Port Econ J (2017) 16:87–112
DOI 10.1007/s10258-017-0130-4

ORIGINAL ARTICLE

Migration outflows and optimal migration policy: rules versus discretion

Ismael Issifou[1] · **Francesco Magris**[2]

Received: 11 May 2016 / Accepted: 9 March 2017 / Published online: 22 March 2017

Abstract We study the effects of more open borders on return migration and show that migrants are more likely to return to the origin country when migration rules are softened, because this implies that they could more easily re-migrate if return migration is unsuccessful. As a result, softening migration rules leads to lower net inflows than is generally acknowledged. We show that if government follows rules to shape the optimal migration policy, it will choose more open "borders" than were its behaviour to be discretionary. However, this requires an appropriate commitment technology. We show that electoral accountability may be a solution to the commitment problem. As a matter of fact, observed softer immigration rules in western countries suggest the effectiveness of such a mechanism.

Keywords Return migration · Optimal migration policy · Time consistency

JEL Classification E61 · F220 · J150

✉ Ismael Issifou
ismael.issifou@univ-orleans.fr

Francesco Magris
francesco.magris@univ-tours.fr

[1] University of Orléans, CNRS, LEO, UMR 7322, F45067, Orléans, France

[2] University "François Rabelais" of Tours and CNRS, LEO, UMR 7322, F45067, Orléans, France

1 Introduction

Immigration is one of the critical emergencies of our time, particularly in Western Europe but also, albeit in different ways, in the United States and other high-income countries, and it seems to make a clear divide between those who prefer the term "put a brake on it" and those who emphasize the duty to "receive". In Europe, especially, the Schengen Treaty has led to an unprecedented circulatory flow, and in particular it has permitted a massive exodus of citizens from the countries of Eastern Europe towards the economically more prosperous states (Lundborg and Segerstrom 2002; Docquier et al. 2014). War and conflicts in Africa and Asia, in recent years, have boosted migration to levels never registered before. For these reasons, most of the literature is concerned with the phenomenon of migration inflows into the destination countries.

In this paper, we study the effects of more open borders also on migration outflows and possible re-instatements in the destination country: migrants who consider returning home but are reluctant to give up their current status in the host country are more likely to return to their origin country if afterwards they think it is still possible to re-migrate to the former. As a result, softening migration rules leads to lower net inflows than is generally acknowledged.

Throughout this paper, we assume that the government's goal is to minimize the stock of migrants settled in the country, taking into account the cost of border control. This reflects a postulated feeling of hostility toward migration among the natives. Were we considering also the benefits coming from a moderate migration flow, our result would consist in an even softer optimal immigration policy. This is the reason why we focus on the extreme case of a complete hostility towards immigration. For example, Card et al. (2012) emphasize how European opinions about migrants reflect cultural points of view more than mere cost-benefit perceptions, and Belot and Ederveen (2011) show that cultural factors explain migration flows between developed countries much more than do economic aggregates such as the GDP per capita and the unemployment rates. Angelucci (2012) studies empirically the effect of US border enforcement on the stock of illegal migrants coming from Mexico, taking into account at the same time the entry flows and the exit flows. She finds that a stronger US border control is beneficial for the country since it decreases the overall stock of Mexican migrants. Bazillier and Magris (2016a) analyse empirically the impact of the Schengen Treaty on the migration outflows inside Europe: they find that by opening the borders one has increased such human mobility.

In our paper, we assume that there is a "home bias" for consumption in the source country, and that therefore migrants take into account the possibility of moving back to it in order to enjoy the larger utility. The origin country, however, is subject to some productivity shock and, were the negative shock to come about, the migrants are likely to try to re-migrate back to the destination country: it follows that the probability of the reinstatement of the condition of migrant in case of an unsuccessful return migration represents, in some sense, an insurance coverage against the typical instability of the source countries. Thus a more permissive migration policy will ensure a greater exit flow from the country which will counterbalance, at least in part, the greater entry flow.

Nevertheless, in this framework, the problem of dynamic incoherence is easily set out (Kydland and Prescott 1977; Barro and Gordon 1983): a government aiming at minimizing the total number of migrants settled in its territory may in fact face the incentive, once a relatively permissive policy is announced (which will incline many immigrants to go back home), in later putting into effect a far more restrictive one and drastically rationing the number of the re-immigrants.

In the absence of a commitment technology, our model predicts an equilibrium outcome corresponding to rather restrictive migration policies which turn out to be inefficient for both the natives and the migrants. This seems to be at odds with observed migration flows which, in view of their importance, emphasize that the majority of the countries implement relatively soft policies. This suggests the existence of some commitment technology allowing the restoration of the first best equilibrium. Since in our case the mechanism based upon reputation is difficult to implement, given the non-stationary nature of the game, we propose a solution for the time inconsistency problem based upon electoral accountability: if politicians value office enough, under the threat of not being re-elected, they will resist the temptation to deviate from the announced policy.

In our model, we assume that migrants are not granted political rights: actually, some of the migrants settled initially in the destination country might be considered illegal and therefore do not vote. As regards the legal migrants, slightly more than half of the European (58%) and American (59%) share the view that political participation rights should be granted to them just like the natives. However, such countries do not extend (even to the legal migrants) the right to vote in the national political elections . The matter is an issue of heated debate in the United States. But to the best of our knowledge few countries (Uruguay, New Zealand, Chile) give national voting rights to immigrants whereas the giving of the voting rights in local elections is more widespread around the world (Belgium, Spain, Sweden among others). Therefore we consider that granting immigrants the right to vote in a national election is the exception rather than the rule. As a consequence, when we introduce the political equilibrium, we do soon the hypothesis that only natives can participate in the democratic mechanism.

This mechanism can in part explain some empirical evidence according to which migration policies are rather soft. Migration policies implemented by the destination countries (and sometimes by the origin countries) are essential for understanding the migration flows. Unfortunately, how the migration policies evolve over time and how they change across countries are severely hampered by data availability. One attempt to measure the migration policies is the periodic survey carried out by the United Nations Department of Economics and Social Affairs over 1976-2007. The survey reports the views and responses to migration of the governments of 195 countries. Based on this survey, Facchini and Mayda (2009) note that most governments adopt policies that maintain or lower the level of migration. Next, these authors propose a median voter theoretical analysis to examine whether migration policies implemented by the political authorities in different countries correspond to migration attitudes expressed by the voters. They find that if migration policies implemented by governments do not fit the voter's migration attitudes, then they tend to be less restrictive.

While several reasons can explain this scenario, we argue that the success or the failure of the electoral accountability mechanism accounts for much.

Our paper is very close in its message to Zimmermann (2014) who argues (but in an informal way) that countries whose goal is to reduce immigration flows by imposing restrictive immigration policies are mistaken: the consequence of such policies is to transform circular migration into permanent. Germany illustrates the point well that less restrictive migration policies encourage return migration or at least render it circular. As Zimmermann (2014) reports it, if we compare migrants from EU countries with those from non-EU countries, the former leave Germany more often than the latter. Because Turkey and former Yugoslavia migrants have not the same ease as Greek, Italian or Spanish to re-enter Germany, they return less frequently to their country of origin.

The remainder of the paper is organized as follows. After offering a brief review of the literature on return migration, we study the choice of migrants whether or not to return home. Then we analyze the outcome of the migration policies implemented a) under commitment and b) under discretion and compare them. In a later section we evaluate the (stochastic) migration dynamics while, in the last section, we propose the electoral accountability mechanism as a solution to the commitment problem.

2 Return migration: literature review

Return migration is a real phenomenon which both developed and developing countries often experience. For example, Sun (2013) reports that during the 1978-2010 period, 632,200 of the 1,905,400 individuals leaving China to study abroad (approximately one migrant out of three) returned home. Piracha and Vadean (2010) estimated that one Albanian out of three returned home between 1990 and 2005. Another country experiencing a great return migration is Egypt where the temporary nature of emigration is often emphasized (Vatn 2008). Obviously, the size of return migration varies from one country to the next: some countries have a high rate of return migration while others record lower rates. This heterogeneity is pointed out by Gundel and Peters (2008) in their study of the determinants of return migration among immigrants settled in Germany, showing that migrants from countries which have a free labor agreement with Germany are more likely to return home. Accordingly, they also find that a lower propensity to return home is observed among migrants from non-EU countries. Note also that the returnees are different in terms of such characteristics as their age, sex or skills. There are several studies focusing on the return migration of immigrants who are skilled or belong to a specific profession (Cohen and Haberfeld 2001; Nekby 2006; Rooth and Saarela 2007). To illustrate, Gibson and McKenzie (2011) observe that 25-30% of the highly skilled migrants from Tonga, Papua New Guinea and New Zealand return to their countries of origin.

Return migration also involves the impact migrants have on their country of origin. Two channels are identified in the literature through which return migration may affect the sending countries. Firstly, emigrants bring financial resources to their domestic economy as they accumulate savings while abroad. Upon returning

home, returnees (immigrants) are engaged in business or entrepreneurial activities (McCormick and Wahba 2001; Mesnard 2004; Wahba 2015). Secondly, as emigrants also gain new skills and increase their human capital from their foreign experience (Mayr and Peri 2009; Dustmann et al. 2011), one implication is that migrants have a wage premium once they move back to their country of origin. Bilateral migration and FDI represent two credible ways through which migrants are deemed to benefit the economy of the country of origin. For example, migrants could promote the domestic market overseas by making it attractive for FDI, or reduce the transaction costs between their country of origin and the destination country. Not only do migrants promote trade, they are also good entrepreneurs who can start new firms thanks to their financial capital accumulated abroad, and ensure their survival as regards to their human capital. For example, Rauch and Trindade (2002) find that networks from various ethnic populations in China increase bilateral trade and Javorcik et al. (2011) show a positive relationship between US FDI with a given country and the migrants from this country living in the US. Return migration effect on the source country labor market was also analyzed. In the context of Albania, de Coulon and Piracha (2005) observe that return migrants hardly move the wage distribution to the right while a significant rightward shift will be observed should returnees present the same characteristics as stayers.

Several reasons for return migration were extensively studied in the literature. Firstly, negative shocks in the destination country, whether economic or political, can explain the migrants' choice to leave it. For example, Mesnard (2004) reports that the major economic downturn of 1973-1974, together with political tension between Libya and Tunisia, partly explains why Tunisian migrants moved back home. Passel et al. (2012) point out that the return of Mexican immigrants from the US had to do with the deterioration of the U.S. job market. Bazillier et al. (2016b) analyze how the economic fluctuations of a short period produce, in terms of exit flows, the same effects as restrictive policies in recessionary periods. Secondly, return migration can also occur as the socio-economic and political situation improves in the country of origin. This explains the over 70% of return migration that Albania experienced after 2001 (European Training Foundation 2007). Thirdly, the immigration policy implemented by the destination country is also a determinant in explaining return migration. For example, Mayr and Peri (2009) develop a model in which return migration is an optimal decision for migrants, as is the choice to migrate or invest in schooling, and show that these choices can be affected by the restrictiveness of immigration policies in receiving countries. Fourthly, migrants' decisions to leave their destination country do not necessarily result from economic and political shocks, or immigration policy, or any other change that might have occurred either in their destination country or their country of origin. Borjas and Bratsberg (1996) show that the return migration of immigrants settled in the United States over a period of time is in line with the "optimal life-cycle residential location" that migrants initially define. Alternatively, the return migration occurs because the reality faced by migrants once they arrive in the destination country is different from what they expected in terms of opportunities. Disappointed, they choose to leave their destination country. Supporting this view, De Haas et al. (2015) interpret return migration as the sign of the migrants' success or failure in the hosting

country. However, should market opportunities existing in the destination countries meet migrants' expectations, it is difficult to imagine some migrants deciding to return home since this would involve moving away from the income opportunities in the destination countries. Actually, other motivations seem to outweigh the income opportunities existing in their host country (Such as the domestic environment). The preference of migrants for the environment in their country of origin is empirically shown by Gibson and McKenzie (2011). Looking at the determinants of the significant return migration among the highly skilled migrants from three Pacific countries, these authors find that the desire to live closer to family and the way of life in the home countries are the most important reasons.

3 The model

In this Section we introduce the model and present the main results. We first describe the migrants' behaviour and the choices they are faced with, paying particular regard to the possibility of a return to the origin country. Since we assume that there is home bias in consumption, limiting the return migration option back to the country of origin is reasonable. However, onward migration is a standard practice: as a matter of fact, not all immigrants would return to their country of origin. Borjas and Bratsberg (1996), for example, show that immigrants who leave the United States choose the rich countries nearby. One can assume, therefore, that migrants leaving the destination country may decide to move not necessarily to their country of origin but to a third country.

However, throughout this paper our hypothesis is that a migrant who decides to leave the destination country will first try to re-migrate to country of origin since there the home bias of consumption is strongest. However, should a bad shock occur there, he will face different choices in terms of which country to re-migrate to; indeed, the possibility of re-migrating to the initial destination country is not the only one. Of course, there will be different migration policies implemented by each of these countries. However, we can assume that each of these countries is subject to an exogenous stochastic shock. If the bad shock occurs in the country the migrant succeeds in moving to, he will try to move to another country and so on. Since in the destination country the state of nature is already known, it follows that if in all the other countries the economic environment turns out to be negative, or if the migrants do not succeed in migrating anywhere else, in the end they will try to move back to the initial destination country.

We assume that the state-dependent migration policy defined by a given destination country depends on the nationality of the migrant, who will face the same probability of entering the destination country no matter what his country of provenance. In view of the above considerations, the possibility for the migrants of moving to other countries makes it less risky to return home; nevertheless, the migration policy implemented by the destination country still matters. As a matter of fact, the more flexible policies can still be viewed as insurance against the impossibility, for a migrant having returned home and there faced with a negative shock, of moving to some other country or of experiencing also there some negative shock. This case

is analyzed in Bazillier et al. (2016b) where the choice of return migration depends upon the possibility for the migrants, in the case of a bad shock at home, of returning to the destination country, or of moving to a third country. This is the case, for example, of the countries that adhered to the Schengen Treaty: the circular migration flow has indeed increased given that migrants, once they decide to leave a given country, have the choice of a large number of countries to finally settle in. In this paper, we do not consider the possibility for a migrant of moving to a third country with respect to the destination country and the country of origin; however, this does not entail any loss of generality since the probability of re-migrating to the destination country will in any case increase the incentive for the migrants to return home. If we were to account for the possibility of moving to a third country, the only thing that would change would be the critical home bias above which migrants would choose to return home; such critical home bias, under these circumstances, would be indeed lower.

After having described the choice of migrants in terms of migration return, we present the government goal, which is to minimize the total stock of migrants settled in the destination country at the end of period, taking into account the implementation costs of the migration policies. Under such hypotheses, we derive the optimal migration policies a) when the government follows rules and b) when its behaviour is discretionary. Finally, we compare the outcome in these two cases and we appraise the stochastic dynamics of the number of migrants settled in the destination country over time.

3.1 Migrants

We consider a one-period, two-country economy composed of a destination country D and of an origin country O. At the beginning of the period there is a stock M of migrants settled in the destination country D and a stock N of potential migrants settled in country O. Each migrant located initially in O must decide whether to migrate to the destination country D and each migrant settled at the beginning of the period in D faces the choice whether or not to move back to O. In both countries, each migrant has access to a linear production function in labour and whose supply, to keep things as simple as possible, is assumed to be inelastic and normalized to one. However, the two countries differ in terms of labour productivity. In country D, the corresponding productivity is k_D, and therefore the single consumption good can be produced according to the technological relationship

$$c_D = k_D.$$

The utility function is assumed to be linear in consumption, which means that individuals are risk-neutral[1]

$$u(c_D) = c_D = k_D.$$

[1]We assume risk neutrality for sake of simplicity. By assuming more general utility functions, results would not change from a qualitative point of view. Only, it would become impossible to derive explicitly the critical parameters of the model.

On the other hand, if a migrant decides to remain in O (either because he was settled there at the beginning of the period and does not want, or is not able, to migrate to D, or because he is settled in D and, after having decided to move back to O, he does not want or is unable to re-migrate to D), he or she will face a stochastic labour productivity which will take the value of k_O^H with the probability $q \in [0, 1]$ and the value of k_O^L with the probability $1-q$ (where H and L stand, respectively, for "high" and "low"), with

$$k_O^H > k_O^L. \tag{1}$$

The parameter q captures the relative instability of country O to D. A q very close to one reflects a rather stable origin country in which productivity is very likely to be high, whereas a q close enough to zero denotes an origin country where the labour productivity is very likely to be low. In country O, there is a preference for domestic consumption reflected by the parameter $\alpha \geq 0$ measuring the marginal utility of consumption. As a matter of fact, the utility function in O of a migrant with a preference for domestic consumption α is

$$u(c_O) = \alpha c_O = \alpha k_O^i, i = H, L.$$

If α is larger than one, an individual prefers to consume in O a given amount of the consumption good; if, on the other hand, $\alpha < 1$, consumption in D yields more utility relatively to O. Let us observe at this stage that one difference made between migrants and non-migrants in the literature is their attitude towards risk. Investigating internal migration in Germany, Jaeger et al. (2010) show that those who migrate show greater preference for risk compared to non-migrants. Gibson and McKenzie (2011) look at the determinants of emigration and return migration among the highly skilled emigrants from Tonga, Papua New Guinea and New Zealand. They find that those who have migration experience have risk appetite, supporting the finding of Jaeger et al. (2010). In our paper, however, we assume the same degree of risk aversion for migrants and non-migrants; actually, we assume that all of them are risk-neutral. Were we to try to introduce some asymmetries with respect to the individual degree of risk aversion, the main features of the model would nevertheless not change dramatically. Indeed, only the migrants exhibiting a large enough home bias would be willing to return home. In the case of risk-averse individuals, of course, the required level for the home bias would be higher, since the expected utility, ceteris paribus, associated with the return home would be lower. Actually, in this paper the only degree of heterogeneity across migrants concerns their individual home bias, according to which they are consequently distributed. Eventually, by assuming risk-neutral migrants, we can explicitly derive the critical home bias above which migrants will decide to return home. At the beginning of the period, a migrant settled in O experiences the shock and then decides whether or not to migrate to D. We assume that if the good state of the nature is realized, he will choose to remain in O, i.e. we make the hypothesis that $\alpha k_O^H > k_D$, implying

$$\alpha > k_D / k_O^H \equiv \alpha_{\min}. \tag{2}$$

On the other hand, if the adverse shock occurs, we assume that the migrant will immediately try to migrate to D. This means $\alpha k_O^L < k_D$, i.e.

$$\alpha < k_D/k_O^L \equiv \alpha_{\max}. \tag{3}$$

Notice that the assumed home bias for domestic consumption means that, at least for some kind of migrants, a given amount of the same physical good (here we assume that there is a single consumption good, to be found in both countries) is more valued at home. This is the consequence of some postulated complementariness between the environment prevailing in the country of origin and the consumption taking place there. Such complementariness is actually effective only if the consumption takes when the migrant is settled in his country of origin: indeed, even had the good being consumed in the destination country been imported from the country of origin, such complementariness would nevertheless no longer be effective since the political, social, and economic environment, from the point of view of the migrant, would still be foreign. The preference of migrants for the environment in the country of origin is empirically shown by Gibson and McKenzie (2011). Looking at the determinants of the important return migration among the highly skilled migrants from three Pacific countries, they find that the desire to live closer to the family and the way of life in the home countries are the most important reasons. This clearly shows that the home bias in consumption is not limited to the country of origin's food/goods: migrants value their physical presence in their country of origin. Accordingly, home bias in consumption may lead to return migration.

If there is evidence in the literature that migrants promote bilateral trade and foreign direct investment (Rauch and Trindade 2002; Javorcik et al. 2011), Gibson and McKenzie (2012) pointed out that this finding cannot be generalized as it is specific to countries such as India, Taiwan and China where information technology is important. Therefore, little is known about the frequency of such experiences around the world and in countries with small domestic markets. Focusing on five massive emigration countries, Gibson and McKenzie (2012) find that highly skilled immigrants do not play any role in bilateral trade. However, these authors noticed the consumption of goods from their home country by highly skilled migrants, reporting that a very significant proportion of those migrants purchase their domestic country's foods in their destination country.

Finally, we assume that the stock M of migrants settled in D and the total number N of the candidate migrants settled at the beginning of the period in O are distributed according, respectively, to the density functions $f(\alpha)$ and $g(\alpha)$ with $M = \int_{\alpha_{\min}}^{\alpha_{\max}} f(\alpha)\, d\alpha$ and $N = \int_{\alpha_{\min}}^{\alpha_{\max}} g(\alpha)\, d\alpha$.

3.2 Return migration

Suppose that migrants settled in D must decide whether or not to move back to O at the beginning of the period. They must however take a decision before they know the realization of the shock, since the state of nature in O can be observed only when an individual is already settled there. It is clear that they can acquire some information

about the state of nature there (for example from the internet, communications with the extended family, or from return visits as a tourist). However, we assume that in both D and O countries, production takes a given length of time. Thus, some shocks may occur after the migration return choice has been effectuated and therefore they could not have been anticipated. In any case, we make the hypothesis that the probability regulating the occurrence of the shock in the country of origin is subjective (although commonly shared) and that it depends upon all the information available to the migrants settled in D at the moment when they must choose whether or not to return home.

Under such an hypothesis it follows that once the migrants have decided which country to settle in (this occurs at the beginning of the period, perhaps after migrants have moved back to O and perhaps re-migrated to D), they undertake production. However, for this purpose, they are bound to remain in the country until the end of the period, when production is completed and consumption takes place. This hypothesis prevents migrants from undertaking production (and from consuming) in both countries, by taking advantage of the assumed costless mobility across countries. If migrants decide to return to O, once they reach it, they wait for the realization of the shock. However, before choosing whether or not to move back to O, they face a state dependent probability vector $\left(p_H^e, p_L^e\right)$, announced by the government, and which corresponds to the probabilities a candidate migrant faces to succeed in re-migrating to D as a function of the realization of each state of the nature.

One may wonder, at this stage, why migrants do not simply return home for visits as tourists. To answer such a question, we assume throughout this paper that migrants have no freedom to come and go unhindered between O and D. This is either due to the fact that they are illegal (and so when they leave the country, they face only a given probability of returning) or because they have only a temporary permit that will expire, should they leave the country, after a given length of time. Under such circumstances, they are the same as the illegals from the point of view of the destination country. Since in our case consumption in the country of origin takes time and thus requires sufficient time spent in it, we can without any loss of generality assume that the temporary permit for a migrant expires after the decision to return home becomes effective: should the migrant decide to move back to D, his entry requirements would be the same as for any other would-be migrant. In view of the above-mentioned nature of the home bias, it follows that even if there is a migrant-induced trade, the incentives to stay abroad or to come back to the country of origin are not modified. This can have some important consequences for the trade balance of the respective countries but not for the choices of return migration. Notice that we assume that the home bias for domestic consumption is not the same for all migrants: as a matter of fact, it can be greater for some of them and lesser or even non-existent for others. This is the reason why we consider that migrants initially settled in the destination country are heterogeneous and distributed according to their respective home bias.

The state dependent migration policy can be viewed as an entry requirement contingent upon some specific requisite, as is the case when granting the status of political refugee is conditional on some specific characteristic of the country of provenance. We define a migration policy as a vector (p_H, p_L) representing the effective probabilities of migrating to D as a function of the realization of each state

of nature, given the announced policy $\left(p_H^e, p_L^e\right)$. The expected utility u^e for an individual with a preference for domestic consumption α , however, depends upon the announced migration policy $\left(p_H^e, p_L^e\right)$, and is given by

$$u^e = \alpha q k_O^H + p_L^e (1-q) k_D + \alpha (1-q) \left(1 - p_L^e\right) k_O^L. \tag{4}$$

Equation 4 has the following meaning. If a migrant settled in D moves to O, with a probability q he faces a labor productivity k_O^H (which yields an utility αk_0^H) and, in view of (2), remains in O. Conversely, with a probability $(1-q)$, he faces a labour productivity k_O^L (which yields a utility αk_L) and, in view of Eq. 3, he tries to re-migrate to D. If he succeeds (with an expected probability p_L^e), he will enjoy the productivity k_D; if not (with an expected probability $1 - p_L^e$) the productivity will be k_O^L entailing a utility αk_L. It follows that the migrant will decide to return to O at the beginning of the period if and only if the associated expected utility (4) is larger than the utility guaranteed by remaining in D, namely if and only if $u^e > k_D$. From Eq. 4, under condition (2), it is immediately verifiable that for $p_L^e = 1$, the individual settled in D will always choose to move from D to O since, in such a case, Eq. 4 boils down to $\alpha q k_O^H + (1-q) k_D$ which, under inequality (2), is larger than k_D for all q. Such a feature is in particular true when the government of D grants nationality to the migrant. Since u^e is increasing in α, by solving for α the indifference condition $u^e = k_D$, one obtains the critical preference α_M for domestic consumption such that for $\alpha > \alpha_M$ individuals settled in D will decide to move back to O. As a matter of fact, this will be true when α satisfies

$$\alpha > \alpha_M \equiv \frac{\left[1 - (1-q) p_L^e\right] k_D}{q k_O^H + (1-q) \left(1 - p_L^e\right) k_O^L}. \tag{5}$$

It is immediately verifiable that α_M is decreasing in q since it moves from $\alpha_{\max}$ (when $q = 0$) to $\alpha_{\min}$ (when $q = 1$): indeed, the higher the probability q of the occurrence of the good state of nature, the lesser the preference for consumption in O needed to provide the incentive to agents to return to O. It is also immediately verifiable that the larger the labour productivity k_D in D, the larger α must be in order to push migrants to leave D. Thirdly, the larger the labour productiveness k_O^H and k_O^L in O, the lower the critical preference for the domestic consumption α_M needed to make a return to O profitable in expected terms. Finally, α_M is decreasing in p_L^e, since the expected probability of a successful re-migration to O can be viewed as a kind of insurance against the realization of an adverse shock. As a matter of fact, we have the following useful expression

$$\frac{d\alpha_M}{dp_L^e} = -\frac{q (1-q) k_D \left(k_O^H - k_O^L\right)}{\left[q k_O^H + (1-q) \left(1 - p_L^e\right) k_O^L\right]^2} < 0. \tag{6}$$

with

$$\frac{d^2\alpha_M}{dp_L^{e2}} = \frac{-2\left[q k_O^H + (1-q)(1-p) k_O^L\right](1-q) k_O^L q (1-q) k_D \left(k_O^H - k_O^L\right)}{\left[q k_O^H + (1-q)\left(1 - p_L^e\right) k_O^L\right]^4} < 0. \tag{7}$$

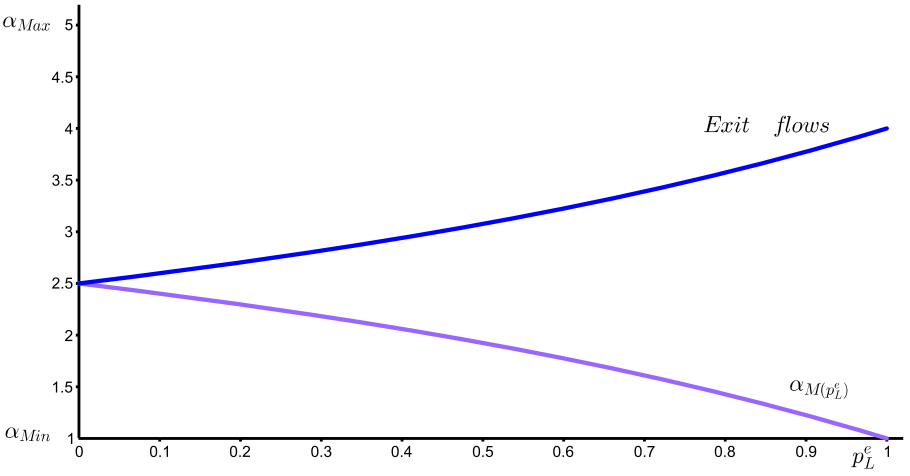

Fig. 1 Critical preference for domestic consumption and Exit flows

In order to test the responsiveness of the migration outflows with regard to the implementation of softer policy rules, we provide a numerical example. As a matter of fact, we want to assess how the critical level α_M of the home bias defined in Eq. 5 reacts when the policy migration p_L^e is set larger and larger. This, as a consequence, will

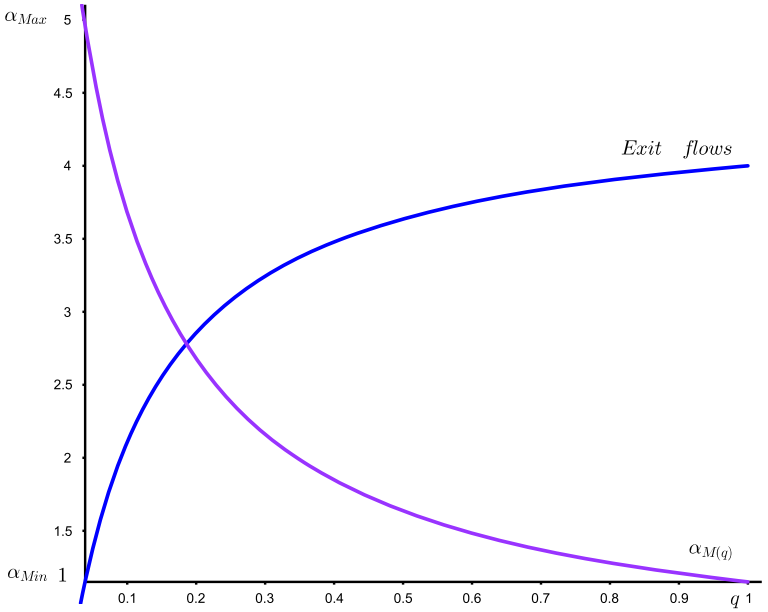

Fig. 2 Critical preference for domestic consumption and Exit flows

allow us to appreciate the migration outflows for a given distribution of the migrants. To this end, let us set $k_D = 10, \quad k_0^H = 10, \quad k_0^L = 2$ and $q = 1/4$. In addition, we assume that the migrants settled in country D are uniformly distributed in the interval $[\alpha_{min} = 1, \alpha_{max} = 5]$. In such a way we obtain α_M and the migration outflows as functions of p_L^e, depicted in Fig. 1.

Next, we want to assess how the critical level α_M of the home bias reacts when the parameter q (the relative instability of country O to D) is set larger and larger. We maintain the same calibration for $k_D, \quad k_0^H \quad , k_0^L$ and set $p_L^e = 1/2$. We carry out the same graphical exercise as above. In Fig. 2, we depict α_M and the migration outflows as functions of q.

3.3 Optimal policy with return migration

We assume that the unique role for the government is to regulate both the exit and entry migratory flows and to try to minimize the total number of migrants settled in D at the end of the period.[2] This is done in view of a postulated aversion toward immigration characterizing natives' preferences that the benevolent government is willing to satisfy (for example, in order to ensure its re-election in the future). It is obvious that migrant-receiving countries benefit from immigration. But one cannot ignore that migration is seen as a problem in the eyes of several natives in the host countries. To be convinced of this, the Transatlantic Trends survey conducted in 2014 reports that more than half of Europeans (58%), when asked if emigration is a problem, agreed that it was. The percentage of agreement is very high in countries such as Italy (84%), Spain (87%), Portugal (93%) or Greece (95%). Moreover, in the UK the Conservative Party had aimed at reducing net immigration to below 100,000 by the general elections in May 2015. The Brexit option is the fruit of an aversion, on the part of the majority of UK citizens, to immigration.

In this context, we want to consider the extreme case in which there is a complete aversion to immigrants. Our argument is that if we show that even in extreme cases of hostility against migrants, there are good reasons to implement a less restrictive migration policy; our conclusion will so be applicable to more realistic perceptions of immigration. For example, we could assume some concave benefit function related to positive immigration flows as the sustainability of the pay-as-you-go pension system or the filling of the chronic shortage in some occupational sectors. In other words, populations with insufficient fertility rates (as is the case in much of Europe) need migration if they want to survive as a country. By taking into account also the benefits associated with immigration, our model would predict an even more permissive optimal migration policy.

Nevertheless, the logic applied would still be the same, since the ex-post migration policy chosen by the government would be less restrictive than the ex-ante one.

[2]Notice that we assume that government is interested only in minimizing the total number of the migrants in the period under study and therefore ignores the impact of its choice on the stock of migrants settled in D in all future periods.

The time consistent problem would thus be still at work. For all these reasons, we focus on the extreme case in which there are no immigration benefits and migrants represent only a burden from the natives' point of view. As a matter of fact, the government must choose the optimal degree of frontier openness consisting in a vector $(p_H, p_L) \in ([0,1] * [0,1])$ representing the migration policies effectively implemented in correspondence to each state of the nature, taking into account the announced state contingent policy $\left(p_H^e, p_L^e\right) \in ([0,1] * [0,1])$. However, the implementation of such a policy is costly: i.e. the more permissive the migration policy, the less expensive its implementation; in particular, a complete closure of the frontier entails an infinite cost. A reliable shape for the cost function is the following:

$$C(p_i) = p_i^{-1} - p_i, i = H, L. \tag{8}$$

It is immediately verifiable that $C(0) = +\infty$, $C(1) = 0$, $C'(p_i) = -p_i^{-2} - 1 < 0$ with $C'(0) = -\infty$ and $C'(1) = -2$. At the beginning of the period the government announces a state dependent migration policy $\left(p_H^e, p_L^e\right)$ establishing the probability candidate migrants face of moving successfully from O to D in each state of the nature. In response to the announced policy, migrants settled in D decide whether or not to return to O, before they know the realization of the shock. On the other hand, migrants settled in O observe the shock and react consequently either by trying to migrate to D, (should the adverse shock realize) or by deciding to remain in O (if the good shock occurs). When shaping the optimal migration policy, the government can either follow rules or adopt a discretionary behaviour. For a given anticipated policy $\left(p_H^e, p_L^e\right)$ and an implemented policy (p_H, p_L) the expected loss function is

$$\begin{aligned} & q\left(\int_{\alpha_{\min}}^{\alpha_M\left(p_L^e\right)} f(\alpha)\, d\alpha\right) \\ & +(1-q)\left[p_L N + \int_{\alpha_{\min}}^{\alpha_M\left(p_L^e\right)} f(\alpha)\, d\alpha + p_L \int_{\alpha_M\left(p_L^e\right)}^{\alpha_{\max}} f(\alpha)\, d\alpha\right] \\ & +q\left(p_H^{-1} - p_H\right) + (1-q)\left(p_L^{-1} - p_L\right). \end{aligned} \tag{9}$$

Actually, Eq. 9 has the following interpretation. First, recall to mind that migrants settled in D at the beginning of the period will decide whether or not to move to O on the basis of the expected announced policy $\left(p_H^e, p_L^e\right)$. If the good state of nature is realized (with a probability q), all migrants settled in D at the beginning of the period and who decided to move back to O will remain there and, at the same time, no migrant initially settled in O will leave the country. On the other hand, if the adverse shock is realized (with a probability $1-q$), all migrants settled in D and who decided to move back to O will attempt to re-migrate to D; nevertheless, only a share p_L of them will succeed. At the same time, all the migrants settled initially in O will try to migrate to D but only a share p_L of them will reach such a goal. Setting $F(\alpha)$ the

repartition function of $f(\alpha)$ and after straightforward rearrangements, expression (9) can be rewritten as

$$\begin{aligned} & F\left(\alpha_M\left(p_L^e\right)\right)\left[1-(1-q)\, p_L\right]-F\left(\alpha_{\min}\right) \\ & +(1-q)\left(N+F\left(\alpha_{\max}\right)\right) p_L \\ & +q\left(p_H^{-1}-p_H\right)+(1-q)\left(p_L^{-1}-p_L\right). \end{aligned} \tag{10}$$

Notice that the loss function (10), provided $p_L \leq p_H$ (we will see in the sequel that such an inequality is satisfied), is decreasing in the probability q of the realization of the good shock as one can easily verify by a direct inspection of Eq. 10. This suggests that a more stable source country is beneficial for everybody: for the natives of country D in view of the reduced expected loss and for the immigrants because of the higher expected labour productivity in the origin country.

In the sequel, we will study equilibria emerging under two hypotheses. According to the first one, the government, when implementing the immigration policy, must follow "rules"; alternatively, we will focus on the case where its behavior is discretionary. Introducing the "rules" and "discretion" contrast seems at first sight too simple. One can have migration rules that vary with circumstance but which do not necessarily provide with discretion to politicians. We think here of countries like Australia, Canada, and New Zealand that run "points schemes" for settlement migrants. These schemes are the rules and the politicians do not alter them, but the particular level of points needed (e.g., from having a job offer, or from having a graduate degree, or from being in a certain age range) may sometimes be insufficient to meet a flexible target level of points which may vary with supply and demand conditions. However, for the sake of analytic tractability, in our paper we focus on the extreme regimes for the management of the migration policy where the government either is bound to follow rules or its behavior is completely discretionary. Of course, if we were to assume some intermediate regime, the results would be close to those obtained in the two extreme cases according to the relative proximity of the actual conduct of the government to one of the two benchmarks.

3.4 Optimal policy under rules

If government is constrained to follow rules, the policy implemented must be equal to the announced one, i.e. $(p_H, p_L) = \left(p_H^e, p_L^e\right)$. To this end, notice that Eq. 10 is decreasing in p_H and therefore its optimal value is $p_H = 1$. In addition, Eq. 10 is positive for all $p_L \in [0, 1]$; namely, it is $+\infty$ when $p_L = 0$ and reaches a positive and finite value when $p_L = 1$. It follows that it possesses a minimum, which may be either interior to the interval $[0, 1]$ or may correspond to the corner solution $p_L = 1$. To characterize such a minimum, let us write the derivative of Eq. 10 with respect to p_L equalized to zero which, after straightforward rearrangements, can be written as

$$\begin{aligned} & (1-q)\ \left(N+F\left(\alpha_{\max}\right)-F\left(\alpha_M\right)\right)+F'\left(\alpha_M\right)\alpha_M'\left[1-(1-q)\, p_L\right] \\ & =(1-q)\ \left(p_L^{-2}+1\right) \end{aligned} \tag{11}$$

Notice that the left-hand side of Eq. 11 is continuous in $p_L \in [0, 1]$ and that it will be positive as well as negative, according to the magnitude of α'_M. If the latter is close enough to zero, the derivative is positive and the solution for p_L will very likely belong to (0, 1): this is particularly true when $N + F(\alpha_{\max}) - F(\alpha_M) > 2$. If, on the other hand, $|\alpha'_M|$ is large enough, the left-hand side of Eq. 11 will be negative; it follows that the number of migrants settled in D at the end of the period will decrease in response to an increase of p_L and the solution may be $p_L = 1$. The intuition is straightforward: if the number of the migrants settled in D and deciding to move back to O increases sharply in response to an increase of p_L, the total number of migrants who will try to re-migrate to D in reaction to an adverse shock will be large, and therefore a more restrictive migration policy would be needed to lesser the number of the entries. The opposite feature is observed when α'_M is close enough to zero; the number of migrants who moved back to O and who try to go back to D will be lower and therefore the migration policy need not be very restrictive.

One may wonder, at this point, what the effect is of an increase of the probability q of the realization of the good shock on the optimal choice for p_L. Here the answer is ambiguous since it depends again upon the behavior of $F'(\alpha_M)$ and of α'_M. If these functions are relatively stable, the left-hand side of Eq. 11 will undergo, in reaction to an increase of q, an upward shift (since $F(\alpha_M)$ is decreasing in q) and therefore will cross the function $p_L^{-2} + 1$ in correspondence to a lower p_L and the optimal policy will then be more restrictive. On the other hand, when $F'(\alpha_M)$ and α'_M are rather elastic (and maybe $F''(\alpha_M) < 0$), the optimal policy can turn out to be more permissive. In any case, the total stock of migrants settled in the destination country at the end of the period, will be lower since immigrants will face a stronger incentive to move back to O and it will be very likely that they will remain there.

3.5 Optimal policy under discretion

Suppose now that the government adopts discretionary behaviour and agents expect a migration policy $\left(p_H^e, p_L^e\right)$. When the good state of nature is realized, no migrant settled initially in O will try to migrate and all those who left D and moved back to O will remain there. Should the adverse shock be realized, all those individuals who were initially in O, together with those who moved back to O from D, will try to migrate (or re-migrate) to D. However, once the migrants have taken a decision concerning which country to settle in, the government re-minimizes the loss function (10) with respect to p_H and p_L. It is immediately verifiable that the optimal deviation, should the good state of the nature be realized, is $p_H = 1$ which represents also the time consistent equilibrium, since in such a case no migrant in O will try to migrate to D. On the other hand, when the adverse shock occurs, the government ri-minimizes its loss function (10) with respect to p_L, setting p_H equal to one. It is immediately verifiable that in such a case (10) is infinite for $p_L = 0$ and finite and positive for $p_L = 1$. Therefore its derivative vanishes almost once in [0, 1], and the optimal p_L will be either one or a value included in (0, 1) . As a matter of fact, the derivative of Eq. 10 with respect to p_L equalized to zero (setting $p_H = 1$) gives

$$N + \left[F(\alpha_{\max}) - F\left(\alpha_M\left(p_L^e\right)\right)\right] = p_L^{-2} + 1 \tag{12}$$

i.e.

$$p_L^{dev} = \left(N + \left[F\left(\alpha_{\max}\right) - F\left(\alpha_M\left(p_L^e\right)\right)\right] - 1\right)^{-1/2} \tag{13}$$

where dev stands for "deviation" representing the government's best response to the announced policy. Notice that when $N + [F(\alpha_{\max}) - F(\alpha_M(0))] > 2$, p_L^{dev} is always interior to the interval [0, 1] and, in the opposite case, it can be equal to one. Since agents are endowed with rational expectations, they anticipate correctly the government's best response and then one has $p_L^{dev} = p_L^e = p_L$. It follows that the time consistent migration policy is

$$p_L = \left(N + \left[F\left(\alpha_{\max}\right) - F\left(\alpha_M\left(p_L\right)\right)\right] - 1\right)^{-1/2}. \tag{14}$$

The right-hand side of Eq. 14, as is easily verifiable, is continuous, decreasing and bounded in p_L. It follows that it will cross the curve p_L once at most. If it were not the case, the discretionary equilibrium would be $p_L = 1$. By inspecting (14), one can easily verify that, since α_M is decreasing in q and $F'(\alpha_M) > 0$, in response to an increase in q, the right-hand side of Eq. 14 will shift downward and will cross the line p_L in correspondence to a point closer to zero. The new optimal migration policy will therefore become more restrictive and will entail, of course, a larger implementation cost. However, this higher cost is more than counterbalanced by the decrease of α_M and therefore by the lower stock of migrants settled in D at the end of the period. Notice, finally, that the best response function (14) is discontinuous in $q = 1$ as is possible to verify by a direct inspection of Eq. 10). In such a case, the optimal deviation will be $p_L = 1$.

3.6 Comparing the two regimes

We have seen that both in the "rules" and in the "discretionary" regime, the optimal migration policy contingent to the realization of the good shock is equal to one. We have in addition proved that under rules the optimal policy p_L contingent to the occurrence of the adverse shock solves (11), namely

$$\left(N + F\left(\alpha_{\max}\right) - F\left(\alpha_M\right)\right) + \frac{F'\left(\alpha_M\right)\alpha_M'\left[1 - (1-q)\,p_L\right]}{(1-q)} = p_L^{-2} + 1 \tag{15}$$

and under discretion it solves (12) once one has replaced p_L^e with p_L,i.e.

$$N + F\left(\alpha_{\max}\right) - F\left(\alpha_M\right) = p_L^{-2} + 1 \tag{16}$$

Comparing the left-hand sides of Eqs. 15 and 16, we easily see that the former is lower than the latter for all p_L included in [0, 1], since their difference is given by

$$\frac{F'\left(\alpha_M\right)\alpha_M'\left[1 - (1-q)\,p_L\right]}{(1-q)} < 0. \tag{17}$$

It follows that under discretion, the migration policy will be more restrictive, since the left-hand side of Eq. 15 intersects $p_L^{-2} + 1$ in correspondence to a larger p_L. However, if, on the one hand, under discretion the implementation cost increases, on the other the stock of migrants settled in D at the end of the period may be higher as well as lower, according to the elasticity of the critical preference for domestic consumption α_M with respect to the optimal policy p_L , as is possible to verify by a direct

inspection of Eq. 10. If such an elasticity is rather low, one should expect a lower stock of migrants settled in the destination country at the end of the period within the discretionary regime than the corresponding stock obtained under the hypothesis that government follows rules. If the number of migrants within the discretionary regime is lower than the number obtained under "rules", this will be more than counterbalanced by a higher implementation cost: it follows that the "rules" regime dominates the "discretionary" one in terms of aggregate welfare. As a matter of fact, when government is bound to follow rules, one observes a lower expected loss for the natives in D and a larger probability for the candidate migrants of returning successfully to D, should they attempt to do that. It follows that everybody will better off.

In order to test the dynamic inconsistency of the equilibrium under rules, we provide a numerical example. To this end, we keep the same calibration as in Fig. 1, namely $k_D = 10, \quad k_0^H = 10, \quad k_0^L = 2$ and $q = 1/4$ and set $N = 4$. We first depict the function (10) by setting $p_L^e = p_L$. Once we have calculated its minimum, we draw the same function (10) but now we replace p_L^e with the value previously obtained which is $p_{L(min)} = p_L^R = 0,46$, where p_L^R is the optimal migration policy corresponding to the best state of nature in country O chosen when the government follows rules. Figure 3 depicts the two functions. As should be expected, the minimum of the function obtained by fixing the announced policy $p_L^e = 0,46$ entails a more severe migration policy: actually, it is $p_L^{dev} = 0,40$. The rationale of this result, as discussed previously, is to be found in the fact that the government, after having

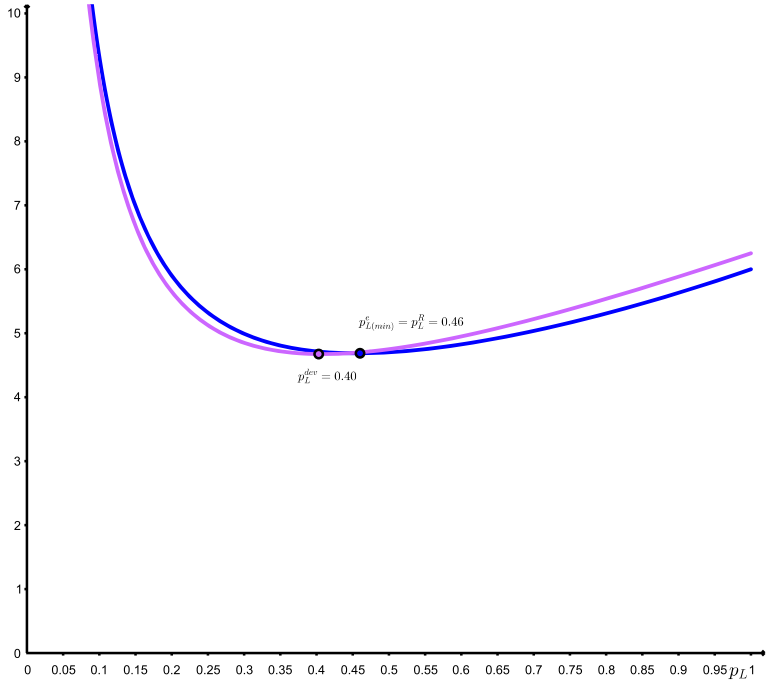

Fig. 3 Dynamic inconsistency of the equilibrium under rules

announced a relatively soft migration policy (and thus having provided the incentive to a large number of migrants to leave the destination country) has the interest, were the negative shock in country O to realize, to implement a more severe border control in order to limit the expected larger migration inflow. By solving Eq. 14 for p_L, one obtains that the optimal policy under discretion is $p_L^{dis} = 0.41$.

3.7 Migration dynamics

Since we have assumed that government is short-sighted, in each period it will choose an optimal state-dependent immigration policy regardless of its effects on the total mass of immigrants settled in the destination country in the following periods. This implies that the number of migrants settled in the destination country at the end of each period will follow a stochastic pattern in response to the realization of the shock and to the nature of the implemented policy, which can follow rules or be discretionary. To appraise the dynamic behaviour of the stock of migrants settled in D, let us assume that the population is constant, that agents are infinitely lived and that, at the beginning of each period, each migrant is settled in the same country where he was located at the end of the previous one. In addition, let N_0 and f_0 be, respectively, the stock of the candidate migrants settled in the origin country and the density function of the stock of migrants living in the destination country at the beginning of period zero. Finally let us denote with N_t and f_t, respectively, the stock of the candidate migrants settled in the origin country and the density function of the migrants settled in D at the beginning of period t. The number of migrants settled in D at the end of period $t+1$ will be, within the regime $i = R, D$, where R stands for "rules" and D for "discretion", and setting p_L^i the corresponding migration policy (for sake of simplicity, we omit the time index)

$$M_{t+1} = \int_{\alpha_{\min}}^{\alpha_M(p_L^i)} f_t(\alpha)\, d\alpha$$

in the case of the realization of the good shock and

$$M_{t+1} = \int_{\alpha_{\min}}^{\alpha_M(p_L^i)} f_t(\alpha)\, d\alpha + p_L^i N_t + p_L^i \int_{\alpha_M(p_L^i)}^{\alpha_{\max}} f_t(\alpha)\, d\alpha$$

in the case it is the adverse shock to occur. Notice, finally, that one has $N_t = \int_{\alpha_{\min}}^{\alpha_{\max}} f_0(\alpha)\, d\alpha + N_0 - \int_{\alpha_{\min}}^{\alpha_{\max}} f_t(\alpha)\, d\alpha$ and therefore the equilibrium dynamics within each regime follows a stochastic process depending upon the initial condition (M_0, N_0) and upon the whole history of the realization of the shocks.

4 Electoral accountability

In this section we analyze migration policy in a representative democracy and focus on whether electoral accountability may partly or wholly overcome the time inconsistency problem. Our analysis is inspired on performance voting models originally developed by Barro (1973), Ferejohn (1986), Aidt and Magris (2006) and Magris and Russo (2016). The last paper, in particular, focuses on the time inconsistency problem arising in the context where government must choose to what extent to grant amnesties to irregular workers. As a matter of fact, government weighs the fiscal gain deriving from the labour income tax of a legalized migrant against the temptation of deporting him back to his home country. Magris and Russo (2016) characterize the set of immigration amnesties which can be sustained at symmetric equilibrium, and show that it can contain the first-best under the hypothesis that politicians value political office enough. Within this framework, voters can provide incentives to politicians by holding them accountable at election times for past behaviour by threatening not to re-elect them if they deviate from a specified migration policy.

This mechanism can be viewed as complementary to the reputation one, but possesses the advantage of not depending upon the entire history of policies and, as a consequence of not requiring excessively large discount rates and an infinite time horizon. The sustainability of the political equilibrium is based, indeed, on the "ego" rent enjoyed by politicians in office and its dimension is crucial to providing a reliable incentive to not deviate from the announced policies and therefore to allow the implementation of the first best, namely the "rules" outcome. Following Magris and Russo (2016), we adopt Aidt and Magris (2006) logic to our model, but depart from their stationary equilibrium framework which rests upon the hypothesis of an infinitely repeated game made possible by the time-invariant structure of the model, in terms of number and of the type of the players involved.

In our case, by contrast, the number of the immigrants settled in the destination country and the number of the immigrants settled in the origin country evolve through time in response to previous migration policies, and new migration inflows and outflows make it impossible to focus on stationary equilibria whose sustainability is based upon the reputation mechanism requiring an infinitely repeated game. We therefore consider a simple two-period model where in the first period a politician takes office and voters announce a performance standard indicating, for the implementation of each migration policy, whether or not the politician will get the vote of a native in the election held at the end of the period. At the beginning of the second period, however, the elected politician knows that he could not be re-elected since the game will not go on and thus he will always take advantage of a deviation: the discretionary outcome in the second period is therefore bound to prevail.

In our political model we can distinguish two cases. According to the first, we can assume that those who vote for and, accordingly, may punish politicians should they misbehave are solely the natives; alternatively, we can hypothesize that migrants are also allowed to vote. Notice, however, that in both cases, those who must anticipate correctly the migration policies to be implemented, and decide whether or not to leave the destination country, are the immigrants. In any case, even under the hypothesis that migrants do not vote, the threat of punishment on the part of the natives provides

the misbehaving politicians with an incentive not to deviate and thus can make the "rules" equilibrium credible to the immigrants too. The implementation of the threat to not re-elect the incumbent politician is indeed credible since it does not involve any cost. Thus it follows that if politicians care sufficiently about holding office, the first best immigration policy (rules) will be supported by a symmetric political equilibrium. Therefore, in spite of the discrepancy arising between those who use the vote as a punishment device (the natives) and those who can only anticipate the migration policies (the immigrants), the electoral accountability mechanism can easily be used to support the first best (rules) outcome.

In the alternative case where migrants are granted the right to vote, there can arise, within the electoral strategies, an asymmetry between the natives' goal and the migrants'. Indeed, if on the one hand the natives are most concerned with the regulation of the migratory flows, on the other hand a migrant settled in D improves his expected utility as soon as the degree of the border control becomes lower, no matter what the total size of the migration is. However, this apparent discrepancy between the respective objectives of natives and migrants appears, once inspected more closely, innocuous in terms of the voting strategies and outcome at the Nash equilibrium. This is immediately verifiable once one observes that the "rules" equilibrium, which corresponds to a more permissive migration policy, dominates the discretionary one from the natives' point of view. However, the former policy, by definition, is also preferred by the migrants, since it entails a more flexible border control. It follows, then, that migrants can be willing to use the same punishment strategy as the natives do. In particular, they would be willing to re-elect the politician in office if and only if he implements the "rules" equilibrium and, conversely, to kick him out of office should he deviate from it. Things are slightly different if we assume that migrants are also eligible as politicians. In such a case, their objective function would differ from the natives' one: in this context, one should introduce two different payoffs relative to, respectively to the natives and migrants and weighted by the mass of each type of agents. In any case, the empirical evidence suggests that in the majority of cases migrants do not enjoy the right to vote. Thus, this is the hypothesis that we will retain in the sequel.

Consider now the first period. The politician in office must choose a migration policy that minimizes the loss of the representative native of D. The discount factor of the politician is the same as that of the households. In each period, politicians enjoy the same (dis)utility of the households but also earn the ego rent m from holding office. At the end of the first period elections take place: by assuming that all households are eligible to vote in the elections, a challenger selected from one of the natives runs against the incumbent politician. If the latter loses office, in the second period he will return to the private sector and the challenger will become the politician. In the second period the new politician will enjoy the ego rent m and at the end the game is over. To keep things as simple as possible, we suppose a continuum of natives defined on the unit interval, i.e. the set of natives is $H = [0, 1]$. Consider a voter j drawn from H. He or she will set a performance standard at the beginning of the first period, once the politician is already in office. Namely, each voter $j \in H$ announces a vote function $\lambda_i(p^I)$ indicating, for each migration policy $p^I = \left(p_L^I, p_H^I\right)$, whether the politician will receive the vote of voter j in the election held at the end of the period.

$\lambda_i(p^I)$ can be thus viewed as a simple probability for the politician of getting the vote of individual j. We assume that the vote functions have the following form:

$$\lambda_j(p^I) = 1 \;\; iff \;\; p^I = p^s_J$$
$$\lambda_j(p^I) = 0 \;\; iff \;\; p^I \neq p^s_J$$

where[3] $p^s_j = \left(p^s_{j,L}, p^s_{j,H}\right)$ is the performance standard announced by voter $j \in H$ at the beginning of period one. This means that the politician in office will get the vote of the voter $j \in H$ if and only if the implemented migration policy is equal to the performance standard. After the performance standard has been announced, the politician implements a policy in the foregoing period, consisting in a mapping from the set of performance standards onto $[0, 1]^2$. He will be re-elected if and only if at least half of the standards are satisfied. At the end of the first period, natives cast their votes according to their vote functions and the politician is re-elected or not. In the latter case, in the second period, he will return to the private sector and the newly elected politician will hold the office until the end of the period and implement a migration policy regardless of the possibility of a reelection, in view of the finite time horizon of the model.

We define a political equilibrium, a set of vote functions and policy implementation rules satisfying the following conditions: (i) given the vote functions, the politician chooses the migration policy that maximizes his life-time utility; (ii) the vote functions announced by each voter $j \in H$ must maximize her life-time utility taking as given the vote functions of the other natives and the policy implementation rule of the politician. We will focus on the special case where all voters use the same vote function and will refer to it as symmetric political equilibrium. In order to construct the political equilibrium, consider the voters. Since it is impossible for the politician to give different treatment to any subset of voters, at symmetric equilibrium one has $p^s = p^s_j$ for all $j \in H$. Notice, in addition, that any particular voter j cannot change the policy outcome by deviating from the performance standard and thus has no (strict) incentive to deviate. Consider now the politician in office in the first period. His pay-off can be written as

$$V = m + G_1(p^I, p^s) + \beta\lambda(p^I)V^E + \beta\left(1 - \lambda(p^I)\right)V^{NE} \tag{18}$$

where β is the discount factor, $G_1(p^I, p^s) < 0$ is the loss of an implemented migration policy p^I in the first period given the standard performance (and therefore the immigrants' expectation) p^s, V^E the continuation value of the politician if he is reelected at the end of the first period and V^{NE} the continuation of his utility if he is not reelected and returns to the private sector. Notice that in the second period, whoever the politician in office is, the unique policy outcome will be the discretionary one, since no elections at the end of the period are held and therefore no vote functions are shaped. It follows that the loss in the second period will be either G_2^{dev} (if in

[3]Notice that the commitment problem arises in correspondence only to the realization of the adverse shock. Indeed, as we have already seen in correspondence to the good shock, we have that $p_H = 1$ is not only optimal but also time consistent.

the first period the government did not comply) or G_2^s (if the government complied). As a matter of fact, if the politician is willing to deviate, he will choose a less or more restrictive migration policy than the one immigrants are expecting, and his life-time utility will therefore be

$$V^{NE} = G_1(p^{dev}, p^s) + m + \beta G_2^{dev}$$

Suppose the politician wants to be reelected. Then the best implementation policy is $p^I = p^S$ and the associated payoff is

$$V^E = G_1(p^s, p^s) + m + \beta \left[m + G_2^s\right]$$

Assuming that the politician complies if indifferent and voters behave according to their vote functions, since this does not entail any cost, a necessary and sufficient condition for compliance is $V^E > V^{NE}$ i.e.

$$m > \frac{1}{\beta}\left[G_1(p^{dev}, p^s) - G_1(p^s, p^s)\right] + G_2^{dev} - G_2^s \tag{19}$$

It follows that p^s can be supported as the outcome of a symmetric political equilibrium under the domain of inequality (19). In particular, the first best immigration policy p^R, where R stands for "rules", can be supported as the outcome of a symmetric political equilibrium if Eq. 19 holds once one has replaced p^s with p^R. The rationale of the above-described mechanism is the following: in the first period the politician faces the temptation to deviate and implements a more restrictive migration policy, ensuring a loss $G_1(p^{dev}, p^s)$; the incumbent politician balances such a temptation to deviate against the desire to be re-elected and earn the ego rent m. Voters therefore must coordinate on a symmetric performance standard such that the politician prefers to comply to secure election. If the ego rent m is high enough, the policy under rules can be supported by a symmetric political equilibrium. The mechanism based on electoral accountability exploits the fact that politicians value political office, from which they enjoy the ego rent. Voters know that and, accordingly, can punish politicians by replacing them with a challenger. The political equilibrium therefore does not require an infinitely repeated game and a large enough discount factor, as is the case within the reputation mechanism consisting in threatening politicians by revoking their trust in them.

As pointed out by Aidt and Magris (2006) and Magris and Russo (2016), performance voting requires that voters coordinate their voting strategies. More specifically, by allowing individuals to set their own standard performance in a non-cooperative manner, opens the door for a very large set of equilibria, some dominating others. This, in turn, would require shaping some theory of equilibrium selection or employing some more demanding equilibrium concepts. However, we are able to characterize the set of outcomes that can be sustained by the mechanism of electoral accountability and to provide necessary and sufficient conditions to the inclusion in this set of the first best, namely the equilibrium emerging under rules. In addition, in our model we assume that politicians are perfect substitutes for each other and therefore voters are indifferent regards of any two candidates at the election and thus they have no strict incentive to deviate from their announced voting strategy. Were politicians different, each with his own characteristics, the accountability problem would become

more complicated and would require taking into account more cumbersome voting strategies, as suggested, e.g., by Banks and Sundaram (1993, 1998).

5 Concluding remarks

In this paper we have derived the optimal migration policy under the hypothesis that opening the borders influences not only the migration entry flows, but the exit ones too. We have shown that a more permissive policy increases both flows and that, in the end, the stock of immigrants settled in the destination country will be lower than if one had considered solely the entry flows. We have shown that in this context there could arise a problem in terms of commitment concerning the implementation of the migration policy. In particular we have found that under discretion, border controls are stricter than when government follows rules. For observed migration policies to correspond to what voters would like them to be, one needs a suitable commitment technology. We identify such a technology in electoral accountability.

We have also shown that a more stable origin country may alleviate the migration pressure and allows for a Pareto improvement. These results suggest the opportunity for policies aimed, by means of aid programs and economic partnerships, at stabilizing the origin countries by minimizing the frequency at which negative shocks occur, with the result of increasing the average labour productivity in the source countries.

The choice of the immigrants whether or not to return home depends upon the incentives they are faced with, and it is positively related to the probability of a successful re-emigration should a negative shock occur in the origin country, and to the preference for domestic consumption. Such a parameter can be viewed as the measure of the "distance" (geographical, cultural, political, social, and environmental) between the two countries. The migration policy we have described appears therefore to be "selective" since the immigrants who are more likely to remain in the destination country are those who exhibit a larger cultural proximity with it.

It would be interesting, following (Dustmann 2003) and Dustmann and Weiss (2007), to consider a process of wealth accumulation (for example physical capital) in the destination country. The immigrant will indeed use his wealth to finance consumption in the origin country, should he return there, but, in view of the postulated instability of the country, the return of this wealth will be risky and the measure of the risk will in turn influence the choice to return home. Finally, one could easily extend the model by assuming that the migrants living initially in the destination country face a different migration policy that faced by the migrants settled initially in the origin country. In such a case, one should expect a more permissive policy for the migrants living initially in the destination country in view of the migration outflow mechanism, taking obviously into account also the stock of migrants in D relative to O.

Acknowledgements We would like to thank an anonymous referee for his very helpful comments and suggestions. We would also like to acknowledge Toke Aidt, Rémi Bazillier, Francesca Busetto, Giulio Codognato, Jean-Pierre Drugeon, Clara Graziano, Daniel Mirza, Flavio Pressacco, Giuseppe Russo and Marina Shenker for their help. Any errors are our own.

References

Aidt TS, Magris F (2006) Capital taxation and electoral accountability. Eur J Polit Econ 22(2):277–29. doi:10.1016/j.ejpoleco.2005.06.007. http://www.sciencedirect.com/science/article/pii/S0176268005000674

Angelucci M (2012) Us border enforcement and the net flow of Mexican illegal migration. Econ Dev Cult Chang 60(2):311–357. http://www.jstor.org/stable/10.1086/662575

Banks J, Sundaram RK (1993) Adverse selection and moral hazard in a repeated elections model. In: Barnett WA, Hinich M, Schofield (eds) Norman Political Economy: Institutions, Competition and Representation: Proceedings of the Seventh International Symposium in Economic Theory and Econometrics. Cambridge University Press, New York, pp 295–311

Banks J, Sundaram RK (1998) Optimal retention in agency problems. J Econ Theory 82(2):293–323. doi:10.1006/jeth.1998.2422

Barro RJ (1973) The control of politicians: An economic model. Public Choice 14(1):19–42. doi:10.1007/BF01718440

Barro RJ, Gordon DB (1983) Rules, discretion and reputation in a model of monetary policy. J Monet Econ 12(1):101–121. doi:10.1016/0304-3932(83)90051-X

Bazillier R, Magris F (2016a) The effects of schengen on outmigration: Theory and evidence. Mimeo

Bazillier R, Magris F, Mirza D (2016b) Outmigration and economic cycles. Mimeo

Belot M, Ederveen S (2011) Cultural barriers in migration between OECD countries. J Popul Econ 25(3):1077–1105. doi:10.1007/s00148-011-0356-x

Borjas G, Bratsberg B (1996) Who leaves? The outmigration of the foreign-born. Rev Econ Stat 78(1):165–176. http://www.jstor.org/stable/2109856

Card D, Dustmann C, Preston I (2012) Immigration, wages, and compositional amenities. J Eur Econ Assoc 10(1):78–119. doi:10.1111/j.1542-4774.2011.01051.x

Cohen Y, Haberfeld Y (2001) Self-selection and return migration: Israeli-born Jews returning home from the United States during the 1980s. Popul Stud 55(1):79–91

de Coulon A, Piracha M (2005) Self-selection and the performance of return migrants: the source country perspective. J Popul Econ 18(4):779–807. doi:10.1007/s00148-005-0004-4

De Haas H, Fokkema T, Fihri MF (2015) Return migration as failure or success J Int Migr Integr 16(2):415–429

Docquier F, Ozden C, Peri G (2014) The labour market effects of immigration and emigration in oecd countries. Econ J 124(579):1106–1145. doi:10.1111/ecoj.12077

Dustmann C (2003) Return migration, wage differentials, and the optimal migration duration. Eur Econ Rev 47(2):353–369. doi:10.1016/S0014-2921(01)00184-2

Dustmann C, Weiss Y (2007) Return migration: Theory and empirical evidence from the UK. Br J Ind Relat 45(2):236–256. doi:10.1111/j.1467-8543.2007.00613.x

Dustmann C, Fadlon I, Weiss Y (2011) Return migration, human capital accumulation and the brain drain. Journal of Development Economics 95(1):58–67. doi:10.1016/j.jdeveco.2010.04.006 http://www.sciencedirect.com/science/article/pii/S0304387810000453, symposium on Globalization and Brain Drain

European Training Foundation (2007) The contribution of human resources development to migration policy in Albania. Tech. rep., Torino

Facchini G, Mayda AM (2009) The political economy of immigration policy. Human Development Research Paper 2009/03

Ferejohn J (1986) Incumbent performance and electoral control. Public Choice 50(1):5–25. doi:10.1007/BF00124924

Gibson J, McKenzie D (2011) The microeconomic determinants of emigration and return migration of the best and brightest: Evidence from the Pacific. J Dev Econ 95(1):18–29. doi:10.1016/j.jdeveco.2009.11.002. http://www.sciencedirect.com/science/article/pii/S0304387809001163, symposium on Globalization and Brain Drain

Gibson J, McKenzie D (2012) The economic consequences of 'brain drain' of the best and brightest: Microeconomic evidence from five countries. Econ J 122(560):339–375. doi:10.1111/j.1468-0297.2012.02498.x

Gundel S, Peters H (2008) What determines the duration of stay of immigrants in Germany? evidence from a longitudinal duration analysis. Int J Soc Econ 35(11):769–782. doi:10.1108/03068290810905414

Jaeger DA, Dohmen T, Falk A, Huffman D, Sunde U, Bonin H (2010) Direct evidence on risk attitudes and migration. Rev Econ Stat 92(3):684–689

Javorcik BS, Ozden C, Spatareanu M, Neagu C (2011) Migrant networks and foreign direct investment. J Dev Econ 94(2):231–241. doi:10.1016/j.jdeveco.2010.01.012. http://www.sciencedirect.com/science/article/pii/S0304387810000222

Kydland FE, Prescott E (1977) Rules rather than discretion: The inconsistency of optimal plans. J Polit Econ 85(3):473–491. http://www.jstor.org/stable/1830193

Lundborg P, Segerstrom PS (2002) The growth and welfare effects of international mass migration. J Int Econ 56(1):177–204. doi:10.1016/S0022-1996(01)00105-2

Magris F, Russo G (2016) Fiscal revenues and commitment in immigration amnesties. Eur J Polit Econ 42:75–90. doi:10.1016/j.ejpoleco.2015.11.004. http://www.sciencedirect.com/science/article/pii/S017626801500097X

Mayr K, Peri G (2009) Brain drain and brain return: theory and application to Eastern-Western Europe. The BE J Econ Analysis & Policy 9(1). doi:10.2202/1935-1682.2271

McCormick B, Wahba J (2001) Overseas work experience, savings and entrepreneurship amongst return migrants to ldcs. Scottish J Pol Econ 48(2):164–178. doi:10.1111/1467-9485.00192

Mesnard A (2004) Temporary migration and capital market imperfections. Oxford Economic Papers 56(2):242–262. doi:10.1093/oep/gpf042. http://oep.oxfordjournals.org/content/56/2/242.abstract, http://oep.oxfordjournals.org/content/56/2/242.full.pdf+html

Nekby L (2006) The emigration of immigrants, return vs onward migration: evidence from Sweden. J Popul Econ 19(2):197–226. doi:10.1007/s00148-006-0080-0

Passel JS, D'Vera Cohn GBA, Gonzalez-Barrera A (2012) Net migration from Mexico falls to zero–and perhaps less. Pew Research Center, Washington

Piracha M, Vadean F (2010) Return migration and occupational choice: Evidence from Albania. World Dev 38(8):1141–1155. doi:10.1016/j.worlddev.2009.12.015. http://www.sciencedirect.com/science/article/pii/S0305750X10000045

Rauch JE, Trindade V (2002) Ethnic Chinese networks in international trade. Rev Econ Stat 84(1):116–130. http://www.jstor.org/stable/3211742

Rooth DO, Saarela J (2007) Selection in migration and return migration: Evidence from micro data. Econ Lett 94(1):90–95. doi:10.1016/j.econlet.2006.08.006. http://www.sciencedirect.com/science/article/pii/S0165176506002746

Sun W (2013) The productivity of return migrants: the case of China's "sea turtles". IZA J Migration 2(1):1–19

Vatn A (2008) Temporary and circular migration: the Egyptian case, analytical and Synthetic Notes 2008/09 EUI: CARIM

Wahba J (2015) Selection, selection, selection: the impact of return migration. J Popul Econ 28(3):535–563. doi:10.1007/s00148-015-0541-4

Zimmermann KF (2014) Circular migration. IZA World of Labor