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### **« Migration Outflows and Optimal Migration Policy: Rules versus Discretion »**

**Ismael ISSIFOU  
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# Migration Outflows and Optimal Migration Policy: Rules versus Discretion\*

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## 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 softer, 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 generally acknowledged. We show that if government follows rules to shape the optimal migration policy, it will chose more open borders than in the case its behavior is discretionary. However, this requires an appropriate commitment technology. We show that electoral accountability may be a solution of the commitment problem. As a matter of fact, observed softer immigration rules in western countries suggest the effectiveness of such a mechanism.

*Keywords:* Migration Return; Optimal Migration Policy; Time Consistency

*JEL Classification:* E61; F220; J150

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# Politique Migratoire Optimale, migration retour: Règles versus Discrétion

## Résumé

Cet article analyse les effets d'une politique souple de fermeture des frontières sur la migration retour. Nos résultats montrent que les migrants sont plus incités à retourner dans leur pays d'origine lorsque les politiques migratoires sont souples, leur garantissant ainsi la possibilité de re-émigrer en cas de chocs adverses dans le pays d'origine. Jusqu'alors méconnu, les politiques migratoires moins restrictives réduisent les flux nets de migrants. Aussi, la politique migratoire optimale définie par un gouvernement sous une politique de règle est plus souple qu'elle le serait si le même gouvernement adoptait une politique discrétionnaire. Par ailleurs, des pays d'origine plus stables sont profitables à la fois aux pays de destination par un faible de stock de migrants et aux migrants par une forte productivité du travail dans leur pays d'origine.

*Mots clés:* Migration Retour; Politique Migratoire Optimale; Incohérence temporelle

*JEL Classification:* E61; F220; J150

# 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”. However, the feeling that seems to prevail in many States is the former, as is shown by the increase in the elections of parties whose ideological platform is based primarily on promises of greater control of the borders and a no-quarter onslaught on clandestine immigration. Faced with the threat of an erosion of the electoral consensus, and in order to remove the monopoly of this issue from emerging forces, openly xenophobic and that feed on social disquiet, certain more traditional parties, which until a short time ago did not appear to harbour deep-seated prejudices on the subject, have also begun to make some of their own anti-immigration speeches and make promises concerning its control and its restriction.

In this paper, we study the effects of more open borders on return migration: 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 host country. As a result, softening migration rules leads to lower net inflows than generally acknowledged. Nevertheless, in this framework the problem of dynamic incoherence is easily set out (Kydlund and Prescott, 1977; Barro and Gordon, 1983): the government may in fact face the incentive, once a relatively permissive policy is announced (that will push 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.

We show that the optimal migration policy implemented following rules is more permissive than that put into effect should the government adopt a discretionary behavior. In absence of a commitment technology, our model predict an equilibrium outcome corresponding to rather restrictive migration policies. This seems to be at odds with observed migration flows which, in view of their importance, emphasize that most part of the countries implement softer policies. This suggests the existence of some commitment technology allowing to reach the first best equilibrium. We propose a solution of the time inconsistency problem based upon electoral accountability.

Several database that provide a comprehensive overview of migration report that the number of international migrants substantially increased since 1960. In 2013, the number of international migrants reached 232 million and this number represents an increase of 33% compared to 2000. Migrations policies, tools for many receiving countries to determine how many people to admit account for much. To assess how migration policies evolve over time and its changes across countries is severely hampered by data availability. However, efforts are made to collect government views and responses to migrations. In a survey covering 195 countries, policy makers are invited to express if they perceive migration policies in their country high, suitable or rather low. Once keeping in mind

that the data must be interpreted with caution, it appears that in 2007, barely 80% governments are satisfied with the current immigration levels. Less than 20% view them unduly high while 5% find them very low. It follows that actual policies is less restrictive than would be called for. Moreover, Ortega and Peri (2013) reach the similar result by constructing immigration laws database for the main OECD countries. They construct an index to assess whether migrations policies are enough restrictive or not. They find considerable periods during which laws for entry are low. This was the case in the US between 1980 and 1990, Canada and Germany since 1990 or Sweden since the mid 1990s. While periods of too restrictive migration policy can be identified ( for example Danmark in the 2000), there are more countries that conduct mild migration policies than countries that severely restrict them. While several reasons are put forward to explain this figure <sup>1</sup> we argue that electoral accountability account for much.

Throughout the paper, we assume that the government goal is to minimize the stock of migrants settled in the country taking into account the cost of border control. Such a goal reflects a postulated feeling of hostility toward migration among the natives. Such widespread feeling is the result of the uncontrollable dimensions it has assumed in recent years, in itself the result of various historical events of the time such as the collapse of the Soviet Union, the Arab Spring and the proliferation of regional armed conflicts in Africa and Asia which have released an explosive potential of economic and political refugees. In Europe, especially, the Schengen Treaty has led to an unprecedented circulatory flow within those nations that adhere to it, 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). These hostile feelings towards the migration phenomenon have hardened since the recession of 2008 and the changed nature of immigration itself: if at first it was for the most part seasonal and temporary, but from the 70's on it was characterized by families reuniting and settling permanently (Castles, 2006). This explain why in many western countries a substantial number of citizens exerted upon their governments, under threat of electoral sanctions, considerable pressure in order that policies be adopted to contain the entry flow and at the same time ensure the rapid exit of those immigrants already settled in the country. Card *et al.* (2012) emphasize how European opinions about migrants reflect more cultural points of views rather than mere cost-benefit perceptions and Belot and Ederveen (2012) as well as Bertoli *et al.* (2013) analyze the huge resistance, not merely economical but also cultural, in developed countries to migration.

Controlling the entry flow depends on policies aimed at rendering access to the national territory more difficult, and are the more burdensome the more impassable one wants to make the borders. The policies that aim at increasing the exit flow can take on the semblance of coercive deportation, as for example the penalties predicted in Italy following the introduction of “the crime of clandestinity”(only recently abolished), or specific legislative dispositions such

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<sup>1</sup>See

as the worsening of the conditions governing the renewal of residence permits and the granting of work permits that limit the duration of residence abroad (OECD, 1999, 2001, 2013; Boeri and Brucker, 2005; Khraiche, 2014). But one can also influence the choices of the immigrants themselves, for example by way of arranging tempting financial incentives that will induce them to return home voluntarily (OECD, 2009).

The perception of migration as a temporary phenomenon has produced a relatively recent literature. Dustmann (1997, 2003) proposes to establish the optimal length of the migration period on the hypothesis that there exist complementarities between consumption and the location where consumption takes place, and shows that this length is reduced when the consumption is most valued at home and/or the accumulation of wealth in the host country occurs at a faster rate. Such hypotheses are tested by Dustmann and Weiss (2007) in the context of the United Kingdom. In a more recent paper, Dustmann *et al.* (2011) deepen the analysis by accounting for the role of human capital accumulation and the related brain drain phenomenon on the return migration choice. On the basis of the insights of Kossoudji (1992) and Faini (1996), Magris and Russo (2009) show how a more permissive migration policy reduces the average length of each period spent in the country of immigration, presuming that the individuals emigrate repeatedly in the course of their lives. Bazillier *et al.* (2015) observe how the economic fluctuations of a short period produce, in terms of exit flows, the same effects as restrictive policies in recessionary periods. Borjas and Bratberg (1996) and Dustmann and Gorlach (2014) ascertain how return migration is rather “selective” and more easily to be found among the immigrants coming from high-income countries rather than those still developing. Fan and Wang (2006) and de Haas *et al.* (2014) interpret return migration as the sign of a success or a failure of the migrant in the hosting country. Domingues Dos Santos and Wolff (2010) interested to know why Portuguese migrants are more likely to return home show that the explanation also has to do with the family ties with their country. Indeed, 40% of Portuguese in France have at least one parent living in Portugal compared to 23% for Italian and Spanish migrants.

The total stock of immigrants settled in a country at a particular period is made up of the difference of entry flows and the exit ones and apparently only the first flow is susceptible to the policies of border closure. In this article we propose to analyze the impact of such policies on the second flow too. The decision to emigrate often represents a reaction to an adverse shock which involves the origin country and which may consist of an environmental catastrophe, a famine, a war, a *coup d'état*, a decline in the course of goods destined for export or a rise in the course of those imported. Common to each of such contingencies is the drop in earnings following the drop in productivity. The presence of productivity shocks are emphasized in Coulombe (2006) when he analyzes interprovincial migration in Canada and shows that it is principally driven by structural factors such as the long-run regional differential in unemployment rates, the rural/urban differential structure of the provinces and, as it is our case, labor productivity.

However, if consumption is more valorized in the country of provenance to the extent of compensating for possible differences in terms of productiv-

ity between the two countries (should the adverse shock not be realized), an immigrant will carefully weigh up the advisability of returning to his country on the basis of the expected advantage represented by such a choice. Such advantage is obviously correlated positively with the preference for domestic consumption, with the stability of the country of provenance and, above all, with the probability of the reinstatement of his condition as migrant in case of an unsuccessful migration return i.e. if, once returned home, he observes the realization of the negative shock (which we suppose to be distributed independently). More open borders represent, in some sense, an insurance coverage against the typical instability of the source countries usually low-income with weak and unstable politico-economic structures, exposed to environmental risks, and frequently shaken by the tremors of war. 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. Therefore, softening migration rules leads to lower net inflows than generally acknowledged and as a consequence, the optimal migration policy is likely to be more permissive than that implemented when only the exit flows are taken into account. The commitment problem is easily comprehensible once one observes that after having announced a strategical permissive policy to encourage migrants to return home, the government acting under discretion could be tempted to change idea. In response to an adverse shock in the source country, the government would in fact face a strong migratory pressure (composed by those immigrants settled at the beginning of the period in the source country and by those who voluntarily moved back to it). This would in turn require to strengthen the policy in order to limit the total number of entries. If, on the other hand, the government follows rules, it will implement a moderately permissive policy in order to avoid a too much large migratory flow that would make it necessary to reshape its policy in more restrictive terms. Let us observe that the first best outcome attained under rules cannot be implemented in a repeated game since the composition of the immigrants in the two countries is not time-invariant. The unique way to implement the “rules” equilibrium requires therefore the availability of an appropriate commitment technology.

Since closing the border is costly, it follows that the policy implemented following rules Pareto dominates the discretionary one from the point of view of the destination country: in the case of an adverse shock in the origin country, the lower stock of immigrants implied by the latter will be more than compensated by the larger implementation cost. Of course, under both policies, the optimal state dependent migration policy entails a complete degree of frontiers’ openness contingent to the realization of the good shock, since all the migrants that decided to go back home, will remain there until the end of the period. Eventually, a more stable origin country implies a Pareto improvement for both natives and immigrants. The former will expect a lower stock of immigrants, meanwhile the latter will face a larger average labor productivity in the source country. This suggests the opportunity of policies aimed at stabilizing the source countries by means of specific financing programs and the institution of economic partnerships with the developed countries.



## 2 The Model

In this Section we introduce the model and present the main results. We first describe the migrants' behavior and the choices they are faced with, with particular regard to the possibility of a return to the origin country. We analyze the conditions under which such a choice would be effectuated. Then we present the government goal consisting in minimizing of 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 when the government follows rules and when its behavior 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.

### 2.1 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 labor 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 labor 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 <sup>2</sup>

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

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 labor 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

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

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<sup>2</sup>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 be come impossible to derive explicitly the critical parameters of the model

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 labor 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  $\alpha$  is

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

If  $\alpha$  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  $O$ . At the beginning of the period, a migrant settled in  $O$  observes the realization of 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

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

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.

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

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  $N = \int_{\alpha_{\min}}^{\alpha_{\max}} g(\alpha) d\alpha$ .

## 2.2 Return Migration

Suppose that migrants settled in  $D$  must decide whether or not to move back to  $O$  at the beginning of the period. However, they must 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. If they decide to return to  $O$ , once they reach such a country, 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  $(p_H^e, p_L^e)$ , 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. The state dependent migration policy can be viewed as an entry requirement contingent upon some specific requisite, as it is the case when granting the status of political refugee is conditional to 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  $(p_H^e, p_L^e)$ . The expected utility

$u^e$  for an individual with a preference for domestic consumption  $\alpha$ , however, depends upon the announced migration policy  $(p_H^e, p_L^e)$ , and is given by

$$u^e = \alpha q k_O^H + p_L^e (1 - q) k_D + \alpha (1 - q) (1 - p_L^e) k_O^L. \quad (4)$$

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  $\alpha k_O^H$ ) and, in view of (2), remains in  $O$ . Conversely, with a probability  $(1 - q)$ , he faces a labor productivity  $k_O^L$  (which yields a utility  $\alpha k_L$ ) and, in view of (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 an utility  $\alpha k_L$ . 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 (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, (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 the nationality to the migrant. Since  $u^e$  is increasing in  $\alpha$ , by solving for  $\alpha$  the indifference condition  $u^e = k_D$ , one obtains the critical preference  $\alpha_M$  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  $\alpha$  satisfies

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

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

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

with

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

### 2.3 Optimal Policy with Migration Return

We assume that the unique role for the government is to regulate both the exit and the entry migratory flows and to try to minimize the total number of migrants settled in  $D$  at the end of the period. 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). 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  $(p_H^e, p_L^e) \in ([0, 1] * [0, 1])$ . 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. 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:

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

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  $(p_H^e, p_L^e)$  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  $D$  (in the case the adverse shock should realize) or by deciding to remain in  $O$  (if the good shock occurs). When shaping the optimal migration policy, the government can follow either rules or adopt a discretionary behavior. For a given anticipated policy  $(p_H^e, p_L^e)$  and an implemented policy  $(p_H, p_L)$  the expected loss function is

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

Actually, (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  $(p_H^e, p_L^e)$ . 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

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

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 (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 labor productivity in the origin country.

## 2.4 Optimal Policy under Rules

If government is constrained to follow rules, the policy implemented must be equal to the announced one, i.e.  $(p_H, p_L) = (p_H^e, p_L^e)$ . To this end, notice that (10) is decreasing in  $p_H$  and therefore its optimal value is  $p_H = 1$ . In addition, (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 (10) with respect to  $p_L$  equalized to zero which, after straightforward rearrangements, can be written as

$$\begin{aligned} (1 - q)(N + F(\alpha_{\max}) - F(\alpha_M)) + F'(\alpha_M)\alpha'_M [1 - (1 - q)p_L] = \\ (1 - q)(p_L^{-2} + 1) \end{aligned} \quad (11)$$

Notice that the left-hand side of (11) is continuous in  $p_L \in [0, 1]$  and that it will be positive as well as negative, according to the magnitude of  $\alpha'_M$ . If the latter is close enough to zero, the derivative is positive and the solution for  $p_L$  will be very likely to 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 (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 mitigate the entries. The opposite feature is observed when  $\alpha'_M$  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 would need not be very restrictive.

One may wonder, at this point, what is the effect 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  $\alpha'_M$ . If these functions are relatively stable, the left-hand side of (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  $\alpha'_M$  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.

## 2.5 Optimal Policy under Discretion

Suppose now that the government adopts a discretionary conduct and agents expect a migration policy  $(p_H^e, p_L^e)$ . 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 are 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 in 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, in the case the good state of the nature realizes, 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 re-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 (10) with respect to  $p_L$  equalized to zero (setting  $p_H = 1$ ) gives

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

i.e.

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

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

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

The right-hand side of (14), as it is easily verifiable, is continuous, decreasing and bounded in  $p_L$ . It follows that it will cross the curve  $p_L$  at most once. If it were not the case, the discretionary equilibrium would be  $p_L = 1$ . By inspecting (14), one can easily verify that, since  $\alpha_M$  is decreasing in  $q$  and  $F'(\alpha_M) > 0$ , in response to an increase in  $q$ , the right-hand side of (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 become therefore more restrictive and will entail, of course, a larger implementation cost. However this higher cost is more than counterbalanced by the decrease of  $\alpha_M$  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 it is possible to verify by a direct inspection of (10). In such a case, the optimal deviation will be  $p_L = 1$ .

## 2.6 Comparing the Two Regimes

We have seen that both in the “rules” as well as 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

$$(N + F(\alpha_{\max}) - F(\alpha_M)) + \frac{F'(\alpha_M) \alpha'_M [1 - (1 - q)p_L]}{(1 - q)} = p_L^{-2} + 1 \quad (15)$$

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

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

Comparing the left-hand sides of (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

$$\frac{F'(\alpha_M) \alpha'_M [1 - (1 - q)p_L]}{(1 - q)} < 0. \quad (17)$$

It follows that under discretion, the policy migration will be more restrictive, since the left-hand side of (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 one 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  $\alpha_M$  with respect to the optimal policy  $p_L$ , as it is possible to verify by a direct inspection of (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  $D$ , in the case they attempt to do that. It follows that everybody will be better off.

## 2.7 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 behavior of the stock of migrants settled in  $D$ , let us assume that the population is constant, that agents are infinite 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. Let, in addition,  $N_0$  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. Eventually 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.

### 3 Electoral Accountability

In this section we analyze migration policy in a representative democracy and focus 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 (2015). The latter, in particular, focus on the time inconsistency problem arising in the context where government must chose to which extent to grant amnesties to irregular workers. As a matter of fact, government weights the fiscal gain deriving from the labor income tax of a legalized migrant with the temptation of deporting him back to his home country. Magris and Russo (2015) characterize the set of immigration amnesty which can be sustained at symmetric equilibrium and show that it can contain the first-best under the hypothesis that politicians values political office enough. Within this framework, voters can provide incentives to politicians by holding them accountable at election times for past behavior and by threatening not to reelect them if they deviate from a specified migration policy. This mechanism can be viewed as complementary to the reputation one, but possesses the advantage to do not depend upon the entirely history of policies and, as a consequence, to do not require 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 provide a reliable incentive to do not deviate from the announced policies and therefore to allow the implementation of the first best, namely the rules outcome.

Following Magris and Russo (2015), we adopt Aidt and Magris (2006) logic to our model, but depart from their stationary equilibrium framework resting 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, on the contrary, 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 each migration policy implementation, 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 reelected since the game will not go on and thus he will always take advantage from a deviation: the discretionary outcome in the second period is therefore bound to prevail. In our model, those who vote and may punish politicians in case of their misbe-

havior are uniquely the natives, meanwhile those who must anticipate correctly the migration policy and decide whether or not to decide to leave the destination country are the immigrants, who by hypothesis do not vote. However, the threat of punishment from the part of the natives to the misbehaving politicians provides to the latter an incentive to not deviate and make the rules equilibrium credible to the immigrants too. The implementation of the threat is indeed credible since it does not involve any cost and, provided politicians care about holding office enough, the first best immigration policy 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 must form anticipations about the migration policies (the immigrants), the electoral accountability mechanism can be easily used to support a first best (rules) outcome.

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  $\lambda_j(p^I)$  indicating, for each migration policy  $p^I = (p_L^I, p_H^I)$ , whether the politician will receive the vote of voter  $j$  in the election held at the end of the period.  $\lambda_j(p^I)$  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:

$$\begin{aligned}\lambda_j(p^I) &= 1 \quad \text{iff } p^I = p_j^s \\ \lambda_j(p^I) &= 0 \quad \text{iff } p^I \neq p_j^s\end{aligned}$$

where  $p_j^s = (p_{j,L}^s, p_{j,H}^s)$  is the performance standard announced by voter  $j \in H$  at the beginning of period one. This means that 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 reelected or not. In the latter case, in the second period, he will return to the private sector and the new elected politician will hold the office until the end of the period and implement a migration policy regardless to 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. More in detail, 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  $p^s = p_j^s$  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 not (strict) incentive to deviate. Consider now politician in office in the first period. His payoff can be written as

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

where  $\beta$  is the discount factor,  $G_1(p^I, p^s)$  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 payoff will correspond to the discretionary equilibrium, i.e.  $G_2(p^{dis,k}, p^{dis,k})$  where *dis* stands for discretionary,  $G_2$  refers to the private utility in period two and  $k = s, dev$  stands for the type of policy implemented in period one, which consists either in complying the standard performance ( $k = s$ ) or in deviating ( $k = dev$ ). Notice, indeed, that  $G_2(p^{dis,k}, p^{dis,k})$  depends upon the mass of immigrants settled in the destination country and in the origin country in period two which in turn depend upon the type of policy implemented in the first period. Suppose the politician does not want to be reelected. He will deviate and the best deviation will be  $p^{dev} \neq p^s$  where *dev* stands for "deviation". As a matter of fact, if the politician is willing to deviate, he will choose a more or less restrictive migration policy than the one immigrants are expecting, and his life-time utility will therefore be

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

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

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

Assuming that 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.

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

It follows that  $p^s$  can be supported as 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 (19) holds once one has replaced  $p^s$  with  $p^R$ . The rationale of the mechanism above described is the following. In the first period the politician face the temptation to deviate and implement a more restrictive migration policy, ensuring a payoff  $G_1(p^{dev}, p^s)$ . The incumbent politician balance such a temptation to deviate against the desire to be reelected and earn the ego rent  $m$ . Voters therefore must coordinate on a symmetric performance standard such that politician prefer 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 the 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 it is the case within the reputation mechanism consisting in threatening politicians by revoking them the trust. As pointed out by Aidt and Magris (2006) and Magris and Russo (2015), performance voting requires that voters can coordinate their voting strategies. More specifically, by allowing individuals to set their own standard performance in a non-cooperative manner, this opens the door for a very large set of equilibria, some dominating others. This, in turn, would require to shape some theory of equilibrium selection or to employ some more demanding equilibrium concepts. However, we are able to characterize the set of outcomes that can be sustained by the mechanism of the 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 between 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 desirable characteristics, the accountability problem would become more complicate and would require to take into account more cumbersome voting strategies, as suggested, e.g., by Banks and Sundaram (1993, 1998).

## 4 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, at the end, the stock of immigrants settled in the destination

country will be lower than in the case one would have 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 the case where government follows rules. Since observed migration policy are rather laxist, this suggest the existence of an appropriated commitment technology. We identify such technology in the electoral accountability: if politicians value office enough, under the threat of not being reelected, they resist to the temptation of deviating from the announced policy. 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 of policies aimed, by means of aid programs and economic partnerships, at stabilizing the origin countries by minimizing the frequencies at which negative shocks occur, with the result of increasing the average labor productivity in the source countries.

The choice of the immigrants whether to return home depends upon the incentives they are faced with, and it is positively related with the probability of a successful re-emigration should in the origin country occur a negative shock, and with the preference for domestic consumption. Such a parameter can be viewed as the measure of the “distance” (geographical, cultural, political, social, 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 the latter.

It would be interesting, following Dustmann (2003, 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 of return home. Eventually, one could easily extend the model by assuming that the migrants living initially in the destination country face a different migration policy than 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 relative stock of migrants in  $D$  to  $O$ .

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