

An Incentive Mechanism to Break the Low-skill Immigration Deadlock

David de la Croix and Frédéric Docquier

IRES-UCLouvain

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Research question

- ▶ Paper on South-North migration
 - ▶ $\pm 1.5p.$ of the pop. of the South
 - ▶ $\pm 8.0p.$ of the pop. in the North (1.5p. in 1960)
- ▶ Contrasting perceptions
 - ▶ Substantial gains for the South (lab. market, remittances)
 - ▶ Source of problems in the North (for 2/3 of natives)
- ▶ What do we do?
 - ▶ Opening borders: alternative to aid but not politically feasible
 - ▶ Design coordination mechanism to break the gridlock (i.e. incite voters to host more LS immigrants)
 - ▶ Quantitative analysis: assess its potential effectiveness

Plan of the talk

1. **Approach and contribution to the literature**

- ▶ Lit1 - Migration and global welfare
- ▶ Lit2 - Political economy of immigration
- ▶ Lit3 - Experimental economics: aversion to extreme poverty
- ▶ Gains from coordinating immig. policies

2. Theory: design of the scheme

3. Quantitative Assessment

Lit1 - Migration and global welfare

- ▶ Positive approach: effect of liberalization
 - ▶ Quantify effect of partial/total liberalization on the world economy
 - ▶ From small (DMS: +10%) to huge effects (Hamilton-Whalley: +150%)
 - ▶ Liberalization of low-skilled migration increase income in the South (Walmsley and Winters 2004, Pritchett 2006, Clemens 2011, etc.)
- ▶ Normative approach: social planner's problem
 - ▶ Benevolent planner max utilitarian SWF (Benhabib-Jovanovic)
 - ▶ Move many LS workers from South to North (2 bil.)
 - ▶ No concern for political feasibility!!!
- ▶ **We care about welfare in the South (objective)**

Lit2 - Political economy

- ▶ Political economy framework explains restrictions
 - ▶ Survey data: 40-50% of voters in EU and US believe immigration reduces their income, want to decrease migration
 - ▶ Important issue for political parties (in Europe and USA)
- ▶ Voters' attitudes are endogenous
 - ▶ Facchini-Mayda (2008): attitudes affect policy, depend on labor market and welfare state characteristics
 - ▶ Facchini-Mayda (2009): skill-heterogenous attitudes, depend on generosity of welfare benefits, tax rates/progressivity... (R^2 0.1-0.2)
 - ▶ Dustmann-Preston (2007): key role of the welfare state and xenophobic preference (non-economic factors)
 - ▶ No concern for global welfare!!!
- ▶ **We care about welfare in the North (impl. constraint)**

Lit2 - Political economy

Effects of low-skilled migration permits on voters' welfare

- ▶ Economic effects (income)
 - ▶ Labor market effect
 - ▶ Fiscal effect (welfare state)
 - ▶ Surplus
- ▶ Non-econ effects (residual)
 - ▶ Insecurity feelings
 - ▶ Trust, social K
 - ▶ Illegal migration
 - ▶ Xenophobic preferences
- ▶ Aversion to extreme poverty!!!



Lit3 - Experimental economics

- ▶ Overwhelming evidence that households care about the worst-off's (Charness-Rabin 2002-05)
- ▶ Fehr and Schmidt (2006): conditions under which the maximin motive is key
 - ▶ Not important when players view each other as agents behaving strategically;
 - ▶ Highly relevant in the context of charitable giving or in the context of elections with a large number of people, where strategic voting is unlikely to occur (Aid, S-N migration)
 - ▶ We assume voters care about extreme poverty on Earth, to a small extent!
- ▶ *Note: same rationale operates if improving the situation of the worst-off benefits to the donor*

Lit3 - Experimental economics

- ▶ Altruism (humanitarian motive) used to explain policies towards refugees (Hatton 2004, Hatton-Williamson 2006, Bubb et al. 2011)
- ▶ What about economic migration?
 - ▶ 2006: IOM asked for EU development-friendly immigration policy
 - ▶ 2014: Obama asks for “altruistic immig policy” (↘ deportations)
 - ▶ World Bank (David McKenzie): “improved labor mobility is by far the greatest way to give a leg up to low-income people around the globe [...] Allowing lower-skilled workers in is directly going to improve poverty in poor countries” .
 - ▶ And Prichett (2006), Clemens (2011), Winters (2012), etc.

In sum...

- ▶ Despite aversion to extreme poverty, the richer have no incentives to welcome more migrants
- ▶ The welfare of worst-off's = public good:
 - ▶ When country j welcomes an additional migrant, income in source country increases
 - ▶ Everybody on Earth enjoys it (positive externality) but country j bears the cost alone
- ▶ Use coordination gains to minimize extreme poverty
- ▶ Secondly, a taxation/subsidy scheme could help rich countries to internalize the externality

Plan of the talk

1. Approach and contribution
2. **Theory: design of the scheme**
 - 2.1 Environment
 - 2.2 Nationalist allocation
 - 2.3 No-regret allocation
 - 2.4 Decentralization
3. Quantitative Assessment

Environment

- ▶ World made of $J + 1$ countries,
 - ▶ J developed ($j=1\dots J$)
 - ▶ The developing world ($j=0$)
- ▶ Two types of national citizens: $n_j = n_j^h + n_j^l$
 - ▶ The low-skilled supply raw labor (l_j)
 - ▶ The high-skilled supply raw labor + human capital (h_j)
 - ▶ They share another fixed factor (k_j)
- ▶ We model low-skilled migration from 0 to j (m_j)
 - ▶ In the South: $n_0^l - m^l \mathbf{1}_J$

Environment

- ▶ Preferences in country j :

$$U_j^s = \underbrace{u(c_j^s)}_{[Econ]} + \underbrace{\beta u(c_0^l)}_{[Altruism]} - \underbrace{\varepsilon_j \left(\frac{m_j}{n_j} \right)^2}_{[Non-Econ]}$$

- ▶ Production and surplus:

$$\begin{aligned}y_j &= F_j(k_j, h_j; l_j) = f_j(l_j) \\l_j &= l_j(n_j, \delta_j m_j) \\s_j(l_j) &= f_j(l_j) - f_j'(l_j)l_j\end{aligned}$$

- ▶ High- and low-skilled citizens share the surplus $(1 - \zeta_j, \zeta_j)$

Environment

- Consumption levels:

$$c_j^l = f_j'(l_j)l'_{j,1}(n_j, \delta_j m_j) + \frac{\zeta_j s_j(l_j)}{n_j^l} + \tau_j$$

$$c_j^h = f_j'(l_j)l'_{j,1}(n_j, \delta_j m_j) + \frac{(1 - \zeta_j)s_j(l_j) - (n_j^l + \zeta_j m_j)\tau_j}{n_j^h}$$

$$c_j^m = f_j'(l_j)\delta_j l'_{j,2}(n_j, \delta_j m_j) + \tau_j \zeta_j$$

- In the South: c_0^l depends on m_j and m_i ($i \neq j$)!!!

$$c_0^l = f_0'(n_0^l - \mathbf{m}' \mathbf{1}_J)l'_{0,1}(n_0^l - \mathbf{m}' \mathbf{1}_J, 0)$$

Environment

- ▶ Probabilistic voting set-up:
 - ▶ Smooth aggregation of preferences instead of median voter
 - ▶ Maximization of a "political objective function":

$$\begin{aligned}W_j &\equiv \frac{n_j^h}{n_j} U_j^h + \frac{n_j^l}{n_j} \theta_j U_j^l \\ &= \frac{n_j^h}{n_j} u(c_j^h) + \frac{n_j^l}{n_j} \theta_j u(c_j^l) + \frac{n_j^h + \theta_j n_j^l}{n_j} \left(\beta u(c_0^l) - \varepsilon_j \left(\frac{m_j}{n_j} \right)^2 \right)\end{aligned}$$

- ▶ Note that only natives have the right to vote!

Environment

Definition (Country)

A country j is a multiplet $\Omega_j = \{n_j^h, n_j^l, \tau_j, \xi_j, \theta_j, \delta_j, \zeta_j, \varepsilon_j\}$ representing the size and skill structure of the population, the intensity of redistribution, the degree of political participation, the productivity of immigrants relative to low skilled nationals, the share of the surplus going to low-skilled natives, the scale of aversion to immigration, and functions $f_j(\cdot)$, $l_j(\cdot)$ characterizing the production technology.

Nationalist equilibrium

2.2. Nationalist equilibrium ($\tilde{m}_j, j = 1, \dots, J$):

Definition (Nationalist)

A nationalist allocation is a vector $\tilde{\mathbf{m}}$ such that the objective

$$W_j(m_j) = W_j([\tilde{m}_1 \dots \tilde{m}_{j-1}, m_j, \tilde{m}_{j+1} \dots, \tilde{m}_J]')$$

is maximized with respect to m_j in each developed country j given the migration choices of other countries (\tilde{m}_{-j})

= Nash(nationalist) equilibrium

Nationalist equilibrium

Welfare impact at the margin: $\frac{\partial W_j}{\partial m_j}$

► Income of the high-skilled:

- ↘ in income from raw labor (-)
- ↗ in return to human capital (+)
- ↗ in return to physical capital (+)
- ↗ in redistributive taxes (-)

► Income of the low-skilled:

- ↘ in income from raw labor (-)
- ↗ in return to physical capital (+)

► Non-econ effect: ↗ cost (-), ↘ extreme poverty (+)

FOC ($\frac{\partial W_j}{\partial m_j} = 0$): weighted sum of these effects determines \tilde{m}_j

Nationalist equilibrium

Intermediate results:

Lemma (interior solution)

For a given country j , the corner solution $\tilde{m}_j = 0$ cannot be an optimum to country j 's problem if $(\frac{n_j^l}{n_j^h}, \theta_j, \tau_j, \xi_j, \varepsilon_j)$ not too large.

Lemma (upper bound)

Under the condition of Lemma 1, there exists a threshold m_j^{\max} such that $W_j(m_j^{\max}) = W_j(0)$. It follows $\tilde{m}_j < m_j^{\max}$. Then, if ε_j 's not too small, $\sum_j m_j^{\max} < m_0^{\max} \Leftrightarrow \sum_j \tilde{m}_j < m_0^{\max}$.

Nationalist equilibrium

Important results:

Theorem (tradeoff HS-LS)

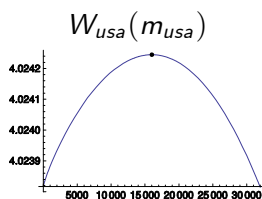
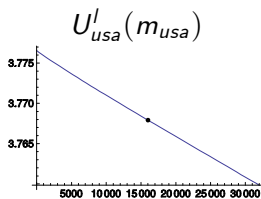
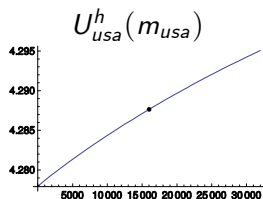
When the nationalist allocation = interior maximum, if (ζ_j, τ_j, ξ_j) not too large, each high-skilled national prefers increasing immigration whereas each low-skilled national prefers decreasing it

Theorem (comparative static results)

The immigration level \tilde{m}_j is and decreasing in $(\theta_j, \frac{n_j^l}{n_j^h}, \tau_j, \xi_j, \varepsilon_j)$ if utility not too concave; \tilde{m}_j is ambiguously affected by (ζ_j, δ_j)

Nationalist equilibrium

Anticipating the calibration exercise:



No-Regret Allocation

2.3. The no-regret solution (\bar{m}_j):

- ▶ Objective: Min extreme poverty \iff Max $\mathbf{m}' \mathbf{1}_J$
- ▶ s.t. Political Feasibility: no welfare loss for North citizens

Definition

No-regret allocation is a vector $\bar{\mathbf{m}}$ such that $\mathbf{m}' \mathbf{1}_J$ is maximized subject to the implementability constraint: $W_j(\tilde{\mathbf{m}}) \leq W_j(\bar{\mathbf{m}}) \forall j$

No-Regret Allocation

A quick look at the first order conditions:

$$1 + \lambda_j \frac{\partial W_j(\mathbf{m})}{\partial m_j} + \sum_{k \neq j} \lambda_k \frac{\partial W_k(\mathbf{m})}{\partial m_j} = 0$$

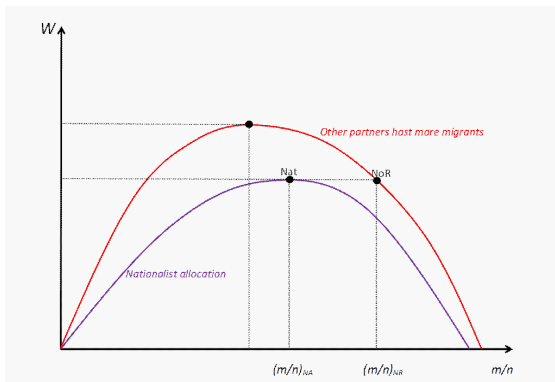
$$\lambda_j (W_j(\bar{\mathbf{m}}) - W_j(\tilde{\mathbf{m}})) = 0, \quad \lambda_j \geq 0, \quad W_j(\bar{\mathbf{m}}) \geq W_j(\tilde{\mathbf{m}}).$$

The externality is now internalized: $\partial W_k(\mathbf{m})/\partial m_j$ is given by

$$\frac{\partial W_k(\bar{\mathbf{m}})}{\partial m_j} = -\beta \frac{n_k^h + \theta_k n_k^l}{n_k} u'(c_0^l) f_0''(l_0) l_{0,1}'(n_0^l - \bar{\mathbf{m}}' \mathbf{1}_J, 0)$$

No-Regret Allocation

Shape of $W_j(m_j)$ when immigration increases in other countries:



No-Regret Allocation

Theorem

In the absence of altruism, the no-regret allocation coincides with the nationalist allocation, i.e. $\beta = 0 \Rightarrow \bar{\mathbf{m}} = \tilde{\mathbf{m}}$

Theorem

Assume all rich countries are identical and $\beta > 0$. Then the symmetric allocations $\tilde{\mathbf{m}}$ and $\bar{\mathbf{m}}$ satisfy $\bar{\mathbf{m}} > \tilde{\mathbf{m}}$.

When countries are different:

- ▶ Not sure that $\forall j : \bar{m}_j > \tilde{m}_j$ if β not very small
- ▶ Requires quantitative exercise

Implementation

2.4. How to decentralize the no-regret?

- ▶ Delegation
 - ▶ A supranational agency manages immigration policies
- ▶ Or design a tax-subsidy scheme:
 - ▶ Vector q of country-specific lump-sum taxes to be paid to agency
 - ▶ Vector p of country-specific subsidy rates per migrant

Decentralization

- ▶ Agency's budget constraint: $\mathbf{p}'\mathbf{m} - \mathbf{q}'\mathbf{1}_J = 0$
- ▶ Set subsidy rate such that nationalist FOC(p_j, \bar{m}_j) = 0 at the no-regret level of immigration (\bar{m}_j):

Theorem

The no-regret allocation $\bar{\mathbf{m}}$ can be decentralized with subsidy rates $\bar{\mathbf{p}}$ and lump-sum taxes $\bar{\mathbf{q}}$ satisfying $\bar{p}_j \bar{m}_j = \bar{q}_j \forall j$.

Theorem

A system of tradable quotas (constant price) cannot be used to decentralize the no-regret

Plan of the talk

1. Approach and contribution
2. Theory: Design of the scheme
3. **Application: By how much does it help?**
 - 3.1 Calibration
 - 3.2 Robustness and fit
 - 3.3 No-regret and decentralization
 - 3.4 Remittances and aid

Calibration

3.1. Calibration of the nationalist eq.

- ▶ Hypothesis: situation in 2000 = nationalist equilibrium
- ▶ Two sets of host countries: G7 or HI-OECD
- ▶ Goals:
 - ▶ We choose $U(.) = \ln(.)$, $F(.)$ C-D, and $I(.)$ CES
 - ▶ Need to calibrate $\Omega_j = \{n_j^h, n_j^f, \theta_j, \tau_j, \xi_j, \delta_j, \zeta_j, \varepsilon_j\}$, β
 - ▶ And the parameters of $F(.)$ and $I(.)$
 - ▶ To match some moments (y_j , m_j , ω_j^h , ω_j^m , ΔGini)

Calibration

- ▶ Simplest tasks:
 - ▶ We use labor force data for (n_j^h, n_j^l) and \tilde{m}_j
 - ▶ We assume θ_j equals LS/HS wage ratio
 - ▶ Sharing the surplus (ζ_j):
 - ▶ Human capital is owned by the high-skilled
 - ▶ Physical capital ownership is proportional to wages
 - ▶ Relative welfare benefits $\tilde{\zeta}_j$ from Barbone et al.
- ▶ Then...

Calibration

- ▶ Technology $y_j = \bar{\mu}_j k_j^{\alpha_j^k} h_j^{\alpha_j^h} l_j^{\alpha_j^l}$ with $\alpha_j^k = 0.365 \forall j$
- ▶ Raw labor: $l_j = \left(v_j (n_j)^{\frac{\sigma-1}{\sigma}} + (1 - v_j) (\delta_j m_j)^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$ with
 - ▶ Elasticity $\sigma = 20$
 - ▶ Downgrading δ_j from Coulombe-Tremblay (cognitive ability)
 - ▶ Preference v_j to match ω_j^m (LS citizens/immig)
 - ▶ Elasticity α_j^h to match ω_j^h (HS/LS citizens)
 - ▶ Scale factor to $\bar{\mu}_j k_j^{\alpha_j^k}$ to match GDP per capita
- ▶ Once gross income levels are identified, calibrate τ_j to match ΔGini (Ratio "before/after" redistribution)

Calibration

- ▶ Calibration of altruism rate based on US data on Charities:
 - ▶ 1.5% of US pop in extreme poverty (USD 700 per year)
 - ▶ 50% of active Americans with $y = \text{USD } 87,500$ per year
 - ▶ They give 2% of their income to organizations protecting individuals in precarious situation
 - ▶ $t=.02 \max \ln(y - yt) + \beta \ln(.008y + 33ty)$ if $\beta \simeq .007$
 - ▶ Experimental economics: $\beta = .013$
 - ▶ Benchmark: $\beta = .007$ and robustness for $\beta \in [0; .013]$
- ▶ Calibrate ε_j to match m_j

Calibration

	ν_j	α_j^l	$\hat{\mu}_j$	$\hat{\zeta}_j$	τ_j	θ_j	ε_j
Developing	1.000	0.587	7.067				
Australia	0.431	0.579	59.380	0.420	1.354	0.653	0.535
Belgium	0.452	0.564	53.823	0.347	1.800	0.586	0.300
Canada	0.420	0.568	61.942	0.388	1.314	0.619	0.439
France	0.504	0.583	49.604	0.273	1.267	0.498	0.185
Germany	0.502	0.571	49.562	0.313	1.535	0.546	0.175
Japan	0.464	0.534	51.130	0.268	1.212	0.501	4.162
Korea Rep	0.551	0.531	30.163	0.216	0.707	0.430	15.716
Italy	0.481	0.607	49.611	0.324	0.237	0.564	1.573
Switzerland	0.426	0.550	60.575	0.242	0.947	0.453	0.363
UK	0.517	0.564	48.141	0.228	1.103	0.441	0.481
USA	0.499	0.493	72.116	0.289	2.634	0.518	0.164

Robustness and fit

3.2. Robustness and model fit

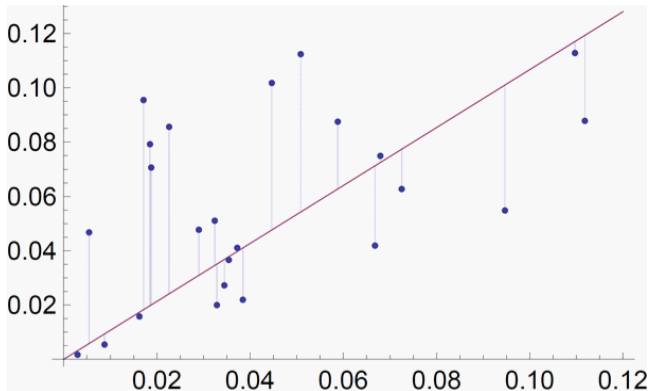
- ▶ Counterfactual simulations: Compute \tilde{m}_j with
 - ▶ No altruism ($\beta = 0$): negligible effect
 - ▶ No redistribution ($\tau_j = 0$ or $\xi_j = 0$): big effect
 - ▶ Full political power to HS ($\theta_j = 0$): big effect
- ▶ Fraction of cross-country variability explained by econ factors
 - ▶ Simulate model with $\theta_j = \theta^{med}$ and $\varepsilon_j = \varepsilon^{med}$
 - ▶ Only source of variation: economic factors
 - ▶ $R^2=0.5$ (1/2 explained by econ, 1/2 by non econ factors)

Robustness and fit

Counterfactual experiments

G7	Obs	no altr \tilde{m}	no redist $\tau_j = 0$	$\zeta_j = 0$	Full power to HS $\theta_j = 0$	Remove non econ $\varepsilon_j = \varepsilon^{med}$ $\theta_j = \theta^{med}$
Can	2.1	2.1	2.7	3.0	6.3	2.0
Fra	3.0	3.0	7.3	8.2	9.8	0.7
Ger	4.7	4.7	11.3	12.7	15.4	1.3
Ita	0.9	0.9	1.0	1.0	3.5	1.6
Jap	0.5	0.5	0.6	0.7	1.0	0.8
UK	1.8	1.8	2.4	3.3	7.1	1.1
USA	16.0	15.6	34.3	37.9	48.3	2.9

Robustness and fit



Counterfactual vs observed immig rates: $R^2=0.5$

No-regret & decentralization

3.3. How much does the no-regret help?

Additional migration ($\times 1000$) and GDP gap with $\beta = 0.007$

	Nationalist	No-regret	
		G7	OECD
Additional migration ($\times 1000$)	0	1,660 +5.7%	2,603 +7.4%
Ratio of US/Developing GDP	7.07	7.05 -0.3%	6.95 -1.7%

No-regret & decentralization

- ▶ Who takes more migrants?
 - ▶ Countries with small immig rates
- ▶ Subsidy per million of migrants
 - ▶ Decrease with country size
 - ▶ Increase with productivity
- ▶ Comparison with Utilitarianism
 - ▶ Benthamite is less effective (max gains for the rich)
 - ▶ Millian is more effective (loss for large countries)
 - ▶ Not Pareto-improving!!! No incentive to participation

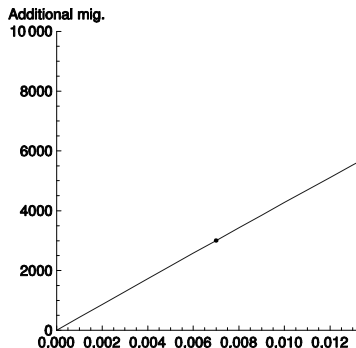
No-regret & decentralization

Selected j	\tilde{m}_j	\bar{m}_j	$\Delta m_j / m_j$	p_j / n_j	Benth.	Millian
Australia	1010.8	1056.6	+4.5%	\$100	1031.5	1020.2
Belgium	351.2	391.1	+11.4%	\$101	377.7	358.4
Canada	2108.7	2192.5	+4.0%	\$57	2151.7	2140.9
France	2966.9	3233.3	+9.0%	\$13	3192.7	3316.9
Germany	4752.7	5151.9	+8.4%	\$8	5103.7	5584.0
Italy	914.9	999.4	+9.2%	\$47	933.7	947.6
Japan	498.4	606.7	+21.7%	\$38	511.2	552.6
Korea Rep	71.8	97.7	+36.1%	\$105	73.5	74.8
Portugal	307.7	327.7	+6.5%	\$125	314.6	309.5
Switzerland	525.4	547.9	+4.3%	\$222	537.8	527.6
UK	1837.9	1984.2	+8.0%	\$26	1900.8	1938.4
USA	16000.2	17071.9	+6.7%	\$4	16955.1	24335.6
All	35227.0	37830.8	+7.4%	-	37128.6	45050.3

Robustness

Additional migration ($\times 1000$) as a function of β

- ▶ $\beta = 0.007$ (US charities)
 - ▶ Emmig incr. by 7.4%
 - ▶ Income incr. by 1.5%
- ▶ $\beta = 0.013$ (Exp. Econ)
 - ▶ Emmig incr. by 15%
 - ▶ Income incr. by 3.0%



With remittances and aid

3.4. Accounting for remittances and aid

- ▶ Introducing recorded remittances boosts the results:
 - ▶ Hyp: migrants sent back $\eta = 3\%$ of c_j^m (Bollard et al. 2011)
 - ▶ In country 0:

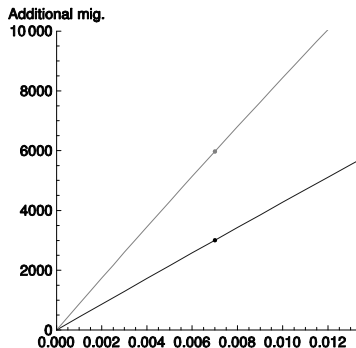
$$c_0^l = f_0'(l_0)l_{0,1}'(n_0^l) + \eta \sum_j \frac{m_j c_j^m}{l_0}$$

- ▶ The value of the externality increases!!!
 - ▶ More migrants & greater effect on poverty
 - ▶ No-regret is much more effective (+17% rather than +7%)
- ▶ Introducing aid does not modify the results

With remittances

Total additional migration ($\times 1000$) with recorded remittances

- ▶ $\beta = 0.007$ (US charities)
 - ▶ Emmig incr. by 17%
 - ▶ Income incr. by 4%
- ▶ $\beta = 0.013$ (Exp. Econ)
 - ▶ Emmig incr. by 33%
 - ▶ Income incr. by 8%



Conclusion

- ▶ Small aversion to extreme poverty ($\beta = .007$):
 - ▶ Negligible role in determining nationalist immigration policies
 - ▶ Significant gains from coordination
 - ▶ With remittances (+17% of mig., +4% in inc.)
- ▶ Greater effectiveness if $\beta = .013$ (+33% of mig., +8% in inc.)
- ▶ Greater effectiveness with unofficial remittances...
- ▶ Our treaty is unlikely... but highlights the "free-riding" consequences of uncoordinated visa restrictions