

# CAREER PLACEMENT OF SKILLED MIGRANTS ON THE US LABOR MARKET: A DYNAMIC APPROACH

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\*The opinions expressed in this study belong to the author and should not be attributed to the World Bank

# MOTIVATION

- ◉ Contribute to research examining immigrants' performance in destination country's labor market.
- ◉ Mattoo et al (2008); Borjas (2000); Duleep and Regets (1997)
- ◉ **Why use Occupational Placement (OP)?**
  - Reduced spatial variability
  - Less elastic to labor market volatility
  - Indicative of job quality

# QUESTIONS

1. How does Occupational Placement of skilled US migrants change over time?
1. Does the pattern of OP differ by country of origin?
2. Do country of origin attributes explain OP and its variation?

# MAIN FINDINGS

1. **Predicted occupational placement ( $\widehat{OP}$ )** of skilled migrants in the US varies widely by country of origin;
2. The US skilled male migrants experience an **improvement in their  $\widehat{OP}$**  over time ( $\Delta\widehat{OP} = \widehat{OP}_{t+1} - \widehat{OP}_t$ );
3. Individuals from countries with lower initial  $\widehat{OP}$  have a higher  $\Delta\widehat{OP}$  than the ones from countries with a better start-up;
4.  $\Delta\widehat{OP}$  for a particular cohort diminishes over time;
5. No full catch-up is observed for countries that start at lower levels of  $\widehat{OP}$ ;
6. Initial  $\widehat{OP}$  is influenced by country specific attributes, but their impact on  $\Delta\widehat{OP}$  is less strong.

## 1. Estimate using individual-level dataset

$$\ln OP_i = \alpha + \beta_1 AGE_i + \beta_2 AGE_i^2 + \beta_3 YRSINUSA_i + \sum_{v=1}^6 \beta_{4v} EDUC_{iv} + \sum_{\tau=1}^{122} \beta_{5\tau} CTRY_{i\tau} + \varepsilon_i$$

*Occupational Placement: Prestige Index*  
*Education Index 1*  
*Education Index 2*

*15 REGRESSIONS: separate by CENSUS and COHORT (decade)*

1980	1970s arrivals
1990	1980s arrivals
2000	

## 2. Predict hypothetical individuals' OP and $\Delta OP$ in 1980, 1990 and 2000

	Hypothetical individuals type A	Hypothetical individuals type B
Year of arrival	1975	1985
Age at arrival	25	25
Level of education	At least college degree	At least college degree
Age as of Census 1980	30	-
Age as of Census 1990	40	30
Age as of Census 2000	50	40
Predicted Occupational Placement	$\hat{OP}_{1980}, \hat{OP}_{1990}, \hat{OP}_{2000}$	$\hat{OP}_{1990}, \hat{OP}_{2000}$
Predicted Improvement in Occupational Placement	$\widehat{\Delta OP}_{1980-1990}$ $\widehat{\Delta OP}_{1990-2000}$	$\widehat{\Delta OP}_{1990-2000}$

## Definitions of Occupational Placement

- *from the Census dataset*
  - ⊙ **1. Prestige index [0;100]** - based on survey evaluating the prestige (social standing) of each occupation.
  - ⊙ **2. Education index 1 [0;100]** - based on percentage of people in an occupational category who completed one or more years of college.
- *constructed variable*
  - ⊙ **3. Education index 2 [0;17]** - weighted average of the years of education of all individuals (US-born and foreign born) in an occupation.

# DYNAMIC PATTERNS - CENSUS DATA (2)

- Censuses 1980, 1990, 2000, 5% samples
- Foreign-born males, employed, not in school, not living in group quarters, education acquired before coming to US

	DECADE 1970-1979			DECADE 1980-1989	
	Census 1980	Census 1990	Census 2000	Census 1990	Census 2000
	(1)	(2)	(3)	(4)	(5)
<b>Individuals in the sample (unweighted)</b>	41,234	39,445	35,880	75,851	78,745
<b>Total number of people (after weighting)</b>	824,680	847,573	750,289	1,668,342	1,704,575
<b>Age interval</b>	16-40	26-50	36-60	16-50	26-60
<b>Median age</b>	30	40	49	32	41
<b>By cohort of arrival:</b>					
1970-1974 / 1980-1984	41%	40%	38%	47%	43%
1975-1979 / 1985-1989	59%	60%	62%	53%	57%
<b>By education:</b>					
None or preschool	4%	7%	8%	8%	6%
Grade 1, 2, 3, or 4	9%	9%	7%	6%	4%
Grade 5, 6, 7, or 8	25%	20%	21%	17%	19%
Grade 9	5%	5%	4%	6%	6%
Grade 10	4%	3%	2%	3%	3%
Grade 11	4%	2%	2%	3%	2%
Grade 12	19%	20%	21%	23%	24%
1 to 3 years of college	9%	13%	13%	13%	14%
4+ years of college	21%	21%	22%	21%	21%

- ◉ Different individuals interviewed for different censuses
- ◉ No indication of return migration or illegal immigration
- ◉ Censuses 1980 and 1990 report years since migration as intervals
- ◉ Change in question: Census 2000 - “When did you come to live?; Census 1990 and earlier- “When did you come to stay?”

recent immigrants sample in decennial censuses “may be neither recent nor immigrant” (Jasso et al, 2000)

# DYNAMIC PATTERNS - ESTIMATION RESULTS

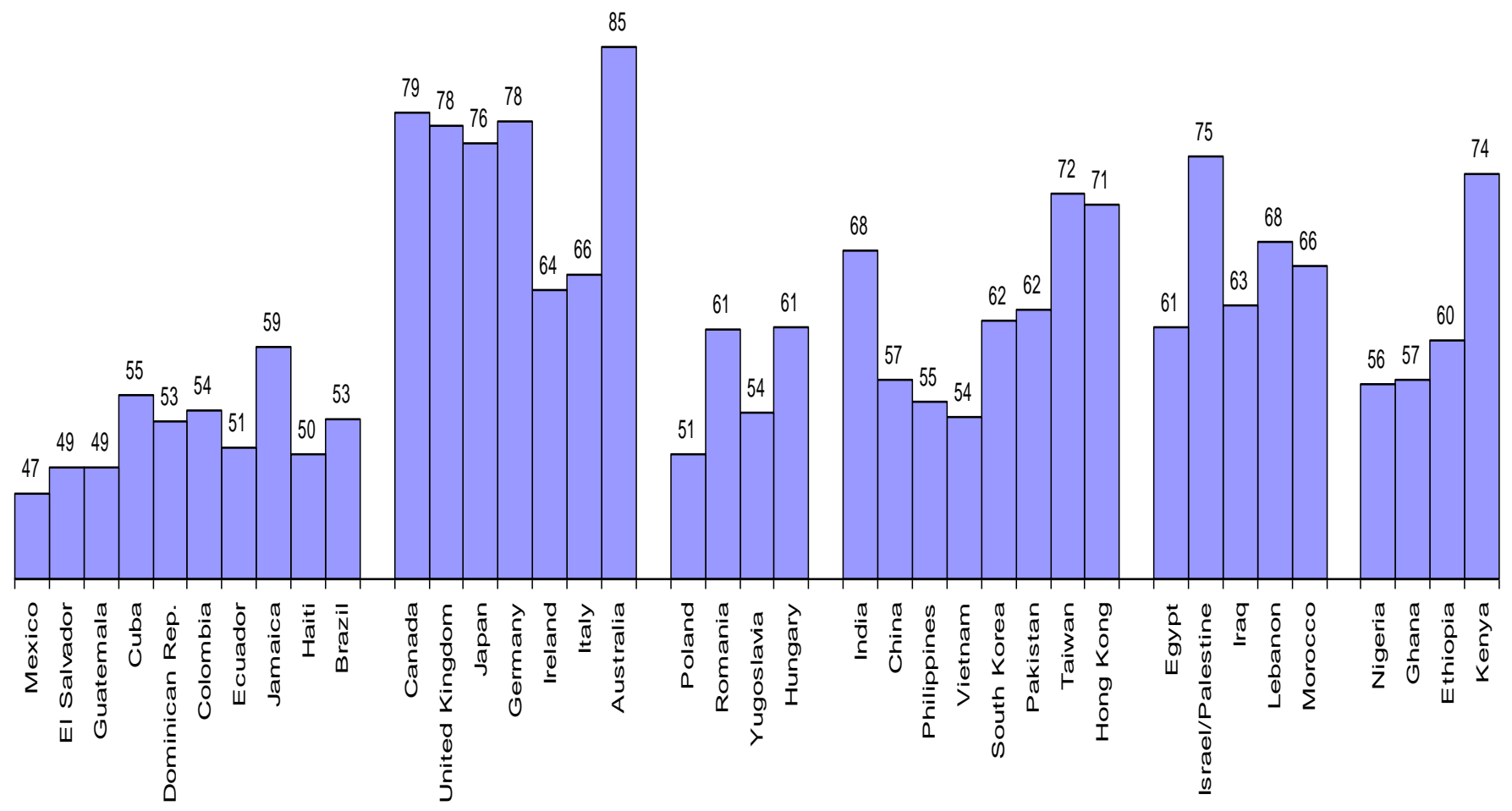
EDUCATION INDEX 2	DECADE: 1970-1979			DECADE: 1980-1989	
VARIABLES	CENSUS 1980	CENSUS 1990	CENSUS 2000	CENSUS 1990	CENSUS 2000
Age	0.00316 [0.00410]	0.00684 [0.00482]	-0.0069 [0.00624]	0.00884*** [0.00163]	0.00568*** [0.00207]
Age squared	0.0000214 [0.0000700]	-0.000106* [0.0000610]	0.0000401 [6.32e-05]	-0.000113*** [2.38e-05]	-9.29e-05*** [2.37e-05]
Dummy for Cohort of arrival	-0.0596*** [0.00573]	-0.0300*** [0.00490]	-0.0352*** [0.00502]	-0.0413*** [0.00344]	-0.0317*** [0.00332]
<b>EDUCATION DUMMIES</b>					
five to nine years of education	0.00444 [0.00705]	0.0231*** [0.00646]	0.0382*** [0.00697]	-0.000464 [0.00491]	0.0201*** [0.00531]
ten to twelve years of education	0.0566*** [0.00933]	0.0646*** [0.00874]	0.0866*** [0.00969]	0.0195*** [0.00571]	0.0606*** [0.00604]
high-school level	0.168*** [0.00974]	0.173*** [0.00836]	0.191*** [0.00860]	0.109*** [0.00564]	0.146*** [0.00576]
some college	0.451*** [0.0134]	0.419*** [0.0105]	0.430*** [0.0107]	0.317*** [0.00735]	0.380*** [0.00712]
Bachelor's Degree or higher	1.011*** [0.0123]	0.825*** [0.0101]	0.826*** [0.0103]	0.700*** [0.00740]	0.746*** [0.00702]
Constant	5.610*** [0.189]	5.654*** [0.181]	6.056*** [0.221]	5.950*** [0.0785]	6.015*** [0.0828]
Observations	41234	39445	35880	75851	78745
Country fixed effects	yes	yes	yes	yes	yes
R-squared	0.51	0.51	0.51	0.49	0.48

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Robust standard errors in brackets

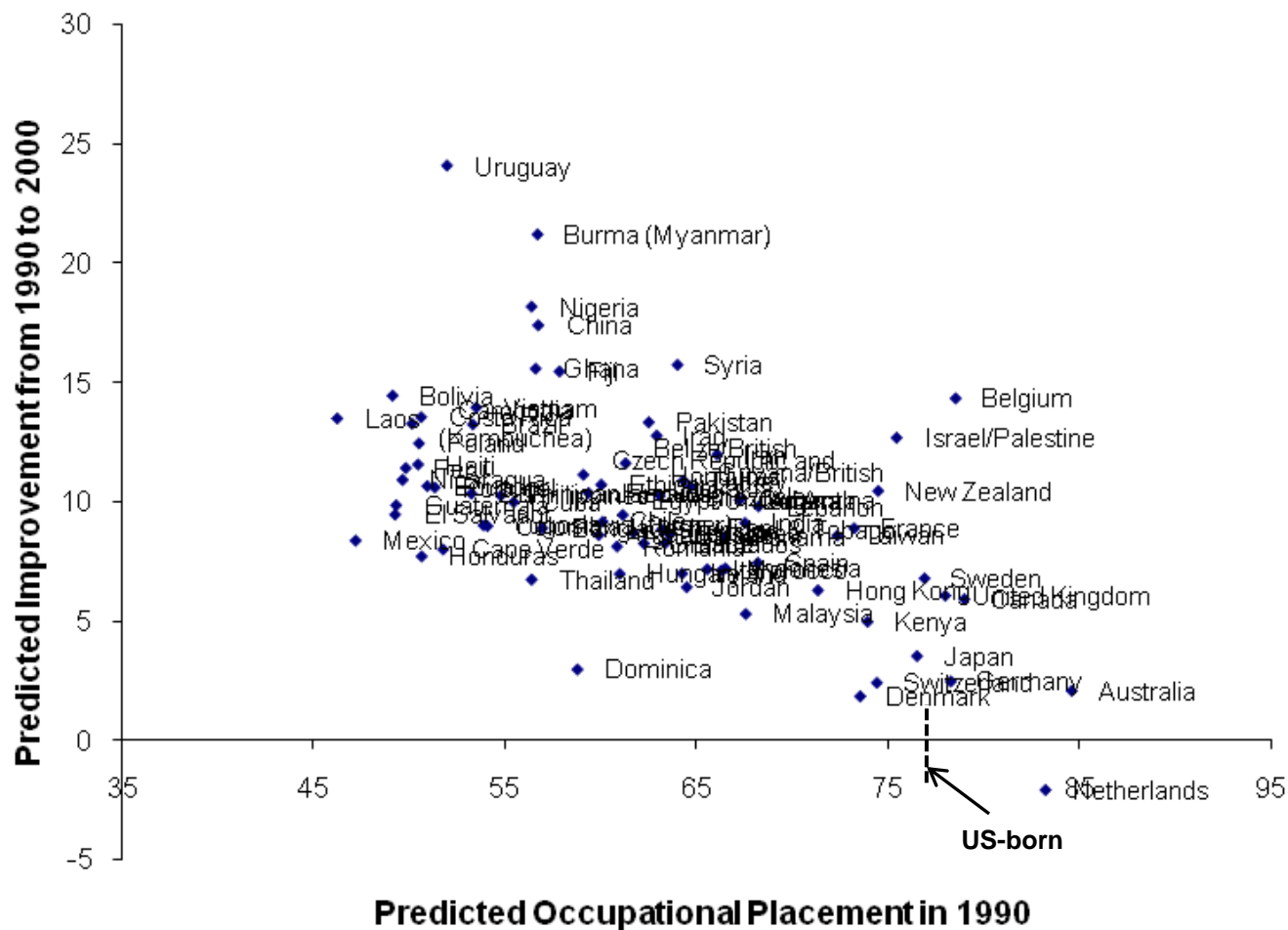
## 1. HETEROGENEITY IN INITIAL OP

$\widehat{OP}_{1990}$  for the 1985 arrivals (Individual B)



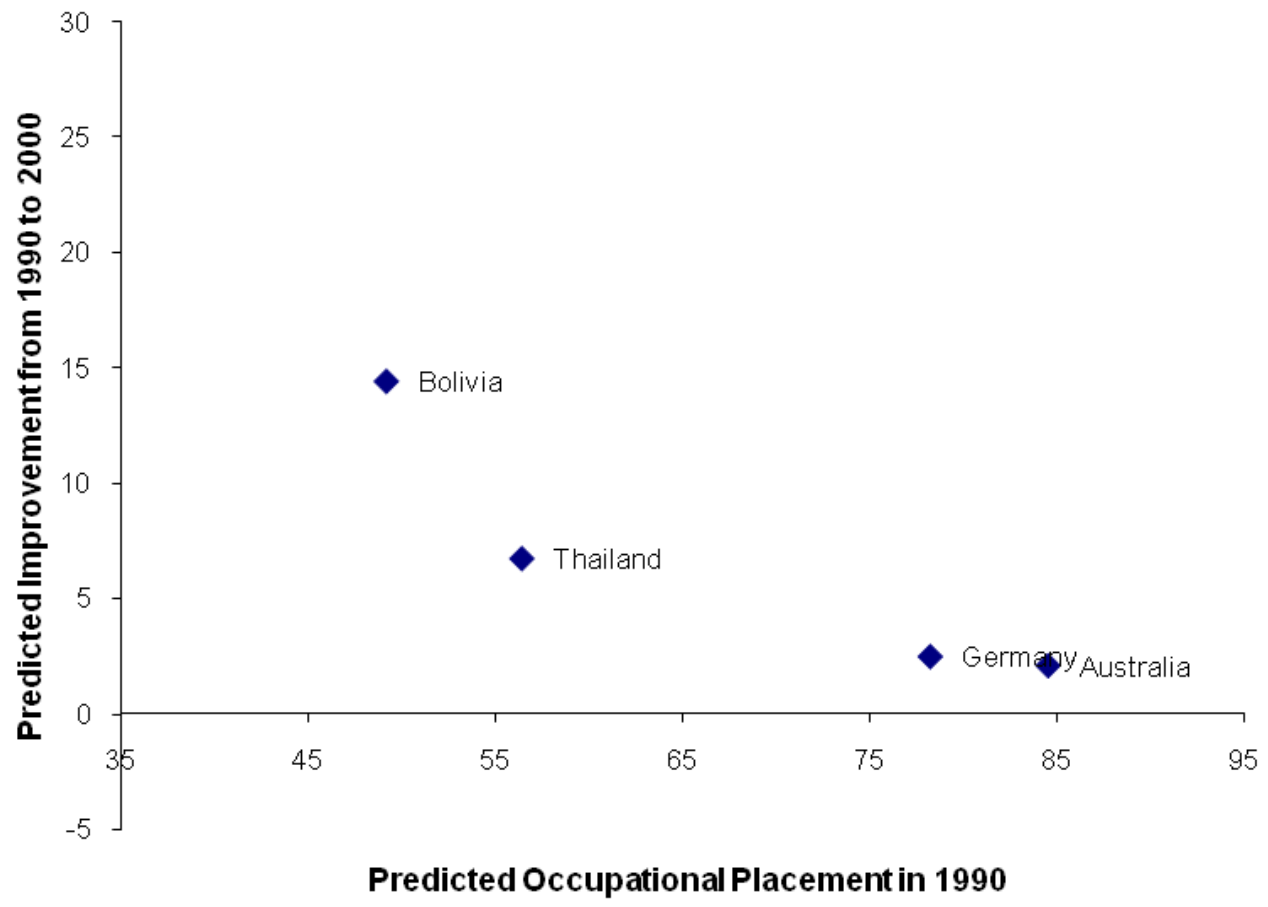
## 2. IMPROVEMENT OVER TIME

$\widehat{\Delta OP}_{1990-2000}$  versus  $\widehat{OP}_{1990}$ ,  
 1985 arrivals (Individual B)



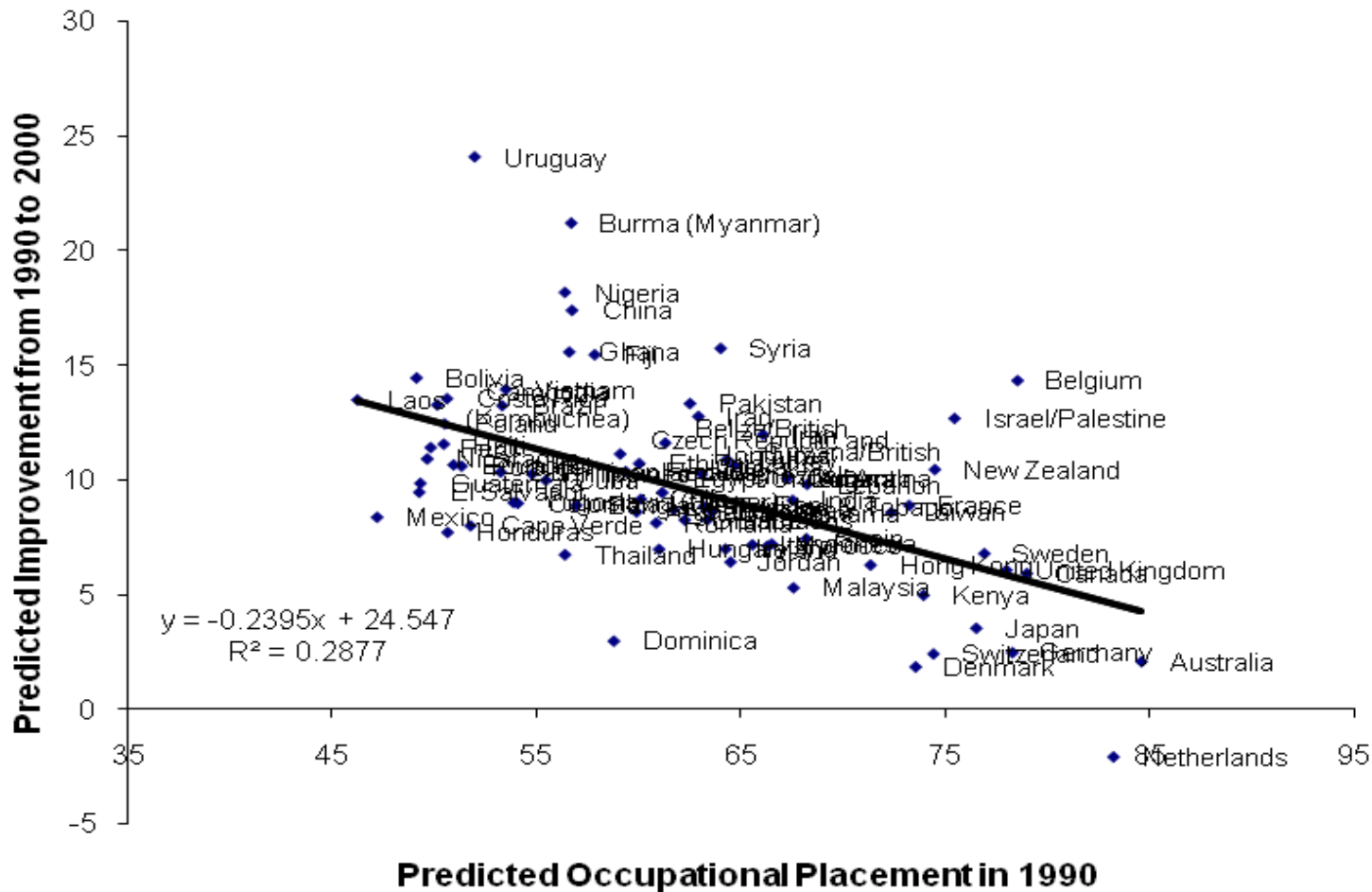
## THERE IS CATCH-UP

$\Delta \hat{OP}_{1990-2000}$  versus  $\hat{OP}_{1990}$ ,  
*1985 arrivals (Individual B)*



### 3. THERE IS CATCH-UP

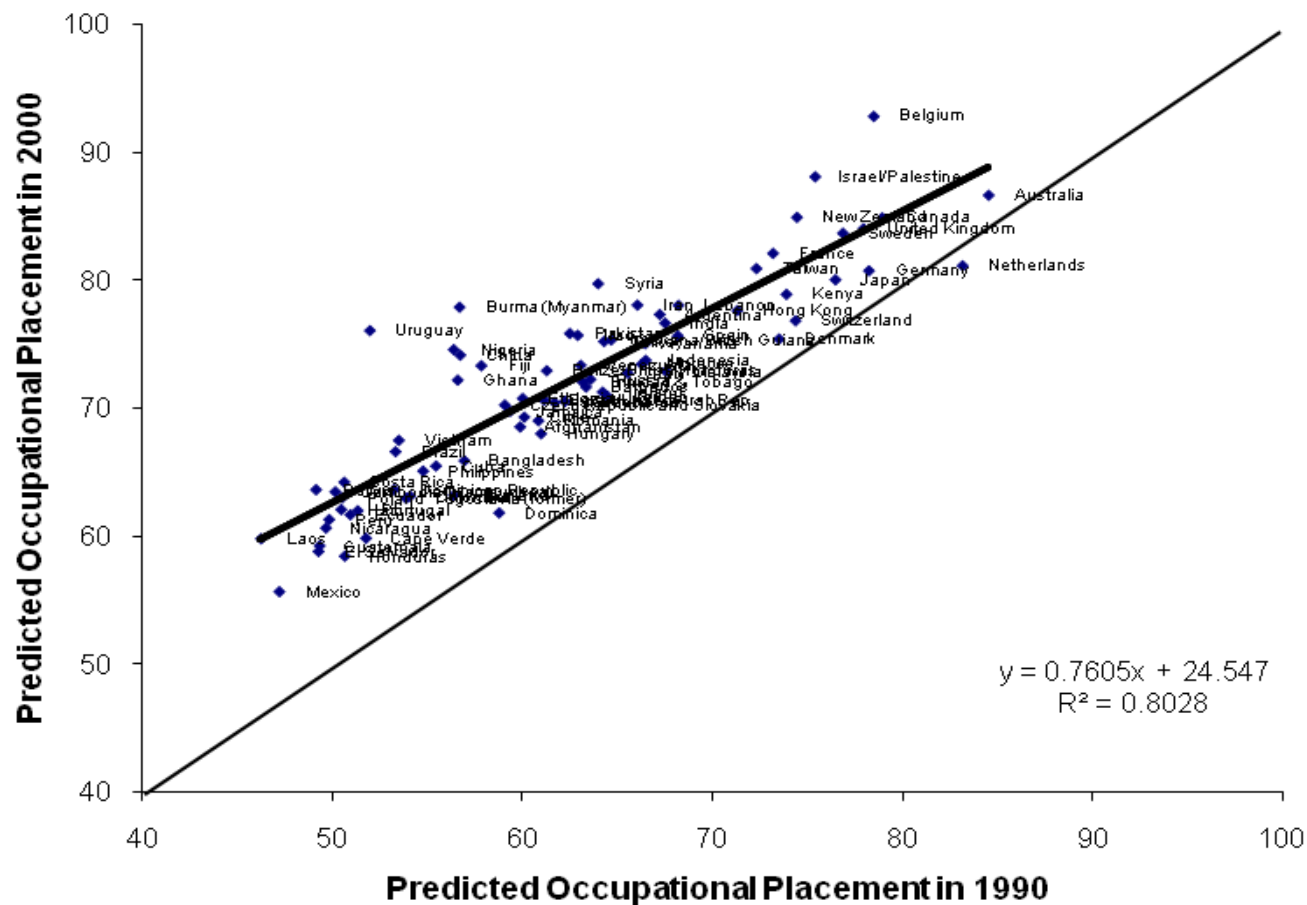
$\widehat{\Delta OP}_{1990-2000}$  versus  $\widehat{OP}_{1990}$ ,  
 1985 arrivals (Individual B)





# 5. There is no full catch-up.

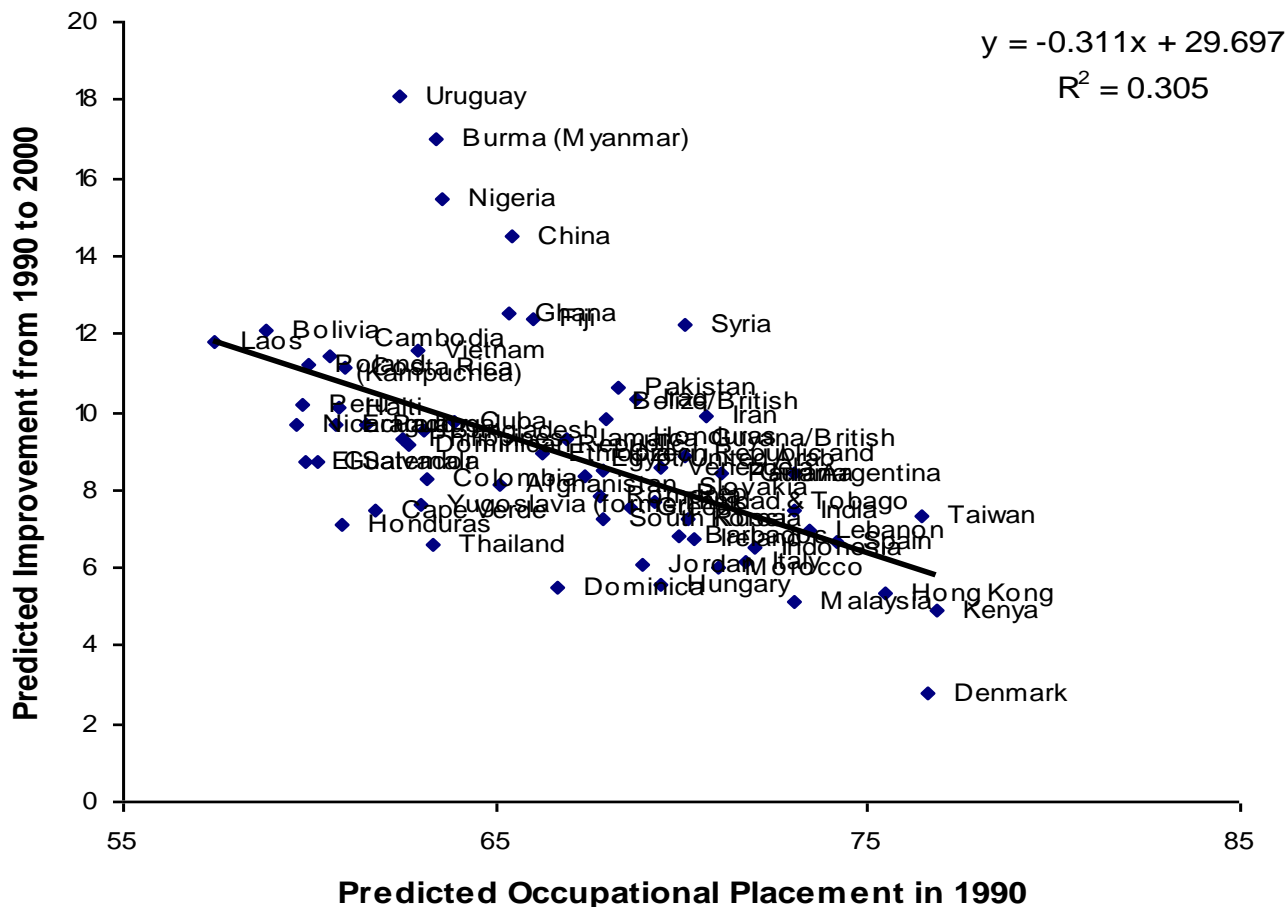
$\widehat{OP}_{2000}$  versus  $\widehat{OP}_{1990}$ ,  
 1985 arrivals (Individual B)



## Out-Migration

1985 arrivals (Individual B)

**criterion:**  
absolute  
change in  
the number  
of skilled  
migrants  
between  
1990 and  
2000;  
**focus:**  
cohort of  
arrival  
1985-1989



Japan (71%), UK, Canada, Germany, Israel, France, Mexico, Turkey, Netherlands, Australia, Brazil, Belgium, New Zealand, Sweden,

## PSEUDO-PANEL

$$y_{i(t)t} = x_{i(t)t} \beta + \theta_{i(t)} + \varepsilon_{i(t)t} \quad i(t)=1, \dots, N, \text{ and } t=1, \dots, T.$$

-individual effects  $\theta_{i(t)}$  are likely to be correlated with the explanatory variables in  $x_{i(t)t}$

$$\bar{y}_{ct} = \bar{x}_{ct} \beta + \bar{\theta}_{ct} + \bar{\varepsilon}_{ct} \quad c=1, \dots, C, \text{ and } t=1, \dots, T$$

-for large cohorts it may be assumed that  $\bar{\theta}_{ct} = \bar{\theta}_c$

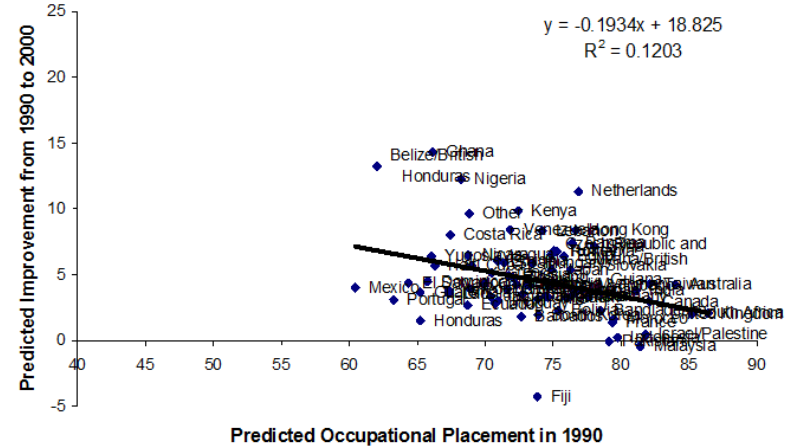
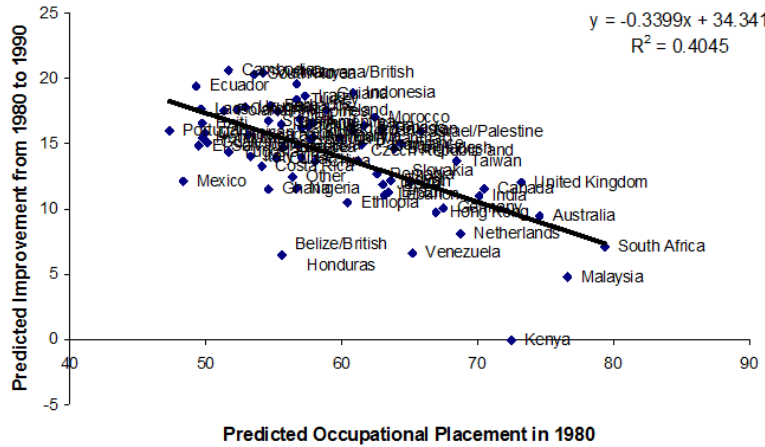
$$\bar{y}_{ct} = \bar{x}_{ct} \beta + \bar{\theta}_c + \bar{\varepsilon}_{ct}$$

-for **cohorts with size greater than 100** measurement error from estimating population means using sample means is typically ignored

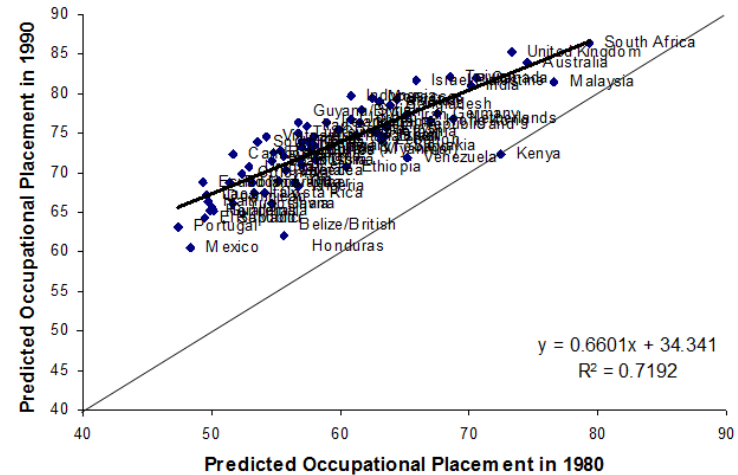
-for consistent estimates, average characteristics of individuals should not differ across cross-sections

References: Deaton (1985)  
Verbeek and Nijman (1992)

## Implementing Pseudo-Panel Methodology



**1975 arrivals  
(Individual A)**



# EXPLAINING DYNAMIC PATTERNS - CONDITIONAL CONVERGENCE (1)

$$(1/10)\Delta(\textit{predicted} \ln OP_{1990-2000\tau}) = \theta_1 * \textit{predicted} (\ln OP_{1990\tau}) + \eta_{1,\tau} \quad (1)$$

$$(1/10)\Delta(\textit{predicted} \ln OP_{1980-1990\tau}) = \theta_2 * \textit{predicted} (\ln OP_{1980\tau}) + \eta_{2,\tau} \quad (2)$$

$$(1/20)\Delta(\textit{predicted} \ln OP_{1980-2000\tau}) = \theta_3 * \textit{predicted} (\ln OP_{1980\tau}) + \eta_{3,\tau} \quad (3)$$

$$(1/10)\Delta(\textit{predicted} \ln OP_{1990-2000\tau}) = \theta_4 * \textit{predicted} (\ln OP_{1990\tau}) + \eta_{4,\tau} \quad (4)$$

# EXPLAINING DYNAMIC PATTERNS - CONDITIONAL CONVERGENCE (2)

	1985 arrival	1975 arrival			
	1990-2000	1980-1990	1980-2000	1990-2000	1990-2000 (IV)*
	(1)	(2)	(3)	(4)	(5)
<b>EDUCATION INDEX 1</b>					
Predicted Log of OP in 1990	-0.0291*** [0.00522]			-0.0278*** [0.00726]	-0.0179*** [0.00654]
Predicted Log of OP in 1980		-0.0523*** [0.00442]	-0.0297*** [0.00166]		
Constant	0.202*** [0.0341]	0.359*** [0.0281]	0.205*** [0.0105]	0.189*** [0.0481]	0.124*** [0.0434]
Observations	79	80	80	80	80
R-squared	0.554	0.834	0.906	0.343	0.299
<b>PRESTIGE INDEX</b>					
Predicted Log of OP in 1990	-0.0290*** [0.00377]			-0.0183** [0.00706]	-0.00617 [0.00790]
Predicted Log of OP in 1980		-0.0341*** [0.00566]	-0.0177*** [0.00210]		
Constant	0.188*** [0.0236]	0.218*** [0.0353]	0.114*** [0.0132]	0.118*** [0.0447]	0.0415 [0.0501]
Observations	79	80	80	80	80
R-squared	0.562	0.419	0.546	0.178	0.1
<b>EDUCATION INDEX 2</b>					
Predicted Log of OP in 1990	-0.0234*** [0.00492]			-0.0198*** [0.00677]	-0.0102 [0.00648]
Predicted Log of OP in 1980		-0.0382*** [0.00469]	-0.0214*** [0.00172]		
Constant	0.0660*** [0.0133]	0.107*** [0.0125]	0.0603*** [0.00457]	0.0552*** [0.0184]	0.0294* [0.0176]
Observations	79	80	80	80	80
R-squared	0.414	0.647	0.773	0.213	0.164

Robust standard errors in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

\* instrument: Predicted Log of OP in 1980

## 1) Effects of **country attributes** on predicted levels of **Occupational Placement**

$$\text{predicted } \ln OP_{\tau} = \alpha' + \beta_1' * GDPpc_{\tau} + \beta_2' * OPEN_{\tau} + \beta_3' * ENGLISH_{\tau} \\ + \beta_4' * DIST_{\tau} + \beta_5' * CONFLICT_{\tau} + \beta_6' * COM_{\tau} + \varepsilon'_{\tau,t}$$

## 2) Effects of **country attributes** on predicted **Occupational Placement Improvement**

$$\Delta(\text{predicted } \ln OP_{t-(t+10),\tau}) = \alpha'' + \beta_1'' * GDPpc_{\tau} + \beta_2'' * OPEN_{\tau} + \beta_3'' * ENGLISH_{\tau} \\ + \beta_4'' * DIST_{\tau} + \beta_5'' * CONFLICT_{\tau} + \beta_6'' * COM_{\tau} + \varepsilon''_{\tau,t}, t = 1980, 1990, 2000$$

## 3) Effects of **country attributes and initial Occupational Placement** on predicted **Occupational Placement Improvement**

$$\Delta(\text{predicted } \ln OP_{t-(t+10),\tau}) = \alpha''' + \theta''' * \text{predicted } \ln OP_{t,\tau} + \beta_2''' * OPEN_{\tau} + \beta_4''' * DIST_{\tau} \\ + \beta_5''' * CONFLICT_{\tau} + \beta_6''' * COM_{\tau} + \varepsilon'''_{\tau,t}, t = 1980, 1990, 2000$$

GDPpc = log of per capita-GDP in constant 2000 prices averaged over 1970-1975, and 1980-1985; source: Penn World Tables (Version 6.2)

OPEN = the ratio of exports plus imports to GDP; source: Penn World Tables

English = dummy for English being the the main spoken language; source: CIA – The World Factbook (2002)

DIST = the log of distance in miles to the US; source: Andrew Rose dataset

CONFLICT = military conflict in the seventies and eighties; source: Gledisch, Wallenstein, Eriksson, Sollenberg and Strand (2004)

COM = index for communist regime in 1970, and respectively 1985; Robert Barro's "Religion Adherence Data" [http://www.economics.harvard.edu/faculty/barro/data\\_sets\\_barro](http://www.economics.harvard.edu/faculty/barro/data_sets_barro)

# EXPLAINING DYNAMIC PATTERNS -COUNTRY SPECIFIC ATTRIBUTES (3)

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>1980-1989</b>					
Log of GDP per capita	71	8.52	0.95	6.05	10.09
Openness Index	71	50.91	31.11	7.53	142.98
Log of Distance to the US	71	8.45	0.55	6.98	9.15
English	71	0.41	0.50	0.00	1.00
Military conflict	71	0.38	0.49	0.00	1.00
Communism index	71	0.14	0.35	0.00	1.00
<b>1970-1979</b>					
Log of GDP per capita	72	8.34	0.93	6.20	10.01
Openness Index	72	51.10	36.09	7.16	189.99
Log of Distance to the US	72	8.43	0.56	6.98	9.15
English	72	0.42	0.50	0.00	1.00
Military conflict	72	0.40	0.49	0.00	1.00
Communism index	72	0.07	0.26	0.00	1.00

# EXPLAINING DYNAMIC PATTERNS -COUNTRY SPECIFIC ATTRIBUTES (4)

	1985 arrival			1975 arrival		
EDUCATION INDEX 2	1990-2000			1980-1990		
	predicted (lnOP <sub>1990</sub> )	Δpredicted (lnOP <sub>1990-2000</sub> )	(1/10) Δpredicted (lnOP <sub>1990-2000</sub> )	predicted (lnOP <sub>1980</sub> )	Δpredicted (lnOP <sub>1980-1990</sub> )	(1/10) Δpredicted (lnOP <sub>1980-1990</sub> )
	(1)	(2)	(3)	(4)	(5)	(6)
Log of GDP per capita	<b>0.0249***</b> [0.00496]	<b>-0.00882***</b> [0.00194]		0.0151 [0.00974]	-0.0064 [0.00427]	
Openness Index	-0.00003 [0.000155]	0.00004 [5.42e-05]	0.00000 [4.02e-06]	-0.00006 [0.000256]	-0.00001 [0.000116]	-0.00001 [5.85e-06]
Log of Distance to the US	<b>0.0303***</b> [0.0111]	<b>-0.00408***</b> [0.00144]	<b>0.000468**</b> [0.000206]	0.0144 [0.0118]	-0.00305 [0.00438]	0.000449 [0.000394]
English	0.0132 [0.0105]	<b>-0.00479**</b> [0.00224]		0.0233 [0.0144]	-0.00149 [0.00618]	
Military conflict	<b>-0.0239**</b> [0.0111]	0.00371 [0.00261]	-0.0000189 [0.000333]	0.000991 [0.0248]	-0.00359 [0.0119]	-0.000136 [0.000450]
Communism index	-0.00533 [0.0164]	<b>0.00925**</b> [0.00457]	<b>0.00124**</b> [0.000618]	0.00645 [0.0260]	-0.00408 [0.0121]	-0.000495 [0.000491]
Predicted Log of OP in 1990			<b>-0.0216***</b> [0.00439]			
Predicted Log of OP in 1980						<b>-0.0383***</b> [0.00478]
Constant	2.204*** [0.110]	0.144*** [0.0227]	0.0572*** [0.0105]	2.389*** [0.132]	0.138*** [0.0487]	0.103*** [0.0121]
Observations	71	71	71	72	72	72
R-squared	0.617	0.621	0.579	0.216	0.089	0.669

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Robust standard errors in brackets

\* instrument: Predicted Log of OP in 1980

# CONCLUSIONS ABOUT THE OCCUPATIONAL PLACEMENT (OP) OF SKILLED US MIGRANTS

1. **Heterogeneous** by country of origin;
2. **Improves** with time spent in the US;
3. There is **catch-up**;
4. Improvement **declines over time**;
5. Catch-up is **not full**;
6. **Country variables** explain initial OP and, to a lesser extent,  $\Delta OP$ ;
7. **Convergence factor** indicative of “skill transferability”.

# IMPLICATIONS

- ◎ **Destination country:**
  - eliminate unnecessary barriers related to professional recognition;
  - become aware of factors influencing migrants' selectivity (immigration policy)
- ◎ **Origin country:**
  - improve allocation of education resources