

# Migration experience, aspirations and the brain drain

## Theory and empirical evidence

Marcus Böhme <sup>1</sup>    Toni Glaser <sup>2, 3</sup>

<sup>1</sup>OECD

<sup>2</sup>Universität Bielefeld

<sup>3</sup>KU Leuven

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# Motivation and Research Questions

Is migration from third to first world good or bad for sending countries?  
Recent research suggests that households with some migrant members are more aspiring.

Research Questions:

- Previous research did only show correlation between migrations and aspirations. Is it possible to establish causality?
- What implications do higher aspirations for households with a migration experience have for the brain drain?

# Structure of the talk

- 1 Contribution
- 2 Literature Review
- 3 Aspirations
- 4 Brain drain
- 5 Empirical evidence
- 6 Conclusion

- We use panel data from Indonesia to show that a migration experience in the past increases the aspirations of the migrant
- Incorporating this finding into a theoretical model, we find that previous brain drain models underestimate the positive effect of migration on education incentives
- We show that more countries will be net-winners of migration if this effect is accounted for

- Czaika and Vothknecht (2014) and Böhme (2012) show that migrants and their households are found to have higher aspirations
- Ray (2006) and Dalton et al. (2011) argue that a lack of aspirations is a reason for underinvestment in education in poor societies
- Beine et al. (2008), Mountford (1997) and Stark (2004) show that migration of skilled individuals from third to first world (brain drain) must not necessarily be bad for the sending countries

- A reference point of wealth, status or lifestyle that one pursues
- Aspirations form as a result of interactions with our social environment (family and peers that are in the *aspirations window*)
- Appadurai (2004) states that the *capacity to aspire* can be underdeveloped in absolutely poor societies
- Ray (2006) identifies *aspirations failure* as one reason for persisting poverty in the third world
- Dalton et al. (2011) develop a theoretical model for poverty traps, sustained by aspirations failure. They argue that policy needs to tackle aspirations formation of the poor in order to fight persisting poverty

# Aspirations gap and effort

Ray (2006) states that individuals with high but achievable aspirations will exert more effort to attain their goals

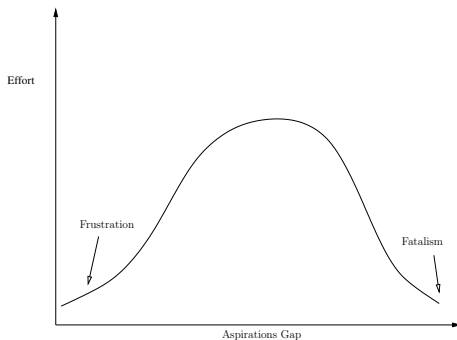


Figure: Aspiration gap and corresponding effort

Recent research has proposed several ways to increase aspirations and thereby investment in education

- Wydick et al. (2013) observe that child sponsorship programs increase children's aspirations and thereby their schooling outcomes
- Chiapa et al. (2012) show that exposing children to highly educated people raises their aspirations
- Macours and Vakis (2008) find that exposing households to role models changes their investment behavior
- Krishnan and Krutikova (2010) demonstrate that rising pupils self-esteem by giving them positive feedback on themselves also widens their *aspirations window*



We find an additional channel through which aspirations are raised:

## Migration Experience

- Emigration exposes people to new lifestyles and values
- Emigrants will meet new people, thereby broadening their *aspirations window*
- Destination countries are likely to be wealthier and less segregated than country of origin
- As a result, emigrants will encounter new social and economic norms that they will aspire to
- They will transmit these aspirations to their left-behind families

Mountford (1997), Beine et al. (2008) and Stark (2004) show that migration from third to first world has two opposing effects on the rate of skilled workers in the sending country.

Key assumption: Skilled individuals are more likely to emigrate.

- Migration of the skilled depletes the stock of educated workers
- Possibility of migration increases expected return to education  
⇒ Incentive Effect
- For small enough migration rates, the second effect outweighs the first
- ⇒ Brain gain

All use macro variables and focus on the aggregate effects of migration on the sending country. Heterogeneity is introduced through an 'ability' variable.

# Introducing aspirations to brain drain models

- Stylized fact: aspirations are higher in households with migration experience

## *Idea for theoretical model*

- Partly endogenize heterogeneity of individuals' occupational choice
- Higher aspirations in households with emigration experience
- $\Rightarrow$  Aspirations lower the perceived cost of education
- $\Rightarrow$  Additional migration increases aspirations, and thereby, educational attainment

# Setup brain drain model

Individuals choose, whether they invest in education or not. Education increases their effective units of work to  $h$ .

Skilled individuals can emigrate to a high wage destination with probability  $p$ . Since  $w^* > w$ , everybody wants to emigrate.

Individuals differ in their ability, which is inversely related to the perceived cost of education  $c_i$ .

An individual will invest in education if

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

From this we get the benchmark value of the perceived cost, for which an individual chooses education.

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

Positive migration probability lowers benchmark ability.

# Setup with aspirations

A fraction  $\pi$  of households has a migration experience. This increases their aspirations to  $1 + \gamma$ . We assume that this reduces the perceived cost of education. The benchmark value of perceived cost for which an aspiring individual chooses education is

$$\begin{aligned} c_i < \tilde{c}(p)_\gamma &\equiv (1 + \gamma)(w(h - 1) + ph(w^* - w)) \\ &= (1 + \gamma)\tilde{c}(p) \end{aligned} \quad (3)$$

Aspirations relax education constraint.

Fraction of the population that chooses education:

$$\begin{aligned} H_a &= (1 - \pi)F(\tilde{c}(p)) + \pi F((1 + \gamma)\tilde{c}(p)) \\ &= \int_0^{\tilde{c}(p)} f(c_i)dc_i + \pi \int_{\tilde{c}(p)}^{(1+\gamma)\tilde{c}(p)} f(c_i)dc_i \end{aligned} \quad (4)$$

Variable of interest: Post-migration percentage of skilled workers in the economy

$$H_p = \frac{(1 - p)H_a(p)}{1 - pH_a(p)} \quad (5)$$

Two effects of migration:

- A percentage of skilled workers leaves the sending country
- The possibility of migration increases the pre-migration stock of educated

## Proposition

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

$$H_p^\gamma(p_0^{\gamma=0}) > H_p(0) \quad (6)$$

Beine et al. (2008) rank several countries according to their migration rates and calculate whether they win or lose from migration at their current migration rate.

Our model predicts that accounting for the aspirations effect of migration, more countries than previously assumed benefit from migration. [Proof](#)

# Optimal migration rate

The effect of aspirations on the optimal migration rate can be found, using the implicit function theorem. We assume that  $\pi(p) = gp$ , where  $g$  is constant.

$$\frac{\partial p^*}{\partial \gamma} = -\frac{\frac{\partial \eta}{\partial \gamma}}{\frac{\partial \eta}{\partial p}} \quad (7)$$
$$> 0 \quad \text{if} \quad \frac{\partial \eta}{\partial \gamma} > 0$$

$$\frac{\partial p^*}{\partial g} = -\frac{\frac{\partial \eta}{\partial g}}{\frac{\partial \eta}{\partial p}} \quad (8)$$
$$> 0 \quad \text{if} \quad \frac{\partial \eta}{\partial g} > 0$$

where  $\eta$  is the FOC evaluated at  $p^*$ .

An aspirations effect will increase the optimal migration rate under some weak conditions on the ability distribution.



- We want to find evidence that a migration experience is causal for an increase in aspirations
- Previous studies show that there is a positive correlation
- We use panel data to control for pre-migration aspirations
- Additionally, we instrument the migration decision

- The Indonesian Family Life Survey (IFLS) is a panel household survey. It is representative of around 80 %
- We use the last two waves (2000 & 2007) of the survey
- Individuals are defined as migrants, if they lived in a different village for more than 6 months.
- This provides us with 12,092 individuals that had no migration experience prior to 2000
- The survey covers migration of all adult (15+) household members
- There is almost no international migration recorded
- National migration prevalence stands at around 17.3 %
- Average distance to destination is at around 150 km (2000) and 105 km (2007)

# Aspirations Question

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? (Current Situation)

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

Table: 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 &amp; 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	

- OLS to establish basic correlation  $\Rightarrow$  Problem: Endogeneity of migration decision.
- We use fixed effects in order to control for the pre-emigration level of aspirations
- We also use random and between effects
- Additionally, we run an IV-regression on the fixed effects estimator

- We instrument migration, using birth order and households gender distribution.
- There is evidence, that at least one adult child will remain geographically close to take care of elderly.
- First born is likely to emigrate, if the share of male siblings close to working age is high.
- Identifying assumption: Birth order and gender composition of household will influence likelihood to emigrate, but not aspirations.
- F-test suggests that our instrument is strong and predicts migration well

Table: *The effect of migration on aspirations*

	(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 <sup>2</sup> Overall	0.1079	0.1359	0.0858	0.1348	0.0006	0.1094
R <sup>2</sup> Within	/	/	0.0420	0.1451	0.1459	0.1469
R <sup>2</sup> 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: Fixed Effects - Alternative Approaches

	(1) IV (Change in Ratio of male siblings)	(2) IV (Firstborn interacted with ratio)	(3) Propensity score <sup>‡</sup> (Kernel)	(4) Propensity Score <sup>‡</sup> (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; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; <sup>‡</sup> Standard errors for the treatment effect and regression treatment effect are computed using a bootstrap with 500 replications.



## Defining $\pi(p)$ for counterfactual

How can we estimate the probability of having a migrant in the aspirations window? It will depend on three things:

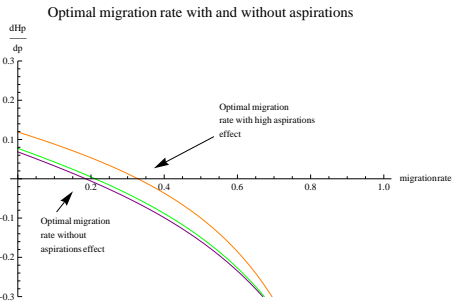
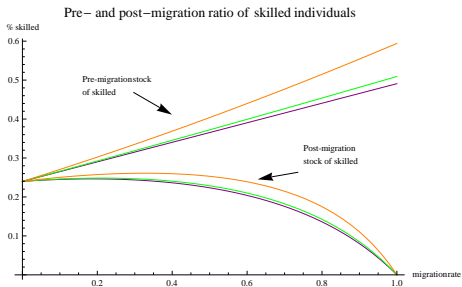
- The size of the aspirations window  $w$
- The probability that someone in the aspirations window is skilled  $H_{a,t-1}$
- The probability that this skilled person was allowed to migrate  $p_{t-1}$

In steady state, the probability  $\pi(p)$  is thus

$$\pi(p) = 1 - (1 - H_a * p)^w \quad (9)$$

With an aspirations window of one, we can write this as  $\pi(p) = gp$ , where  $g$  is a constant calibrated on  $H_a$ .

# Counterfactual: Optimal migration rates



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

- We show theoretically that existing models underestimate the incentive effect of migration on skill accumulation and thereby the benefit of migration on the sending country.
- This is because they omit the the aspirations effect that a migration experience has on the household.
- We present evidence that supports our assumption that migration increases aspirations on the household level.

# What to tell your friends?

- Emigration changes people's goals and social norms.
- The behavior of the remaining family members will change in order to achieve these new goals
- As a result, the effect of emigration on human capital of the sending country will be more positive than previously assumed.

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# Conditions for positive aspirations effect

$$\frac{\partial \eta}{\partial \gamma} > 0 \quad \text{implies} \quad \frac{\partial \eta}{\partial g} > 0$$

Sufficient conditions:

$$\frac{\partial \eta}{\partial \gamma} > 0 \quad \text{if} \quad f\left(\frac{\tilde{a}}{1+\gamma}\right) \left( \tilde{a}(1 - 2p^*(1 - H_a)) + \frac{\partial \tilde{a}}{\partial p}(1 - p^*)p^* \right) > -f'\left(\frac{\tilde{a}}{1+\gamma}\right) \frac{(1 - p^*)p^* \tilde{a}}{1+\gamma} \frac{\partial \tilde{a}}{\partial p} \quad (10)$$

$$\text{Where } \frac{\partial \tilde{a}}{\partial p} = -\tilde{a} \frac{h(w^* - w)}{w(h-1) + \rho h(w^* - w)}.$$

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.
- $H_a$  is small. This implies that the initial education rate is low.
- $f'\left(\frac{\tilde{a}}{1+\gamma}\right)$  is negative or small.

Can be shown to be fulfilled for uniform distribution. [back](#)



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

$$p_{0|\gamma=0} = \frac{h(w^* - w) - w(h - 1)(1 - w(h - 1))}{h(w^* - w)(1 - w(h - 1))} \quad (11)$$

We want to show that at this rate  $H_{p,\gamma}(p_{0|\gamma=0}) > H_p(0)$

$$\frac{(1 - p_{0|\gamma=0})(1 + gp\gamma)((w(h - 1) + p_{0|\gamma=0}h(w^* - w))}{1 - p_{0|\gamma=0}(1 + gp\gamma)((w(h - 1) + p_{0|\gamma=0}h(w^* - w))} > w(h - 1) \quad (12)$$

Setting in (11) for  $p_{0|\gamma=0}$  and rewriting, we obtain  $g\gamma w(h - 1) > 0$  which is fulfilled by the assumption that  $h > 1$ . [back](#)