

# Impact of Cross-Border Migration on the Gender Gap in Labor Force Participation in Latin America and in the Caribbean Countries

Cassie Chen Xiang and Manuk Ghazanchyan

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**Prepared by Cassie Chen Xiang and Manuk Ghazanchyan \***

Authorized for distribution by Patrizia Tumbarello  
August 2025

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**ABSTRACT:** Migration has been typically accompanied by persistently large gender gaps in labor force participation (LFP) rates within the Latin American and the Caribbean (LAC) countries from 1990 to 2020. However, the impact of both emigration (moving abroad) and immigration (coming in to the host country), and their joint effect on gender gap in labor force participation in LAC remains to be explored. This paper fills this gap by using both country-level data across LAC countries and individual-level data within Colombia as a supplementary case study. Our country-level analysis of LAC countries from 1991 to 2019 reveals that emigration is associated with decreased labor force participation rates, particularly among women. Supporting these findings, and based on data on Colombia from 2017 to 2019, we found that remittances, serving as a proxy for emigration, are associated with reduced labor force participation, especially among less-educated, older, and informal-sector women workers shaped by structural barriers and policy gaps. The reduced LFP rates for all genders are also shown with the influx of Venezuelan immigrants (serving as a proxy for an immigration shock) in the Colombian case.

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## WORKING PAPERS

# Impact of Cross-Border Migration on the Gender Gap in Labor Force Participation in Latin America and in the Caribbean Countries<sup>2,3</sup>

Prepared by Cassie Chen Xiang and Manuk Ghazanchyan

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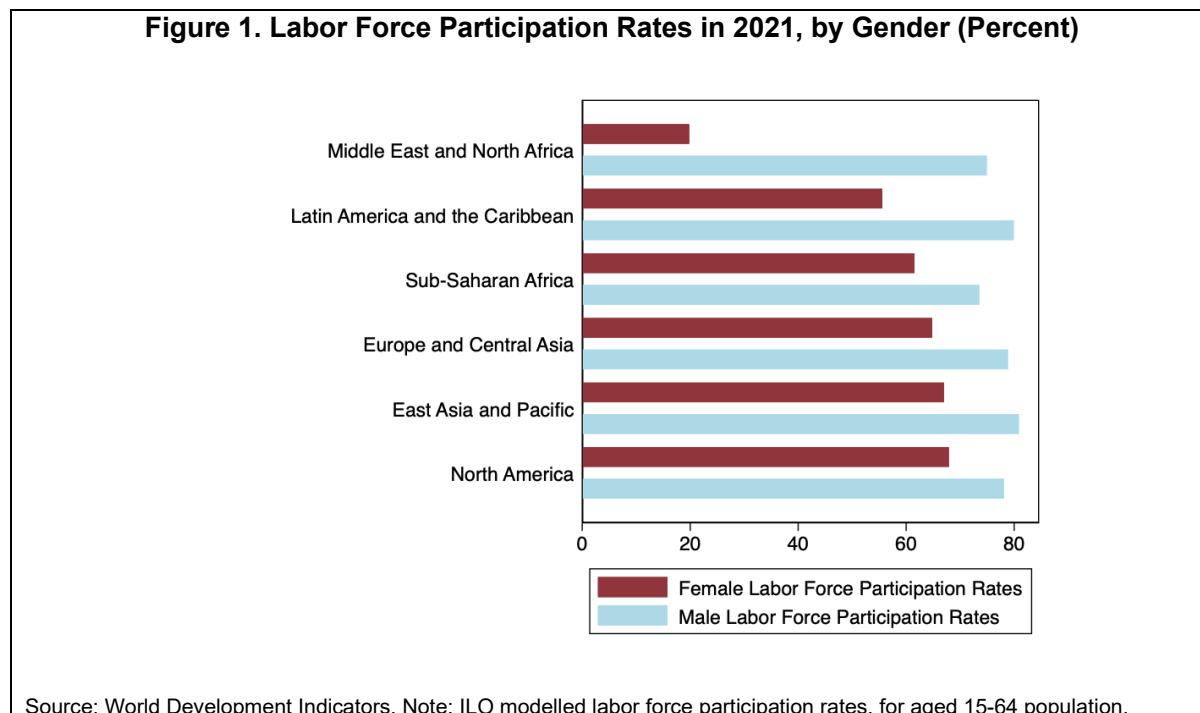
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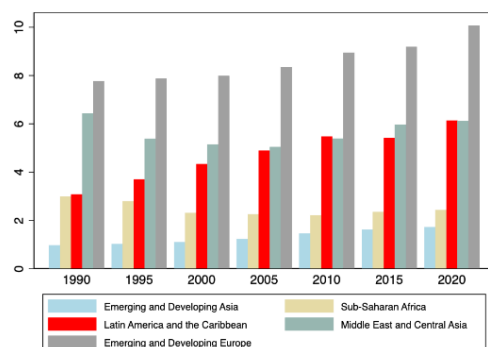
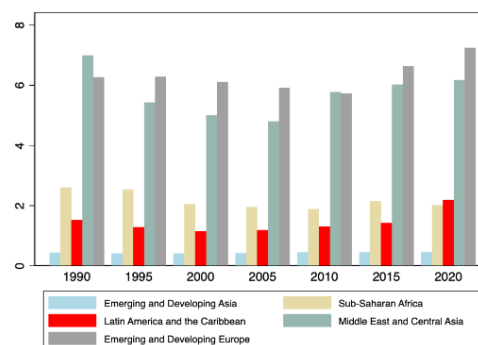
# I. Introduction and Stylized Facts

1. **The gender gap in labor participation (the difference between male and female labor force participation rates) has been declining substantially in Latin America and the Caribbean (LAC) since 1990.**<sup>4</sup> Female labor force participation rate has increased by approximately 13 percentage points (from 1994 to 2014), contributing to narrowing the gender gap (Kochhar et al., 2017). That said, gender gap in LAC remains the second highest in the world (Figure 1). These trends will of course have macro critical implications including on economic growth.



2. **In parallel with high gender gaps in labor force participation rates, cross-border migration has greatly increased for LAC countries.** By 2020, around 6.5 percent of the LAC population resided abroad, almost double relative to 1990 (and the highest increase among all regional groups). This makes emigration a critical policy issue for LAC countries (Figure 2). In addition, the share of foreign residents in LAC has also been growing, albeit at a smaller scale than emigration (Figure 3).

<sup>4</sup> Data on the gender gap in labor force participation, defined as the percentage difference between male and female participation rates for individuals aged 15 and over, indicate that the most significant change occurred in the Latin America and Caribbean region from 1994 to 2014, leading the global trend. Please refer to Figure 1.1 of Kochhar et al. (2017) for more details.

**Figure 2. Emigrants as Percentage of the Total Population in the Origin Country****Figure 3. Immigrants as Percentage of Total Population in the Destination Country**

Source: United Nations Population Division (UNPD).

**3. In this paper, we investigate how cross-border migration (both immigration and emigration) influences labor force participation rates by gender.**<sup>5</sup> Migration profoundly affects human wellbeing, economic development, and overall labor force participation (Beaton et al., 2017; Carare et al., 2024). However, the specific effect of migration on the gender gap in labor force participation is less explored. Given women typically exhibit higher labor supply elasticity to income (Hilgenstock and Kóczán, 2018; McClelland and Mok, 2012), we estimate the effect of migration on labor participation rates by gender in LAC countries to explain the gender gap in labor force participation.

**4. We begin with a cross-country analysis using country-level data on migration rates and gender-specific labor force participation rates.** Our macro-level analysis of LAC countries from 1991 to 2019 reveals that emigration is associated with decreased labor force participation rates, particularly among women. Furthermore, the macro analysis at the LAC level demonstrates a statistically significant positive correlation between immigration and male labor force participation rates, while the correlation with female labor force participation rates is statistically insignificant.

**5. We add Colombia as a case study to support our findings on migration.** With Colombia having a substantial stock of emigrants (6 percent of the population) and immigrants (3.7 percent) as of 2020, the case study helps better understand the migration and labor force participation decisions of the individuals. Also, Colombia has detailed individual-level data on remittances, employment status, and demographic information, allowing us to enrich our analysis. Since the dataset lacks information on the emigration status of family members, we use remittances as a proxy for emigration.<sup>6</sup>

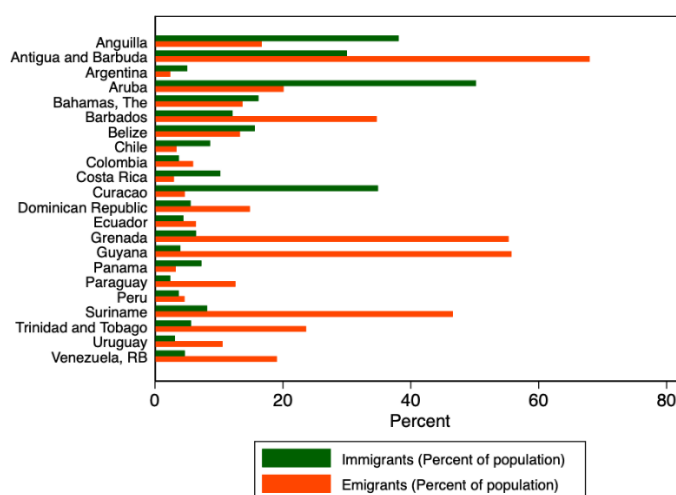
**6. Our analysis of Colombia yields two main findings.** Based on data on Colombia from 2017 to 2019 we found that remittances, serving as a proxy for emigration, are associated with reduced labor force participation, especially among less-educated, older, and informal-sector women. Additionally, the analysis of Colombian data shows that the influx of Venezuelan immigrants reduces labor force participation for all genders, with a lesser impact on women, after employing a shift-share design to address endogeneity. This calls for the importance of inclusive policies that protect both host and migrant workers.

<sup>5</sup> According to the United Nations' definition, immigration refers to the act of moving into a country other than one's country of nationality or usual residence, with the destination country becoming the individual's new usual residence. Conversely, emigration is defined as the act of leaving one's country of nationality or usual residence to relocate to another country. Source: <https://www.iom.int/key-migration-terms>.

<sup>6</sup> Several studies demonstrate the impact of emigration and remittances on labor market outcomes (Acosta, 2020; Hanson, 2007) and that countries with higher emigration levels tend to receive greater remittances (Figure A.1 in Annex).

**7. As few studies have explored the effect of both emigration and immigration on the gender gap in labor force participation, our paper fills this gap in the literature.** Emigration often results in the loss of prime-age workers and weakens the country's economic base, while immigration can intensify competition for job opportunities among natives and immigrants. In countries with large emigration and immigration, the effects of emigration may be mitigated by the influx of immigrant labor, and competition may be less pronounced due to worker outflows. Our paper studies these effects both at the LAC level and at a country level. As figure 4 illustrates, in LAC countries emigrants and immigrants represent at least 2 percent of the total population as of 2020, highlighting the important roles of both emigration and immigration for many LAC countries, and the need of a joint analysis to understand their impact on the labor force participation, and if they affect men and women differently.<sup>7</sup> Our joint analysis of remittances and immigration in Colombia indicates that labor force participation rates are negatively correlated with cross-border migration, with female labor force participation being more adversely affected by emigration and less affected by immigration compared to male labor force participation rates.

Figure 4. LAC Countries with Significant Emigration and Immigration, 2020



Source: International Migrant Stock 2020, UNPD. Note: This chart shows LAC countries for which both the stock of emigrants and the stock of immigrants represented at least 2 percent of the total population.

**8. The rest of the paper is structured as follows:** Section II reviews the literature; Section III details the data used in the study. Section IV outlines migration patterns in LAC. Section V presents our empirical strategy and findings regarding the effects of emigration, immigration, and their joint impact on gender gap in labor force participation. Section VI explores heterogeneity in the results, and Section VII concludes the paper.

## II. Review of the Literature

**9. Our work is closely related to the literature examining the effects of emigration on the labor markets in source countries.** Many studies have examined the impact of emigration on the overall labor market supply and some on gender differences (Mishra, 2006; Airola, 2008; Carare et al. 2024). Research that specifically focused on gender disparities generally found that emigration and remittances had a negative effect on the labor supply of women. For instance, Hanson (2007) finds larger emigration-induced reductions in labor supply for women in Mexico, and Rodriguez and Tiongson (2001) report similar findings for Philippines. Also, Amuedo-Dorantes and Pozo (2006) finds that a 16 percent increase in remittances reduces rural women's labor supply by 6 to 12 hours per month in Mexico, with no significant impact on men or urban

<sup>7</sup> We dropped outliers where emigrants' or immigrants' shares were larger than 100 percent.



women. Our work supplements this strand of literature, looking at the aggregate level in LAC, and using Colombian data.

**10. Our contribution to the literature also stems from examining the impact of immigration on the wage and labor supply of host country (native) workers.** Numerous studies have explored this topic, particularly in developed countries (e.g., Grossman, 1982; Friedberg, 2001; Dustmann et al., 2017; Altonji and Card, 2018; Hilgenstock and Kóczán, 2018). For developing countries, Viseth (2020) investigated the effects of immigration for several African countries, highlighting that the impact of immigration depended on the complementarity of immigrants and local workers' skills. Alvarez et al. (2020) examined the impact of Venezuelan immigrants on the Colombian labor market and concluded that there is no significant displacement effect. Our analysis differs from theirs in several key aspects. First, the unit of analysis varies: their study operates at the regional level, while our analysis focuses on individuals, resulting in significantly different sample sizes. While macro-level analyses may capture broader trends that do not apply to individuals, our individual-level analysis offers detailed insights into individual behaviour and allows us to control for a range of individual and regional characteristics. Second, Alvarez et al. (2020) focus on changes in labor force participation during the 2016-19 migration period, whereas our outcome variable reflects the level of labor force participation for each year from 2017 to 2019. Our findings align with those of Caruso et al. (2021) and Peñaloza-Pacheco (2022), both revealing negative effects of the Venezuelan exodus on wages and employment, particularly for low-skilled and urban native workers. The later calls for inclusive policies that protect both host and migrant workers.

**11. Our research is also particularly relevant to papers on south-south migration, and its impact on labor force participation, as it looks at cross-border migration across LAC countries.** At a country specific level, Blyde (2020) analysed the effects of Nicaraguan immigrants on the labor market outcomes of native workers in Costa Rica, documenting heterogeneous effects across skill groups, a finding echoed in a study on Dominican Republic (Hiller and Rodríguez Chatruc, 2023). Morales and Pierola (2020) explored the heterogeneous effects of Venezuelan migrant inflows on employment, informality, and earnings in Peru, while Contreras and Gallardo (2020) emphasized skill-level heterogeneity on effects of mass migration to Chile. Our study is closest to Bahar et al. (2021), in assessing the labor market effects in the context of broader labor market dynamics of a large-scale amnesty program for undocumented Venezuelan immigrants in Colombia and finding only marginal negative impacts on natives' formal employment. However, our paper reveals gender-specific effects, where women are less negatively affected by immigrants, probably because immigrants are more likely to compete with native male workers. More broadly, our paper adds to the literature by providing some evidence on the impact of Venezuelan immigrants on the gender gap in labor force participation among Colombian natives.

**12. We contribute to the literature on migration in LAC and fill the gap by examining both emigration and immigration in a unified framework.** While existing literature on migration and labor force participation mostly focuses on emigration or immigration separately, for completeness we study the effects of both emigration (as proxied by remittances) and immigration on labor force participation and look at gender differences. With the data rich with countries with simultaneous emigration and immigration flows, omitting these interactions may bias estimations. Our proposed framework is based on the micro-level data for Colombia.

### III. Data

**13. For the analysis across countries, we employ macroeconomic data from the World Bank World Development Indicators (WB WDI), International Labor Organization (ILO) and United Nations Development Program (UNDP)'s migration database.** Remittances as a share of GDP, labor force participation rates for women and men, unemployment rate, and GDP per capita for LAC countries are sourced from the WB WDI. To exclude the COVID-19 event, we included annual data for all LAC countries from 1991 to 2019. Labor force participation rate represents the proportion of the population aged 15-64 that is economically active, as estimated by International Labor Organization (ILO). Emigration and immigration data are sourced from the UNPD International Migrant Stock Database, which provides migrant stock data for each country every five years from 1990 to 2020 based on official statistics on foreign-born population.

**14. For our micro-level analysis, we employ the monthly Large Integrated Household Survey data of Colombia.** This dataset consists of monthly repeated cross-sections that capture individual socio-demographics and labor outcomes. We focus on survey years 2017-2019 to ensure consistency and avoid the effects of COVID-19. We restrict the sample to including all native individuals aged 15-64. The primary outcome variable is labor force participation status. To capture emigration, a key independent variable, we create a dummy variable for remittance receipts based on the question: "During the last twelve months, did you receive money from other households or persons residing outside the country?" We also use the amounts of remittances, along with control variables such as age, marital status, and educational attainment.

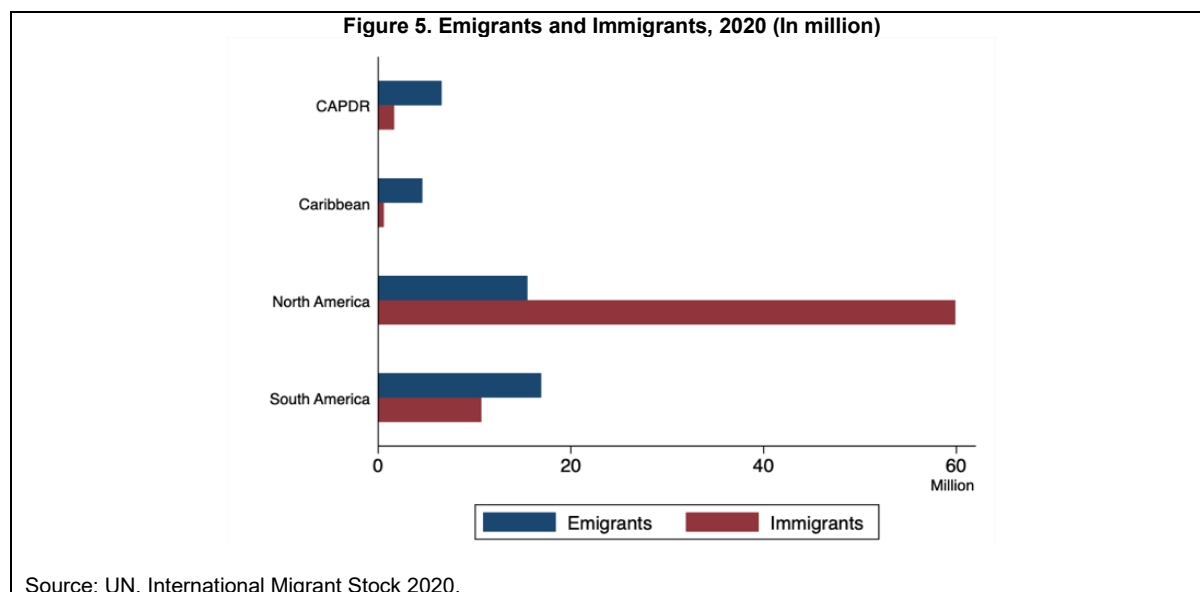
**15. Given the large inflow of approximately 1.8 million Venezuelan immigrants to Colombia by 2020, we use Venezuelan immigration as a proxy for an immigration shock.** To measure individual's exposure to immigrants, we calculate the share of Venezuelan immigrants in the local population of their municipality during the survey year. To address the potential endogeneity issue of this variable, we construct an instrument by using yearly inflow data of Venezuelan immigrants to Colombia at the national level, along with the inverse distance to the municipality's border. The national inflow measure is derived from official statistics on monthly bilateral migration flows between Colombia and other countries. The distance to the nearest Colombia-Venezuela border is sourced from Bahar et al. (2021), who estimate distances from the centroid of each municipality to five border entry points: Cúcuta, Maicao, Arauca, Puerto Carreño, and Puerto Inírida, and calculate a weighted average of these distances based on the total number of Venezuelan migrants entering Colombia through each point between 2014 and 2017. The inverse distance measure is then constructed as the reciprocal of this weighted average. Descriptive statistics for our sample are presented in Table A.1 in the Annex.

### IV. Migration Patterns in the Western Hemisphere

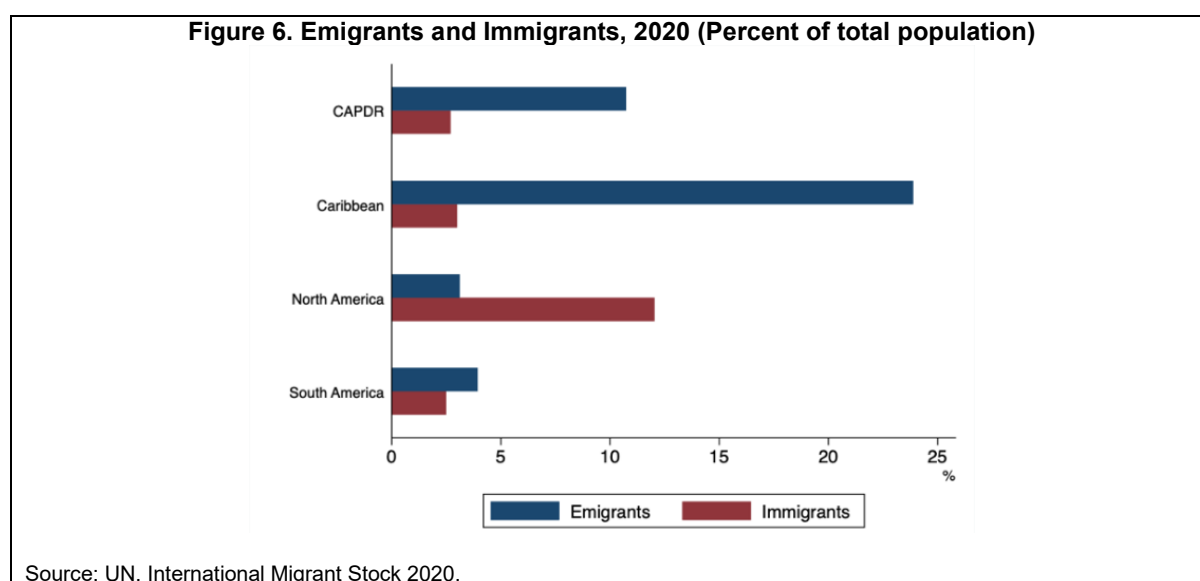
**16. We document large differences in cross-border migration across countries within the Western Hemisphere region.** The data is sourced from the UNPD International Migrant Stock Database 2020, at five-year intervals, between 1990 and 2020. The database includes estimates of the number (or "stock") of international migrants disaggregated by sex, country of origin, and country of destination based on official statistics on the foreign-born or the foreign population. We group countries to North America, South America, Caribbean, as well as Central America, Panama, and the Dominican Republic (CAPDR).<sup>8</sup> By 2020, North America exhibited higher immigrant stocks compared to emigrant stocks, while South America, CAPDR, and

<sup>8</sup> Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama are grouped as CAPDR. North America includes Canada, Mexico, United States, and Puerto Rico. South American countries are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela. The Caribbean countries include Guyana, Suriname, Trinidad and Tobago, Haiti, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Dominica, Grenada, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines.

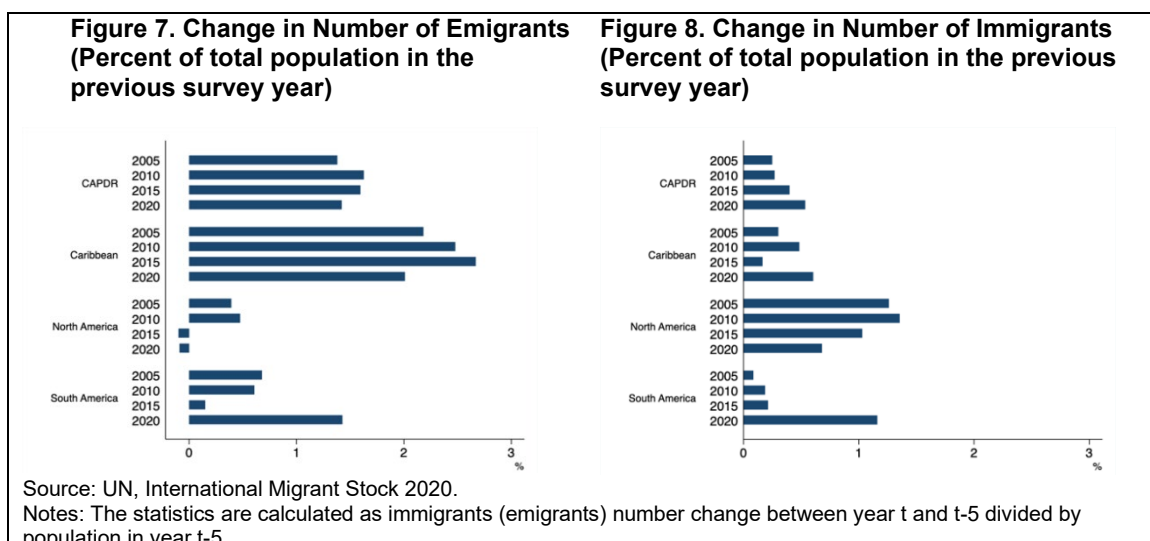
Caribbean countries showed a higher number of emigrants than immigrants, as shown by Figure 5. The migration patterns for each country are shown in Annex II.



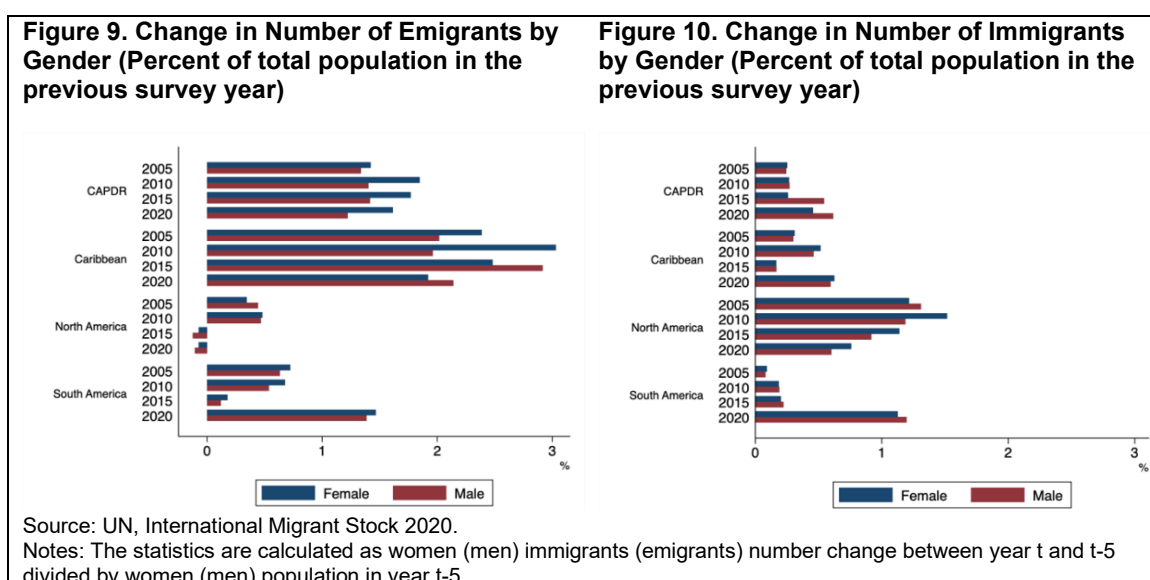
**17. Figure 6 presents the number of emigrants and immigrants as a percentage of the total population for each region.** North America has the highest population share of emigrants. In contrast, although South America reports the highest total number of emigrants, the Caribbean region demonstrates the greatest population share of emigrants, followed by CAPDR.



**18. The shares of migration outflows in population have been consistently high in the Caribbean and CAPDR in the past decades, and recently, surging in South America.** We next examine the change in the number of emigrants and immigrants normalized by the population size in the previous survey year over recent years (Figures 7 and 8). Migration inflows are also increasing in these regions albeit with much slower pace than outmigration.



**19. Women dominate the migration outflow shares in population across all LAC regions except recently in the Caribbean (Figure 9), while the gender distribution of migration inflows is relatively even.**



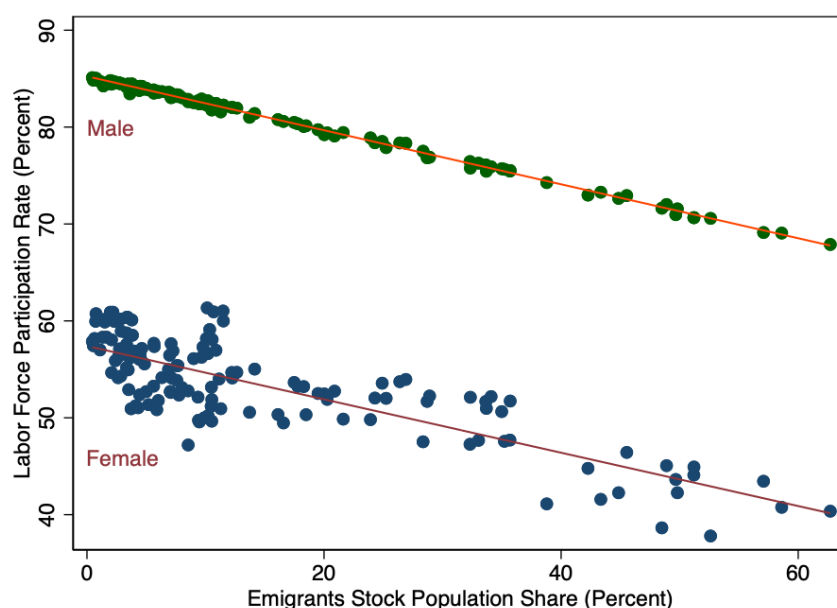
## V. Empirical Strategy and the Effects of Migration

**20. In this section, we conduct two sets of empirical tests.** First, we present macro-level evidence by regressing the labor force participation rates of women and men in LAC countries against emigration and immigration rates (as a share of the population). To gain insights into individual-level decisions regarding labor force participation and migration, we use Colombia as a case study, examining the impacts of receiving remittances (as a proxy for emigration) and exposure to Venezuelan immigrants on the likelihood of labor force participation among native women and men.

**21. Our regression analysis indicates that LAC countries with higher shares of emigrants in the population experience lower labor force participation rates for both genders, with similar effects.** Specifically, we regress female and male labor force participation rates in LAC countries from 1991 to 2019 on the share of emigrants in the population, controlling for the unemployment rate and GDP per capita. As shown in Figure 11, for every 1 percentage

point increase in the emigrant share of the population, the female labor force participation rate is expected to decrease by 0.30 percentage point (statistically significant), and the male labor force participation rate is expected to decrease by 0.27 percentage point (statistically significant), holding all other factors constant. Duflo and Loree (2019) emphasize that emigrants are more likely to be "running from the mouth of the shark" rather than being attracted by economic incentives. Factors such as violence, drug wars, military juntas, and civil wars significantly influence emigration decisions. To take these factors into consideration, we utilize the Global Peace Index (Institute for Economics and Peace, 2019), which provides a comparable measure of the absence of violence across 163 countries and territories from 2008 to 2019. We average the index across this period and include it as an additional control in our regression analysis, where a 1 percentage point increase in the emigrant share of the population is associated with a statistically significant decrease of 0.16 percentage point in the female labor force participation rate and a decrease of 0.09 percentage point in the male labor force participation rate, holding all other factors constant.

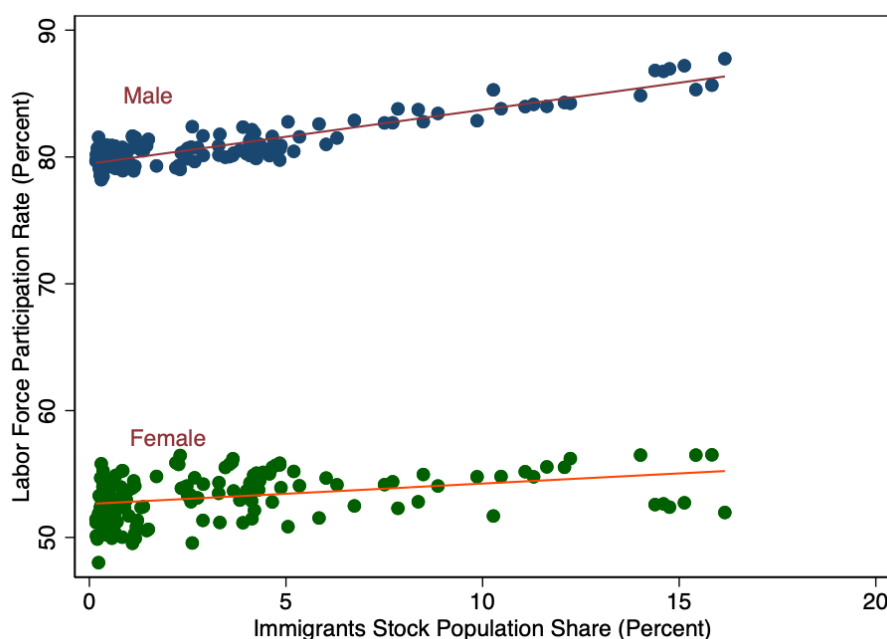
**Figure 11. Emigrants Share of Population and Labor Force Participation Rates by Gender**



Sources: World Development Indicators, 1991-2019 and IMF staff estimates. N = 139. Unemployment rate, GDP per capita, country and year fixed effects are controlled. Each dot represents a predicted labor force participation rate.

**22. Immigration is associated with an increased male labor force participation rate.** We regress the labor force participation rates of both women and men in LAC countries from 1991 to 2019 against the share of immigrants in the population, controlling for the unemployment rate and GDP per capita. As illustrated in Figure 12, a 1 percentage point increase in the immigrant share of the population is associated with a 0.56 percentage point increase in the male labor force participation rate (statistically significant), holding all other factors constant. This seems to point out that immigrants complement rather than substitute men in domestic labor supply. However, the correlation between the share of immigrants and female labor force participation rates is statistically insignificant.

Figure 11. Immigrants Share of Population and Labor Force Participation Rates by Gender



Sources: World Development Indicators, 1991-2019 and IMF staff estimates. N = 139. Unemployment rate, GDP per capita, country and year fixed effects are controlled. Each dot represents a predicted labor force participation rate.

**23. Although the cross-country analysis provides valuable insights, it is subject to endogeneity bias.** Migration is often non-random, and migrants tend to self-select (Antman, 2012), suggesting that migration might be correlated with factors that influence native labor force participation rates. Consequently, Ordinary Least Squares (OLS) estimates may not accurately reflect whether migration is driving differences in labor force participation rates. Given that migration and labor supply decisions are made at the individual household level, we complement our macro-level findings with a micro-level analysis using data for Colombia.

**24. Next, we study the impact of emigration and immigration on labor force participation by using micro-level data for Colombia.** Due to the lack of information on emigration status for households, we use remittances as a proxy. We employ the following linear regression model to identify the impact of remittances on the labor force participation of left-behind family members:<sup>9,10</sup>

$$\mathbb{I}(\text{Labor Force Participation}_{idym} = 1) = \beta_0 + \beta_1 \mathbb{I}(\text{Remittance}_{idym}) + \beta_2 (\text{Female}_i) + \beta_3 \mathbb{I}(\text{Remittance}_{idym} \times \text{Female}_i) + \beta_4 X_{idym} + \sigma_y + \sigma_m + \sigma_d + \varepsilon_{idt} \quad (1)$$

where the outcome variable is a dummy variable indicating labor force participation for individual  $i$  in municipality  $d$  during month  $m$  of year  $y$ . Key independent variables include a dummy for remittances receipt, a female indicator, and their interaction term. We control age, marriage status, and college education, as well as fixed effects for year, month, and municipality. The coefficient of the interaction term captures the gender differential in labor force participation responses to remittances. In addition, to quantify the intensive-margin effect, we replace the dummy variable for remittance receipts with the continuous variable representing the total amount of remittances received in the past 12 months, normalized by Colombia's minimum wage.

<sup>9</sup> The results are robust with using Probit model.

<sup>10</sup> As migration and labor supply are household-level decisions, we take advantage of the detailed information provided in the monthly Large Integrated Household Survey data from Colombia from 2015 to 2019.

**25. We find that for Colombia remittances from emigrants reduce labor force participation propensity, especially for women (Table 1).** Column 2 in Table 1 shows that the effect is more pronounced if the value for remittances is larger. Specifically, remittances of ten times the minimum wage led to around 3.5 percentage points larger gender gap in labor force participation. These results are consistent with the findings of Amuedo-Dorantes and Pozo (2006) and Hanson (2007), suggesting that emigration and the accompanying return flow of remittances lead to an income effect which raises the reservation wage for non-migrating household members, thereby decreasing their labor force participation. Moreover, since women are less attached to the labor market and have higher labor supply elasticity to income (Hilgenstock and Kóczán, 2018; McClelland and Mok 2012), their labor force participation is more adversely affected than that of men. We observe a similar negative relationship when using the share of remittances in GDP as a proxy for emigration in our cross-country analysis (Figure A.2).

**Table 1. Effects of Emigration on Labor Force Participation**

	(1)	(2)
	Labor force participation	
Receiving remittances from outmigrants	-0.0720** (0.0290)	
Remittances value (normalized by minimum wage)		-0.00253* (0.00141)
Female	-0.0319* (0.0165)	-0.0339** (0.0164)
Receiving remittances from outmigrants * Female	-0.0567** (0.0266)	
Remittances value (normalized by minimum wage) * Female		-0.00347** (0.00142)
Constant	0.291*** (0.0415)	0.291*** (0.0411)
Observations	270,096	270,096
R-squared	0.090	0.089
Control	Age, marriage status, and education	
FE	Year and month and municipality	
Cluster	Municipality	
Notes: The data come from the Large Integrated Household Survey data of Colombia . The sample includes working age (15-64) individuals. Standard deviations are presented in parentheses. *** p<0.01 ** p<0.05 * p<0.1		

**26. Next, we find that higher Venezuelan immigrants' share reduces labor force participation propensity, especially for men.** Table 2 shows both the OLS and the two-stage-least-square (2SLS) results as described below. While OLS specifications yield no significant results, the 2SLS results in Column (2) indicate that a 1 percent increase in Venezuelan immigrants share leads to a 1.21 percent lower labor force participation of native Colombians. Moreover, such negative effect is less pronounced for women, as indicated by a positive interaction term in Column (4). Hence, the direction of the impact depends on the degree of substitution or complementarity between natives and immigrants (Viseth, 2020). Notably, around 90 percent of immigrants that are men are in the labor market compared to only 70 percent of women immigrants, suggesting that immigrants are more likely to compete with native male workers, consistent with Contreras and Gallardo's (2020) findings on the wage effects of mass migration from Venezuela to Chile.

**Table 2. Effect of Immigration on Labor Force Participation**

	(1)	(2)	(3)	(4)
	OLS	Labor force participation 2SLS	OLS	2SLS
Venezuelan immigrants share	-0.000998 (0.00241)	-0.0121*** (0.00220)	-0.00456 (0.00376)	-0.0182*** (0.00347)
Female	-0.0346* (0.0169)	-0.0346* (0.0165)	-0.0450** (0.0199)	-0.0507* (0.0235)
Venezuelan immigrants share * Female			0.00455 (0.00348)	0.00707* (0.00316)
Observations	266,115	266,115	266,115	266,115
R-Square	0.086	<b>0.0851</b>	0.086	<b>0.0851</b>
FE		Year and Municipality		
Cluster		Municipality		
Control		Age, marriage status, education		
First-stage F-test		85.47		42.8

Notes: The data come from the Large Integrated Household Survey data of Colombia. The sample includes working age (15-64) individuals. Standard deviations are presented in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Columns (1) and (3) show OLS estimates, while (2) and (4) include 2SLS estimates. The Venezuelan immigrants share in columns (2) and (4) is the predicted value by using the shift-share instrument in the first stage. First-stage F-test is conducted under the null hypothesis that all coefficients of the included instruments are zero.

**27. Our findings are based on studying the immigration impact on the labor force participation of native Colombians.** Colombia is one of the largest recipients of migrants in LAC, hosting approximately 1.8 million Venezuelans by 2020 (Bahar et al., 2021). To assess the impact of Venezuelan immigrants on the labor force participation of native Colombians, we employed the following model specification:

$$\mathbb{I}(\text{Labor Force Participation}_{idym} = 1) = \beta_0 + \beta_1(\text{Immigrants Share}_{dy}) + \beta_2(\text{Female}_i) + \beta_3(\text{Immigrants Share}_{dy} \times \text{Female}_i) + \beta_4 X_{idym} + \sigma_y + \sigma_m + \sigma_d + \varepsilon_{idt} \quad (2)$$

Immigrants Share<sub>dy</sub> represents the share of Venezuelan immigrants of local population in municipality *d* and year *y*. We include the same control variables and fixed effects as in Equation 1.

**28. To address potential endogeneity issues, we adopted a shift-share instrument commonly used in migration literature (e.g., Card, 2001 and Altonji and Card, 2018).** The distribution of Venezuelan immigrants across municipalities is not random, which may bias our estimates. For instance, if immigrants are more likely to settle in municipalities with more equal gender beliefs, OLS estimates could yield a positive bias. We define the yearly inflow of Venezuelan immigrants to Colombia in the national level (*Immigrants<sub>y</sub>*) as the shift and the inverse of distance to border of municipality (*dis<sub>d</sub>*) as the share. The instrument is constructed as  $Z_{dy} = dis_d \times Immigrants_y$ . The use of this instrument is consistent with the fact that migrants tend to be drawn to municipalities closer to the border between Venezuela and Colombia, and the distance to the border is exogenously given (Lebow, 2022). The identification assumption validating the instrument is that national-level inflow of immigrants and geographic variation across municipalities are exogenous to the factors affecting the labor market of the municipality.

In the first stage, we estimated the following model to obtain the predicted immigrants share *Immigrants Share<sub>dy</sub>*:

$$\text{Immigrants Share}_{dy} = \beta_0 + \beta_1(Z_{dy}) + \beta_2(\text{Female}_i) + \beta_3(Z_{dy} \times \text{Female}_i) + \beta_4 X_{idym} + \sigma_y + \sigma_m + \sigma_d + \varepsilon_{idt} \quad (3)$$



In the second stage, we substituted the predicted immigrants share  $\widehat{Immigrants\ Share}_{dy}$  for the actual share in Equation 2.

**29. Although both emigration (proxied by remittances) and immigration negatively affect the overall labor force participation, the effect of remittances dominates the immigration effect.** Several key findings emerge from this analysis. First, consistent with our earlier findings on the separate effects of emigration and immigration, both factors negatively influence overall labor force participation. Remittances have a greater impact on women, while the effect of immigration on women is smaller. Second, a comparison of the coefficients reveals that the effect of remittances on the gender gap in labor force participation is larger than that of immigration, indicating that remittances dominate the immigration effect in this context. To explore the joint effects of immigration and emigration on gender gap in labor force participation rate, we combined equations 1 and 2 into a single specification:

$$\begin{aligned} \mathbb{I}(\text{Labor Force Participation}_{idym} = 1) = & \beta_0 + \beta_1 \mathbb{I}(\text{Remittance}_{idym}) + \beta_2 (\text{Female}_i) + \\ & \beta_3 \mathbb{I}(\text{Remittance}_{idym} \times \text{Female}_i) + \\ & \beta_4 (\widehat{\text{Immigrants Share}}_{dy}) + \\ & \beta_5 (\widehat{\text{Immigrants Share}}_{dy} \times \text{Female}_i) + \\ & \beta_6 X_{idym} + \sigma_y + \sigma_m + \sigma_d + \varepsilon_{idt} \end{aligned} \quad (4)$$

We employed the shift-share design to instrument the immigrant share, as detailed earlier. The results are listed in Table 3.

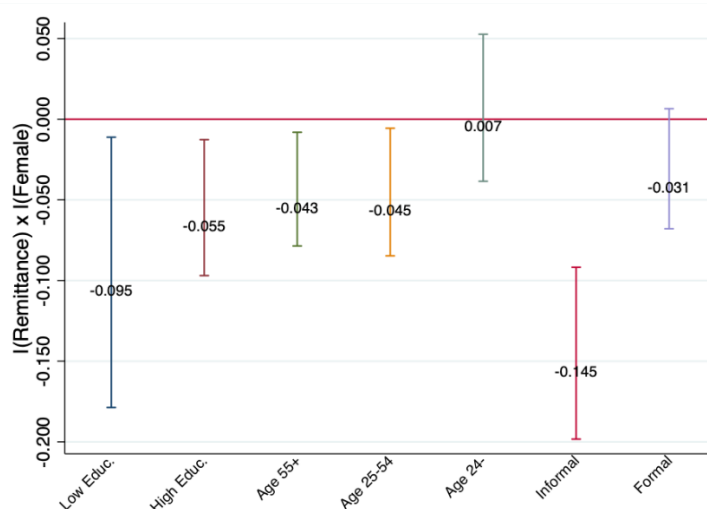
**Table 3. Joint Effect of Emigration and Immigration**

	(1)	(2)
	Labor force participation	
Venezuelan immigrants share	-0.0125*** (0.00224)	-0.0180*** (0.00351)
Receiving remittances	-0.113*** (0.0124)	-0.0710* (0.0288)
Venezuelan immigrants share * Female		0.00652* (0.00311)
Receiving remittances * Female		-0.0566* (0.0266)
Observations	266115	266115
R-Square	0.0869	0.087
FE	Year and Municipality	
Cluster	Municipality	
Control	Age, marriage status, education	
First-stage F-test	85.45	42.8

Notes: The data come from the Large Integrated Household Survey data of Colombia. The sample includes working age (15-64) individuals. Standard deviations are presented in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The Venezuelan immigrants share in the table is the predicted value by using the shift-share instrument in the first stage. First-stage F-test is conducted under the null hypothesis that all coefficients of the included instruments are zero.

## VI. Heterogeneous Effects of Emigration

**30. In a case study for Colombia, we found that less-educated, older, and informal-sector women are more adversely affected by remittances compared to their male counterparts (Figure 13).** We run the regression specified in Equation 1 across different subsamples to examine whether emigration has heterogeneous effects based on individual characteristics, including gender, education level (beyond high school vs. less than high school), age (under 25 vs. age 25-54 vs 55 and older), and employment sector (formal vs. informal).

**Figure 13. Heterogeneous Effect of Remittances on Gender Gap in Labor Force Participation**

Notes: Each coefficient shows the results of a separate regression as specified in Equation (1) for each subsample described in the horizontal axis. The figure also includes 90 percent confidence intervals.

## VII. Conclusions

**31. This paper investigates the relationship between cross-border migration and the gender gap in labor force participation in Latin America and the Caribbean (LAC), a region characterized by notable emigration and increasing immigration.** Understanding how these migration dynamics impact gender disparities in labor markets is macro-critical for economic growth and is essential for developing effective policies to promote gender equality and economic empowerment of women. First, the paper examines the effect of emigration on labor force participation, at LAC level, and based on household survey (micro-level data) in Colombia. We next quantify how the exposure to Venezuelan immigrants affects the gender gap in labor force participation of Colombian natives, employing a shift-share instrument. Lastly, we investigate the joint effect from emigration and immigration using a unified framework.

**32. Our macro-level analysis of LAC countries from 1991 to 2019 reveals two main findings.** First, a higher share of emigrants in the population is linked to decreased labor force participation rates, particularly among women. Second, we find a statistically significant positive correlation between immigration and male labor force participation rates, while the correlation with female labor force participation rates is statistically insignificant.

**33. Our micro-level data analysis of Colombia from 2017 to 2019 yields three primary findings.** We found that remittances, serving as a proxy for emigration, are associated with reduced labor force participation, especially among less-educated, older, and informal-sector women workers. We also found that the influx of Venezuelan immigrants to Colombia could reduce labor force participation for both genders, with a lesser impact on women, after employing a shift-share design to address endogeneity. Our joint analysis of remittances and immigration in Colombia also indicates that labor force participation rates are negatively correlated with cross-border migration, with female labor force participation being more adversely affected by emigration and less affected by immigration compared to male labor force participation.

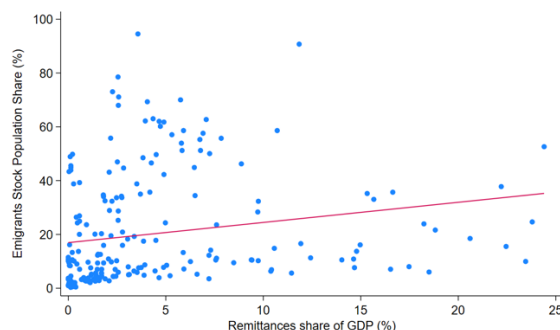
**34. There are two reminders when interpreting our findings.** First, we do not draw conclusions regarding the welfare effects of cross-border migration. The findings documented in this paper reflect partial equilibrium effects on labor supply. In a general-equilibrium setting, immigration may improve welfare by reducing the prices of non-tradable goods (Lach, 2007; Cortes, 2008). Second, micro-level analyses of immigration's impact on labor force participation can be highly context-dependent and exhibit dynamic patterns. The findings from our case study

of Venezuelan immigrants in Colombia may not be applicable to other countries, particularly developed nations with different market structures and policies. Furthermore, as immigrants can increase aggregate demand, it is possible that the effects of immigration on labor force participation will diminish in the medium to long run as labor and goods markets gradually adjust to a new equilibrium (Mølster Galaasen et al, 2025).

**35. Gender equality can be promoted by improving the socio-economic conditions to retain human capital and empower women including by prioritizing resource allocation to women's educational and professional development.** This study highlights the complex and often conflicting influences of migration on gender disparities in labor force participation. Understanding these dynamics will not only support economic growth but also improve gender inclusiveness. Our findings also emphasize the necessity of targeted interventions that address the unique challenges faced by women workers in the context of migration. Furthermore, enhancing labor market attachment for women, such as vocational trainings will be key going forward as well as promoting financial literacy and entrepreneurship among women receiving remittances could help them leverage these funds to enhance their participation in the labor market.

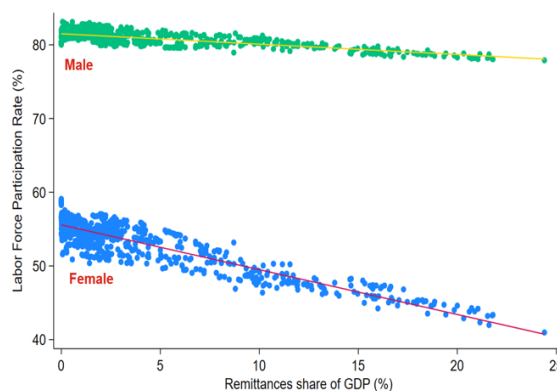
## Annex I. Correlations and Descriptive Statistics

**Figure A.1. Correlation between Emigrants' Share and Share of Remittances in GDP (Percent)**



Sources: UNPD, World Development Indicators and IMF staff estimates. Notes: This figure shows the correlation between remittances (as share of GDP) and number of emigrants (as share of total population). Each dot represents a country-year observation. The red line is the fitted line.

**Figure A.2. Share of Remittances in GDP and Labor Force Participation Rates by Gender**



Sources: World Development Indicators, 1991-2019 and IMF staff estimates. N = 765. Unemployment rate, GDP per capita, country and year fixed effects are controlled. Each dot represents a predicted labor force participation rate.

**Table A.1. Descriptive Statistics—Colombia Survey Data**

	Observations	Average	Standard Deviation	Min	Max
Female	270,111	0.617	0.486	0	1
Age	270,111	37.042	12.864	15	64
Married	270,111	0.496	0.5	0	1
Years of education	270,096	10.939	4.255	0	26
Informal sector	254,681	0.311	0.463	0	1
Receiving remittance	270,111	0.033	0.178	0	1
Remittance value (normalized by minimum wage)	270,111	0.176	2.319	0	483.024
Venezuelan immigrants ratio	270,111	2.528	2.149	0.01	13.572
In the labor force	270,111	0.695	0.46	0	1

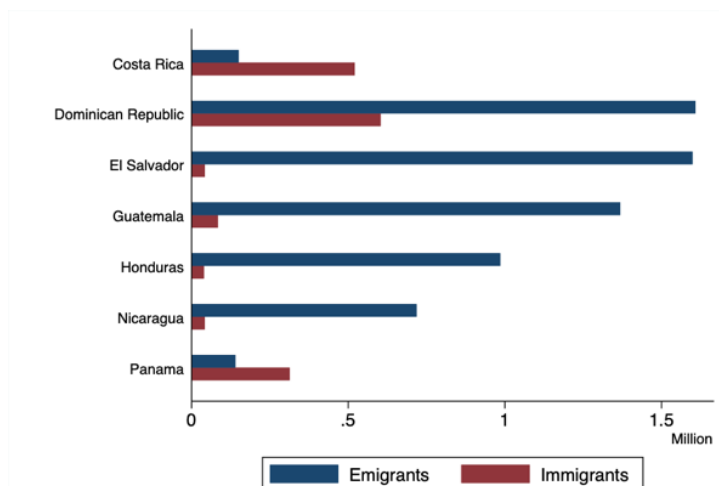
Notes: This table shows the descriptive statistics for the sample in the Monthly Large Integrated Household Survey data of Colombia.

## Annex II. Country-Level Migration Patterns

In this Annex, we demonstrate migration patterns for each country within CAPDR, Caribbean region, North America, and South America.

**1. Most countries in CAPDR (Central America, Panama, and the Dominican Republic) exhibit a higher number of Emigrants compared to immigrants.** Costa Rica and Panama are notable exceptions, having more immigrants than emigrants (Figure A.3).

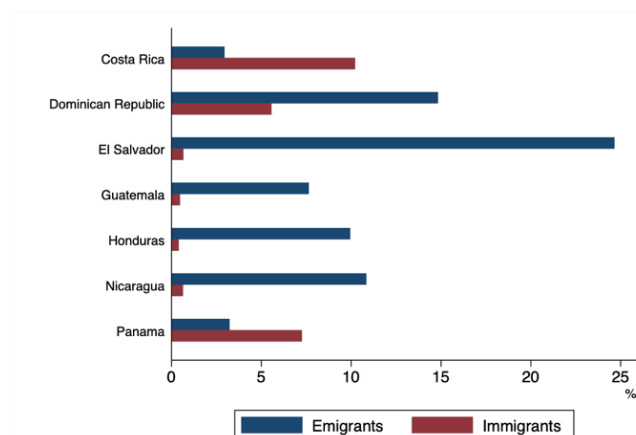
**Figure A.3. Emigrants and Immigrants: CAPDR, 2020 (in million)**



Source: UN, International Migrant Stock 2020.

**2. El Salvador has the highest share of emigrants in CAPDR, with approximately one-quarter of its population being emigrants.** Figure A.4 presents the number of emigrants and immigrants as a percentage of the total population for each country within CAPDR, representing a notable trend of outmigration within the region.

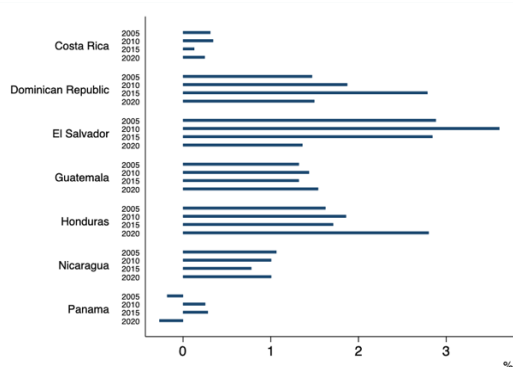
**Figure A.4. Emigrants and Immigrants, CAPDR 2020 (Percent of total population)**



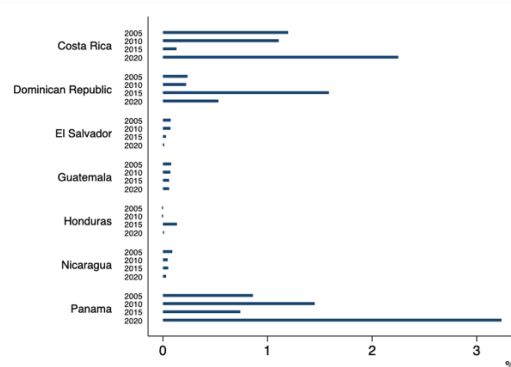
Source: UN, International Migrant Stock 2020.

3. Over the past decades, migration outflows consistently remained high in Dominican Republic, El Salvador, and Guatemala and Honduras has recently experienced a surge in migration outflows. Migration inflows to Costa Rica and Panama have been increasing greatly from 2015 to 2020 (Figures A.5 and A.6). We further explore the migration outflows and inflows by gender. In Honduras and the Dominican Republic, the share of women emigrants is higher than that of men emigrants. Conversely, the share of men immigrants is higher than that of women immigrants in almost all countries within the region (Figure A.7 and A.8).

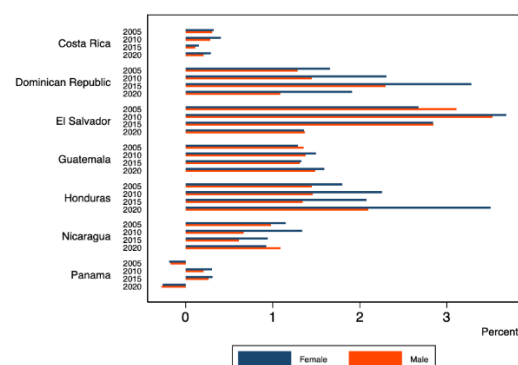
**Figure A.5. Change in Number of Emigrants (Percent of total population in the previous survey year): CAPDR**



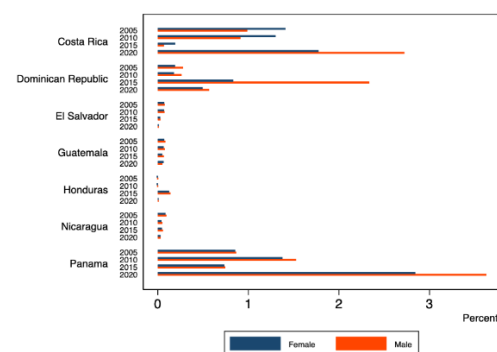
**Figure A.6. Change in Number of Immigrants (Percent of total population in the previous survey year): CAPDR**



**Figure A.7. Change in Number of Emigrants by Gender (Percent of total population in the previous survey year): CAPDR**

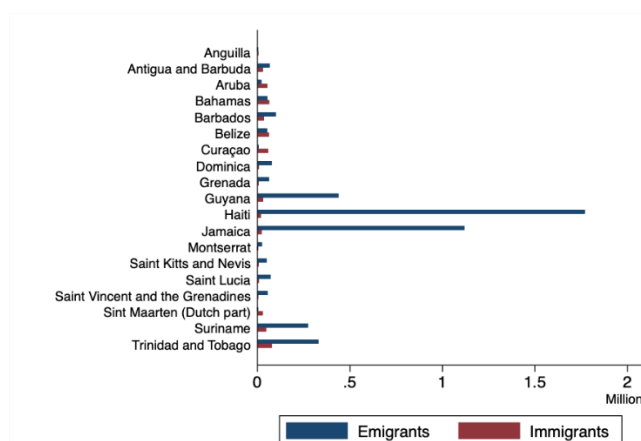


**Figure A.8. Change in Number of Immigrants by Gender (Percent of total population in the previous survey year): CAPDR**



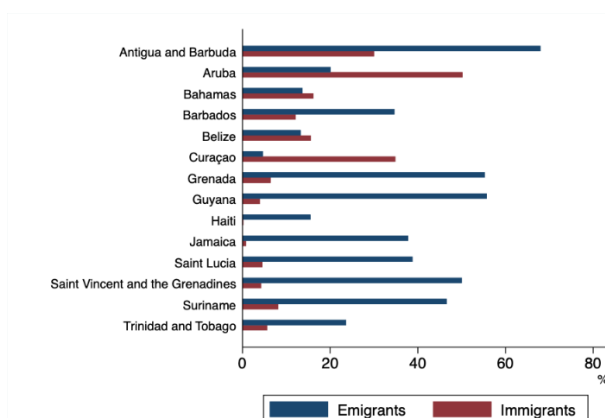
Source: UN, International Migrant Stock 2020

4. Most Caribbean countries have a higher number of emigrants compared to immigrants. The exceptions include Aruba, the Bahamas, Belize, and Curaçao, which have more immigrants than emigrants (Figure A.9).

**Figure A.9. Emigrants and Immigrants: Caribbean Countries, 2020 (In million)**

Source: UN, International Migrant Stock 2020.

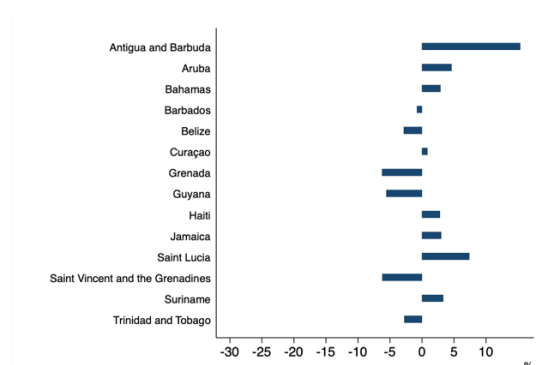
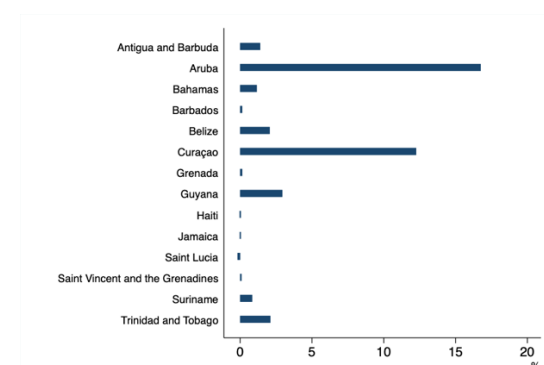
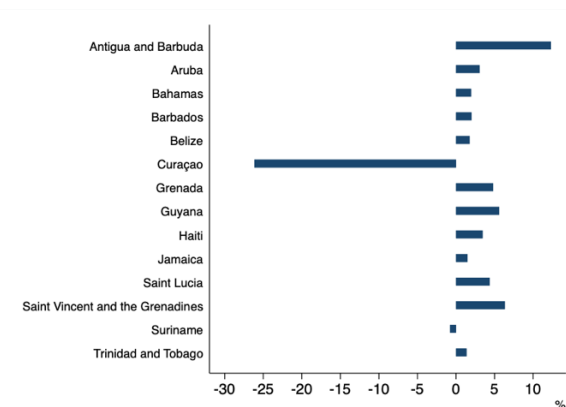
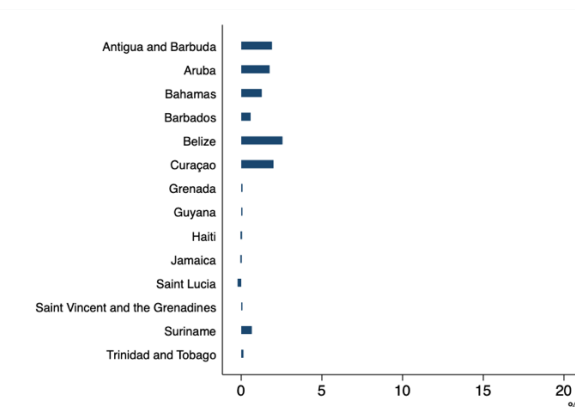
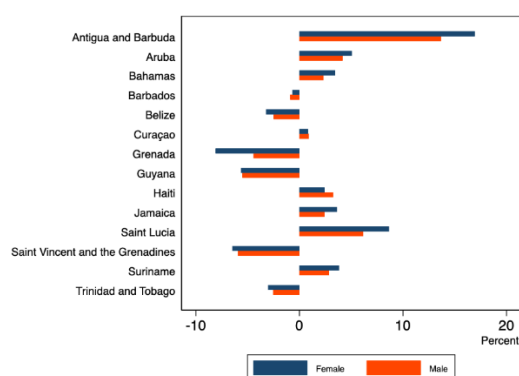
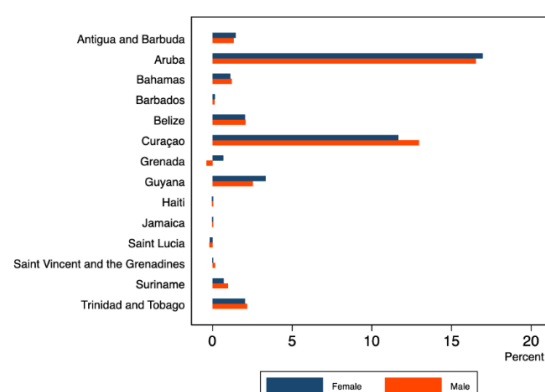
**5. The share of emigrants within the region is strikingly high and women dominate both inflows and outflows in population shares.** Antigua and Barbuda exhibit the highest share of emigrants, with approximately 68 percent of its population being emigrants. Guyana and Grenada follow, with around 55 percent of their populations as emigrants. Aruba has a high immigrant share of about 50 percent, while Curaçao has around 35 percent.

**Figure A.10. Emigrants and Immigrants, Caribbean Countries 2020 (Percent of total population)**

Source: UN, International Migrant Stock 2020.

**6. The migration outflows from Curaçao have greatly increased from 2010-15 to 2015-20.** In contrast, migration outflows have decreased for Belize, Grenada, Guyana, and Saint Vincent and the Grenadines during the same period (Figure A.11 and A.12). Migration inflows to Aruba, Curaçao, Guyana, and Trinidad and Tobago have increased substantially from 2010-15 to 2015-20 (Figure A.12 and A.14). Figure A.15 and A.16 show that women migration inflows and outflows in population shares are higher than men for most of the Caribbean countries.

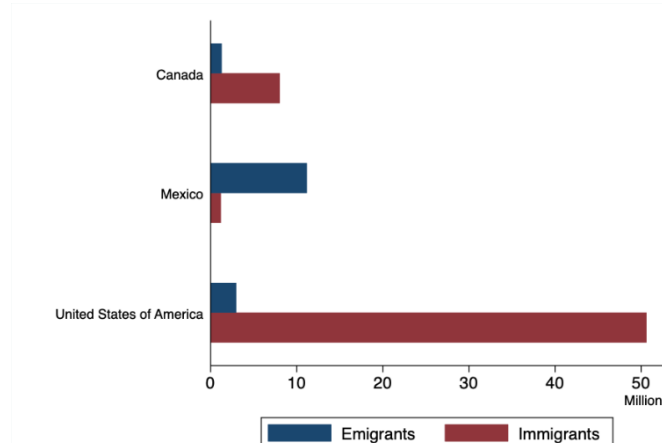


**Figure A.11. Change in Number of Emigrants (Percent of total population in the previous survey year): Caribbean Countries, 2015-20****Figure A.12. Change in Number of Immigrants (Percent of total population in the previous survey year): Caribbean Countries, 2015-20****Figure A.13. Change in Number of Emigrants (Percent of total population in the previous survey year): Caribbean Countries, 2010-15****Figure A.14. Change in Number of Immigrants (Percent of total population in the previous survey year): Caribbean Countries, 2010-15****Figure A.15. Change in Number of Emigrants by Gender (Percent of total population in the previous survey year): Caribbean Countries, 2015-20****Figure A.16. Change in Number of Immigrants by Gender (Percent of total population in the previous survey year): Caribbean Countries, 2015-20**

Source: UN, International Migrant Stock 2020.

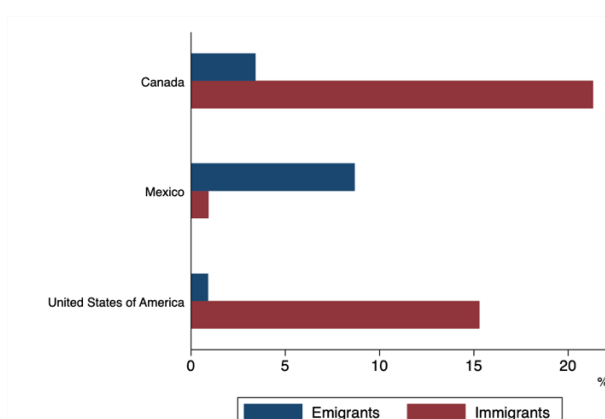
**7. The US and Canada have substantial immigrant populations with women dominating the shares (Figure A.17).** The US has about 20 percent of its population as immigrants and Canada around 15 percent. In contrast, Figure A.18 shows Mexico as a notable source of emigrants, with approximately 10 percent of its population living abroad.

**Figure A.17. Emigrants and Immigrants: North America, 2020 (In million)**



Source: UN, International Migrant Stock 2020.

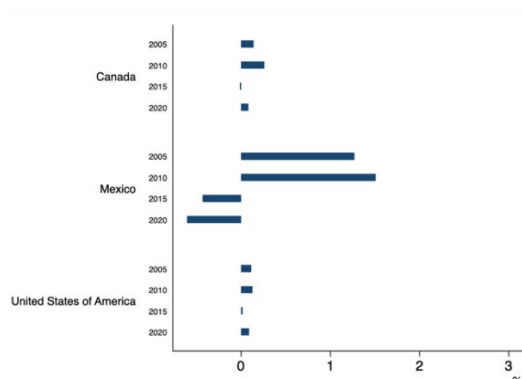
**Figure A.18. Emigrants and Immigrants, North America 2020 (Percent of total population)**



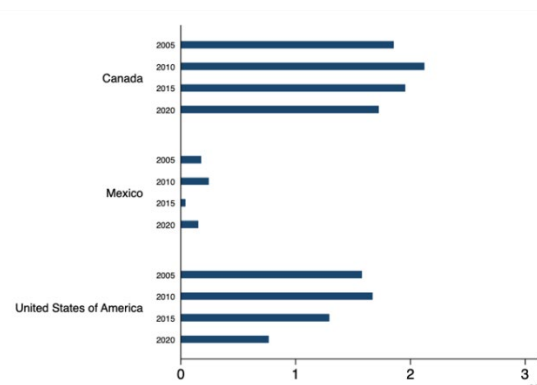
Source: UN, International Migrant Stock 2020.

**8. Further analysis in Figures A.19 and A.20 reveals a decline in emigration from Mexico since 2015, alongside a decrease in immigration to both Canada and the US over the years.** Figures A.21 and A.22 provide insight into the gender composition of migration, indicating that men predominantly make up the emigrant population from Mexico, while women represent a larger share of the immigrant population in Canada and the US.

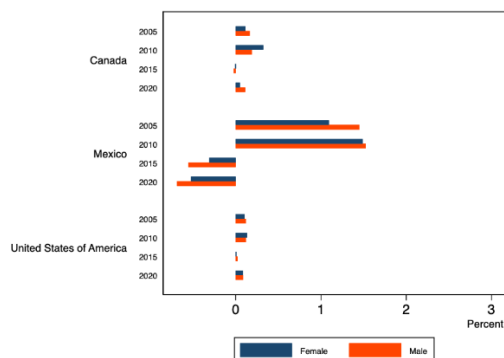
**Figure A.19. Change in Number of Emigrants (Percent of total population in the previous survey year): North America**



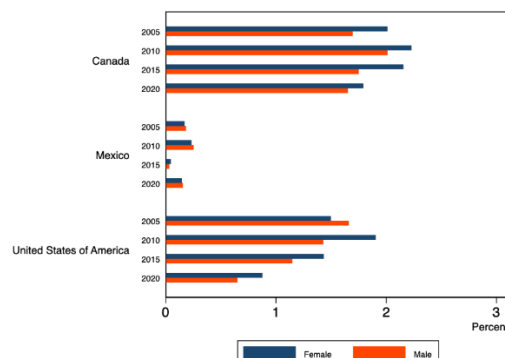
**Figure A.110. Change in Number of Immigrants (Percent of total population in the previous survey year): North America**



**Figure A.21. Change in Number of Emigrants by Gender (Percent of total population in the previous survey year): North America**

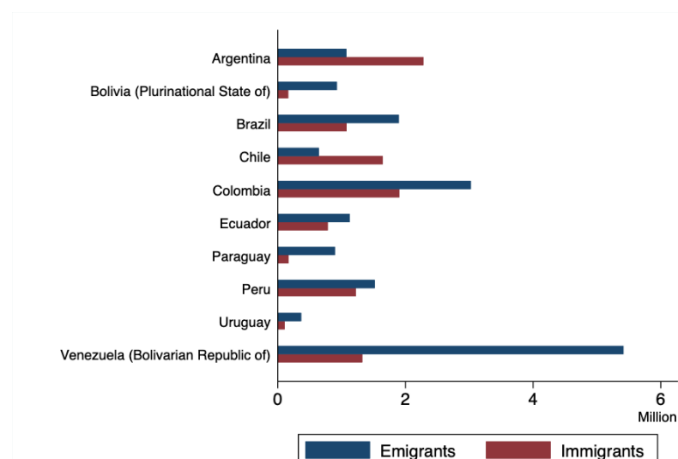


**Figure A.22. Change in Number of Immigrants by Gender (Percent of total population in the previous survey year): North America**

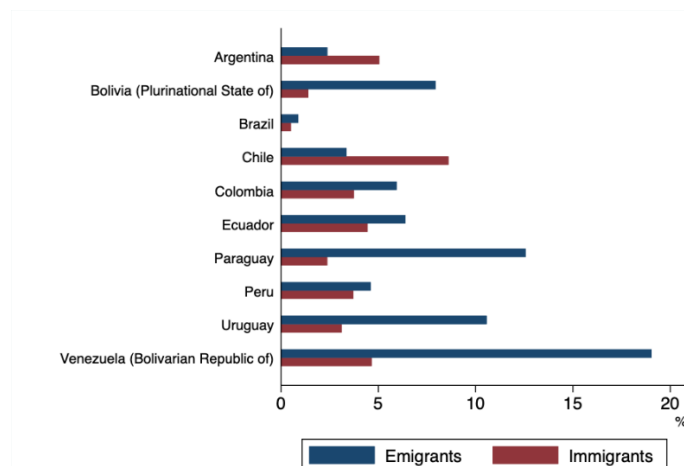


Source: UN, International Migrant Stock 2020.

9. As of 2020, most countries in the South American region experienced more emigrants than immigrants, with Argentina and Chile being notable exceptions (Figure A.23). Furthermore, in Figure A.24, Venezuela stands out as the country with the highest percentage of emigrants, with around 20 percent of its population living abroad, followed by Paraguay, which has approximately 13 percent of its population as emigrants. Chile, on the other hand, has the highest share of immigrants, accounting for about 10 percent of its population.

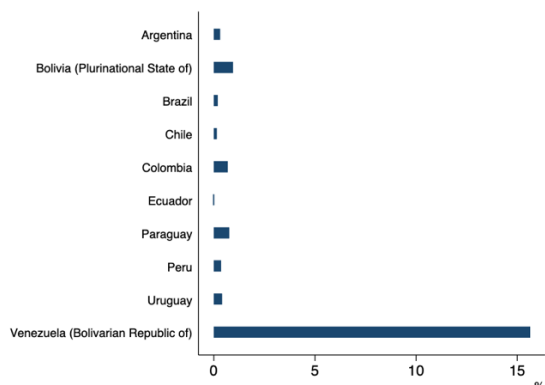
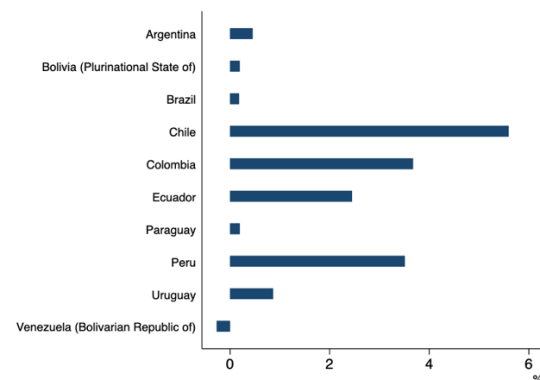
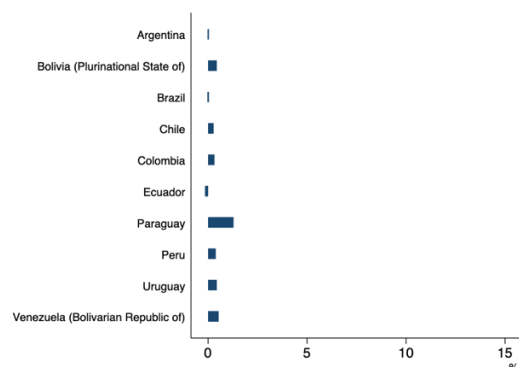
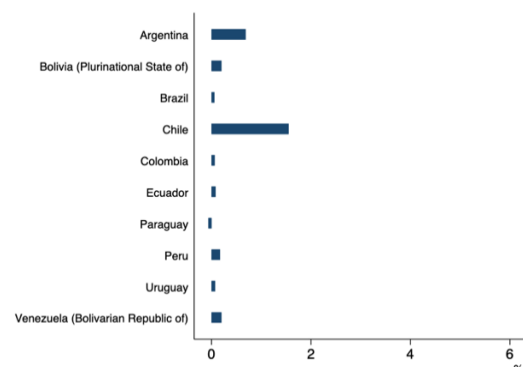
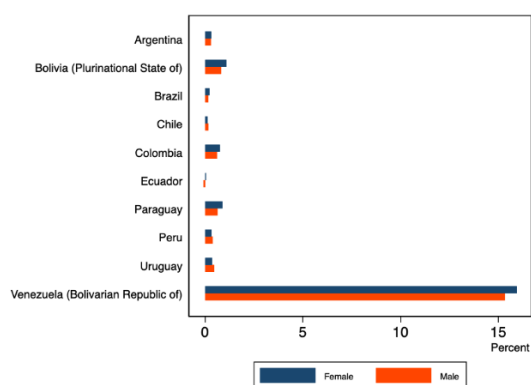
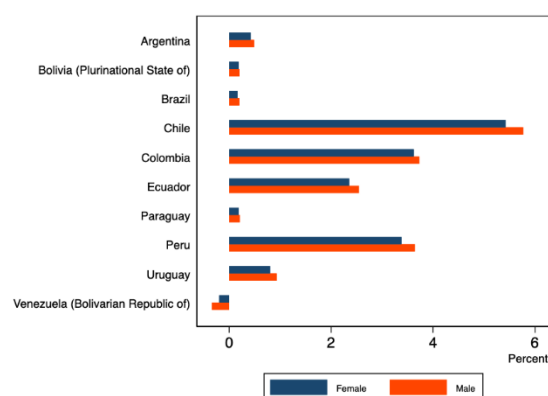
**Figure A.23. Emigrants and Immigrants: South America, 2020 (In million)**

Source: UN, International Migrant Stock 2020.

**Figure A.24. Emigrants and Immigrants, South America 2020 (Percent of total population)**

Source: UN, International Migrant Stock 2020.

**10. Figures A.25 and A.26 illustrate the changes in migration patterns from 2015 to 2020, showing that Venezuela experienced the highest outflow of population during this period, indicating a large increase in emigration.** In contrast, Chile and Colombia saw substantial inflows of migrants. The figures also reveal a marked increase in emigration from Venezuela in the later period of 2015-20 compared to 2010-15. The inflow shares for Chile, Colombia, and Peru also increased greatly in the latter period. Finally, Figures A.29 and A.30 indicate that the migration flows are relatively balanced in terms of gender, with both inflow and outflow patterns showing no notable differences between men and women migrants.

**Figure A.25. Change in Number of Emigrants (Percent of total population in the previous survey year): South America, 2015-20****Figure A.26. Change in Number of Immigrants (Percent of total population in the previous survey year): South America, 2015-20****Figure A.27. Change in Number of Emigrants (Percent of total population in the previous survey year): South America, 2010-15****Figure A.28. Change in Number of Immigrants (Percent of total population in the previous survey year): South America, 2010-15****Figure A.29. Change in Number of Emigrants by Gender (Percent of total population in the previous survey year): South America, 2015-20****Figure A.30. Change in Number of Immigrants by Gender (Percent of total population in the previous survey year): South America, 2015-20**

Source: UN, International Migrant Stock 2020.

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