International migration policy

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Outline

- Tools for migration policy
- Labor movements
  1. Static
     - Without welfare state
     - With welfare state
  2. Dynamic
- A lobbying model
- Coordinating immigration policies: The case of asylum seekers

Migration policy instruments

- Migration quotas are the most commonly used tool. They put a limit to the number of foreign workers admitted to the country. (Examples: the US set a quota for H1B visas for highly skilled professionals; quotas on nurses etc.)
- Quota cum tax instruments: Migrants face a quota and they are taxed differently from the native population
- Migration subsidies. They have been used in the past by many Latin American countries to attract foreign workers. For a nice overview see Timmer and Williamson (1998)

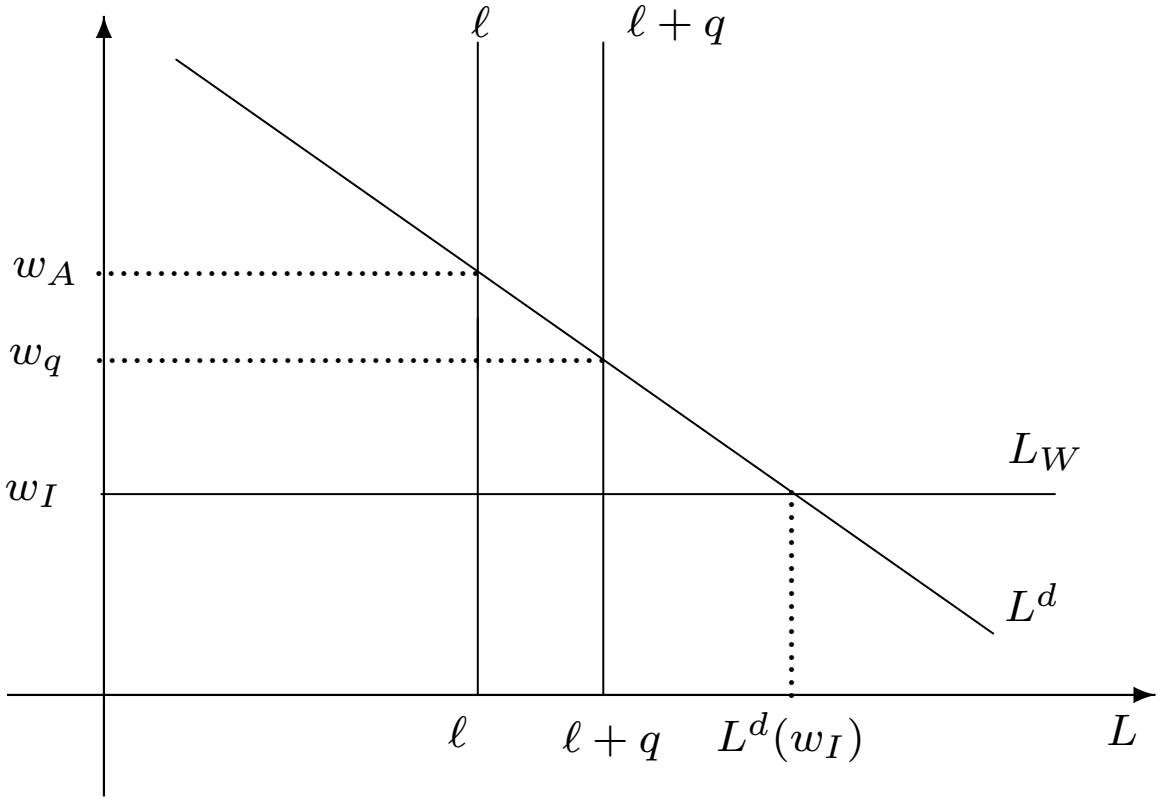


Figure 1: A migration quota

Effects of a quota

- If the quota is binding it reduces the inflow of migrants compared to free factor mobility.
- The result is that the wage in the Host country is higher than it would have been if migration was free.
- Compared to free migration, domestic capital owners are made worse off by the quota. Domestic workers on the other hand see their wage and welfare improve.
- What about the migrants? If they are allowed to retain the surplus from the quota, by relocating they earn a higher wage than in the source country.

Quota cum tax

- The main difference from the quota is that part of the rents associated to the quota are captured by the Host country government.
- This might occur because migrants face a different tax treatment, or simply bacause they are practically excluded from some of the benefits of the welfare state.

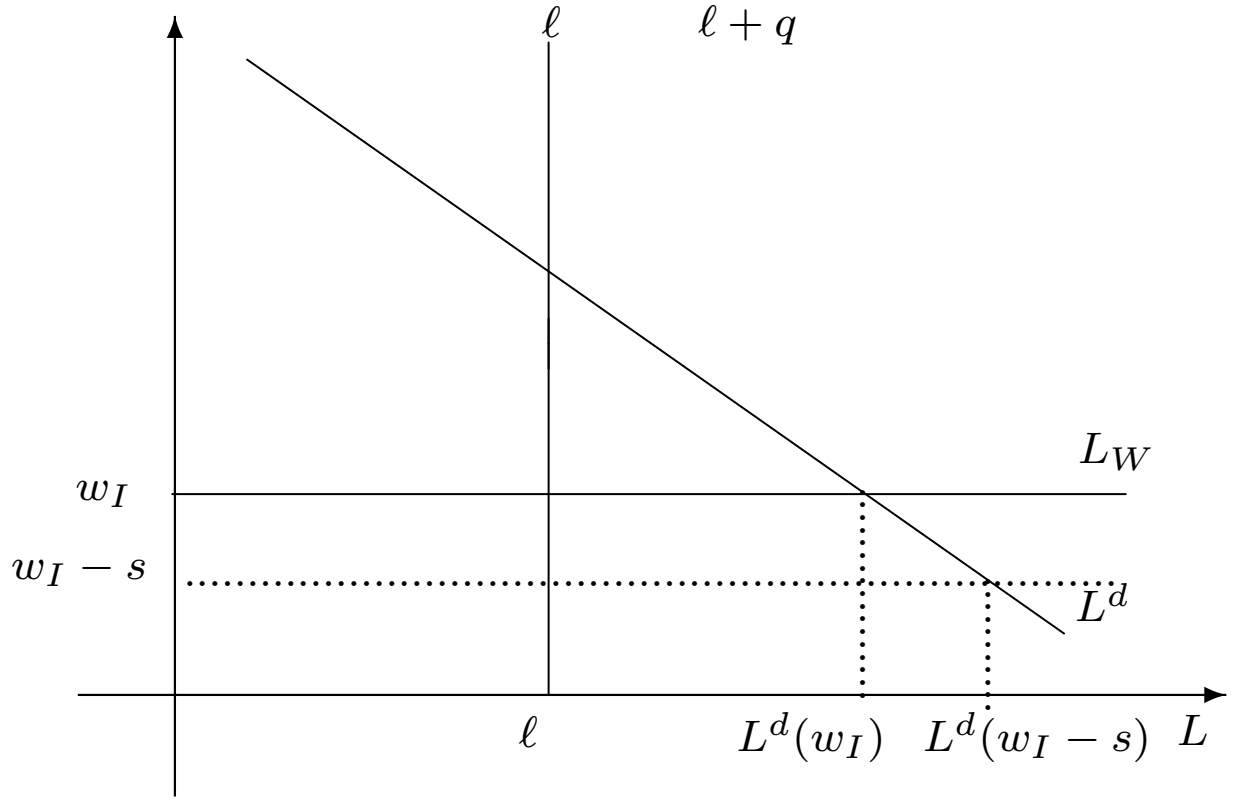


Figure 2: A migration subsidy

Migration Subsidy

- A migration subsidy decreases the wage in the Host country below the free migration level.
- It benefits domestic capital owners, while it hurts domestic workers.
- In general it is inefficient, but it has been used to attract workers in labor scarce countries. Brazil in the late XIX century (to bring workers for the coffee plantations), Argentina in the XIX century, Australia etc.

Labor: Static models

(1) *Foreman-Peck (1992)*

What is the optimal number of immigrants?
The government maximizes

$$\max_{L_2} V = \alpha w_1 + \beta\pi + (1-\alpha-\beta)r$$
$$\text{s.t.} \quad Q = f(L_1, L_2, T, K)$$

- L_1 domestic labor supply, w_1 return, α is the weight attached by the government to the well being of domestic workers
- L_2 immigrant labor supply
- K is domestic capital stock, π return, β is the weight attached by the gov't to the well being of domestic capital owners
- T is land, r return, $(1-\alpha-\beta)$ is the welfare weight

Optimal choice

$$\alpha f_{L_1 L_2} + \beta f_{K L_2} + (1 - \alpha - \beta) f_{T L_2} = f_{L_2} = w_2 \qquad (1)$$

Remarks

1. Only welfare of domestic factors is considered
2. If $\frac{\partial L_2}{\partial w_1} > 0$ immigrant and domestic labor are net substitutes in production; similarly if $\frac{\partial L_2}{\partial \pi} < 0$ immigrant labor and domestic capital are net complements etc.
3. Notice the role of complementarities
4. 'Political economy' is very reduced form

(2) *Benhabib (1996)*

- Optimal migratory policy with capital/skill requirements with heterogenous agents in a median voter setting.
- Non economic aspects of migration are ignored also in this model.

- Modelling assumptions:
  - $Y = F(K, L)$, CRTS aggregate technology, output is the numeraire
  - In equilibrium $w = F(K/L) - F'(K/L)(K/L)$ while $r = F'(K/L)$
  - Native individuals characterized by the number of units of physical or human capital they own k, with density $N(k)$, defined over $[0, \infty)$

- Potential immigrants characterized by k, distributed according to $I(k)$, defined over $[0, +\infty)$
- The initial capital stock in the pre–migration equilibrium is $K_0 = \int_0^\infty N(k)kdk$
- The initial total labor supply is $L_0 = \int_0^\infty N(k)dk$
- $R_0 = \frac{K_0}{L_0}$ is the initial capital labor ratio
- $\frac{\int_0^{k_m} N(k)dk}{L_0} = 0.5$ defines the capital stock owed by the median native

- *Definition* An immigration policy $P[s,q]$ restricts the type of immigrants' to those with a value of k in the interval $[s,q]$.
- The post immigration capital–labor ratio is given by

$$R_s^q = \frac{K_0 + \int_s^q I(k)kdk}{L_0 + \int_s^q I(k)dk} \tag{2}$$

- Individual i will be indifferent between the status quo and an immigration policy $P(s,q)$, if and only if

$$f(R_s^q) - f'(R_s^q)R_s^q + k_i f'(R_s^q) = f(R_0) - f'(R_0)R_0 + k_i f'(R_0) \tag{3}$$

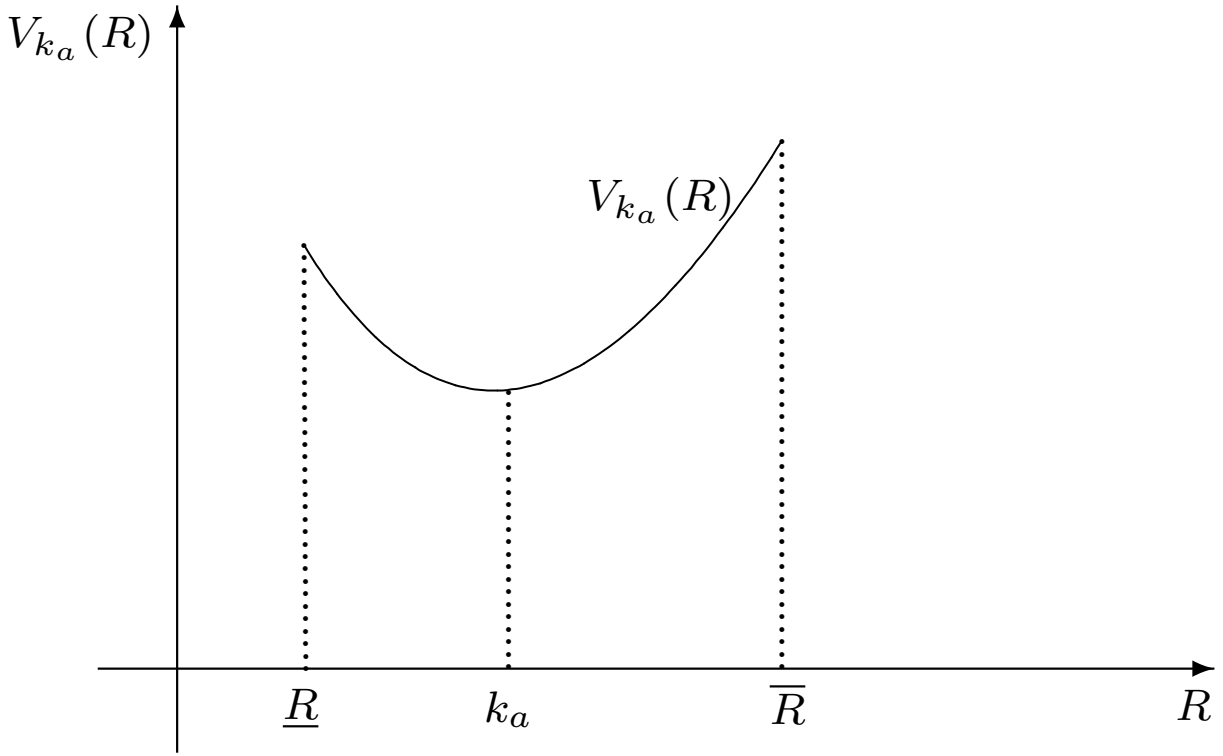
Proposition The following holds:

1. The average person of type $k = R_0$ obtains a higher income under any migration policy $P(s,q)$ than under the status quo
2. If $R_s^q < R_0$ then $R_s^q < k_i < R_0$, and all natives with $k > k_i$ are better off under the policy
3. If $R_s^q > R_0$ then $R_0 < k_i < R_s^q$, and all natives with $k < k_i$ are better off under the policy
4. A policy $P(s,q)$ will be defeated in a referendum if
   (a) $k_m \leq k_i$ when $R_s^q < R_0$
   (b) $k_m \geq k_i$ when $R_s^q > R_0$

Which policy outcome would defeat any other policy in a pairwise contest under majority voting?

- The maximum after migration capital labor ratio is given by $\overline{R} = R(\underline{s}, \infty)$ where $\underline{s}$ is the maximum s such that $R(s, \infty) = s$.
- The minimum after migration capital labor ratio is given by $\underline{R} = R(0, \overline{q})$, where $\overline{q}$ is the lowest q such that $R(0, q) = q$.
- The policy chosen by an individual k_a solves

$$\max_{R \in [\underline{R}, \overline{R}]} f(R) - f'(R)R + f'(R)k_a \tag{4}$$


$V_{k_a}(R)$
$V_{k_a}(R)$
$\underline{R}$
k_a
$\overline{R}$
R

- More generally, depending on individual a endowment of capital, his most desired outcome will be either $\underline{R}$ or $\overline{R}$
- Let k_I be the agent indifferent between $\underline{R}$ and $\overline{R}$.
- A policy $P(\underline{s}, \infty)$ defeats all other immigration policies if $k_m < k_I$; a policy $P(0, \overline{q})$ will instead be chosen if $k_m > k_I$

Remarks

- Notice that while imposing minimal (human or physical) capital requirements might be feasible, it might be very hard to limit the amount of capital workers bring in...
- The policy choice here boils down to minimum or maximum skill or wealth requirements, but does not say anything about the actual number of migrants to be admitted. This is of course an important limitation of the model.

Dynamic Extension (Ortega (2005))

- Immigrants will gain voting rights in the future, and there is uncertainty in the skill level of their children
- Redistribution and immigration policy are decided in every period
- *Trade off*: benefitting from complementarities will result in reduced control over future policies
- Realistic parameter values lead to equilibrium in which median voter is unskilled and high redistribution/unskilled immigration is chosen in equilibrium
- Intuition: immigration policy is used to generate the political support needed to maintain high redistribution.

(3)*Razin, Sadka and Swagell (2002)*

Basic question: To what extent does migration affect the redistribution carried out by the welfare state?

Model setup

- Small country, populated by a population of size 1, endowed with K units of capital.
- Agents characterized by ability e, uniformly distributed according to $G(e)$ over $[0, 1]$.
- Skill acquisition decision: either spend a fraction e of time to acquire skill and supply one unit of labor, or remain unskilled and supply $q < 1$ units of labor

- Pecuniary, non tax deductible cost of acquiring education γ (to guarantee existence of interior solution for tax problem without migration)
- Government imposes linear income tax (τ) rebated through lump sum demogrant b
- Agent characterized by innate ability e is indifferent between acquiring or not an education if

$$wq(1-\tau)+b = w(1-\tau)(1-e)-\gamma+b \tag{5}$$

- Thus, the minimum skill needed to acquire an education

$$e^* = 1-q-\frac{\gamma}{(1-\tau)w} \tag{6}$$

If $e < e^*$, agents stay unskilled.

- m unskilled immigrants are allowed. Total labor supply is then given by

$$L = \int_0^{e^*} (1 - e) dG + q[1 - G(e^*)] + qm \tag{7}$$

and thus

$$L = e^* - \frac{1}{2}(e^*)^2 + (1 - e^* + m)q \tag{8}$$

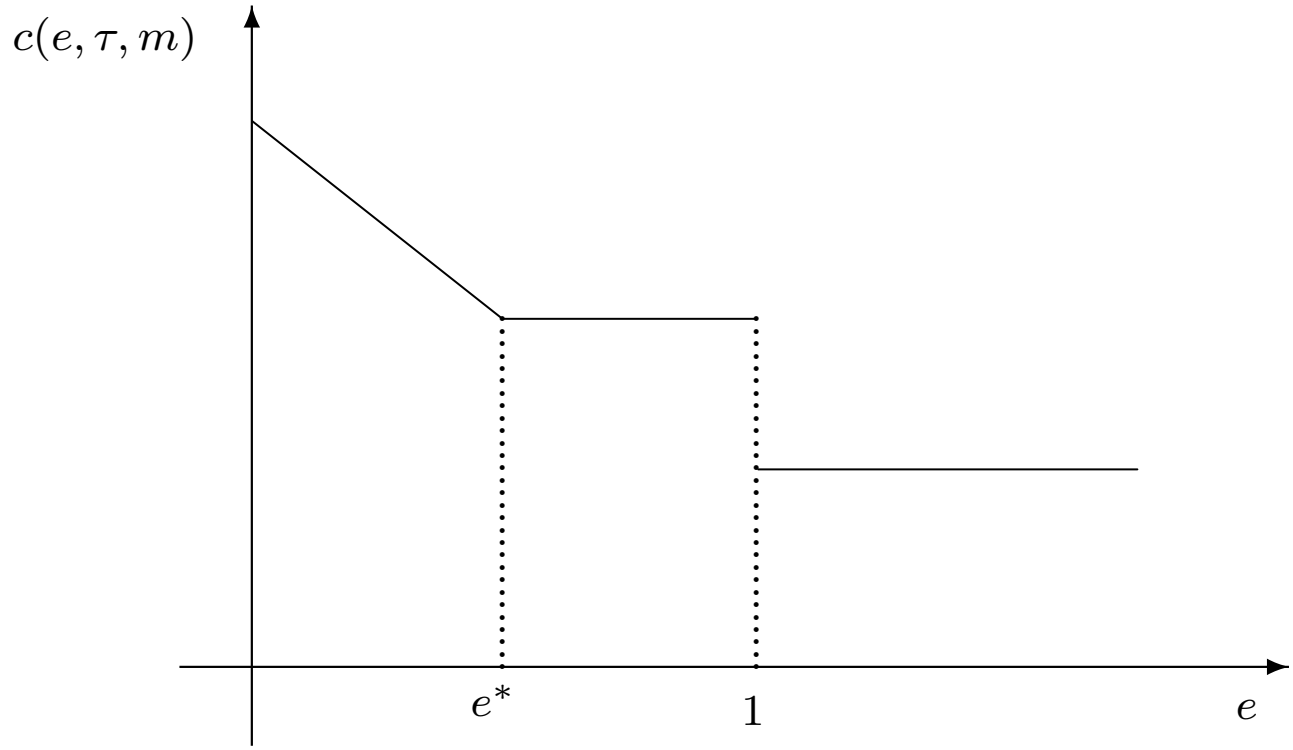
- Technology is characterized by a linear production function, to insure that factor prices are not affected by immigration

$$Y = wL + (1 + r)K \tag{9}$$

- Balanced budget requires

$$b = \frac{\tau(wL + rK)}{1 + m} \tag{10}$$

- Combining equations 6, 8 and 10, we obtain $e^* = e^*(\tau, m)$, $L = L(\tau, m)$ and $b = b(\tau, m)$.
- Let $c(e, \tau, m)$ be the disposable income of agent with ability e.


$c(e, \tau, m)$
e^*
1
e

- It can be shown that $\frac{\partial^2 c(e,\tau,m)}{\partial e \partial \tau} \geq 0$. Thus if $\frac{\partial c}{\partial \tau} > 0$ for e_0, this will be true for all $e > e_0$. On the other hand, if $\frac{\partial c}{\partial \tau} < 0$ for some e_0, this will be true for all $e < e_0$. In other words, the voter with median innate ability chooses tax policy.
- If immigrants can vote, the innate ability level of the median voter is given by $e_M = \frac{1}{2}(1 + m)$. Income tax chosen is

$$\tau_0(m) = \arg\max_{\tau} c(e_M(m), \tau, m) \tag{11}$$

- $\tau_0(m)$ is thus implicitly defined by

$$\frac{\partial c(e_M(m), \tau, m)}{\partial \tau} = B(m, \tau(m)) = 0 \tag{12}$$

- Consider the case of an unskilled native median voter. The following then holds:

$$\left[\tau w \frac{\partial L}{\partial \tau}\right] /(1+m) = I_M - \overline{I} \tag{13}$$

where $I_M = wq + rK$ is the pre tax median income, and $\overline{I} = (wL + rK)/(1+m)$ is the pre–tax mean income.

- Totally differentiating the first order condition we have

$$\frac{d\tau_0}{dm} = -\frac{B_m}{B_\tau} \tag{14}$$

and $B_\tau < 0$.

If migrants can vote...

$$B_m(m) = \begin{cases} \frac{w(q+m)}{1+m} - \frac{rK}{1+m} & \text{if } e_M < e^* \\ -\frac{rK}{1+m} & \text{if } 1 > e_M > e^* \\ 0 & \text{if } e_M > 1 \end{cases}$$

Remarks

- If the median voter is a skilled native, the effect of migration on the extent of redistribution are ambiguous
- If median is unskilled native, an increase in the number of Immigrants *lowers* the tax rate and the demogrant. The decrease is equal to the welfare leakage that occurs from the native (unskilled) to the migrant.

- Intuition: the power balance does not change with the immigrant inflow: at the margin the median native sees more of the demogrant going to the unskilled immigrant

If migrants cannot vote

$$B_m(m) = \begin{cases} \frac{w(q+m)}{1+m}(q-\frac{1}{2}) - \frac{rK}{1+m} & \text{if } e_M < e^* \\ -\frac{rK}{1+m} & \text{if } 1 > e_M > e^* \\ 0 & \text{if } e_M > 1 \end{cases}$$

- In this case an inflow of immigrant does not have any effect on the political power balance, and if the median voter is a skilled native, immigration will reduce the extent of redistribution.

Empirical Analysis

- Use unbalanced panel of 11 European countries, covering the period 1974-1992
- Contains information on:
  - Labor tax rate
  - GDP per capita
  - Transfer/GDP
  - Transfers per capita
  - Income distribution
  - Size of the government
  - Skill levels of natives and migrants
- Regressions are run using both labor tax rates and log of per capita social transfers as the dependent variables and include country fixed effects

Table 1

Table 2

Table 3

Dynamic Models

(4)*Razin, Sadka and Swagell*

Question: In the presence of a redistributive welfare state, and of a welfare leakage, is unskilled migration necessarily unattractive for the native population?

- OLG model, agents live for two periods, population normalized to 1 in the first period, growth rate is n.
- In the first period agents face same skill acquisition decision as in the last paper, but no pecuniary cost associated to schooling. Ability treshold becomes

$$e^* = 1 - q \tag{15}$$

- Agent works, consumes and saves in the first period. In the second period she lives off savings and a pension funded through a PAYGO social security system.
- The intertemporal budget constraint for an agent of ability e born in period zero is

$$c_1 + \frac{c_2}{1+r} = W(e)(1-\tau) + \frac{b_1}{1+r} \tag{16}$$

  where $W(e) = w(1-e)$ if the agent invests in skill acquisition, while $W(e) = wq$ if he doesn't.
- Let $V_1^e(W(e)(1-\tau), b_1, r)$ is the indirect utility of the young in period zero, strictly increasing with b_1
- Let $V_0^e(b_0, r)$ be the indirect utility of the old in period zero, also strictly increasing with b_0

- With m unskilled immigrants arriving in period zero, and following the same reproductive behavior of the native population, labor supply in zero is

$$L_0 = e^* - \frac{1}{2}(e^*)^2 + (1 - e^* + m)q \tag{17}$$

  while labor supply in period one is

$$L_1 = (1+m)(1+n)[e^* - \frac{1}{2}(e^*)^2 + (1 - e^*)q] \tag{18}$$

- Assuming a linear production technology (i.e. factor returns are fixed) and balanced budget in every period, given a payroll tax τ, the demogrant paid in zero is

$$b_0 = (1+n)\tau w(e^* - \frac{1}{2}(e^*)^2 + (1 - e^* + m)q) \tag{19}$$

- Period zero's old are unambiguously better off the larger the immigrant group

- The demogrant paid in period one is

$$b_1 = \tau w(1+n)[e^* - \frac{1}{2}(e^*)^2 + (1-e^*)q] \tag{20}$$

- Inflow of immigrants in period zero does not have an impact on the demogrant paid in one.
- Summing up: current old are net beneficiary from immigration, while future generations are not affected.
- Unskilled immigration is Pareto improving.

A lobbying model

Facchini and Willmann (2005)

Examples

- Chinese Exclusion Act (1882)
- Literacy Test (1917)
- Immigration Reform and Control Act (1986)
- Silicon Valley executives *trooped* before congress to increase the number of H1B visas (1998)
- Hollings' (2000) bill proposal on restricting FDI in Telecommunication Industry
- New visa program for *nurses* (2001)

- Extensive subsidization of FDI: examples from the USA

Year	Investor	Dollars per Job
1980	Honda	4000
early 1980s	Nissan	17000
1984	Mazda-Ford	14000
mid-1980s	Mitsubishi-Chrysler	35000
mid-1980s	Toyota	50000
mid-1980s	Fuji-Isuzu	51000
1992	BMW	70000
1993	Mercedes-Benz	168000

Table 1: FDI Subsidies (Oman, (2000))

Objective

- Propose a theory of the endogenous formation of policy towards the international mobility of production factors.
- Determine equilibrium policy as a result of the interaction of domestic interest groups with incumbent politicians driven by electoral considerations.
- Highlight the role of complementarities among production factors.

Modeling Strategy

- Home is a small country:
  1. M agents
  2. Government controls international factor flows
- $I = \{1, ..., n\}$ is the set of production factors
- $\alpha_i = \frac{M_i}{M}$ share of the population supplying factor i
- $\Lambda \subseteq I$ (exogenous) set of organized factors

- One output good, DRTS technology: $Y = F(L_1, ..., L_n)$
- $\pi(\mathbf{w})$ is the profit function
  Equal profit shares to all factors.

- ℓ_i is domestic factor supply
  L_i^D is domestic factor demand
  $m_i = L_i^D - \ell_i$ is the amount of factor i imported

- Output price normalized to 1
- w_i, w_i^* are the domestic and foreign *real* prices of factor i

The Factor Protection Game

Agents play a non-cooperative *menu auction* (Bernheim and Whinston, 1986)

- First stage: Lobby presents government with contribution schedule $B_i(\mathbf{w})$
- Second stage: Government sets domestic price vector $\mathbf{w} \in \mathbf{W}$ and collects contributions

Payoffs

- Factor i's *gross* payoff
  $g_i(\mathbf{w}) = w_i \ell_i + \alpha_i[\pi + \sum_{k \in I}(w_k - w_k^*)(L_k^D - \ell_k)]$
- Government
  $S = a \sum_{i \in I} g_i(\mathbf{w}) + \sum_{i \in \Lambda} B_i(\mathbf{w})$

Equilibrium Policy

Proposition 2 If the equilibrium factor price vector lies in the interior of $\mathbf{W}$, then the government chooses a factor price vector that satisfies

$$\mathbf{w} - \mathbf{w}^* = (\nabla^{\mathbf{2}}_{\mathbf{W}}\pi)^{-1}(\mathbf{z})$$

$$z_j = \frac{(I_j - \alpha_\Lambda)\ell_j}{a + \alpha_\Lambda}$$

and $I_j = 1$ if factor j lobbies, 0 otherwise.

Since $(\nabla^{\mathbf{2}}_{\mathbf{W}}\pi)^{-1} = -\nabla^2 F$, then

$$w_j - w_j^* = -\frac{1}{a + \alpha_\Lambda} \sum_i F_{ji}(I_i - \alpha_\Lambda)\ell_i$$

Remarks

If factor j lobbies, protection

1. Increases with the amount of factor domestically supplied
2. Decreases with
   (a) share of the population lobbying (α_Λ)
   (b) weight attached to social welfare in government's objective function (a)
3. Complementarities in production matter

Complementarities

Definition Two inputs i, j are
– complements if $F_{ij} > 0$
– substitutes if $F_{ij} < 0$

If both i and j lobby:
$w_j - w_j^* = -\frac{1}{a+\alpha_\Lambda}(.. + F_{ji}(1-\alpha_\Lambda)\ell_i + F_{jj}(1-\alpha_\Lambda)\ell_j ..)$

A lobbying *complement (substitute)* lowers (increases) the amount of protection granted to a lobbying factor.

Example : Separability

Assume $\frac{\partial^2 \pi}{\partial w_i \partial w_j} = 0$ if $i \neq j$. Then

$$\frac{t_i}{1+t_i} = \frac{(I_i - \alpha_\Lambda)}{a + \alpha_\Lambda} \frac{1}{\epsilon_{m_i,w_i}} \frac{\ell_i}{m_i}$$

Provided that the country is an importer of factor i :

1. If factor i lobbies, it will be granted protection ($t_i > 0$)
   if it does not imports of that factor are going to be subsidized;
2. If factor i lobbies, protection is decreasing in the share of the population lobbying (the parameter α_Λ).
3. Protection is decreasing with the elasticity of import demand and is increasing with the inverse of the import penetration ratio.

Equivalence of Tariffs and Quotas

The quota game

- Define $\phi(\mathbf{w}) \equiv -\nabla\pi : \mathbf{W} \to \mathbf{L}$
- Lobby's contribution schedule $\tilde{B}_i(\mathbf{L})$
- Government chooses domestic employment levels $\mathbf{L}$ and collects the contributions from the lobbies

Payoffs

- Factor i's *gross* payoff

  $\tilde{g}_i(\mathbf{L}) = \phi_i^{-1}(\mathbf{L})\ell_i + \alpha_i[\pi(\phi^{-1}(\mathbf{L})) + \sum_{k\in I}(\phi_k^{-1}(\mathbf{L}) - w_k^*)(L_k^D - \ell_k)]$

- Government

$$\tilde{S} = a\sum_{i\in I}\tilde{g}_i(\mathbf{L}) + \sum_{i\in\Lambda}\tilde{B}_i(\mathbf{L})$$

Proposition 1 The tariff game and the quota game are strategically equivalent.

Proof.

1. Define $\tilde{B}_i(\mathbf{L}) = B_i(\phi^{-1}(\mathbf{L}))$

$\Rightarrow$ It's just a matter of relabeling!

Remark

The result can be extended to a mixed case, where the government chooses any combination of tariffs for some factors and quotas for others .

Conclusion

- General theory of endogenous formation of policy towards factor movements
- Complementarities in production are important
- Lobbying matters in explaining migration and FDI policies, but government is welfare-minded

Extensions

- Multiple outputs
- Multiple countries, i.e. to model bidding wars for FDI
- Richer political interaction: endogenize government's objective function through political competition

Coordinating policies towards asylum seekers

Facchini, Lorz and Willmann (2006)

- Coordination of asylum policies within the EU
  - First steps towards a *Common European Asylum System* (common minimum standards)
  - Proposals for a more substantial coordination (including cost sharing between member states)
- Policy questions
  - Are there welfare gains from a coordination of asylum policies?
  - To what extent should policies be coordinated?

Motivation

- This paper: political economy model of policy-making towards asylum seekers
  - Voters elect representatives who subsequently set immigration levels
  - Representatives are policy motivated and choose immigration policies according to their policy preferences
- Main results:
  - Strategic delegation influences non-cooperative and cooperative decision-making
  - Welfare gains from a policy coordination
  - Welfare gains are higher for a lower degree of cooperation

Economic Model

- Two symmetric countries ($i = 1, 2$)
- Countries control admitted number of asylum seekers m_i
- Altruistic benefit from granting asylum ("warm glow")
- Costs from admitting asylum seekers, with incomplete cost spill-overs ("hot potato")
- Utility specification ($1/2 < \lambda < 1$):

$$U_i(\alpha_i, m) = [1 + \alpha_i]\,[m_i + m_{-i}] + \ln(1 - \lambda m_i - [1 - \lambda]\,m_{-i}) \quad (21)$$

Economic Model

- Heterogenous population:
  citizens differ with respect to the strength of the altruistic motive α
- Continuous distribution of α
- Mean and median α coincide ($\bar{\alpha}$)
- Both countries have the same $\bar{\alpha}$

Utilitarian optimum

- Social planner solves:

$$\max_{m_1,m_2} W = U_1(\bar{\alpha}, m) + U_2(\bar{\alpha}, m) \tag{22}$$

- This implies:

$$m_1^U(\bar{\alpha}) = m_2^U(\bar{\alpha}) = \frac{1 + 2\bar{\alpha}}{2 + 2\bar{\alpha}} \tag{23}$$

- Optimal immigration levels increase in $\bar{\alpha}$

Political Process

- Two stages of the political model:

  1. Representatives of both countries are chosen in national elections

  2. Representatives decide on m_i, with or without policy coordination

- No commitment
  $\Rightarrow$ Representative with preference term $\hat{\alpha}_i$ maximizes own utility
- Solution: backwards

Immigration Levels

- Representative i maximizes

$$U_i(\hat{\alpha}_i, m) = [1 + \hat{\alpha}_i]\,[m_i + m_{-i}] + \ln(1 - \lambda m_i - [1 - \lambda]\,m_{-i}) \quad (24)$$

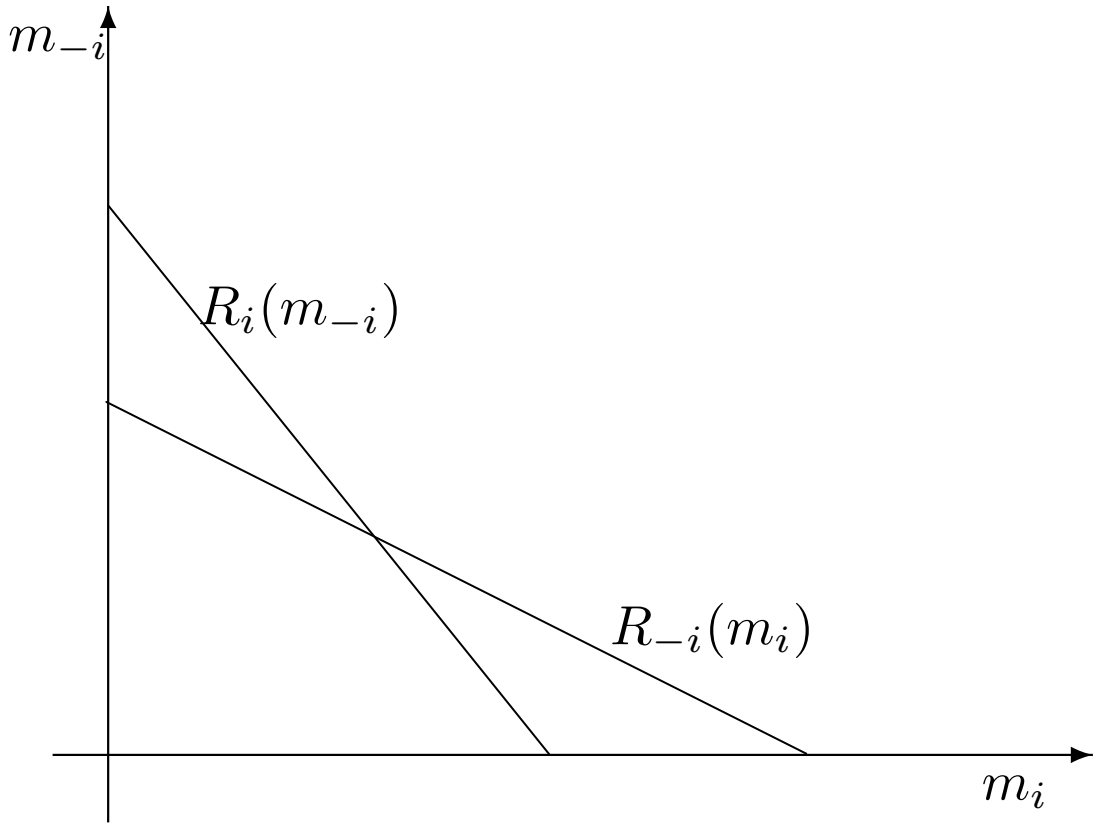
- Reaction function:

$$m_i = \frac{1 + \hat{\alpha}_i - \lambda}{\lambda\,[1 + \hat{\alpha}_i]} - \frac{1 - \lambda}{\lambda} m_{-i} \quad (25)$$

- Symmetric Nash-Equilibrium:

$$m_i^N(\hat{\alpha}) = \frac{1 + \hat{\alpha}_i - \lambda}{1 + \hat{\alpha}_i} \qquad \text{for} \qquad \hat{\alpha}_i = \hat{\alpha}_{-i} \quad (26)$$

Noncooperative Immigration Policy



Election Stage

- Citizens choose $\hat{\alpha}_i$ to maximize $U_i(\alpha_i, m^N(\hat{\alpha}))$
- Median citizen determines election outcome
- Symmetric equilibrium:

$$\frac{\bar{\alpha} - \hat{\alpha}_i}{1 + \hat{\alpha}_i} = \frac{1 - \lambda}{\lambda} \tag{27}$$

- Strategic delegation: Median voter elects a representative with a lower altruistic preference for immigration ($\hat{\alpha}_i < \bar{\alpha}$)

Proposition 1 *Strategic delegation worsens the problem of non-cooperative decision-making:*

$$m_i^N(\hat{\alpha}^N) < m_i^N(\bar{\alpha}) < m_i^U(\bar{\alpha})$$

Policy Coordination

- No cost sharing
- Representatives bargain about m_1 and m_2 in the second stage of the game
- Nash bargaining solution:

$$N = s_1 \cdot s_2$$

s_i: bargaining surplus

$s_i = U_i(\hat{\alpha}_i, m^B(\hat{\alpha})) - U_i(\hat{\alpha}_i, m^N(\hat{\alpha}^N))$

Policy Coordination

- First order condition:

$$\left\{1+\hat{\alpha}_i-\frac{\lambda}{1-\lambda m_i-[1-\lambda]\,m_{-i}}\right\}s_{-i}+ \tag{28}$$

$$\left\{1+\hat{\alpha}_{-i}-\frac{1-\lambda}{1-\lambda m_{-i}-[1-\lambda]\,m_i}\right\}s_i=0 \tag{29}$$

- Symmetric solution:

$$m_i^B(\hat{\alpha})=\frac{1+2\hat{\alpha}_i}{2+2\hat{\alpha}_i} \qquad \text{for} \qquad \hat{\alpha}_i=\hat{\alpha}_{-i} \tag{30}$$

- Same solution as for the utilitarian optimum; however, $\hat{\alpha}_i$ *may differ* from $\bar{\alpha}$

Election Stage

- Citizens choose $\hat{\alpha}_i$ as before
- Symmetric equilibrium:

$$\frac{\bar{\alpha} - \hat{\alpha}_i^B}{(1 + \hat{\alpha}_i^B)^2} = \frac{2\left[m_i^B(\hat{\alpha}^B) - m_i^N(\hat{\alpha}^N)\right]}{1 + s_i} \tag{31}$$

- Interpretation:
  - $\hat{\alpha}_i^B < \bar{\alpha}$: strategic delegation
  - $m_i^B(\hat{\alpha}^B) > m_i^N(\hat{\alpha}^N)$: gains from coordination

Proposition 2 *The number of asylum seekers admitted under policy coordination is higher than without coordination, but is still inefficiently low, i.e.*

$$m_i^N(\hat{\alpha}^N) < m_i^B(\hat{\alpha}^B) < m_i^U(\bar{\alpha})$$

Cost Sharing

- Countries bargain about m_i and about a side-payment Z from country 2 to country 1
- Nash bargaining solution: $N = (s_1 + Z)(s_2 - Z)$
- Immigration levels:

$$m_i^S(\hat{\alpha}) = m_{-i}^S(\hat{\alpha}) = \frac{1 + \hat{\alpha}_i + \hat{\alpha}_{-i}}{2 + \hat{\alpha}_i + \hat{\alpha}_{-i}} \tag{32}$$

- Side payment:

$$Z^S(\hat{\alpha}, m^S(\hat{\alpha})) = [\hat{\alpha}_2 - \hat{\alpha}_1] \left[m_i^S(\hat{\alpha}) - m_i^N(\hat{\alpha}^N) \right] \tag{33}$$

Election Stage

- Citizens maximize:

$$U_i(\alpha_i, m^S, Z^S) = 2\left[1 + \alpha_i\right] m_i^S - \ln(1 - m_i^S) \pm Z^S \tag{34}$$

  where $m_i^S = m_i^S(\hat{\alpha})$ and $Z^S = Z^S(\hat{\alpha}, m^S(\hat{\alpha}))$

- Symmetric equilibrium:

$$\frac{\bar{\alpha} - \hat{\alpha}_i^S}{(1 + \hat{\alpha}_i^S)^2} = 2\left[m_i^S(\hat{\alpha}^S) - m_i^N(\hat{\alpha}^N)\right] \tag{35}$$

Comparison

- Using equations 31 and 35 and rearranging yields:

$$\frac{\bar{\alpha} - \hat{\alpha}_i^B}{\left[1 + \hat{\alpha}_i^B\right] \left\{1 + 2\hat{\alpha}_i^B - 2\left[1 + \hat{\alpha}_i^B\right] m^N(\hat{\alpha}^N)\right\}} = \frac{1}{1+s_i} \qquad (36)$$

$$\frac{\bar{\alpha} - \hat{\alpha}_i^S}{\left[1 + \hat{\alpha}_i^S\right] \left\{1 + 2\hat{\alpha}_i^S - 2\left[1 + \hat{\alpha}_i^S\right] m^N(\hat{\alpha}^N)\right\}} = 1 \qquad (37)$$

- Left-hand-side of both equations decreases in $\hat{\alpha}_i$
  $\Rightarrow \hat{\alpha}_i^B > \hat{\alpha}_i^S$

- More strategic delegation with cost sharing than without

Proposition 3 *Coordination in the determination of policy towards refugees is desirable, but coordination with side payments between countries turns out to be less efficient than coordination without side-payments, i.e.*

$$m_i^N(\hat{\alpha}^N) < m_i^S(\hat{\alpha}^S) < m_i^B(\hat{\alpha}^B) < m_i^U(\bar{\alpha})$$

Summary and Conclusion

- This paper:
  - Altruistic motivations for a common asylum policy
  - Political economy model of policy-making
  - Gains from policy coordination?
- Results:
  - Policy coordination raises aggregate welfare
  - Utilitarian optimum is not reached
  - Less coordination can be better

Extensions

- More general utility functions
- Asymmetric countries
  - Asymmetric preferences
  - Asymmetric costs of immigration
  - Asymmetric spill-overs
- More than two countries