International Migration, Transfers of Norms and Fertility Convergence

Michel Beine, Frédéric Docquier and Maurice Schiff

IRES, University of Louvain

August 2008

Introduction

- Fertility of migrants from high- to low-fertility countries converges to host countries' lower fertility rates (see e.g. Ben Porath, 1973, or Rosenzweig and Schultz, 1985).
- Reason 1: income effect
- Reason 2: old-age insurance
- Reason 3: influence of host countries' values, norms and behavioral modes on migrants increases over time, while the influence of their home countries' norms and behavioral modes declines.
- Another question is whether South-North migration results in a decline in fertility rates in migrants' countries of origin (with important implications in terms of reduced population pressure in the South)

Introduction

Migrants might serve as channels for the transmission of such norms and might affect the behavior of natives in their countries of origin, including their fertility behavior:

- First channel: migrants' direct communication with their family, friends and community
- Second channel: increase in media coverage of both the host country itself and of the migrants living there. Migration typically triggers an increase in interest by those left behind in the situation in host countries, both in terms of assimilation/welfare of migrants and in general (economic, social and political institutions, behavioral norms, culture, etc.).
- Third channel: travel to host countries associated with tourism or business activities.

Introduction

- No systematic empirical studies on migration and fertility
- Cases studies on Morocco, Turkey and Egypt (Fargues, 2007)
- Migration from Morocco and Turkey over the period 1960-2000 has essentially been to the low-fertility countries of Western Europe
- Migration from Egypt has essentially been to the high-fertility countries of the Persian Gulf
- Fertility in these countries converged to those in host countries over that period, declining in Morocco and Turkey while increasing in Egypt.
- Relationship across regions of Turkey and Egypt and finds it to be negative for Turkey and positive for Egypt, thus confirming the relationship obtained over time.

Introduction

- Fargues' hypothesis: fertility convergence between home and host countries associated with international migration is due to the transfer of host-country norms
- However, no rigorous testing
- The impact of international migration on source country fertility may have a number of causes
- Assessing the effect of diffusions of norms requires controlling for the other mechanisms at work
- This paper provides an econometric analysis based on a new database of international bilateral migration for the year 2000

Theory

Cross-sectionally, migration can affect fertility decisions through multiple channels:

- Affecting the expected return to higher education, migration prospects impact on adults' human capital investments, which in turn, determine the opportunity cost of raising children
- Since a more educated child has a higher probability to emigrate to a rich country, expectations about offspring future migration potentially impact on the 'quantity-quality' tradeoff.
- Through remittances, past migrations impact on adults' income and affects the demand for children.
- Migrants can transfer 'fertility norms' to those left behind.

We build a general model including all these mechanisms and then solve different variants to derive testable predictions.

Theory

OLG economy with two-period lived agents

- Adults' utility:

$$U_t = \log(c_t) + \beta \log(\widetilde{w}_{t+1} h_{t+1} n_t)$$

- Adults can invest a fraction E_t of their time in higher education to increase their human capital:

$$H_t = \Theta(E_t, h_t), \qquad \Theta_E^{'}, \Theta_h^{'} \geq 0$$

- Adults can also invest e_t dollars in the human capital of their offspring

$$h_{t+1} = \theta(e_t), \qquad \theta_e^{'} \geq 0,\ \theta_e^{'} \leq 0$$

- Budget constraint:

$$c_t = (1 - E_t - \phi n_t) w_t H_t - n_t e_t + r_t$$

Theory

- Adults' education arises before employment $\Rightarrow$ uncertainty about own future place of work
- Stay in the South (with probability $1 - p_t$): $w_t = w_t^h = 1$
- Move to the North (with probability p_t): $w_t = w_t^f = 1 + \omega$

- Similar uncertainty about the place of work of their children

$$\widetilde{w}_{t+1} = p_{t+1} w^f + (1 - p_{t+1}) w^h = 1 + p_{t+1}\omega$$

- Migration probability depends on country characteristics and individual characteristics:

$$p_t = p_0.\pi(H_t), \qquad \pi^{'} \geq 0,\ \pi^{''} \leq 0$$

Theory

- Let us now solve particular variants of this general model
- Each variant is based on particular analytical specifications for our technological functions $\Theta(.)$, $\theta(.)$ and $\pi(.)$

Fertility, migration and adults' higher education

Relationship between migration prospects and human capital formation, as stated in the new brain drain/gain literature
Timing:

- First, parents decide whether or not to invest
- Second, they emigrate or stay in their home country
- Third, they work, have children and consume

We solve the model backward in two steps.

Fertility, migration and adults' higher education

The following specifications are used:

- Probability to emigrate has a logarithmic form: $\pi(.) = \log(H_t)$.
- Parents' productivity is endogenous has a Cobb Douglas form: $\Theta(.) = AE_t^{\sigma}\overline{h}^{1-\sigma}$.
- Children's human capital is fixed: $\theta(.) = \overline{h}$.
- remittances are nil: $r_t = 0$.

Fertility, migration and adults' higher education

- Additional hypothesis, we assume that the probability that a child will live abroad do not depend on parents' location (parents have no conrol $\widetilde{w}_{t+1}$). Assuming that children born in the North stay with a probability $p_{t+1} = 1$ would reinforce our mechanism.
- As $h_{t+1} = \overline{h}$ is exogenous, the second component of the utility function only depends on n_t.
- Parents thus take two decisions, E_t and n_t (choice of E_t made under uncertainty)
- Step 3. How many children will they have after migration?

Fertility, migration and adults' higher education

- In case of migration, the 'conditional' utility function is given by:

$$U_t^f = \log\left[(1 - E_t - \phi n_t) A E_t^{\sigma} \bar{h}^{1-\sigma} w^f\right] + \beta \log\left[n_t\right] + C$$

- The optimal fertility rate amounts to

$$n_t^* = \frac{\beta(1 - E_t)}{(1+\beta)\phi}$$

- Quasi-indirect utility function depending on parents' education choice:

$$V_t^f(E_t) = (1+\beta)\log(1 - E_t) + \sigma \log(E_t) + \log(w^f) + \Gamma$$

Fertility, migration and adults' higher education

- In case of staying, their conditional utility function is given by

$$U_t^h = \log\left[(1 - E_t - \phi n_t) A E_t^{\sigma} \overline{h}^{1-\sigma}\right] + \beta \log\left[n_t\right] + C$$

- The optimal fertility rate is identical to the one of migrants
- Quasi-indirect utility function becomes

$$V_t^h(E_t) = (1+\beta)\log(1 - E_t) + \sigma \log(E_t) + \Gamma$$

Fertility, migration and adults' higher education

- Steps 1/2: max expected utility function, $(1-p_t)V_t^h + p_t V_t^f$,

$$Max \ (1+\beta)\log(1-E_t) + \sigma\left[1 + p_0 \log(A\overline{h}^{1-\sigma} w^f)\right]\log(E_t)$$

- This gives

$$E_t^* = \frac{\sigma\left[1 + p_0 \log(w^f)\right]}{1+\beta+\sigma\left[1 + p_0 \log(A\overline{h}^{1-\sigma} w^f)\right]}$$

- It follows

$$\partial E_t^* / \partial p_0 \succ 0 \quad and \quad \partial n_t^* / \partial p_0 \prec 0$$

- Need to control for parents' human capital in empirical regressions

1. Introduction
2. Theoretical predictions
    - Fertility, migration and adults' higher education
    - **Fertility, migration and children's basic education**
    - Fertility and remittances
    - Fertility and transfers of norms
    - Summing up: testable predictions
3. Data
4. Empirical results

Fertility, migration and children's basic education

Focus on the link between children's human capital, their expected income and their probability to emigrate.

The following specifications are used:

- Probability to emigrate has a linear form: $\pi(.) = H_t$.
- Parents' productivity is predetermined: $\Theta(.) = h_t$.
- Children's human capital is endogenous: $\theta(.) = e_t^\gamma$ with $\gamma \prec 1$.
- Remittances are nil: $r_t = 0$.

- Optimization problem for remaining adults:

$$Max \;\; \log\left[(1-\phi n_t)H_t - n_t e_t\right] + \beta \log\left[n_t e_t^{\gamma}\left(1+\omega p_0 e_t^{\gamma}\right)\right]$$

- First order conditions

$$\begin{aligned}
\frac{\phi H_t + e_t}{(1-\phi n_t)H_t - n_t e_t} &= \frac{\beta}{n_t} \\
\frac{n_t}{(1-\phi n_t)H_t - n_t e_t} &= \frac{\beta\gamma}{e_t} + \frac{\beta\omega p_0 \gamma e_t^{\gamma-1}}{1+\omega p_0 e_t^{\gamma}}
\end{aligned}$$

- Total cost of children is proportional to the parent's maximal wage at the equilibrium

$$n_t(\phi H_t + e_t) = \frac{\beta}{1+\beta} H_t,$$

Fertility, migration and children's basic education

- This implies

$$n_t^* = \frac{\beta H_t}{(1+\beta)(\phi H_t + e_t)}$$

$$0 = (1-2\gamma)\omega p_0 e_t^{\gamma+1} + (1-\gamma)e_t - 2\gamma\phi H_t \omega p_0 e_t^{\gamma} - \gamma\phi H_t$$

- Assuming $\gamma = \frac{1}{2}$, we have

$$e_t^* = \left[\phi H_t \omega p_0 + \sqrt{(\phi H_t \omega p_0)^2 + \phi H_t}\right]^2$$

- If $p_0 = 0$, $e_t^* = \phi H_t$ and $n_t^* = \frac{\beta}{(1+\beta)2\phi}$
- If $p_0 \succ 0$, e_t^* increases and n_t^* decreases in p_0 (contrats with Chen, 2006), n_t^* decreases with parental income
- Need to control for the degree of openess of the sending country and for the positive selection among emigrants (proxies for p_0)

1. Introduction
2. Theoretical predictions
   - Fertility, migration and adults' higher education
   - Fertility, migration and children's basic education
   - **Fertility and remittances**
   - Fertility and transfers of norms
   - Summing up: testable predictions
3. Data
4. Empirical results

Fertility and remittances

The following specifications are used:

- Probability to emigrate is exogenous: $\pi(.) = 1$.
- Parents' productivity is predetermined: $\Theta(.) = h_t$.
- Children's human capital is endogenous: $\theta(.) = e_t^{\gamma}$.
- Remittances are positive and exogenous: $r_t \succ 0$.

Fertility and remittances

- Optimization problem of remaining adults:

$$Max \;\; \log([(1-\phi n_t)H_t - n_t e_t + r_t] + \beta \log \left[n_t e_t^{\gamma}\left(1+\omega p_0\right)\right]$$

- First order conditions:

$$\begin{aligned} \frac{\phi H_t + e_t}{(1-\phi n_t)H_t - n_t e_t + r_t} &= \frac{\beta}{n_t} \\ \frac{n_t}{(1-\phi n_t)H_t - n_t e_t + r_t} &= \frac{\beta\gamma}{e_t} \end{aligned}$$

- Optimal cost of children is proportional to the parent's maximal income:

$$n_t(\phi H_t + e_t) = \frac{\beta}{1+\beta}(H_t + r_t)$$

Fertility and remittances

- Combining the first order conditions yields

$$
\begin{aligned}
e_t^* &= \frac{\gamma\phi H_t}{1-\gamma} \\
n_t^* &= \frac{\beta(1-\gamma)}{1+\beta}\frac{1+\frac{r_t}{H_t}}{\phi}
\end{aligned}
$$

- With our specifications, the optimal fertility rates increases with the amount of remittances

Fertility and remittances

- Latter result is closely linked to the choice of the utility function and the timing of remittances
- Assume that the second component of the utility function reflects concerns about old-age security (3-period model).
- Suppose that working-aged children transfer a fraction τ of their income to their parents and parents also receive other transfers when old, the utility function would become:

$$U_t = \log(c_t) + \beta \log(\tau \widetilde{w}_{t+1} h_{t+1} n_t + r^o_{t+1})$$

Fertility and remittances

- Adults' optimization problem:

$$\{n_t, e_t\} = \arg\max \langle \log\left(\left[(1-\phi n_t)H_t - n_t e_t\right]\right. \\ \left. +\beta \log\left[\tau n_t e_t^{\gamma}(1+\omega p_0) + r_{t+1}^{o}\right]\right\rangle$$

- First order conditions:

$$\frac{\phi H_t + e_t}{(1-\phi n_t)H_t - n_t e_t} = \frac{\tau\beta e_t^{\gamma}(1+\omega p_0)}{r_{t+1}^{o} + \tau n_t e_t^{\gamma}(1+\omega p_0)}$$

$$\frac{n_t}{(1-\phi n_t)H_t - n_t e_t} = \frac{\beta\gamma n_t \tau e_t^{\gamma-1}(1+\omega p_0)}{r_{t+1}^{o} + \tau n_t e_t^{\gamma}(1+\omega p_0)}$$

Fertility and remittances

- Combining the first order conditions yields the following explicit solution

$$
\begin{aligned}
e_t^* &= \frac{\gamma\phi H_t}{1-\gamma} \\
n_t^* &= \frac{\beta(1-\gamma)}{1+\beta} - \frac{r_{t+1}^o}{(1+\beta)\tau e_t^\gamma (1+\omega p_0)}
\end{aligned}
$$

- Under the old-age security hypothesis, n_t^* decreases with r_{t+1}^o
- Need to control for extra-family remittances (ambiguous effect)

Fertility and transfers of norms

Introduction of a reference level $\widetilde{n}_t$ of fertility (or norm) in the utility function: adults derive utility from $n_t - \widetilde{n}_t$

The following specifications are used:

- Probability to emigrate is exogenous: $\pi(.) = 1$.
- Parents' productivity is predetermined: $\Theta(.) = h_t$.
- Children's human capital is endogenous: $\theta(.) = e_t^{\gamma}$.
- Remittances are nil: $r_t = 0$.

Fertility and transfers of norms

- Optimization problem of remaining adults

$$Max \;\; \log([(1-\phi n_t)H_t - n_t e_t] + \beta \log\left[(n_t - \widetilde{n}_t)\, e_t^{\gamma}\,(1+\omega p_0)\right]$$

- First order conditions

$$\begin{aligned}
\frac{\phi H_t + e_t}{(1-\phi n_t)H_t - n_t e_t} &= \frac{\beta}{n_t - \widetilde{n}_t} \\
\frac{n_t}{(1-\phi n_t)H_t - n_t e_t} &= \frac{\beta\gamma}{e_t}
\end{aligned}$$

Fertility and transfers of norms

- This yields

$$\begin{aligned} e_t &= \frac{\gamma\phi H_t(n_t - \widetilde{n}_t)}{n_t(1-\gamma) + \widetilde{n}\gamma} \\ 0 &= \phi(1+\beta)n_t^2 - \left[\phi\widetilde{n}_t + \beta(1-\gamma)\right] n_t - \beta\gamma\widetilde{n}_t \end{aligned}$$

- Single positive root of the second equation:

$$n_t^* = \frac{\phi\widetilde{n}_t + \beta(1-\gamma) + \sqrt{\left[\phi\widetilde{n}_t + \beta(1-\gamma)\right]^2 + 4\beta\gamma\phi\widetilde{n}_t(1+\beta)}}{2\phi(1+\beta)}$$

- If $\widetilde{n} = 0$, we have $n_t^* = \frac{\beta(1-\gamma)}{\phi(1+\beta)}$
- If $\widetilde{n} \succ 0$, n_t^* increases with $\widetilde{n}$
- If a transfer of norms inceases/reduces $\widetilde{n}$, it impacts positively/negatively on n_t^*

Fertility and transfers of norms

- Aspiration technology:

$$\begin{aligned}\widetilde{n}_t &= \sum_d \left(p_{d,t-1}\right)^{\lambda} n_{d,t-1} \\ &= p_0^{\lambda} \sum_d \left(\varphi_{d,t-1}\right)^{\lambda} n_{d,t-1}\end{aligned}$$

- If $\lambda = 1$, $\widetilde{n}_t$ is the weighted average fertility rate at the previous period
- If $\lambda \succ 1$, more weight is given to the main destination
- If $\lambda \prec 1$, $\widetilde{n}_t$ becomes independent on the location choice of migrants

Summing up - testable predictions

Dependent variable $= \log(n_t)$ and explanatory variables are

- Proportion of adults aged 25+ with secondary or post-secondary education (denoted by H_t)
- Global emigration rate (p_0) or alternatively, the emigration rate to rich countries (p_0^r) and, as a proxy for selection, the skilled/unskilled ratio of emigration rates to rich countries (S_t)
- Inflows of remittances R_t
- Average fertility at destination $\log(\widetilde{n}_t) = \lambda \log(p_0) + \log\left(\overline{n}_t^d\right)$ where $\overline{n}_t^d = \sum_d \left(\varphi_{d,t-1}\right)^{\lambda} n_{d,t-1}$
- Set of explanatory variables X which are not linked to international migration

Summing up - testable predictions

- Empirical model:

$$\begin{aligned}\log\left(n_t\right) &= a_0 + a_1.H_t + a_2.\ln\left(p_0\right) + a_3.\ln\left(S_t\right) + a_4.\ln\left(R_t\right)\\ &\quad + a_5.\lambda.\ln\left(p_0\right) + a_5.\ln\left(\overline{n}_t^d\right) + \sum_k b_k.X_{k,t} + \varepsilon_t\end{aligned}$$

- Main coefficient of interest is a_5. This coefficient depends on λ. In practice, impossibility to estimate λ. We arbitrarily consider three different values ($\lambda = 1$, $\lambda = 2$ or $\lambda = 0.75$).
- Coefficient a_2 cannot be directly estimated. We provide an estimate for $(a_2 + a_5.\lambda)$

1. Introduction
2. Theoretical predictions
   - Fertility, migration and adults' higher education
   - Fertility, migration and children's basic education
   - Fertility and remittances
   - Fertility and transfers of norms
   - Summing up: testable predictions
3. **Data**
4. Empirical results

Data

- Cross-country regressions on the developing countries in 2000
- Data on fertility rates (n_t) are taken from the World Development Indicators
- Data on human capital (H_t), emigration rates to rich countries (p_0^r) and skilled/unskilled ratio of emigration rates to rich countries (S_t) are computed by Docquier, Lowell and Marfouk (2007)
- Data on remittances are taken from the IMF database
- Data on global emigration rates (p_0) and geographic shares of the emigrant population by destination $(\varphi_{d,t})$ are computed by Parsons, Skeldon, Walmsley and Winters (2007) only for the year 2000

Results

Cross-counry regressions

$$\begin{aligned} \log\left(n_t\right) &= a_0 + a_1.H_t + a_2.\ln\left(p_0\right) + a_3.\ln\left(S_t\right) + a_4.\ln\left(R_t\right) \\ &+ a_5.\lambda.\ln\left(p_0\right) + a_5.\ln\left(\overline{n}_t^d\right) + \sum_k b_k.X_{k,t} + \varepsilon_t \end{aligned}$$

with three different values for λ ($\lambda = 1$, $\lambda = 0.75$ or $\lambda = 2$).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate
Constant	3.889	3.697	4.073	3.906	4.103	3.902	4.169	3.998
	(7.40)***	(6.97)***	(8.40)***	(7.93)***	(8.09)***	(7.59)***	(9.05)***	(8.51)***
Fert at dest, γ=1	0.794	0.685	0.977	0.912	0.760	0.653	0.972	0.909
	(2.14)**	(1.87)*	(3.44)***	(3.22)***	(2.08)**	(1.82)*	(3.51)***	(3.28)***
Emig rate to high inc countries	-1.437	-1.419	-1.120	-1.069				
	(3.24)***	(3.27)***	(2.38)**	(2.28)**				
Emig rate, all countries					-1.655	-1.620	-1.294	-1.233
					(3.69)***	(3.75)***	(2.82)***	(2.74)***
Select ratio, tertiary	0.002		0.001		0.001		0.000	
	(0.34)		(0.17)		(0.22)		(0.05)	
Selection ratio, sec and tert		0.058		0.038		0.056		0.036
		(1.70)*		(1.61)		(1.66)*		(1.55)
Log(remit)	0.006	0.029			0.013	0.035		
	(0.14)	(0.61)			(0.28)	(0.74)		
urb	-0.012	-0.011	-0.009	-0.009	-0.012	-0.011	-0.010	-0.009
	(2.47)**	(2.29)**	(1.77)*	(1.67)*	(2.67)***	(2.47)**	(1.91)*	(1.80)*
lngdpcons	-0.141	-0.133	-0.188	-0.185	-0.156	-0.149	-0.196	-0.193
	(1.98)*	(1.94)*	(2.19)**	(2.17)**	(2.43)**	(2.40)**	(2.50)**	(2.47)**
hctst	-1.200	-0.859	-1.239	-1.039	-1.061	-0.726	-1.139	-0.948
	(2.81)***	(1.97)*	(3.09)***	(2.59)**	(2.49)**	(1.69)*	(2.85)***	(2.39)**
reg_eap	0.561	0.546	0.590	0.568	0.523	0.509	0.574	0.552
	(2.35)**	(2.36)**	(2.24)**	(2.15)**	(2.20)**	(2.20)**	(2.15)**	(2.06)**
reg_ssa	1.537	1.550	1.415	1.393	1.573	1.579	1.431	1.404
	(3.96)***	(4.13)***	(4.55)***	(4.56)***	(4.15)***	(4.31)***	(4.73)***	(4.72)***
reg_lac	0.735	0.768	0.584	0.591	0.752	0.784	0.600	0.606
	(4.34)***	(4.63)***	(3.46)***	(3.53)***	(4.59)***	(4.89)***	(3.71)***	(3.78)***
islam	0.538	0.576	0.533	0.541	0.556	0.592	0.554	0.560
	(3.11)***	(3.32)***	(3.10)***	(3.16)***	(3.27)***	(3.46)***	(3.25)***	(3.30)***
Observations	145	145	176	176	145	145	176	176
R-squared	0.81	0.82	0.77	0.77	0.81	0.82	0.77	0.77

Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate
Constant	4.343	4.072	4.757	4.537	4.556	4.275	4.875	4.649
	(8.45)***	(7.83)***	(8.89)***	(8.27)***	(9.52)***	(8.75)***	(9.81)***	(9.04)***
Fert at dest, γ=2	0.403	0.369	0.651	0.627	0.427	0.395	0.686	0.661
	(1.61)	(1.52)	(2.79)***	(2.70)***	(1.77)*	(1.68)*	(3.04)***	(2.95)***
Emig rate to high inc countries	-1.611	-1.551	-1.336	-1.253				
	(2.91)***	(3.01)***	(2.25)**	(2.17)**				
Emig rate, all countries					-1.830	-1.759	-1.535	-1.452
					(3.65)***	(3.76)***	(2.85)***	(2.79)***
Select ratio, tertiary	0.003		0.003		0.002		0.002	
	(0.58)		(0.64)		(0.46)		(0.53)	
Selection ratio, sec and tert		0.067		0.048		0.064		0.045
		(1.91)*		(1.93)*		(1.85)*		(1.85)*
Log(remit)	-0.002	0.023			0.005	0.029		
	(0.04)	(0.47)			(0.10)	(0.59)		
urb	-0.013	-0.011	-0.010	-0.009	-0.013	-0.012	-0.010	-0.010
	(2.59)**	(2.38)**	(1.85)*	(1.75)*	(2.79)***	(2.56)**	(2.00)**	(1.90)*
Gdp pc	-0.085	-0.084	-0.120	-0.121	-0.102	-0.101	-0.129	-0.130
	(1.15)	(1.18)	(1.42)	(1.45)	(1.54)	(1.56)	(1.66)*	(1.67)*
HK level	-1.504	-1.087	-1.598	-1.348	-1.340	-0.936	-1.477	-1.240
	(3.40)***	(2.36)**	(3.84)***	(3.17)***	(3.07)***	(2.09)**	(3.58)***	(2.96)***
reg_eap	0.544	0.528	0.550	0.528	0.498	0.483	0.526	0.505
	(2.25)**	(2.24)**	(2.14)**	(2.04)**	(2.07)**	(2.07)**	(2.02)**	(1.93)*
reg_ssa	1.858	1.826	1.756	1.716	1.874	1.837	1.766	1.723
	(6.52)***	(6.70)***	(6.91)***	(6.93)***	(6.75)***	(6.92)***	(7.12)***	(7.14)***
reg_lac	0.669	0.704	0.406	0.418	0.674	0.707	0.413	0.424
	(3.36)***	(3.60)***	(2.03)**	(2.09)**	(3.58)***	(3.83)***	(2.17)**	(2.25)**
islam	0.611	0.636	0.583	0.585	0.619	0.643	0.601	0.601
	(3.26)***	(3.38)***	(3.32)***	(3.35)***	(3.39)***	(3.49)***	(3.48)***	(3.50)***
Observations	145	145	176	176	145	145	176	176
R-squared	0.80	0.81	0.76	0.77	0.81	0.82	0.77	0.77

Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate	fertrate
Constant	3.723	3.577	3.812	3.679	4.016	3.858	3.965	3.825
	(5.21)***	(4.98)***	(6.42)***	(6.17)***	(5.69)***	(5.43)***	(6.85)***	(6.58)***
Fert at dest, γ=0.75	0.402	0.319	0.490	0.434	0.358	0.277	0.476	0.421
	(1.25)	(1.00)	(2.02)**	(1.80)*	(1.13)	(0.88)	(1.98)**	(1.76)*
Emig rate to high inc countries	-1.637	-1.601	-1.376	-1.313				
	(3.45)***	(3.45)***	(2.76)***	(2.64)***				
Emig rate, all countries					-1.803	-1.756	-1.444	-1.376
					(3.81)***	(3.83)***	(2.99)***	(2.91)***
Select ratio, tertiary	0.002		0.001		0.001		0.001	
	(0.40)		(0.29)		(0.28)		(0.18)	
Selection ratio, sec and tert		0.063		0.043		0.061		0.042
		(1.88)*		(1.86)*		(1.84)*		(1.83)*
Log(remit)	0.013	0.035			0.018	0.041		
	(0.27)	(0.74)			(0.40)	(0.86)		
urb	-0.013	-0.012	-0.011	-0.010	-0.013	-0.012	-0.011	-0.010
	(2.75)***	(2.52)**	(2.08)**	(1.95)*	(2.91)***	(2.66)***	(2.16)**	(2.02)**
Gdp pc	-0.133	-0.124	-0.172	-0.168	-0.152	-0.143	-0.186	-0.182
	(1.77)*	(1.72)*	(1.96)*	(1.93)*	(2.21)**	(2.16)**	(2.30)**	(2.25)**
HK level	-1.272	-0.904	-1.365	-1.143	-1.136	-0.773	-1.267	-1.050
	(2.85)***	(1.98)**	(3.27)***	(2.72)***	(2.58)**	(1.74)*	(3.05)***	(2.53)**
reg_eap	0.603	0.580	0.653	0.624	0.558	0.536	0.630	0.601
	(2.55)**	(2.53)**	(2.41)**	(2.30)**	(2.37)**	(2.35)**	(2.30)**	(2.19)**
reg_ssa	1.688	1.695	1.588	1.565	1.730	1.731	1.605	1.578
	(4.19)***	(4.33)***	(4.89)***	(4.91)***	(4.39)***	(4.52)***	(5.04)***	(5.05)***
reg_lac	0.854	0.871	0.715	0.711	0.857	0.874	0.714	0.711
	(5.33)***	(5.59)***	(4.29)***	(4.33)***	(5.49)***	(5.78)***	(4.41)***	(4.46)***
islam	0.608	0.642	0.628	0.633	0.627	0.661	0.651	0.654
	(3.44)***	(3.65)***	(3.73)***	(3.80)***	(3.61)***	(3.81)***	(3.88)***	(3.93)***
Observations	145	145	176	176	145	145	176	176
R-squared	0.80	0.81	0.76	0.76	0.81	0.82	0.76	0.76

Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Results

- Risk of collinearity between human capital level of the sending countries and the selection ratio (see Table 4)
- Risk of endogeneity of p_0 (to be done)

	(1)	(2)	(3)	(4)	(5)	(6)
	γ=1		γ=2		γ=0.75	
Constant	3.611	3.748	4.011	4.362	3.387	3.278
	(6.89)***	(7.83)***	(7.57)***	(7.79)***	(4.83)***	(5.61)***
Fert at dest	0.796	1.161	0.344	0.631	0.424	0.647
	(2.17)**	(4.02)***	(1.41)	(2.68)***	(1.35)	(2.60)**
Emig rate to high inc countries	-1.382	-0.937	-1.614	-1.290	-1.573	-1.202
	(3.21)***	(2.02)**	(3.14)***	(2.28)**	(3.44)***	(2.47)**
Selection ratio, sec and tert	0.067	0.045	0.083	0.066	0.073	0.053
	(1.95)*	(1.88)*	(2.36)**	(2.57)**	(2.16)**	(2.24)**
Log(remit)	0.039		0.042		0.048	
	(0.83)		(0.86)		(1.03)	
urb	-0.013	-0.010	-0.014	-0.012	-0.014	-0.012
	(2.70)***	(1.89)*	(2.88)***	(2.18)**	(2.92)***	(2.23)**
Gdp pc	-0.181	-0.257	-0.133	-0.181	-0.175	-0.243
	(2.59)**	(3.06)***	(1.80)*	(2.10)**	(2.41)**	(2.82)***
reg_eap	0.614	0.628	0.608	0.625	0.654	0.706
	(2.69)***	(2.42)**	(2.65)***	(2.41)**	(2.90)***	(2.61)***
reg_ssa	1.551	1.318	1.926	1.837	1.693	1.503
	(4.19)***	(4.38)***	(7.40)***	(7.78)***	(4.35)***	(4.63)***
reg_lac	0.713	0.531	0.724	0.480	0.847	0.725
	(3.88)***	(3.09)***	(3.51)***	(2.44)**	(5.02)***	(4.36)***
islam	0.708	0.653	0.805	0.768	0.774	0.757
	(4.05)***	(3.53)***	(4.17)***	(3.95)***	(4.35)***	(4.18)***
catholic	0.004	0.004	0.004	0.003	0.004	0.004
	(1.80)*	(1.99)**	(1.67)*	(1.70)*	(1.73)*	(1.79)*
Observations	145	175	145	175	145	175
R-squared	0.82	0.77	0.81	0.76	0.81	0.76

Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%