

Human Capital Outflows: Selection into Migration from the Northern Triangle

Giselle Del Carmen¹

Liliana D. Sousa²

2019 ACS Data Users Conference (May 14, 2019)

¹ Inter-American Development Bank

² World Bank

Motivation

- Immigration from El Salvador, Guatemala, and Honduras to the United States has grown at an annualized growth rate of 8.1% since 1980
- By 2015 Northern Triangle (NT) there were over 2.8 million immigrants living in the US
- This large diaspora represents ten percent of the NT population
- As the flow of migration has grown, its composition has also changed, reflecting changes both in push factors and pull factors
- Migration rates at this level can have implications for development and labor markets, especially if those with higher skill or productivity levels are the ones exiting.

Research Question

- Assess the extent of non-random selection into migration.
- How has the outflow of skills and human capital of immigrants and non-migrants changed over time?

Data

- *Residents*: 2000 and 2014 household surveys for El Salvador (SLV), Guatemala (GTM) and Honduras (HND)
- *Migrants*: 5 percent Public-Use Microdata Sample (PUMS) from the 2000 US Census of Population and Housing and the 2014 US ACS
 - *US sample*: use only recent migrants (those that arrived in the last 10 years) and limit the sample to individuals who arrived in the US at the age of 18+
- Since the analysis is of labor market returns, we limit it to individuals between the ages of 21-65
- For each country and year we created a stacked data set combining a **limited set of variables** from the US and country of birth datasets

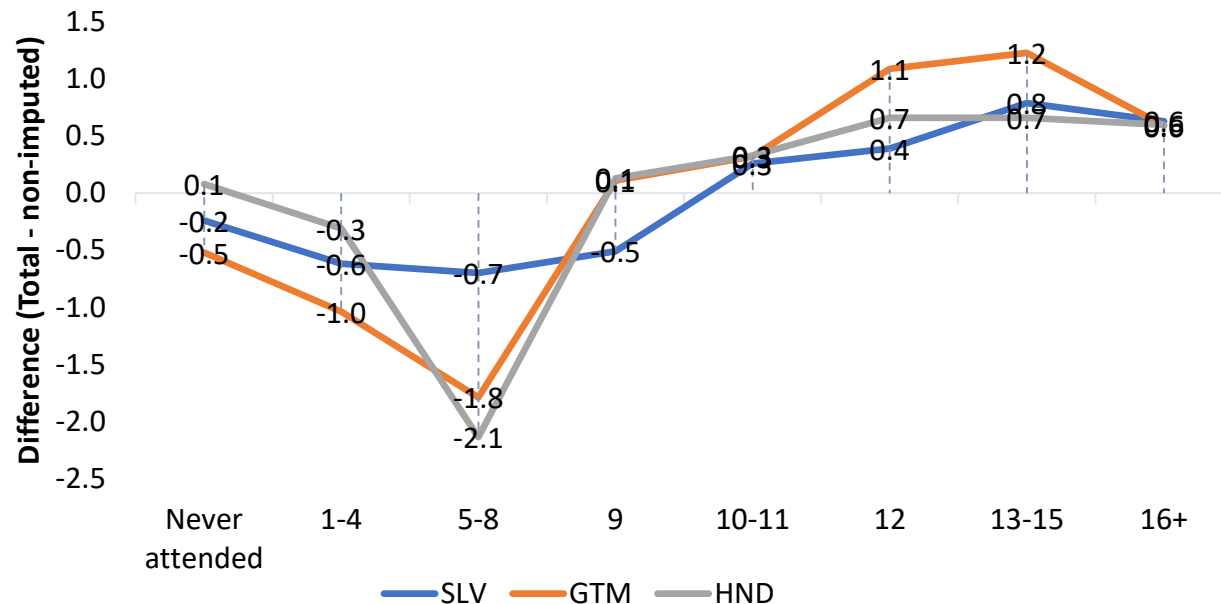
Measurement Issue I: Education

- Differences in the way education questions are asked in the US data and the source countries could introduce bias if we are comparing skill levels of migrants vs non-migrants based on different data sources.
 - However, these questions are largely consistent between the US data and the source country surveys

Country	Survey Question
SLV	(i) What is the highest level of education completed? (ii) What is the highest level of school passed?
GTM	If currently enrolled...(i) What is the highest level of education completed? (ii) What is the highest level of school passed?
HND (2001)	What is the highest level of education completed or currently studying? and what is the last grade or year passed at that level?
HND (2014)	(i) What is the highest level of education completed? (ii) What is your last grade or year of education passed? If currently enrolled...(iii) What is the education level you are currently studying? (iv) What is the current year or grade you are studying?
U.S.	What is the highest degree or level of school this person has COMPLETED?

Measurement Issue I: Education

- Instead, we find that the imputation strategy for education introduces a bias for immigrant groups. This is because imputation includes the US-born as a source of data, but the US-born have much higher educational attainment than these immigrants groups.
 - For NT countries, this accounts for 12-15 percent of the US sample.
 - Ibarrraran and Lubotsky (2007) suggest that evidence of positive selection using the US data may be driven by a high prevalence of imputed values among migrants in the US Census



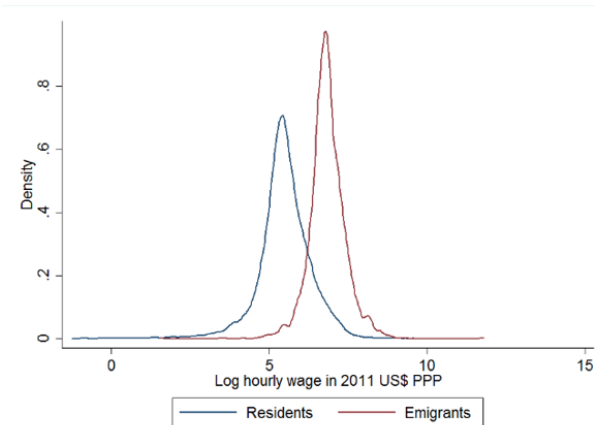
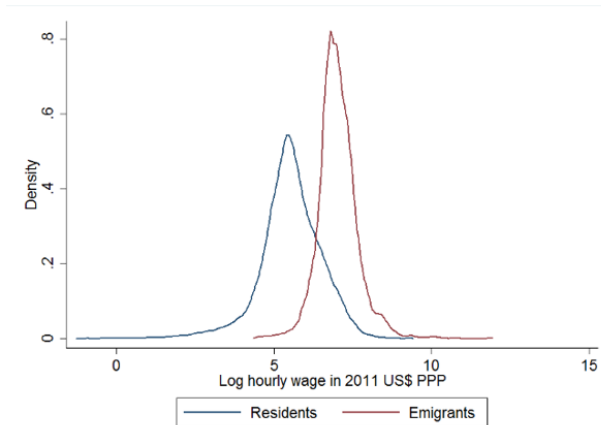
Measurement Issue II: Undocumented Migrants

- Undocumented migrants are more likely to be lower-income and of lower human capital levels, this may generate a bias in the results by yielding a higher distribution of educational attainment
 - As of 2014, an estimated 700,000 Salvadorians, 525,000 Guatemalans, and 350,000 Hondurans were undocumented migrants (Passel and Cohn, 2016).
 - However, push factors are not strictly economic (like violence and family reunification) and may incentivize a broader range of the skill distribution to migrate informally.
- For 2000 to 2009, coverage adjustments increase the estimate for the unauthorized migrant population by 8 to 13 percent; this adjustment falls to 5 to 7 percent for data between 2010 and 2014 (Passel and Cohn 2016, Van Hook et al. 2014).
- Rates of undocumented migration from the NT were lower for the 2000 cohort than for 2014, hence reducing the magnitude of the potential bias for the earlier cohort.
- **Takeaway:** the majority of undocumented migrants are covered by the survey data – but they are underrepresented in the migrant estimates. Thus, results based on these data can be biased against finding negative selection (Pew Research Center 2017)

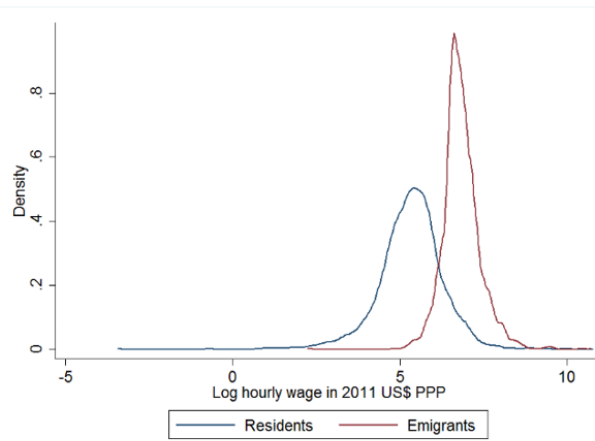
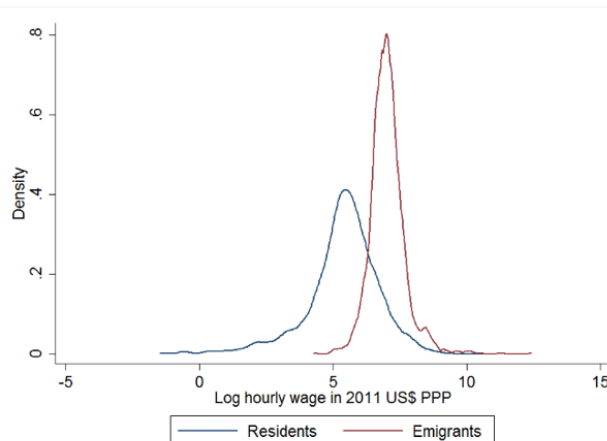
Wage Densities for Migrants and Residents

Wage densities for migrants and residents, by country and year
(a) 2000 (b) 2014

El Salvador



Guatemala



Methodology: Wage Densities

- Building on Chiquiar and Hanson (2005), we denote $f^j(w|x)$ as the wage density in country j conditional on characteristics x . Let D_i be an indicator equal to 1 if individual i is employed and let $h(x|j, k, D_{ij})$ be the distribution of observed characteristics among individuals in country j born in country k .
- Using this notation, we can write the observed wage density of Guatemalan residents and migrants, respectively, as

$$\text{Residents: } g(GTM|GTM) = \int f^{GTM}(w|x) h(x|j = GTM, k = GTM, D_i = 1) dx$$

$$\text{Migrants: } g(US|GTM) = \int f^{US}(w|x) h(x|j = US, k = GTM, D_i = 1) dx$$

Methodology: Foregone Wages

- We construct counterfactual weights that adjust the wage distribution of residents to account for differences in observable characteristics between migrant workers and resident workers:

$$\theta^M = \frac{\Pr(i = US|x)}{\Pr(i = Resident|x)} \quad (I)$$

Methodology: Conditional Probabilities

- Estimate the probability that a local adult is in the United States, using the full sample of migrants and residents:

$$\begin{aligned} \Pr(Migrant_{cti}) = & \beta_0 + \beta_1 Years\ of\ Schooling_{cti} + \beta_2 Age_{it} + \beta_3 Age\ Sq_{cti} + \beta_4 Married_{cti} \\ & + \beta_5 Age * Years\ of\ Schooling_{cti} + u_{cti} \end{aligned} \quad (II)$$

- The product of the conditional probabilities and the fitted coefficients from regression (1) are applied to the sample of wage-earning residents to estimate counterfactual wage kernel densities for migrants in the US.
- The difference between the observed and counterfactual wage densities non-parametrically summarizes migrant selection in terms of local earnings.

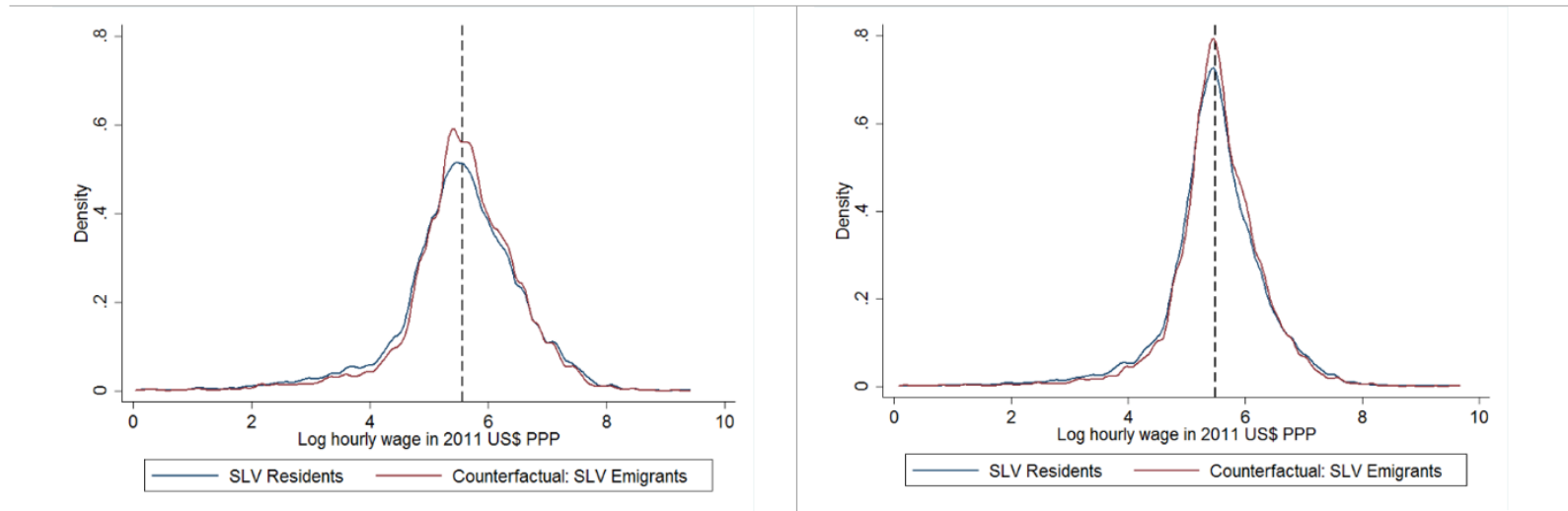
Results: Actual and Counterfactual Wage Densities

Actual and counterfactual wage densities, by country and year, Male

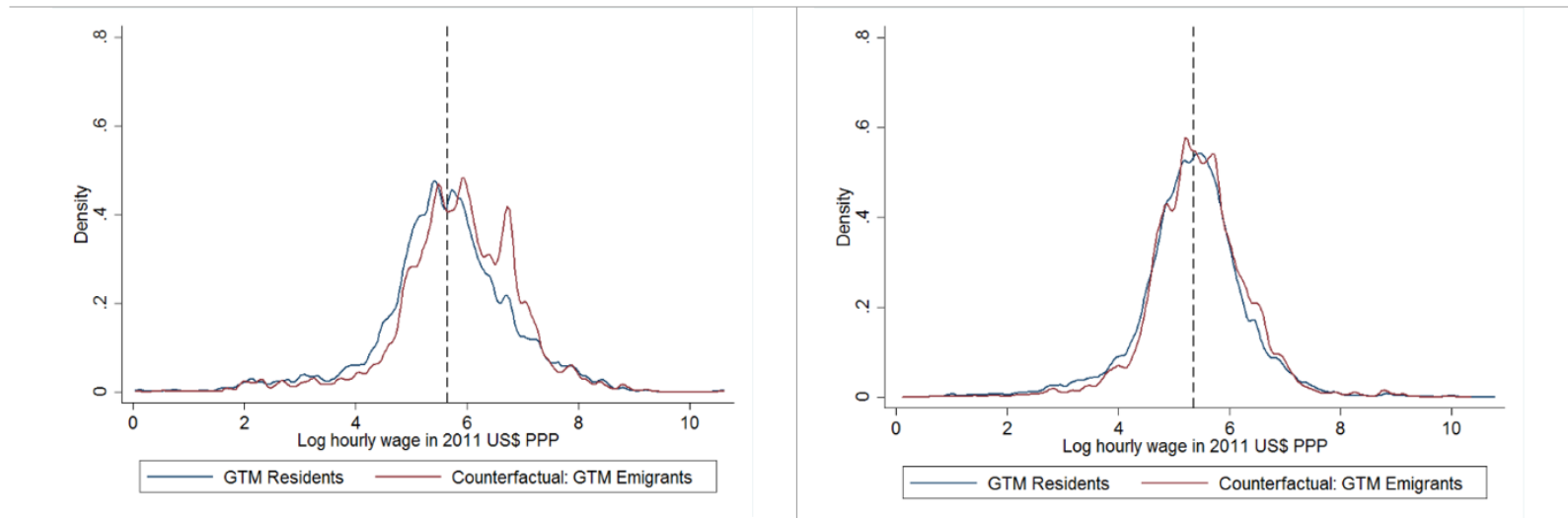
(a) 2000

(b) 2014

El Salvador



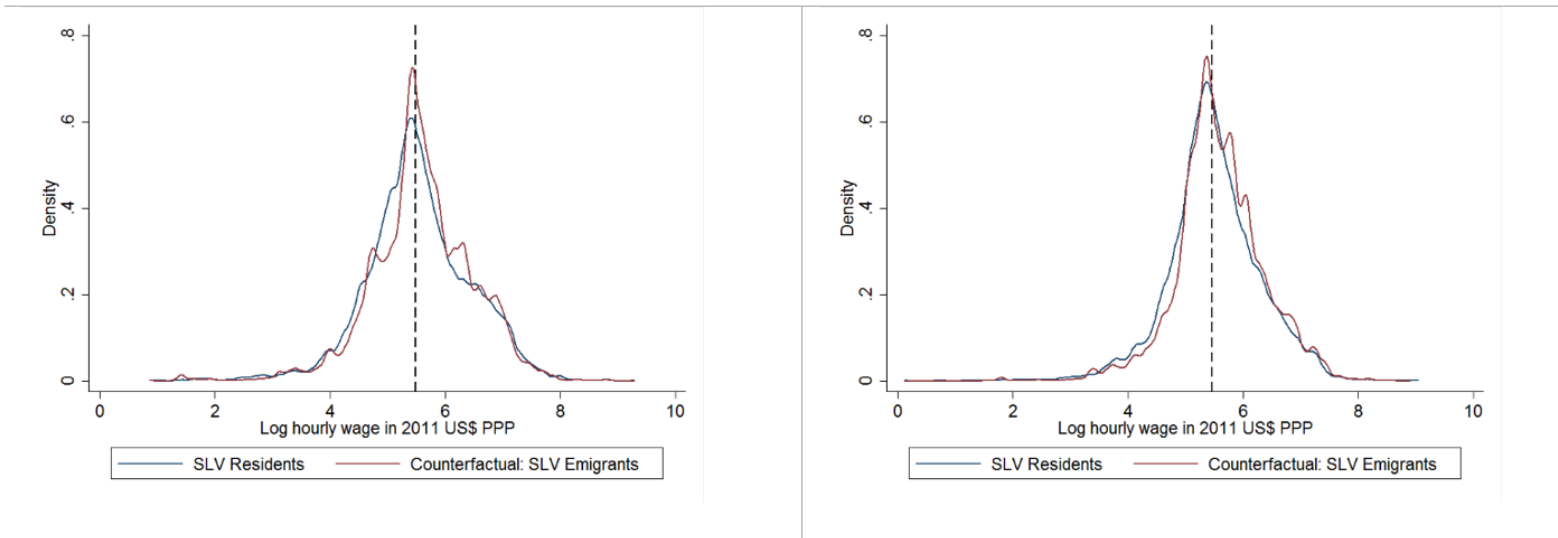
Guatemala



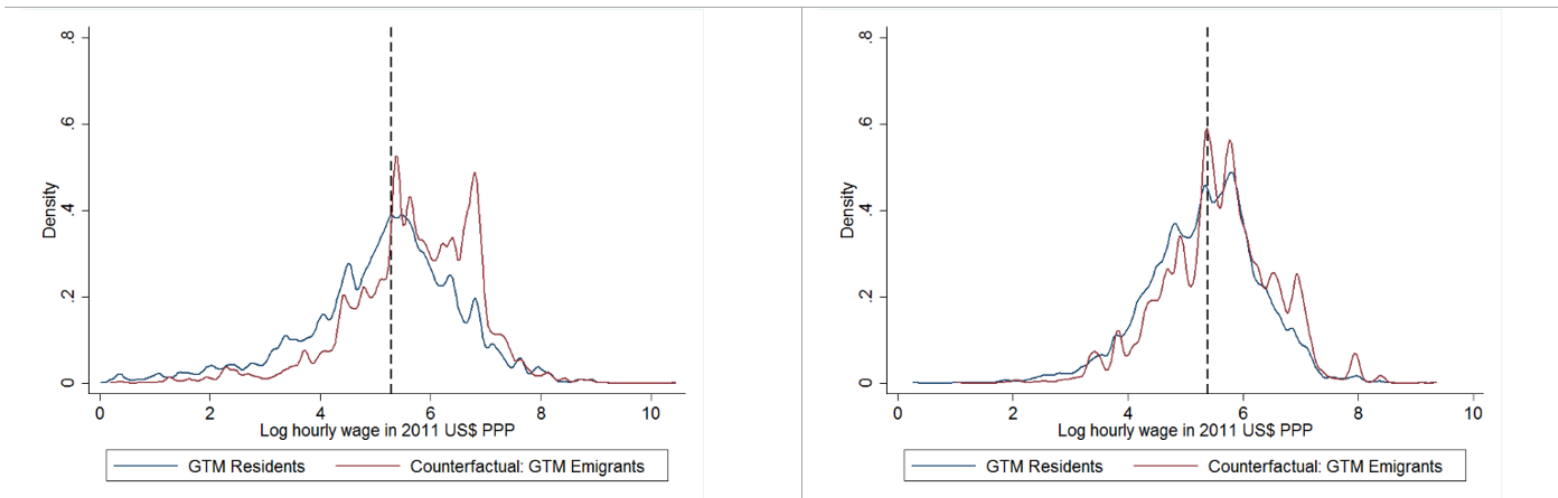
Results: Actual and Counterfactual Wage Densities

Actual and counterfactual wage densities, by country and year, Female
(a) 2000 (b) 2014

El Salvador



Guatemala



Results: Wage Differences (SLV & GTM)

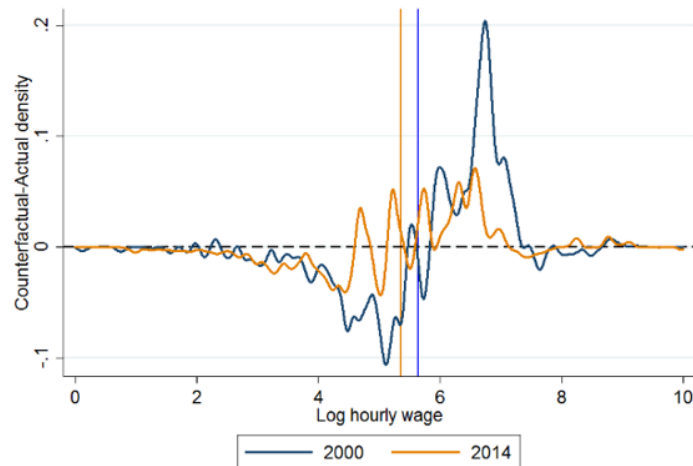
(a) El Salvador, Male



(b) El Salvador, Female



(c) Guatemala, Male

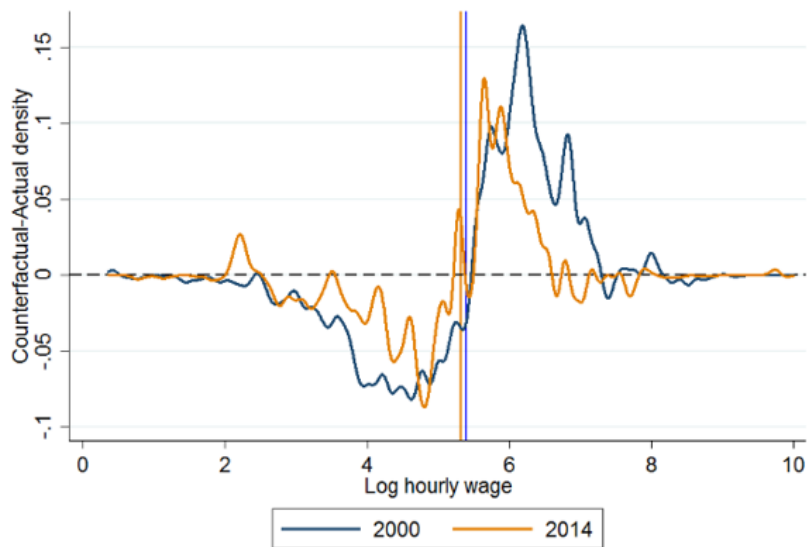


(d) Guatemala, Female



Results: Wage Differences (HND)

e) Honduras, Male



Note: Vertical lines are the median income by year.

f) Honduras, Female



Note: Vertical lines are the median income by year.

Results: Economic Importance of Foregone Wages

Migrant forgone wages in 2000 and 2014, by country

	Arrival cohort	Ten-year cohort, as % of local workers	Ten-year cohort, as % of all migrants	Ten-year cohort's forgone local earnings as % of:		
				Local labor earnings (2011 PPP US\$)	GDP, PPP (constant 2011 international \$)	Remittances (2011 PPP US\$)
GTM	2000	3.1%	25%	5.3%	1.7%	20.9%
	2014	2.4%	16%	3.2%	1.0%	10.8%
HND	2000	3.9%	33%	5.5%	3.1%	50.8%
	2014	2.9%	18%	3.5%	1.5%	8.7%
SLV	2000	6.6%	20%	7.0%	3.2%	23.9%
	2014	5.0%	12%	5.5%	1.9%	11.8%

Source: Author's tabulations using 2014 ACS, 2000 US Census data, and SEDLAC (CEDLAS and World Bank).

Note: The ten-year cohort is defined as all working age (18-65) migrants who migrated as adults (age 18 or older) living in the US from each country who arrived in the 10 years prior to the survey (either prior to 2000 or 2014). The first column of results reports the migrant population as a share of the potential workforce (ages 18-65). The other columns report the total estimated monthly labor earnings of these migrants as a share of total local earnings, GDP, and remittances (each adjusted to 2011 US\$). Due to data limitations, remittances share for the 2000 cohort is based on 20002 data for Guatemala.

Conclusion

- There is clear evidence of **positive selection into migration from the countries of the NT**. The differences between the densities of immigrants and residents remain negative for low wage and positive for upper-middle wage values
 - We also find evidence that the degree of positive selection has fallen between 2000 and 2014. This coincides with increased migration (has it become more “inclusive”?)
- The **cost of migration in terms of lost human capital is high** in these countries: 1.9% of GDP in SLV, 1.5% in HND, and 1% in GTM.
 - These forgone earnings are recovered through remittances, which represent larger shares of the GDP of each country.
- **ACS imputation strategy for education introduces a bias** for immigrant groups.
 - Imputations should take into account country of birth, or at least immigrant status
- Two **measurement caveats** to consider: (i) undercount of undocumented migrants (ii) lack of information on unobservable characteristics, such as motivation.

Thank you!
giselled@iadb.org

Annex

Summary Statistics: 2000

	El Salvador		Guatemala		Honduras	
	Recent Migrants	Residents	Recent Migrants	Residents	Recent Migrants	Residents
Age						
Mean	32.9	38.1	32.0	37.8	32.6	37.5
Median	30.0	36.0	30.0	36.0	31.0	35.0
Yrs of School (%)						
No School	14	18	14	36	8	18
1-4	8	23	10	26	4	25
5-8	26	20	30	20	32	34
9	11	10	6	3	7	4
10-11	6	3	5	3	5	3
12	23	13	23	6	27	11
13-15	8	7	9	3	10	2
16+	4	5	4	4	6	4
Labor Force Participation (%)	67	66	66	70	70	67
Hourly Wage						
Mean	\$ 14.24	\$ 3.83	\$ 14.16	\$ 4.57	\$ 13.01	\$ 3.82
Median	\$ 10.34	\$ 2.50	\$ 10.44	\$ 2.38	\$ 9.93	\$ 2.18
Observations						
Unweighted	7,395	31,951	5,405	14,856	4,084	14,784
Weighted	161,261	2,854,871	116,901	4,480,529	90,838	2,565,230

Summary Statistics: 2014

	El Salvador		Guatemala		Honduras	
	Recent Migrants	Residents	Recent Migrants	Residents	Recent Migrants	Residents
Age						
Mean	34.7	38.8	33.4	37.6	33.6	37.9
Median	33.0	37.0	31.0	35.0	32.0	36.0
Years of School (%)						
No School	6	11	11	24	4	10
1-4	9	19	17	23	8	20
5-8	20	19	31	23	38	34
9	12	12	5	7	5	6
10-11	6	5	4	7	5	6
12	27	19	19	9	23	13
13-15	14	8	9	3	11	5
16+	6	7	4	3	5	7
Labor Force Participation (%)	78	68	80	68	78	68
Hourly Wage						
Mean	\$ 10.54	\$ 3.35	\$ 10.15	\$ 3.32	\$ 9.78	\$ 3.29
Median	\$ 8.81	\$ 2.40	\$ 8.39	\$ 2.15	\$ 8.33	\$ 2.08
Observations						
Unweighted	4,799	40,622	4,520	24,727	3,071	11,328
Weighted	150,960	3,347,170	147,940	7,264,488	102,612	3,917,831

Results: Statistical Significance (SLV)

a. Counterfactual Wage Deciles (El Salvador)

Decile	Males 2000	Males 2014	Females 2000	Females 2014
1	0.08*** [0.073, 0.088]	0.075*** [0.068, 0.082]	0.069*** [0.059,0.081]	0.071*** [0.062,0.081]
2	0.081*** [0.074, 0.089]	0.087*** [0.077, 0.097]	0.10 [0.087,0.114]	0.08*** [0.072,0.089]
3	0.09*** [0.082, 0.098]	0.088*** [0.079, 0.097]	0.081*** [0.070,0.092]	0.102 [0.090,0.117]
4	0.1 [0.091, 0.110]	0.105 [0.094, 0.118]	0.094 [0.081,0.108]	0.104 [0.091,0.119]
5	0.107 [0.097, 0.118]	0.114*** [0.102, 0.127]	0.128*** [0.109,0.150]	0.104 [0.091,0.119]
6	0.11 [0.100, 0.121]	0.118*** [0.106, 0.132]	0.116 [0.098,0.136]	0.092 [0.080,0.105]
7	0.116*** [0.106, 0.127]	0.104 [0.094, 0.116]	0.108 [0.095,0.124]	0.11 [0.094,0.128]
8	0.119*** [0.109, 0.130]	0.118*** [0.106, 0.132]	0.093 [0.079,0.108]	0.104 [0.089,0.121]
9	0.11 [0.100, 0.122]	0.106 [0.095, 0.119]	0.108 [0.092,0.128]	0.116 [0.100,0.134]
10	0.086*** [0.077, 0.096]	0.084*** [0.074, 0.095]	0.103 [0.091,0.117]	0.117*** [0.104,0.132]

Results: Statistical Significance (GTM)

b. Counterfactual Wage Deciles (Guatemala)

Decile	Males 2000	Males 2014	Females 2000	Females 2014
1	0.042*** [0.031, 0.057]	0.057*** [0.050, 0.066]	0.068*** [0.049,0.094]	0.068*** [0.053,0.087]
2	0.038*** [0.029, 0.050]	0.082*** [0.070, 0.096]	0.076 [0.057,0.100]	0.089 [0.068,0.114]
3	0.074*** [0.058, 0.094]	0.11 [0.098, 0.124]	0.081 [0.060,0.109]	0.067*** [0.051,0.088]
4	0.078*** [0.065, 0.093]	0.099 [0.088, 0.112]	0.068*** [0.049,0.095]	0.06*** [0.047,0.077]
5	0.097 [0.080, 0.117]	0.115 [0.100, 0.132]	0.099 [0.072,0.133]	0.101 [0.072,0.139]
6	0.107 [0.088, 0.129]	0.11 [0.095, 0.128]	0.089 [0.061,0.127]	0.09 [0.068,0.117]
7	0.122 [0.098, 0.151]	0.107 [0.093, 0.123]	0.086 [0.063,0.115]	0.1 [0.072,0.138]
8	0.133*** [0.110, 0.159]	0.101 [0.088, 0.117]	0.129 [0.090,0.181]	0.102 [0.078,0.132]
9	0.173*** [0.146, 0.204]	0.11 [0.096, 0.126]	0.185*** [0.144,0.236]	0.134*** [0.107,0.166]
10	0.136*** [0.112, 0.164]	0.108 [0.093, 0.125]	0.119 [0.093,0.151]	0.19*** [0.158,0.226]

Results: Statistical Significance (HND)

c. Counterfactual Wage Deciles (Honduras)

Decile	Males 2000	Males 2014	Females 2000	Females 2014
1	0.055*** [0.047, 0.064]	0.079*** [0.064, 0.099]	0.045*** [0.033,0.062]	0.076 [0.051,0.111]
2	0.056*** [0.048, 0.066]	0.079*** [0.065, 0.094]	0.061*** [0.044,0.084]	0.089 [0.064,0.123]
3	0.069*** [0.059, 0.080]	0.085 [0.072, 0.101]	0.066*** [0.047,0.092]	0.092 [0.067,0.125]
4	0.087 [0.076, 0.101]	0.109 [0.091, 0.131]	0.073 [0.052,0.102]	0.076 [0.054,0.104]
5	0.09 [0.078, 0.104]	0.107 [0.089, 0.128]	0.098 [0.075,0.127]	0.093 [0.071,0.120]
6	0.109 [0.094, 0.126]	0.111 [0.093, 0.131]	0.092 [0.069,0.122]	0.084 [0.064,0.110]
7	0.134*** [0.117, 0.154]	0.126*** [0.105, 0.151]	0.126 [0.096,0.164]	0.114 [0.085,0.151]
8	0.135*** [0.119, 0.153]	0.125*** [0.104, 0.149]	0.118 [0.093,0.147]	0.123 [0.091,0.163]
9	0.141*** [0.122, 0.162]	0.101 [0.085, 0.120]	0.185*** [0.144,0.233]	0.132*** [0.105,0.165]
10	0.124*** [0.109, 0.141]	0.077*** [0.061, 0.098]	0.136*** [0.105,0.175]	0.122 [0.093,0.158]