Efficiency gains from liberalizing labor mobility

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Economics and migration

- Increasing literature on int'l migration, but there are still some unresolved issues. In particular:
  - How do immigration restrictions affect the allocation of the world labor force and world GDP?
  - Are there huge gains from liberalizing labor mobility?

- Addressing these issues requires quantifying...
  - Immigration restrictions
  - General equilibrium effects induced by labor mobility
  - Interactions between migration decisions and the economy

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Literature review

Migration barriers $\Rightarrow$ Trillion-dollar bills on the sidewalk?

- ▶ Existing literature shows that removing remaining barriers on trade generates increase in world GDP between 0.5 and 4%...

- ▶ Removing barriers on FDI generates $+0.1$ to $+1.7\%$...

- ▶ Removing all barriers to labor mobility induces huge efficiency gains, often in the range of 50-150% of world GDP

Literature review

- Summary table in Clemens (JEP 2011)
- Scenario with fixed K (conservative) and no differences in inherent productivity of people (^{sk}):
  - +147.3% in Hamilton-Whalley (1984)
  - +122% in Klein and Ventura (2007)
  - +96.5% in Moses and Letnes (2004)
  - +67.0% in Iregui (2005)^{sk}

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Literature review

- Existing works are based on partial equilibrium or CGE multi-region models + simplistic treatment of liberalization: wage equalization across countries

- None of these studies accounts for...
    - existence of incompressible migration costs
    - endogeneity of migration decisions (emigration of 1/2 of poor-country residents)
    - the role of human capital (^{sk})
    - bilateral structure of migration flows/costs

- Recent databases allow doing it!

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Power of quantitative theory

We use **quantitative theory** (King 1995), i.e.

- ▶ Develop a very simple and abstract economic model ("supply-side" model of the world economy)
- ▶ Use consensual analytical specifications
- ▶ Use properly estimated elasticities
- ▶ Identify unobserved exogenous variables by forcing the model to match observations
- ▶ Evaluate the sensitivity of the model to parameters/data
- ▶ Proceed to numerical experiments

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Looking for consensual tools

Economics of int'l migration = segmented area:

▶ Determinants of size/structure of migration: multinomial discrete choice
   model widely used + fits data (Belot-Hatton 2008, Grogger-Hanson 2010,
   Beine et al. 2010-12, Razin-Wahba 2012, Rosenzweig 2008)

▶ Consequences for destination countries: emergence of a consensus
   framework (Card 2001, Borjas 2003, O-Peri 2012)

▶ Consequences for origin countries: evidence of long-run benefits from
   human capital accumulation, uncertain feedback effects of migration
   (D-R 2012)

We combine these ingredients into a large model with about 200
countries (i.e. about 40K bilateral migration flows)

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Computational issues

- We solve a large-scale system: about 40K equations for migration flows, for college graduates and less educated workers + Aggregates

- Easy thing for modern computers (we use a Gauss-Seidel algorithm in Matlab) but...

  - Possibility of multiplicity of equilibria when migration and inequality are jointly endogenized (de la Croix-Docquier 2012)
  - However (i) this only concerns small states ($\prec 1$ of world GDP)
  - And (ii) we study local effects, using an algorithm starting from current observations and converging slowly towards the new equilibrium
  - No sign of jump toward other trajectories

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Main insights

- Efficiency gains from liberalizing labor mobility may exceed estimated gains from trade of financial liberalization, but are much lower than in previous studies (max 9% of world GDP)
- Due to incompressible migration costs and...
- Redistributive effects are important and most gains accrue to new emigrants:
    - Pos selection of emigrants ($\searrow$ TFP in poor countries)
    - Neg selection of immigrants ($\searrow$ TFP in rich countries)
- Results are robust to all variants

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Structure

- In the benchmark, we endogenize...
  - Migration decisions (multinomial discrete choice model)
  - Wages and TFP in destination countries (CES production function with endogenous TFP)
  - Wages and TFP in sending countries (idem)

- And decompose migration cost into "private costs" and "policy restrictions"

We consider our model as a long-run one (calibrated on migration stock data, long-run effect of human capital on TFP)

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Migration decisions

MDC without spatial correlation in the unobserved:

- Utility depends on wages, amenities (net benefits from public goods, transfers and taxes + non monetary), moving costs (only for migrants), and an individual-specific iid component (taste, matching between skills and labor demand, etc.)
- Linear specification recommended by Rosenzweig (2008) or Grogger-Hanson (2010) to fit the data
- Utility of staying in the home country

$$u_{ii,s} = \alpha \left(w_{i,s} + z_{i,s} \right) + \epsilon_{ii,s}$$

- Utility of moving to country j:

$$u_{ij,s} = \alpha \left(w_{j,s} + z_{j,s} - c_{ij,s} \right) + \epsilon_{ij,s}$$

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Migration decisions

Optimal location:

- If ϵ's are extreme-value distributed (McFadden, 1984):

$$\Pr\left[u_{ij,s} = \max_k u_{ik,s}\right] = \frac{\exp\left[\alpha\left(w_{j,s} + z_{j,s} - c_{ij,s}\right)\right]}{\sum_k \exp\left[\alpha\left(w_{k,s} + z_{k,s} - c_{ik,s}\right)\right]}$$

- This yields ($2 \times J \times J - 1$ Eqs):

$$\ln\left[\frac{L_{ij,s}}{L_{ii,s}}\right] = \alpha\left(w_{j,s} - w_{i,s}\right) - x_{ij,s}$$

with $x_{ij,s} \equiv \alpha\left(c_{ij,s} - z_{j,s} + z_{i,s}\right)$, and $x_{ii,s} = 0$.

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Decomposition of migration costs

- Migration costs $c_{ij,s}$ vary across country pairs and education levels: addition of...
    - Incompressible private cost ($\underline{c}_{ij,s}$): transport, housing, search, discrimination, psychic, etc.
    - Monetary visa cost ($b_{ij,s} \equiv c_{ij,s} - \underline{c}_{ij,s}$): difficulty to obtain a visa (due to policy restrictions abroad + home-country hurdles)
- We define $\underline{x}_{ij,s} \equiv \alpha \left(\underline{c}_{ij,s} - z_{j,s} + z_{i,s} \right)$ as the incompressible net migration cost (net of amenity differential)
- Liberalizing labor mobility: $x_{ij,s} \longrightarrow \underline{x}_{ij,s}$

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Production technology

- Production is proportional to labor in efficiency units (as if physical capital was perfectly mobile across nations!)
- Homogenous firms in country i: $Y_i = A_i Q_i$
- Labor in efficiency unit: $Q_i = \left[\theta_h Q_{i,h}^{\frac{\sigma-1}{\sigma}} + \theta_l Q_{i,l}^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}$
- Endogenous TFP: $A_i = a_i F \left(\frac{Q_{i,h}}{Q_{i,h}+Q_{i,l}} \right)$
- Firms do not internalize TFP externalities
- Wages: $w_{i,s} = A_i \frac{\partial Q_i}{\partial Q_{i,s}} = \theta_s A_i \left(\frac{Q_i}{Q_{i,s}} \right)^{1/\sigma}$ $(2 \times J \text{ Eqs})$

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Equilibrium allocation

Definition

For a given distribution of native population $\{N_{i,s}\}_{\forall i,s}$, productivity FE's $\{a_i\}_{\forall i}$, and bilateral structure of migration costs $\{x_{ij,s}\}_{\forall ij,s}$, an equilibrium allocation of labor is a set $\{L_{ij,s}\}_{\forall i,j,s}$ satisfying (i) aggregate constraints $N_{i,s} \equiv \sum_{k \in J} L_{ik,s}$ and $Q_{i,s} \equiv \sum_{k \in J} L_{ki,s}$, (ii) utility maximization conditions and (iii) profit maximization conditions for all i, j and s.

Note: system of $2 \times J \times (J+1)$: $2 \times J \times J - 1$ bilateral migration stocks, $2 \times J$ wage rates, and $2 \times J$ aggregation constraints. With $J = 195$: 76,440 simultaneous equations

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Numerical experiments

We use the model to simulate the effect of a complete liberalization ($x_{ij,s} \rightarrow \underline{x}_{ij,s} \forall ij, s$), focusing on income variables (improperly referring to "efficiency"):

- GDP per capita
- Income per natural/native
- Income per stayer (incl. remittances modeled as a constant fraction of expats' income)

in all regions of the world (redistributive effects)

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Production technology

- Data on GDP in USD (Y_i): WDI 2011
- Labor force data ($Q_{i,l}$, $Q_{i,h}$): Defoort 2008
- Proportion of college graduates: $H_i = \frac{Q_{i,h}}{Q_{i,l} + Q_{i,h}}$
- Common technological parameters $(\sigma, \theta) = (3.0, 0.6)$
    - In line with empirical literature
    - Realistic skill premia in poor and rich countries
- Identification of TFP: $A_i = Y_i / Q_i$
- Computation of skill-specific wage rates: $w_{i,s}$ $\forall i, s$

Endogenous TFP

- We use panel data for $A_{i,t}$ and $H_{i,t}$ (1985-2005): 780 obs
- We estimate the following specification:

$$\ln\left(\frac{A_{i,t+1}}{A_{i,t}}\right) = \alpha_i + \alpha_t - \beta \ln(A_{i,t}) + \rho \ln(H_{i,t}^-) + \lambda \ln(H_{i,t}^+) + \varepsilon_{i,t}$$

  with $H_{i,t}^- = \min\left(H_{i,t}, H_0\right)$ and $H_{i,t}^+ = \max\left(H_{i,t}, H_0\right)$
- Excellent fit with $(\lambda, \beta) = (0.17^{***}, 0.53^{***})$. ρ not significant
- Long-run elasticity of TFP to human capital: $\lambda/\beta = 0.32$ when $H_{i,t} \geq 0.015$ (zero otherwise)
- Ident. of TFP-FE's in 2000: $a_i = A_i / \left[Max\left(0.015; H_i\right)\right]^{0.32}$

Migration technology

▶ Grogger-Hanson (2010) estimated the form and parameter of the utility function governing migration decisions: they recommend linearity with $\alpha = (0.026; 0.060)$

▶ With migration and wage data (year 2000), we identify total migration costs:

$$x_{ij,s} = \alpha \left(w_{j,s} - w_{i,s} \right) - \ln \left[\frac{L_{ij,s}}{L_{ii,s}} \right]$$

▶ Wage data: output of production block

▶ Migration data: Docquier-Marfouk-Ozden-Parsons 2011

Migration data

Structure of the DMOP2011 database:

- ▶ 195 countries (38,025 country pairs)
- ▶ Migrants = foreign-born population
- ▶ Population aged 25 and over
- ▶ College graduates and the less educated
- ▶ Men and women (not used here)

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Identifying migration barriers

Migration data

Immigration/Population
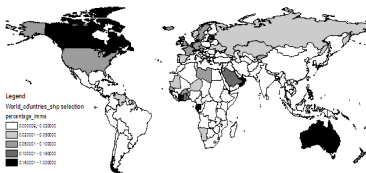
High-skill immig/total immig
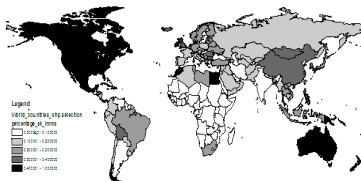
Emigration/Population
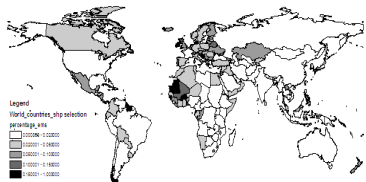
High-skill emig/total emig

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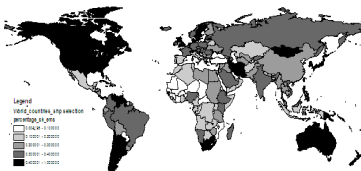
Example of TFP shocks

Are general equilibrium effects sensitive to the choice of α?

China's economy
Gross domestic product in US $bns

SOURCE: World Bank, Riskin,
"China's Political Economy"
nb: Figures before 1979
less reliable
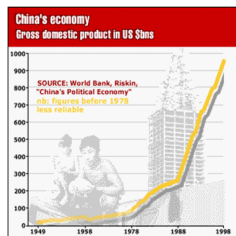
Propagation of TFP shocks?

- ▶ 5% TFP shock in immigration regions (US, EU)
- ▶ 5% TFP shock in emigration regions (China+India, SSA)
- ▶ Focus on the world economy + shocked region

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Example of TFP shocks

TFP shocks in immigration regions (effect in % of deviation)

	US shock			EU shock		
	Ex $L_{ij,s}$	0.026	0.060	Ex $L_{ij,s}$	0.026	0.060
World GDP	1.06	1.10	1.16	1.08	1.13	1.19
World migr.	0.00	1.33	3.23	0.00	0.10	0.30
Reg GDP	5.00	5.00	5.00	5.00	5.32	5.73
Reg Im$_l$	0.00	5.25	12.80	0.00	2.26	5.75
Reg Im$_h$	0.00	7.38	17.87	0.00	5.12	12.56
Reg Em$_l$	0.00	-5.35	-12.14	0.00	-1.25	-3.12
Reg Em$_h$	0.00	-7.68	-16.91	0.00	-4.08	-9.15

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Example of TFP shocks

TFP shocks in emigration regions (effect in % of deviation)

	China+India			Sub-Saharan Africa		
	Ex $L_{ij,s}$	0.026	0.060	Ex $L_{ij,s}$	0.026	0.060
World GDP	0.85	0.85	0.85	0.08	0.08	0.08
World migr.	0.00	-0.05	-0.24	0.00	-0.01	-0.03
Reg GDP	5.00	5.04	5.18	5.00	5.22	5.51
Reg Im$_l$	0.00	0.29	1.38	0.00	0.13	0.31
Reg Im$_h$	0.00	1.26	5.88	0.00	1.27	2.91
Reg Em$_l$	0.00	-0.33	-1.68	0.00	-0.01	-0.04
Reg Em$_h$	0.00	-1.33	-5.99	0.00	-1.55	-3.54

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Example of TFP shocks

Insights from TFP shocks:

▶ College graduates are relatively more responsive than the less educated

▶ Very small contagion effects when shocks occur in poor countries

▶ Little multiplier effects when TFP shocks occur in rich immigration regions

▶ Migration response sensitive to α, income response less sensitive

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Disentangling migration costs

▶ Problem: no quantitative data on the size of migration restrictions (current IMPALA project)

    ▶ Part of them is due to emigration countries
    ▶ Major part is due to immigration countries
    ▶ Differ by education level

▶ Alternative method: look at people who want to leave their country if they were not subject to restrictions

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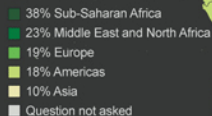Are general equilibrium effects important?
Identifying migration barriers

Disentangling migration costs

- Use of Gallup World Poll 2007-09:
  - Phone and face-to-face interviews with 260K adults (1K-3K per country), aged 15+, in 135 countries (93% of the world's adult population)
  - Q1 - Ideally, if you had the opportunity, would you like to move permanently to another country, or would you prefer to continue living in this country?
  - Q2 - To which country would you like to move?
- First interpretation: "opportunity" = no policy restriction!
- Allowing would-be migrants to move would increase the world migration stock by 524% (228% for college graduates and 628% for the less educated)
- Low-skill immig. ↗ by 498% in US, 435% in EU27

Disentangling migration costs

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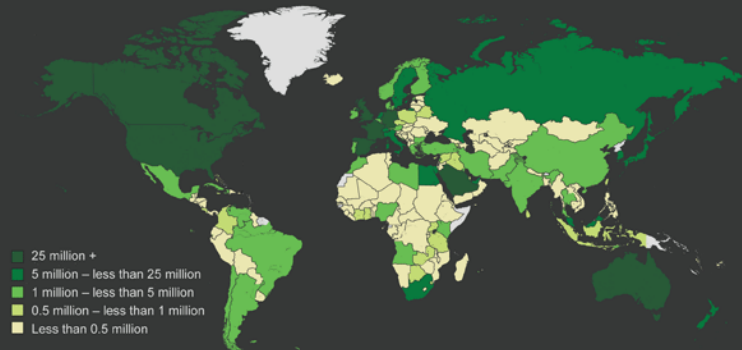
Disentangling migration costs

Gallup average regional prop. of people who want to leave

By education level

Regions (R)	College grad.	Less educ.	Ratio $(d_{R,h}/d_{R,l})$
Latin Am. & Caribbean	0.26	0.17	1.53
North America	0.09	0.13	0.69
Austr. & New Zealand	0.08	0.11	0.73
Asia	0.18	0.14	1.29
European Union	0.24	0.13	1.85
CIS	0.19	0.11	1.73
Sub-Saharan Africa	0.36	0.26	1.38
MENA	0.24	0.17	1.41

Disentangling migration costs

- Gallup allows us to proxy the unconstrained allocation of labor ($L^u_{ij,s}$)
- Skill-specific desire to leave:

$$
d_i \quad = \quad \frac{L_{ii,h}}{L_{ii,l} + L_{ii,h}} \widehat{d}_{i,h} + \frac{L_{ii,l}}{L_{ii,l} + L_{ii,h}} \widehat{d}_{i,l}
$$

$$
\implies \widehat{d}_{i,l} = d_i \left[1 + \frac{L_{ii,h}}{L_{ii,l} + L_{ii,h}} \left(\frac{d_{R,h}}{d_{R,l}} - 1 \right) \right]^{-1}
$$

$$
\implies \widehat{d}_{i,h} = \widehat{d}_{i,l} \left(\frac{d_{R,h}}{d_{R,l}} \right)
$$

- Numbers of additional migrants: $\widehat{d}_{i,l} L_{ii,l}$ and $\widehat{d}_{i,h} L_{ii,h}$
- Dest. shares as in benchmark (excl. free mobility partners)

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Disentangling migration costs

▶ Assuming interviewed people do not internalize general equilibrium effects due to migration of others, we identify incompressible migration costs ($\underline{x}_{ij,s}$):

$$\underline{x}_{ij,s} = \alpha \left(w_{j,s} - w_{i,s} \right) - \ln \left[\frac{L^u_{ij,s}}{L^u_{ii,s}} \right]$$

▶ Mig barriers in \$ ($b_{ij,s} \equiv x_{ij,s} - \underline{x}_{ij,s}$) or in % of total migration costs ($\beta_{ij,s} \equiv b_{ij,s} / x_{ij,s}$)

  ▶ On average $\beta_{ij,l} = 21\%$ and quartiles $= [0.12, 0.27]$
  ▶ On average $\beta_{ij,h} = 21\%$ and quartiles $= [0.10, 0.25]$
  ▶ Note: BDO 2011: a quarter of diaspora effect on migration costs is accounted for by the policy channel.

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Complete liberalization
Low-skilled liberalization

Liberalizing labor mobility

Shock: complete liberalization $x_{ij,s} \longrightarrow \underline{x}_{ij,s} \forall ij, s$

- Partial equilibrium migration response as in Gallup:
  - World stock of adult migrants: from 74 Mil. to 541 Mil. (+524%), from 3 to 18% of the world labor force
  - Skill structure: +228% for college graduates, +628% for the less educated
  - Low skilled immigration increases by 498% in the US, 435% in the EU27
- Δ in world income per capita at constant $w_{j,s}$: +17.65%
- Then general equilibrium effects step in...

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Immigration and emigration in Part. Eq. (Change in %)

	Immigration			Emigration		
	Tot	HS	LS	Tot	HS	LS
World	523.7	227.8	628.0	523.7	227.8	628.0
USA	385.0	233.3	497.9	177.1	130.9	243.1
EU27	384.2	203.1	434.9	251.4	237.1	258.0
CANZ	370.6	185.9	573.1	228.4	139.1	347.3
China-India	1136.4	249.0	1251.1	1658.5	226.7	2276.1
SSA	496.7	308.5	499.5	644.6	307.0	670.6
MENA	511.7	270.0	581.7	409.0	160.2	486.7
Others	783.7	266.0	902.7	424.0	238.0	493.6

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Immigration and emigration with $\alpha = 0.026$ (Change in %)

	Immigration			Emigration		
	Tot	HS	LS	Tot	HS	LS
World	494.0	228.7	587.4	494.0	228.7	587.4
USA	359.5	231.4	454.9	188.1	132.1	267.9
EU27	371.7	200.7	419.5	249.8	238.2	255.1
CANZ	356.6	185.0	544.7	233.4	139.0	359.1
China-India	1148.1	238.4	1265.7	1419.4	227.3	1933.5
SSA	496.4	315.0	499.1	635.1	315.0	660.6
MENA	502.2	263.7	571.2	399.0	167.3	471.3
Others	712.6	278.8	812.3	411.0	238.2	475.7

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Immigration and emigration with $\alpha = 0.06$ (Change in %)

	Immigration			Emigration		
	Tot	HS	LS	Tot	HS	LS
World	469.6	229.4	554.3	469.6	229.4	554.3
USA	336.4	230.3	415.4	198.9	132.6	293.5
EU27	357.2	198.2	401.7	249.6	239.9	254.1
CANZ	343.4	184.8	517.3	238.3	138.7	370.8
China-India	1162.1	231.7	1282.4	1232.3	226.3	1666.2
SSA	496.4	322.7	499.0	625.0	301.9	649.9
MENA	492.6	258.8	560.3	389.8	172.2	457.9
Others	660.3	287.6	746.0	399.0	238.3	459.2

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Efficiency gains from liberalization (Perc. change in GDP pc)

	Ex $w_{i,s}$	0.026	0.060
World	17.65	8.88	8.24
USA	-3.27	-8.18	-7.17
EU27	-0.64	-7.11	-6.98
CANZ	-3.60	-9.14	-8.19
China-India	-0.91	-2.94	-3.37
SSA	12.52	-5.53	-6.35
MENA	14.88	7.94	6.86
Others	18.24	6.99	6.93

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Efficiency gains from liberalization (% change in income per...)

	0.026			0.060		
	Capita	Native	Stayer	Capita	Native	Stayer
World	8.88	8.88	3.25	8.24	8.24	2.51
USA	-8.18	-4.84	-4.52	-7.17	-4.34	-3.97
EU27	-7.11	-4.20	-7.13	-6.98	-4.21	-7.11
CANZ	-9.14	-5.05	-4.74	-8.19	-4.69	-4.15
China-India	-2.94	21.62	7.75	-3.37	19.34	6.46
SSA	-5.53	91.97	26.27	-6.35	88.01	24.59
MENA	7.94	30.64	9.88	6.86	30.01	8.92
Others	6.99	12.47	2.97	6.93	11.77	2.42

Liberalizing labor mobility

Efficiency gains (max 9%) are lower than in previous studies. Why?

- Previous studies badly account for education level of would-be migrants
  - Overestimate TFP differentials: differences in GDP per capita exceed differences in GDP per worker and in wages (see next figure)
  - Migration reduces human capital in destination and origin regions: TFP's decrease in most regions
  - With exogenous TFP, we'd have +16.7%
- They don't account for incompressible mig costs!

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Liberalizing labor mobility

GDP per capita, per worker and wages in 2000 (USA=100%)

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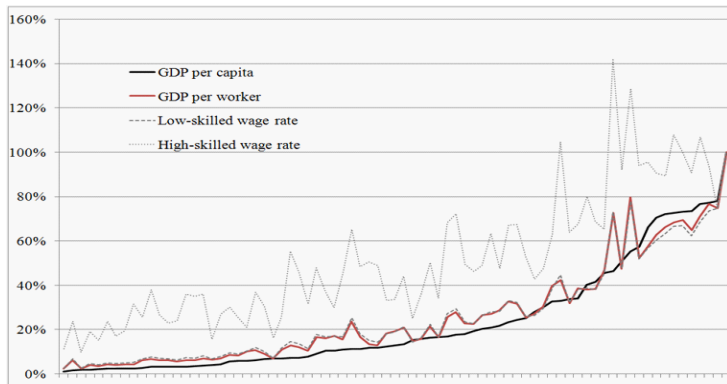
Liberalizing labor mobility

Are we too pessimistic?

- ▶ Using Gallup, we might overestimate migration barriers
    - ▶ Opportunity = obtaining a visa + receiving a transfer?
    - ▶ Some people desiring to leave will leave!

- ▶ We might be too optimistic, except if overestimation could be larger for college graduates (too many college graduates leave poor countries?)

- ▶ Let's restrict liberalization to the less educated...
    - ▶ Lower global efficiency gains!
    - ▶ Larger costs for host countries
    - ▶ Beneficial effects for stayers in poor countries

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Liberalizing labor mobility

Efficiency gains from liberalization (% change in income per...)

	Complete liberalization			Only for the less educated		
	Capita	Native	Stayer	Capita	Native	Stayer
World	8.88	8.88	3.25	7.03	7.03	7.88
USA	-8.18	-4.84	-4.52	-13.41	-7.40	-7.04
EU27	-7.11	-4.20	-7.13	-4.76	-3.67	-0.49
CANZ	-9.14	-5.05	-4.74	-19.92	-11.56	-8.84
China-India	-2.94	21.62	7.75	3.30	20.18	11.61
SSA	-5.53	91.97	26.27	12.30	79.82	42.85
MENA	7.94	30.64	9.88	6.25	27.34	19.45
Others	6.99	12.47	2.97	9.81	10.30	9.90

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Liberalizing labor mobility

Who wins, who loses?

- "β-convergence" analysis

$$\Delta \ln \left(Income \right) = \beta_0 + \beta_1 \ln \left(Ex - ante\ Income \right)$$

- β_1 not significant with income per capita and income per stayer
- $\beta_1 = -0.26$ with income per natural (for all α)
- All gains accrue to new migrants from poor to rich countries
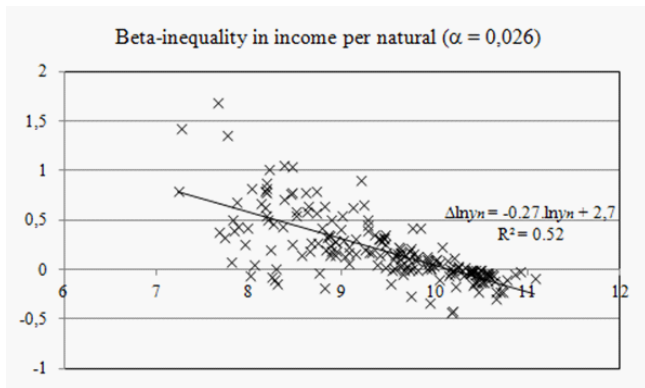
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Beta-inequality in income per natural ($\alpha = 0{,}026$)

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Robustness checks

So, are we too pessimistic or too optimistic?

- ▶ Absence of physical capital
    - ▶ Assuming linearity in production function implies that physical capital follows people (LR)
    - ▶ Lower gains would be obtained with fixed capital stock (SR)

- ▶ Is the elasticity of substitution too large?
    - ▶ With $\sigma = 1.1$ (higher inequality in South), we'd have $+4.6\%$

- ▶ Four additional extensions:
    - ▶ Congestion
    - ▶ Downgrading education acquired in poor countries
    - ▶ Accounting for diaspora effects
    - ▶ Labor interactions between natives and immigrants

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Four extensions

First, we account for **congestion** effects:

- ▶ Change in the TFP equation

$$A'_t = a'_i F \left(\frac{Q_{i,h}}{Q_{i,h} + Q_{i,l}} \right) (Q_{i,t})^{-\phi}$$

- ▶ Ciccone and Hall (1996): $\phi = 0.03$
- ▶ Based on share of land in total income

Four extensions

Second, we **downgrade education** obtained in poor countries:

- ▶ Immigrants with higher education tend to find jobs in occupations typically staffed by less educated natives

- ▶ We use Coulombe-Tremblay's skill schooling gap by country of origin: SSG of n years means that Canadian nationals with y y.o.s = immigrants with $y + n$ y.o.s

- ▶ We predict relative productivity of immigrants (benchmark value of 1 for Canadians), assuming 1 y.o.s generates 8% productivity gain (e.g. college graduate Angolans $\approx$ 0.73 Canadians)

- ▶ We split college graduate immig+stayers into two categories (e.g. 1 educated Angolan = 0.73 coll + 0.27 less educ.)

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Third, we endogenize $\underline{x}_{ij,s}$ **accounting for diaspora effects**:

- ▶ Large literature on social networks: existing diasporas increase benefits and lower costs faced by new migrants
- ▶ Two channels: assimilation costs (after migrants cross the border) and restrictions (family reunion, info on visas)
- ▶ BDO 2011 "dissected" diaspora effects by education level for the US. Effect on assimilation costs:

$$\underline{x}_{ij,h}^{new} \quad = \quad \underline{x}_{ij,h}^{base} - 0.655 \cdot \ln\left(L_{ij,T}^{new} / L_{ij,T}^{base}\right)$$

$$\underline{x}_{ij,l}^{new} \quad = \quad \underline{x}_{ij,l}^{base} - 0.763 \cdot \ln\left(L_{ij,T}^{new} / L_{ij,T}^{base}\right)$$

- ▶ We use the US elasticities and account for "multiplier" effects

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Fourth, we better account for **labor interactions** between natives and immigrants:

▶ Immigrants and natives within the same skill/education category are allowed to be imperfect substitutes within a nested CES structure

$$Q_{i,s} = \left[\theta_n Q_{ii,s}^{\frac{\delta-1}{\delta}} + \theta_i \left(\sum_j Q_{ji,s} \right)^{\frac{\delta-1}{\delta}} \right]^{\frac{\delta}{\delta-1}}$$

▶ Why?
  ▸ Heterogeneity in motivations and tastes
  ▸ Culture-specific skills and limitations
  ▸ Network effects or historical accidents: occupational clustering

▶ Elasticity of substitution: $\delta = 20$ (Ottaviano-Peri 2012)
  $\theta_n = 0.6$ and $\theta_i = 0.4$

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Liberalizing labor mobility

Efficiency gains from liberalization (Robustness)

	0.026				0.060			
	Cong	Down	Dia	LInt	Cong	Down	Dia	LInt
World	8.1	8.1	9.2	2.9	7.3	7.4	8.9	4.3
USA	-9.1	-9.6	-8.4	-14.7	-8.0	-8.3	-7.6	-7.9
EU27	-7.3	-8.1	-7.3	-11.9	-7.1	-7.9	-7.4	-5.6
CANZ	-10.6	-10.7	-9.4	-19.5	-9.6	-9.6	-8.8	-13.5
Chi/Ind	-2.5	-2.9	-3.1	-2.7	-2.8	-3.3	-3.8	-0.7
SSA	-5.7	-0.7	-5.3	-14.8	-6.5	-1.6	-6.0	-9.7
MENA	6.9	8.2	-8.2	1.1	5.4	7.1	7.4	2.4
Others	5.9	7.1	-7.3	1.0	5.6	7.0	7.6	3.0

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Liberalizing labor mobility

- Efficiency gain in the range of 3-9%: max 9.2% of world GDP

- Effects are very robust, even to more extreme assumptions. With $\alpha = 0.026$:

  - Downgrading with the squared Canadian index: $+7.76\%$
  - Increasing complementarity *a la* MMW 2011 ($\delta = 5$): $+5.12\%$

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- ▶ Efficiency gains from liberalizing labor mobility have probably been overestimated
- ▶ Accounting for education of people and incompressible migration costs, we obtain a max of 9% of the world GDP
- ▶ Most gains accrue to emigrants; stayers in poor countries only benefit through remittances
- ▶ Still, this exceeds estimated gains from trade and FDI liberalization. And liberalization of low-skill migration would be highly beneficial for poor countries
- ▶ Political economy problems: nationals in high-income countries suffer income losses

Thanks for your attention!

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Appendix on Arab Spring

Uncertainty about the long-run effects of the Arab Spring

- ▶ Optimistic view: +5% TFP shock
- ▶ Pessimistic view: -5% TFP shock
- ▶ Focus on the world economy + MENA (Egypt, Libya, Syria, Tunisia, Yemen)

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Shocks in immigration regions (effect in % of deviation)

		+5%			-5%	
	Ex $L_{ij,s}$	0.026	0.060	Ex $L_{ij,s}$	0.026	0.060
World GDP	0.05	0.05	0.05	-0.05	-0.05	-0.05
World migr.	0.00	-0.02	-0.04	0.00	0.02	0.05
Arab GDP	5.00	5.31	5.77	-5.00	-5.28	-5.69
Arab Im$_l$	0.00	1.06	3.27	0.00	-1.03	-2.98
Arab Im$_h$	0.00	3.76	9.80	0.00	-3.58	-8.71
Arab Em$_l$	0.00	-0.65	-1.57	0.00	0.67	1.68
Arab Em$_h$	0.00	-1.83	-4.29	0.00	1.92	4.79

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Insights from MENA shocks:

▶ Very small contagion effects

▶ In the pessimistic case...

  ▸ Low-skilled immigration could increase by to 10K in the EU, 2K in the US, 25,000 in the Gulf

  ▸ High-skilled immigration could increase by to 5K in the EU, 6K in the US, 10K in the Gulf

  ▸ Half of the effect is due to diaspora externalities

  ▸ No discernible effect on income per capita in the EU or the US