Why Don't Labor and Capital Flow Between Young and Old Countries?

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Abstract

To counter the effects of population aging in rich industrialized countries, raising immigration from and raising capital exports to younger developing countries are often seen as alternative solutions. In this paper, we explicitly account for mobility constraints in the form of immigration restrictions in industrialized countries and expropriation risk in developing countries to investigate whether efficiency gains from factor movements are likely to be realized. We set up a one-period general equilibrium model of two economies with young and old individuals, and investigate how the age structure in both countries affects the political-economy equilibrium. When the level of factor flows is determined by policy, large differences in age structures still encourage admitting more migrants. Meanwhile, the effect on FDI is ambiguous. The degree to which integrating immigrants is costly plays a crucial role for the size of labor flows. Emigration from the developing country weakens the young's expropriation preferences but, if it changes the median voter's identity from young to old, there is no FDI.

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1 Introduction

All industrialized countries and many developing countries are facing a decline in birth rates and an increase in life expectancy resulting in population aging. However, the projected evolution of old-age dependency-ratios in various world regions differs widely and thus seems to offer the possibility of large efficiency gains from capital and labor movements. While the United Nations' report on replacement migration calculates the size of labor movements necessary to offset the effects of aging in low-fertility countries (United Nations Population Division 2001), the INGENUE (2001) model and the model by Brooks (2003) simulate the effects of demographic trends on the size of international capital flows under the assumption that capital is perfectly mobile while labor is not. Brooks (2003) predicts that the US and the EU will be large capital exporters until their baby boomers retire around 2020, but that capital flows would be considerably lower if risk were taken into account. Additionally, Facchini and Mayda (2008) make restrictive immigration policies responsible for low observed international labor flows.

In this paper, we aim to fill a gap and account for endogenous policies. We investigate whether increasing factor movements is feasible in a world with two open economies and endogenous policy. In particular, we assume policies to be determined by the respective median voter's preferences. The policy decision in the industrialized country is how many immigrants to admit, while in the developing country, imported capital can either be expropriated or not. High emigration from the developing country may change the identity of the median voter there from young to old, and induce an equilibrium with no foreign direct investment (FDI). Even if the median voter is always old in the industrialized country and young in the developing country, marginal changes in population growth rates alter the politically feasible volume of immigration and FDI. If the industrialized country's natives incur a high cost of integrating immigrants, only few immigrants are admitted. The subsequently higher labor supply in the developing country has three effects on expropriation preferences. First, returns on FDI (to be distributed in case of expropriation) rise. Second, these returns are distributed among a larger number of recipients. Third, the wage loss in case of expropriation is proportional to the wage level without expropriation, which is low if emigration is low. In our model, expropriation preferences decrease in emigration, despite the lower number of recipients. However, if integration costs are lower than some threshold value, migration is sufficiently high to reverse the majority in the developing country, making equilibrium FDI drop to zero.

Our analysis draws on two strands of literature. The first one deals with the impediments to capital flows from rich to poor countries. Contrary to

Lucas (1990), Alfaro et al. (2008) find that bad institutional quality does play a major role in explaining the low level of capital investment in poor countries. Several authors have explicitly dealt with expropriation risk of FDI, see e.g. Cole and English (1991) and Thomas and Worrall (1994). Both papers model dynamic games between international investors and a host-country government under the assumption that investors punish expropriation by withholding future investment. The authors find that in order to avoid expropriation, FDI must not exceed a critical threshold. Additionally, Harms (2002) shows in a theoretical model that the taxation of foreign capital is more likely if the host country is poor.

The second strand of literature we build on is the analysis of endogenous immigration policy. In the static models by Benhabib (1996) and Mazza and van Winden (1996), individuals support admitting immigrants if these are different from themselves. Preferences may be reversed if immigrants receive political rights, which is also an important prediction of the dynamic models of Dolmas and Huffman (2004) and Ortega (2005). In our model, capital owners' preferences are reversed for high immigration, although immigrants do not have any political rights. This is because migration raises the capital intensity and thus lowers returns on the part of capital invested in the developing country, although it raises capital returns in the industrialized country. As we do, Sand and Razin (2007) analyze the impact of aging on immigration and also on redistribution policy. Since they consider an infinite time horizon, the median voter's identity may change not only due to native population aging but also due to the immigration of individuals who have more children than natives. This may restrain the old's preference for admitting immigrants. In order to focus on the effect of marginal changes in the population share of both generations, we assume that the median voter in the industrialized country is always old.[1] Our model is novel in combining the political economy of immigration and of expropriation risk.

We set up the economic model in section 2 and analyze equilibrium policies in section 3. Section 4 examines the impact of marginal changes in parameters on the equilibrium and section 5 concludes.

2 The Economic Model

We consider an industrialized country (IC) and a developing country (DC), both populated by young and old individuals. The size of the total population

[1] This assumption may be relaxed.

is normalized to one in both countries:

$$N^y + N^o \equiv 1 \qquad \text{and} \qquad N^{y*} + N^{o*} \equiv 1 \,,$$

where the asterisk denotes the developing country's variables. We assume that the old are in the majority in the industrialized country, while the opposite holds for the developing country.

In both countries a homogeneous good can be produced with a Cobb-Douglas production function:

$$Y = AK^{\alpha}L^{1-\alpha} \quad \text{and} \quad Y^* = A^*(K^*)^{\alpha}(L^*)^{1-\alpha} \,.$$

The old generation in the industrialized country owns a given capital stock $\bar{K}$. Meanwhile, the old in the developing country do not own any capital. Production in the developing country thus hinges on capital inflows from the industrialized country ($K^* = \bar{K} - K$). The young in both countries exogenously supply one unit of labor. We set depreciation to zero for simplicity. We assume that total factor productivity (TFP) in the industrialized country A exceeds TFP in the developing country A^*, even though investors also bring along their expertise. This results from a less favorable business climate, for instance less infrastructure, in the developing country. Defining M as the migration from the developing to the industrialized country, factor prices are given by

$$\begin{aligned} w &= (1-\alpha)A\left(\frac{K}{N^y + M}\right)^{\alpha} \quad \text{and} \quad r = \alpha A\left(\frac{K}{N^y + M}\right)^{\alpha-1} \,, \\ w^* &= (1-\alpha)A^*\left(\frac{K^*}{N^{y*} - M}\right)^{\alpha} \quad \text{and} \quad r^* = \alpha A^*\left(\frac{K^*}{N^{y*} - M}\right)^{\alpha-1} \end{aligned} \tag{1}$$

in the industrialized and the developing country respectively.

Expropriation refers to the seizure of the capital stock and is assumed to be always total. If there were no costs to expropriation, the developing country would be subject to a classical time-inconsistency problem and would always expropriate. Consequently, no capital would flow there. However, expropriation usually comes at some cost. As expropriation leaves foreign investors without any capital, it is sensible to assume them to withdraw their expertise, as in Eaton and Gersovitz (1984).[2] The seized capital stock is still used for production. However, TFP drops further below its level in the industrialized country to θA^*, where $\theta < 1$, thereby lowering output and

[2]In a setting with a larger time horizon, one could also argue that expropriation reduces future capital inflows, see Cole and English (1991) and Thomas and Worrall (1994).

the young's wages. We refer to θA^* as the developing country's TFP. The old do not incur any cost from expropriation. We assume that the benefits from expropriation (the gross return to capital) are distributed equally among the developing country's old and those young who have not emigrated. Each inhabitant of the developing country thus receives a transfer t with

$$t = \frac{T}{1-M} = \frac{(1+r^*)K^*}{1-M} \ .$$

Immigration to the industrialized country affects its citizens' welfare in two ways. First, it alters factor prices. The young generation clearly suffers since wages decline. The old generation benefits from increasing capital returns on the part of capital invested at home k and suffers from decreasing returns on that part invested in the foreign developing country k^*. Second, we assume that immigration causes a disutility d to all of the industrialized country's citizens, proportional to the ratio of immigrants to natives $M/(N^y + N^o) = M$. This disutility captures different non-monetary costs related to the integration of immigrants in a tractable way. Immigration may reduce natives' utility due to an increased heterogeneity of social norms and customs as in Hillman (2002). In the presence of social security, natives may also resent immigration if immigrants are entitled to benefits, see e.g. Sinn (2005), or if immigration can tilt the political balance in favor of more redistribution as in Ortega (2005).[3]

Individuals' utility is linear in consumption:

$$U^i = c^i - d \cdot M \quad \text{and} \quad U^{i*} = c^{i*} \qquad i = y, o \ ,$$

with

$$\begin{aligned} c^y &= w \\ c^o &= k(1+r) + k^*(1+r^*) \end{aligned}$$

and

$$c^{y*} = \begin{cases} w & \text{in case of emigration} \\ w^* & \text{in case of non-expropriation} \\ w^*|_E + t & \text{in case of expropriation} \end{cases}$$

$$c^{o*} = \begin{cases} e^* & \text{in case of non-expropriation} \\ e^* + t & \text{in case of expropriation} \end{cases} \ .$$

[3]Asked about their worries and concerns in the 2007 wave of the German Socio-Economic Panel (SOEP), 34.44% of respondents said they were very concerned and 46.07% of respondents said they were somewhat concerned about immigration to Germany.

Recall that the old generation in the developing country does not have any capital or labor income. We do assume, however, that they consume an (agricultural) endowment e^* as in Cole and English (1991). We assume the sequence of events illustrated in figure 1. First, the industrialized country's old allocate their capital to both countries. Second, the industrialized country determines maximum immigration before, third, the developing country's young migrate. Fourth, the developing country decides whether to expropriate the foreign capital stock. Fifth, production and consumption take place. We solve the model by backward induction, that is, we start with the expropriation decision and go back to optimal capital allocation.

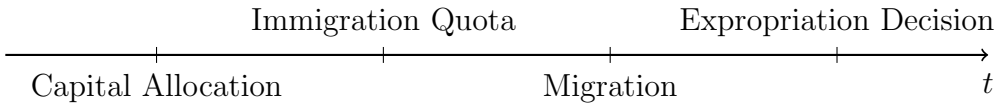


Figure 1: Sequence of Events

3 Equilibrium Policy

We now come to the determination of the model equilibrium and thereafter, we investigate the impact of different model parameters on the equilibrium. When deciding whether to expropriate in the fourth step, the developing country faces given levels of capital imports K^* and migration M. If the median voter is old (because of high emigration, that is $M > N^{y*} - N^{o*}$), any foreign capital is always expropriated. The young who have not emigrated benefit from the transfer like the old, but additionally suffer from a reduced wage rate due to a drop in TFP. We define the *non-expropriation constraint* K^{*max} as the level of FDI for which the median voter in the developing country is indifferent between expropriation and non-expropriation. Since an old median voter always prefers expropriation, we have

$$K^{*max} = 0 \,, \qquad M > N^{y*} - N^{o*} \,.$$

A young median voter prefers expropriation if the transfer compensates for the wage loss:

$$(1-\theta)w^* < t \,. \tag{2}$$

From (2) we can derive a critical level of capital imports that serves as an upper bound for capital inflows for each level of migration:

$$K^{*max} = \left[\frac{(1-\theta)A^*(1-\alpha)(1-M) - \alpha\theta A^*(N^{y*}-M)}{(N^{y*}-M)^{\alpha}} \right]^{\frac{1}{1-\alpha}} , \qquad M \leq N^{y*} - N^{o*} . \tag{3}$$

The young thus prefer expropriation for high levels of capital imports $K^* > K^{*max}$.

We can calculate the derivative of the *non-expropriation constraint* with respect to emigration as

$$\frac{dK^{*max}}{dM} = \left(\frac{K^{*max}}{N^{y*}-M} \right)^{\alpha} \left[(1-\theta)A^* \left(\frac{\alpha(1-M)}{(N^{y*}-M)} - 1 \right) + \alpha\theta A^* \right] .$$

A necessary and sufficient condition for $dK^{*max}/dM > 0$ for all M between 0 and N^{y*} is given by

$$\frac{1}{\theta} < 1 + \frac{N^{y*}\alpha}{N^{y*}-\alpha} ,$$

which we assume to be fulfilled. On the one hand, the marginal effect of migration on the wage loss becomes smaller if the domestic productivity level θA^* increases. On the other hand, the negative marginal effect of migration on the return to capital and the aggregate transfer T is enhanced by a high θ. It turns out that the risk of expropriation declines and FDI increases with M if θ is sufficiently high. Naturally, FDI cannot be restricted to be lower than zero. The condition for $K^{*max} > 0$ for all M between 0 and N^{y*} yields a lower bound for $1/\theta$, given by:

$$\frac{1}{\theta} > 1 + \frac{N^{y*}\alpha}{1-\alpha} .$$

In summary, expropriation has to be costly for non-expropriation compatible FDI to be larger than zero. However, the non-expropriation compatible level of FDI only increases in emigration if expropriation costs are not too high. Analogously, we can define a *non-expropriation constraint* for the old median voter.

In the preceding step, the developing country's young would migrate until utility and thus wages in both countries are equal, if they faced no migration restriction. Given that FDI does not exceed K^{*max}, they know that expropriation will not occur and therefore compare w to w^* and not to $w^*|_E$. This would yield an *emigration constraint*. However, in our model the migration restriction imposed by the industrialized country, the *immigration policy constraint* M^{max}, turns out to be binding, as we show below. Immigration

policy is determined in the second step by the industrialized country's median voter, who is always an old individual. Immigration from the developing country increases the interest rate on that part of capital invested in the industrialized country and decreases the interest rate on the part invested in the developing country. Maximizing the old's indirect utility function yields the first-order condition

$$k\frac{dr}{dM} + k^*\frac{dr^*}{dM} = d\ , \tag{4}$$

with

$$\frac{dr}{dM} = \frac{1-\alpha}{N^y + M}r \quad \text{and} \quad \frac{dr^*}{dM} = -\frac{1-\alpha}{N^{y*} - M}r^*\ . \tag{5}$$

Equation (4) illustrates that immigrants are admitted as long as the marginal gain from immigration, $k(dr/dM)$, outweighs the marginal cost, $-k^*(dr^*/dM) + d$. The first-order condition can also be written as

$$\frac{\alpha(w - w^*)}{N^o} = d\ .$$

Note that for unrestricted migration the wage rates in both countries are equal, and the left-hand side is zero. This is a solution for the *immigration policy constraint* only if $d = 0$, i.e. there are no costs of integrating immigrants. Although we cannot solve explicitly for M^{max}, we can show that the left-hand side of equation (4) is declining with M. Intuitively, M^{max} must be smaller than unrestricted migration for any d larger than zero. Hence, we can abstract from the *emigration constraint* as equilibrium migration is always determined by the industrialized country's policy. Larger capital exports imply that a higher fraction of the capital stock is invested in the developing country. Therefore, chosen immigration is a declining function of FDI. Using the implicit function theorem, we can show that the derivative of the industrialized median voter's preferred level of migration to FDI is

$$\frac{dM^{max}}{dK^*} = -\frac{w/(\bar{K} - K^*) + w^*/K^*}{w/(N^y + M) + w^*/(N^{y*} - M)} \quad < 0\ .$$

In the first step the industrialized country's old allocate their capital endowment. In the absence of expropriation risk, they would export the share of capital necessary to equalize capital returns in both countries. We call the level of capital exports in the absence of expropriation risk K^{*opt}, the *investment constraint*, with

$$K^{*opt} = \frac{(A/A^*)^{\frac{1}{\alpha-1}}\bar{K}(N^{y*} - M)}{(N^y + M) + (A/A^*)^{\frac{1}{\alpha-1}}(N^{y*} - M)}\ . \tag{6}$$

Obviously, the difference in capital returns and thus the optimal level of capital exports is lower the higher immigration, such that K^{*opt} is a declining function of M. We further assume that, although investors are atomistic and do not anticipate any impact of their personal investment decision on immigration policy, they dispose of some coordination mechanism to ensure that actual total capital flows to the developing country do not exceed the level compatible with the *non-expropriation constraint*.

Our equilibrium is thus characterized by the three equations (3),(4) and (6), leaving out the *emigration constraint* since migration is always determined by the *immigration policy constraint*. Figure 2 shows these equations for $\alpha = 0.35$, $A = 1$, $A^* = 0.8$, $\theta = 0.75$, $N^y = 0.44$, $N^{y*} = 0.57$ and $d = 0.12$.

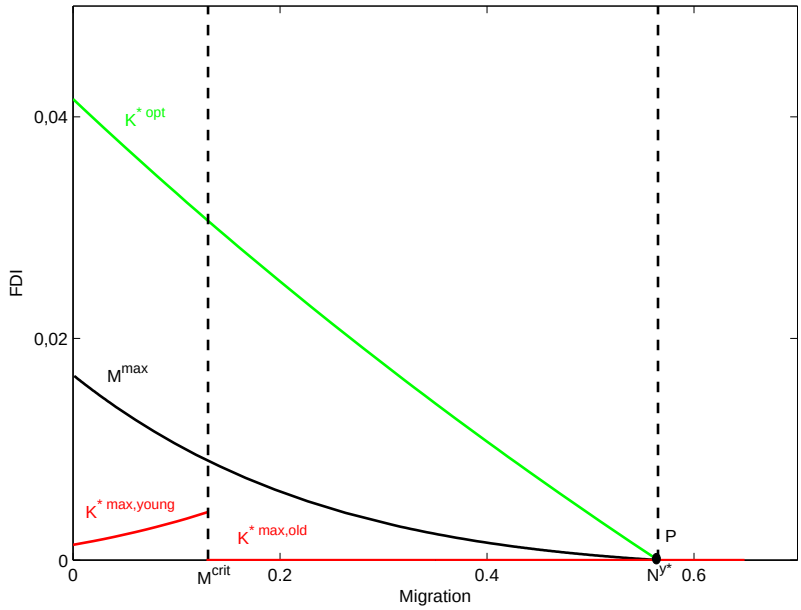


Figure 2: Migration and FDI in Equilibrium

In choosing our benchmark parameters we adhere to common assumptions in the literature. According to Börsch-Supan et al. (2003), the production share of capital is usually set between 0.3 and 0.4, so our benchmark is $\alpha = 0.35$. We normalize TFP in the industrialized country A to 1, since what matters for our analysis is the relative size of A, A^* and θA^*. According to Dreher et al. (2007), developing countries' average TFP relative to the US is 0.53 if only official output is considered and 0.84 if the shadow economy is

also taken into account. We set the developing country's TFP to $\theta A^* = 0.6$ and the industrialized country's investors' TFP in the developing country to the intermediate value $A^* = 0.8$, which yields $\theta = 0.75$. In order to determine the relative sizes of the young and old generations, we look at the United Nations' Population Division's statistics on children per woman.[4] For the period of 2000-2005, total fertility in the world's more developed regions was about 1.6, while it was 2.6 for the world's less developed regions excluding the least developed regions. With the total population normalized to one in both countries, the resulting sizes of the young generations are $N^y = 0.44$ and $N^{y*} = 0.57$. We choose the level of the capital stock to be $\bar{K} = 0.09$, implying an autarky capital intensity of about 0.2 in the industrialized country. This corresponds to the industrialized country's capital intensity in an autarky steady state, given the above parameter values. The disutility parameter d is, of course, rather arbitrary since we have not explicitly modeled immigration-related costs. We call the threshold value of migration for which there remain as many old as young individuals in the developing country $M^{crit} = N^{y*} - N^{o*}$. We further define a minimum immigration cost d^{crit}, which solves the *immigration policy constraint* (4) for $M = M^{crit}$ and $K^* = K^{*max}(M^{crit})$. Hence, for any $d < d^{crit}$, the *immigration policy constraint* and the *non-expropriation constraint* intersect at some migration level larger than M^{crit}. Consequently, the median voter in the developing country is young if and only if $d \geq d^{crit}$. Given that all other parameters are set to their benchmark values, $d^{crit} = 0.14$.

Other than in the case of migration, the level of capital exports equalizing capital returns, K^{*opt}, is not necessarily higher than the non-expropriation incentive compatible level K^{*max}. This is the case if the median voter in the developing country is old, but may not be the case if she or he is young, since then, the former is a decreasing and the latter an increasing function of migration. However, we make the assumption that at the critical migration level M^{crit}, the young-median-voter's *non-expropriation constraint* binds, i.e. $K^{*max}(M^{crit}) < K^{*opt}(M^{crit})$. Then, the *non-expropriation constraint* also binds in any young-median-voter equilibrium. Consequently, such an equilibrium exists if and only if the *immigration policy constraint* and the young median voter's *non-expropriation constraint* intersect at $M < M^{crit}$.

For $d < d^{crit}$, figure 2 illustrates the equilibrium, labeled P.

Proposition 1 *Given that $d < d^{crit}$, there is an old-median-voter equilibrium and it is unique.*

In P FDI equals zero while for migration it holds that $M^{crit} < M \leq N^{y*}$,

[4]United Nations Population Division (2006)

where M decreases with d. We know that as the median voter in the developing country is old, there cannot be any capital flows. Therefore the equilibrium is given by $(M^{max}(B=0), 0)$, where the level of migration depends on the disutility parameter d. If $d = d^{crit}$, the *immigration policy constraint* and the young median voter's *non-expropriation constraint* intersect at $M = M^{crit}$ and some $K^* > 0$. Since the *immigration policy constraint* M^{max} declines with K^*, $M^{max}(K^* = 0) > M^{crit}$. Naturally, desired immigration is lower the higher the disutility from admitting immigrants. If migration does not cause any cost ($d = 0$), the industrialized country's median voter would like to admit an infinite number of immigrants. Nevertheless N^{y*} must be the upper bound for immigration. Hence $M^{crit} < M \leq N^{y*}$, in the case of $d < d^{crit}$.[5]

Figure 3 shows the case $d > d^{crit}$ (for $d = 0.18$), with a young-median-voter equilibrium labeled P' and an old-median-voter equilibrium labeled P as in figure 2.

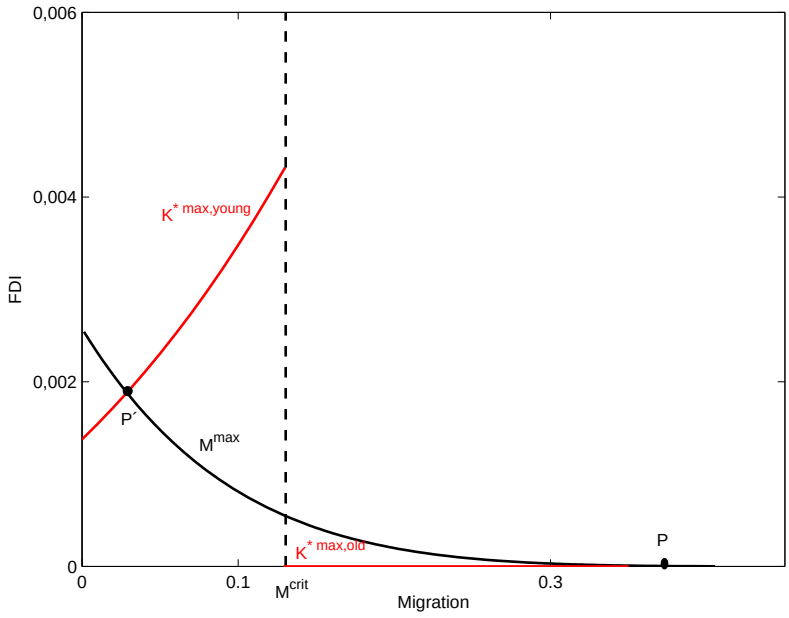


Figure 3: Equilibrium for $d > d^{crit}$

[5]Even in the absence of expropriation risk, it is optimal to produce only in the country with the higher TFP, if migration does not cause any cost.

Proposition 2 *Given that $d \geq d^{crit}$, there is at least a young-median-voter equilibrium. Additionally, there is an old-median-voter equilibrium for sufficiently small d.*

Since $d \geq d^{crit}$, the developing country's young median voter's *non-expropriation constraint* and the *immigration policy constraint* intersect at $M \leq M^{crit}$. This is the young-median-voter equilibrium. It is unique if $M^{max}(K^* = 0) \leq M^{crit}$. Then, the industrialized country never admits more than M^{crit} migrants and the median voter's identity in the developing country never changes. Conversely, if $M^{max}(K^* = 0) > M^{crit}$, P is also an equilibrium, with an old median voter in the developing country. If both equilibria exist, we have to compare the industrialized country's old's indirect utilities in order to determine which equilibrium is realized. This is because they are the first to take a decision. We find that the industrialized country's old median voter always prefers the young-median-voter equilibrium P'. Starting from equilibrium P' we ask how utility changes as we move along the *immigration policy constraint* toward P. The utility change is approximately given by

$$dU^o = \frac{\partial U^o}{\partial M} dM + \frac{\partial U^o}{\partial K^*} dK^* \qquad < 0 \,,$$

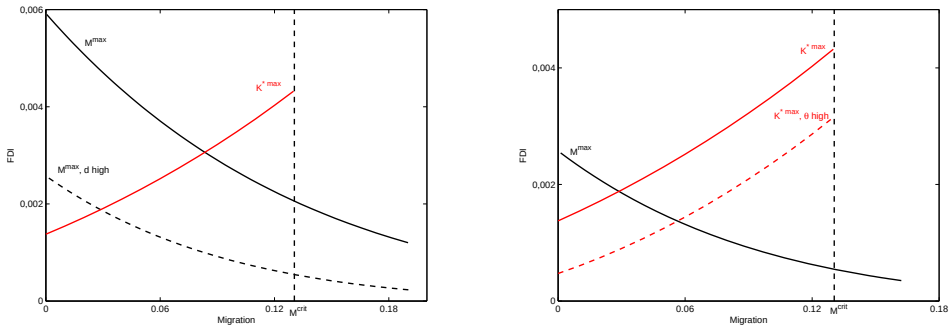
where $dM > 0$ and $dK^* < 0$ (see figure 3). Using the envelope theorem, $\partial U^o / \partial M = 0$, while $\partial U^o / \partial K^* > 0$ since $r^* > r$.

4 Comparative Statics

We now come to the effect of marginal changes in the model parameters on the young-median-voter equilibrium. Changes in the *immigration policy constraint* also apply to the old-median-voter equilibrium, while the old median voter's *non-expropriation constraint* always restricts FDI to zero. Before looking at the population shares of the old and young generations, we investigate two other important model parameters which affect equilibrium labor and capital movements, the disutility d that the industrialized country's inhabitants incur when admitting immigrants, and the developing country's TFP parameter θ, which determines its expropriation cost. The higher individuals' disutility from integrating immigrants, the more restrictive is immigration policy. Because of lower emigration, expropriation preferences in the developing country change. On the one hand, the transfer from expropriation has to be distributed among a higher number of inhabitants. On the other hand, more workers are accompanied by high capital returns. This implies a high per-capita transfer. Taking into account that the wage the young

earn in case of non-expropriation is lower the more individuals are kept from emigrating, the wage loss $(1-\theta)w^*$ decreases and expropriation becomes more attractive. In summary, a high immigration-related cost leads to low equilibrium immigration and to low non-expropriation compatible FDI, see figure 4(a). We conclude that a policy which lowers this immigration-related disutility or cost would not only spur the integration of immigrants but also protect industrialized countries' FDI flows. Remember that this only holds as long as the young are in the majority in the developing country.

While d is the main driving force of the industrialized country's mobility constraint, the main driving force of the developing country's mobility constraint is the TFP loss in case of expropriation $(1-\theta)A^*$. For given A^*, the loss is lower the higher θ. A higher θ encourages expropriation and thus lowers capital flows. This contradicts some previous evidence, see Harms (2002), but is compatible with what we observe e.g. in Venezuela. The intuition is that a developing country is more likely to expropriate foreign investors' machines, if its own inhabitants know how to use these machines. The developing country's TFP has an indirect positive effect on migration (via capital exports), since less capital exports imply a higher marginal gain from immigration, see figure 4(b).



(a) Effects of higher d

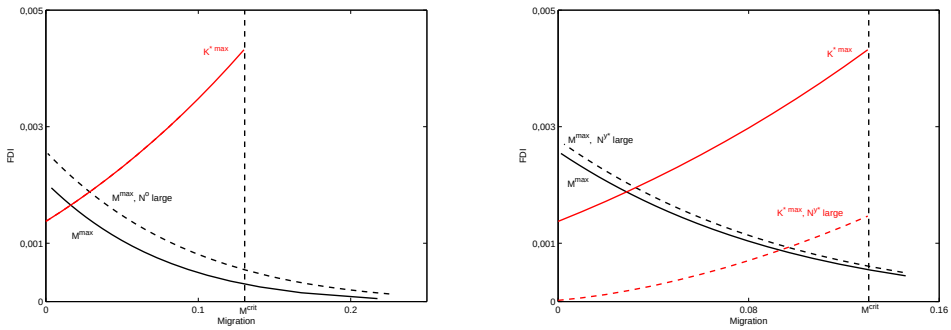
(b) Effects of higher θ

Figure 4: Effects of d and θ

Finally, we analyze the impact of demographic change on the equilibrium. In the absence of political mobility constraints, larger demographic diversity would clearly boost both capital and labor movements. Now, the level of factor flows is determined by policy. A larger share of the old generation in the industrialized country's population reduces the return to capital there, such that a marginal increase in labor supply has a stronger impact. This directly influences immigration policy. The immigration policy constraint is

loosened to exploit the larger utility gain from increasing capital returns at home. Remember that higher emigration reduces the preference for expropriation. We thus find that the older the population in the industrialized country, the larger are both labor and capital flows, see figure 5(a).

Concerning the relative shares of old and young in the developing country, things are less clear-cut. Ceteris paribus, migration is higher the younger the population in the developing country, since this implies a higher return to capital there. While the share of the old generation in the industrialized country's population has no direct effect on equilibrium capital exports, there is a direct effect of relative population shares in the developing country. A larger share of the young induces a strong preference for expropriation. This is because a high interest rate implies that the possible transfer from expropriation is also high, while wages are low even, making the wage loss $(1-\theta)w^*$ decrease. Therefore, the non-expropriation compatible level of capital imports is lower. Since the industrialized country's median voter's preferred level of migration is declining in capital exports, it increases. Equilibrium migration is clearly higher, the younger the population in the developing country, while capital flows could be either higher or lower, but turn out to be lower for the above parameters, see figure 5(b). We thus find that although population



(a) Effects of lower n

(b) Effects of higher n^*

Figure 5: Effects of n and n^*

aging in the industrialized country enhances both politically determined migration and FDI, population aging in the developing country may also lead to higher FDI although it would clearly reduce migration.

5 Conclusion

In summary, we show that even in the presence of mobility constraints, increasing immigration from and capital exports to younger developing countries are feasible policy options in an aging country. In a young-median-voter equilibrium, we observe both international capital and labor flows. However, factor flows are politically restricted, thus leaving room for further efficiency gains from removing mobility barriers. If the immigration-related disutility that natives incur can be lowered, both migration and FDI increase. This clearly enhances efficiency. This result is subject to one caveat, as there is the possibility that emigration changes the median voter's identity in the developing country. Then FDI immediately drops to zero, as the expropriation of any foreign capital is certain. We therefore conclude that even though migration protects an aging country's stock of FDI, the aging country does not benefit from completely depriving host countries of their labor force.

The model may further be extended in various directions. First, we could allow for economic mobility barriers. If moving is costly for the migrants, our results do not change, unless the (political) demand for migrants would then exceed individually optimal migration. Second, since in industrialized countries much of the debate concerning migration and capital investment is related to the sustainability of pensions systems, it would be promising to introduce a pension system to the model.

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