Immigration Policy and Long-Run Assimilation[*]

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****PRELIMINARY-ESTIMATION IN PROGRESS****

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Abstract

We study the migration and return decision in presence of heterogeneity in preferencence for home consumption, when both the stability of the origin country and the possibility to recover abroad are uncertain. The model shows the self-selection between temporary and permanent immigration. Restricitive immigration policies incentivize permanent migration -thus reproduction abroad. Then, we address the problem of immigrants' assimilation: as long as assimilation is an intergenerational process, immigration policies can have have very long-lasting effects. We find that restrictive immigration policies can cause lower assimilation of the future generations. This issue is more serious when the cultural distance between the sending and the receiving country is higher. Since concerns for assimilation are an important cause of closed-door policies, our findings cast some doubts over the effectiveness of such policies in the long run. We find evicence of such effects after the 1973 Anwerbestopp in Germany.

Keywords: return migration, enclaves, cultural transmission.
JEL classification: D91, F22.

1 Introduction

Migrations are one of the most compelling topics on the policy-makers agenda. As a result of increased labour market competition and concerns about terrorism, the trend of the recent legislation over immigration points to an increasing border closure (OECD 1999, 2001).

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Moreover, fears for the possible entry of terrorists have increased pressures to defend the national culture and fight both legal and illegal immigration[1].

Efforts to combat illegal immigration always came along with barriers to entry, because the latter do not eliminate incentives to emigrate: wage differentials continue to spur inflows, and macroeconomic shocks cause waves of constrained emigration. Therefore, the question one should answer is how restrictive immigration policies change the individual behavior, and what are their effects.

Simple textbook models show that migrations occur when wage differentials incentivate international labour mobility, until full convergence is achieved. Reality, indeed, is much more complicated than this: wage differentials among countries are persistent, (Lucas 1990) and there exist both inflows and outflows of migrants.

Early contributions, like Hill (1987) and, more recently, Dustmann (2000, 2001) have initiated the study of migrations as an intertemporal phenomenon: permanent migration is a corner solution, rather than the rule.

In this paper, we analyse the decision about optimal duration duration when entry to the destination country is rationed. We consider a population of potential migrants where each individual is indexed with respect to home bias. Emigration from an Origin country to a Destination country and *viceversa* may occur in each period.

In our model, there are two reasons why an individual should migrate: wage differentials and economic shocks. In the first case, the decision comes from intertemporal maximization; in the second case the agent is forced to leave her country. Shocks as wars, floods, famines, earthquakes, have always been important push factors . The recent surge in regional conflicts (ex Jugoslavia and Middle East, for instance), has generated new migration waves (for a comprehensive survey, see Chiswick and Hatton, 2002); long-term climatic changes are contributing to the desertification of vast regions, and are moving entire populations. These shocks are typical of the source countries, whose unstable economic and political environments are quite often associated to poverty and underdevelopment .

Our aim is to stress the long-lasting effects of the entry barriers adopted by destination countries. As we shall see in Section 2.1 and Section 4, current policies affect the choice between permanent and temporary emigration, generating very persistent effects. Permanent immigrants reproduce abroad, and, as long as the assimilation of their children is not immediate, reproduction is the transmission mechanism that causes current policies to affect future generations.

In their well-known contribution, Bisin and Verdier (2000) show that ethnic and religious traits can be conveyed across generations through family socialization and marital segregation decisions. With respect to the transmission of religious preferences, Bisin, Topa and Verdier (2004) prove the possibility of a steady-state equilibrium where the U.S. population is composed of a majority of Protestants and a minority of residual groups.

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[1] The most recent example is the referendum in Switzerland against the authorization for new mosques.

In the sociological literature, for example, it is known since the 1950s that the low rate of interreligious marriages would hinder the assimilation of immigrants (Herberg, 1955)[2].

Assimilation of immigrants is, indeed, a multi-dimensional process which may take several generations and is not always complete: again, Bisin and Verdier (2000) prove that a culturally heterogeneous population can well be a locally stable equilibrium. In Sociology, the concepts of "segmented assimilation" or "downward assimilation" are used to depict the possibility that many in the second and third generations from the immigrants can be incorporated into a society as disadvantaged minorities (Alba and Nee, 2003; Portes and Rumbaut, 2001).

This issue is of particular importance when we consider the widespread concern for the preservation of a country's cultural homogeneity: while the U.S. are *ab initio* a multi-cultural society, European countries are by far more homogeneous. A huge literature confirms that racials and cultural factors matter in preferences over immigration.

In their study on British data, Dustmann and Preston (2000) find that, though welfare and labor market concerns are significant, racial discrimination is by far the most important factor to explain opposition to immigration. Other authors present similar, though less extreme, results: O' Rourke and Sinnott (2004), using survey evidence for 24 countries, show that attitudes towards immigration reflect not only economic interests, but also nationalist sentiment. Gang, Rivera-Batiz and Yun (2001) find similar results for European countries. Scheve and Slaughter (2001) also find evidence for the importance of non-economic factors in the U.S.

Since socio-cultural factors matter in raising barriers to entry, we must hypothesize that the dislike for immigration is conveyed towards *non-assimilated enclaves of immigrants*. Since such enclaves are made of immigrant dinasties, we have to take into account the effect of closed-door policies over all dinasties until assimilation is achieved. Intuitively, assimilation is the more difficult the more dissimilar are culture, customs and language of the sending and receiving countries (Lazear, 1999; Kònya, 2002). In the present model, closing borders to immigrants can increase the size of the enclaves and may thus exacerbate racial tensions in the future.

We test the prediction of the model through the natural experiment occured in Germany in 1973: after the oil shock immigration was forbidden for non-EU citizen ("Anwerbestopp"). As an unwanted consequence, this law fostered family reunification and permanent immigration.

In terms of our model we expect that second-generation immigrants born after 1973 experience assimilation problems. We test this prediction using a difference-in differences approach based on European Social Survey. Our identification is based on a comparison between immigrants in Germany and similar European countries (France, Netherlands, Belgium and the UK) before and after

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[2] We refer to the Introduction of Bisin, Topa and Verdier (2001) for a survey of the sociological and economic literature about interreligious marriages.

1973.

Preliminar results suggest that assimilation along several dimensions drops for the second generation and for children who entered Germany through family reunification.

The paper is organised as follows: Section 2 develops our model and comparative statics results; Section 3 is devoted to the assimilation problem; Section 4 focuses on the long-term effect of entry rationing; Section 5 contains an analysis of the trade-off between less immigration in the current period and less assimilation in the future; Section 6 contains our conclusions.

2   The Model

We use a simple two-period, two-country model with risk-neutral agents. Countries are an origin -or source- country (O), and a destination country (D). D is a developed country, and O is a developing country. Each individual is endowed with a unit of labor she supplies inelastically in each period in order to produce and consume a storable good. In O a unit of labour produces one unit of good, whereas in D the same unit of labour produces $\omega_D > 1$. For simplicity, O and D cannot trade.

This difference in productivity makes it possible to increase consumption by emigrating to D.

As a consequence, nobody would have any incentive to stay in O. This is indeed the case if migration were determined only by economic factors. With respect to this issue, we must then explain why current emigration flows are very *low*, given the existing wage differentials.

For example, Ramos (1992) shows that only 25% of Puerto Ricans migrate to the US even though they are U.S. citizens. According to Borjas (1999) this proves that "important non-economic factors help to restrain migration flows". These restraining factors include differences in language and culture and the psychic costs of entering an alien environment. Therefore, in order to emigrate, workers need a wage differential sufficient to compensate the non-economic costs of migration.

We take into account the latter effect by introducing a home bias. This assumption is common in emigration models[3]. According to this hypotesis, the utility of consuming at home is higher than the utility of consuming abroad.

Since we are considering the whole population of O, it is quite natural to introduce some heterogeneity in the home bias. Therefore, we assume that this bias is captured by a parameter $\theta_j \in (1, \theta_{\max}]$ (with $\theta_{\max}$ arbitrarily high). When θ_j is close to unity the agents decide their location only on the basis of the wage differential, but for some individuals θ_j is high enough to offset any economic incentive.

Therefore, for a j, individual utility is multiplied by θ_j when consuming in O : $u(c) = \theta_j u(c_O)$. In D, instead, utility is simply $u(c) = u(c_D)$.

We adopt a linear utility:

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[3] (See, for example, Dustmann 1997; Dustmann and Kirchkamp 2002)

$$
\begin{aligned}
u(c_D) &= c_D \\
u(c_O) &= \theta_j c_O \\
\theta_j &\sim f(\theta_j), \quad \theta_j \in (1, \theta_{\max}]
\end{aligned}
\tag{1}
$$

Moreover, as we argued in the Introduction, macroeconomic shocks are another major cause of (forced) migration: instability of the economic environment can overcome any home bias.

Floods, famines, wars, political turmoils are some examples of these shocks[4]. We rule out such shocks in D, which enjoys a comparatively highly stable economic environment. As a consequence, the state of the world in O is good with a probability p and migration is voluntary, whereas with a probability $q \equiv (1 - p)$ constrained migration arises. This happens because, by migrating, individuals can get a positive expected utility, while in O their utility would be zero.

We depict this situation assuming that in O a shock may drive to zero the utility of consumption. The expected utility of consuming at home is, then,

$$
E[u(c_O)] = p\theta_j c_O
\tag{2}
$$

where p is the probability of the "good" state of nature, and q is the probability of the "bad" state of nature.

For simplicity, we assume that an individual migrates voluntarily only when young. This assumption greatly simplifies the algebra.

Consider now that restrictive immigration policies work via entry rationing in D. Since the number of attempts to enter D is finite by assumption, no individual is certain of succeding in crossing the border. The probability of a successful migration is $\pi \in (0, 1]$.

π captures the degree of border closure chosen by the destination country. $\pi = 1$ means total freedom of entry; when π approaches 0, it is increasingly difficult to enter.

A possible migrant must choose where to live in both periods. The possible choices are: staying home both periods (O-O), staying abroad one period and returning home (D-O), staying abroad both periods (D-D). We have thus to rank these choices.

The timing of the decision is as follows: first, the nature reveals the state of the world in O, then the agent decides whether to migrate. Notice that the bad state of nature generates a migration wave.

In D, there are no restrictions to re-migrate to O, but the decision is taken without observing the state of the world in O. This assumption may seem too strong, but it is only used to simplify our model: with three periods there would be no need of informational asymmetries between O and D, but we'd

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[4]Think, for example, to the recent surge in regional conflicts which has pushed thousands of refugees towards the EU.

have to compare 9 possible strategies, with a substantial analytic complication and without changing our results[5].

We are now going to compare the consumer's utility under the different migration choices[6]. The expected utility of the different strategies are $E\left[u\left(O-O\right)\right]$, $E\left[u\left(D-D\right)\right]$, $E\left[u\left(D-O\right)\right]$, where *O-O*, *D-D* and *D-O* indicate the country where the individual lives in period one and two respectively.

Given the simple structure of the model, the utility of a permanent migrant is simply $2\omega_D$.

$$[u\left(D-D\right)] = 2\omega_D \tag{3}$$

A consumer who stays in O both periods has to solve

$$
\begin{aligned}
MaxE\left[u\left(O-O\right)\right] &= \theta_j(c_{1O} + pc_{2O}) + q\pi c_{2D} \tag{4}\\
s.t. \quad c_{1O} &\leq 1 - s_O\\
c_{2O} &\leq 1 + s_O\\
c_{2D} &\leq \omega_D + s_O\\
c_{1O},\ c_{2O},\ s_O,\ c_{2D} &\geq 0,
\end{aligned}
$$

Where
$c_{1i}, \quad i = O, D$ is the first-period consumption in country i;
$c_{2i}, \quad i = O, D$ is the first-period consumption in country i;
$s_{i,} \quad i = O, D$ are savings in country i.
A returning migrant computes

$$
\begin{aligned}
\max E\left[u\left(D-O\right)\right] &= c_{1D} + p\theta_j c_{2O} + q\pi c_{2D} \tag{5}\\
s.t. \quad c_{1D} &\leq \omega_D - s_D\\
c_{2O} &\leq 1 + s_D\\
c_{2D} &\leq \omega_D + s_D\\
c_{1D},\ s_D,\ c_{2O},\ c_{2D} &\geq 0
\end{aligned}
$$

Since we use risk-neutral individuals, we have corner solutions: the first-period consumption is either 0 or ω_i.

First of all, remark that there is no incentive to save when one lives both periods in O: the only way to increase total consumption in O is to bring savings from D.

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[5] We want to study the effect of the migration policy on both inflows and outflows of migrants. Imagine a three-period model, and consider a successful migrant willing to return after the first period: if the state of the world in O is good, return is possible. However, the possibility of a shock in the third period and the uncertainty about the ability to recover abroad may dominate the incentive to return. In this case one can compute the critical values of θ as well. To preserve simplicity, we have preferred a two-period model.

[6] For simplicity, agents do not discount the future.

In the Appendix we show that a temporary migrant will always save her first-period income. Thus, we have to rank the agents' preferences with respect to the strategies *D-D*, *O-O* with no saving and *D-O* with saving.

In the Appendix we prove that two cases are possible: in the first case, the population of *O* is partitioned between temporary migrants and permanent migrants; in the second case the population is partitioned between permanent migrants and non-movers.

To rank the migration choice intuitively, it is useful to introduce the following inequality:

$$p\omega_D \geq 1 \tag{6}$$

As we show in the Appendix, when (6) holds any individual has an incentive to migrate at least for one period; when the sign of the inequality is reversed there is either permanent emigration or no emigration at all. In the first case, we can write the following Proposition:

Proposition 1 *(Permanent migration and return migration): when $p\omega_D \geq 1$ the population of O is partitioned between permanent migrants and temporary migrants. Given*

$$\theta^* \equiv \frac{2\omega_D(1-q\pi)}{p(1+\omega_D)} \tag{7}$$

emigration is permanent for $\theta_j < \theta^*$ and temporary for $\theta_j \geq \theta^*$

Proof. see the Appendix. ■

In principle, according to the individual preferences, we can find permanent migrants, temporary migrants and non-movers. However, when $p\omega_D \geq 1$ there are no non-movers (see the Appendix).

It is important to notice that $\frac{\partial \theta^*}{\partial \pi} \leq 0$, i.e. that border openness incentivates return migration. We will analyse extensively the policy implication of this finding in Section 2.1 and Section 4.

When (6) does not hold, we need a new Proposition:

Proposition 2 *(No return migration): when $p\omega_D < 1$ the population of O is partitioned between permanent migrants and non-movers. Given*

$$\theta^A \equiv \frac{\omega_D(2-q\pi)}{1(1+p)} \tag{8}$$

when $\theta_j < \theta^A$ emigration is permanent, and when $\theta_j \geq \theta^A$ there is no voluntary emigration.

Proof. see the appendix. ■

This means that when $p\omega_D < 1$ there is no incentive to temporary migration: the expected utility of a temporary migrant is lower with respect to a non-mover. In other words, expected returns to savings are negative. As a consequence, either emigration is permanent or there is no emigration at all.

However, constrained migration and return migration after a shock are still possible.

Notice that in this case we have $\frac{\partial \theta^A}{\partial \pi} \leq 0$ as well.

Having found the critical values θ^* and θ^A, it is easy to get the number of permanent migrants, returining migrants and non-movers: given a distribution $f(\theta_j)$, when $p\omega_D \geq 1$, we observe permanent migrants and returning migrants:

$$PM = \int_0^{\theta^*} f(\theta_j) \, d\theta_j \quad \text{(permanent migrants)} \tag{9}$$

$$RM = \int_{\theta^*}^{\theta_{\max}} f(\theta_j) \, d\theta_j \quad \text{(returning migrants)}$$

Case (a)

whereas, when $p\omega_D < 1$, we have only permanent migrants and non-movers:

$$PM = \int_0^{\theta^A} f(\theta_j) \, d\theta_j \quad \text{(permanent migrants)} \tag{10}$$

$$PD = \int_{\theta^A}^{\theta_{\max}} f(\theta_j) \, d\theta_j \quad \text{(non-movers)} \tag{11}$$

Case (b)

In Figure 1 we give an example of case (a) using, for simplicity, a normal distribution for θ_j: permanent migrants are in the dark area, and temporary migrants are in the clear area[7].
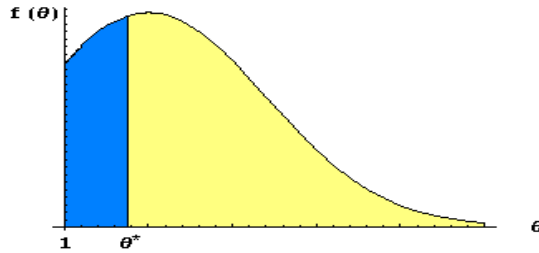

Figure 1

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[7] Intuitively, in case (a) there are no permanent residents because return migration is the only way to increase period 2 consumption. If there were the possibility to get a return on savings in O, persons with a sufficiently high θ_j would be permanent residents.

Case (b) looks like case (a), substituting θ^A to θ^* : the dark area gives permanent migrants, and the clear area the non-movers.

We are now going to present some comparative statics results.

2.1 Comparative Statics

In this section we show the comparative statics properties of the model. As to the effect of π, it is easy to compute

$$\frac{\partial \theta^*}{\partial \pi} \quad \leq \quad 0 \quad \text{and} \tag{12}$$

$$\frac{\partial \theta^A}{\partial \pi} \quad \leq \quad 0 \tag{13}$$

the derivative (12) shows that, as π grows, the share of temporary migrants increases. This happens because border openness makes it easier to recover abroad in case of a shock, thus a lower value of θ is required to make the return possible. Of course, when $\pi = 1$, $\theta^* = \frac{2\omega_D}{(1+\omega_D)}$ depends only on the ratio between wages in D and in O, and $\frac{\partial \theta^*}{\partial \pi} = 0$.

The derivative (13) has the same meaning: when there exists no return migration the value of θ necessary to stay forever in O decreases as π increases. Here, too, θ^A does not depend on π anymore when $\pi = 1$. In this case, we have the simple result $\theta^A = \frac{\omega_D}{1}$.

Summarizing, border openness shifts the incentives toward return migration, and restrictive policies bias the incentives towards permanent migration. As we shall see in Section 2.1 and Section 4, though a low value of π may reduce entries in the current period, it can backfire in future periods.

The comparative statics derivatives of θ^* and θ^A with respect to p are

$$\frac{\partial \theta^*}{\partial p} \quad < \quad 0 \quad \text{and} \tag{14}$$

$$\frac{\partial \theta^A}{\partial p} \quad < \quad 0 \tag{15}$$

Here the effect is quite intuitive: improved economic conditions at home reinforce the incentive to return and induce more individuals to be non-movers. It is interesting to remark that substituting $\pi = 1$ into θ^* and θ^A is equivalent to set $p = 1$. In other words, total freedom of emigration creates an insurance against risk in O.

3 Immigrants and assimilation

When economists study assimilation, they usually refer to wage convergence between natives and immigrants, and therefore only to labor market assimilation. Currently, a growing literature has initiated the study of migrants' cultural

assimilation (Kònya, 2002; Bisin and Verdier, 2000; Lazear, 1999; Dustmann, 1996), thus broadening the definition beyond wage convergence. Now, we can define assimilation as the convergence of a vector of characheristics - for example language abilities, income, human capital, fertility rates, criminality rates, mortality rates- between immigrants and the mainstream of the destination country[8]. Notice that convergence may occur in both directions: even some elements of the mainstream characheristics may converge towards the immigrants' ones.

It is important now to stress why a permanent migrant creates more assimilation concerns with respect to a temporary migrant. If there were no difference between the two types, a country would simply be indifferent in having 99% of permanent migrants and 1% of temporary ones, or viceversa. However, attempts to limit immigration are mostly targeted to permanent migration.

There are many reasons why permanent migration differs from temporary migration, the main one being that permanent migrants are entitled to family reunification and reproduce themselves in the host countries. Family reunification is generally considered -at least in the short run- as a burden for the welfare system of the receiving country: families of unskilled workers with high fertility rates consume more subsidies and health services, and the low women's participation rates mean that their net contribution to the welfare system is negative (Borjas, 1994; 2002).

More importantly, according to Bisin and Verdier (2000), homogamous families are the technology required to transmit cultural and ethnic traits. This enables minority cultures to persist over generations, particularly when immigrants live in segregated enclaves. Such enclaves may delay indefinitely the assimilation process.

An example can be some Afro-American or Mexican communities. Borjas (1993) reports evidence for the downward assimilation of Mexican immigrants. This problem is well-known since Chiswick (1978) and Carliner (1980)[9].

Dustmann (1996) studies the social assimilation of immigrants. He finds that a decade of residence within Germany increases by 3% the probability that an immigrant considers himself as a German, and decreases by 14% the probability that the immigrant declares to stick to his original nationality. This finding underscores the importance of a protracted interaction with the mainstream of the host country.

We are aware that, in some cases, enclaves may play a positive role, providing new immigrants with information and connections to get a job, speeding up the assimilation. For our approach to be valid, however, we need only that this process takes time.

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[8]Early definitions of assimilation pretend minority groups would shed their own cultures to adopt the cultural model of middle-class Protestant whites. Contemporay sociologists, instead, define assimilation as the decline of an ethnic distinction, where "decline" means that individual's ethnic origin become less and less relevant in relation to the members of others ethnic groups (Alba and Nee, 2003).

[9]We refer to the concept of downward assimilation reported in the Introduction.

In our view, therefore, assimilation is not only a matter of citizenship,[10] even though citizenship affects assimilation by itself: we can simply mention the right to vote. Intuitively, the assimilation time should be longer the more different are the cultures of origin and destination (Lazear 1999).

It is well-known that initial differences between natives and immigrants tend to persist across generations (Borjas 1992, 1993, 1994).

Comparing data from the 1940 and 1970 U.S. censuses, Borjas (1993) finds that roughly half of the wage differential between any two national origin groups persists from the first to the second generation. "In fact, if the intergenerational correlation is on the order of .5 and is constant across generations, the evidence suggests that the ethnic skill differentials will persist into the third generation and perhaps even into the fourth.[...] Ethnicity matters, and it seems to matter for a very long time" (Borjas 1994, p.1711).

The point is now to include properly the foreign-born in the total number of non-assimilated individuals. This depends on the time interval required to achieve assimilation.

In other words, unless we admit that no assimilation problem exists, and that there is no difference between the immigrants and the natives of D, we have to consider a time lag necessary to the integration.

4 Barriers to entry and assimilation

As we have shown above, the extent of border openness affects deeply the individual behaviour, and encourages permanent migrations. Now we address the problem of computing the expected population of migrants abroad. In order to achieve this goal, we develop an OLG-like framework. In the previous section we have partitioned the population of potential migrants according to their location choice. We are now introducing a new assumption: old individuals in O reproduce in the second period *before* the shock is realized at rate $(1+n)$. This assumption is used to avoid the possibility of a total population depletion in O after a migration wave.[11] We denote the shares of permanent migrants and temporary migrants with $\alpha_1(\pi)$ and $\alpha_2(\pi)$ respectively. When $p\omega_D \geq 1$ we can write

$$\alpha_1(\pi) = \frac{\int_0^{\theta^*} f(\theta)\,d\theta}{\int_0^{\theta_{\max}} f(\theta)\,d\theta} \tag{16}$$

$$\alpha_2(\pi) = \frac{\int_{\theta^*}^{\theta_{\max}} f(\theta)\,d\theta}{\int_0^{\theta_{\max}} f(\theta)\,d\theta} \tag{17}$$

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[10] Notice that often the first generation of foreign-born is entitled to conserve the citizenship of O.

[11] Suppose that $\pi = 1$ and the shock occurs. In that case, the whole population -young and old- of O is able to enter D. However, if reproduction occurs in D nobody will return to O at the end of the period. On the other hand, when reproduction occurs before the shock, return migration occurs.

$$(\alpha_1(\pi) + \alpha_2(\pi) = 1)$$

when $p\omega_D < 1$, $\alpha_1(\pi)$ and $\alpha_2(\pi)$ will denote permanent migrants and non-movers -obviously the critical value of θ_j will be θ^A.

The evolution of the population in O is thus given by

$$N_t^y = [1 - \pi\alpha_1(\pi)] N_{t-1}^y (1 + n) \tag{18}$$

where $n > 0$ is the rate of growth of the population.

The steady-state rate of population growth is $n^* = \frac{\pi\alpha_1(\pi)}{1-\pi\alpha_1(\pi)}$: it has to be high enough to avoid that eventually emigration causes total population depletion in O.

For simplicity, we assume that foreign-born children are not willing to return to their Origin country: being born abroad, they do not get any externality in consuming in O. Preference for home-consumption may indeed translate into preference for consumption within the enclave[12] –

We want now to compute properly the expected stock of aliens living in D at time t. This stock is given by the current entrants plus the inherited non-assimilated dinasties. Therefore, we have to know the number of individuals inherited from the past generations of immigrants.

Permanent emigrants to D reproduce at the rate of their origin country until they are assimilated. Convergence in fertility rates is indeed an important indicator of assimilation. Let us indicate with m the number of generations necessary to a complete assimilation.

As a first example, we are going to consider the shortest possible lag: we suppose that assimilation needs only a generation ($m = 1$): the migrants' children are not different with respect to natives of D. In such a case, we should take into account just their fathers, entered at $(t - 1)$. Thus, in t we have $\pi\alpha_1(\pi)N_{t-1}^y$ old immigrants entered in the previous period.

In this case, the stock of inherited aliens is

$$[S_t \mid m = 1] = \pi\alpha_1(\pi)N_{t-1}^y \tag{19}$$

where $S_t \mid m = 1$ stands for "stock at time t conditioned to an assimilation lag of one generation".

When $m = 2$, we have an inherited stock of $\pi\alpha_1(\pi)N_{t-2}^y(1+n)$ (children of young immigrants entered in $(t-2)$), plus $\pi\alpha_1(\pi)N_{t-1}^y(2+n)$ (immigrants in $(t-1)$ plus their children born in t.

Therefore,

$$[S_t \mid m = 2] = \pi\alpha_1(\pi)N_{t-2}^y(1+n) + \tag{20}$$
$$+ \pi\alpha_1(\pi)N_{t-1}^y(2+n)$$

By iterating this procedure, we get the general expression for m generations of assimilation, and we can write the following Proposition:

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[12] It is possible to incorporate into the model a share of return migration of future generations; this, however, would cause unnecessary complications.

Proposition 3 *(inherited aliens): when m generations are required for achieving assimilation, the number of inherited aliens is*

$$[S_t \mid m] = \pi\alpha_1(\pi)N_{t-m}^y(1+n)^{m-1} + \tag{21}$$

$$+\pi\alpha_1(\pi)\sum_{k=2}^{k=m} N_{t-m+(k-1)}^y[(1+n)^{m-(k-1)} + (1+n)^{m-k}] \tag{22}$$

substituting (18) into (21) we can get the stock of non-assimilated individuals as a function of N_{t-m}^y [13].

Proof. See the Appendix. ∎

To know the total non-assimilated population we only need to add the entries in the current period. They are given by the weighted average of the entrants in the good state of the world and the bad state of the world. When $p\omega_D \geq 1$ we indicate them with $E[M_t^*]$.

$$E[M_t^*] = p\pi_t N_t^y + q\pi_t(N_t^y + N_t^o) \tag{23}$$

where $N_t^o = [1 - \pi_{t-1}\alpha_1(t-1)]N_{t-1}^y$ are the old inhabitants of O, and $N_t^y = [1 - \pi_{t-1}\alpha_1(t-1)]N_{t-1}^y(1+n)$ are the young born in t.

Therefore, the expected stock of aliens $E[A^1]$ is

$$E[A^1] = [S_t \mid m] + p\pi_t N_t^y + q\pi_t(N_t^y + N_t^o) \qquad (p\omega_D \geq 1) \tag{24}$$

Denoting with $E[M_t^A]$ the expected entrants when $p\omega_D < 1$,

$$E[M_t^A] = p\pi_t\alpha_1(t)N_t^y + q\pi(N_t^y + N_t^o) \tag{25}$$

and the stock of aliens $E[A^2]$ is

$$E[A^2] = [S_t \mid m] + p\pi_t\alpha_1(t)N_t^y + q\pi(N_t^y + N_t^o) \qquad (p\omega_D < 1) \tag{26}$$

Now we can study the effect of the immigration policy.

5   Immigration policy

In our model, the immigration policy decides essentially the extent of the entry rationing. As a consequence, it can be depicted by the probability to enter D.

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[13]It is important to remark that $f(\theta)$ and π may change over time. In this case, π and $f(\theta)$ may be time- dependent, and we should write $\alpha_1(t) = \alpha_1(\pi_t, f_t(\theta))$. The stock of non-assimilated individuals is

$$[S_t \mid m] = \pi_{t-m}\alpha_1(t-m)N_{t-m}^y(1+n)^{m-1} +$$

$$+\pi_{t-m+(k-1)}\alpha_1(t-m+(k-1))\sum_{k=2}^{k=m} N_{t-m+(k-1)}^y[(1+n)^{m-(k-1)} + (1+n)^{m-k}]$$

obviously in this case computing the number of inherited aliens is more difficult because we need to know $f_t(\theta)$ and π_t from $(t-m)$ to $(t-1)$

Since the inherited stock cannot be modified, the chosen policy affects only the current expected entrants: when $(p\omega_D \geq 1)$ it is easy to verify that a more severe entry rationing reduces entries in the current period:

$$\frac{\partial E[M_t^*]}{\partial \pi_t} > 0. \tag{27}$$

A restrictive immigration policy is effective in reducing entries, but, as we have seen in Section 2.1 and Section 4, it biases incentives towards permanent migration. As a result, governments face a trade-off between less immigrants today and more children to assimilate in the future.

This result is known especially among demographers (Bonifazi and Strozza, 2002; King, 1993). When this issue is addressed, we know that increasing borders closure may create more assimilation problems in the long run: in our simplified model the stock of non-assimilated individuals is minimum for $\pi = 1$.

When $(p\omega_D < 1)$, the effect of the policy is

$$\frac{\partial E[M_t^A]}{\partial \pi_t} = pN_t^y \left[\alpha_1(t) + \pi_t \frac{\partial \alpha_1(t)}{\partial \pi} \right] + q(N_t^y + N_t^o) \tag{28}$$

Since in this case $\frac{\partial \alpha_1(t)}{\partial \pi} < 0$ the sign of the derivative depends on the magnitude of the change in the share of permanent immigrants.

Interestingly, from (28) we see that, when there are only permanent immigrants, a restrictive policy may in principle backfire even in the current period. The possibility of such an outcome should be investigated empirically.

As we told in the Introduction, legislative trends in OECD countries point to increasing borders closure. From this perspective, unless a country is able to assimilate quickly the immigrants' culture, the change in incentives may spur the creation of ethnic enclaves that make assimilation more difficult.

This would be particularly true for immigrants bringing in cultures quite different with respect to the destination country.

A tempting conclusion is that a restrictive immigration policy is the more likely to backfire the less assimilable are the immigrants.

For marginal changes in π it would be important to know the magnitude of $\frac{\partial \alpha_1}{\partial \pi}$. However, the most important finding of our model is that the effect of current policies tend to persist in the future. This means, for example, that even though only a generation is required for assimilation the consequences of current choices last for two or three decades, i.e. more than the time horizon of any government.

From another prespective, what is happening today may be the effect of choices made many years ago.

5.1 Consumption and savings

Our model produces some important links between economic volatility, migration policy, and saving bahaviour well-known in the literature. Given the simple

nature of the model, the only way to increase the second-period consumption is to save abroad. Thus, aggregate savings S exist only when $(p\omega_D \geq 1)$:

$$S = \pi\omega_D \int_{\theta^*}^{\theta_{\max}} f(\theta)\, d\theta \qquad (29)$$

The comparative statics results of the previous Section imply imply that $\frac{\partial S}{\partial \pi} > 0$, i.e. aggregate savings are increasing in π. As $\pi \to 1$, θ^* tends to its lowest value, and a larger share of the distribution $f(\theta)$ enters the area of the integral (29). As a consequence, π determines the flow of remittances towards O. Therefore, we should be aware that entry barriers in developed countries may hinder the development in poor countries. This result is well-known in the literature (See, for example, 'O Rourke, 2003).

Even though the present model is not concerned with growth issues, our findings suggest that restrictive immigration policies may backfire on the steady-state equilibrium in endogenous growth[14].

A combination of restricted access and high probability of negative shocks in the source countries appears particularly dangerous from this point of view. Unfortunately, such policies seem to be quite pervasive and they are getting even more severe after the concerns for terrorism.

Finally, when $(p\omega_D < 1)$, there will be no aggregate savings in O. We have seen that this occurs when **a very low p makes the expected returns on savings negative.** The intuition behind this result is that high uncertainty about the future unincentivates savings, and incentivates permanent migration.

So far, we have not discussed the role of $f(\theta)$. Of course, its shape is crucial for the empirical importance of our results. We can conjecture that a high kurtosis may dampen the consequences of the immigration policies, and *viceversa*. If $f(\theta)$ is skewed towards low values of θ, **restrictive policies may be effective.** Moreover, as we told above, it is reasonable to hypothesize that $f(\theta)$ may change from one generation to another. In such a case, we should write $f_t(\theta)$.

Estimating $f(\theta)_t$ for a country may be an interesting, though difficult, task.

6 Empirical analysis

[to be written]

7 Conclusions

Our intention was to study how migration policies in the destination countries affect individual incentives to migration duration and the size of immigrant dinasties. Our results question the effectiveness of the policies currently chosen in developed countries: entry restrictions incentivate permanent migrations,

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[14] This result is already known in the literature, too: for example, Reichlin and Rustichini (1998) show that migration in endogenous growth can exacerbate the divergence between poor and rich countries.

spur the creation of enclaves and reduce remittances, contributing to the risk of generating poverty traps.

The existence of a time-requiring assimilation process implies a trade-off between less entries in the current period and more individuals to assimilate in the future. Moreover, border closure makes agents more reluctant to be assimilated to settle permanently.

These effects reinforce each other, and suggest that borders enforcement, in the long run, is likely to fail the task of protecting a country's cultural homogeneity.

Some empirical evidence supporting our results is found, for example, in Bonifazi and Strozza (2002): they show that, after the oil shocks caused border closure in Europe, the foreign population has been growing significantly, mainly through family reunifications.

Family reunification is an important signal that the expectations about the migration duration have changed: the costs implied by this decision are usually too high to permit an easy reversal[15]. Currently, family reunification accounts for no less than 50% of the *legal* inflows to EU (OECD, 2004). This seems to indicate that permanent migration is indeed responsive to policy changes.

We think that more empirical research is needed to assess the importance of these effects, and we hope to develop this point in the future.

Our results stress as well the importance of the economic instability in the origin countries: uncertainty reduces savings and induces permanent migration. Restrictions to entry in the destination countries reinforce this unwanted effect.

From this point of view, immigration policies based on border closure might hinder growth prospect for source countries, without succeeding in preserving the cultural homogeneity of destination countries.

An alternative incentive-compatible policy could try to match less entry rationing and more efforts to promote economic and political stability in developing countries. In our setting, this would increase p, creating more return migration and more remittances towards the origin countries.

Though the empirical importance of our results has to be evaluated, we think that it is no negligible *a priori*.

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[15] Think, for example, to the childrens' education.

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19

Appendix

Proof of Proposition 1):
First, we have to prove that a permanent resident does not save in the first period, i.e. that

$$E\left[u(O - O \mid s = 0)\right] > E\left[u(O - O \mid s = 1)\right]$$

where $E\left[u(O - O \mid s = 0)\right]$ is the expected utility of staying for two periods in O with no saving, and $E\left[u(O - O \mid s = 1)\right]$ is the expected utility of staying two periods in O saving the first-period income. Substituting the values of the expected utility, we have

$$\theta_j 1 + p\theta_j 1 + q\pi\omega_D \quad > \quad p\theta_j 2\omega_O + q\pi\left(1 + \omega_D\right)$$
$$i.e. \quad \theta_j \quad > \quad \pi$$

since $0 < \pi \leq 1$ and $\theta_j > 1$ always, it is proved that a permanent resident will never save her first-period income.

Proof of Proposition 1): step 2
It is useful to prove first that, as $p\omega_D \geq 1$ everybody migrates at least for one period. After we shall prove that, in equilibrium, a temporary migrant always saves her first-period income.

$$E\left[u(D - O \mid s = \omega_D)\right] > E\left[u(O - O \mid s = 0)\right] \tag{30}$$

by substituting the values of the expected utility, we get

$$p\theta_j\left(1 + \omega_D\right) + 2q\pi\omega_D \quad > \quad \theta_j + p\theta_j + q\pi\omega_D$$
$$i.e. \quad q\pi\omega_D \quad \geq \quad \theta_j(1 - p\omega_D)$$

That is always true when $(1 - p\omega_D) \leq 0$.

Therefore, when $p\omega_D \geq 1$ temporary migration dominates no migration for any θ_j.

We still have to rank the expected utility of temporary migration with respect to the utility of a permanent migration.

$$E\left[u(D - O \mid s = \omega_D)\right] > E\left[u(D - D)\right]$$

By substituting the values of the expected utility, we obtain

$$p\theta_j\left(1 + \omega_D\right) + 2q\pi\omega_D \quad > \quad 2\omega_D$$
$$i.e. \quad \theta_j \quad > \quad \frac{2\omega_D(1 - q\pi)}{p\left(1 + \omega_D\right)} \equiv \theta^*$$

This proves Proposition 1.
Proof of Proposition 2)

When $p\omega_D < 1$ no migration is better than temporary emigration for any θ_j. To verify this claim, we can write

$$E\left[u(O - O)\right] > E\left[u(D - O)\right]$$

i.e.

$$\theta_j + p\theta_j + q\pi\omega_D > p\theta_j\left(1 + \omega_D\right) + 2q\pi\omega_D$$

thus

$$\theta_j > \theta_j p\omega_D$$

(always true when $p\omega_D < 1$). We know that no emigration dominates temporary migration and we still have to rank permanent migration with respect to no migration:

$$E\left[u(O - O)\right] \geq u(D - D)$$

is given by

$$\theta_j + p\theta_j + q\pi\omega_D \geq 2\omega_D$$

therefore

$$\theta_j \geq \frac{\omega_D(1 - q\pi)}{1 + p} \equiv \theta^A$$

This proves Proposition 2.
Proof that $\theta^* > 1$:

$$2\omega_D(1 - \pi(1 - p)) > p(1 + \omega_D)$$

since $2\omega_D > 1 + \omega_D$, a sufficient condition for $\theta^* > 1$ is that

$$(1 - \pi(1 - p)) \geq p$$

which gives

$$(1 - \pi) \geq p(1 - \pi)$$

that is always true.
REDUNDANT****We whish now to prove that a returning migrant always saves her first-period income:

$$E\left[u(D - O \mid s = \omega_D)\right] > E\left[u(D - O \mid s = 0)\right]$$

substituting the values of the utilities,

$$p\theta_j\left(1 + \omega_D\right) + 2q\pi\omega_D \quad > \quad \omega_D + p\theta_j 1 + q\pi\omega_D,$$
$$i.e. p\theta_j + q\pi \quad > \quad 1$$

since for any returning migrant we have $\theta_j \geq \theta^*$, substituting θ^* to θ_j we have

$$\frac{2\omega_D(1 - q\pi)}{(1 + \omega_D)} > (1 - q\pi)$$

that is always true for any $\theta_j \geq \theta^*$.***** REDUNDANT

Proof that $\theta^A > 1$:

$$\omega_D(2 - \pi(1 - p)) \geq 1(1 + p)$$

since $\omega_D > 1$ by assumption, it is sufficient that

$$(2 - \pi(1 - p)) \geq (1 + p)$$

by rearranging, we get

$$(1 - \pi) \geq p(1 - \pi)$$

that is always true.

Stock of non-assimilated population:

We are now going to describe how the (inherited) stock of non-assimilated population is computed. We show the derivation for the general case.