Self-Selection and the Economics of Immigration

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June 2010
“Migration poses two broad and distinct questions for the economist. The first, and the one which has received the major attention, concerns the direction and magnitude of the response of migrants to labor earnings differentials over space. The second question pertains to the connection between migration and those earnings, that is, how effective is migration in equalizing inter-regional earnings of comparable labor?”
2. Research on Sjaastad’s two questions

- Research on first question (e.g., research on interstate migration flows in U.S.) confirms that regional wage differentials determine size and direction of migration flows.
- Much less consensus on second question where most of the research uses the international migration context.
- Studies of labor market impact of international migration have found it difficult to document the predicted inverse relation between immigrant-induced supply increases and wages in receiving countries. Some studies question whether immigrant flows equalize inter-regional earnings at all (Card, 2005).
- Nature of empirical exercise determines the outcome: Relating wage differences across cities to immigrant-induced labor market shocks tends to find little impact; examining link between immigration and the evolution of the national wage structure finds much larger effects (Card, 1991; Borjas, 2003).
3. The migration decision

- What determines whether to migrate or not? Basic economic model: person migrates if the income gain from migrating exceeds the migration cost
- Let $V_1$ be present value of earnings (income) if one migrates to, say, the US
- Let $V_0$ be the present value of earnings if one stays in the sending country
- Migration occurs if $V_1 - V_0 > C$, where $C$ measures the cost of migration
4. West Side Story

- Bernardo: I think I’ll go back to San Juan.
- Anita: I know a boat you can get on.
- Bernardo: Everyone there will give big cheer.
- Anita: Everyone there will have moved here.

--Stephen Sondheim
5. Out-migration from Puerto Rico, as % of population
6. A major puzzle

- Why is there so little migration?
- Consider the flow between Puerto Rico and the United States. There has been a very large income gap between these two regions for many decades and there are no restrictions on migration between Puerto Rico and the U.S. mainland.
  - 1960: PPP-adjusted per-capita GDP in the United States was 3 times larger than in Puerto Rico.
  - 1998: PPP-adjusted per-capita GDP was still 3.5 times larger in the United States. PR = $21,500; USA = $34,300. Source: Penn World Tables
- Why did 70 percent of Puerto Ricans choose not to move?
7. Some theory

- A worker moves as long as the discounted gains from moving exceed migration costs.
- The marginal mover is characterized by:

\[
\frac{w_1 - w_0}{r} = C
\]

- where \( w_1 \) gives the wage in the United States; \( w_0 \) gives the wage in the source country; \( r \) is the rate of discount; and \( C \) gives migration costs.
8. Migration costs must be VERY large

\[
\frac{w_1 - w_0}{r} = C \quad \rightarrow \quad \frac{34300 - 21500}{.03} = C,
\]

- Assuming rate of discount is 3 percent, migration costs at the margin must be $426,667. So 70 percent of Puerto Ricans have migration costs that exceed 427,000.

- **What exactly is the nature of these costs?**
9. The selection problem

- The immigrant flow is a non-random sample of the population from the countries of origin.
- Which persons leave the country of origin and which persons stay there?
10. Ad hoc theories of selection

- Benjamin Franklin, 1753: German immigrants are “the most stupid of their own nation.”

- George Patton, 1943: “When we land, we will meet German and Italian soldiers whom it is our honor and privilege to attack and destroy. Many of you have in your veins German and Italian blood, but remember that these ancestors of yours so loved freedom that they gave up home and country to cross the ocean in search of liberty. The ancestors of the people we shall kill lacked the courage to make such a sacrifice and continued as slaves.”
11. More ad hoc theories of selection

- **Chiswick (1978):** immigrants are “more able and more highly motivated” than natives.

- **Carliner (1980):** immigrants “choose to work longer and harder than nonmigrants”
12. Theory of selection: The Roy model

- Suppose immigrants choose to live in the country that maximizes their income.
- There is a linear relationship between wages and “skills” in each country:
  \[ \log \text{wage}_j = a_j + r_j S \]
- The intercept \(a_j\) gives the earnings of a person with little (zero) skills; the slope \(r_j\) gives the rate of return to skills in country \(j\).
- “Skills” increase earnings in both the country of origin and in the United States.
- There are no migration costs.
13. Positive selection

- Log wage
- Source Country
- U.S.
- Do Not Move
- Move
- $a_s$
- $a_{us}$
- $s_p$
- Skills

- Positive selection
14. Negative selection

Log wage

Source Country

U.S.

Move

Do Not Move

$S_N$

Skills

$a_{US}$

$a_S$
15. Impact of decline in U.S. incomes or increase in migration costs (positive selection)
16. Impact of decline in U.S. incomes or increase in migration costs (negative selection)

Source Country

U.S.

Log wage

\[ a_{US} \]
\[ a_S \]

\[ s^* \]
\[ s_N \] Skills
17. Entry wage of immigrants and income inequality in the source country

Each point represents a national origin group

Regression line indicates that a 25-unit increase in the Gini coefficient—roughly the difference between the UK and Mexico—lowers the wage by 30 percent.
18. Trends in emigrant share, by education, Mexico (Chiquiar-Hanson)

![Graph showing trends in emigrant share by education level in Mexico. The graph includes lines for high school graduates, some college, high school dropouts 0-8, and college graduates, with data points from 1960 to 2000.]
19. Chiquiar-Hanson and Fernandez-Huertas

- Chiquiar-Hanson use Census data
- Fernandez-Huertas uses the ENET:
  “The ENET is the household survey...used to calculate the official employment statistics for Mexico from the second quarter of 2000 until the end of 2004...The ENET is very similar to the Current Population Survey in the United States...Since every household is interviewed five times, with one of the five panels dropping out of the sample each quarter, a researcher can match the data on wages or schooling of an individual in a quarter in which she lives in Mexico with the migration behavior of that individual in the following quarter.”
20. Wage distributions of Mexican migrants and non-migrants (Fernandez-Huertas, 2009)
21. Degree of selection (diff. in wages) (Fernandez-Huertas, 2009)
22. The Puerto Rican setting

- Puerto Rico became a possession of the United States after the Spanish-American war in 1898.
- Jones Act of 1917 granted U.S. citizenship to all Puerto Ricans, so Puerto Ricans can move freely to the United States without legal restrictions facing immigrants from foreign countries.
- Little out-migration until after World War II. High unemployment in postwar Puerto Rico and introduction of low-cost air travel sparked initial out-migration (the 6-hour flight from San Juan to New York City cost less than $50).
- Most Puerto Rican out-migrants settled in New York City (in 1970, 68.9 percent of the Puerto Rican–born population in the United States lived there)
23. Data

- U.S. IPUMS
  - Men aged 14 to 64 years old

- Puerto Rican Census
  - Men aged 14-64 years old

- Definition of skill groups (as in Borjas, 2003)
  - Five education groups: 0-8, 9-11 years, 12 years, 13-15 years, 16+ years
  - Four labor market experience groups: 1-40 years in ten-year intervals
  - 20 skill groups over 4 cross-sections for 80 observations
24. Out-migration and in-migration in Puerto Rico, as % of workforce

![Graph showing out-migrant and in-migrant share over years from 1970 to 2000.]

- **Out-migrant share**
- **In-migrant share**
25. Per-capita GDP in Puerto Rico, relative to US (adjusted for international prices)
# 26. Puerto Rican wage structure

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<tr>
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<tbody>
<tr>
<td>Variance of log weekly earnings</td>
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<tr>
<td>Puerto Rico</td>
<td>0.713</td>
<td>0.701</td>
<td>0.883</td>
<td>0.727</td>
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<tr>
<td>United States</td>
<td>0.542</td>
<td>0.615</td>
<td>0.655</td>
<td>0.710</td>
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</table>
27. Out-migration rates from Puerto Rico, by education
28. In-migration of U.S.-born persons of Puerto Rican descent, by education

![Graph showing in-migration rates by education level and year.](image-url)
29. Relation between in-migrant and out-migrant shares
30. Determinants of migration flows

Out-migrant share of Puerto Rican born workers:

\[ q_{ijt} = \beta (w_{ijt}^{US} - w_{ijt}^{PR}) + \text{other variables} + \varepsilon_{ijt}, \]

- \( w^{US} \) = wage that Puerto Rican out-migrants actually earn in the U.S. labor market
- \( w^{PR} \) = wage that the typical Puerto Rican stayer earns in Puerto Rico
31. Determinants of out-migrant share of Puerto Rican workers

<table>
<thead>
<tr>
<th>Variables:</th>
<th>Specification</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
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<tr>
<td>Panel A: $w^{US} = \text{wage of Puerto Rican immigrants in U.S.}$</td>
<td></td>
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<tr>
<td>$\Delta(w^{US} - w^{PR})$</td>
<td>0.098</td>
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<td></td>
<td>(0.041)</td>
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<tr>
<td>$\Delta w^{US}$</td>
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<tr>
<td>$\Delta w^{PR}$</td>
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<tr>
<td>Controls for period fixed effects</td>
<td>No</td>
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</tbody>
</table>
32. Determinants of out-migrant share of U.S. born Puerto Ricans

<table>
<thead>
<tr>
<th>Variables:</th>
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<tr>
<td>Panel A: $w^US = $w^PR$ = wage of Puerto Ricans in U.S.</td>
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<tr>
<td>$\Delta (w^US - w^{PR})$</td>
<td>-0.148</td>
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<td></td>
<td>(0.050)</td>
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<tr>
<td>$\Delta w^US$</td>
<td>---</td>
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<td></td>
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<tr>
<td>$\Delta w^{PR}$</td>
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<td>Controls for period fixed effects</td>
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### 33. Wage consequences

<table>
<thead>
<tr>
<th>Specification</th>
<th>Decadal change in log annual earnings</th>
<th>Decadal change in log weekly earnings</th>
<th>Decadal change in fraction of weeks worked</th>
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<tbody>
<tr>
<td><strong>Model 1</strong></td>
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<tr>
<td>$\Delta$(In-migrant share)</td>
<td>-0.631</td>
<td>-0.543</td>
<td>-0.243</td>
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<tr>
<td></td>
<td>(0.246)</td>
<td>(0.269)</td>
<td>(0.187)</td>
</tr>
<tr>
<td>$\Delta$(Out-migrant share)</td>
<td>0.678</td>
<td>0.537</td>
<td>0.250</td>
</tr>
<tr>
<td></td>
<td>(0.246)</td>
<td>(0.185)</td>
<td>(0.153)</td>
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<tr>
<td><strong>Model 2</strong></td>
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<tr>
<td>$\Delta$(Net migrant share)</td>
<td>-0.665</td>
<td>-0.539</td>
<td>-0.248</td>
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<tr>
<td></td>
<td>(0.175)</td>
<td>(0.165)</td>
<td>(0.090)</td>
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34. Two-equation model

\[ q_{ijt} = \beta_1 w_{ijt}^{US} + \beta_2 w_{ijt}^{PR} + \text{other variables} + \varepsilon_{ijt}. \]

\[ w_{ijt}^{PR} = \theta_1 p_{ijt} + \theta_2 q_{ijt} + \text{other variables} + \varphi_{ijt}. \]

- **BIG CAVEAT:** Instruments are the potential U.S. wage in the out-migrant share equation; and the in-migrant share in the Puerto Rican wage equation.
35. IV estimates

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Dependent variable / Specification</th>
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<tbody>
<tr>
<td></td>
<td>Decadal change in out-migrant share of Puerto Ricans</td>
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<tr>
<td></td>
<td>(1a)</td>
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<tr>
<td><strong>Δ(Mean log wage in U.S.)</strong></td>
<td>0.673</td>
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<td>(0.203)</td>
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<tr>
<td><strong>Δ(Mean log wage in Puerto Rico)</strong></td>
<td>-0.183</td>
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<td>(0.068)</td>
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<tr>
<td><strong>Δ(Net log wage gain: U.S. – P.R.)</strong></td>
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<tr>
<td><strong>Δ(In-migrant share)</strong></td>
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<tr>
<td><strong>Δ(Net migrant share: In – Out)</strong></td>
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36. Conclusion

- A “separation theorem” has guided much of the literature in the economics of immigration.
- Some studies examine the determinants of the flows; other studies examine the consequences of the flows. And the twain never meet.
- Let’s throw the separation theorem away. Wages in both sending and source countries affect the size and composition of the immigrant flow, and the size and composition of the immigrant flow affect wages in both sending and receiving countries.