

Migration Experience, Aspirations and the Brain Drain

Theory and Empirical Evidence

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Abstract

We develop a theoretical model of human skill formation and emigration. Additionally to existing brain drain models, we partly endogenize the heterogeneity of the individuals, by introducing aspirations. We assume that the emigration of a household member will result in increased aspirations of those who stay behind. We find that this effect increases the average skill level in the society for a given migration rate. We show that the optimal migration rate, that maximizes the post-migration skill-rate of the population, is higher if we allow for the aspirations effect of migration. We use panel data from Indonesia to demonstrate that a *migration experience* has an aspirations increasing effect. Our results suggest that there are potentially more countries than previously assumed which benefit from migration.

1. Introduction

The question whether or not outmigration of skilled citizens is a curse or a blessing for developing countries has been of great concern in the recent past. Whereas previous contributions like Bhagwati and Hamada (1974) identified the brain drain as one of the primary reasons for poverty and lacking growth in countries of the global south, more recent articles show that the picture is not as bleak as previously imagined¹. Recently various studies such as Mountford (1997), Beine et al. (2001) and Stark (2004) have made the argument, that the possibility to migrate to a richer country where one can earn considerably higher wages, given the necessary skills, will serve as an incentive to invest in education. With this additional stimulus, it can be shown that some outmigration can actually increase the average skill level of the remaining population.

New empirical insight on aspirations formation² motivates us to augment the previous brain drain models. We use panel data from Indonesia to show that a *migration experience* has a beneficial effect on the aspirations of an individual. This insight is used to introduce a household dimension to a theoretical model of a brain drain. In our model, it is no longer only the aggregate probability to migrate that determines the education decision of an individual, but also the household's migration history. If an individual is found to have a *migration experience* in the family, the rise in aspirations will lead to a lower perceived cost of education and therefore increase the aggregate investment in education.

We find that introducing aspirations to our model increases the positive influence that migration has on skill formation. There are two reasons for this. First, migration increases the probability to know a migrant. The more migrants there are, the more likely it is to have a household member that has a *migration experience*. Thereby, a higher migration rate will increase the average aspirations level in the society, and through this, the average investment in education. Second, the higher aspirations magnify the original incentive effect of migration. The expected skill premium that a higher migration rate implies will be larger for aspiring individuals.

Taken together, these two effects lead to a higher optimal migration rate for every country. Furthermore, it increases the range of migration for which a country can be considered a net-winner of emigration. Our results suggest that omitting the household effect of emigration in empirical studies on the effect of emigration on the skill level of sending countries, will overstate the negative effect of outmigration. Beine et al. (2008) study which countries win and lose from emigration. We suppose that, depending on the size of the aspirations effect, some countries that were found to be net losers of emigration will actually be winners after all.

The remainder of this paper is structured as follows. In section 2 we will give a short overview about aspirations and their influence on economic behaviour. In section 3 we present a theoretical model that investigates the implications of aspirations for the brain drain. In section 4 we show empirical evidence on the influence that a *migration*

¹For an extensive survey of the literature see Commander et al. (2004)

²Czaika and Vothknecht (2014) and Böhme (2012) both find that aspirations are higher for migrants.

experience has on aspirations. In section 5 we conclude.

2. The aspirations concept

An aspiring individual is someone that has a certain goal or dream that she is pursuing with conviction. The notion of aspirations as a social capacity is still rather new to economics Appadurai (2004) argues that aspirations do not form in a void, but that the contact and interaction with our peers is essential for the formation of aspirations. An individual will aspire to a level of wealth, education or social norms that she is confronted with in her immediate environment. The more diverse this social environment, the more likely it is that someone will find a desirable and attainable goal to aspire to. Appadurai points out that in cultures of absolute poverty, individuals will lack this *capacity to aspire*. The point he is making is that if all the peers of a poor individual are equally bad off, than she will not form the capacity to imagine herself better off.

Ray (2006) develops this idea and investigates the economic implications of such a *culture of poverty* in which the poor will accept their destiny. He develops the concept of an *aspirations window*, which is composed of the people that influence an individual's aspirations. Usually these are the closest peers, such as close family members and friends. In some cases, it might also include neighbors. If this window is solely composed of other poor, an individual will be unaspiring because of her unawareness of the possibility of social and economic ascension. Ray (2006) proposes that someone who is aspiring towards an attainable better life, will put a certain amount of effort into the realization of this goal, whereas someone that is unaspiring will not. It is important that the *aspirations gap*, the distance between where an individual sees herself currently and the goal she is aspiring to, must be of a reasonable size, in order to affect her behaviour. A gap that is too small, as in absolute poor or segregated societies, will lead to frustration, since there is no goal worth pursuing. A gap that is larger than what is reasonably attainable is also unlikely to affect an individual's behaviour, since she will get fatalistic at the prospect of never being able to attain her goal. Figure 1 shows this relationship.

Ray (2006) further argues that this *aspirations failure* in absolute poor societies can be the cause for a self-sustaining poverty trap. The poor will not save or invest in education, because the improvement in their lives that this could bring about is not considered as an option. In the aggregate this will lead to a behaviour that is not future-oriented and can for example lead to a lack of skilled human capital which in turn will be detrimental to growth³. Dalton et al. (2011) take up Ray's concept and develop a theoretical model for poverty traps, sustained by aspirations failure. They argue that policy needs to tackle the belief and aspirations formation of the poor, to be successful in fighting persisting poverty.

The points made by Ray (2006) and Dalton et al. (2011) have been taken up by a number of recent empirical studies whose focus is to find ways to increase the aspirations of the poor. Exposing poor individuals to successful role models from a similar social

³There is broad empirical evidence, that low aspirations actually lead to a less future-oriented behaviour. E.g. Wilson and Boldizar (1990) and Bernard et al. (2011)

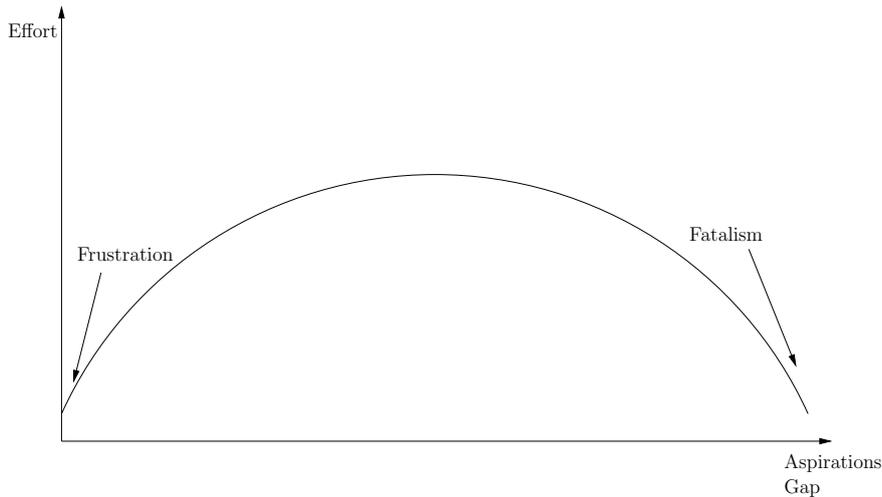


Figure 1: Aspiration gap and corresponding effort

background is such a mechanism that is found to have the desired effect. Macours and Vakis (2008) find that the responsiveness to an asset transfer program increases if the test subjects were exposed to a female leader that also participated in that program. They argue that the proximity to the female leaders increases the aspirations of the test subjects, which in turn increases their investment and human skill accumulation behaviour.

Another analysis looking at the importance of role models has been undertaken by Chiapa et al. (2012). The authors studied participants in a Mexican anti-poverty program and reported higher educational aspirations for children that came into personal contact with professional medical staff such as doctors and nurses. This suggests that the children include this highly-trained personal in their aspirations window.

A different approach that can be found in the literature is the enrolment of individuals in interventions that are designed to raise their self-efficacy. Krishnan and Krutikova (2010) evaluate a program that was specifically designed to foster the psychosocial skills of disadvantaged children in the slums of Bombay. In the course of the program, participating children are enrolled in activities that are meant to boost their non-cognitive abilities. The study finds that aspirations, as well as self-efficacy and self-esteem grow significantly as a result of the intervention. Similarly, Wydick et al. (2013) investigate the effects of international child-sponsorship programs on the schooling outcomes and job-prospects of the sponsored individuals. They find that the long-term enrolment and participation in such a program has a significantly positive effect on children's aspirations, by exposing them to an encouraging and optimistic environment. It is then shown that this raise in aspirations improves their educational attainment.

All this literature shows that increasing aspirations is vital in order to help the poor to overcome their condition. We identify an additional channel through which aspirations failure can be overcome: migration. We argue that migration, or the fact of knowing a

migrant, will have a beneficial effect for the aspirations formation of an individual for several reasons. Migration allows an individual to broaden her horizon and to meet new people. This is equivalent to a widening of the *aspirations window*. The more people an individual knows, the more likely she is to know someone that has a lifestyle that she considers worth aspiring to. Second, migrants usually move to a destination that is wealthier than their place of origin and often differs substantially in culture and norms. This means that the migrant will probably be surrounded by individuals that have a lifestyle that is different to the one of her domestic peers. The migrant might aspire to these new social and economic norms that she discovers while being abroad.

3. Theoretical Framework

⁴ Consider a small open economy where each individual is endowed with one efficiency unit of labour at her birth. Individuals differ in their ability, which is inversely related to their perceived cost for education c_i . During the two periods that each person lives, they can make two decisions: Whether to invest in education while young, and whether or not to emigrate while adult.

In period one, everyone can choose whether or not to invest in education, for which they have to pay the perceived cost c_i . If an individual has chosen education, her skill level will rise to $h > 1$ efficiency units of labour. In the second period, adults can emigrate to a higher wage destination with an exogenous probability. As is argued in Beine et al. (2008) and Docquier and Marfouk (2000), skilled workers are more likely to emigrate. We will adopt this assumption and normalize the probability that an unskilled individual emigrates to $\underline{p} = 0$. The emigration probability for skilled individuals is denoted by p and the same for all the educated. This is a reasonable assumption in our model, where only one education option exists. In a world where more than one education level can be achieved, it would be likely that the emigration probability is increasing in the skill level. This assumption also implicitly indicates that the ability level is unobservable for the visa authority, and that education can therefore be the only variable that influence the authority's choice.

As in Beine et al. (2008), we further assume that individuals are risk neutral and maximize their lifetime income⁵. Since the wage rate at destination country w^* is strictly larger than the domestic wage rate w , an individual that is given the permission to emigrate will do so with certainty.

In the previous brain drain models, heterogeneity was introduced through inherent individual ability and budget constraints. We introduce aspirations as an additional source of heterogeneity. We treat aspirations as a binary variable that depends on the family background. If an individual has a family member that has emigrated, than her

⁴The basic setup of this model follows Beine et al. (2008).

⁵For now, we assume that there is no inter-temporal discounting. However, we are currently working on a version of the model with discounting, in which higher aspirations lower the discount rate. This interpretation of aspirations seems to be closer to the actual definition of aspirations, since a more aspiring individual will give a higher weight to the future than non-aspiring persons.

aspirations will increase by γ .⁶ Otherwise, they are normalized to one. As mentioned before, empirical evidence suggests that increased aspirations will lead to higher educational attainments, which implies that they increase the effort that is put into education. We can imagine three possible ways of introducing aspirations to our model, such that they lead to an increase in education. First, one could think of an aspirations-induced change of preferences. Second, aspirations could lead to a higher valuation for future consumption, lowering the inter-temporal discount rate. Third, aspirations can lower the perceived cost for education. We chose the last option, since it allows us to work with the benchmark model by Beine et al. (2008) without altering the functional forms. We believe that our results are not driven by this choice, and that the other two options will lead to similar conclusions.

First we are going to look at the maximization problem for the non-aspiring individuals. They can choose whether or not to invest in education. Education causes an individual a perceived loss of c_i , which is inversely related to their unobservable inherent ability. c_i follows the cumulative distribution function $F(c_i)$ and the density function $f(c_i)$ and is defined on \mathbb{R}_+ . If an individual chooses education, she earns $w - c_i$ in the first period. In the second period, her effective units of labour will have increased to $h > 1$. With probability p she will emigrate to a high-wage destination, in which case she will earn w^*h . In the case of non-migration, she will earn wh . If she refrains from education, her income is w in both periods⁷. A non-aspiring individual will thus choose education if

$$w - c_i + (1 - p)hw + phw^* > w + w \quad (1)$$

A non-aspiring individual will therefore choose to invest in education as soon as her ability is such that the perceived costs for education are below the following benchmark:

$$c_i < \tilde{c} \equiv w(h - 1) + ph(w^* - w) \quad (2)$$

It can easily be seen that a higher migration probability for skilled workers and a larger international wage gap will increase the benchmark of perceived costs for that an individual will choose education.

For those individuals who are aspiring as a result of a *migration experience* in the family, the education decision changes to

$$w - \frac{c_i}{1 + \gamma} + (1 - p)hw + phw^* > w + w \quad (3)$$

Aspirations decrease the perceived cost of education for any level of ability. The benchmark value for which an individual will choose education increases thus for aspiring individuals.

$$\begin{aligned} c_i < \tilde{c}_\gamma &\equiv (1 + \gamma)(w(h - 1) + ph(w^* - w)) \\ &= (1 + \gamma)\tilde{c} \end{aligned} \quad (4)$$

⁶Since aspirations are a cultural variable that is determined on the household level, it is a reasonable assumption that all household members will adapt their aspirations as a result of the *migration experience* of their peer.

⁷We focus our analysis on the steady state, in which the wage rate remains stable.

This implies that some individuals who previously refrained from education will now change their minds due to an increase in their aspirations. What implications does this have for the brain-drain? We assume that a fraction π of the population has at least one family member that has a *migration experience* and are therefore aspiring. Imposing that there are no-binding budget constraints, which implies that every individual who chooses education over work can do so, the aggregate proportion of educated in the society *ex-ante* emigration can be expressed as

$$\begin{aligned} H_a &= (1 - \pi)F(\tilde{c}) + \pi F((1 + \gamma)\tilde{c}) \\ &= \int_0^{\tilde{c}} f(c_i)dc_i + \pi \int_{\tilde{c}}^{(1+\gamma)\tilde{c}} f(c_i)dc_i \end{aligned} \quad (5)$$

The probability of knowing someone that has a *migration experience* will depend on the previous period's emigration rate p_{t-1} . In steady state, this rate remains constant. We can thus rewrite (5) as a function of p ⁸.

$$H_a(p) = \int_0^{\tilde{c}(p)} f(c_i)dc_i + gp \int_{\tilde{c}(p)}^{(1+\gamma)\tilde{c}(p)} f(c_i)dc_i \quad (6)$$

g is a factor that depends both on the average size of the *aspirations window* and the previous *ex-ante* emigration proportion of educated, since it is only the skilled individuals that will be allowed to emigrate⁹.

It can easily be seen that this skill-adoption rate is increasing in p . The intuition for this is straightforward. The higher the steady-state emigration rate, the higher the expected returns to education. Additionally, a higher steady state emigration rate implies a higher average level of aspirations, which in turn increases the skill-rate of the society.

The variable of interest, that determines whether a country experiences a net brain-drain or gain, is the *ex-post* skill proportion. This is calculated as

$$H_p(p) = \frac{(1 - p)H_a(p)}{(1 - p)H_a(p)} \quad (7)$$

Emigration causes a loss of skilled workers once they are educated. At the same time, the incentive to choose education depends positively on the emigration probability. It is clear that at a high enough emigration rate, the first effect will dominate. If all the skilled citizens leave a country, it doesn't make a difference whether the possibility to emigrate has a positive effect on their education decision. For low migration rates however, the second effect can dominate, and a positive emigration rate can actually be beneficial for the skilled human capital stock of the sending country. Beine et al. (2008) calculate the maximum emigration rate for which a country's post-emigration proportion of educated is just superior to the proportion under autarky. If the actual emigration rate is under this benchmark, a country can be seen as a net-winner of emigration.

⁸For the sake of tractability, we assume a linear relationship between the steady state emigration rate and the probability of knowing an emigrant.

⁹We are currently working on an extension of the model for which g is endogenous in steady state.

We will demonstrate, using the assumption from Beine et al. (2008) that the perceived education costs are uniformly distributed, that this benchmark emigration rate will increase as a result of the aspirations effect.

Proposition 1. *Assuming that $c_i \sim U(0,1)$, the aspirations effect increases the range for which migration is considered to be better than autarky.*

$$H_{p,\gamma}(p_{0|\gamma=0}) > H_p(0) \quad (8)$$

where $p_0^{|\gamma=0}$ is the benchmark emigration rate without aspirations effect, for which the autarky skill-proportion equals the ex-post emigration skill-proportion.

What this proposition states, is that omitting the aspirations effect underestimates the range for which emigration improves the skill-proportion, compared to autarky. Evaluating the actual skill-proportion, i.e. the one that takes the aspirations-effect into account, at the emigration benchmark calculated by Beine et al. (2008) will give us a skill-proportion that is higher than under autarky.

Proof. With $c_i \sim U(0,1)$, and a model without aspirations, Beine et al. (2008) calculate the emigration rate for which a country is indifferent between emigration and autarky as

$$p_{0|\gamma=0} = \frac{h(w^* - w) - w(h - 1)(1 - w(h - 1))}{h(w^* - w)(1 - w(h - 1))} \quad (9)$$

We want to show that at this rate

$$H_{p,\gamma}(p_{0|\gamma=0}) > H_p(0)$$

$$\frac{(1 - p_{0|\gamma=0})H_{a,\gamma}(p_{0|\gamma=0})}{1 - p_{0|\gamma=0}H_{a,\gamma}(p_{0|\gamma=0})} > H_a(0) \quad (10)$$

$$\frac{(1 - p_{0|\gamma=0})(1 + g\gamma p_{0|\gamma=0}\gamma) ((w(h - 1) + p_{0|\gamma=0}h(w^* - w))}{1 - p_{0|\gamma=0}(1 + g\gamma p_{0|\gamma=0}) ((w(h - 1) + p_{0|\gamma=0}h(w^* - w))} > w(h - 1)$$

Setting in (9) for $p_{0|\gamma=0}$ and rewriting¹⁰, we obtain

$$g\gamma w(h - 1) > 0 \quad (11)$$

which is fulfilled by the assumption that $h > 1$. Q.E.D. □

¹⁰See Appendix

This demonstrates that accounting for the aspirations effect when quantifying which country has a net brain drain or gain, will potentially¹¹ increase the number of net winners.

What can we say about the effect on the optimal emigration rate, i.e. the migration rate that maximizes the post-migration skill ratio? The derivative of H_p with respect to p is ambiguous and depends on the level of p . As argued above, a very high level of p will at some point deplete the stock of skilled individuals more than the incentive effect could ever make up for. For small p the incentive effect is likely to dominate.

We can show that, under some conditions on the distribution of ability, the optimal skilled emigration rate is increasing in the level of aspirations and also in g , the parameter that determines the likelihood of knowing a migrant. The migration rate that maximizes the post migration skill ratio is determined by the following equation.

$$\begin{aligned} \frac{dH_p}{dp} &= \frac{\partial H_p}{\partial p} + \frac{\partial H_p}{\partial H_a} \frac{\partial H_a}{\partial p} + \frac{\partial H_p}{\partial H_a} \frac{\partial H_a}{\partial \tilde{c}} \frac{\partial \tilde{c}}{\partial p} \\ &= -\frac{H_a(1-H_a)}{(1-pH_a)^2} + \frac{(1-p)}{(1-pH_a)^2} \left(\frac{\partial H_a}{\partial p} + \frac{\partial H_a}{\partial \tilde{c}} \frac{\partial \tilde{c}}{\partial p} \right) \stackrel{!}{=} 0 \end{aligned} \tag{12}$$

In order to find the influence of the aspirations effect on the optimal emigration rate, we use the implicit function theorem on equation (12)¹². We find that for ability distributions where the density is not strongly increasing in ability¹³ and for moderate optimal emigration rates, the optimal migration rate will increase as a result of the aspirations effect. These conditions are likely to hold and can be explained intuitively. If the ability distribution were such that the density is increasing in ability, there would be a high fraction of the population that has a high inherent ability. In such a setting, the initial education rate is likely to be high, and the beneficial effect of increasing the incentives for education will be low, because decreasing the benchmark will move us to a point on the distribution where the density is lower. The second condition is intuitive, because if the initial emigration rate is already high, then the incentive effect is already strong, even without aspirations. The additional incentives that aspirations bring, are then small compared to the additional loss in skilled migrants.

If these weak conditions on the ability distribution are met, the optimal emigration rate is increasing in aspirations and the probability to know an emigrant. The *aspirations effect* works in two ways. The negative effect of emigration is weakened because it increases the probability to know an emigrant, which increases the aggregate percentage of aspiring individuals. Second, for a given number of aspiring individuals, there will be more individuals who choose education than before, because aspirations lower the

¹¹With a continuum of countries, it would definitely increase the number of net-winners at the margin. Since in reality there is a discrete number of countries, it depends on the actual size of the aspirations effect, whether or not it will shift some net-looser countries on the net-winner side.

¹²See Appendix

¹³For example, the uniform distribution used by both Mountford (1997) and Beine et al. (2008) fulfills these weak requirements. Depending on the mean of the function and the parameters of the distribution, a log-normal distribution will also fulfill these conditions.

ability benchmark.

4. Calibration of the Model

The simulation of our model requires a numerical approximation of the migration-induced increase in aspirations. However the literature on this subject remains scarce and does not provide any suggestions. The main problem is the limited data availability since only few data sets include questions on aspirations and migration at the same time. The analysis of the relationship between aspirations and migration by Czaika and Vothknecht (2014) is one of the few exceptions which we are aware of. The authors study the Indonesian Family Live Survey (IFLS) and discover a significant correlation between migration and the aspirations gap. Their analysis offers interesting insights but does not fully exploit the potential of the dataset. We follow up on their analysis and extend it by focusing on the problem of endogeneity to evaluate the association between migration and aspirations. Making full use of the panel structure of the data we overcome time invariant unobservable characteristics of individuals by emphasizing the importance of fixed effects and difference in difference estimations. Our results suggest that the migration experience of an individual is positively associated with an upward shift in aspirations. This empirical exercise provides important empirical clues that enable us to simulate our model.

4.1. Data and descriptive statistics

The Indonesian Family Life Survey (IFLS) is a panel household survey that is representative of around 80% of the Indonesian population¹⁴. Since the questions that are relevant in order to measure aspirations have only been introduced recently to the survey, we limit our analysis to the third and fourth wave (compiled in 2000 and 2007). The survey keeps track of the internal migration of all household members aged 15 years or more. There are only few recorded incidents of international migration. However, this should not pose a problem since internal migration does expose the migrant to a new socioeconomic environment as does international migration. The intensity of the effect will most likely depend on the difference between origin and destination. In both cases the migrant will revise her own goals and ambitions. It is reasonable to assume that the cultural gap will be even larger for international migration. Therefore, if we find that internal migration has a significant effect on aspirations, the relation should also hold for international migration and might even be stronger.

Individuals were defined as having a migration experience in the last observation period, if they had lived in a different village for more than 6 months. In order to be able to identify the impact of migration we also narrowed our analysis down to individuals that did not migrate before 2000. Although there are only few instances where this is

¹⁴See Strauss et al. (2009)

the case, we decided to keep only migrants that moved for reasons related to labor or education, i.e. we exclude marriage induced migration and whole household migration. This provides us with a sample of 12092 individuals present in each wave that had no migration experience in 2000 and were between 15 and 80 years old. Based on these adjustments, the national migration prevalence in our sub-sample stands at around 16 % in 2007 (see Table 1). Migrants are on average 33 years old compared to non-migrant who were on average 45 years old (not reported in Table 1). About one in five migrants has a higher education degree and 95% of them can write Indonesian. This is quite different from non-migrants where only 78% of all individuals can read and only 7% hold a higher education degree.

Aspirations can be measured in several ways, since the concept can be cultural or socio-economic. A question concerning the desired years of schooling for an individual's offspring is a type of aspirations measure, as is the commitment to a certain saving behavior. The IFLS provides us with a set of questions that allow us to construct a measure for the economic aspirations gap. Participants were asked to assess their subjective current economic well-being, relative to the rest of society, on a 6 step ladder.

Please imagine a six-step ladder where on the bottom (the first step), stand the poorest people, and on the highest step (the sixth step), stand the richest people.

On which step are you today ?

They were also asked where on this ladder they see themselves in the near future.

On which step do you expect to be in one/five years from now?

This forward looking evaluation of the respondents' future is equivalent with what is generally considered as aspirations. The simple difference between the forward looking evaluation and the assessment of her current situation is the aspiration gap our analysis focuses on.¹⁵

Table 1 shows the average current well-being, aspirations and aspirations gap for all individuals in both years. In 2007 migrants had a higher aspiration gap (0.79) than non-migrants (0.59). This is not driven by current aspirations which are 2.91 and 2.84 for migrants and non-migrants respectively (not reported).

It must be noted that between 2000 and 2007 a small adjustment of the aspirations question was undertaken. The authors of the IFLS changed the time horizon of the aspirations from one year to five years. The modification of the question is unfortunate for comparisons in the level of the aspirations gap. It can be seen that there is an increase in the mean aspirations gap for all groups from 2000 to 2007. The change in the time horizon is a probable explanation for this. The change in the question does not affect the distribution of the evaluation of the current situation of individuals (see graph 2a) but

¹⁵We also used ratios of aspirations and current situation assessment of individuals as a measure for the aspirations gap and came largely to the same qualitative conclusions.

Table 1: Descriptive statistics for both waves

	2000		2007	
	Mean	Std Dev.	Mean	Std Dev.
<i>Individual characteristics</i>				
Age	35.43	14.54	42.75	14.49
Gender (male=1)	0.45	0.50	0.45	0.50
Married (yes=1)	0.67	0.47	0.76	0.42
Household head (yes=1)	0.32	0.46	0.44	0.50
<i>Education & household size</i>				
No education	0.12	0.32	0.11	0.32
Years of education	7.62	3.92	7.82	4.04
Household size	12.01	5.38	11.96	5.37
<i>Migration and aspirations</i>				
Migration prevalence	-	-	0.16	0.37
Current wellbeing	2.91	0.78	2.85	0.80
Aspirations	3.24	0.91	3.47	1
Aspirations gap	0.34	0.61	0.62	0.75
Observations	12,092		12,092	

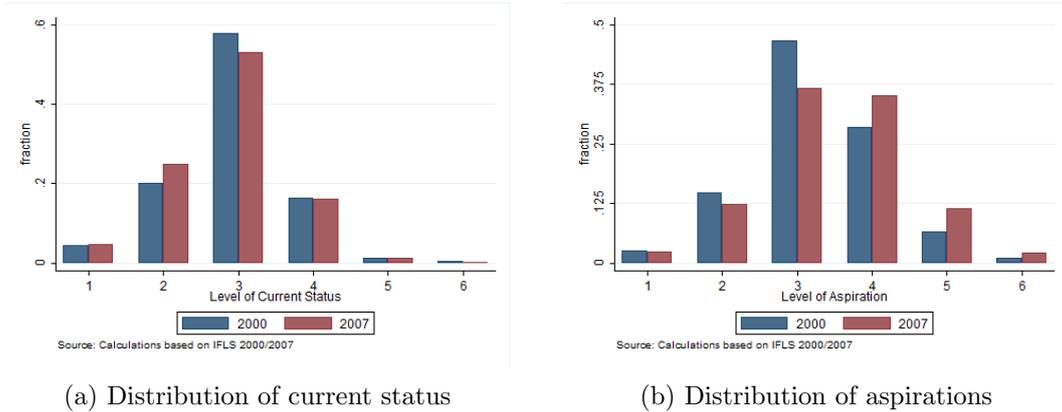


Figure 2: Distributions

does shift the distribution as expected in the forward looking evaluation (see graph 2b). However, for our purposes it does not pose a problem, since the fixed effects estimation that we perform measures the difference in the change in the aspirations gap, not the level. The adjustment of the question would only be problematic if migrants understood the question differently than non-migrants, i.e. they process the changed horizon of the question systematically different. There is no reason to believe that this systematic bias is plausible.

4.2. Empirical Approach

We explore the influence of migration on aspirations both at the individual as well as at the household level. Our standard estimation equation looks as follows:

$$A_{ijt} = \alpha + \beta_1 M_{ijt} + \beta_2 C_{ijt} + \varepsilon_{ijt} \quad (13)$$

where A_{ijt} is the aspiration gap of individual i , in household j at time t . M_{ijt} is a binary migration indicator and C_{ijt} is a vector of observable individual characteristics such as age, gender and education but also the assessment of the current situation. We include the latter to control for possible level effects. We first approach the data with simple OLS to explore the basic relationship between aspirations and migration. The central problem in this setup is the endogeneity of migration. More precisely, unobserved characteristics of the individual might be driving both her aspirations gap as well as her decision to emigrate. We have the big advantage to be able to control for unobserved fixed characteristics by using fixed effects estimation to analyze the IFLS. The fixed effects estimation helps us to establish not only correlation between migration and aspirations, but also causality. The correlation between aspirations and migration is likely to go in both directions. More aspiring individuals are forward looking and are ready to act in order to shape their own future. Migration is one way to achieve this. Therefore,

migrants are likely to have higher aspirations at the time they decide to emigrate. To be able to isolate the effects of migration we limit our analysis to households that had no migrants before 2000.

In the fixed effects setup the identification of the effect of migration on aspirations is based on the inter-temporal variation of both the aspiration gap and the migration behavior of individuals. Equation (13) is therefore reduced to:

$$\Delta A_{ij} = b + \Delta M_{ij} + \Delta e_{ij} \quad (14)$$

This approach controls for fixed group effects, i.e. effects that are common to all groups between the two periods. The fixed effects approach also nets out fixed individual effects, i.e. time invariant individual characteristics. It is reasonable to expect that in the context of Indonesia the distribution of households with specific characteristics is partly exogenous. This is due to the government initiated Transmigration program that has been in place in Indonesia since 1902¹⁶. One of the main goals of the program was to populate uninhabited regions of Indonesia and to counterbalance the increasing urbanization. Within the Transmigration program that moved more than a quarter of a million people per year, a random element can be found. The program provided free farm land and housing in the periphery of Indonesia, as well as free transport and free food and fertilizer for the first year. But most importantly, the free farm land was allocated by lot¹⁷. This implies that the productivity and quality of farmland was independent of the families characteristics. Households might have opted into the Transmigration program with knowing the economic benefit this decision would provide. Consequently some households could be considered randomly distributed.

This particularity of Indonesia can however not remove the doubt about the causal effect of migration on aspirations since there is still a chance that unobservable variable factors influence both the dependent and the independent variable at the same time. We therefore also employ an instrumented variable strategy and propensity score matching to evaluate our fixed effects results. The instruments we use to identify the effect of migration on aspirations are the gender distribution and birth order of siblings within households. Our identifying assumption is that geographic mobility will strongly depend on the composition of households but the gender composition of siblings and the position in the birth order should not have significant effects on the change in aspirations. For example Rainer and Siedler (2009) document that due to intergenerational responsibilities at least one adult child will remain geographically close to take care of the elderly. The same pattern has been documented by Abramitzky et al. (2013). They also point out that birth order could be an extremely important factor for individual migration. We build the birth order based on the first period of observation (2000). It is therefore time invariant and will drop in the fixed effects estimation. However the share of male siblings in the household that have reached working age (+15) varies over time. We keep the effect of being the first born by interacting the share of male siblings and the first born dummy. Hence our identification will run through the change of the share of male

¹⁶See Hugo (2006)

¹⁷See Kechschull (1986)

siblings in the household and the interaction of this share with the first born dummy for each individual.

The first stage of our instrumented fixed effects estimation shows clearly that an increase in the share of male siblings reaching working age is having a negative impact on the likelihood to migrate. However being the firstborn changes the picture entirely. The oldest sibling is significantly more likely to migrate due to an increase in the share of male siblings. All covariates included in the estimation predict migration in the first-stage as found in other studies. For example, we observe an increased probability to migrate of individuals in larger households and of individuals with a higher education. With respect to the statistical strength of the instruments we conduct various tests. First, the first stage F-Test is slightly below the critical value of 19.93 for a 10% bias but above the value of 11.59 for a 15% bias of the instrumented estimator as proposed by Stock and Yogo (2005). This suggests that our instruments are not weak.

Another common approach to evaluate the unconfoundedness of the two comparison groups is propensity score matching. Although we are controlling for a number of covariates in all estimations this does not ensure that the linearity assumption of the comparison is satisfied. More precisely, if migration depends strongly on the covariates and if the average value of the covariates is quite different between the two groups, we should not compare migrants and non-migrants. To address this issue we follow Heckman et al. (1998) and build a comparable synthetic control group based on a nonparametrically derived propensity score estimate.

4.3. Estimation Results

In table 2 we present the benchmark regression results. The standard OLS displayed in rows one and two shows positive but only borderline significant coefficients for the migration dummy. The coefficient size roughly reflects the findings reported by Czaika and Vothknecht (2014). This suggests, that in the cross-section there is a significantly positive correlation between the aspirations gap and migration. Looking at the included covariates we observe that the aspiration gap decreases with age and that gender does not seem to play a significant role. We also observe that married individuals display a significantly more positive outlook than unmarried individuals. And that education and skills represented by the years of education and the ability to read are positively correlated with the aspirations gap.

In a second step we look at between effects, random effects, and finally fixed effects regressions, exploiting the full potential of the panel dataset at hand. A Hausman Test suggest a systematic bias in the random effects model and leads to the conclusion that the fixed effects model is suited best to answer our research question. It is interesting to observe that only marital status and education seem to have a statistically significant impact on the aspiration gap independently of the econometric specification. The last row of Table 2 contains our preferred estimation specification. Migrants experience a significantly higher increase in their aspirations gap than non-migrants between 2000 and 2007. Since the mean change in the gap between 2000 and 2007 was 0.2845 the size of the coefficient of our migration indicator is also economically important.

To check concerns about the importance the change in income vis-a-vis the exposure to a new environment, we also included income and the wealth index based on a principal component analysis (PCA). The results in rows 1 and 2 of Table 3 show only a slight decrease of the strength of the migration effect. As a second robustness check we split the sample into households with a more than median increase and less than median increase in income between 2000 and 2007. The results displayed in rows 3 and 4 do not change the picture. Both these robustness checks suggest that income is not the driver of the observed effects.

We also evaluated the assumption of common trends by using random assignment of the migration status to non-migrants. Using this randomly assigned dummy we should not observe an effect that is different from zero if our difference in difference estimates are unbiased. Obviously for this estimation true migrants were excluded which reduces the used sample size. We report the results of these tests in Table 3. Independent of the stratification used for the random assignment we find no effect that suggests any problems with the assumption of parallel trends.

In Table 4 we address the concern of variable unobserved variables that drive the observed effect of migration on the aspiration gap. As outlined before we use the share of male siblings in the household and the interaction of this share with the first born status for each individual. The results in row 2 of Table 4 repeat the previous finding that migration seems to have a strong causal impact in the aspiration window of individuals. We also use a propensity score model that repeats the effects suggested by our benchmark regressions. Although the effect is slightly higher with 0.121. Taken together, these results give us strong support that a migration experience increases aspirations. This was the key assumption for our theoretical model. We therefore believe that the predictions of our theoretical model are valid.

4.4. Counterfactual simulation

We performed a numerical simulation, assuming a uniform distribution for the perceived education cost, for different magnitudes of the aspirations effect to get an idea of the quantitative implications.¹⁸

Figure 3 depicts the pre- and post-emigration proportion of skilled individuals. As expected, a higher aspirations effect results in more investment in education, which in turn increases the post-emigration human capital. Figure 4 shows the derivative of the post-emigration skill rate with respect to the emigration rate. The intersection of the graphs with the x-axis identifies the optimal emigration rate, which maximizes the *ex-post* skill proportion. It can be seen that already a small aspirations effect of 0.1 increases the optimal emigration rate considerably. In this example from 18% to over 20%. Not even doubling the aspirations from one to 1.7 almost doubles the optimal migration rate. As we have seen in the empirical part, aspirations are a somewhat blurry concept, that is hard to quantify. The examples above are therefore only meant to clarify the possible

¹⁸ g was calibrated such that it is equal to the pre-emigration proportion of skilled individuals. This was done in order to account for the fact that a higher steady state skill rate increases the likelihood of knowing a skilled emigrant.

Table 2: *Benchmark regressions aspirations gap*

	(1) OLS 2007	(2) OLS 2007	(3) BE	(4) RE	(5) FE (no trend)	(6) FE (with trend)
Migration	.0312	.0377*	.0559**	.0808***	.0834***	.0848***
Current wellbeing	-.2062***	-.2181***	-.1540***	-.1892***	-.2355***	-.2350***
Age	-.0094***	-.0084***	-.0058***	-.0058***	.0333***	-.0099
Gender (male=1)	0.259	0.201	-.0030	-.0113	/	/
Married (yes=1)	0.0371**	0.0390**	.0517***	.0644***	.0907***	.0930***
HH head (yes=1)	-.0659***	-.0637***	-.0246*	-.0164	.0061	.0067
Years of education	.0198***	.0239***	.0193***	.0206***	.0160***	.0158***
Reads Indo	.0483***	.0603***	.0432***	.0490***	.0624*	.0626*
HH labourforce size	0.0013	0.0025*	.0020**	.0022***	.0118	.0141
<i>Province fixed effects</i>	No	Yes	Yes	Yes	/	/
R^2 Overall	0.1079	0.1359	0.0858	0.1348	0.0006	0.1094
R^2 Within	/	/	0.0420	0.1451	0.1459	0.1469
R^2 Between	/	/	0.1276	0.1264	0.0310	0.0860
Observations	12,092	12,092	24,184	24,184	24,184	24,184

Notes: Authors calculation based IFLS3 and IFLS4; Dependent variable is aspirations gap. Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Standard errors clustered at the household level.

Table 3: *Fixed Effects - Robustness Tests*

	(1) Including wealth (PCA)	(2) Including log income	(3) Low change in Income	(4) High change in income	(5) Random placebo assignment (Not stratified)	(6) Random placebo assignment (Stratified)
Migration	.0696***	.0822***	.0891**	.0799**	.0071	.0016
R^2 Overall	.1139	.1160	.1033	.0822	.0988	.0989
Observations	23,971	23,971	11,766	11,994	20,330	20,330

Note: Authors calculation based IFLS3 and IFLS4. Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Standard errors clustered at the household level; Estimation setup is the same as in the benchmark. Controls include current level of aspirations, age, gender, education.

Table 4: *Fixed Effects - Alternative Approaches*

	(1) IV (Change in Ratio of male siblings)	(2) IV (Firstborn interacted with ratio)	(3) Propensity score [‡] (Kernel)	(4) Propensity Score [‡] (Kernel on common support)
Migration	3.9429	1.3351***	.125***	.121***
CDF	.107	12.681	/	/
Observations	24,184	24,184	24,184	24,024

Note: Authors calculation based IFLS3 and IFLS4. Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; [‡] Standard errors for the treatment effect and regression treatment effect are computed using a bootstrap with 500 replications.

implications that aspirations could have for the brain drain. However, the results suggest that the effect is sizable even for small aspirations increases due to a *migration experience*.

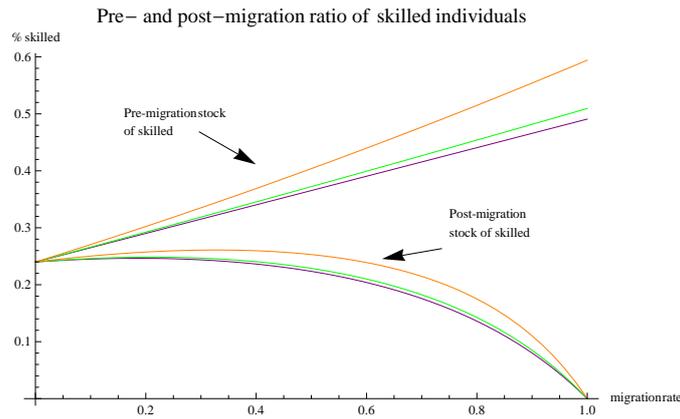


Figure 3: Effect of aspirations on the pre and post-emigration skill proportion

$$\gamma_1 = 0, \gamma_2 = 0.1, \gamma_3 = 0.7$$

5. Conclusion

The brain drain literature of the recent past has been arguing, that a small amount of emigration might actually be beneficial for the sending country, since it increases the

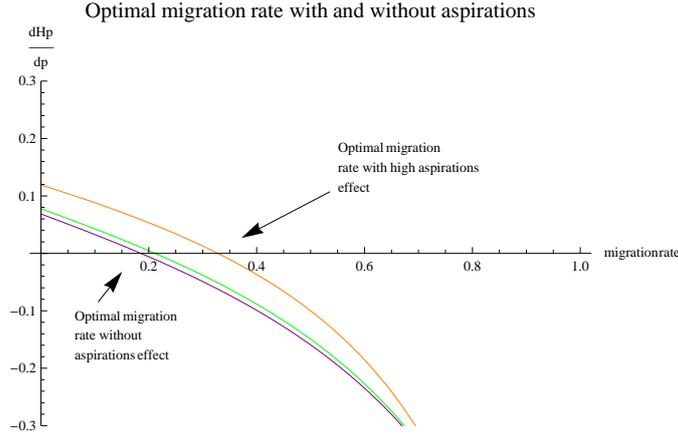


Figure 4: Effect of aspirations on optimal emigration rate

$$\gamma_1 = 0, \gamma_2 = 0.1, \gamma_3 = 0.7$$

incentives to invest in education. However, this literature has only focused on the incentive effect of the aggregate emigration probability.

In this paper we propose that the positive incentive effect of emigration is even stronger than previously assumed, because of spillovers on the household level. We consider the positive *aspiration effect* that emigration has on the remaining household members.

In the empirical part of this paper, we show that there is a significant relationship between migration and aspirations. Having lived and worked in a different location for a while changes the goals and values that an individual aspires to.

We take this stylized fact and build a theoretical brain drain model around it. We find that an aspirations effect will increase the range of the skilled emigration rate, for which a country benefits from skilled emigration. Furthermore, the optimal emigration rate is found to be increasing in aspirations for most distributions of ability.

These first insights about the relationship between aspirations and the brain drain provide a promising starting point for further research. First and foremost, more panel data on the relationship between migration, aspirations and education is needed in order to quantify the actual impact of the *aspirations effect* on the overall brain drain. Since aspirations are still a somewhat blurry concept that can be measured in several dimensions, it is important to develop reliable survey questions to measure aspirations such that they can be compared quantitatively across cultures and across time.

Second, studies which calculate the net brain drain for different countries should incorporate the *aspirations effect*. This would help to gain knowledge how the brain drain develops in the long run if the intergenerational linkages discussed in this study are taken into account.

A. Rewriting equation (10)

We rewrite equation (10) by multiplying with the denominator of the left hand side. We then get

$$(1 + g\gamma p_{0|\gamma=0})(1 - p_{0|\gamma=0})(w(h-1) + p_{0|\gamma=0}h(w^* - w)) > \\ w(h-1) - (1 + g\gamma p_{0|\gamma=0})p_{0|\gamma=0}w(h-1)(w(h-1) + p_{0|\gamma=0}h(w^* - w)) \quad (15)$$

We now subtract $w(h-1)$ and divide both sides by $p_{0|\gamma=0}$. This simplifies the equation to

$$(1 + g\gamma p_{0|\gamma=0})((1 - p_{0|\gamma=0})h(w^* - w) - w(h-1)) + g\gamma w(h-1) > \\ - (1 + g\gamma p_{0|\gamma=0})w(h-1)(w(h-1) + p_{0|\gamma=0}h(w^* - w)) \quad (16)$$

which simplifies to

$$(1 + g\gamma p_{0|\gamma=0})(h(w^* - w)(1 - p_{0|\gamma=0}(1 - w(h-1))) - w(h-1)(1 - w(h-1))) \\ + g\gamma w(h-1) > 0 \quad (17)$$

Setting in (9), the first part of equation (17) becomes zero, and we obtain equation (11).

B. Influence of aspirations on optimal migration rate.

Using equation (12), we know that

$$\eta(p^*, \gamma, g) = -H_a(\tilde{c}(p^*), \gamma, g)(1 - H_a(\tilde{c}(p^*), \gamma, g)) + (1 - p) \frac{\partial H_a}{\partial p} \stackrel{!}{=} 0 \quad (18)$$

We use the implicit function theorem on this equation to obtain an expression for $\frac{\partial p^*}{\partial \gamma}$ and $\frac{\partial p^*}{\partial g}$.

$$\frac{\partial p^*}{\partial \gamma} = - \frac{\frac{\partial \eta}{\partial \gamma}}{\frac{\partial \eta}{\partial p}} \quad (19)$$

If an optimal level of migration exists, $\frac{\partial \eta}{\partial p} < 0$ follows from the second order condition for p^* to be a local maximum. We therefore need $\frac{\partial \eta}{\partial \gamma} > 0$ for a beneficial effect of an increase in the aspirations effect on the optimal migration rate.

As we have written before, the perceived cost of education c_i is a function of the inherent ability of each individual a_i . We assume that $c_i = \frac{\tilde{c}}{a_i}$, and therefore $\tilde{c} = \frac{\tilde{c}}{a}$. H_a can then be rewritten as

$$H_a(\tilde{a}, p, \gamma, g) = (1 - gp)F(c(\tilde{a})) + gp(F((1 + \gamma)c(\tilde{a}))) \\ (1 - gp)(1 - F(\tilde{a})) + gp(1 - F(\frac{\tilde{a}}{1 + \gamma})) \quad (20)$$

With this, we get that

$$\begin{aligned} \frac{\partial \eta}{\partial \gamma} &= -\frac{\partial H_a}{\partial \gamma}(1 - 2H_a) + (1 - p)\frac{\partial^2 H_a}{\partial p \partial \gamma} \\ &= \frac{g\tilde{a}(1 - 2p(1 - H_a))}{(1 + \gamma)^2} f\left(\frac{\tilde{a}}{1 + \gamma}\right) + \frac{(1 - p)pg}{(1 + \gamma)^2} \frac{\partial \tilde{a}}{\partial p} \left(f\left(\frac{\tilde{a}}{1 + \gamma}\right) + f'\left(\frac{\tilde{a}}{1 + \gamma}\right) \frac{\tilde{a}}{1 + \gamma} \right) \end{aligned} \quad (21)$$

This is bigger than zero if

$$\begin{aligned} \frac{\partial \eta}{\partial \gamma} &> 0 \quad \text{if} \\ f\left(\frac{\tilde{a}}{1 + \gamma}\right) \left(\tilde{a}(1 - 2p^*(1 - H_a)) + \frac{\partial \tilde{a}}{\partial p}(1 - p^*)p^* \right) &> -f'\left(\frac{\tilde{a}}{1 + \gamma}\right) \frac{(1 - p^*)p^*\tilde{a}}{1 + \gamma} \frac{\partial \tilde{a}}{\partial p} \end{aligned} \quad (22)$$

Where $\frac{\partial \tilde{a}}{\partial p} = -\tilde{a} \frac{h(w^* - w)}{w(h-1) + ph(w^* - w)}$. This condition is likely to be fulfilled in equilibrium, especially if

- p^* is small. This implies that the aspirations effect will be larger for countries that have otherwise only a small brain gain.
- $f'\left(\frac{\tilde{a}}{1 + \gamma}\right)$ is negative or small. This condition states that, at $\frac{\tilde{a}}{1 + \gamma}$, the density should be non-increasing in \tilde{a} . For ability distributions such as the log-normal distribution or the uniform distribution, this is fulfilled. With $H_a < 0.5$, this will also be fulfilled for the normal distribution, as shown in the graph below.

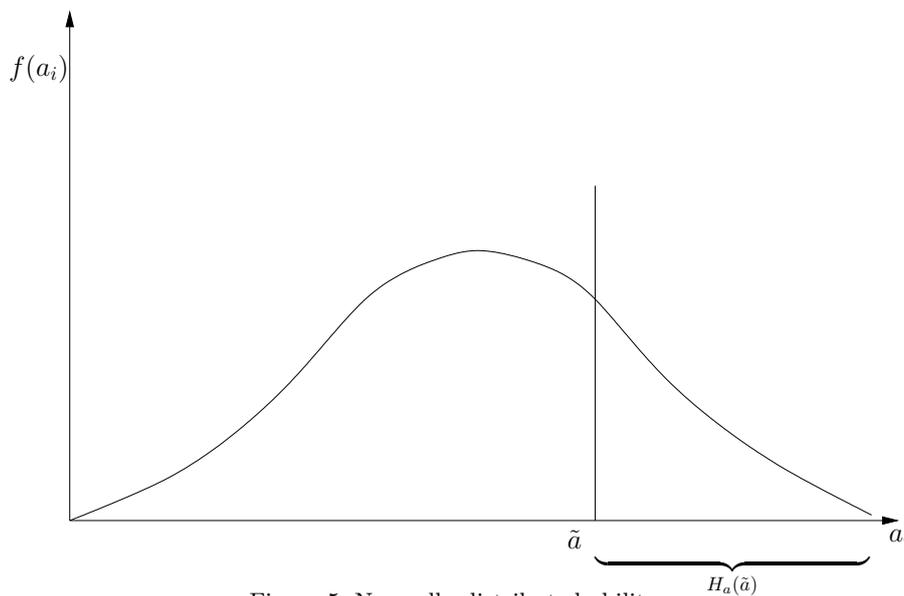


Figure 5: Normally distributed ability

C. Influence of aspirations window on optimal migration rate

We proceed similar to section B of the appendix to show that the optimal migration rate will be increasing in the parameter that determines the probability of knowing a migrant, g . As before, we need to take the derivative of the FOC with respect to the variable of interest.

$$\frac{\partial \eta}{\partial g} = (F(\tilde{a}) - F(\frac{\tilde{a}}{1+\gamma}))(1 - 2p^*(1 - H_a(p^*))) > -(1 - p^*)p^* \frac{\partial \tilde{a}}{\partial p} (f(\tilde{a}) - f(\frac{\tilde{a}}{1+\gamma}) \frac{1}{1+\gamma}) \quad (23)$$

This is a condition that will be fulfilled for distributions with similar attributes as the ones required for $\frac{\partial p^*}{\partial \gamma} > 0$. Notably, for the uniform distribution, both conditions are fulfilled if

$$1 - 2p^*(1 - H_a(p^*)) > (1 - p^*) \frac{p^* h(w^* - w)}{w(h - 1) + p^* h(w^* - w)} \quad (24)$$

References

- Abramitzky, Ran, Leah Platt Boustan, and Katherine Eriksson**, “Have the poor always been less likely to migrate? Evidence from inheritance practices during the Age of Mass Migration,” *Journal of Development Economics*, 2013, *102*, 2–14.
- Appadurai, Arjun**, “The Capacity to Aspire: Culture and the Terms of Recognition,” in Vijayendra Rao and Michael Walton, eds., *Culture and Public Action*, Stanford Social Sciences 6 2004, pp. 59–84.
- Beine, Michel, Frédéric Docquier, and Hillel Rapoport**, “Brain drain and economic growth: theory and evidence,” *Journal of Development Economics*, 2001, *64* (1), 275 – 289.
- , – , and – , “Brain Drain and Human Capital Formation in Developing Countries: Winners and Losers,” *Economic Journal*, 04 2008, *118* (528), 631–652.
- Bernard, Tanguy, Stefan Dercon, and Alemayehu Seyoum Taffesse**, “Beyond fatalism-an empirical exploration of self-efficacy and aspirations failure in Ethiopia.,” 2011.
- Bhagwati, Jagdish and Koichi Hamada**, “The brain drain, international integration of markets for professionals and unemployment: a theoretical analysis,” *Journal of Development Economics*, 1974, *1* (1), 19–42.
- Böhme, Marcus**, “Roots and Wings - Poverty, Aspirations and Migration,” *Kiel Working Paper*, 2012, *1811*.
- Chiapa, Carlos, José Luis Garrido, and Silvia Prina**, “The effect of social programs and exposure to professionals on the educational aspirations of the poor,” *Economics of Education Review*, 2012, *31* (5), 778–798.
- Commander, Simon, Mari Kangasniemi, and L Alan Winters**, “The brain drain: curse or boon? A survey of the literature,” in “Challenges to Globalization: Analyzing the Economics,” University of Chicago Press, 2004, pp. 235–278.
- Czaika, Mathias and Marc Vothknecht**, “Migration and aspirations—are migrants trapped on a hedonic treadmill?,” *IZA Journal of Migration*, 2014, *3* (1), 1.
- Dalton, Patricio, Sayantan Ghosal, and Anandi Mani**, “Poverty and aspirations failure,” 2011.
- Docquier, Frédéric and Abdeslam Marfouk**, “International Migration by Educational Attainment (1990-2000)-Release 1.1,” *database*, 2000, *1990*, 16.
- Heckman, James J, Hidehiko Ichimura, and Petra Todd**, “Matching as an econometric evaluation estimator,” *The Review of Economic Studies*, 1998, *65* (2), 261–294.

- Hugo, Graeme**, “Forced migration in Indonesia: Historical perspectives,” *Asian and Pacific migration journal*, 2006, 15 (1), 53.
- Kebschull, Dietrich**, *Transmigration in Indonesia: An Empirical Analysis of Motivation, Expectations and Experiences*, Verlag Weltarchiv, Hamburg, Germany, 1986.
- Krishnan, Pramila and Sofya Krutikova**, “Non-cognitive skill formation in poor neighbourhoods of urban India (updated 27-02-2012),” Cambridge Working Papers in Economics 1010, Faculty of Economics, University of Cambridge January 2010.
- Macours, Karen and Renos Vakis**, “Changing households’ investments and aspirations through social interactions: Evidence from a randomized transfer program in a low-income country,” *World Bank Research Paper. World Bank, Washington, DC*, 2008.
- Mountford, Andrew**, “Can a brain drain be good for growth in the source economy?,” *Journal of Development Economics*, August 1997, 53 (2), 287–303.
- Rainer, Helmut and Thomas Siedler**, “O brother, where art thou? The effects of having a sibling on geographic mobility and labour market outcomes,” *Economica*, 2009, 76 (303), 528–556.
- Ray, Debraj**, “Aspirations, Poverty and Economic Change,” in Abhijit Vinayak Banerjee, Roland Benabou, and Mookherjee, eds., *Understanding Poverty*, Oxford University Press, USA April 2006, pp. 409–422.
- Stark, Oded**, “Rethinking the Brain Drain,” *World Development*, 2004, 32 (1), 15 – 22.
- Stock, James H and Motohiro Yogo**, “Testing for Weak Instruments in Linear IV Regression,” *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg*, 2005, p. 80.
- Strauss, John, Firman Witoelar, Bondan Sikoki, and Anna Marie Wattie**, ““The 4th Wave of the Indonesian Family Life Survey (IFLS4): Overview and Field Report,”,” Technical Report, WR-675/1-NIA/NICHD 2009.
- Wilson, Kenneth L and Janet P Boldizar**, “Gender segregation in higher education: Effects of aspirations, mathematics achievement, and income,” *Sociology of Education*, 1990, pp. 62–74.
- Wydick, Bruce, Paul Glewwe, and Laine Rutledge**, “Does international child sponsorship work? A six-country study of impacts on adult life outcomes,” *Journal of Political Economy*, 2013, 121 (2), 393–436.