Can Health Foreign Assistance Break the Medical Brain Drain

Yasser MOULLAN

\textsuperscript{1} yassermoullan@wanadoo.fr

CES-CNRS

Univ. Paris I Pantheon-Sorbonne

Migration and Development Conference, World bank
Introduction
- Brain Drain
- Brain Gain
- Medical Brain Drain
- Aim of the paper

Review of Literature
- Determinants of Medical Brain Drain
- Consequence of medical brain drain
- Consequence of medical brain drain

Analytical Framework
- Direct Impact of Health Foreign Aid
- Indirect Impact of Health Foreign Aid

Empirical issues and data
- Data
- Methodology
- Empirical model
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Conclusion
In 1965, the world counts 75 millions of migrants (2% of world population), and in 2000 the number of migrants is around 175 millions which is correspond to 3% of world population (Simon, 2002).

In 2000, the number of migrant with tertiary education living in the OECD countries amounted to about 20.4 millions which represent 34.6% amount immigrants (Docquier & Marfouk, 2005).
In 1965, the world counts 75 millions of migrants (2% of world population), and in 2000 the number of migrants is around 175 millions which is correspond to 3% of world population (Simon, 2002).

In 2000, the number of migrant with tertiary education living in the OECD countries amounted to about 20.4 millions which represent 34.6% among immigrants (Docquier & Marfouk, 2005).

$\Rightarrow$ A migrant tax system have to be implement to compensate the lost for source countries.
New Contributions: Skilled migration has a **positive effect on sending country** (Mountford 1997, Beine et al 2001, Stark and Wang 2002).

- A positive effect on human capital accumulation (Mountford 1997, Beine et al 2001, Stark and Wang 2002). The perspective of migration increases the return on education, so more people invest in education and positive externalities even though part of them migrate.
- Positive feedbacks of return migration (Dos Santos and Postel-Vinay 2005, Dustmann and Kirchkamp 2002).
- Role of diaspora externalities (Kugler and Rapoport 2007).
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- 23% of physicians in Canada were trained abroad, 23.5% in USA (Astor et al, 2005).
- The number of new doctor arriving from overseas in UK was 2763 in 2000 (32% of the total number of new registrants). It was around 40% in 1990’s (Winter, 2002).
- Possibility of shortage of physicians in these developing countries
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- **Goal 4**: Reduce by two thirds, between 1990 and 2015, the under-five mortality rate.
- **Goal 5**: Improve maternal health by reducing by three quarters, between 1990 and 2015, the maternal mortality ratio.
- **Goal 6**: Combat the epidemics. Have halted by 2015 and begun to reverse the spread of HIV-AIDS and the incidence of other major diseases (Malaria and Tuberculosis)
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Aim of the paper

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- Few study investigates empirically the effect of foreign aid on migration (except Cogneau & Lambert 2006 and Berthélémy, Maurel & Beuran 2009).

- New database on bilateral medical brain drain (Bhargava and Docquier, 2007). It covers the bilateral physicians’ emigration of 192 developing countries (even in Sub-Saharan Africa) to 16 OECD countries over 14 years (1991-2004).

- Are international labor and foreign aid in health sector complements or substitutes? Substitutes means that aid is a great tool to reduce physicians emigration by improving medical working conditions whereas complements means that aid give incentives to South physicians to migrate.
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- 91% of physicians interviewed are attracted by higher income (Astor & al 2005, Awases & al 2006).

- Working conditions are important in migration decision (Vujicic & al 2004) and lack resources in health services (Awases & al 2006).


- More perspective for training and experience and health equipment (Awases & al 2006).
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Medical brain gain:

- As the "Brain gain" theory, the incentive to migrate should have an impact on the education process, or on the medical training. Winters & al (2007) do not find fact in that way because migrants is too strongly screened.

- Brain drain must be limited to benefits to sending countries (threshold of 15% of emigration) (Docquier 2007).

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Quality and delivery of health services:

- Awases & al (2004) show the problem of replacement and quality into the teaching in medical school.

- In Pakistan, Nigeria and Phillipines more than 50% of physicians interviewed are agree to said that large emigration has led to insufficient physicians in source countries (Astor & al (2005)).

- The lack of health care professionals causes a big damage on the child health (Chauvet et al, 2008).
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- **Education channel**: Training abroad and then stay in the destination countries after their diploma (Chauvet et al, 2008).
- **Pro-poor channel**: Improve poor’s chance or health to exceed the threshold of migration cost.
- **Environment channel**: A substantial improvement in working conditions by providing medical equipments.
- The helped health sector can attract physicians from private sector.
- Health can be viewed to a compensation of medical emigration from "south" to "north" countries (Lahiri and Raimondos-Moller 2000).
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Direct Impact of Health Foreign Aid

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Health foreign assistance can have an indirect effect via the combat against diseases to retains health emigration. We try to approximate epidemics prevalence rate (malaria, HIV-AIDS and tuberculosis) as the death rate crude per 1000 people. Death rate includes death due to these big pandemics but also other death due to less fatal diseases such as measles, diphteria, tetanus and pertussis.
Bilateral Physicians’ Emigration Dataset (Bhargava and Docquier, 2007) on 192 source countries to 16 OCDE countries during the period of 1991 to 2004.

Doctor Emigration = Physicians educated in their countries but working abroad.

Emigration rate

\[ \text{Emigration rate} = \frac{M_{ij,t}}{(P_i,t + \sum_{j=1}^{16} M_{ij,t})} \]

\( M_{ij,t} \) is defined as the stock of physicians from country \( i \) working abroad in country \( j \)

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Empirical issues and data

Data

### Table: Physicians Distribution across country group

<table>
<thead>
<tr>
<th>1995</th>
<th>Physicians Emigration Rate</th>
<th>Nb Physicians per 1000 people</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population Size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>small (pop &lt; 2.5m)</td>
<td>12%</td>
<td>0.88</td>
</tr>
<tr>
<td>lower middle (2.5m &lt; pop &lt; 10m)</td>
<td>8%</td>
<td>1.50</td>
</tr>
<tr>
<td>upper middle (10m &lt; pop &lt; 25m)</td>
<td>6%</td>
<td>1.52</td>
</tr>
<tr>
<td>large (pop &gt; 25m)</td>
<td>2%</td>
<td>1.35</td>
</tr>
<tr>
<td><strong>Income group (WB Classification)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td>6.2%</td>
<td>0.08</td>
</tr>
<tr>
<td>lower middle income</td>
<td>2.1%</td>
<td>0.78</td>
</tr>
<tr>
<td>upper middle income</td>
<td>3.1%</td>
<td>1.39</td>
</tr>
<tr>
<td>high income</td>
<td>3.8%</td>
<td>1.82</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Asia - Pacific</td>
<td>1.1%</td>
<td>0.65</td>
</tr>
<tr>
<td>Europe - Central Asia</td>
<td>0.7%</td>
<td>2.95</td>
</tr>
<tr>
<td>Latin America - Caribbean</td>
<td>2.4%</td>
<td>1.18</td>
</tr>
<tr>
<td>Middle East - North Africa</td>
<td>5.5%</td>
<td>1.25</td>
</tr>
<tr>
<td>OECD</td>
<td>3.9%</td>
<td>2.64</td>
</tr>
<tr>
<td>South Asia</td>
<td>8.5%</td>
<td>0.27</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>16.8%</td>
<td>0.15</td>
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Notes: Author Computations from Bhargava and Docquier (2007) dataset.
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<th>Physicians Emigration Rate</th>
<th>Nb Physicians per 1000 people</th>
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<tbody>
<tr>
<td>small (pop &lt; 2.5m)</td>
<td>14%</td>
<td>0.99</td>
</tr>
<tr>
<td>lower middle (2.5m &lt; pop &lt; 10m)</td>
<td>7%</td>
<td>1.61</td>
</tr>
<tr>
<td>upper middle (10m &lt; pop &lt; 25m)</td>
<td>5%</td>
<td>1.64</td>
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<td>2%</td>
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- The Country Reporting System (CRS) database which is provided from Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD).
- Health sector includes assistance to hospitals and clinics, assistance to specialised institutions such as those for tuberculosis, maternal and child care, other medical and dental services, disease and epidemic control, vaccination programmes, nursing, provision of drugs, health demonstration, public health administration and medical insurance programmes.
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Figure: Aid evolution
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- IV estimation for controlling endogeneity bias

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- Decomposition of causality between direct impact and reverse causality
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- Disturbance between different equations is taking into account
- Limits: It is appropriate for cross section but for panels data it requires huge programming

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Simultaneous equation gravity model:

\[ MBD_{ij,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 Healthaid_{ij,t} + \beta_3 X_{mbd,t} + u_{ij,t} \]

\[ Healthaid_{ij,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 MBD_{ij,t} + \beta_3 X_h,t + u_{ij,t} \]

- **MBD** = Medical Brain Drain defined as the rate of physicians’ emigration
- **Health Aid** = The amount of Health assistance from the OECD countries to the receiving countries.
Simultaneous equation gravity model:

\[ MBD_{ij,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 Healthaid_{ij,t} + \beta_3 X_{mbd,t} + u_{ij,t} \]

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Empirical issues and data

Empirical model

- \( Y_{i,t} \) = common variables which appear into both equations: GDP per capita, Population, distance, colony, contiguity, langue commune, ICRG Political risk.
- \( X_{mbd,t} \): Physicians per 1000-d and Pop65-d.
- \( X_{h,t} \): the ICRG economic and financial index and finally the budget of the donors.
Can Health Foreign Assistance Break the Medical Brain Drain

Empirical issues and data

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Empirical issues and data

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- \( X_{h,t} \) = the ICRG economic and financial index and finally the budget of the donors.
### Table: OLS and IV Estimation - Direct Impact

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### Empirical Issues and Data

**Empirical Model**

**Table: 3SLS Estimation - Direct Impact**

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**Observations** 2179 2179 2179 2179
Health ODA is negatively correlated to emigration rate of physicians. If we increase the amount of health aid to 1%, emigration rate of physicians will reduce to around 1%.

Health aid is distributed to regions where the emigration rate is high.
Empirical model

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- Health aid is distributed to regions where the emigration rate is high.
Empirical issues and data

Impact Indirect

\[ \sum_{j=1}^{16} (M_{ij}, t) = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 Death - rate_{i,t} + u_{i,t} \]

\[ \text{Death-rate}_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 \sum_{j=1}^{16} Healthaid_{ij,t} + \beta_3 X_{z,t} + u_{i,t} \]

\[ \sum_{j=1}^{16} Healthaid_{ij,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 X_{h,t} + u_{i,t} \]

Où

\[ \sum_{j=1}^{16} (M_{ij}, t) \] is the emigration rate of physicians whatever the destination countries.

\[ \sum_{j=1}^{16} Healthaid_{ij,t} \] is the health aid received by recipient countries whatever the donors.

\[ Death - rate_{i,t} \] is the death rate crude per 1000 people.

\[ X_{z,t} \] exclusions variables of death rate: ICRG financial risk and tuberculosis prevalence rate.
Impact Indirect

\[ \sum_{j=1}^{16} (M_{ij,t}) = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 \text{Death - rate}_{i,t} + u_{i,t} \]

\[ \text{Death-rate}_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 \sum_{j=1}^{16} \text{Healthaid}_{ij,t} + \beta_3 X_{z,t} + u_{i,t} \]

\[ \sum_{j=1}^{16} \text{Healthaid}_{ij,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 X_{h,t} + u_{i,t} \]

\[ \sum_{j=1}^{16} (M_{ij,t}) \] is the emigration rate of physicians whatever the destination countries.

\[ \sum_{j=1}^{16} \text{Healthaid}_{ij,t} \] is the health aid received by recipient countries whatever the donors.

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Can Health Foreign Assistance Break the Medical Brain Drain

Empirical issues and data

Impact Indirect

- \[ \sum_{j=1}^{16} (M_{ij,t}) = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 Death - rate_{i,t} + u_{i,t} \]
- \[ Death - rate_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 \sum_{j=1}^{16} Healthaid_{ij,t} + \beta_3 X_{Z,t} + u_{i,t} \]
- \[ \sum_{j=1}^{16} Healthaid_{ij,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 X_{H,t} + u_{i,t} \]

où

- \[ \sum_{j=1}^{16} (M_{ij,t}) \] is the emigration rate of physicians whatever the destination countries.
- \[ \sum_{j=1}^{16} Healthaid_{ij,t} \] is the health aid received by recipient countries whatever the donors.
- Death - rate_{i,t} is the death rate crude per 1000 people.
- \[ X_{Z,t} \] exclusions variables of death rate: ICRG financial risk and tuberculosis prevalence rate.
$\sum_{j=1}^{16} (M_{ij,t}) = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 Death - rate_{i,t} + u_{i,t}$

Death-
rate$_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 \sum_{j=1}^{16} Healthaid_{ij,t} + \beta_3 X_z,t + u_{i,t}$

$\sum_{j=1}^{16} Healthaid_{ij,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 X_h,t + u_{i,t}$

 où

$\sum_{j=1}^{16} (M_{ij,t})$ is the emigration rate of physicians whatever the destination countries.
$\sum_{j=1}^{16} Healthaid_{ij,t}$ is the health aid received by recipient countries whatever the donors.
$Death - rate_{i,t}$ is the death rate crude per 1000 people.
$X_z,t$ exclusions variables of death rate: ICRG financial risk and tuberculosis prevalence rate.
Can Health Foreign Assistance Break the Medical Brain Drain

Empirical issues and data

Impact Indirect

Table: 3SLS Estimation - Indirect Impact

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Health ODA is negatively correlated to emigration rate of physicians.

- Improve working conditions of physicians through the combat of epidemics.
- Health aid is distributed to regions where the emigration rate is high.
Health ODA is negatively correlated to emigration rate of physicians.

Improve working conditions of physicians through the combat of epidemics.

Health aid is distributed to regions where the emigration rate is high.
Health ODA is negatively correlated to emigration rate of physicians.

Improve working conditions of physicians through the combat of epidemics.

Health aid is distributed to regions where the emigration rate is high.
Thank you for your attention.