



Immigrants Inflows, Native outflows, and the Local Labor Market Impact of Higher Immigration

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Introduction

- Over the past decades, immigration to the United States have risen while the real wages of younger and less-educated workers have fallen.
- A growing body of research finds only modest evidence that immigrant competition has hurt labor market of low wage natives.
- A 10 percentage point increase in the fraction of immigrants reduce native wages by no more than 1 percentage point.

Introduction: Conceptual Problems

- Natives may move out in response to immigrants inflows
- This cross-sectional correlation may be upward bias by local demand shocks that raise wages and attract in-migrants
- In the long run, an immigration induced increase in the labor supply to a particular city can be diffused across the economy by intercity trade

Introduction: The Framework of This paper

- local labor market is stratified along occupational lines and CES technology
- The role of mobility in offsetting the effects of immigrants
- Nationally base probabilities for working in different occupation
- Distinguishing recent and past 5 years immigrants

Theoretical Framework

$$Y_c = F(K_c, L_c)$$

$$L_c = \left[\sum_j (e_{jc} N_{jc})^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}$$

$$FOC: \log N_{jc} = \theta_c + (\sigma - 1) \log e_{jc} - \sigma \log w_{jc}$$

$$\theta_c = \sigma \log [q_c F_L(K_c, L_c) L_c^{\frac{1}{\sigma}}]$$

$$\log \left(\frac{N_{jc}}{P_{jc}} \right) = \epsilon \log w_{jc}$$

Theoretical Framework (cont.)

$$\log w_{jc} = \frac{1}{\epsilon + \sigma} \{(\theta_c - \log P_c) + (\sigma - 1) \log e_{jc} - \log \left(\frac{P_{jc}}{P_c} \right)\}$$

$$\log \left(\frac{N_{jc}}{P_{jc}} \right) = \left(\frac{\epsilon}{\epsilon + \sigma} \right) \{(\theta_c - \log P_c) + (\sigma - 1) \log e_{jc} - \log \left(\frac{P_{jc}}{P_c} \right)\}$$

$$\log e_{jc} = e_j + e_c + e'_{jc}$$

Theoretical Framework (cont.)

$$\log w_{jc} = u_j + u_c + d_1 \log f_{jc} + u_{jc} \quad (4)$$

$$\log \left(\frac{N_{jc}}{P_{jc}} \right) = v_j + v_c + d_2 \log f_{jc} + v_{jc} \quad (3)$$

$$d_1 = -\frac{1}{\epsilon + \sigma}$$

$$d_2 = -\frac{\epsilon}{\epsilon + \sigma}$$

Theoretical Framework (cont.)

- The local productivity shocks raise wages and lead to an increase to in the population of a particular occupation
- So d_1 , d_2 in equation 3 and 4 have positive biases.
- Instrument variable = supply push component of the immigrant inflows to a particular city
- The assumption of supplying same unit of labor and earn same wage!
- You could assume different demographic subgroups within occupation.

limitation of the model

- Most important limitation is the assumption of one output good.
- Some goods and services can be exported.
- Change in local industry structure.
- However since the market signal to change is shift in relative wages at least in the short run we are good.
- Nevertheless OLS estimator of the equation 3 and 4 are likely to be smaller in magnitude than the effects would rise with fixed industry structure but they are larger than the run effects.

Implementation: Defining Local Labor market

Table 1
Characteristics of Natives and Immigrants

	All United States	In 175 Largest Cities	Outside of Largest Cities	In 175 Largest Cities		
				Natives	Pre-1985 Immigrants	Recent Immigrants
Weighted count (millions)	160.0	102.0	58.0	87.9	11.1	3.0
Immigrants (%)	10.2	13.9	3.7	.0	100.0	100.0
Immigrated, 1985–90 (%)	2.1	3.0	.7	.0	.0	100.0
Black (%)	9.9	11.5	7.0	12.3	6.8	6.8
Hispanic (%)	8.0	10.1	4.3	4.7	42.3	48.4
Average education (years)	12.6	12.9	12.2	13.1	11.6	11.1
Average age	39.9	39.6	40.3	39.7	40.7	31.9
Labor market outcomes:						
Worked in 1989 (%)	77.9	78.7	76.6	79.6	76.0	63.5
Average hours worked in 1989	1,403	1,427	1,360	1,445	1,390	1,025
Average hourly wage in 1989	11.92	12.82	10.25	12.99	12.30	9.20
Distribution of workers:						
By hourly wage (%):						
<\$6.00	25.6	21.8	32.8	20.8	24.6	44.3
\$6.00–\$9.99	28.4	27.4	30.4	27.1	29.2	29.3
\$10.00–\$15.00	22.0	23.1	19.8	23.6	21.4	13.1
>\$15.00	24.0	27.7	17.0	28.5	24.8	13.2
By location (%):						
Living in Los Angeles, New York, or Chicago	8.4	13.1	.0	10.0	31.6	35.1
Major city residents who lived elsewhere in 1985 ^a	...	20.5	...	19.6	27.6	...

Implementation: Defining occupation group

- An important question is who competes whom?
- Most existing studies treat immigrant workers as one factor of production and various subgroups of natives as separate factors.
- An alternative approach = individuals who work in the same occupation are perfect substitutes with each other regardless of their gender or country origin.
- Problems with this assumption: individual can move between occupations, it may be difficult to measure the population who could potentially work in an occupation.

Implementation: Defining occupation group

- π_{ij} is the probability of individual i to work in occupation j
- Six occupation: laborers, operative and craftsman, clerical workers, sales workers, managers, professional and technical workers.
- The paper estimated a set of multinomial logit models, by gender and immigrant status, for the probabilities of working in six occupations.
- The model included age, education, race, marital status, disability status, dummies for the 30 largest cities and dummies for living in some special cities
- The model for immigrants included the same basic covariates plus dummy variables for 17 different country origins

Implementation: Defining occupation group(cont.)

Table 2
Characteristics of Predicted Occupation Groups

	Occupation Group					
	I	II	III	IV	V	VI
Percentage female	53.9	23.8	81.8	55.9	45.8	53.8
Mean education	11.1	11.4	12.8	13.0	14.4	15.6
Percentage black	19.4	12.3	11.3	7.3	6.2	8.2
Percentage Hispanic	16.9	16.6	12.1	10.5	7.2	6.2
Percentage immigrant	19.1	16.9	11.9	11.5	9.4	10.6
Percentage recent immigrant	5.4	3.7	2.0	2.4	1.3	1.8
Percentage Mexican immigrant	4.7	5.5	2.3	1.8	.2	.1
Mean years in the United States among immigrants	14.4	15.5	18.3	17.4	20.5	18.7
Mean log wage	2.10	2.29	2.18	2.30	2.52	2.56
Percentage of workers	17.4	23.2	16.2	11.3	12.0	19.8
Percentage of population	19.5	22.8	17.2	11.4	11.0	18.1

Implementation: Defining occupation group(cont.)

Table 3
Predicted Occupation Distributions of Natives, Older Immigrants, and Recent Immigrants

	Predicted Percentage of Occupation						Index of Competition
	I	II	III	IV	V	VI	
Natives:							
All	18.3	21.9	17.6	11.8	11.6	18.8	.98
Dropouts	37.5	36.5	12.7	9.1	2.6	1.6	1.31
High school	22.6	28.4	22.0	12.2	7.9	6.9	1.08
Some college	14.8	19.6	21.2	13.9	13.4	17.2	.93
College or more	3.3	5.2	9.7	10.2	21.1	50.5	.67
Pre-1985 immigrants:							
All	24.5	27.5	15.6	9.5	8.3	14.6	1.09
Dropouts	38.5	41.8	10.5	6.8	1.6	.8	1.35
High school	25.7	28.4	20.4	11.7	7.4	6.4	1.12
Some college	18.5	21.9	20.9	12.1	11.7	15.0	.99
College or more	6.9	9.0	11.7	8.0	16.4	48.0	.74
Recent immigrants (all)	35.1	28.3	11.8	9.2	4.8	10.8	1.22

Implementation: The Degree of competition

- Intuitively, two groups with very similar predicted occupation distribution are in direct competition.
- Natives and older immigrants are fairly similar.
- The occupation distribution of recent immigrants is similar to natives who did not finish high school
- More formally we could build an index for measuring competition.
- Index I measures the effective increase in labor supply experienced by one group as the population of another group rises.

- $$I_{1,2} = \sum_j \frac{f_j^2 f_j^1}{f_j}$$

Immigrant Inflows and Intercity Mobility Patterns I

- Main Question: whether immigrant inflows to particular cities lead to offsetting mobility flows by natives and earlier immigrants

$$N_1^{90} = N_1^{85} + N_1^J - N_1^L$$

N^J : Joiners

N^L : Leavers

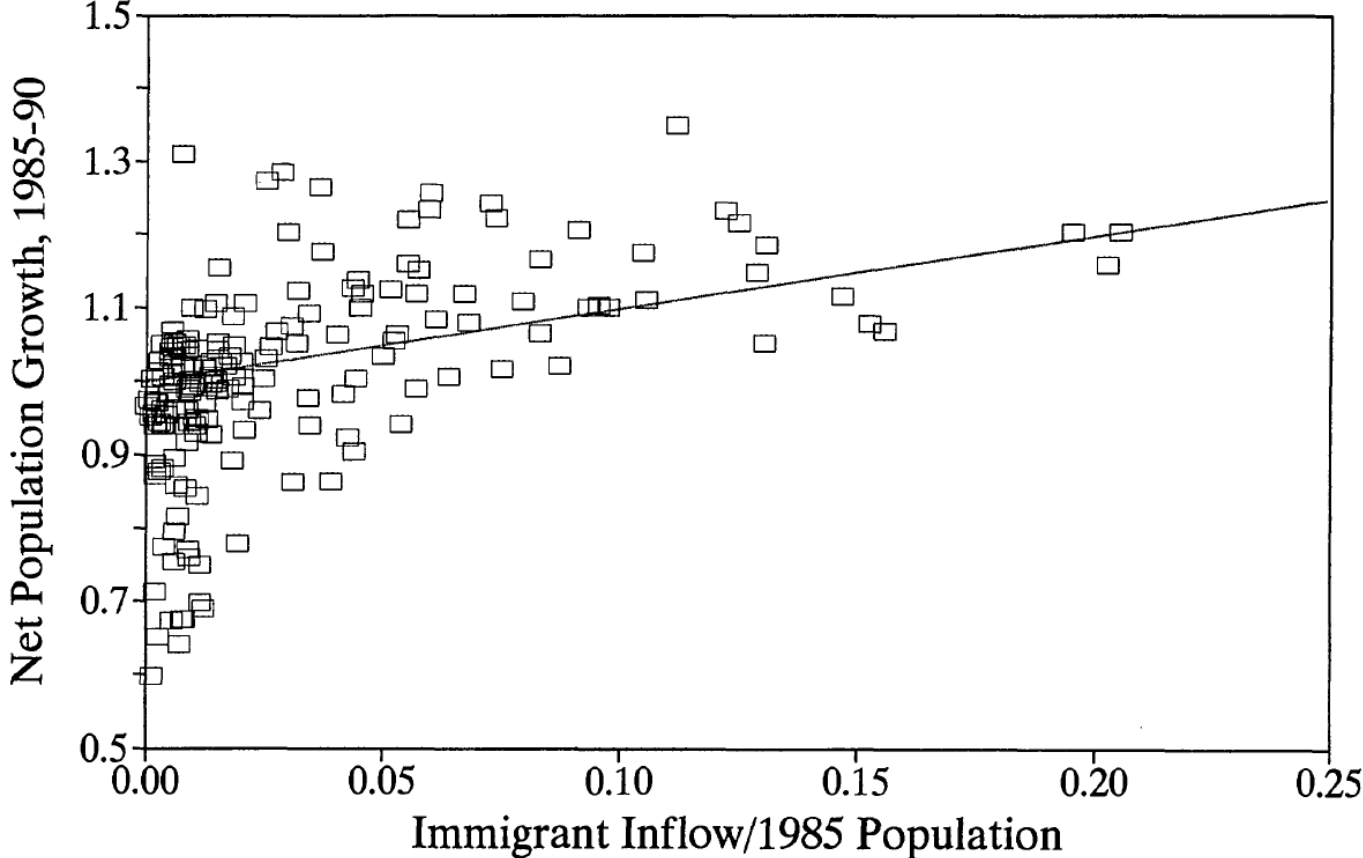
$$\frac{N^{90}}{N^{85}} = 1 + s_1(J_1 - L_1) + (1 - s_1)(J_2 - L_2) + R$$

s_1 : Share of natives in 1985

$$R = \frac{N_3^{90}}{N^{85}}$$

- Implication?

Immigrant Inflows and Intercity Mobility Patterns II



Immigrant Inflows and Intercity Mobility Patterns III

- Regression Equation:

$$y_{jc} = Z_{jc}\beta + \gamma R_{jc} + d_j + \theta_c + e_{jc}$$

y_{jc} : population growth for occupation j in city c

Z_{jc} : a vector of observable factors that affect this growth rate

d_j : skill-group fixed effect

θ_c : city fixed effect

III. Immigrant Inflows and Intercity Mobility Patterns IV

- Instrumental Variable:

$$SP_{jc} = \sum_g \tau_{gj} \lambda_{gc} M_g$$

- 17 country groups

Table 5
Countries of Origin and Predicted Occupation Distributions of Recent Immigrants

	Percent of Total	Mean Education (Years)	Predicted Fraction in Occupation Groups					
			I	II	III	IV	V	VI
All source countries	100.0	11.0	35.0	28.4	11.6	9.3	4.8	11.0
Mexico	26.2	8.0	39.3	41.9	10.3	7.5	.6	.4
Caribbean countries	8.4	11.1	37.6	26.0	17.7	8.3	4.4	6.0
Central America	8.2	9.0	39.9	31.3	13.2	8.3	3.4	4.0
China, Hong Kong, and Singapore	6.2	13.0	32.3	16.9	9.3	9.7	8.3	23.4
South America	6.0	12.2	32.0	26.0	18.1	8.7	6.2	8.9
Indonesia, Malaysia, and Brunei	6.0	11.3	42.5	23.7	9.8	8.4	4.3	11.1
Korea and Japan	5.9	13.6	29.9	18.0	8.5	17.0	9.0	17.6
Philippines	5.1	13.4	33.6	18.3	15.0	7.3	5.4	20.4
Burma, Laos, Thailand, and Vietnam	4.6	9.3	36.7	38.8	7.2	6.8	2.4	8.1
Australia, New Zealand, Canada, and United Kingdom	4.4	14.0	24.8	16.6	12.0	11.1	10.8	24.6
India, Pakistan, and Central Asia	4.1	14.0	21.9	17.1	12.2	12.8	8.0	28.0
Russia, Central Europe	4.0	13.0	33.3	28.3	7.1	7.2	5.7	18.3
Turkey, North Africa, and the Middle East	3.4	13.1	28.2	17.5	9.2	17.3	8.8	19.1
Northwestern Europe and Israel	2.9	14.3	27.5	15.9	11.3	11.7	9.6	23.9
Southwestern Europe	2.0	12.1	36.4	25.1	6.8	9.4	6.7	15.6
Africa (excluding North Africa)	1.7	13.3	29.9	24.0	18.7	7.0	6.8	13.7
Cuba	1.0	10.5	39.2	32.2	8.9	7.3	4.1	8.3

Table 4
Effects of Recent Immigrant Inflows on Migration Rates of Natives and Earlier Immigrants in the Same-Skill Group

	Native Out- and Inflows				Earlier Immigrant Out- and Inflows				Total Population Gain per New Immigrant
	Outflow Rate		Inflow Rate	Net Population Growth	Outflow Rate		Inflow Rate	Net Population Growth	
	Raw	Adjusted			Raw	Adjusted			
Ordinary least squares estimation:									
A. 175 cities weighted	.02 (.02)	.02 (.02)	.13 (.02)	.11 (.03)	.13 (.04)	.08 (.04)	.09 (.06)	-.04 (.07)	1.25 (.04)
B. 175 cities unweighted	.05 (.03)	.05 (.03)	.08 (.05)	.02 (.06)	.13 (.07)	.06 (.07)	-.16 (.10)	-.29 (.12)	1.19 (.06)
C. Top 50 cities weighted	.00 (.03)	.01 (.03)	.18 (.03)	.17 (.04)	.08 (.05)	.05 (.04)	.14 (.08)	.07 (.09)	1.30 (.05)
D. 158 cities outside California weighted	-.11 (.04)	-.08 (.04)	.11 (.05)	.22 (.06)	.16 (.07)	.04 (.07)	.19 (.10)	.03 (.12)	1.36 (.07)
Instrumental variables estimation (instrument is predicted immigrant inflow):									
E. 175 cities weighted	.02 (.02)	.03 (.02)	.13 (.03)	.11 (.03)	.14 (.04)	.10 (.04)	.14 (.06)	.00 (.07)	1.25 (.05)
F. Top 50 cities weighted	.00 (.03)	.01 (.03)	.16 (.03)	.16 (.04)	.10 (.05)	.07 (.04)	.24 (.09)	.13 (.09)	1.28 (.05)
G. Three least-educated occupations only	-.06 (.02)	-.03 (.03)	.11 (.03)	.15 (.03)	.08 (.05)	.00 (.05)	.26 (.07)	.19 (.08)	1.25 (.04)
H. Laborers/low-skill services and professional/technical only	-.12 (.05)	-.08 (.05)	.15 (.05)	.27 (.07)	.16 (.08)	.06 (.07)	.14 (.11)	-.02 (.13)	1.43 (.08)

III. Immigrant Inflows and Intercity Mobility Patterns V

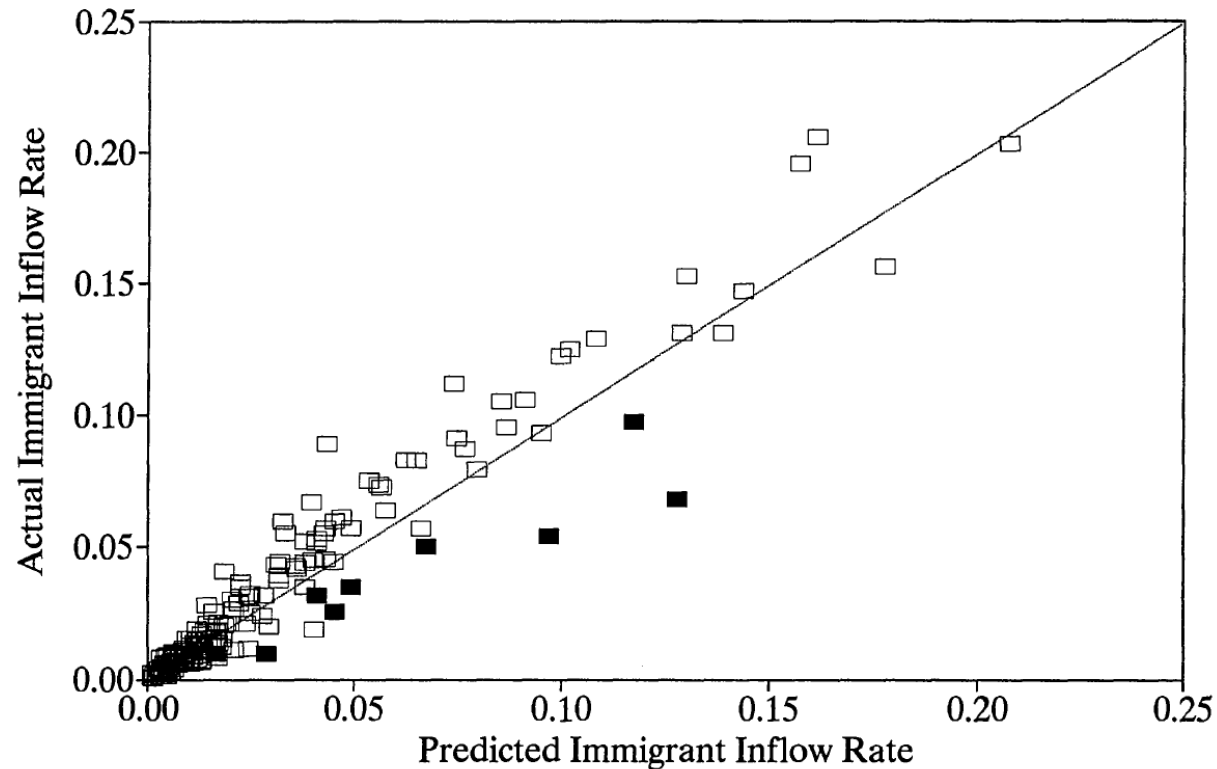


FIG. 2.— Actual and supply-driven immigrant inflows of laborers and less-skilled service workers. Texas cities shown with filled squares.

III. Immigrant Inflows and Intercity Mobility Patterns VI

- Main results are quite robust
- Mobility flows of natives and older immigrants are not very sensitive to inflows of new immigrants
- One caveat: time frame

IV. Effects of Local Population Shares on Employment and Wages I

- Analysis of effects of changes in the skill composition of the local labor force on the labor market outcomes of different occupation group
- Theory specifies that the relative wages and employment rates of each group depend on the population shares of the groups

IV. Effects of Local Population Shares on Employment and Wages II

Table 6
Effects of Skill Group Population Shares on Employment-Population Rates of Natives and Earlier Immigrants

	Natives		Pre-1985 Immigrants	
	Men	Women	Men	Women
Ordinary least squares estimation:				
A. 175 cities weighted	-.028 (.004)	-.045 (.005)	-.019 (.005)	-.023 (.007)
B. 175 cities unweighted	-.035 (.005)	-.047 (.005)	-.032 (.006)	-.020 (.008)
C. Top 50 cities weighted	-.022 (.008)	-.046 (.009)	-.007 (.006)	-.035 (.009)
Instrumental variables estimation (instrument is predicted immigrant inflow):				
D. 175 cities weighted	-.202 (.042)	-.081 (.018)	-.096 (.040)	-.146 (.036)
E. Top 50 cities weighted	-.185 (.056)	-.070 (.020)	-.041 (.027)	-.072 (.032)
F. Three least-educated occupations only	-.068 (.019)	-.032 (.014)	-.020 (.020)	-.045 (.036)
G. Laborers/low-skill services and professional/technical only	-.040 (.010)	-.060 (.010)	-.022 (.011)	-.038 (.013)

IV. Effects of Local Population Shares on Employment and Wages III

Any Problem ?

Table 7
Effects of Skill Group Population Share on Mean Log Wages of Natives and Earlier Immigrants

	Natives		Pre-1985 Immigrants	
	Men	Women	Men	Women
Ordinary least squares estimation:				
A. 175 cities weighted	-.025 (.005)	-.058 (.005)	-.051 (.010)	-.041 (.010)
B. 175 cities unweighted	-.010 (.006)	-.051 (.004)	-.037 (.013)	-.022 (.012)
C. Top 50 cities weighted	-.054 (.009)	-.058 (.007)	-.059 (.013)	-.064 (.012)
Instrumental variables estimation (instrument is predicted immigrant inflow):				
D. 175 cities weighted	-.099 (.033)	.063 (.020)	.037 (.073)	-.251 (.055)
E. Top 50 cities weighted	-.039 (.038)	.050 (.023)	-.022 (.055)	-.116 (.042)
F. Three least-educated occupations only	-.041 (.020)	.020 (.012)	-.018 (.036)	-.213 (.054)
G. Laborers/low-skill services and professional/technical only	-.031 (.012)	-.056 (.008)	-.057 (.022)	-.048 (.019)

IV. Effects of Local Population Shares on Employment and Wages IV

- Selectivity Bias: We do not observe unemployed
- Suppose:

$$\begin{aligned}\log w_{ijc} &= \log w_{jc} + \zeta_{ijc} \\ H_{ijc} &= d_{jc} + \alpha \zeta_{ijc} + v_{ijc}\end{aligned}$$

- H_{ijc} is a latent index – wage is observed only if $H_{ijc} > 0$

$$\text{Bias} = \rho \sigma(\zeta) \lambda(\pi_{jc}) \approx 0.05$$

IV. Effects of Local Population Shares on Employment and Wages V

- Estimations:

$$-0.15 \leq d_1 \leq -0.05 \quad \& \quad -0.2 \leq d_2 \leq 0.1$$

- Interpretation: an inflow of 10% for one occupation group would reduce relative wages for that occupation by 1.5% at most

V. Summary and Conclusions

3 Substantive Conclusions:

- Inflows of new immigrants did not generate large offsetting mobility flow by natives or earlier immigrants in the same skill groups
- Shifts in population shares are associated with systematic changes in relative employment
- Shifts in relative population shares are associated with changes in relative wages