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ABSTRACT

Shoring up Economic Refugees: Venezuelan Migrants in the Ecuadorian Labor Market*

Ecuador has become the third largest receiver of the 4.3 million Venezuelans that left their country in the last five years, hosting around 10% of them. Little is known about the characteristics of these migrants and their labor market outcomes. This paper fills this gap, analyzing a new large survey (known as EPEC). On average, Venezuelan workers are highly skilled and have high rates of employment, compared to Ecuadorians. However, their employment is of much lower quality, characterized by low wages and high rates of informality and temporality. Venezuelans have experienced significant occupational downgrading, relative to their employment prior to emigration. As a result, despite their high educational attainment, Venezuelans primarily compete for jobs with the least skilled and more economically vulnerable Ecuadorian workers. Our simulations suggest that measures that allow Venezuelans to obtain employment that matches their skills, such as facilitating the conversion of educational credentials, would increase Ecuador's GDP between 1.6% and 1.9% and alleviate the pressure on disadvantaged native workers. We also show that providing work permits to Venezuelan workers would substantially reduce their rates of informality and increase their average earnings.

JEL Classification: O15, J61, D31

Keywords: Ecuador, Venezuela, migration, skills, credentials, legalization

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1 Introduction

The political and economic crisis in Venezuela has given rise to a massive exodus, estimated at 4.3 million people (as of the end of 2019). Many Venezuelans sought refuge in neighboring countries. It is estimated that 1.5 million Venezuelans had settled in Colombia by the end of 2019, and over 2 million elsewhere in Latin America.

Naturally, Venezuelan migrants have sought employment in the host countries but, because of their recent arrival and their transient status, our knowledge of their working conditions is scant. Our paper aims to fill this gap focusing on Ecuador, where almost 400,000 Venezuelans have settled and many more have transited through the country on the way to other destinations. More specifically, we provide the first analysis of the labor-market conditions of Venezuelan migrants in Ecuador, based on a new nationally representative survey of this population that also includes information on the Ecuadorians living in the same localities. The survey (known by its Spanish acronym EPEC) was promoted by the World Bank and the government of Ecuador and implemented during the summer of 2019. The design and scope of the survey are unique in the context of the countries across Latin America hosting Venezuelan migrants.

By providing detailed information on the skills, employment and wages of Venezuelan migrants, as well as the Ecuador-born population in the same local areas, we are able to analyze the effects of several policies aimed at improving the economic conditions of migrants while alleviating the adjustment costs on the native population and maximizing the net economic gain for the receiving country.

Our analysis delivers several important findings. First, we estimate that the inflows of Venezuelan migrants (between 2016 and the summer of 2019) amounted to 2% of Ecuador's population, reaching much higher concentrations in several provinces. The data also show that Venezuelan migrants are young (aged 32 on average) and highly educated, compared to Ecuador's working-age population. They also have very high employment rates, about 17 percentage-points higher than Ecuadorians in the same canton of residence, and account for 3% of Ecuador's employment. However, their employment is of much lower quality, characterized by high informality and temporality, higher weekly work hours, and lower wages, despite the higher schooling levels. The survey also provides information on the occupations held by migrants back in the home country, allowing us to document a high degree of occupational downgrading.

All in all, the previous findings strongly suggest that the skills of many Venezuelan migrants are vastly underutilized. At the same time, the brunt of the adjustment

to the inflows of Venezuelan workers has fallen disproportionately on the lower paid and least skilled Ecuadorian workers. The silver lining is that the high educational attainment of Venezuelan migrants, and the cultural and linguistic affinity between them and the Ecuadorian population, point toward promising policy actions that can generate substantial economic gains for Ecuador and, at the same time, shift the burden of adjustment away from the most vulnerable segments of the labor market.

We use our data to carry out two policy simulations. The first one entails providing legal work permits to all Venezuelan workers. Our analysis suggests that the rate of informal employment for Venezuelans would fall substantially and, as a result, average wages for Venezuelan migrants are likely to experience important gains (in the range of 9 to 18% depending on their education levels). We also simulate a scenario where Ecuador's government adopts measures that allow Venezuelan workers to obtain employment that matches their education level or their pre-migration occupation. Our estimates show that Ecuador's GDP would increase between 1.6% and 1.9%. In addition, this policy would help shift the burden of adjustment away from the more economically vulnerable native workers. This goal has become particularly important since the beginning of 2020. As argued in Olivieri (2020), Ecuador is now facing a *triple crisis* due to the combination of an increasingly restricted access to international credit, a dramatic plunge in oil prices and the health crisis due to the COVID-19 pandemic. These imbalances are rapidly eroding the economic footing of low-income families.

Our paper contributes to the literature on forced migration and the economic consequences for migrants and the host communities.[1] Despite its enormous policy interest, this topic has remained understudied due to the scarcity of high quality data. In the last few years, the literature has evolved rapidly thanks to a large number of high-quality studies analyzing the large inflows of Syrian refugees into Turkey (estimated at 3.6 million individuals). The main contributions to this literature are Balkan and Tumen (2016), Ceritoglu et al. (2017), DelCarpio and Wagner (2015), Loayza et al. (2018), Tumen (2016) and Tumen (2018), and their main focus is to estimate the effects on the labor market participation, employment and wages of the workers in the host regions using a variety of empirical approaches. Taken together, these studies find evidence of negative effects on the employment and wages of native workers, typically concentrated heavily on segments of the labor market characterized by low-skill, low-pay and

[1]See Becker and Ferrara (2019) and Ruiz and Vargas-Silva (2013) for insightful reviews and a discussion of the main conceptual issues and empirical challenges. In a recent study, Fasani et al. (2018) estimate the economic gaps between refugees and natives using data for a large set of European countries.

high informality. Some of these studies also find that women and young workers were disproportionately affected.

More recently, researchers have shifted the focus to other dimensions of the effects of Syrian refugee inflows into Turkey. Altindag et al. (2020) argue that refugee inflows had a positive impact on firm production, both in terms of the volume of production and the introduction of new product varieties. Akgunduz and Torun (2020)examine other channels by which Turkish workers and firms accommodated the inflows of Syrian refugees. The authors find that skilled native workers increased their specialization in complex tasks, moving away from manual tasks, and domestic companies took advantage of the increased abundance of labor by reducing capital intensity. As shown in earlier studies, both mechanisms contribute to mitigate the effects of immigration on the wages of the receiving country (Lewis (2005), Peri and Sparber (2009), Gonzalez and Ortega (2011) and Dustmann and Glitz (2015)).

In the last few years, some researchers have begun to analyze the economic effects of the exodus of Venezuelans on the surrounding countries but progress has been slow due to the difficulty of analyzing Venezuelan migrants equipped solely with government-provided data or the standard labor force surveys. The existing work has so far focused on the labor market effects in Colombia, the main receiver of Venezuelan migrants (e.g. Caruso et al. (2019) and Penaloza-Pacheco (2019)). To our knowledge, the only existing study concerning the labor market effects of Venezuelan migration to Ecuador is Olivieri et al. (2020). This paper relies on Ecuador's labor force survey to document adverse effects of the inflows on the wages and employment quality of young, low-educated Ecuadorian workers in the main receiving areas within the country.

Relative to these studies, our paper provides the first analysis of the labor market conditions of Venezuelan migrants in a Latin American context on the basis of a survey specifically designed for this purpose. We also use this information to analyze policies that are tailored to the specific characteristics of Venezuelan migrants in Ecuador. In this sense, our paper is also related to Clemens et al. (2018). This paper analyzes the effects of granting formal labor market access to refugees, highlighting the potential for substantial economic gains for the host country but also the potential costs for certain groups of the host population, which will depend importantly on the characteristics migrants (e.g. education) as well as features of the host labor markets. In the US context, some recent studies have analyzed the economic effects, on wages and GDP, of providing legal status to undocumented workers (Edwards and Ortega (2017) and Ortega et al. (2019)).

The structure of the paper is as follows. Section 2 describes the survey. Section 3 presents summary statistics. Section 4 describes the main characteristics of Venezuelan migrants, using natives in the same local area as benchmark. Section 5 analyzes the occupations of Venezuelans in Ecuador and in the home country. Section 6 collects our policy analysis and Section 7 concludes.

2 Data: the EPEC survey

The goal of the EPEC survey was to collect household-level information on the population of recent Venezuelan migrants to Ecuador along with the native population in the receiving communities. The survey focuses on Venezuela-born individuals that arrived in Ecuador after January 2016 and over-samples this population.[2]

In June and July 2019, almost 1,900 households were interviewed (in person) and provided information on 6,425 individuals. The survey is representative of the population of recent Venezuelan migrants in Ecuador and of the native population residing in the areas where Venezuelan migrants are found. Besides the typical socio-demographic and labor market information of labor force surveys, the questionnaire also includes questions regarding pre-migration employment, the gateways of entry into the country, health, children's schooling, access to internet and remittances, among other topics.[3]

In the final sample (of 6,425 individuals), 10% of respondents resided in sectors with low density of Venezuelan migrants (below 5% of the sector's population), 43% in medium-density sectors (with a density ranging between 5 and 15%), and 47% from high-density sectors (with a density of Venezuelan migrants above 15% of the sector's population). The final sample contained 6,425 individuals. Among these, 1,715 were born in Venezuela and considered recent migrants.

[2]EPEC stands for *Encuesta a Personas en Movilidad Humana y en Comunidades Receptoras en Ecuador*, which can be translated as Survey of Migrants and Receiving Communities in Ecuador.

[3]To be specific, Ecuador is administratively organized into 221 cantons. To implement the survey, the cantons were subdivided into *sectors* classified according to the density of Venezuelans estimated using mobile phone data (described in detail in Olivieri et al. (2020)). About 190 sectors were randomly selected and, within those, households were also selected for the interview at random. By virtue of the sampling strategy, the survey is nationally representative of the target populations and the three strata of sectors defined by low, medium and high density of Venezuelan migrants.

3 Summary Statistics

3.1 Gateways and Geographical distribution of migrants

According to our survey, around 340,000 Venezuelans migrated to Ecuador between 2016 and the summer of 2019.[4] As a result, the share of Venezuelan migrants in Ecuador's population grew from close to zero to 2% in less than 3 years. The majority of Venezuelans entered Ecuador by land from Colombia, while the rest mostly arrived by plane.[5] Perhaps not surprisingly, about 10% of the college-educated educated Venezuelans arrived by air, compared to fewer than 3% of the less educated migrants. As shown in Olivieri et al. (2020), most migrants spread across Ecuador's geography in search of economic opportunity and the particular gateway of entry has little explanatory power regarding their ultimate choice of location.

Table 1 summarizes the geographical distribution of Venezuelan migrants across provinces in Ecuador. Columns 1 and 2 report the raw counts of respondents born in Ecuador (4,406) and in Venezuela (1,780), respectively. Columns 3 and 4 elevate the raw counts to population estimates, amounting to 16.8 million Ecuador-born individuals and 340,633 Venezuelan migrants, or about 2 Venezuelans for each 100 Ecuadorians.

The top two provinces by the estimated number of Venezuelan migrants are Pichincha (with capital Quito) and Guayas (with capital Guayaquil). We estimate that around 145,000 Venezuelan migrants were living in Pichincha at the time of the survey, followed by 61,000 in Guayas and over 38,000 in Los Rios. Thus, about 72% of all Venezuelan migrants were living in these three provinces. These figures also show that, relative to the population in the province, Venezuelan migrants made up around 2-3% of the population in Pichincha and Guayas, and over 4.5% in the province of Los Rios.[6]

3.2 Sample descriptive statistics

Table 2 presents summary statistics for the main variables that will be used in our analysis for the whole sample, including both natives and foreign-born individuals. The

[4]By the end of 2019, this figure had risen to approximately 390,000 individuals.

[5]As shown in Appendix Table .1, the majority of Venezuelan migrants (92%) entered by land through the Rumichaca bridge that connects Ecuador and Colombia (82%), and other land entry points were San Miguel (7%) and Huaquillas (3%). Most of the remaining arrivals (6%) were by air, with an even split between the airports of Quito and Guayaquil.

[6]The table also indicates that the population density of Venezuelans may have been over 10% in some provinces. However, the small sample size in those provinces implies large confidence intervals around these values.

data show that the average age of respondents is 30.3 years and 50.6% are women. About 70% of the respondents were born in Ecuador, 27% in Venezuela and the remaining 3% in Peru, Colombia or Argentina. In addition, slightly over 71% of the respondents have Ecuadorian nationality.[7]

It is helpful to classify the population into three education levels. For the sample as a whole, 34% have at most completed primary education, 41% completed secondary education, and 25% have a college degree. Turning now to employment status, in the sample 48% of all respondents (of any age) were employed at the time fo the survey. Among these, 31% were self-employed and the rest were salaried workers. Importantly, informality and temporality rates are high in Ecuador's workforce. Among those employed, about 43% were classified as having informal employment. In addition, slightly over half of all employees (53%) have temporary contracts. As for work hours and wages, we find that, conditional on employment, the average weekly hours worked is 45.7 and average monthly earnings are $460. As a result, the hourly wage is estimated at $2.92.[8]

The next section provides a systematic comparison of the socio-demographic characteristics and labor-market outcomes of Venezuelan migrants relative to Ecuador's workforce.[9]

4 Characteristics of Venezuelan Migrants

4.1 Socio-demographic characteristics

The effects of Venezuelan migration on the local labor markets of the hosting regions will depend on the size and skill composition of the inflows. As a first approximation to this question, this section provides a comparison of the socio-demographic characteristics, employment and wages of Venezuelan migrants vis-a-vis the natives in the corresponding destination cantons.

Specifically, we classify all individuals in the sample in three groups according to their

[7] Out of the all individuals born in Venezuela, 96% (or 1,780) are considered recent Venezuelan migrants, the target population.

[8] Ecuador dollarized its economy in March of 2000.

[9] Appendix Table .2 reports a similar table for the sub-sample of Venezuelan migrants. Those data show that about 48% arrived in Ecuador in 2018, 14% in 2017 and 7% in 2016. The remaining 31% have arrived between January and June of 2019. In addition, we estimate that 11.4% of Venezuelans sent remittances in the 3 months prior to the survey. However, these amounts were relatively low. Percentiles 25, 50 and 75 were $40, $80 and $100, respectively, and the highest value was $500. Thus the median remittance over the 3-month period was about 10% of the monthly earnings.

country of birth: individuals born in Ecuador, individuals born in Venezuela, and those born in other countries, which corresponds mostly to Peru, Colombia and Argentina. Then we estimate a battery of linear regression models:

$$y_{i,c} = \alpha_c + \beta_1 Vza_{i,c} + \beta_2 Other_{i,c} + \varepsilon_{i,c}, \tag{1}$$

where $Vza_{i,c}$ is an indicator taking value one if individual i was born in Venezuela. Similarly, $Other_{i,c}$ is an indicator for country of birth other than Venezuela or Ecuador.[10] Importantly, the model also includes dummy variables (α_c) for each canton. Thus, coefficient β_1 captures the difference in the mean value of outcome y_i for Venezuelans living in canton c relative to Ecuador natives in the *same* canton.[11] To make the estimates more informative we restrict the estimation sample to working-age individuals (defined as age bracket 15-70), which includes 70% of the overall sample.

Table 3 collects the estimates. The first panel of the Table presents the mean value for Ecuador natives (estimated from a separate model that contains only an intercept). The bottom panel presents the estimated difference in the mean value of the dependent variable for Venezuelans (or other immigrants) relative to Ecuadorians in the same canton of residence. In terms of age, we estimate that Venezuelans are 3.5 years younger, on average, than natives (while immigrants from other origins have the same average age as natives). In terms of gender, we find that the share of female is estimated to be around 51% for Ecuadorians and possibly slightly higher for Venezuelans.

The most striking differences across the three groups are found for educational attainment. The proportion of individuals with low educational attainment (at most primary education) is 22 percentage points lower for Venezuelan migrants than for Ecuadorians. At the same time, the proportion of college-graduates is 27 percentage points higher for Venezuelans than for Ecuadorians.[12] Hence, Venezuelan migrants appear to be much more educated than the Ecuadorian population. Thus, it is important to view this immigration episode as one of highly skilled immigration, relative to the schooling levels of the native population.

The Table also makes clear that Venezuelan migrants have much higher employment (to population) rates than Ecuadorians. We estimate this gap to be 17 percentage

[10] The omitted category is individuals born in Ecuador.

[11] Analogously, β_2 captures the difference in means for individuals born in countries other than Ecuador and Venezuela, relative to natives. The regression model does not include any other controls (such as age or educational attainment).

[12] Immigrants from other origins are also substantially more educated than Ecuadorian natives and Venezuelans living in the same cantons.

points. Interestingly, the employment rates of immigrants from other origins seem to be substantially lower than for natives, although the difference is not statistically significant. It is also very clear that the quality of employment is much lower for Venezuelan workers than for natives. Their informality rate is 15 percentage points higher and they are 29 percentage-points more likely to have temporary contracts. Additionally, Venezuelan workers were 6 percentage-points more likely to be underpaid by their employers than the average native in their canton of residence.

Turning now to columns 10-12, we learn that Venezuelan migrants work 5.5 hours more than the average native worker. However, their monthly earnings are 45 log points lower. More specifically, the average monthly earnings for Ecuadorians in our sample is $476 but the average Venezuelan worker in the same canton earns 36% less. Obviously, the higher working hours and lower monthly earnings lead to a very large gap in terms of hourly wages. Whereas the average Ecuadorian worker earned $2.84, the average Venezuelan in the same canton earned 43% per hour of work, despite the fact that Venezuelan migrants have substantially higher educational attainment.

It will also be useful to compare the main labor market outcomes (employment, informality, temporality, work hours, earnings and hourly wages) between Venezuelan migrants and Ecuadorian workers with the same (nominal) education levels. This comparison also allows us to examine whether the outcomes of highly educated Venezuelans are relatively better or worse than the outcomes for the less educated ones.[13]

Table 4 reports this information. As before, we restrict the sample to the working-age population (age 15-70). The first column summarizes the values for Ecuadorian natives, column 2 reports the data for the Venezuelan migrants, and column 3 presents the ratio of the value in column 2 relative to column 1. Several points are worth noting. As noted earlier, Venezuelan workers are much less likely to have low education levels (26 percentage points) and much more likely to have a college degree (25 percentage points) than the average native. In terms of employment rates, we observe that among

[13] We have not succeeded in obtaining a systematic comparison of the quality of education in Venezuela and Ecuador. The best assessment is based on an analysis by Juan Maragall (Inter-American Development Bank) based on a 2009 PISA study conducted in the state of Miranda in Venezuela. The data show that students in Venezuela have lower reading and math levels than the average for Latin America. More specifically, the gap is estimated to be 13 percentage points for public schools and 6 percentage points for private schools. Given that Ecuador's scores are in line with the average for Latin America, these data suggest that the quality of the Venezuelan education system is somewhat below the Ecuadorian counterpart. However, we also note that many Venezuelan migrants were schooled prior to the recent deterioration of educational institutions in Venezuela and that migrants are typically positively selected in regards to their origin populations. As a result, it seems reasonable to assume that the educational credentials of Venezuelans are comparable to those of Ecuadorian workers.

low-educated workers, the employment rates of Venezuelan migrants are very similar to those of natives (in the 70-74% range). However, at higher education levels, we observe much higher employment rates for Venezuelan workers than for natives – about 30% higher.

Let us now turn to two measures of the quality of employment: informality and temporality rates. The figures in the Table suggest that the quality of employment is similar for Venezuelan migrants and natives with low education levels. However, the native-migrant gap widens dramatically as educational attainment increases. For college graduates, the rates of informality and temporality are about *4 times* larger for Venezuelan migrants than for native workers. The data also show that Venezuelan workers have higher weekly work hours than natives, with gaps ranging between 9 and 15% across the three education levels. Once again, we find that the migrant-native earnings gap increases with education levels. At the bottom educational category, Venezuelan migrants earn 45% less than the average native, and the gap rises to 64% for college-educated workers. Not surprisingly, the native-migrant gaps in work hours and earnings lead to gigantic gaps in hourly wages, with migrant-native ratios ranging between 0.39 (college educated workers) and 0.63 (high-school graduates).

Summing up, this section has shown that Venezuelan migrants are substantially younger and much more educated, on average, than Ecuadorians in the same cantons. Despite this more favorable characteristics, they work longer hours and have much lower earnings than natives, both on a per-month and per-hour bases. Additionally, the native-immigrant gaps in quality of employment and earnings are much larger among workers with higher education levels. This evidence strongly suggests that college-educated Venezuelans are unable to access high-skill, high-productivity jobs. An important implication is that low-skill Ecuadorians are disproportionately bearing the brunt of Venezuelan migration because they compete for jobs with both the low and the high-education recent arrivals (as documented in detail in Olivieri et al. (2020)).

4.2 Characteristics of Venezuelan migrants by year of arrival

Next, we carry out a comparison of the characteristics of the Venezuelan migrants in Ecuador by year of arrival. The interest of this information is twofold. First, it will provide descriptive evidence on whether the composition of the immigrant flow changes over time. Second, because all outcomes are measured at the same date (summer of 2019), the data will also be informative regarding whether migrants' employment quality

and earnings improve with time in Ecuador.[14]

Table 5 classifies Venezuelan migrants on the basis of their arrival in Ecuador. Let us first describe the size of each arrival cohort. We estimate that 11,140 Venezuelans arrived in 2016 (and remained in the country until the time of the survey). The flows increased 6-fold in 2017 to 66,305 arrivals in that year. Once again the annual inflow tripled in 2018 to an estimated 184,075 individuals. The inflows probably plateaued in 2019 and we estimate that about 63,664 Venezuelans settled in Ecuador in the first half of 2019.

The top panel of the table also shows that the average age of migrants has been falling over time. The average migrant arriving in 2016 was 32.3 years old whereas the average age of the most recent arrivals (2019) has fallen to 24.6 years. The data also shows a 10 percentage-point increase in the share of females between 2016 and 2019 and a marked change in the skill composition of the Venezuelan arrivals in Ecuador. Among those that arrived in 2016, 70% had a college degree. In contrast, that proportion is only 29% among those arrived in 2019. In sum, these observations suggest that the most educated migrated first. But, as economic conditions deteriorate in Venezuela, individuals with a lower propensity to migrate, such as women and lower-educated workers are also choosing to leave their home country.

The remaining panels in the Table focus on labor market indicators for working-age individuals. It is helpful to focus on the two most recent arrival cohorts, which are fairly similar in terms of average age and educational attainment. The data show that the 2018 arrival cohort has a higher employment rate, higher earnings and a higher hourly wages than the 2019 arrival cohort. Thus, Venezuelan migrants do seem to experience a substantial improvement in their work conditions through the first year in Ecuador. However, the improvement appears to stall when comparing to the 2017 arrival cohort.

The bottom panels of the Table also stratify by education level. Focusing again on the two most recent arrival cohorts, we observe no sign of improvement in working conditions for migrants with at most primary schooling. In contrast, earnings and hourly wages appear to increase substantially for workers with medium and high education levels, one year after arrival. The data is less conclusive regarding whether the earnings for these workers keep improving with time in the country. We will return to this question in the next section.

[14]Our data is a single cross-section. Thus we will not be able to disentangle cohort effects from economic assimilation. Furthermore, the picture is complicated further by selective out-migration. As a result, our focus here is mainly descriptive.

4.3 Earnings and skill prices

The data presented so far clearly show the existence of very large wage gaps between Venezuelan migrants and Ecuadorian workers with the same education levels. Specifically, Table 4 showed that Venezuelan migrants earn 37 to 61 percent less than natives with the same education level. The same Table also documented that the hourly wages of Venezuelan workers are increasing in educational attainment (from $1.07 for workers with at most primary schooling to $1.32 for high-school graduates and $1.95 for college graduates).

This section provides cleaner estimates of the wage gaps between native and migrant workers by estimating Mincer wage regressions that allow us to account for individual heterogeneity in socio-demographic characteristics. We also investigate the effect of informality on wages and its determinants. This analysis will also be an important input in our policy simulations.

The dependent variable in our analysis in this section is the log of hourly wages. We begin by considering the whole sample, which contains both native and foreign-born workers. Namely, the log of the hourly wage for individual i in canton c is given by

$$\ln w_{i,c} = \alpha_c + \beta_1 Vza_i + \beta_2 Other_i + \lambda X_{i,c} + \varepsilon_{i,c}, \tag{2}$$

where α_c stands for canton-level fixed-effects, and Vza_i and $Other_i$ are indicators for being born in Venezuela or in another foreign country, respectively. The specification also includes controls for age, gender and education level (in vector X_i). Thus, coefficient β_1 identifies the average wage gap between Venezuelan workers and Ecuadorians living in the same canton and with similar socio-demographic characteristics.[15]

Table 6 presents the results. Column 1 illustrates the existence of very large gaps in hourly wages between native and foreign-born workers in Ecuador. Specifically, the Venezuelan-native gap is estimated to be 56 log points. Controlling for individual characteristics (column 2) shows that the wage gap is even larger (at a staggering 79 log points), reflecting the fact that Venezuelans are more educated, on average, than Ecuador-born workers. The estimates in column 3 also show that women's wages are 31 log-points lower than men's with similar characteristics and that college education exhibits a large wage premium (of 68 log points relative to workers with at most primary schooling). Column 3 also shows that informality is associated with much lower hourly wages (by about 49 log

[15]Similarly, β_2 captures the wage gap between native workers and similarly skilled individuals born in countries other than Ecuador and Venezuela.

points). Further, the Venezuelan-native wage gap now falls to 66 log points, indicating that the rate of informality is higher among Venezuelan migrants than for Ecuador-born workers.

The dependent variable in the last two columns is an indicator for informal employment. The estimates show that informality rates are 31 log-points higher among Venezuelan workers than for native workers in the same canton and with similar individual characteristics. Not surprisingly, informality rates tend to be much lower for highly educated workers. Last, columns 4 and 6 restrict the sample to female workers and show that the Venezuelan-native wage and informality gaps have the same magnitude in the female sub-sample.

Next, we restrict our analysis to the sub-sample of Venezuelan workers. This allows us to estimate the returns to education in Ecuador for these workers along with the pattern of economic assimilation over time (subject to the caveats noted earlier due to the purely cross-sectional nature of our data). Table 7 reports the results. Comparing columns 1 (whole sample) and 2 (only Venezuelans) shows that the determinants of hourly wages are similar for Venezuelan and Ecuadorian workers. Namely, women earn lower wages than men in the same canton and with the same educational attainment, and workers with higher education levels earn higher wages. Specifically, all things being equal, women's wages are 22 log-points lower than men's and college graduates earn wages that are 53 log-points higher than workers with at most primary education (column 2).

Column 3 controls for arrival cohort. The estimates suggest that, relative to 2019 arrivals, workers that arrived between 2016 and 2018 earn much higher wages (by 33 log-points), which may be due to transitions to better jobs, migration to higher-wage areas or a general upward trend in economic conditions in the country. In addition, the point estimates in Column 4 suggests that wages in the informal sector are 23 log-points lower, but the precision of the estimate is too low to make strong assertions.

The dependent variable in column 5 is an indicator for informal employment. The estimates suggest that women are much more likely to be in the informal sector and that educational attainment does not provide a safeguard against this low-quality employment. It also appears that informality falls by 5 percentage-points one year after arrival in Ecuador. Furthermore, we learn that individuals with *regular status* (i.e. work permit) are 17 percentage-points less likely to have informal employment, which will be a crucial piece of information in our policy simulation exercises.

In sum, the estimates presented here show that the wage structure of Venezuelan

workers is similar to that of native workers, although wage levels are much lower. In addition, informality is associated to lower wages and, in turn, informality is strongly influenced by legal status.

5 Occupational analysis

5.1 Occupations in Ecuador

Education levels may lack comparability across Ecuador and Venezuela, and this could distort the wage gaps by education level reported in the previous section (as discussed in footnote 13). For instance, if tertiary education has deteriorated in Venezuela to the point that the quality of a college education is substantially lower than in Ecuador, the large migrant-native wage gaps for college graduates reported earlier would not reflect productivity gaps and, hence, a waste of productive skills.

To address this concern we use data on workers' occupations in Ecuador. More specifically, we rely on the survey question that informs us about the type of employer and classifies workers into the following categories: private-sector employee, self-employed, government employee, day laborer (*jornalero or peón*), manager, domestic employee and outsourced employees (*empleado terciarizado*).[16]

The results are collected in Table 8. The top panel reports the occupational distribution for Ecuadorian natives. According to the data, an estimated 2.7 million individuals are private-sector employees and a similar number are self-employed. The highest average hourly wage is $5.59 for government employees, followed by $3.67 for managers. The middle panel reports the analogous information but in reference to Venezuelan migrants. We estimate that about 102,000 Venezuelans in Ecuador are private-sector employees, about 66,000 are self-employed and close to 14,000 are day laborers.

The bottom panel compares the within-occupation characteristics of Venezuelan migrants to native workers by computing ratios for all variables included in the Table. The main take aways are the following. Relative to their population density, Venezuelan migrants are over-represented in three occupations: outsourced workers, domestic employees and private-sector employees. Except for private-sector employment, these occupations are characterized by low wage levels (on the basis of the data for Ecuadorian

[16]The EPEC survey also contains a more traditional occupation variable. However, the variable is too detailed and cannot be aggregated as it lacks numerically coded categories. For example, the top 10 occupations only account for 4% of the workers in the survey.

workers).

Second, within-occupation hourly wages are much lower for Venezuelan workers in all occupations, with the exception of government employees and outsourced workers. However, these occupations employ very few Venezuelan migrants (merely 2.5%). In the occupations employing the highest numbers of Venezuelans, Venezuelan migrants earn between 25 and 50% less than Ecuadorians. We also note that informality rates are often much higher among Venezuelan migrants than for native workers in the same occupation. For private-sector employees and self-employed, the excess informality is around 20 percentage points. In contrast, the informality rate for Venezuelan day laborers is 14% lower than for natives. Last, the last column of the Table shows that the share of college-educated Venezuelan migrants in all occupations is substantially higher than the corresponding share for natives, strongly suggesting a serious problem of over-qualification for Venezuelan migrants.

Summing up, within a given occupation, Venezuelan migrants tend to earn much lower wages than native workers and have higher informality rates, despite their higher education levels. These findings suggest that educated Venezuelan migrants face large entry barriers into the more qualified occupations and that their skills may be inefficiently allocated.

5.2 Migration and Occupational downgrading

Language barriers, institutional constraints and localized knowledge imply that skill transferability across borders is imperfect. As a result, migration may entail negative effects on the productivity and wages of migrants, often reflected in terms of occupational downgrading (Jasso et al. (2000)). For instance, our survey indicates that 72% of the Venezuelans that migrated to Ecuador report that their skills were used more productively in their jobs back in Venezuela.

On the other hand, international migration typically entails moving from low to high productivity countries, which can lead to increases in wages and productivity (Clemens (2011)). Migration driven by natural or man-made disasters, such as the Venezuelan exodus, is much more likely to be of the South-South type and, as a result, this type of productivity gain may be less relevant.

An important feature of the EPEC survey is that it contains retrospective information on the last job held by migrants prior to leaving Venezuela. The goal in the remainder of this section is to compare the changes in occupation experienced by Venezuelan migrants

relative to their pre-migration jobs. Accordingly, we restrict the sample to Venezuelan migrants (living in Ecuador) that report information on both their current job and their last job prior to migration.

The findings are collected in Table 9. Among Venezuelan migrants to Ecuador, the three most popular occupations *prior* to migration were private-sector employment (about 116,000), government employment (about 30,000) and self-employment (21,000). In comparison, their shares of employment in Ecuador as self-employed, day laborers, domestic employees or outsourced employees have experienced large increases. In contrast, the shares of managers and government employees are sharply lower than prior to migration. More specifically, when we focus on Venezuelan migrants employed as day laborers in Ecuador, we find that their main occupations in Venezuela were private-sector and government employment. Both of these occupations are characterized by much higher wages than what day laborers typically earn and highlight the large occupational downgrading experienced by Venezuelan migrants.

6 Policy Simulations

This section carries out a number of simple, yet informative policy simulations. We focus on two policy actions: legalization (in the sense of providing legal work and residence permits to all migrants) and measures aimed at improving the quality of employment for highly educated Venezuelan migrants.

6.1 The Effects of Legalization

Based on the EPEC survey, approximately 90% of Venezuelan migrants in Ecuador lack legal status, in the sense that are not authorized to work. This has important consequences for Venezuelan workers. As shown in Section 4.3, lack of legal status is associated with a higher likelihood of informal employment (column 5 in Table 7).

Inspired by Clemens et al. (2018), the goal of this section is to use the estimates of these effects to simulate the consequences of providing legal work permits to Venezuelans on the quality of their employment (measured by informality) and, through this channel, on their productivity (measured by wages).

The relevant information is collected in Table 10. We classify Venezuelan workers that *lack legal status* on the basis of their education level (primary, secondary or tertiary) and the quality of their employment (formal or informal). Based on the data in column 3

of the Table, at a given education level, hourly wages are lower for workers with primary and secondary education levels employed in the informal sector. Specifically, Venezuelan workers with (at most) primary schooling who are working informally earn an average hourly wage of \$0.65 whereas those in the formal sector earn 2.6 times more (1.68\$). Similarly, those with tertiary education with formal employment earn 1.5 times more than those in the informal sector. Interestingly, for workers with secondary education wages are slightly lower in the formal sector (\$1.29 versus \$1.41), which is probably due to sampling variability.

Column 4 reports the baseline distribution of workers in terms of informality for each education level. The data show that the majority of Venezuelan workers (lacking legal status) are employed in the informal sector. This is the case for 53% of the workers with (at most) primary education, 64% of those with secondary education and 58% of the tertiary educated. Next, column 5 combines the data in the two previous columns to produce the average hourly wages for Venezuelan workers lacking legal status by education level. Those with at most primary education earn \$1.14 per hour on average, those with secondary education earn \$1.37, and the college-educated earn \$1.91.

Columns 6 and 7 consider the hypothetical scenario where all Venezuelan workers are granted legal work permits. On the basis of our earlier estimates (column 5 in Table 7), the proportion of workers employed in the formal sector would increase by 17 percentage points at each education level, as shown in column 6. Assuming that wages by education and type of employment stay constant, the change in composition will produce increases in the average wage for workers with primary and tertiary education of 15.4% and 7.5%, respectively. In contrast, the average wage of workers with secondary education would remain practically unchanged.[17] Our simulation keeps wages constant, but given that Venezuelan migrants account only for about 3% of employment in Ecuador (and 2% of the overall population), general equilibrium effects are likely to be negligible.[18]

It is worth noting that the wage increase estimated by our simulation could be a lower bound for the actual increase. The reason is that gaining legal status is likely to improve the wage bargaining power of Venezuelan migrants. In fact our data show that while 91% of Ecuadorian workers receive the payment they expected from their employers, the corresponding figure is 6 percentage points lower for Venezuelans (column 9 in Table 3).

[17]Taking the figures in column 3 literally, the average wage for workers with secondary education would fall from \$1.37 to \$1.35 per hour.

[18]For a general-equilibrium treatment of the effects of legalization on GDP and wages in the context of the United States, see Edwards and Ortega (2017) and Ortega et al. (2019).

6.2 Employment Upgrading for Skilled Migrants

Our empirical analysis has shown that over-qualification is a pervasive problem among Venezuelan migrants in Ecuador. As a result, their productivity and wage levels are well below those of Ecuadorians in the same region of residence and with the same education level. This is a waste of productive skills that lowers GDP and shifts the burden of the labor-market adjustment toward low-skill natives (as documented in Olivieri et al. (2020)).

A natural policy to consider is to facilitate the access of highly educated Venezuelans to skilled jobs. The main goal of this section is to conduct a simulation of the potential effects of such a policy. As a first step, we begin by analyzing some relevant information in the EPEC survey. In practical terms, a barrier that may be preventing skilled Venezuelan workers from applying to skilled jobs may be the lack of transferability of education credentials or even the lack of credentials altogether.

We estimate that around 51,000 Venezuelan migrants in Ecuador (completed) college education prior to migration. Among these, 76% report having received a college degree certification. Presumably, the remaining 24% left the country prior to receiving the certificate.[19] Our data reveal that only 17% of the 51,000 Venezuelan college graduates have registered their college certificate with the corresponding government agency in Ecuador (SENESCYT). The survey also reveals that among those graduates that have not registered their degree, about 90% state that they are interested in carrying out the registration but are unable to do so because they lack the required documents (47%), are not familiar with the procedure (35%), or lack the funds to pay for the associated fees (7%). In contrast, only 1.4% are currently in the process of registering their degree in Ecuador.[20]

6.2.1 Upgrading in terms of Education

We turn to simulating the effects on GDP, for Ecuador as a whole and for the main host provinces, from policies that successfully allow college-educated Venezuelan migrants

[19] In many countries these official certificates are signed by a high government official, introducing a substantial delay between graduation and actually receiving the official certificate.

[20] More specifically, among the 47% college-educated Venezuelans that have not undertaken the registration of their degree in Ecuador, 21% did not bring their college diploma to Ecuador and 26% did bring it but have not obtained the Apostille of the Hague. Obtaining the Apostille in Ecuador costs $20 and legalization of the document with the Ecuadorian government costs an additional $20.

to obtain jobs according to their qualifications.[21] In other words, in our counterfactual scenario every Venezuelan migrant earns the wages of native workers in the same province of residence with the same education level.[22] As discussed earlier, a policy that would help approximate this situation is to facilitate the registration of Venezuelan college degrees with the corresponding Ecuadorian agency.

Table 11 presents our findings (column 1). The top panel reports the estimated increase in GDP at the national level. Relative to the baseline value, GDP would increase by 1.9% if all migrants with tertiary education were able to transition to highly skilled jobs. More specifically, we estimated that Venezuelan migrants account for 0.4%, 2.4% and 4.9% of the primary, secondary and tertiary employment in Ecuador, respectively. Further, we found that the wages of Venezuelan workers are 37-61% (Table 4) lower than the wages of Ecuadorian workers with the same education level and living in the same canton. Closing the migrant-native wage gap for each education group entails a substantial salary increase for the Venezuela-born workers (which account for 3% of Ecuador's employment), resulting in an aggregate 1.9% increase in Ecuador's GDP.

The bottom panel of the Table shows the estimated GDP gains for the two provinces with the largest Venezuelan resident populations. Respectively, GDP in Pichincha (capital Quito) and Guayas (capital Guayaquil) is estimated to increase by 3.5% and 2.1%. These estimates are in line with the density of Venezuelan migrants in these provinces, which we estimated at 3.3% and 2.0%, respectively (Table 1).

6.2.2 Upgrading in terms of Occupation

As discussed earlier, it seems reasonable to assume that education levels in Venezuela and in Ecuador are comparable. However, this assessment was based on very limited data. This raises concerns about the realism of the previous simulation where we relied heavily on the comparability of the education levels across the two countries. This section performs an alternative simulation that avoids this issue altogether.

As documented earlier (Section 5.2), Venezuelan migrants in Ecuador have experienced substantial occupational downgrading, relative to their last occupations prior to emigrating from Venezuela. The EPEC data show that 12,255 Venezuelan migrants are employed as day laborers in Ecuador, one of the low-pay occupations. However, only

[21] We switch our geographic unit to Ecuador's 24 provinces, as opposed to 221 cantons. This higher level of aggregation increases sample size and delivers more robust findings.

[22] We note that our simulation keeps relative wages across education levels constant. This is a reasonable assumption given that Venezuelan migrants are only around 2.9% of Ecuador's employment.

855 of these workers were day laborers back in Venezuela. Almost 8,000 of them were private-sector employees and 2,300 were public-sector employees. Similarly, it is estimated that 5,750 Venezuelan migrants are domestic employees in Ecuador when only 63 held this occupation back in Venezuela and approximately 5,300 were private-sector employees.

Next, we simulate the economic outcomes that would result in a scenario where Venezuelan migrants in Ecuador are able to work in the same occupations they held in the country of origin. As before, we then compare the counterfactual GDP (both nationally at by province) to the baseline value. More specifically, the counterfactual scenario assigns each Venezuelan worker to his/her/their occupation prior to migration and assume he/she/they receives the same wages as Ecuadorian workers in the same occupational category. As we show next, this increases the wages of practically all Venezuelan migrants, leading to an increase in GDP.

Table 11 presents the results (column 2). Our calculations suggest that Ecuador's GDP would increase by 1.6% relative to the baseline value. This increase is only slightly lower than the one obtained earlier in our educational upgrading simulation (1.9%). Turning now to the province-level analysis, we estimate that the GDP of the Pichincha and Guayas provinces would experience increases of 2.8% and 1.1%, respectively, which are somewhat lower than what we obtained in the education-based simulation (3.3% and 3.1%, respectively).

Summing up, the results in this section suggest that policies aimed at speeding up employment upgrading among Venezuelan migrants, so that those with higher skills are able to transition to better jobs, can lead to substantial increases in GDP. Furthermore, these changes would have the additional benefit of shifting the burden of adjustment away from low-skill, low-income Ecuadorian workers who are currently experiencing the largest increase in labor market competition.

It is worth emphasizing that the realized economic gains from Venezuelan immigration differ from the estimates reported here. Those could be assessed using a general-equilibrium model that compares economic outcomes with and without Venezuelan migrants. What we report in this section is the additional increase in GDP that could be obtained should the quality of the employment of Venezuelan migrants be upgraded to their potential level.[23]

[23] A back-of-the-envelope calculation of the economic contribution of Venezuelan migrants to Ecuador as of the summer of 2019 can be done as follows. On the basis of the survey, we have established that Venezuelans account for about 3% of overall employment in Ecuador. If migrant workers had the same skill distribution as natives and were employed accordingly, we would expect their contribution

7 Conclusions

Our data provide a detailed overview of the size and characteristics of the Venezuelan migrants that have arrived in Ecuador since 2016, as well as their labor market conditions. We estimate that over 340,000 Venezuelans migrated to Ecuador between 2016 and the summer of 2019, which amounts to 2% of Ecuador's population (and 3% of employment). Relative to Ecuador's workforce, Venezuelan migrants are highly skilled, both in terms of educational attainment and the occupations they held prior to leaving their home country.

The data also demonstrate that a large majority of Venezuelans have found employment in Ecuador. However, their employment is characterized by high informality, temporary contracts, and very low wages, compared to Ecuadorian workers with the same educational attainment living in the same regions.

These findings have two important implications. First, the skills of many Venezuelan migrants are vastly underutilized. Secondly, the brunt of the adjustment to the inflows of Venezuelan workers has fallen disproportionately on the lower paid and least skilled Ecuadorian workers in the main receiving areas (as shown in Olivieri et al. (2020)). There is a silver lining to this situation. The high educational attainment of Venezuelan migrants and the cultural and linguistic proximity between them and the Ecuadorian population point toward promising policy actions that can generate substantial economic gains for Ecuador and, at the same time, shift the burden of adjustment away from the most vulnerable segments of the labor market. This policy goal has become more urgent since the beginning of 2020 due to the sharp drop in oil prices, the reduced access to international credit and the health impact of the COVID-19 pandemic. Collectively, these events are disproportionately hurting low-income workers and their families (Olivieri (2020)).

Our simulation analysis suggests that there are large economic gains to be had from adopting measures that allow Venezuelan workers to obtain employment that matches their skills. We estimate that this could entail an increase in Ecuador's GDP in the range of 1.6% to 1.9%. It is worth noting that administrative actions to facilitate the validation of Venezuelan educational credentials do not have a large price tag and could

to GDP to be also around 3%. To the extent that we have documented substantial under-employment of Venezuelan migrants, their contribution to GDP at the time of the survey is likely to be well below 3%. On the other hand, because of their high educational attainment, their potential contribution to Ecuador's GDP is likely to be significantly higher than 3%. To attain this potential level, Venezuelan migrants would need to access employment that is in accordance with their skills.

have a large rate of return. We also estimate that providing legal work permits to Venezuelan migrants would lower their rate of informal employment by 17 percentage points, generating important wage increases. Due to the ongoing pandemic, economic conditions are deteriorating rapidly in Ecuador and households that rely on informal employment are particularly vulnerable. As we have documented, Venezuelan workers are highly reliant on informal employment.[24] Thus, policies that help improve their labor market outcomes, while simultaneously shift the burden away from the most vulnerable Ecuadorian workers, are urgently required.

[24]Preliminary data suggests that Venezuelan migrants are suffering the effects of the pandemic even more intensely than Ecuadorians. Between February and June 2020, it is estimated that 27% of Venezuelan households experienced loss of employment (for at least one member of the household). In comparison, the corresponding figure is 50% for Venezuelan households in Ecuador (Olivieri (2020)).

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Table 1: Geographical Distribution Venezuelan Migrants

	(1)	(2)	(3)	(4)	(5)	(6)
Weights	no	no	yes	yes	yes	yes
Province	Ecuadorians	Venezuelans	Ecuadorians	Venezuelans	Shares canton (%)	Vz/Pop (%)
Pichincha	672	400	4,199,771	145,204	42.6	3.3
Guayas	851	403	3,028,132	60,937	17.9	2.0
Los Rios	227	79	810,372	38,313	11.2	4.5
Manabi	800	359	1,947,224	25,917	7.6	1.3
El Oro	281	108	890,554	17,562	5.2	1.9
Imbabura	111	135	104,250	16,869	5.0	13.9
Azuay	133	54	1,153,850	16,455	4.8	1.4
Sto. Domingo	328	130	912,210	10,532	3.1	1.1
Orellana	57	27	37,403	4,436	1.3	10.6
Santa Elena	301	29	183,526	2,027	0.6	1.1
Esmeraldas	274	29	715,720	1,222	0.4	0.2
Carchi	61	6	32,299	594	0.2	1.8
Sucumbios	132	21	89,430	567	0.2	0.6
Tungurahua	45	0	634,462	0	0.0	0.0
Loja	22	0	549,726	0	0.0	0.0
Morona Stgo.	42	0	34,134	0	0.0	0.0
Bolivar	27	0	19,786	0	0.0	0.0
Cotopaxi	21	0	613,756	0	0.0	0.0
Canar	21	0	837,259	0	0.0	0.0
Total	4,406	1,780	16,793,862	340,633	100	2.0

Notes: The Table reports the observation counts (and population-weighted totals) for Ecuador-born and Venezuela-born individuals in the EPEC survey, at the province level. The provinces have been sorted by the estimated number of Venezuelans. Ecuador has 24 provinces (further subdivided into 221 cantons) but only 19 provinces were included in the survey. Columns 1-2 report the raw number of observations in the survey. Columns 3 and 4 apply the survey weights to inflate the raw counts to population estimates. Column 5 computes the province *shares* of Venezuelans. Column 6 is the share of Venezuelan migrants in each province. The Total entry in column 6 is the share of Venezuelan migrants in Ecuador's population on the basis of our survey. The capital cities of Pichincha and Guayas are Quito and Guayaquil, respectively.

Table 2: Descriptive Statistics EPEC Survey. Complete sample

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	6425	30.281	20.358	0	99
Female	6425	.506	.5	0	1
Ecuadorian nationality	6303	.715	.451	0	1
Born Ecuador	6303	.699	.459	0	1
Born Venezuela	6303	.272	.445	0	1
Born Other	6303	.029	.167	0	1
Primary education	5600	.341	.474	0	1
Secondary education	5600	.405	.491	0	1
Tertiary education	5600	.253	.435	0	1
Employed	6425	.479	.5	0	1
Self-employed	3077	.314	.464	0	1
Informal employment	3049	.434	.496	0	1
Temporary employment	2113	.527	.499	0	1
Paid as agreed	2102	.89	.313	0	1
Weekly work hours	3045	45.681	22.851	0	224
Monthly earnings (USD)	2885	459.502	631.648	0	13000
Hourly wage (USD)	2830	2.917	4.897	0	146.188

Notes: EPEC survey, unweighted data. Primary education includes those that did not complete primary education. Secondary and tertiary education include only individuals that completed the corresponding stages. Variable *Paid as agreed* is an indicator taking value of one if the worker received the payment that had been previously agreed upon with the employer.

Table 3: Estimation Migrant-Native Gaps. Specifications contain canton fixed-effects

Birth country	(1) Age	(2) Fem	(3) Edu1a	(4) Edu2a	(5) Edu3a	(6) Emp.	(7) Informal	(8) Tempo	(9) Agreed	(10) Hours work	(11) $\ln w$	(12) $\ln wh$
Ecuador	36.01***	0.51***	0.30***	0.51***	0.19***	0.68***	0.51***	0.41***	0.91***	42.76***	5.65***	0.63***
	[0.84]	[0.02]	[0.04]	[0.04]	[0.03]	[0.02]	[0.04]	[0.04]	[0.02]	[1.37]	[0.12]	[0.10]
Venezuela	-3.49	0.04	-0.22***	-0.05	0.27***	0.17***	0.15**	0.29***	-0.06***	5.49**	-0.45***	-0.56***
	[2.28]	[0.03]	[0.02]	[0.07]	[0.07]	[0.03]	[0.07]	[0.05]	[0.02]	[2.25]	[0.11]	[0.08]
Other country	0.01	0.23*	-0.22***	-0.26***	0.48***	-0.21	-0.07	-0.12	-0.17	3.62	-0.63	-0.72
	[1.36]	[0.12]	[0.06]	[0.07]	[0.11]	[0.22]	[0.13]	[0.16]	[0.19]	[4.20]	[0.79]	[0.70]
Est. pop. (Mn)	11.5	11.5	11.3	11.3	11.3	11.5	7.9	5.0	5.0	7.9	7.0	6.8
Obs.	4,400	4,400	4,282	4,282	4,282	4,400	3,002	2,081	2,091	2,998	2,662	2,629
N. cantons	42	42	42	42	42	42	42	42	42	42	42	42

Notes: Regressions use survey weights and include canton fixed-effects. Working-age sample (15-70). The top panel reports the mean of the corresponding dependent variable for individuals born in Ecuador (without fixed-effects). Bottom panel collects estimates for indicators for born in *Venezuela* and born in *Other country*. In those regression models the omitted category is *Born in Ecuador*. Variables *Edu1a*, *Edu2a* and *Edu3a* are indicators for (at most) primary education, (completed) secondary and tertiary education, respectively. Variable *Emp* is an indicator for employment status. Variables *Informal* and *Tempo* are indicators for informal employment and temporary contract, respectively. *Agreed* is an indicator for receiving the agreed upon pay from employer. The dependent variables in columns 11 and 12 are the logs of monthly earnings and hourly wages (in USD). Standard errors clustered at the canton level and heteroskedasticity-robust. The bottom panel reports the estimated population size of each sample, in millions of individuals.

Table 4: Employment and earnings by education and country of birth

	Ecuadorian	Venezuelan	Vza/Ecu
Freq. Obs.	3,000	1,311	0.44
Freq. Est. Pop.	11,178,362	255,755	0.02
Educ. shares			
Edu 1a	0.30	0.04	
Edu 2a	0.51	0.52	
Edu 3a	0.19	0.44	
Employment rate			
Edu 1a	0.74	0.70	0.94
Edu 2a	0.65	0.84	1.30
Edu 3a	0.69	0.87	1.27
Informality rate			
Edu 1a	0.75	0.57	0.76
Edu 2a	0.50	0.64	1.28
Edu 3a	0.13	0.52	4.19
Temporality rate			
Edu 1a	0.53	0.96	1.82
Edu 2a	0.45	0.69	1.53
Edu 3a	0.20	0.77	3.76
Weekly work hours			
Edu 1a	43.13	49.45	1.15
Edu 2a	43.32	50.48	1.17
Edu 3a	42.03	45.60	1.09
Monthly earnings ($)			
Edu 1a	393.57	218.40	0.55
Edu 2a	360.58	246.11	0.68
Edu 3a	853.06	309.44	0.36
Hourly wage ($)			
Edu 1a	2.43	1.07	0.44
Edu 2a	2.10	1.32	0.63
Edu 3a	5.06	1.95	0.39

Notes: Working-age population (age 15-70). Means computed using survey weights.

Table 5: Employment and Earnings Venezuelan migrants by year of arrival in Ecuador

Arrived in	2016	2017	2018	2019 (Junio)
All				
Obs.	118	245	816	534
Est. Pop.	11,140	66,305	184,075	63,664
Shares	0.03	0.20	0.57	0.20
Age	32.3	27.3	25.4	24.6
Female	0.40	0.34	0.55	0.49
Edu 1a	0.07	0.14	0.21	0.22
Edu 2a	0.23	0.33	0.49	0.50
Edu 3a	0.70	0.53	0.31	0.29
All Edu				
Employed	0.88	0.97	0.87	0.68
Informal	0.19	0.57	0.63	0.57
Monthly earnings	621	281	276	182
Weekly hours work	56	50	48	46
Hourly wage	3.40	1.52	1.63	1.22
Edu 1a				
Employed	0.10	1.00	0.69	0.72
Informal	1.00	0.40	0.63	0.51
Monthly earnings	205	394	169	260
Weekly hours work	45	47	46	55
Hourly wage	1.14	2.21	0.76	1.33
Edu 2a				
Employed	0.70	0.95	0.85	0.77
Informal	0.56	0.72	0.65	0.56
Monthly earnings	347	208	273	181
Weekly hours work	45	55	50	50
Hourly wage	2.24	0.99	1.44	1.09
Edu 3a				
Employed	0.94	0.98	0.91	0.51
Informal	0.09	0.49	0.60	0.63
Monthly earnings	684	299	284	158
Weekly hours work	59	47	45	36
Hourly wage	3.67	1.67	1.96	1.52

Notas: EPEC Survey, weighted means, working-age population (15-70).

Table 6: Mincer regressions (hourly wages). Full sample

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	$\ln wh$	$\ln wh$	$\ln wh$	$\ln wh$	Informal	Informal
Born Vza	-0.56***	-0.79***	-0.66***	-0.67***	0.31***	0.35***
	[0.08]	[0.06]	[0.06]	[0.07]	[0.06]	[0.07]
Born Other	-0.72	-0.96	-0.96	-1.41	0.08	-0.01
	[0.71]	[0.76]	[0.79]	[1.08]	[0.10]	[0.11]
Age		-0.01	-0.01	-0.01	0.00	0.00
		[0.01]	[0.01]	[0.01]	[0.00]	[0.00]
Female		-0.31**	-0.27**		0.11	
		[0.12]	[0.10]		[0.10]	
Edu2a		-0.14	-0.25**	-0.08	-0.19***	-0.11
		[0.10]	[0.10]	[0.18]	[0.07]	[0.11]
Edu3a		0.68***	0.40***	0.54	-0.53***	-0.56***
		[0.14]	[0.13]	[0.35]	[0.09]	[0.10]
Informal Emp.			-0.49***	-0.50***		
			[0.08]	[0.17]		
Observations	2,629	2,555	2,555	1,094	2,915	1,282
R-squared	0.18	0.28	0.30	0.39	0.30	0.35
Cantons	42	42	42	41	42	41
Sample	All	All	All	Females	All	Females

Notas: EPC survey, working-age population (15-70). Estimation using survey weights. All specifications include canton fixed-effects. The omitted category is (at most) primary education (Edu 1a). From column 3 to the end we also control for the density of Venezuelans in the population at the sector level, which is a subdivision of canton. The coefficient is never statistically significant. Standard errors are heteroskedasticity-robust and clustered by canton (in brackets). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: Mincer regressions (hourly wages). Venezuelan sample

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	lwh	lwh	lwh	lwh	Informal
Age	-0.01	0.00	0.00	0.01*	0.01**
	[0.01]	[0.01]	[0.00]	[0.00]	[0.00]
Female	-0.32**	-0.22**	-0.22**	-0.17***	0.18**
	[0.12]	[0.09]	[0.08]	[0.04]	[0.07]
Edu 2a	-0.15	0.29**	0.18	0.21	0.11
	[0.10]	[0.12]	[0.12]	[0.13]	[0.10]
Edu 3a	0.62***	0.53***	0.39**	0.38**	-0.02
	[0.15]	[0.13]	[0.15]	[0.15]	[0.12]
Arrived 2016-18			0.33*	0.31	-0.05
			[0.17]	[0.21]	[0.18]
Informal emp.				-0.23	
				[0.21]	
Regular status					-0.17***
					[0.04]
Obs.	2,555	843	843	843	947
R-squared	0.26	0.12	0.17	0.19	0.20
Cantons	42	27	27	27	27
Sample	All	Vza	Vza	Vza	Vza

Notas: EPC survey, working-age population (15-70), born in Venezuela (except in column 1 where we use the whole sample). Estimation using survey weights. All specifications include canton fixed-effects. The omitted category is (at most) primary education (Edu 1a). Standard errors are heteroskedasticity-robust and clustered by canton (in brackets). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8: Occupation en Ecuador by country of birth

	Freq.	Est. Pop.	Hourly wage	Informal	Edu3a
Birth country	Ecuador	Ecuador	Ecuador	Ecuador	Ecuador
Private-sector employee	749	2,698,328	3.31	0.23	0.25
Self-employed	624	2,767,916	1.96	0.79	0.10
Government employee	189	607,761	5.59	0.00	0.72
Laborer	140	655,637	1.87	0.68	0.07
Manager	98	203,119	3.67	0.79	0.08
Domestic employee	43	152,698	2.65	0.59	0.04
Outsourced employee	15	51,881	1.35	0.00	0.04
Birth country	Venezuela	Venezuela	Venezuela	Venezuela	Venezuela
Private-sector employee	511	101,803	1.66	0.27	0.46
Self-employed	269	66,642	1.32	0.97	0.52
Government employee	11	1,807	10.30	0.00	0.99
Laborer	120	13,658	1.40	0.58	0.18
Manager	10	1,045	3.06	0.24	0.79
Domestic employee	20	6,010	1.40	0.93	0.74
Outsourced employee	13	3,263	2.17	0.75	0.85
Ratio	100*Vza/Ecu	100*Vza/Ecu	Vza/Ecu	Vza/Ecu	Vza/Ecu
Private-sector employee	68.2	3.8	0.50	1.19	1.86
Self-employed	43.1	2.4	0.67	1.23	5.22
Government employee	5.8	0.3	1.84	NA	1.38
Laborer	85.7	2.1	0.75	0.86	2.67
Manager	10.2	0.5	0.83	0.30	9.36
Domestic employee	46.5	3.9	0.53	1.59	20.56
Outsourced employee	86.7	6.3	1.61	NA	20.62

Notes: Information based on survey question 4.18 (relationship to employer, current employment in Ecuador). Means computed using survey weights using the working-age population (15-70). In columns 1-2 in the bottom panel the figures have been multiplied by 100 (percentage points).

Table 9: Occupation in Venezuela and in Ecuador. Venezuelan migrants only

	Freq.	Est. Pop.	Edu1a	Edu2a	Edu3a
Employment in	Venezuela	Venezuela	Venezuela	Venezuela	Venezuela
Private-sector employee	495	115,770	0.03	0.46	0.51
Self-employed	137	21,191	0.05	0.61	0.34
Government employee	163	30,254	0.03	0.25	0.72
Laborer	22	3,418	0.10	0.88	0.02
Manager	24	5,074	0.14	0.63	0.23
Domestic employee	3	143	0.11	0.89	0.00
Outsourced employee	4	508	0.00	0.53	0.47
Employment in	Ecuador	Ecuador	Ecuador	Ecuador	Ecuador
Private-sector employee	511	101,803	0.03	0.51	0.46
Self-employed	269	66,642	0.02	0.46	0.52
Government employee	11	1,807	0.00	0.01	0.99
Laborer	120	13,658	0.12	0.69	0.18
Manager	10	1,045	0.00	0.21	0.79
Domestic employee	20	6,010	0.00	0.26	0.74
Outsourced employee	13	3,263	0.02	0.13	0.85
Ratio	Ecu/Vza	Ecu/Vza	Ecu/Vza	Ecu/Vza	Ecu/Vza
Private-sector employee	1.03	0.88	1.16	1.09	0.91
Self-employed	1.96	3.14	0.43	0.76	1.51
Government employee	0.07	0.06	0.00	0.03	1.38
Laborer	5.45	4.00	1.20	0.79	8.59
Manager	0.42	0.21	0.00	0.32	3.46
Domestic employee	6.67	42.03	0.03	0.29	NA
Outsourced employee	3.25	6.42	NA	0.25	1.79

Notes: Information based on survey question 4.48 (relationship to employer, usual employment in Venezuela prior to emigration) and 4.18 (relationship to employer, employment in Ecuador). Means computed using survey weights using the working-age population (15-70) for Venezuelan migrants reporting information on last job in Venezuela. The bottom panel reports the ratio of the value corresponding to the job in Venezuela relative to the job in Ecuador.

Table 10: Simulation Effects of Legalization on Average Hourly Wage Venezuelan workers

Edu	Empleo	(1) Base freq.	(2) Base freq. weights	(3) Base wh	(4) Base shares	(5) Base wh edu	(6) Simula shares	(7) Simula wh	(8) Sim./Base %
1a	Formal	15	2,848	1.68	0.47	1.14	0.64	1.31	15.4
1a	Informal	40	3,207	0.65	0.53		0.36		
2a	Formal	287	35,735	1.29	0.36	1.37	0.53	1.35	-1.5
2a	Informal	154	62,687	1.41	0.64		0.47		
3a	Formal	131	29,704	2.40	0.42	1.91	0.59	2.05	7.5
3a	Informal	198	41,822	1.56	0.58		0.41		
	Total	825	176,003						

Notes: Baseline values in columns 1-5. Simulated values columns 6-7. Working-age population (15-70). Baseline values are means (using survey weights). Simulated scenario keeps education levels and working conditions as in baseline. Hourly wages for Venezuelan workers (by education level) are also kept constant. Variable *wh* is the hourly wage.

Table 11: Simulation Employment Upgrading on the basis of education levels and occupational category

	(1) Education GDP Sim./Baseline	(2) Occupation GDP Sim./Baseline
Ecuador	101.9	101.6
Province		
Pichincha	103.5	102.8
Guayas	102.1	101.1

Notes: GDP base value indexed to 100. According to the EPEC survey, Venezuelan workers account for 2.9% of employment in Ecuador. Simulated scenario assumes that Venezuelan workers obtain the same monthly earnings as Ecuadorian workers with the same education level (in column 1) or occupational category (in column 2) in the same province of residence. The simulation maintains wage levels constant at each education level and province. Quito is the capital of the Pichincha province and Guayaquil is the capital of Guayas.

Appendix

Table .1: Gateways into Ecuador

	All	Primary Educ.	Secondary Educ.	Tertiary Educ.
By Land				
Rumichaca	82.6	93.1	79.9	84.6
Huaquillas	2.6	1.3	3.8	1.2
San Miguel	7.0	2.9	9.9	3.9
By Air				
Quito Airport	2.9	0.0	1.3	5.3
Guayaquil Airport	2.8	2.0	1.4	4.7
Other				
Unofficial entry points	2.0	0.8	3.7	0.2
Population	235,477	14,100	126,137	95,061
Observations	1,239	104	655	479

Notas: Entry points into Ecuador. Estimations based on EPEC data for sub-sample of individuals born in Venezuela, age 18 or older.

Table .2: Descriptive Statistics EPEC Survey. Venezuelan sample

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	1715	25.257	14.994	0	78
Female	1715	.501	.5	0	1
Ecuadorian nationality	1715	.038	.192	0	1
Born Ecuador	1715	0	0	0	0
Born Venezuela	1715	1	0	1	1
Born Other	1715	0	0	0	0
Arrived in 2018	1715	.476	.5	0	1
Arrived in 2017	1715	.143	.35	0	1
Arrived in 2016	1715	.069	.253	0	1
Regular status	1715	.093	.291	0	1
Primary education	1521	.221	.415	0	1
Secondary education	1521	.445	.497	0	1
Tertiary education	1521	.334	.472	0	1
Employed	1715	.568	.496	0	1
Self-employed	974	.277	.448	0	1
Informal employment	967	.521	.5	0	1
Temporary employment	705	.716	.451	0	1
Paid as agreed	704	.885	.319	0	1
Weekly work hours	966	50.66	23.485	0	189
Monthly earnings (USD)	944	315.535	390.495	0	6400
Hourly wage (USD)	926	1.839	2.601	0	40

Notes: EPEC survey, unweighted data. Sample includes only individuals born in Venezuela that arrived in Ecuador prior to January 1, 2016. In EPEC sample 30.5% of respondents were born in Venezuela. In weighted sample, Venezuelans account for 2%% of Ecuador's population. Primary education includes those that did not complete primary education. Secondary and tertiary education include only individuals that completed the corresponding stages. Variable *Regular status* is an indicator for valid and current work and residence permit. Variable *Paid as agreed* is an indicator taking value of one if the worker received the payment that had been previously agreed upon with the employer.