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Time-consistent Immigration Policy Under Economic and Cultural Externalities

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Time-consistent immigration policy under economic and cultural externalities

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Abstract

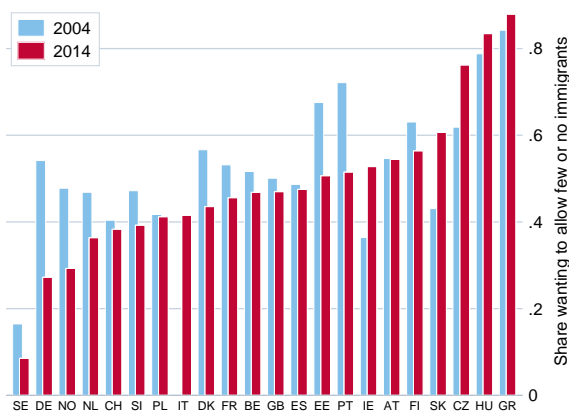
Discussions of immigration policy are typically framed in the context of their economic effects in receiving countries, notably labor market and fiscal effects. In this paper we characterize immigration policy in a richer model where migrants are, in addition, a source of cultural externalities stemming from either preferences or the functioning of formal and informal institutions in receiving countries. While in terms of pure economic effects immigrants do not generally have any more incentives than natives to allow for more immigration in the future, this is not the case when accounting for cultural externalities. Therefore, insofar as past immigrants have a voice in affecting future policies, a time-consistent immigration policy entails back-loading, as natives attempt to limit the future immigration flows and the associated cultural externality. Furthermore, natives exploit any precommitment device to limit the future opening of the borders, e.g., by building “walls” or accumulating fiscal surpluses.

Few countries have had consistent immigration policies over long periods of time. Japan, however, is one that has: it has consistently kept immigrants out throughout its history. (Sowell, 1996, p. 44)

1 Introduction

Surveys of European voters’ attitudes towards immigration reveal large potential support for restrictive immigration policies, with sizable heterogeneity across countries and over time. Figure 1 illustrates using data from the European Social Survey (ESS). Native individuals are asked to what extent they think their country should allow immigrants to come and live there. The fraction of respondents who answered “few” or “none” can be taken as a rough indicator of the potential support for restrictive immigration policies. The Figure displays this fraction in waves 2004 and 2014 for 22 countries. The population-weighted average was 51.1% in 2004 and 43.9% in 2014. Countries such as Sweden and Germany appear more open, and progressively more so over the past decade, with only 8.5% and 27.2% of respondents, respectively, in the 2014 wave wanting few or no immigrants. At the opposite side of the spectrum, in Hungary and Greece the fraction favoring a restrictive immigration policy has increased since 2004, and in the 2014 wave it was as large as 83.4% and 87.9%, respectively.

Figure 1: Share potentially favoring restrictive immigration policies in Europe



Notes: The figure shows, for 22 European countries, the fraction of respondents in the 2004 and 2014 waves of the European Social Survey (ESS) who stated that their country should allow “few” or “none” immigrants to come and live there, as opposed to “some” or “many”. Sampling weights are applied. For Greece, Italy, and Slovakia, this information is not available in the 2014 wave of the ESS, and it is replaced by the most recently available data (2010 for Greece, 2012 for Italy and Slovakia).

While economic analyses suggest that the welfare gains from an “open borders” immigration policy are relatively large (e.g., Freeman, 2006; Clemens, 2011; Kennan, 2013), the widespread popular opposition to these policies may reflect the perceived or actual impact of migrants on the labor market and welfare system of receiving countries, coupled with the difficulty in implementing mechanisms that redistribute the large welfare gains generated by an open immigration policy from the winners (first and foremost the immigrants themselves) to the losers (low-skilled workers and users of congestable public welfare services, possibly).¹

¹ Auctions to allocate employment permits to employers and work permits to those immigrants who can contribute the most to economic activity in a specific country is one such mechanism (Peri, 2012).

Without disputing this argument, we take seriously the possibility that the opposition to open borders might also be due to a perceived, large negative cultural externality that immigration imposes on natives, and we present in this paper a theoretical study of immigration policy where immigrants affect natives via three channels: labor market outcomes, congestable public goods, and cultural externalities.² The model is intentionally simple, and it is meant to illustrate in a transparent way the consequences of cultural concerns for our understanding of natives' aversion to open borders in many countries. Therefore, cultural externalities are at center stage in our model. We posit that this class of external effects arises from different channels (direct and indirect preferences, functioning of informal and formal institutions), and we show that they induce natives to oppose a welfare-improving open immigration policy even in the absence of any labor market or fiscal impact. Furthermore, it turns out that the presence of cultural externalities makes immigration policy time-inconsistent, despite individual preferences being not necessarily so. This time-inconsistency induces natives, at the outset of the process of opening borders, to oppose immigration flows more strongly than they would if the government had commitment over its future immigration policy. In other words, even if it's costly to keep immigrants out, natives want to limit the flow because they perceive a negative impact of immigrants carrying a different cultural identity, and they fear that the immigration flow and the associated external effect on them will be self-reinforcing due to the social, political and economic participation of immigrants giving them a direct or indirect voice in immigration policy. The underlying time inconsistency problem also induces a demand for commitment devices by natives, anything that may increase the cost of admitting migrants in the future (or, equivalently, reduce the cost of keeping them out). One such strategy is building "walls". A more interesting strategy analyzed in this paper is a tight fiscal policy.

Our message is that a deeper understanding of the nature and consequences of the cultural externalities generated by immigration helps gaining deeper insights about immigration policy. We convey this message in various steps. [Section 2](#) summarizes the state of the art about the labor market and fiscal effects of immigration, as well about cultural externalities. Data from the ESS is analyzed in this Section to show how perceived labor market and fiscal effects diverge from estimated effects found in the literature, and to suggest the possibility that perceived economic effects may be at least in part a reflection of cultural concerns. In [Section 3](#) we build a model formalizing such cultural concerns and featuring the labor market and the congested public good channels in a stylized way. Immigration policy is then characterized in such a model. [Section 4](#) concludes.

² Other channels are possibly relevant, such as the perceived impact of immigration on crime rates (see [Bell and Machin, 2013](#) for a review). These other channels are not considered here.

2 Three channels

2.1 Labor market channel

Despite a massive empirical literature, there is no consensus among economists about the impact of immigration on the labor market outcomes of different workers. One view is that immigration to the US over the past 30 years has reduced the wages of native workers, with larger effects for low-skilled individuals, in the short run but also in the long run (e.g., [Borjas, Friedman, and Katz, 1997](#); [Borjas, 2003](#); [Borjas, 2014](#) offers a comprehensive summary of this view). A contending view is that the long-run impact of immigrants on the wages of natives is positive both in the US and the UK ([Ottaviano and Peri, 2012](#); [Manacorda, Manning, and Wadsworth, 2012](#); [Card, 2009](#) summarizes this alternative view). A somewhat intermediate view is that the overall impact of immigrants on wages is negligible but such impact is heterogeneous at different points of the wage distribution: negative at lower quantiles, positive at upper quantiles ([Dustmann, Frattini, and Preston, 2013](#)).

Part of the disagreement is due to divergence of opinions about what the relevant measure of immigration is, i.e., how one should measure the relevant immigration inflow. For instance, [Card and Peri \(2016\)](#) show that if one uses the shift in the supply of labor to a particular skill group accounted for by immigrants, then the negative correlations between immigration and natives' wages reported by [Borjas \(2014\)](#), who uses instead the share of immigrants or the change in this share, vanish. There is no convergence of opinions on this matter. Apart from this possibly minor measurement issue, there are three more fundamental reasons behind the disagreement ([Card, 2012](#)).

First, whether the capital stock is held constant or not. Studies allowing for adjustment in the capital stock in response to the changing skill composition of the work force tend to find no wage effects of immigration.

Second, how one classifies education groups. Studies that aggregate dropouts and high school graduates into a single high school equivalent group tend to find no wage effects.

Third, and perhaps most important, the elasticity of substitution between immigrants and natives within the same education group. The great divide in this literature, is about whether such elasticity is infinite (in which case immigrants are perfect substitutes for, and so obviously hurt, natives with similar education and labor market experience) or possibly large but finite (in which case immigrants are imperfect substitutes for comparable natives and hurt the labor market outcomes of other immigrants only). Advocates of the imperfect substitutability view point out that factors such as the inferior language and communication skills of new immigrants allow natives to specialize in occupations where such skills are im-

portant, leaving immigrants to those where these skills are less valuable. In other words, the skill set of immigrants has no close substitute in the natives: the former tend to work in niche jobs not otherwise taken up by the latter, or which natives are willing to leave. Estimating these crucial elasticities of substitution is itself tricky, and the econometric specification or even apparently minor modeling choices can make a big difference, contributing to the persistent disagreement. For instance, [Borjas *et al.* \(2012\)](#) claim that “by using a statistically valid set of regression weights and by defining the earnings of a skill group as the mean log wage of the group (rather than the unconventional log mean wage used by [Ottaviano and Peri, 2012](#)), we find that the [Ottaviano and Peri \(2012\)](#) data reveal an effectively infinite substitution elasticity.” (p. 199).

A fourth possible reason, emphasized by [Dustmann and Preston \(2012\)](#), is the misspecification implied by the downgrading process of immigrants as they enter the labor market of the host country, i.e., the possibility that immigrants and natives within the same education-experience cell are imperfect substitutes in the short run but perfect substitutes in the long run. The presence of downgrading also cast doubts on the conjecture that older cohorts of immigrants are a group with an interest to oppose increased immigration flows.

There is no convergence of opinions on these issues either, and the jury is still out. This conclusion is based on studies of labor markets in the US and the UK, which are similar in many respects but which are different from labor markets in continental Europe. Also, the skill composition of the US and the UK labor force, as well as the composition of the immigration flows resulting from self-selection of immigrants differs from continental Europe. This suggests caution when extrapolating results for the US and the UK to other labor markets. However, the theoretical and methodological issues arising from studies of the US or the UK are general. Moreover, [Docquier, Ozden, and Peri \(2014\)](#) provide a consistent set of model-based estimates of the impact of immigration on natives’ wages and employment for a large group of OECD countries: qualitatively, results for the US and the UK extend to the bulk of the OECD group, although there is interesting heterogeneity.

2.2 Congested public good channel

The fiscal effects of immigration are no less elusive than the labor market effects. To fix ideas, suppose that a congestable public good is produced by the government under constant returns to scale by means of inelastically supplied inputs. Let the per-capita amount of the public good consumed at time t be denoted g_t , and consider a budget balanced stationary economy at time $t - 1$, before opening of the borders to immigration. Suppose now that a flow m_t of immigrants (normalized so that it expresses a population fraction) is allowed into

the country, and that immigrants contribute a per-capita amount τ_t^m to the public good, while the contribution of natives remains unchanged.³ Then,

$$g_t = \frac{g_{t-1}}{1 + m_t} + \frac{m_t \tau_t^m}{1 + m_t}.$$

Trivially, if $\tau_t^m = g_{t-1}$ then $g_t = g_{t-1}$ and there is no external effect. That is, if new immigrants contribute a per-capita amount equivalent to the per-capita public good enjoyed by residents before their arrival, then immigration is fiscally neutral.⁴ This is a brutally simplified version of the general framework illustrated by [Preston \(2014\)](#). The relevance of the public good channel depends on the empirical sign and magnitude of the appropriately measured net fiscal contribution of immigrants, and even this simple example raises issues in this respect. For instance, the difference $\tau_t^m - g_{t-1}$ is the average net fiscal impact of the new immigrants in period t that is relevant for previous residents. The corresponding quantity that is relevant for the public budget, though, is $\tau_t^m - g_t$. Moreover, these are static (period t) quantities. The net fiscal impact of the new immigrants is the discounted present value of these period impacts, over the expected duration of their stay. Therefore, estimating the net fiscal impact of immigrants raises a number of methodological issues, and until recently no conceptual framework was available. A framework was first provided by [MaCurdy, Nechyba, and Bhattacharya \(1998\)](#), who made important points for an appropriate estimate.

First, estimating the net fiscal impact of immigrants requires a multi-period, multi-generation setting because taxes paid and the use of social services unfold over time, and so they depend on age and other time-varying, uncertain factors such as family composition, health status, employment status, income. Static estimates based on the net contribution of immigrants in a given year are misleading, especially if one uses past cohorts of immigrants to evaluate the impact of new cohorts, which may have different characteristics. A related point is that the evaluation of the education component of the net fiscal benefit (educating the children of immigrants) is very tricky, because of its investment component and the disagreement among scholars about the value added of education spending.

Second, the definition of costs and benefits to be used in the calculation depends on whether one is evaluating the net fiscal benefit to the government or to native taxpayers. For instance, in the first case when evaluating fiscal benefits, tax incidence is irrelevant and what matters is the impact on tax revenues. Not so in the second case. A related point is

³ Similarly, we could consider the situation where immigrants' and natives' contributions are the same but their relative consumption of the public good differs.

⁴ Notice that we are implicitly assuming here that the tax contributions of immigrants are not diverted from public good provision by the government. Whether they are or not is a political economy issue, not an effect of immigration per se.

that the net fiscal impact is different at different levels of government, e.g., central vs local.

Third, estimates of the net fiscal benefit from immigration may vary greatly depending on assumptions about: the degree to which government services are subject to congestion; the interest rate on additional public debt; the marginal cost of providing government services; the consumption and saving behavior of immigrants relative to other residents; the growth rate of the immigrant population across the different demographic and labor market groups; the expected duration of immigrants' stay.

A recent overview of existing estimates in the light of some of these issues can be found in [Vargas-Silva \(2014\)](#), who emphasize the consequences of using a static or a dynamic model, and [Preston \(2014\)](#). [Liebig and Mo \(2013\)](#) provide, to the best of our knowledge the only existing comparative analysis of the net fiscal impact of immigration for European OECD countries. The drawback of this study is that it employs a static accounting framework. Nonetheless, the pattern emerging from this research effort is that the net fiscal impact of immigrants may be positive or negative, but it is small relative to GDP, and essentially zero, on average, across European countries. This zero average hides heterogeneity indicating that immigration is more costly for some European countries than others, suggesting that transfers within Europe neutralizing the net fiscal impact of immigrants are possible, in principle. [Liebig and Mo \(2013\)](#) report that the substantial heterogeneity underlying the negligible average effect across European countries reflects both the different generosity of the respective welfare systems and the different composition of the immigrant population in different countries (e.g., immigrants attracted by labor market prospects vs refugees), although the main driver is the composition mechanism. That is, the different net fiscal impact of immigrants in Europe reflects more the taxes they pay than the benefits they receive in different countries. This observation is consistent with the fact that empirical analysis does not provide strong support for the (theoretically appealing) "welfare magnet" hypothesis ([Borjas, 1999](#)). Reviewing the evidence about welfare benefits as driving self-selection of immigrants, [Preston \(2014\)](#) concludes that "while several studies have found evidence linking welfare to immigrant selection in particular cases, this is only one among several factors influencing migration decisions and no uniform picture emerges of relative welfare dependency among immigrants." (p. F576). That is, there seems to be no important or at least consistent self-selection of immigrants in response to the different generosity of welfare systems across different locations. Moreover, like for the labor market impact of immigrants, mechanisms exist even for a single country to internalize the externalities arising from congestion of public goods. For instance, the eligibility of immigrants for several means-tested public programs is restricted in the US ([Wasem, 2014](#)).

2.3 Cultural externalities channel

Natives may care about the cultural composition of their country for a variety of reasons, and an inflow of immigrants carrying a distinctive cultural identity different from the natives' increases the cultural heterogeneity of the country and generates a cultural externality. Similarly, immigrants care about this same cultural composition and they are also affected by the arrival of other immigrants. Several such reasons are emphasized in the literature, as reviewed in [Bisin and Verdier \(2011\)](#).

First, direct and indirect preference effects. A direct preference effect on natives occurs because of pure cultural intolerance; for example, the utility of a native may be decreasing in cultural heterogeneity because of a pure distaste for it. An indirect preference effect occurs when native parents are biased towards the native culture in the process of building their offspring's identity due to imperfect empathy ([Bisin and Verdier, 1998](#)), whereby native parents evaluate their offspring's outcomes through their own preferences. This form of paternalistic altruism induces preferences over the cultural composition of one's community, because such composition has a bearing on the process of cultural socialization of children and, possibly, grandchildren in a context in which the socialization technology available to parents takes as inputs their own effort and societal effects. For example, immigration affects the cultural composition of schools and neighborhoods, in a context where peers matter in the development of a child's identity. This "oblique" socialization mechanism implies a negative externality for parents of a certain cultural type when their children are exposed to a different type. Another example is the marriage market, whose composition is affected by the presence of immigrants. Heterogamous marriages (as opposed to homogamous ones) are associated with different socialization technologies because in mixed marriages the socialization efforts of parents work in opposite directions ([Bisin and Verdier, 2000](#)). This "vertical" socialization mechanism implies a negative externality if it increases the likelihood that one or one's children end up in a heterogamous marriage. Similarly, previous immigrants may instead value positively the arrival of more immigrants of the same type (e.g., ethnic or religious group) because the presence of a larger community sharing their own cultural identity facilitates the process of socialization of their own children via both oblique and vertical socialization. The cultural externality is positive, for them.⁵

Second, informal and formal institutional effects. An efficient institutional system optimally trades off informal and formal institutions. Informal institutions (e.g., reputational

⁵ Whether a larger or smaller cultural group of one's own type increases or decreases parents' socialization effort depends on whether the socialization technology exhibits cultural substitution (cultural distinction) or cultural complementarity, i.e., whether minorities, other things equal, socialize more or less intensely their children. As a consequence, these mechanisms depend on the level of segregation and discrimination of immigrants.

concerns facilitating the enforcement of contracts or virtuous forms of social control preventing crime) are relatively inexpensive but require civic capital, i.e., “persistent and shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities” (Guiso, Sapienza, and Zingales, 2011, p. 419). Formal institutions (e.g., the political and judicial systems) are relatively expensive but they, too, require civic capital to work effectively (Putnam, 1993). It has been argued that an increase in ethnic and cultural heterogeneity, like the increase that would follow from a large influx of immigrants of a different ethnic group from the majority, may lead to a reduction in the stock of civic capital because trust, ability to cooperate, and shared norms are lower in heterogeneous communities (Alesina and La Ferrara, 2002, 2005). Like the preference effects, this cultural externality arising from institutional effects is negative for the natives, who own the stock of civic capital at the baseline, pre-immigration state, but positive for immigrants, who build more of their own civic capital as more immigrants of the same type enter the economy.

Dustmann and Preston (2007) and Card, Dustmann, and Preston (2012) provide persuasive evidence that the cultural externality channel is relevant. These authors estimate on ESS and British Social Attitudes Survey data, respectively, empirical models identifying the effects of immigration on wages, welfare provision or net fiscal contribution, and cultural identity (or “compositional amenities”) and conclude that the perceived labor market and the net fiscal impact of immigrants are of second-order importance in explaining attitudes towards immigration and, therefore, support for a restrictive immigration policy.

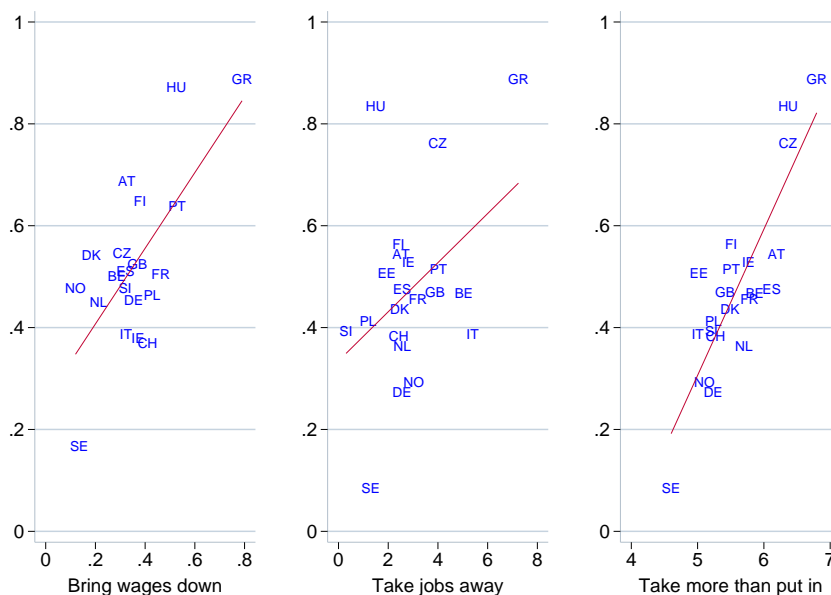
2.4 The three channels in survey data

To corroborate the presumption that cultural externalities play a key role in shaping immigration policy, we turn again to the ESS. As it turns out, while the perceived labor market and fiscal effects of immigrants are related to voters’ attitudes towards an open immigration policy, they are less related to estimated effects and more to various different cultural attitudes which directly and indirectly affect the predisposition towards immigrants. In other words, the frequently observed opposition to immigration, often justified in terms of its perceived economic effects, might be motivated in large part by its cultural effects. The remainder of this Section provides evidence supporting this conclusion. It is this evidence that justifies a theory of immigration policy centered around the notion of cultural externalities.

The ESS allows us to gauge at the perceived labor market and fiscal effects of immigrants. The 2002 wave included in fact a question on how much a respondent agreed or disagreed with the statement that “average wages and salaries are generally brought down by people coming to live and work” in the respondent’s country. All waves, instead, ask for the degree

of agreement with the statement that “people who come to live here generally take jobs away from workers,” and also asked the following question: “Most people who come to live here work and pay taxes. They also use health and welfare services. On balance, do you think people who come here take out more than they put in or put in more than they take out?”. In Figure 2 we plot the cross-country relationship between each of these measures of perceived economic effects of immigrants with the share stating that their government should allow few or no immigrants in the country in that same year (horizontal axis). All these relationships are strong and positive.

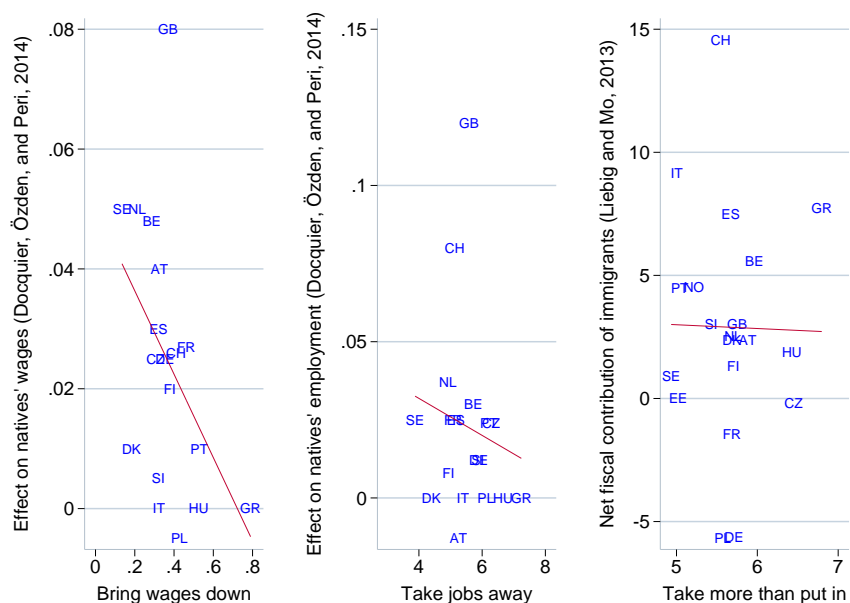
Figure 2: Share favoring restrictive immigration policies vs. perceived effects of immigrants.



Notes: The figure plots the fraction of respondents in the ESS stating that their country should allow “few” or “none” immigrants to come and live in their country (vertical axis) against the share of respondents believing immigrants bring wages down (2002 wave), agreement with the statement that immigrants take jobs away, and agreement with the statement that immigrants net fiscal contribution is negative (2014 wave, 2002 for Italy and Greece). Linear fit superimposed. Sampling weights are applied.

The actual cross-country economic effects corresponding to the perception evoked in the ESS survey are difficult to identify. Nonetheless, for the labor market effects, [Docquier, Ozden, and Peri \(2014\)](#) provide a set of model-based, mutually consistent estimates of the effects of immigration on natives’ wages and employment for a large group of OECD countries. As for the fiscal effects, [Liebig and Mo \(2013\)](#) estimate the net fiscal contribution of immigrants in 2007-2008 in a static framework (see [Section 2.2](#)). The cross-country correlation between perceived and estimated effects is illustrated in [Figure 3](#). Although for the labor market effects the correlation has the “right” sign, in most countries the wage and employment impacts of immigrants are estimated to be positive, contrary to natives’ perceptions of negative effects. For the fiscal effects, instead, there is no correlation.

Figure 3: Actual vs. perceived labor market and fiscal effects of immigrants.

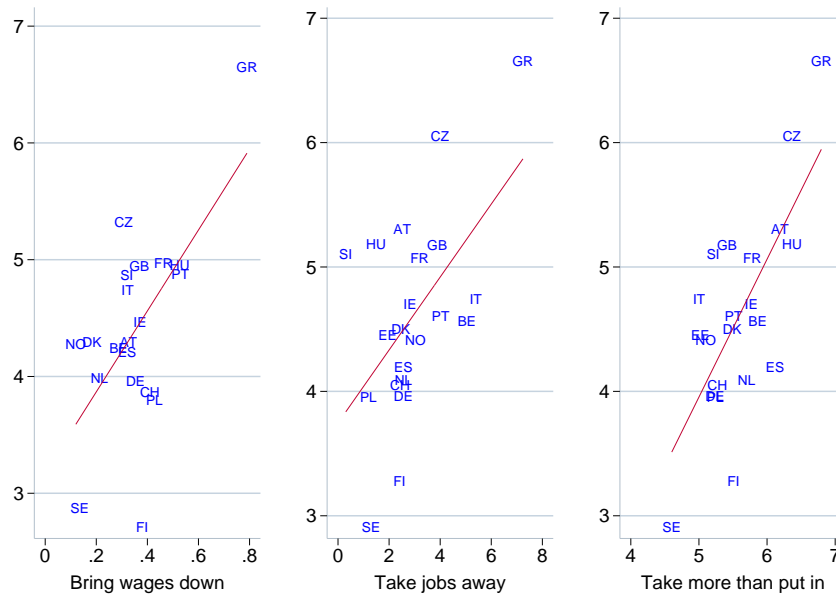


Notes: The figure relates the perceived labor market and fiscal effects of immigration (horizontal axis, as in Figure 2) and the actual effects as estimated by Docquier, Ozden, and Peri (2014), percentage effects, and Liebig and Mo (2013), thousand of euros. Linear fit superimposed. Sampling weights are applied to ESS data.

Taking the estimated effects at face value, how can we explain the stark discrepancy between perceptions and reality? One possibility is that people’s perceptions are largely imprecise. Estimates of economic effects certainly are. Moreover, voters’ preferences over immigration should be driven by the availability and effectiveness of the appropriate redistributive mechanisms rather than average gains and losses. Another possibility is that the positive correlations displayed in Figure 2 may reflect a justification of one’s prejudice reflecting motives that are not strictly economic. For instance, a respondent who is intolerant towards immigrants because of cultural or ethnic reasons may have persuaded himself (or report to the interviewer, as a justification) that immigration has adverse economic effects. Some evidence in favor of this second possibility can be found in the ESS. We offer here three pieces of evidence.

The first is Figure 4, which plots the average agreement (on a 0-10 scale) with the statement that the “country’s cultural life is undermined by immigrants” (vertical axis) against the perceived economic impact of immigration. The cross-country correlation is neat. One’s concern about “cultural life” is a particular aspect (not very well defined, admittedly) arguably bearing little connection with the labor market or fiscal impact of migrants. Therefore, the positive correlation displayed in Figure 4 is most likely spurious, a pattern pointing to the possible importance of cultural externalities.

Figure 4: Concern over cultural impact of immigration vs. perceived effects of immigrants.



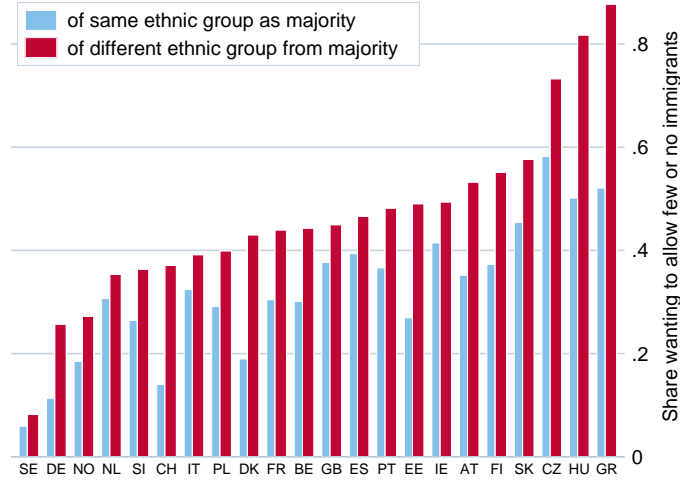
Notes: The figure plots the average degree of agreement (0-10 scale) with the statement that immigrants “undermine country’s cultural life” (vertical axis) against the share of respondents believing immigrants bring wages down (2002 wave), agreement with the statement that immigrants take jobs away, and agreement with the statement that immigrants net fiscal contribution is negative (2014 wave, 2002 for Italy and Greece). Linear fit superimposed. Sampling weights are applied.

A second piece of evidence consists in the expressed preference for a restrictive immigration policy with respect to the ethnic origin of immigrants. Indeed, the survey question underlying Figure 1 is asked separately for “immigrants of same race/ethnic group as majority” and “immigrants of different race/ethnic group from majority”. The respective shares of respondents stating that their country should allow “few” or “none” of a specific type of immigrants to come and live in the country is displayed in Figure 5 for year 2014. The population-weighted average fractions across the 22 countries were 31.1% for immigrants of the same group as the majority, and 42.2% for immigrants of a different group, a substantial difference suggesting that the cultural identity of migrants matters per se.

Third, further suggestive evidence is provided by the relation between one’s attitude towards immigration and distinctive cultural traits such as generalized trust (the belief that most people can be trusted) and religiosity. We used the ESS trust measure (0-10 scale), and a dichotomic measure of religiosity found in the ESS, namely whether an individual reports affiliation with a religious denomination, as explanatory variables in individual-level regressions where the dependent variable is a dummy indicating whether one thinks his country should allow few or none immigrants to come and live there, after conditioning on a second-degree polynomial in age, gender, marital status, education, employment status, and children in household, as well as country and year fixed effects. Results are reported

in Table 1: belonging to a religious denomination increases one’s propensity to restrict immigration by about 2 percentage points, and every additional point on the 0-10 trust scale decreases such propensity by about 3 percentages.

Figure 5: Share potentially favoring restrictive immigration policies, by type of immigrants



Notes: The figure shows, for 22 European countries, the fraction of respondents in the 2014 wave of the European Social Survey (ESS) who stated that their country should allow “few” or “none” immigrants to come and live there, as opposed to “some” or “many”, by ethnic origin of the immigrants in question. Sampling weights are applied. For Greece, Italy, and Slovakia, this information is not available in the 2014 wave of the ESS, and it is replaced by the most recently available data (2010 for Greece, 2012 for Italy and Slovakia).

Table 1: Projection of attitude towards immigration on trust and religiosity

	Allow few or no immigrants		
Trusts others (0-10 scale)	-0.028** (0.002)		-0.029** (0.002)
Belongs to religious denomination		0.018+ (0.010)	0.022* (0.009)
Constant	0.563** (0.039)	0.382** (0.038)	0.548** (0.038)
Observations	227,789	227,789	227,789
Individual covariates	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes

Notes: Robust standard errors in parentheses, clustered at the country level. + significant at 10%; * significant at 5%; ** significant at 1% or better.

3 A simple model

Taking stock of the labor market, fiscal, and cultural aspects of immigration discussed above, we now introduce a simple theoretical model whose objective is to frame a more formal discussion of the effects of immigration and to provide a tool for the study of immigration policies when cultural externalities matter. While the model can be easily extended to perform quantitative exercises, we intentionally present it here in its simplest, bare-bone form to strip down the analysis to its fundamental theoretical components.

3.1 Setup

The economy is populated by a group of natives who live for three periods, $t = 0, 1, 2$. The native population is constant over time and is normalized to 1. At time $t = 0, 1$ a flow of m_t immigrants (a population fraction) are admitted into the economy. The total population in the economy at time t is denoted $p_t = 1 + \sum_{\tau=0}^t m_\tau$. Let q_t denote the fraction of immigrants.

Border enforcement is costly, i.e., it is costly to keep those migrants willing to enter the country (a decision that we take as given) outside the borders. For instance, a restrictive immigration policy may result into attempts to enter the economy in an unauthorized way, which is costly to contain. Let $\alpha(m_t)$, a decreasing concave function, denote such costs.

The labor market is characterized by inelastic labor supply and an elastic labor demand function $w_t = w(p_t)$, where w_t denotes the wage rate at time t . The equilibrium w_t decreases in m_t , so negative labor market effects of immigration (channel 1) are embedded in our model. Natives and immigrants have identical preferences over a private and a public good. Let c_t and g_t denote, respectively, the per-capita consumption of private and public goods. The public good is provided by means of exogenous public expenditure γ_t , financed by lump-sum taxes τ_t on both natives and immigrants. The government budget is balanced at each time t , i.e., $\gamma_t = \tau_t$. We will allow for accumulated deficits and surpluses at the end of [Section 3.5](#).

Preferences over goods are represented by a strongly monotonically increasing and strictly concave function $u(c_t, g_t)$ which agents maximize in each period t subject to the budget constraint and a public good provision constraint:

$$\begin{aligned}c_t &= w_t - \tau_t, \\g_t &= \gamma_t - g(p_t).\end{aligned}$$

Function $g(p_t)$ is increasing, with $g(0) = 0$, and captures a congestion effect arising, for instance, from decreasing returns in the production of the public goods. Therefore, negative fiscal effects of immigration (channel 2) are embedded in our model as well.

As for cultural identity (channel 3), natives are characterized by a cultural trait θ^n and migrants, at arrival, are characterized by cultural trait θ^m . These traits do not change over time, but immigrants can (choose to) assimilate to the natives, in which case they acquire cultural trait θ^n . Cultural externalities are captured by a component of each agent’s preferences which depends on his/her cultural profile. The cultural component of preferences is represented by an additive indirect utility term $h(q_t; \theta^j)$, $j = n, m$, which embeds in a reduced-form way all of the cultural externalities discussed in [Section 2.3](#). That discussion implies that $h(q_t; \theta^n)$ decreases in q_t , while $h(q_t; \theta^m)$ increases in q_t , i.e., the cultural externality of immigration is negative for natives but positive for non-assimilated past immigrants. Denoting by $v(\cdot)$ the value function resulting from the maximization of $u(c_t, g_t)$ subject to the budget and public good provision constraints, preferences are represented by

$$v(w_t, g_t) + h(q_t; \theta^j), \quad j = n, m. \quad (1)$$

Notice that the component of preferences reflecting labor market outcomes and the public good is assumed to be the same for natives and immigrants, contrary to their different evaluation of the cultural composition of the economy. The assumed separability of the two components simplifies the exposition, but it is not driving the results derived below.

The cultural dynamics is represented by the population dynamics of the distribution of cultural traits,

$$q_{t+1} - q_t = f(q_t) + m_{t+1} \quad (2)$$

where the map $f(q_t)$ represents cultural identity formation. Because we have assumed that immigrants may assimilate to the host culture but natives keep their cultural trait, $f(q_t) \leq 0$ represents the (negative of the) assimilation rate of immigrants. Several micro-foundations of [Equation 2](#) ([Bisin and Verdier, 2011](#)) suggest the following function form for $f(q_t)$:

$$f(q_t) = q_t(1 - q_t)d(q_t), \quad (3)$$

where $d(q_t) \leq 0$ captures the socialization effort of immigrant parents, and is assumed to satisfy (i) $d'(q_t) < 0$ (i.e., “cultural substitution”); (ii) $d(q^*) = 0$ for some $0 < q^* < 1$ (i.e., “cultural heterogeneity”).⁶

Thus, this model features the three channels discussed above: labor market outcomes, congested public goods, and cultural externalities. To further compress the notation, we perform an innocuous change of variable (immigrant-type share q_t for population p_t) and define the *economic profile* $s(q_t) \equiv (w(q_t), g(q_t))$, with $s'(q_t) < 0$ (a reduced indirect form for the wage and public good effects of immigration) and the *cultural profile* $\Theta_t \equiv (\theta^n, \theta^m, q_t)$.

⁶ [Bisin and Verdier \(2011\)](#) summarize evidence in favor of cultural substitution and cultural heterogeneity.

3.2 Social welfare

Without explicitly specifying an institutional (e.g., voting) mechanism which delineates and implements policies, we assume that immigration policies are the result of social welfare maximization, and that immigrants' welfare is taken into account by the government for political, economic, social, or humanitarian reasons that are not specified here. Then social welfare is written as

$$S_t(s(q_t), \Theta_t) = \phi(q_t)V_t^n + (1 - \phi(q_t))V_t^m - \alpha(m_t), \quad (4)$$

where $\phi(q_t)$, an increasing function, is the weight on immigrants' welfare, and

$$V_t^j = \sum_{\tau=t}^2 v(s(q_\tau)) + h(q_\tau; \theta^j), \quad j = n, m. \quad (5)$$

We next characterize the immigration policy problem in this framework. The analysis is positive, with the government choosing the immigration flow $\{m_t\}_{t=0,1}$ and hence, effectively, the cultural composition of the population $\{q_t\}_{t=0,1,2}$.

3.3 Equilibrium immigration policy

To simplify the analysis we structure the policy problem so that the first immigrants are admitted at time $t = 0$, so that $q_{-1} = 0$, and immigration is not allowed at $t = 2$, so that $m_2 = 0$. The flow of immigrants m_t is chosen at time $t-1$ so to maximize $S_{t-1}(s(q_{t-1}), \Theta_{t-1})$. Proceeding backwards, we can describe the maximization problems whose solution gives rise to the economy's immigration policy. The *equilibrium* immigration policy is a sequence $\{m_t\}_{t=0,1}$ such that

i) At $t = 0$, given q_0 , the immigration flow m_1 maximizes

$$\sum_{\tau=1}^2 (1 - q_0) [v(s(q_\tau)) + h^n(q_\tau)] + q_0 [v(s(q_\tau)) + h^m(q_\tau)]$$

subject to

$$\begin{aligned} q_1 &= q_0 + f(q_0) + m_1, \\ q_2 &= q_1 + f(q_1). \end{aligned}$$

Let $m_1(q_0)$ denote the solution of this maximization problem.

ii) At $t = -1$, the immigration flow m_0 maximizes

$$\sum_{\tau=0}^2 v(s(q_\tau)) + h^n(q_\tau)$$

subject to

$$\begin{aligned} q_0 &= m_0, \\ q_1 &= q_0 + f(q_0) + m, \\ m_1 &\in m_1(q_0), \\ q_2 &= q_1 + f(q_1). \end{aligned}$$

Several results are obtained by studying this equilibrium immigration policy problem. They all stem from the following fundamental property we have built into the model:

The social welfare function is time-inconsistent.

Social welfare at time $t = 0$ weights the preferences of immigrants, while only the natives' preferences enter social welfare at time $t = -1$. As consequence, time-consistent immigration policy entails the natives, when choosing m_0 at time -1 anticipating the subsequent policy choice m_1 . A fundamental implication of our analysis is that

Time-inconsistency is a consequence of the cultural externality.

Absent a cultural component of preferences, it would still be the case social welfare at time $t = 0$ weights the preferences of immigrants, while only natives' preferences enter social welfare at time $t = -1$, but the welfare evaluation of the effects of future immigration would be aligned between natives and immigrants. Formally:

$$h(q_t; \theta^n) = h(q_t; \theta^m) = 0 \Rightarrow (1 - \phi(q_t))V_t^n + \phi(q_t)V_t^m = V_t(\{w_\tau, g_\tau\}),$$

a time-consistent social welfare function reflecting labor market and fiscal effects only. This is a consequence of the twofold fact that (a) new immigrants at $t = 1$ affect the labor market through the wage map $w(q_1)$, which is the same for natives and immigrants who have previously (at time $t = 0$) entered the economy; (b) congestion in public good production also affects natives and immigrants who entered at time $t = 0$ in the same way under our budget balance assumption, $\gamma_t = \tau_t$, for $t = 0, 1, 2$, combined with the assumption that natives and immigrants have identical preferences for private and public good consumption.

3.4 Commitment immigration policy

The equilibrium immigration policy in our economy is therefore different from the policy that natives would choose if the social and political process of the economy guaranteed commitment to the choices of natives at time -1 , before opening the border to immigration. To be more specific, and to characterize these differences, consider as a benchmark the immigration policy which would result under such commitment. The *commitment* immigration policy is a sequence $\{m_t\}_{t=0,1}$ such that at $t = 0$, given q_0 , the immigration flow $\{m_t\}_{t=0,1}$ maximizes

$$\sum_{\tau=0}^2 v(s(q_\tau)) + h^n(q_\tau)$$

subject to

$$\begin{aligned} q_0 &= m_0, \\ q_1 &= q_0 + f(q_0) + m_1, \\ q_2 &= q_1 + f(q_1). \end{aligned}$$

By comparing the first-order conditions of the commitment and the equilibrium policies at time $t = 0$, we can conclude that, other things equal,

**Once borders are open, immigration (m_1) at equilibrium
will be higher than at commitment.**

This is not surprising, as only the equilibrium policy (not the commitment policy) accounts for the preferences of immigrants who entered the country at time $t = 0$, and these immigrants gain (in terms of a positive cultural externality) when the fraction of immigrants in the population increases. More interestingly, it can be shown that, anticipating larger future immigration flows at $t = 0$,

The equilibrium immigration policy entails back-loading.

That is, at equilibrium natives choose a smaller flow m_0 than they would have chosen under commitment.⁷ Finally, it can be shown that, under a few regularity conditions,

**The total immigration flow at equilibrium
is higher than at commitment.**

⁷ The FOC of the commitment problem at $t = 0$ is

$$-\alpha'(m_1) + \frac{d}{dq_1} [v(s(q_1)) + h^n(q_1)] + \frac{d}{dq_1} [v(s(q_2)) + h^n(q_2)] \frac{d}{dq_1} f(q_1) = 0.$$

This is a consequence of the convexity of the border enforcement cost function, $\alpha(m_t)$, which induces a relative preference for smoothing the flows over time.

Summing-up, using superscripts E and C to denote the Equilibrium and Commitment policies, respectively, cultural externalities imply that

$$\begin{aligned} m_0^E &< m_0^C, \\ m_1^E &> m_1^C, \\ m_0^E + m_1^E &> m_0^C + m_1^C. \end{aligned}$$

3.5 Commitment strategies

The time-inconsistency of the social welfare function induces at time $t = -1$ a demand, on the part of natives, for commitment strategies, i.e., choices and distortions which would increase the cost of new immigration perceived by themselves and past immigrants at time $t = 0$. While in the bare model we are using no such strategy is available, we can envision several interesting extensions which would allow for them. We offer the reader three examples.

First, investing in irreversible border protection devices. For instance, the natives may ask the government to tax them and build a wall around the border at time $t = -1$. This is tantamount to a downward shift in cost function $\alpha(m_t)$. At that point, it is relatively inexpensive to keep immigrants out, and at the equilibrium the government will choose a low m_1 relative to what it would have chosen had the wall not being built.⁸

Defining $H(q_\tau; q_0) = q_0 h^m(q_1) + (1 - q_0) h^n(q_1)$, the FOC of the equilibrium problem at $t = 0$ is, instead,

$$-\alpha'(m_1) + \frac{d}{d q_1} [v(s(q_1)) + H(q_1; q_0)] + \frac{d}{d q_1} [v(s(q_2)) + H(q_2; q_0)] \frac{d}{d q_1} f(q_1) = 0.$$

The FOC of the commitment problem at $t = -1$ is

$$-\alpha'(q_0) + \frac{d}{d q_0} [v(s(q_0)) + h^n(q_0)] + \sum_{\tau=1}^2 \left[\frac{d}{d q_0} [v(s(q_\tau)) + h^n(q_\tau)] \right] \prod_{j=0}^1 \frac{d}{d q_0} f(q_j) = 0$$

The FOC of the equilibrium problem at $t = -1$ is, instead,

$$\begin{aligned} &-\alpha'(q_0) + \frac{d}{d q_0} [v(s(q_0)) + h^n(q_0)] + \sum_{\tau=1}^2 \left[\frac{d}{d q_0} [v(s(q_\tau)) + h^n(q_\tau)] \right] \prod_{j=0}^1 \frac{d}{d q_0} f(q_j) + \\ &\left[\sum_{\tau=1}^2 \left[\frac{d}{d q_0} [v(s(q_\tau)) + h^n(q_\tau)] - \alpha'(m_1) \right] \frac{d}{d q_0} m_1 \right] = 0 \end{aligned}$$

Note that the last line is $\neq 0$ as, because of time-inconsistency: the Envelope theorem does not apply.

⁸ A “wall” is a metaphor for any costly and hard to reverse choice making borders less permeable. In this sense, the 2016 “Brexit” was like building a wall.

Therefore

**Border policy at equilibrium
will be tougher than at commitment.**

Second, reducing the welfare weight on immigrants. For instance, the natives may ask the government to limit immigrants' political rights (such as voting rights) at time $t = -1$. This would result in a downward shift in welfare weight function $\phi(q_t)$ in Equation 4. At that point, the government admits fewer new immigrants at $t = 0$ (i.e., low m_1) than it would have done had it weighted more the welfare of past immigrants. Therefore

**Immigrants' political rights at equilibrium
will be more limited than at commitment.**

Third, engaging in a tight fiscal policy. Let's relax the budget balance assumption in every period, so that the government now can run a deficit or a surplus. It is possible to show that, in general,

**Fiscal policy at equilibrium
will entail smaller budget deficits than at commitment.**

It is worthwhile to elucidate the logic of the argument. Assume $\gamma_t = \gamma$, exogenously, for any t ; and let's maintain the assumption that natives and immigrants have to be taxed homogeneously. Consider fiscal policies in which τ_0 , the lump-sum tax to be paid by natives and immigrants alike at time 0, is chosen at time $t = -1$; while τ_1 must satisfy intertemporal budget balance, that is, $(\gamma - \tau_0)(1 + m_0) + (\gamma - \tau_1)(1 + m_0 + m_1) = 0$. When $\gamma < \tau_0$, that is, fiscal policy is characterized by a fiscal surplus at time $t = 0$, is it more costly, for both natives and immigrants entered at $t = 0$, to admit new immigrants at $t = 1$. This is because the new immigrants will participate in sharing the proceeds of the surplus at $t = 0$ by facing lower taxes τ_1 , at time $t = 1$. In other words, a fiscal surplus is a commitment device which the natives could use to restrict the incentives to open up the economy to immigration at time 1, to increase the cost of the immigration flow m_1 . This commitment device is costly, in that the fiscal surplus created at time $t = 0$ is shared with the new immigrants at $t = 1$. On the other hand, when $\gamma > \tau_0$, that is, fiscal policy is characterized by a fiscal deficit at time $t = 0$, is it less costly, for both natives and immigrants entered at $t = 0$, to admit new immigrants at $t = 1$. This is because the new immigrants will have to contribute to the re-payment of the debt contracted at time $t = 0$ by means of higher taxes τ_1 , at $t = 1$. In

other words, a fiscal deficit reduces the fiscal burden for natives and immigrants entered at $t = 0$; but, in the presence of time inconsistency, it represents a cost for the natives as it induces stronger incentives to open up the economy to immigration at time $t = 1$.

4 Concluding remarks

We have motivated and studied a model of the effects of immigration flows where cultural externalities are a key driving force, in addition to standard economic channels. We have argued that cultural effects seem central in driving the widespread popular opposition to relatively open border policies in Europe. We have then shown that cultural effects have important theoretical implications through the time-inconsistency they induce on the social and political process which determines immigration policy, and we have discussed three examples of commitment devices (border infrastructure, political rights, and fiscal policy) we should expect natives to acquire in response to such time-inconsistency. Perhaps it is no accident that these three examples correspond to heated political issues in contemporary Europe. Although the model we have studied is simple and lays no claims to being general, we believe it leads to important insights and, most important, it provides a theoretical framework for more comprehensive studies of immigration policy when cultural concerns play a primary role in shaping attitudes towards migrants in receiving countries. This seems to us a key issue the present economic and political landscape.

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