

# International Migration, Transfers of Norms and Home Country Fertility

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- We look at one possible externality of international migration.
- Migration externality on home country fertility through transfer of fertility norms from host country.
- Develop a theoretical model capturing the various channels of the impact of migration on home country fertility.
- Empirically test for a transfer of norm effect using worlwide migration data

# Migration externalities

- Cross country flows of workers have well-known direct impacts on home country macroeconomic performances such as human capital level, growth, consumption, investment, ... .
- Diasporas or migrants' networks exert also indirect impacts on home country performances.
- Examples : Institutions (Docquier et al., 2008); Democracy (Spilimbergo, 2008)
- We look at a new type of externality : impact on home country fertility through transfers by migrants of host country fertility norms

## Existing Literature: the adaptation hypothesis

- A first condition : migrants should adopt the fertility norms of host countries.
- Strong evidence in favour of convergence of migrants' fertility rates to those of natives.
- for internal (rural-urban) migration (Brockeroff, 1995 among others).
- for international migration (Stephen and Bean, 1992, Rosenzweig and Schultz, 1985).
- More evidence in favour of adaptation rather than selection.
- Results also consistent with a transfer of norm from the host country through return migration (Lindstrom and Giorguli Saucedo, 2002) or through information transmitted by migrants (e.g. better contraceptive knowledge, Lindstrom and Giorguli Saucedo, 2005).

## Existing Literature: channels of transmission

- A second condition : migrants should serve as a channel of transmission of norms.
- What channels ?
- Direct communication with relatives and friends.
- Presence of a diaspora in country  $j$  triggers interest in country  $i$  by those left behind.
- Media attention to the (higher) migrants' performances.
- Impact of migrants' networks on trade (Rauch and Trindade, 2001), Combes et al. (2005) and on FDI (Kugler and Rapoport, 2006).

- Preliminary research in favour of fertility norm diffusion provided by Fargues (2007) through case studies on Morocco, Turkey and Egypt.
- Migration from Morocco and Turkey over the period 1960-2000 essentially to low-fertility countries of Western Europe → decrease of fertility rates and convergence to those of host countries.
- Migration from Egypt over the period 1960-2000 essentially to high-fertility countries of the Persian Gulf → increase or stability of fertility rates.

# Contribution of this paper

- So far, no systemic analysis of international migration as a channel for diffusion of fertility norms at a macroeconomic level
- No theoretical analysis accounting for the other effects of international migration on fertility →we develop an OLG model controlling for the possible theoretical effects of migration on home country fertility and derive testable implications.
- Using a new database of worldwide migration (Parsons et al., 2007), we test for a transfer of norm effect along with the other impacts of migration.
- Our work yields important implications in terms of long-run reduced population pressure in the South.

- OLG model with two-period lived agents (adults and children)
- $U_t = \log(c_t) + \beta \log(\tilde{w}_{t+1} h_{t+1} n_t)$   
Utility function includes (contemporaneous) parents' consumption and (future) children consumption that depends on their number  $n_t$ , future education level  $h_{t+1}$  and future wages  $\tilde{w}_{t+1}$ .
- Adults can invest a fraction of their time in higher education ( $E_t$ ), can invest  $e_t$  dollars in the HK level of their offsprings and can also receive family and extra family remittances ( $r_t$ )
- In this setting, 4 different channels through which higher migration rates with  $p_t = p_0 \pi(H_t)$  will affect optimal home country fertility ( $n_t^*$ ).
- Derive results with various variants of the models.

# Fertility, migration and Adult's higher education

- Consistent with the new brain gain literature ( Beine, Docquier, Rapoport, 2008)
- Children's HK is assumed to be fixed and remittances are nil.
- Higher prospects of migration  $p_t$  raises expected return to education  
→ raises adult's HK investment  
→ raises opportunity cost of raising children and decreases optimal fertility ( $n_t^*$ )
- We include incentive effect of migration and human capital level in empirical regressions.

- Adults' HK is assumed to be fixed and remittances are nil.
- Higher education of the children increases probability of migration.
- Higher prospects of migration  $\rightarrow$  raises expected return to education  $\rightarrow$  incentives to invest in children's education
- This leads to a quantity-quality trade-off for children  $\rightarrow$  decrease in fertility
- Need to control in regressions for openness of the sending country and degree of positive selection among emigrants (proxies for  $p_t$ ).

- Children's HK endogeneous and remittances positive and exogeneous ( $r_t > 0$ ).
- 2 different impacts:
- optimal fertility rates increase with  $r_t$  (income effect);
- optimal fertility rates decrease with remittances associated with old-age security concerns (3-period model). Extra-family remittances as a substitute to transfers of children devoted to old-age consumption.
- Need to control for (family and extra family) remittances in the econometric specification with ambiguous net theoretical effect.

# Fertility and transfers of norms

- Introduction of reference level  $\tilde{n}$  of fertility (or norm): adults derive utility from  $n - \tilde{n}$
- $\tilde{n}$  depends on the signal ( $\bar{n}^d$ ) and the diffusion technology which might depend on openness ( $p_0$ ):  $\tilde{n} = N(p_0, \bar{n}^d)$
- $\bar{n}^d$  depends on  $\theta_d$ , the proportion of the emigrant population living in country  $d$ :  $\bar{n}^d = \sum_d \theta_d n_d$  (weighted fertility rates at destination).
- We allow for the following diffusion technology :  
 $\ln(\tilde{n}) = \phi(p_0) \cdot \ln(\bar{n}^d) = c \cdot \log(\bar{n}^d) + b \cdot p_0 \log(\bar{n}^d)$
- Note that if  $\phi'$  (i.e.  $b$ ) is low or nil, it means that the diffusion of norms is relatively independent on the intensity of migration : norms can be seen as public goods. Since no prior information, test for that (follow Spilimbergo, 2008).
- This suggests to include  $\log(\bar{n}^d)$  and  $p_0 \log(\bar{n}^d)$ .

## Summing up : testable predictions

- Dependent variable =  $\log(n_t)$  with following explanatory variables (expected theoretical impact under parentheses):
- $H_t$  human capital level of country captured by proportion of adults aged 25+ with secondary education (-);
- Global emigration rates ( $p_0$ ) (-);
- Proxy for selection in migration rates ( $S_t$ ) (-);
- Remittances  $R_t$  (?);
- Fertility at destination weighted by share of migrants  $\log(\bar{n}^d)$  and  $p_0 \log(\bar{n}^d)$  (+);
- Set of explanatory variables unrelated to migration : religion, geographic location, urbanization, gdp per head, ... .

# Summing up : testable predictions

- Empirical regression model :

$$\log(n) = a_0 + a_1 \cdot \ln(\bar{n}^d) + a_2 \cdot p_0 \ln(\bar{n}^d) + a_3 \cdot \ln(p_0) \\ + a_4 \cdot \ln(S) + a_5 \cdot \ln(R) + a_6 \cdot H + \sum_k b_k \cdot X_k + \varepsilon$$

- Cross sectional data because bilateral migration data  $\theta_d$  and emigration rates  $p_0$  available only for one year (2000).

- Cross-country regressions involving all countries (developing and developed) in 2000.
- Global emigration rates ( $p_0$ ) and geographic shares of the emigrant population by destination  $\theta_d$  from new bilateral migration data (208\*208 countries) of Parsons, Skeldon, Walmsley and Winters (2007) only for the year 2000.
- Selection in migration rates proxied by the ratio of migrants to residents for skilled relative to unskilled labor ( $S$ ) and human capital level ( $H$ ) from Docquier et al. (2007).
- Data on remittances ( $R_t$ ) from IMF database  $\rightarrow$  implies a loss of data points (155 instead of 208 countries).

**Table 1. Descriptive statistics on fertility rates and norms**

	Nb. of obs.	Emig. rate (%)	Home-country Fertility			Fertility at destination				
			Mean	St. dev	Min	Max	Mean	St. dev	Min	Max
All countries	208	11.2	3.19	1.72	0.90	7.96	2.58	1.01	1.40	5.58
High-income	53	14.8	1.87	0.55	0.90	3.10	2.14	0.61	1.40	4.10
Developing	155	10.0	3.64	1.76	1.15	7.95	2.73	1.08	1.44	5.58
All countries (data on remit.)	155	10.3	3.10	1.66	0.98	7.96	2.55	1.04	1.44	5.58
Developing (data on remit.)	126	10.5	3.43	1.66	1.15	7.96	2.68	1.09	1.44	5.58
All countries (no data on remit.)	53	14.0	3.42	1.90	0.90	7.77	2.68	0.91	1.40	5.33
Islamic countries	56	7.6	4.24	1.73	1.84	7.96	3.17	1.19	1.46	5.58
Countries with Catholics	190	11.4	3.14	1.68	0.90	7.96	2.61	1.01	1.40	5.58
MENA countries	13	6.95	3.61	1.33	2.09	6.08	2.84	0.73	2.01	4.12
Latin Am. & Carib.	54	19.6	2.76	1.07	1.23	7.77	2.22	0.47	1.66	4.00
Sub Saharan Africa	68	12.1	4.58	1.77	1.23	7.96	3.41	1.16	1.47	5.58
East Asia & Pacific	48	15.1	2.87	1.40	0.90	7.77	2.27	0.54	1.40	4.00
South Asia	28	18.1	3.20	1.63	1.23	7.77	2.50	0.64	1.66	4.00

# Benchmark Results (OLS)

- Strong support in favour of transfer of norms effect.
- No evidence that effect is proportional to migration intensity (public good nature of norms)
- Robust findings across alternative samples (with and w/o remittances).
- Some evidence of incentive effect through investment in education (of adults and/or children).
- Limited evidence of a positive impact of remittances (income effect dominates old-age security impact).
- Controls are important (GDP, location, urbanization, religion).

**Table 2. OLS regressions - All countries**

	(1)	(2)	(3)	(4)
Constant	1.200 (5.51)***	1.037 (6.23)***	1.459 (5.11)***	1.432 (5.92)***
Log of fertility at dest	0.343 (3.35)***	0.383 (4.37)***	0.273 (2.40)**	0.291 (2.76)***
p <sub>0</sub> .Log of fertility at dest	-0.202 (0.77)		-0.405 (1.54)	
log of p <sub>0</sub>	-0.025 (0.78)	-0.040 (1.90)*	-0.018 (0.59)	-0.053 (2.44)**
Selection ratio (sec+tert)	0.001 (0.04)		0.001 (0.02)	
Remittances (in logs)			0.018 (1.16)	0.032 (2.18)**
Urbanization	-0.005 (2.62)***	-0.005 (2.88)***	-0.004 (2.54)**	-0.003 (2.24)**
GDP per capita	-0.076 (2.46)**	-0.079 (3.32)***	-0.100 (2.80)***	-0.117 (3.86)***
Adult's education	-0.256 (1.70)*		-0.190 (1.09)	
East Asia & Pacific	0.272 (2.85)***	0.277 (2.99)***	0.308 (3.29)***	0.272 (2.90)***
Sub-Saharan Africa	0.427 (4.67)***	0.420 (4.72)***	0.537 (4.75)***	0.521 (5.40)***
Latin Am. & Carib	0.350 (5.13)***	0.323 (5.31)***	0.451 (6.49)***	0.486 (8.03)***
Mena	0.115 (1.21)		0.159 (1.26)	
High-income	0.089 (0.96)		0.229 (2.22)**	0.239 (2.70)***
Islamic Countries	0.004 (4.40)***	0.004 (5.59)***	0.003 (2.96)***	0.003 (4.55)***
Catholic (perc of pop)	0.001 (1.81)*	0.002 (2.68)***	0.001 (1.43)	
Observations	175	175	145	145
R-squared	0.78	0.77	0.83	0.81

Robust t statistics in parentheses

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

- Global emigration rates ( $p_0$ ) are potentially endogenous wrt fertility because
- (i) Labour market pressures (more fertility  $\rightarrow$  excessive labour supply  $\rightarrow$  higher wage differential  $\rightarrow$  higher  $p_0$ ).
- (ii) More fertility  $\rightarrow$  lower income per capita  $\rightarrow$  excessive migration costs  $\rightarrow$  lower  $p_0$ .
- Instruments for  $\log(p_0)$  : island dummy, log of size (surface) and log of distance to main destination.
- Strong instruments (see F-stat 1st stage) and uncorrelated with  $\log(n)$  (see Hansen test).

**Table 3. IV regressions - All countries**

	(1)	(2)	(3)	(4)
Constant	1.253 (5.99)***	1.116 (5.90)***	1.482 (6.30)***	1.101 (5.86)***
Log of fertility at dest	0.385 (3.44)***	0.390 (4.18)***	0.236 (1.91)*	0.273 (2.57)**
p <sub>0</sub> .Log of fertility at dest	-0.223 (0.41)		-0.090 (0.23)	
log of p <sub>0</sub>	-0.020 (0.28)	-0.019 (0.52)	-0.060 (1.12)	-0.075 (2.45)**
Selection ratio (sec+tert)	-0.005 (0.18)		-0.017 (0.58)	
Remittances (in logs)			0.019 (1.29)	0.032 (2.17)**
Urbanization	-0.005 (2.79)***	-0.005 (2.69)***	-0.005 (2.97)***	-0.005 (2.88)***
GDP per capita	-0.075 (2.17)**	-0.072 (2.81)***	-0.107 (3.18)***	-0.063 (2.74)***
Adult's education	-0.282 (1.87)*		-0.204 (1.24)	
East Asia & Pacific	0.238 (2.51)**	0.245 (2.63)***	0.268 (2.70)***	0.220 (2.38)**
Sub-Saharan Africa	0.372 (4.35)***	0.434 (5.15)***	0.499 (4.69)***	0.495 (5.22)***
Latin Am. & Carib	0.321 (4.57)***	0.371 (6.27)***	0.435 (5.92)***	0.412 (7.18)***
Mena	0.076 (0.73)		0.238 (2.39)**	
High-income	0.169 (1.81)*	0.191 (2.26)**	0.205 (1.98)**	0.134 (1.62)
Islamic Countries	0.235 (4.17)***	0.220 (4.02)***	0.227 (3.88)***	0.210 (3.68)***
Catholic (perc of pop)	0.001 (1.17)		0.001 (1.21)	
Partial Corr First Stage	0.174	0.342	0.212	0.400
F-stat First Stage	12.39	20.27	11.26	36.36
Hansen J Test (p-value)	0.130	0.319	0.63	0.67
R-squared	0.774	0.757	0.824	0.803
Observations	174	175	144	144

Robust t statistics in parentheses

Instruments for ln(p<sub>0</sub>): island, ln(size), ln(distance to main destination)

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

## Results (IV)

- Results quite similar to OLS findings.
- Transfer of norms effect confirmed.
- Effect unproportional to migration intensity.
- Some findings in favour of incentive effect of migration and positive impact of remittances.

## Results : developing countries (OLS and IV)

- Strong support in favour of transfer of norms effect (unsignificant difference in impact between all and developing countries)
- No evidence that effect is proportional to migration intensity (public good nature of norms).
- Some evidence of incentive effect.
- Less evidence of an income impact of remittances (old-age security concerns offset more income effect due to less developed pension systems).

**Table 4. OLS regressions - Developing countries**

	(1)	(2)	(3)	(4)
Constant	1.270 (5.40)***	1.267 (6.20)***	1.587 (5.17)***	1.525 (6.29)***
Log of fertility at dest	0.337 (3.28)***	0.338 (3.65)***	0.267 (2.26)**	0.261 (2.34)**
p <sub>0</sub> .Log of fertility at dest	-0.181 (0.60)		-0.368 (1.21)	
log of p <sub>0</sub>	-0.019 (0.54)	-0.028 (1.17)	-0.009 (0.28)	-0.034 (1.49)
Selection ratio (sec+tert)	-0.001 (0.02)		-0.013 (0.41)	
Remittances (in logs)			0.008 (0.52)	0.016 (1.14)
Urbanization	-0.004 (1.97)*	-0.003 (1.84)*	-0.005 (2.87)***	-0.004 (2.38)**
GDP per capita	-0.088 (2.67)***	-0.094 (3.25)***	-0.112 (2.85)***	-0.116 (3.81)***
Adult's education	-0.375 (2.30)**	-0.422 (2.67)***	-0.350 (1.91)*	-0.383 (2.15)**
East Asia & Pacific	0.406 (3.50)***	0.387 (3.40)***	0.407 (3.98)***	0.363 (3.66)***
Sub-Saharan Africa	0.428 (4.55)***	0.387 (4.34)***	0.519 (4.52)***	0.439 (4.40)***
Latin Am. & Carib	0.335 (4.81)***	0.298 (4.38)***	0.414 (6.15)***	0.344 (5.23)***
Mena	0.115 (1.11)		0.192 (1.40)	
Islamic Countries	0.004 (4.51)***	0.005 (5.44)***	0.004 (3.11)***	0.004 (4.93)***
Catholic (perc of pop)	0.002 (2.62)***	0.002 (2.86)***	0.002 (3.03)***	0.003 (3.30)***
Observations	143	143	119	119
R-squared	0.77	0.76	0.84	0.83

Robust t statistics in parentheses

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

**Table 5. IV regressions - Developing countries**

	(1)	(2)	(3)	(4)
Constant	1.319 (5.35)***	1.388 (6.02)***	1.529 (5.62)***	1.422 (6.42)***
Log of fertility at dest	0.375 (3.45)***	0.360 (3.70)***	0.219 (1.91)*	0.229 (2.12)**
log of p <sub>0</sub>	0.048 (0.62)	0.005 (0.12)	-0.070 (1.24)	-0.069 (2.22)**
p <sub>0</sub> .Log of fertility at dest	-0.695 (1.14)		0.041 (0.10)	
Selection ratio (sec+tert)	0.016 (0.44)		-0.024 (0.71)	
Remittances (in logs)			0.015 (1.07)	0.024 (1.67)*
Urbanization	-0.004 (2.06)**	-0.003 (1.41)	-0.005 (2.95)***	-0.004 (2.62)***
GDP per capita	-0.070 (1.81)*	-0.099 (3.29)***	-0.118 (3.28)***	-0.107 (3.69)***
Adult's education	-0.413 (2.55)**	-0.482 (3.01)***	-0.318 (1.83)*	-0.321 (1.82)*
East Asia & Pacific	0.425 (3.93)***	0.396 (3.72)***	0.364 (3.33)***	0.334 (3.26)***
Sub-Saharan Africa	0.445 (4.43)***	0.378 (4.08)***	0.502 (4.99)***	0.451 (4.97)***
Latin Am. & Carib	0.353 (4.78)***	0.276 (3.96)***	0.390 (5.62)***	0.361 (5.62)***
Mena	0.098 (0.88)		0.179 (1.47)	
Islamic Countries	0.004 (4.31)***	0.004 (5.20)***	0.004 (3.51)***	0.004 (5.61)***
Catholic (perc of pop)	0.002 (2.22)**	0.002 (2.87)***	0.003 (3.38)***	0.003 (3.35)***
Partial Corr First Stage	0.150	0.336	0.183	0.367
F-stat First Stage	9.46	19.00	8.03	25.40
Hansen J Test (p-value)	0.298	0.420	0.803	0.623
R-squared	0.755	0.758	0.829	0.824
Observations	142	142	118	118

Robust t statistics in parentheses.

Instruments for ln(p<sub>0</sub>): island, ln(size), ln(distance to main destination)

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

- Previous research suggests transfer of fertility norms through migration for a couple of cases through simple stylized facts (Fargues, 2007)
- We provide econometric evidence of impact of transfer of fertility norms through migration on home country fertility rates, even after accounting for other causes of fertility variations (related or not to migration).
- Impact not proportional to migration intensity (public good nature).
- Suggest a new externality for migration with potential long-run implications for future demographic pressures in developing countries.