. But this is a long term process (in the latter case assimilation is even faster when controlled for observable characteristics). Finally, they conclude that the main factor responsible for increasing welfare utilization of immigrants is the change in structure of incoming migrants (with increasing number of refugee immigrants as the main contributing factor). Hansen and Lofstrom (2009) extend their previously discussed analysis by introducing a set of transitions between labor market statuses and welfare dependency statuses (over the same period as presented above). According to the results presented immigrants participate to a greater extent in both unemployment benefits as well as social assistance than is observed in the case of natives. Differences in the case of welfare utilization are particularly large and they are higher for refugee immigrants. Authors attempt to test whether observed outcomes are attributable to "structural dependency" (e.g. depreciation of human capital, negative signaling effects) or are due to time invariant heterogeneity ("spurious dependency"). They argue that immigrants display far larger state dependency in terms of welfare participation. But there are significant differences between the immigrant groups considered: in the case of refugee immigrants a significant "welfare trap" was found, in the case of other immigrant groups differences in welfare utilization are attributable to unobserved characteristics.

Andrén (2007) and Andrén and Andrén (2012) compare welfare reliance in native and foreign-born households: controlling for the initial conditions and unobserved heterogeneity. The results obtained support the outcomes of the Hansen and Lofstrom (2009) study and show that there is a higher propensity to rely on social welfare for immigrants and additionally that the state dependence in terms of welfare participation is three times higher for immigrants as compared to natives. In general terms the study shows relatively strong state dependence in the case of welfare participation in Sweden (in general terms).

Italy

In the case of Italy there is a long lasting discussion over the main factors responsible for the inflow of immigrants. Referring to the welfare magnet hypothesis Sciortino (2004) argues that what really attracts immigrants is the Italian welfare state and not the labor market alone. This hypothesis is highly controversial, however. This is particularly so when the author suggests that what really matters is not the opportunity to get access to welfare benefits but rather a demand for low skilled labor. This – according to Sciortino – is the outcome of structural problems in the welfare state. In fact, the welfare state may affect the immigration process in an indirect way through creating certain labor market behavior among natives[89].

Paniagua (2009) presents a very basic back-of-the-envelope analysis and argues that immigrants positively affect the Italian welfare state. He refers to several studies presented in the Italian media discourse portraying significant positive net fiscal contribution of immigrants to the public coffers: e.g. this effect was estimated at 5 billion euros in 2007, in 2008 the legalization alone brought around 2.5 billion euros into the social security system in one year alone. He also suggests putting more emphasis on the legal status of immigrants in a given country and on the state's provisions concerning people of different status. Additionally Paniagua portrays a large variety of labor-market related

[89] But the general conclusion made by Sciortino (2004) is absolutely right: the welfare systems interact with other systems including the labor market; if it is necessary to include in the analysis the process of interaction and its results. In the case of Italy the main issue would be the structural tension between the welfare system designed according to the traditional male breadwinner model and changes in the women's position on the labor market resulting in the structural demand for foreign labor.

activities of immigrants in Italy, with a particular emphasis on self-employment and employment in household services.

Pellizzari (2011) refers to 2007 EU-SILC data in assessing the welfare dependence of immigrants in Italy. However, due to the fact that the Italian welfare system is highly decentralized, the author suggests that standard survey data may fail to show the whole picture and, indeed, the complexity of that picture. For this reason the analysis based on the EU-SILC data is complemented by an analysis of data coming from the administrative archives of the National Social Security Administration (INPS). In both cases higher welfare dependency among non-European immigrants is reported. Similarly to previously discussed studies, most of those differences disappear (in the case of the non-EU15 immigrants) or get seriously reduced (in the case of the non-EU immigrants) when controlling for observable characteristics. Interestingly, Pellizari (2011) suggests that there is a welfare magnet effect observable in the case of the Italian regions (but strong endogeneity is also noted).

Spain

Collado *et al.* (2004) refer to the extremely interesting case of Spain that experienced the highest dynamics of immigration over the last decade. They analyze the impact of the inflow against the background of an ageing Spanish society and ask the question whether (such massive) immigration can improve the fiscal situation of the host country. In order to assess the impacts of both recent as well as future generations the methodology of Generational Accounting is being applied: see the next section for details.

The authors refer to previous studies on Spain but the analysis presented is the first one looking specifically at the role of immigration. 2000 is used as a base year and three scenarios are considered:

- no immigration after 2000 (as a base year);
- annual net immigration of 60,000 individuals (benchmark scenario), and
- annual net immigration of 200,000 individuals[90].

An extensive set of assumptions is made in order to apply: the GA (including population projection (with rising fertility rate and increasing life expectancy – similar to the UN projection – assumed); the characteristics of the future immigrant population (importantly, the authors decide to refer rather to characteristics of recent flows than recent stocks of immigrants in Spain); the annual productivity rate; and the discount rate (tested for robustness). Then, based on the microdata (ECHP and other available data, e.g. Spanish Consumer Expenditure Survey), relative age-profiles for both taxes and transfers are calculated (including direct and indirect taxes[91]).

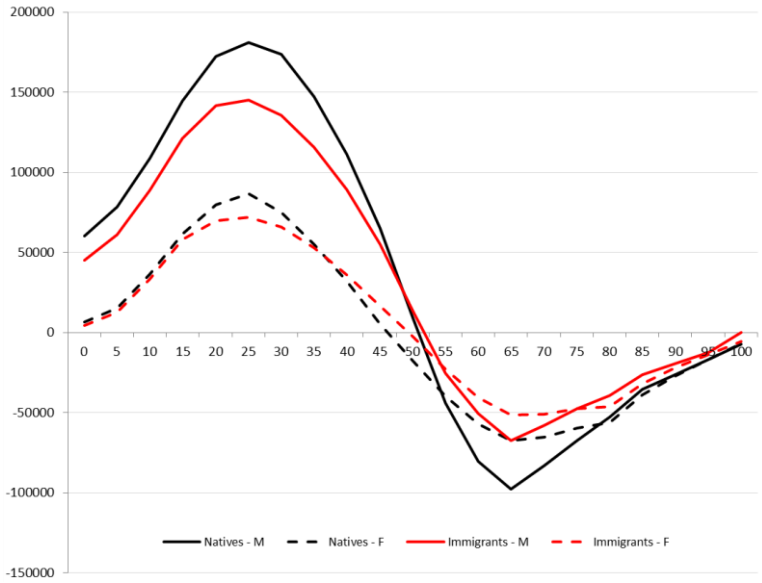
Figure 22 presents the generational accounts for both natives and immigrants according to the standard GA approach. This assumes that the whole balance is paid by future generations alone[92].

[90] In fact this number is close to the actual size of immigration to Spain in the early 2000s.

[91] With respect to this issue very restrictive assumptions are made: income data is derived from averages, there was no information possible on the nativity in the expenditure survey and thus VAT profiles needed to be derived in an indirect way. Transfers taken-up by immigrants are assumed to be as high as 75 percent of value for the natives. Educational profiles are derived indirectly as well, finally, no health profile for Italy was available and thus the Belgian profile is used (due to similar age structures).

[92] The alternative approach assumes that fiscal policy changes immediately. Under this assumption outcomes are similar, however, the changes in taxes and transfers necessary to fill the gap are much smaller (4.7 percent) (Collado *et al.* 2004).

Figure 22. Generational accounts for Spain, by age and immigration status (no immediate changes in fiscal policy), benchmark scenario, in EUR



Source: Own elaboration based on Collado *et al.* 2004: 346.

According to the picture presented above the life-cycle pattern of generational accounts is similar to those observed in other countries. Accounts become negative around 50-55 (later for males) and reach their minimum at 65 years of age. An interesting feature of immigration in Spain is the fact that differences between males and females are larger than between natives and immigrants. This is mostly due to significant differences in participation ratios noted between men and women. Consequently, for the benchmark scenario the generational accounts are as high as 60,188 EUR for native male born in 2000 and 6,436 EUR for native female born in 2000 and 98,652 EUR and 43,251 EUR for immigrant males and females[93]. Thus the proportional change in all taxes and transfers necessary to restore the balance is estimated at 20.4 percent; in cases when there is an immediate change in fiscal policy it is much smaller (see footnote 91).

Table 1. Changes necessary to cover burdens of newborn and future generations

Fiscal policy changes	All burden on future generations	Immediate change
Benchmark scenario (60,000 immigrants per year)		
% change in taxes and transfers	20.4	4.7
% change in taxes only	34.5	7.9
% change in transfers only	49.8	11.3
No immigration after 2000		
% change in taxes and transfers	27.6	5.1
% change in taxes only	47.8	8.8
% change in transfers only	65.4	12.4
200,000 immigrants per year		
% change in taxes and transfers	12.0	3.8
% change in taxes only	19.8	6.3
% change in transfers only	30.3	9.2

Source: Collado *et al.* 2004: 347.

[93] For 2001 these numbers are much higher and equal 107,160 EUR, 40,973 EUR, 153,855 EUR and 80,436 EUR respectively.

Table 1 presents the changes necessary to keep the balanced budget under the conditions of an ageing population and different migration scenarios. Generally, the results presented above show that the impact of immigration on the welfare system is positive and significant. It is particularly visible when comparing results from the no immigration scenario and the high immigration scenario: necessary changes in transfers and taxes are 15.6 or 1.3 percentage points lower depending on the fiscal policy applied.

Results obtained are far more positive than those presented by Auerbach and Oreopoulos (2000) using similar methodology. Collado *et al.* (2004) explains that it can result from more vivid differences in terms of age observable in Spain than in the USA (due to more rapid population ageing). Additionally, immigrants targeting Spain are generally better educated than those choosing the US: and the level of education explains, to a degree, the fiscal position of immigrants.

* * * * *

The above presented review of empirical studies does provides neither a clear nor a coherent picture of the fiscal impacts of immigration. Generally, the results of most of the studies presented here are rather mixed, see Table 2. Most conclude that immigrants are using social welfare to a greater extent than natives. Most of those differences (*welfare dependency residual*), however, disappear when accounting for the structural characteristics of immigrants: when controlling for observable characteristics the welfare residual becomes very small or negligible. Moreover, in many cases welfare use by immigrants depends on the rules and structural characteristics of the welfare system: i.e. it is country specific.

The total net fiscal impact of immigration is strongly system dependent. Table 2 shows that in countries with more flexible labor markets and relatively lower generous welfare systems immigration affects the welfare system in a positive way (but the scale of its impact is small). On the other hand, outcomes for generous Nordic economies are predominantly negative. In this, however, one needs to consider both the impacts of the system as such as well as the very particular structure of immigration (with a large share of refugees or dependents).

The review also indicates a number of factors responsible for the net fiscal position of immigrants. The answer to the question of whether immigrants are net beneficiaries or net contributors to the systems depends not only on such basic characteristics as age, age at arrival or position in the life-cycle. It also goes beyond the common explanation referring to the skill level (with low-skilled workers commonly assumed to be net burden). In fact, most of the studies available emphasize the efficiency of labor market incorporation and the structure of the welfare system itself.

Last but not least, a different picture is revealed when analyzing dynamic approaches to the welfare effects of immigration. Several studies show that the fiscal contribution of immigrants may be substantial when countries suffer from or are expecting) rapid demographic decline (but mostly it is presented as a transitory effect only). As shown by Bonin *et al.* 2000, Bonin 2001, Collado *et al.* 2003, Moscarola 2001 the size of future changes (higher taxes or lower transfers) depends on the scale of immigration. Thus, immigration may be treated as a safety valve. This approach can be challenged: for example, Coleman and Rowthorn (2004) claim that the fiscal impacts of immigration are not large enough to prevent structural changes in ageing societies. However, most of the studies quoted emphasize the positive role of immigration in the sustainability of European welfare systems.

Table 2. Fiscal impacts of immigration – empirical evidence

Authors	Country	Method	Time period	Impact	Comments
Static approaches					
Simon 1984	US	Life-cycle framework	Early 1980s	+	Tax contribution of immigrants can be higher than the contributions of natives
Akbari 1989	Canada	Life-cycle framework	1981	+	Immigrants who resided in Canada up to 35 are assessed as net contributors
Borjas and Trejo 1991	US	Cohort and assimilation effects	1970-1980	-[1]	Increase in welfare consumption of immigrants attributed to a change in the ethnic mix
Borjas and Trejo 1993	US	Cohort and assimilation effects	1970-1980	-[1]	Structural characteristics of immigrants explain 2/3 of the variance of welfare use rate
Huddle 1993	US	Net fiscal position	1990s	-	Net fiscal impact of immigration: -0.4 percent of GDP; flat rate of taxation and displacement effect assumed
Borjas 1994	US	Basic assessment	1970-1990	-	-0.2 percent of GDP
Simon 1996	US	Life-cycle framework	Early 1990s	+	Previous results supported
Passel and Clark 1994	US	Net fiscal position	Early 1990s	+	0.4 percent of GDP; Problematic assessment of welfare programmes
Borjas and Hilton 1996	US	Participation in welfare systems	1984-1991	-	Overrepresentation of immigrants among welfare users; network effect confirmed
Lee and Miller 1998	US	Net fiscal position	1994	+	0.35 percent of GDP; costs of public goods not considered
Lee and Miller 2000	US	Increase in immigration assessed	1994	+	Effect of increase the number of immigrants by 100 thous. annually: 0.4 percent of tax revenue
OECD 2013	OECD	Static and dynamic approaches	2007-2009	-/+	Mixed results for OECD countries; generally net fiscal position is small in terms of GDP with labor market status as the single most important explanatory variable
Brücker *et al.* 2002	EU	Assessment of welfare dependency	1994-1996	+	Immigrants generate relatively large but transitory contribution to the pension system; Differences between countries noted
Boeri 2010	EU	Assessment of welfare dependency	1994-1996	+/-	No residual welfare dependency when controlling for observables; Selective immigration policy recommended
Barrett and Maitre 2011	EU	Assessment of welfare dependency	2007	+/-	Mixed results; Significant differences between Scandinavian countries and the rest of the EU
Bird *et al.* 1999	Germany	Assessment of welfare dependency	1996	-	Immigrants more often rely on welfare (than natives); welfare usage to be explain by their structural characteristics and not by immigrant status itself
Castronova *et al.* 2001	Germany	Assessment of welfare dependency	1996	-	Immigrants more often rely on welfare (than natives); welfare usage to be explained by their structural characteristics and not immigrant status itself
Sinn 2000	Germany	Basic assessment	Post-2004	-	Post-accession migration as a threat to EU welfare systems
Riphan 2004	Germany	Assimilation in or out of welfare	1984-1996	-	Strong assimilation effects confirmed
Büchel and Frick 2004	Germany/UK	Assessment of welfare dependency	Late 1990s	-/+	Strong dependency on welfare in the case of Germany; much less in the UK
Riphahn *et al.* 2010	Germany	Assessment of welfare dependency	2003-2007	-	High welfare dependence found for Turkish immigrants; they disappear though while controlling for structural characteristics
Weber and Straubhaar 1999	Switzerland	Net fiscal position	Late 1990s	+	0.2 percent of GDP
Gott and Johsnton 2002	UK	Net fiscal position	2000	+	0.27 percent of GDP
Sriskandarajah *et al.* 2005	UK	Net fiscal position	1999-2004	+	Net fiscal position of immigrants is positive, higher for newcomers and stable even in time of budget deficit
Rowthorn 2008	UK	Net fiscal position	2003-2004	+	0.6 billion GBP (small but positive), differences between skill levels assumed
Dustmann *et al.* 2010	UK	Assessment of welfare dependency	2005-2009	+	Fiscal position of A8 immigrants assessed as very positive when compared to natives
Barrett and McCarthy 2008	Ireland	Assessment of welfare dependency	2005	+	Immigrants found to be less likely than natives in welfare receipt
Wadensjö 1999	Denmark	Net fiscal position	1990s	+/-	Net fiscal contribution assessed as positive in the case of immigrants from Western countries, negative for those coming from less developed ones
Nannestad 2004	Denmark	Net fiscal position	Late 1990s	-	Immigrants from non-Western countries found to be net beneficiaries
Blume and Werner 2007	Denmark	Assessment of welfare dependency	1984-1999	-	Significant relationship between welfare dependence and country of origin
Wadensjö 2007	Denmark	Net fiscal position	1996-2001	+	Impact much smaller (but positive) for non-Western migrants, differences between levels of government
Ekberg 1999	Sweden	Net fiscal position	1950s-1990s	+/-	Positive contribution in 1950s-1970s, negative later on (attributable to worse situation of immigrants on the

					labour market)
Hansen and Lofstrom 2003	Sweden	Assessment of welfare dependency	Early 1990s	-	It is possible for immigrants to assimilate out of the welfare but it is a long process
Andren 2007	Sweden	Assessment of welfare dependency	Early 2000s	-	Strong dependence on welfare shown (in the case of immigrants)
Hansen and Lofstrom 2009	Sweden	Assessment of welfare dependency	1990-1996	-	Much higher welfare dependency in the case of immigrants; significant differences between particular groups (with refugees being "trapped" in welfare dependency)
Andren and Andren 2012	Sweden	Assessment of welfare dependency	Early 2000s	-	Strong dependence on welfare shown (in the case of immigrants)
Sciortino 2004	Italy	General assessment	1990s	-[3]	Interactions between welfare system and other systems (labour market) do matter
Paniagua 2009	Italy	Basic assessment	Late 2000s	+	Importance of various modes of labour market participation stressed
Pellizzari 2011	Italy	Assessment of welfare dependency	2007	-	Higher welfare dependency among non-European immigrants observed (but not when controlled for observable characteristics)
Dynamic approaches					
Auerbach and Oreopoulos 1999	US	Generational Accounting (GA)	Post-2000	+/-[2]	Massive change in immigration policy (halting all migration) has only a small effect on the US treasury
Storesletten 2000	US	Net Present Value (NPV) approach	Late 1990s	+	Targeted immigration policy as partial solution of budgetary problems; all efficient naturalization actions are expected to improve the fiscal position of the US
Smith and Edmonston 1997	US	NPV	1990s	+	Immigrants and their descendants create net fiscal gains, they are very high for highly skilled ones; outcomes are very sensitive to the income position of immigrants
Bonin 2002	Germany	GA	2000-2050	+	Positive outcomes due to favourable age structure of immigrants (1996 the base year); even better outcomes expected in the case of targeted immigration policy
Bonin 2006	Germany	GA	2005-2050	+	Positive net effects both in terms of static as well as dynamic assessment
Chojnicki and Ragot 2011	France	Applied General Equilibrium Model	2000-2100	+	Selective immigration policies were expected to reduce the tax burden resulting from ageing by 50 percent by 2050
Monso 2008	France	Life-cycle approach	Post-2005	+/-	Impact difficult to assess but small or negligible (short term positive impacts are offset by long term costs)
Rodenburg *et al.* 2003	Netherlands	Net fiscal position / GA	2001	-	Fiscal impact of immigration depends on structural characteristics, it is negative for non-Western immigrants
Storesletten 2002	Sweden	Net Present Value (NPV) approach	Post-2005	-	Outcomes very sensitive to assumptions and age structure of newcomers; if the 1990 age structure is applied significant losses are expected
Collado *et al.* 2004	Spain	GA	Post-2000	+	Immigration as a significant factor improving the fiscal position of Spain

Notes:
[1] Higher shares of welfare participation in the case of immigrants, tax side not considered
[2] Effects are strongly dependent on assumptions made
[3] In the context of welfare magnets hypothesis only

Source: Own elaboration

Discussion and Possible Empirical Strategies

From the review of existing empirical evidence it follows that there are *two main ways of estimating the fiscal impacts of immigration*: 1) a static approach and 2) a dynamic approach. Both of them offer advantages and drawbacks (Nannestad 2006; Vargas-Silva 2013).

1) *Static approach*: in this approach analysis refers to a given year (tax year) and compares the contribution of immigrants to the public treasure (in the form of direct and indirect taxes; in practice, most studies are limited to the first case) with the value of benefits and services received.

Advantages:

- Simplicity;
- Use of historical data;
- No detailed data on generations needed;
- No need to impose strict assumptions concerning future events (concerning immigrants and the native-born as well as the government).

Disadvantages:

- Lack of forward-looking perspective (critical for policy-oriented assessments);
- Lack of assessment of the long-term consequences of recent migration processes (e.g. the inflow of persons at mobile age);
- Lack of proper assessment of population ageing and its dynamics.

2) *Dynamic approach*: in this case the idea is to compute the net present value of both contributions and benefits obtained over the lifetime of migrants (and their children, if necessary).

Advantages:

- A forward-looking perspective which is able to assess the fiscal impacts of immigration in the life-cycle framework;
- Adjustment for structural differences between migrants and natives (particularly age structure);
- Possibility of assessing the impact of immigration on structural changes resulting from population ageing (e.g. pension system and its sustainability).

Disadvantages:

- Very strong assumptions concerning the future are necessary; those assumptions include variables related to immigrants (fertility rates, life expectancies, return migration rates, productivity rates, labor market participation rates, regularity rates etc.), to natives (similar set of assumptions) and to the government (tax rates, government spending, structure and characteristics of the pension system);
- Outcomes of the dynamic approach tend to depend strongly on the set of assumptions made;
- This approach becomes problematic in the context of recent debt crisis (particularly in the case of the generational accounting – see below).

In this context it is worth noting the outcomes of Storesletten (2002) who notes that around two thirds of all government expenditures are age dependent and thus the age structure of a given immigrant group determines the outcome of the account. Due to the fact that this structure changes over time, the static approach does not say much about the net public effects of immigration over the whole lifetime of members of this group. Additionally, immigrants are usually young and the largest costs to spending are expected when they retire (and these should be discounted). Storesletten (2002) compares *the cash flow approach* (static one) with the dynamic approach (*NPV approach*) and concludes that

static measures overestimate the annualized costs of migration to Sweden drawn from the NPV approach by a factor of 2.8 (and this is mostly due to the particular structure of the Swedish immigrant population)[94].

Dynamic approaches employ the Net Present Value method or generational accounting introduced by Auerbach, Gokhale and Kotlikoff (1991, 1994)[95]. In the previous section NPV approach was presented in an extensive way. Below we refer to studies using GA and referring to the United States (Auerbach and Oreopulous 2000), Germany (Bonin 2002, 2006), Spain (Berengauer, Bonin and Raffelhueschen 1999; Bonin, Gil and Patxot 2001; Abio *et al.* 2001; Collado *et al.* 2004) to present the idea and practicalities of the approach in a detailed way.

The main idea of Generational Accounting is to measure the prospective net tax burdens of different generations under current fiscal policies (tax and government expenditures policies)[96]. Important features of the approach are following:

- fiscal burdens are evaluated over cohorts' remaining lifetime;
- subject of interest is "net taxation", i.e. taxes minus transfers (benefits);
- dynamic perspective means that future money flows need to be actuarially discounted (net present value approach);
- it is possible to assess implied changes in fiscal policies (while holding other factors constant).

As a point of departure we refer to *government's intertemporal budget constraint* expressed as:

$$A + B = C + D$$

Where:
D is the government net debt,
C is the sum of future government expenditures,
B is the sum of the generational accounts of those now alive
and *A* is the sum of generational accounts of future generations (Kottlikoff and Raffelhueschen 1999).
In practical terms the above formula is to be expressed in NPV terms, e.g. (Collado *et al.* 2004):

$$\sum_{s=t}^{\infty} \frac{T_s}{(1+t)^{s-t}} \equiv \sum_{s=t}^{\infty} \frac{E_s}{(1+t)^{s-t}} + B_t$$

where t is the base year, T_s and E_s are total tax revenues and government expenditures in year s, respectively, B_t is the government net debt in year t and r is the real interest rate. The main idea is following: all government expenditures are to be paid out of taxes at the expense of recent or future generations.

To apply the GA it is necessary to (Collado *et al.* 2004):

1) split government expenditures into government consumption (not attributed to particular individuals) and government transfers (attributable to particular individuals, including pension benefits, unemployment benefits and other transfers);

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[94] Conversely, the model proposed by Storesletten (2000, 2002) differs from the Generational Accounting in as much as both taxes paid and benefits obtained prior to the start of the model are not included, i.e. taxes are constant across agents and time: in the GA approach taxes and benefits may differ across cohorts which offers a serious advantage for this approach).

[95] See also: Auerbach, Kotlikoff and Leibfritz 1999; Kottlikoff and Raffelhueaschen 1999; Collado *et al.* 2004.

[96] Originally, the method was proposed to estimate the economic impacts of fiscal policy on different cohorts defined by birth year and gender.

2) create accounts for current and future generations assigning transfers and tax payments to every generation by age, sex and nativity (based on micro-data and aggregate data);
3) use projections to estimate future government expenditure and tax payments (population projection, fiscal projection etc.).

Accounts for current and future generations (point 2) are constructed in the following way. All government transfers and tax payments are to be assigned to individuals (generations) by age, sex and place of birth (or citizenship). The account of generation born in year *k* in year *t* is given by $N_{t,k}$ and equals the present value of the stream of net contribution (taxes net of transfers) over the remaining life span. Assuming that the maximum life span is as long as *D*, the accounts of already existing generations are $N_{t,t}$, $N_{t,t-1}$, ..., $N_{t,t-D}$ and the accounts for future generations are $N_{t,t+1}$, $N_{t,t+2}$, etc., and government consumption in year *s* is represented by G_s the above proposed equation can be rewritten as follows:

$$\sum_{s=0}^{D} N_{t,t-s} + \sum_{s=1}^{\infty} N_{t,t+s} \equiv \sum_{s=t}^{\infty} \frac{G_s}{(1+r)^{s-t}} + B_t$$

The account of a generation born in year k can be expressed as:

$$N_{t,k} = \sum_{j=\max(t,k)}^{k+D} P_{j,k}\, T_{j,k} (1+r)^{-(j-t)}$$

where $P_{j,k}$ refers to the number of individuals born in year *k* (still alive in year *j*) and $T_{j,k}$ to the average net contribution made in year *j* by a member of this generation.

Importantly, in empirical terms the left-hand-side of the main equation represents the generational accounts is estimated with reference to one of two methods. The first one assumes that the fiscal policy remain fixed for the existing generations (all burden is being put on the future generations). The second one (proposed by Auerbach and Oreopulous (2000)) assumes that fiscal policy changes immediately to absorb all possible imbalances (Collado *et al.* 2004).

Even if GA is commonly presented as an efficient method of assessment in the case of fiscal impacts of immigration, there are several points of criticism. First, benefits derived from public goods and services are excluded (e.g. health, education). Second, dynamic economic responses are ignored: changes in the structural conditions, "static" estimates based on particular assumptions are assumed to constitute lower bounds of adjustment. Third, a common discount rate is used to discount future fiscal flows (but theoretically it is possible to refer to different discount rates for different cohorts). Fourth, the whole method and its outcomes are very strongly dependent on a large set of (restrictive) assumptions. And fifth, in most cases indirect taxes are included in an unconvincing fashion (Nannestad 2006; Vargas-Silva 2013).

On top of this, Generational Accounting is a very promising and well-founded approach. It refers not only to the structural characteristics of immigrants and population dynamics but also to the welfare system as such (in fact, the assessment of the intertemporal budget constraint serves as a point of departure for further analyses). Notwithstanding, it remains highly demanding in empirical terms and controversial with respect to the assumptions made. The critical point is, however, that only the dynamic approaches (including GA) allows us to assess the population ageing in a proper way and gives insights into links between immigration and the sustainability of welfare systems.

Concluding Remarks

The effects of immigration on the welfare system of host countries are considered as one of the most controversial topics in recent migration debates. This is due to the very scale of the process (immigrants make up significant portion of population in many European countries) and due to broadly acknowledged welfare crisis in the EU. The theoretical literature presented in this paper departs from one of the basic assumptions of the welfare oriented approach in claiming that the impact of immigration will depend on whether immigrants are net contributors or net beneficiaries. Thus the main question becomes: what are the factors responsible for the fiscal position of immigrants? Answers to this question seem so very important because countries may wish to attract fiscal contributors and they may also discourage fiscal beneficiaries (as suggested by DeVoretz 2006). This is also important in the context of recent public discussion on that issue.

However, answering this question is not trivial in either theoretical or empirical terms. Many of the theoretical approaches presented suffer from simplistic assumptions, which mar outcomes (e.g. low skilled workers are net beneficiaries). Empirical literature reveals that the net fiscal position of immigrants depends to some extent on their socio-demographic characteristics (age, skills, marital status, family status etc.). A few of the studies assessed (e.g. Storesletten 2000) present age and skill level as the most important explanatory factors. This cannot be acknowledged in general terms. Instead, what really matters is, first, the institutional framework at destination. Comparison of the welfare outcomes of immigrants in the UK and traditional immigration countries, on the one hand, and Nordic countries, on the other, shows that the efficiency of labor market absorption and the structure of the welfare system matters a lot. Thus the problem often lies not necessary in immigration itself but rather in the construction of the welfare system. This is responsible for weak incentives to be economically active and also for the creation of entry barriers to immigrants into the labor market through upward pressure on minimum wages. Second, the structure of immigration is also critical (and is also shaped by the structure of the welfare system). The same refers to migration strategies.

In general terms, we could support Coleman and Rowthorn (2004) saying that the net fiscal effects of immigration are strongly structure-dependent and rather small (or even negligible – normally within the range of +/- 1 per cent of the GDP). But, in fact, we would claim that in many cases these impacts – particularly those related to the welfare system – are not negative, but rather positive. This is also shown by recent analyses presented in OECD (2013). With respect to this issue we suggest that dynamic approaches are more productive. In a future-oriented perspective immigration is commonly presented as beneficial and this is mostly due to relatively favorable age structures of immigrants but it is due also to their lower pension costs. This kind of approach is also better founded than the static one because a large share of all government expenditures are age dependent and due to the fact that this structure changes over time. The static approach says little about the net public effects of immigration over the whole lifetime of members of particular group.

A review of the theoretical and empirical literature concerning the effects of immigration on welfare reveals a number of issues that are important in the context of policy making. First, many European countries will need more immigrants to sustain their welfare systems: for example, Spain. Second, immigration policies need to be more selective (and not only with respect to age and skills) if countries want to maximise positive impact of the inflow. Third, steps for legalization are critically important in improving the net fiscal position of immigrants. Fourth, labor market absorption remains one of the most important factors shaping both immigrants' well-being as well as their net fiscal contribution. Last but not least, it is necessary to improve the efficiency of welfare policies which tend to put immigrants in the "poverty trap" and not to assimilate them out of the welfare.

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