

The Unintended Consequences of Deportations

Evidence from Firm Behavior in El Salvador

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Abstract

Can repatriation inflows impact firm behavior in origin countries? This paper examines this question in the context of repatriation inflows from the United States and Mexico to El Salvador. The paper combines a rich longitudinal data set covering all formal firms in El Salvador with individual-level data on all registered repatriations from 2010 to 2017. The empirical strategy combines variation in the municipality of birth of individuals repatriated over 1995–2002—before a significant change in deportation policies—with annual variation in aggregate inflows of repatriations to El Salvador. The findings show

that repatriations have large negative effects on the average wages of formal workers. This is mainly driven by formal firms in sectors that face more intense competition from the informal sector, which deportees are more likely to join. Repatriation inflows also reduce total employment among formal firms in those sectors. Given that most deportees spend less than a month abroad, these findings suggest that the experience of being detained and deported can have strong negative effects not only on the deportees, but also on their receiving communities.

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The Unintended Consequences of Deportations: Evidence from Firm Behavior in El Salvador*

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I Introduction

What are the effects of repatriation inflows on firm behavior in origin countries? Can repatriated inflows cause different effects in origin countries compared to those caused by the typical forced migrant displaced by violence or political instability in hosting locations? We argue that the effects of repatriation inflows in origin countries deserve a separate analysis. Repatriations are a special and unique case of forced migration that could arguably prompt positive, negative, or null effects on the firms located in origin countries.

Return migration from developed to developing countries can bring a host of positive effects such as improved skills, know-how, and networks ([Bahar et al., 2018](#)). However, these impacts would be insignificant if deportees spent little or no time working abroad or if they were more likely to engage in criminal activities. In addition, being forcibly displaced can have long-term negative effects on deportees and their receiving communities. For instance, [Sviatschi \(2019\)](#) documents that the increase in criminal deportations from the United States in 1996 exposed more children to gang leaders, resulting in lower education investments in El Salvador, and [Rozo et al. \(2020\)](#) show that repatriated inflows from the United States to Mexico induced higher homicide rates in proximity to the repatriation centers in Mexico. Consequently, the direction of the impacts of repatriation inflows on firm behaviors in origin countries, remains an empirical question that we aim to address in this paper.

We examine the impacts of repatriation inflows from the United States and Mexico on formal firms located in El Salvador. In the last 40 years, El Salvador has been a net source of irregular migrants to other regions in North America, predominantly the United States. In fact, deportations intensified during the country's brutal civil war (1980-1992), when a vast number of Salvadoran irregular migrants fled conflict and harsh economic conditions in their homeland for better opportunities abroad. The level of deportations was stable, at around 4,000 individuals per year after 1999, and increased dramatically after 2002, when the United States strengthened migration en-

forcement following the terrorist attacks of 2001.¹ Ever since, deportations to El Salvador have maintained steady growth rates, reaching almost 50,000 individuals per year by 2018.

In principle, repatriation inflows can be understood as a pure labor supply shock as more workers enter the labor market. However, 76 percent of deportees to El Salvador spend less than one month abroad. Thereby, their effects are more likely to reflect the experience of detention, including, for example, trauma, potentially being exposed to individuals with criminal backgrounds, and being stigmatized since the reason for deportation is unknown by others back home. At the same time, repatriation inflows can represent a labor demand shock if deportees are more likely to engage in crime or other illegal activities; or if they are likely to join the informal sector, thereby affecting labor demand among formal firms facing increased competition from informal ones. Following this logic, we first examine the effects of repatriation inflows as a *supply shock*, evaluating its effects on firm wages and employment. In a second step, we study the effects of repatriation inflows on outcomes that could be more directly linked to the *demand shock*, including firm entry and growth (measured as number of branches), as well as increased competition from the informal sector.

We carry out our empirical analysis combining data from El Salvador's migration authorities that include all registered repatriations with rich socioeconomic information about deportees with administrative information from the Salvadoran Social Security Institute (*Instituto Salvadoreño de Seguridad Social*, ISSS) containing the universe of firms and workers in the formal sector. Our period of analysis covers the years 2010 to 2018 and employs municipal and annual variation.

Considering that repatriated migrants may choose their location depending on local economic conditions, or that their location may have been forced on them by migration authorities, we cannot simply estimate a linear regression of firm outcomes on repatriation inflows. To account for these possible biases we use a shift share instrument that exploits two sources of variation: i) annual

¹As documented by [Rozo et al. \(2020\)](#) after 2001, resources devoted to enforcing immigration law increased greatly. With the creation of the new Department of Homeland Security (DHS), resources devoted to both border enforcement (Customs and Border Protection, CBP) as well as interior enforcement (Immigration and Customs Enforcement, ICE) expanded.

variation from national repatriation inflows, and ii) municipal variation on birth municipality of individuals repatriated in the period 1995-2002. Based on our 2010-2018 sample, we document that deported individuals overwhelmingly go back to their birth municipalities. Individuals who were repatriated between 1995 and 2002 came back to El Salvador before the United States drastically strengthened and changed its migration enforcement in response to the terrorist attacks of 2001. The changes in the United States' migration policies not only included a sudden increment in the number of repatriations, they also modified the strategies of deportations. ²

We document that repatriation inflows have a negative impact on average wages in the formal sector. An increase of 0.04 percentage point in the inflow of returnees reduces the average monthly salary paid by formal firms by approximately 9.4 percent. These effects are predominantly driven by men's salaries. The wage impacts are larger among formal firms in sectors that face more intense competition from informal ones. In the case of employment, while we do not find any aggregate impacts from repatriation inflows, the effects are negative and statistically significant among formal firms in sectors that are predominantly informal. When looking at other outcomes related to labor demand, such as firm entry and number of firms, we do not find any significant impacts. These findings are consistent with deportees representing a labor supply shock in the informal sector which tends to reduce wages, even among formal firms in typically informal sectors. At the same time, the reduction in formal employment among the latter is consistent with repatriation inflows inducing negative effects on formal firms and weakening their demand for labor as they face increased unfair competition from their informal peers, as documented by [Rozo and Winkler \(2019\)](#).

Our paper contributes to the growing literature that examines the effects of forced migration. The impacts of large international forced migration inflows in hosting countries have been largely centered around studying the impacts of forced migrants on the local workers;³ with a smaller

²Total United States deportations are composed of voluntary returns and involuntary removals. As documented by [Rozo et al. \(2020\)](#), after 2002 involuntary removals from the United States spiked dramatically while voluntary returns fell sharply. As such, the initial location of voluntarily repatriated individuals should be more related to family and network ties and less related to firm behavior.

³See [Card \(1990\)](#); [Ruiz and Vargas-Silva \(2015\)](#); [Del Carpio and Wagner \(2015\)](#); [Ceritoglu et al. \(2017\)](#); [Borjas](#)

groups of studies exploring the effects of refugee inflows on general prices,⁴ political outcomes,⁵ education outcomes,⁶ health,⁷ and overall economic growth.⁸

More recently, new studies have emerged examining the effect of forced migration flows on firms located in developing countries, which receive the lion's share of forced migration and have large informal sectors. One of these studies examines the effects of Syrian migration on Turkish formal firms (see [Altindag et al., 2020](#)). The authors document that firms are positively affected by the Syrian refugee shock, and that firms operating in the hospitality and construction sectors are disproportionately affected. The positive effects observed are partly explained by the fact that Syrian refugees reduce labor costs for firms, bringing capital from Syria, and that, they are also a large demand shock in the service sector, where Syrians are predominantly employed.

Another paper by [Rozo and Winkler \(2019\)](#) examines the effects of Colombian Internally Displaced Persons (IDPs) on firm behavior. In contrast to the Turkish context, IDPs had a negative effect on formal businesses in Colombia. The authors document that the effects are explained by the fact that IDPs disproportionately worked in informal economic activities that competed with formal businesses, displacing them from the market. Moreover, IDPs were poorer and had a predominantly agricultural experience, as such, they had a harder time joining formal firms.

Our main contribution to these groups of studies consists of examining the impacts of repatriated individuals who spent very little time abroad and who did not settle down or gain work experience in a foreign firm. As a result, any impacts on Salvadoran firms would likely capture the experience of being detained itself, which can have long-lasting impacts on deportees. These include trauma, being exposed to criminals or facing stigma back home. The impacts of repatriations on hosting countries are not well understood yet and have only been explored by [Rozo et al. \(2020\)](#), who study the effects of Mexican repatriations on homicide rates; and [Sviatschi \(2019\)](#)

and [Monras \(2017\)](#); [Clemens and Hunt \(2017\)](#); [Mayda et al. \(2017\)](#); [Peri and Yasenov \(2018\)](#).

⁴See [Alix-Garcia and Saah \(2009\)](#); [Balkan et al. \(2015\)](#); [Tumen \(2016\)](#); [Balkan and Tumen \(2016\)](#); [Al-Hawarin et al. \(2018\)](#).

⁵See [Dustmann et al. \(2019\)](#); [Rozo and Vargas \(2018\)](#).

⁶See [Assad \(2019\)](#); [Namen et al. \(2020\)](#).

⁷See [Ibáñez and Rozo \(2020\)](#).

⁸See [Alix-Garcia et al. \(2018\)](#).

who examines whether peer effects generate changes in education investments in the areas where deported criminals are located in Central America, using administrative data on El Salvador. Our paper also contributes to the general analysis of how repatriations affect origin locations, with a special focus on firm behavior.

II Conceptual Framework

There are two direct channels through which repatriations can affect labor markets in an economy with no market segmentation (i.e., no formal and informal divisions): a positive supply and demand shock. Ultimately, the effects that we observe empirically on wages and employment will be a combination of both shocks and their relative strength.

1. *Supply Shock*: if repatriated individuals spent a long time abroad, they would increase the overall supply of labor upon their return. On the other hand, if they were deported within a short time period after leaving, it is unlikely that this would be the case since labor markets may still have not adjusted since their departure.

If the supply shock prevails, a simple supply and demand model predicts that repatriated individuals who spent a significant amount of time abroad would lead to *lower wages* and *higher employment*.

2. *Demand Shock*: there are many channels through which repatriated individuals can prompt a positive demand shock. The most obvious one is through higher consumption levels that are being pushed by the larger population shock. This channel is likely to be weak if deportees return with fewer resources than before departure.

A second, more indirect channel, through which repatriated individuals can affect firms' demand for labor is through intrinsic changes that they can cause to firms production processes if they are employed by those firms. For example, repatriated individuals can bring

know-how and commercial networks from the United States.⁹ As such, repatriated individuals employed in firms can increase firms' productivity or even change their production technologies. How much change is observed in firms' technologies will also depend on how complementary or substitute repatriated individuals are to the other inputs of production and also on their skill composition. This channel would be weak if deportees spent very little time working abroad.

The prediction of a simple model of supply and demand indicates that repatriated individuals who spent a significant amount of time abroad will strengthen firms' labor demand, *increasing wages and employment.*

In sum, we expect that a large sudden repatriation shock should induce changes in employment and wages that *will depend on the strength of the relative changes in labor supply and demand.* If the demand shock is larger than the supply shock, wages should increase, and vice versa. However, these impacts would depend strongly on whether deportees spent a significant amount of time abroad or not.

II.1 Will repatriated individuals join the informal or formal economy?

The predicted effects of a simple labor supply and demand model depend on whether repatriated individuals join the formal or informal productive economies. For example, if repatriated individuals work and consume products and services from informal businesses, we will likely see a positive demand and supply shock in that sector with other indirect effects in the formal sector. At the same time, if deportees return suffering trauma or stigma, being more likely to engage in criminal activities or being poorer after spending their resources to cover migration expenses (and thereby less likely to start a business), they may be more likely to join the informal sector than before departure.

⁹Examples of these effects have been documented by [Cadot et al. \(2011\)](#); [Imbs and Wacziarg \(2003\)](#); [Cadot et al. \(2011\)](#); [Bahar et al. \(2018\)](#).

If deportees are more likely to join the informal sector, formal firms can still be affected by, for example, facing higher competition from informal economic activity. In such scenario the effects on the formal businesses can be negative on firms' behavior. Given that we do not observe the outcomes of informal firms, it is not possible to test if repatriation inflows affect their outcomes directly.¹⁰ We can only test the existence of indirect effects on formal firms that face stronger competition from informal ones.

III Local Context: Repatriations to El Salvador

Migration flows from El Salvador to North America have been high since the beginning of El Salvador's civil in the early 1980s. Most migrants from El Salvador seek to reach and settle in the United States, where many of them have communities and networks they can rely upon to support their assimilation into the country ([Contreras, 2019](#)).

After the United States approved the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 and strengthened immigration enforcement following the September 11 attacks of 2001, mass repatriations from the United States to El Salvador increased dramatically (see [Figure 1](#)). In fact, total deportations to El Salvador from the United States increased more than five times between 1995 and 2018. Considering that approximately 50 percent of the repatriations to El Salvador come from the United States (see [Figure 2](#)), the higher levels of enforcement in the United States were translated into large increases in the overall repatriation flows to El Salvador.

Although Salvadoran migration abroad has been constant since the second half of the twentieth century, the composition of migrants has changed over time. Most of the migrants who arrived in the United States in the 1980s and 1990s tended to be civil war refugees. The individuals who migrated during this period successfully settled in the United States, albeit their legal status has always been under question ([Menjívar, 2000](#)). Since the 2000s, the migrants are predominately

¹⁰The main household survey in El Salvador (*Encuesta de Hogares y Propósitos Múltiples*, EHPM), contains information on whether individuals' jobs are formal or informal. However, it is representative of only 55 municipalities.

driven out by El Salvador's poor and deteriorating economic conditions, as well as the violence brought about by the rise of gang activity (Cardoso et al., 2016; Menjívar, 2000). In the 2010s, the economy and violence keep being the main push factors, but there was also a rise in unaccompanied minors trying to reach the United States for family reunification (Clemens and Hunt, 2017). At the same time, Mexico has also increased its enforcement, leading to more repatriations as the migrants are en route to the United States.¹¹

A large body of anecdotal and empirical evidence shows that the impacts of being forcibly removed by itself can have large and long lasting effects on deportees and their communities. Deportees often experience traumatic events, such as being subjected to verbal and physical violence, and deprived of basic needs such as food and water (Phillips et al., 2006; López et al., 2020). This experience can leave long-lasting impacts on them, such as an increase in the incidence of post-traumatic stress disorder (Pena et al., 2017). At the same time, they often face stigma in their local communities, since the reason for deportation is not known by others who are concerned about their potential criminal experience abroad (Wheatley, 2011; Brotherton and Barrios, 2009; Dako-Gyeke and Kodom, 2017). In addition, given that several of them have used their savings (or those of their family network) to afford the costs of migration, they return home poorer and with fewer resources to start over.

III.1 What are the characteristics of repatriated individuals?

Summary statistics of demographic characteristics of returned migrants are shown in Table 2. There are almost 200,000 deportees in our data set, most of which (81 percent) are men. About 76 percent of them spent less than a month abroad. Given that these deportees did not get to settle and gain work experience abroad, it is unlikely that they would have positive effects—through knowledge transfers or large networks abroad—on Salvadoran firms. Instead, it is the exposure to law

¹¹With the rise of enforcement at the Southern Border, the number of repatriations “upon arrival” (in the United States) has also increased. These individuals do not tend to acquire much human capital as they never manage to settle in the United States.

enforcement, trauma, stigmatization, and individuals with criminal backgrounds while detained, which may drive their impacts on labor market prospects and firm dynamics upon return.

The levels of education of deportees tend to be low. About 71 percent of the deportees in our sample have completed primary education, whereas only 4 percent have secondary education, and 2 percent have completed technical education or university. Deportees have significantly lower levels of education than Salvadorans living in El Salvador and the United States (13 and 14 percent of them, respectively, has at least 14 years of education, Figure 3). On the other hand, Salvadorans living in the United States have higher educational attainment than their counterparts in El Salvador, which is in line with the idea that repatriated individuals were able to improve their knowledge abroad (Figure 3). We also have data on English proficiency for about 45 percent of our sample, which indicate that 51 percent out of the total of returnees do not speak English.¹²

The characteristics of deported individuals suggest that any positive impacts of deportees on Salvadoran firms through a knowledge transfer from a developed to a developing country will be hard to find. Instead, given that most repatriated individuals did not get to live and work in the United States and that they returned to El Salvador within a month of arrival in the United States, any impacts of repatriation flows on Salvadoran firms are likely to reflect the experience of being deported and its impacts on deportees.

IV Data

We combine multiple sources of administrative data to construct a municipal panel of individual firm outcomes and aggregated repatriation inflows.

¹²While we do not observe the sector of economic activity of the jobs of deportees who worked abroad, data from the American Community Survey (ACS) show that most Salvadorans in the United States work in construction, restaurants and hotels, business services, commerce and education and health (see Figure 4). In other words, they are more concentrated in skilled services when compared to their counterparts in El Salvador, who are disproportionately concentrated in agriculture.

1. *Firm Longitudinal Data*: Our main source of information comes from ISSS, the Social Security agency in El Salvador. The data cover the universe of firms operating in the formal sector independent of their economic sector and size.¹³ We use monthly data between 2010 and 2018 on annual wages, number of employees per firm separated by gender, and number of branches per firm. The data also include information on firms' general characteristics—such as location (municipality and department), economic sector and activity, the year it started operating, and whether the firm stopped operating.¹⁴ Once a firm becomes formal, it is followed over time until it goes out of business.

As described Table 1, our sample consist of the universe of firms operating in the formal sector, which employ an average of 25 workers. On average, the firms in our sample pay a monthly salary of US\$310 per worker, with an important difference between men and women—20.1 percent more to male workers. In our data set, we observe the location of the branch of each firm. Since a firm can have branches in many municipalities, we impute the location of each firm according to the location of the biggest branch. On average, we find that there are 80 firms operating at the municipality level. The average firm is in a municipality where returnees represent about 0.05 percentage points of the local population.

2. *Repatriations*: data on returned migrants comes from records of the General Directorate of Migration (*Dirección General de Migración y Extranjería*, DGME) and are available at the individual level. In total we have information on 403,851 repatriations of Salvadoran citizens from 1995 to 2018. Starting in 2011, we have rich administrative information on specific characteristics on all returnees. Upon their arrival in El Salvador, each returned migrant has to visit the repatriation center in the country. In this center, a migration officer greets each returnee and conducts an interview collecting information on the date of repatriation, date of birth, marital status, level of education, gender, time spent abroad, country in

¹³We exclude firms in public administration, education, health, social work, and utilities (e.g., electricity, gas and water sectors) since they are managed or heavily regulated by the government and do not capture the full dynamics of the private sector.

¹⁴The economic sector classifications follow those of the United Nations' International Standard Industrial Classification (ISIC) of All Economic Activities, Revision 3.

which the individual was living, whether the individual speaks English, reason for emigrating, municipality and city of birth, address of residence after repatriation, occupation and whether the subject has any criminal records. For repatriations that took place between 1995 and 2010, this detailed interview was not in place, thus, we observe only information on the reason and date of deportation, intended place of residence after repatriation, and date and place of birth.

This data set of Salvadoran returned migrants is the only source of information on all individuals who were returned to El Salvador, shedding light on their motive to flee the country, and the situation they may face once back in the country. Since the registration and interview is mandatory for all returnees, the data set includes information on the total number of individuals returned in each municipality.

Descriptive statistics of our sample are presented in Table 2. Around 64 percent of returnees have primary or no education—88 percent of those from which we have education data—and around 80 percent of them lived less than 1 month abroad—i.e., they were likely apprehended and repatriated when entering the United States.

Figure 5 presents the geographic distribution of the intensity of repatriations as a share of the mean municipal population between 2011 and 2016. There is an important variation in the share of repatriations across municipalities. The mean repatriation share for all the municipalities is 0.05, suggesting that, on average, all Salvadoran municipalities received approximately 5 percent of their population due to forced repatriation between 2011 and 2016. There are also some municipalities that saw a repatriation share of 67 percent, suggesting that their population was almost doubled by returnees. The figure also shows that the share of returned migrants to the northwest of the country was of relatively low intensity.

3. Additional municipal controls: other municipal covariates employed in our analysis include population and crime variables. Information on crime comes from the National Civilian Police of El Salvador (*Policía Nacional Civil*, PNC) and socioeconomic and demographic

data come from a report compiled by the United Nations Development Program (UNDP) in 2009.¹⁵

V Empirical Methodology

V.1 Identification Strategy

In the absence of endogeneity concerns, the simplest empirical strategy to estimate the effects of repatriations on labor outcomes using municipal data is given by the following specification

$$y_{imt} = \alpha_m + \lambda_t + \theta \text{Repatriation Share}_{mt} + \gamma \mathbf{X}_{mt} + \epsilon_{imt} \quad (1)$$

where Y_{imt} is the outcome of interest for firm i located in municipality m in period t . $\text{Repatriation Share}_{mt}$ stands for the population share of returnees that arrive in each municipality m at period t . X_{mt} is a vector of time-varying municipal characteristics, that include the homicide rate. α_m and λ_t account for municipality and time fixed effects and the standard errors are clustered at the municipality level. Such an empirical strategy, thus, relies on comparing firm outcomes in locations that are exposed to varying levels of returnee inflows.

The estimate of θ in this specification, however, is biased since repatriated individuals will likely choose their locations in El Salvador or else it is chosen for them by migration authorities for reasons that may be correlated with our outcomes of interest. One concern is that, for example, returnees can go disproportionately to municipalities with more employment opportunities, less labor market competition, or higher wages.

Since we have information on both the municipality of return and the municipality of birth for our 2010-2019 sample, we were able to document that more than 70 percent of the returnees go

¹⁵El Salvador has not conducted a census since 2007 and reliable and recent data for all of the country's municipalities is lacking. The 2009 UNDP report contains the most detailed, recent demographic and socioeconomic measures that cover all of El Salvador's 262 municipalities.

back to their municipalities of birth. Consequently, we construct a shift-share instrument for the population share of repatriations that uses the district of birth of the early wave of deportees and the number of new arrivals, as follows:

$$\text{Predicted Repatriations}_{mt} = \frac{R_{m1995-2002}}{L_{m1995-2002}} R_t \quad (2)$$

where $R_{m1995-2002}$ is the number of returnees born in municipality m , who were deported in the period 1995-2002, $L_{m1995-2002}$ is the average population at the municipality level in the period 1995-2002, and R_t is the number of repatriations at the national level at period t . Our instrument exploits two sources of variation: (i) cross-sectional variation that comes from the birth municipality of individuals who were deported and repatriated in the period 1995-2002, and (ii) changes in temporal variation from national repatriation inflows to El Salvador which are likely exogenous to municipal firm behavior. We chose municipality of birth for individuals repatriated in 1995-2002, as they correspond to the period before the United States drastically strengthened and changed immigration enforcement in response to the terrorist attacks of 2001. The changes in United States policy not only included a sudden increment in the number of deportations, but also changed the locations and strategies of deportations. We standardized our measure of Predicted Repatriations to facilitate the interpretation of our results.

In this framework, municipality fixed effects control for time invariant differences between municipalities that receive many returnees and municipalities that receive a small share, and time fixed effects control for changes in aggregate time trends across periods. The instrument thus exploits municipality-time variation and is based on the insight in [Card \(2001\)](#), that past migration, in this case forced migration, is a good predictor of future migration within the same group.

Figure 5 illustrates that the *Predicted Repatriations* measure is strongly correlated with returnee inflows for the 2011-2016 period. The formal test is presented in Tables 3 through 8, which show the estimates of the first stage equation confirming the positive correlation between the endogenous variable and the instrument.

Our empirical strategy will be valid so long as our instrument only impacts firm behavior through repatriation shares. Given that our estimates include fixed effects by year and firm (or municipality), aggregate time components or time-invariant firm characteristics are not a threat for our identification strategy. A particularly relevant threat to our identification strategy is that since returned migrants are fleeing violence, they may return to areas with presumably lower levels of violence. It is also possible that, upon arrival in their new locations, returned individuals may be increasing local violence levels or eroding the rule of law either by becoming perpetrators or victims of violence. In that sense, higher violence and conflict could also affect firm performance (Rozo and Vargas, 2018; Banegas and Winkler, 2020). To account for this, we control in all our estimates for homicide rates (as a proxy for violent crime).

VI Results

We estimate equation (1) using (2) as instrumental variable. We first study the effects of repatriation inflows on the formal labor market. Then, we expand our analysis to examine whether firm creation was affected by repatriation inflows and we also explore the role of the informal sector in shaping the effects of repatriations. For all our estimations, we present an OLS regression (Panel A), a reduced form regression (Panel B), and a 2SLS regression (second stage in panel C and first stage in panel D).

VI.1 Repatriations as a supply shock

First, we explore the effects of repatriations on wages and employment in Table 3. The OLS estimates suggest that the impact of the share of deported migrants is statistically insignificant, indicating an attenuation bias due to the endogeneity of the share of deported migrants. For example, the attractiveness of some locations where firms are paying higher salaries or demanding more employment can motivate migrants to move into those municipalities when they are deported. As

a result, the greater number of returned migrants will just clear the higher labor demand in those locations.

To address the endogeneity of immigrants' location choices, we implement the instrumental variables approach described in the empirical methodology section. The results are presented in panels C-D in Table 3. For each outcome, we present two models: a model that includes the homicide rate at the municipal level as control, and a second one that does not include it. As discussed above, the rationale for the inclusion of this variable is to control for the potential effects of crime on labor market outcomes at the municipal level. As shown in [Banegas and Winkler \(2020\)](#), unlike other countries where crime tends to be concentrated in more disadvantaged areas ([Sackett, 2016](#)), homicide rates in El Salvador are higher in municipalities with greater levels of economic activity.

Our estimations indicate that an inflow of repatriations equivalent to one standard deviation (an increase of 0.04 percentage point in the inflow of returnees that accounts for an 80 percent increase in the exposure of the average firm) has negative impacts on the average monthly salary paid by the firms of approximately 9.4 percent ($\exp(-0.099) - 1 = -0.094$), after controlling for homicide rates. This estimated impact corresponds to a reduction of about US\$31.4 from the average monthly salary paid by the average firm.

In terms of the impacts of returned migrants on employment, the estimated coefficient is not statistically significant. However, the magnitude of the coefficient is economically relevant and similar to the effects on wages: A one standard deviation increase in repatriation inflows can reduce employment in the formal sector by about 9 percent ($\exp(-0.095) - 1 = -0.090$) after controlling for crime.

We next explore the differential effects of returned migrants on wages by gender. Considering that most Salvadoran migrants are men (around 80 percent in our sample), it is possible that they will mostly affect male salaries upon their return. However, it is also likely that the reduction in the cost of labor would induce firms to hire women too. Estimated effects on wage data separated

by gender are presented in Table 4. Columns (1)-(2) present the estimated effects on wages for male workers and columns (3)-(4) present similar results for female employees. Before controlling for the homicide rate, we find that the reduction in the average salaries due to the inflow of deportees is similar for both men and women. Specifically, an inflow of returnees equivalent to one standard deviation will reduce the average salary paid by the firms to male and female workers by approximately 12.0 and 9.5 percent per month, respectively. After controlling for crime, these estimated effects fall to 11.2 and 8.2 percent, but only the effect on the average salary of men remains statistically significant. These percentages correspond to US\$34.8 and US\$22.6 reductions in the average worker salaries paid by the firms to male and female employees, respectively. In sum and as expected, these results indicate that the wage reduction generated by the deportees in the formal labor market seems to be driven by male employees.

VI.2 Repatriations as a demand shock

By reducing wages, the influx of returned migrants shock can determine either the entry decision of a firm (extensive margin) or the growth decision through new branches (intensive margin). We explore these effects in Table 5. The monthly variables measuring these outcomes are firm entry (column 1) and total number of formal firms at the municipal level (column 2). These are the only firm related outcomes available in our data. We find no statistically significant effects of returned migrants on the intensive and extensive margins of firm growth, particularly for the reduction in the efficiency of the estimations.¹⁶

VI.3 Are the effects driven by an enlarged informal sector?

The analysis discussed so far is based on data from the formal sector only, thus it may not take into account the substitution between the formal and informal sectors that migrant inflows can cause, as

¹⁶Despite that the estimated coefficients are not statistically significant, the magnitude of the effect in the number of firms at the municipal level is important: Our estimations indicate that when the share of deportees increases by a standard deviation, the number of branches per firm located in that municipality falls by approximately 41 percent.

documented by [Ceritoglu et al. \(2017\)](#); [Rozo and Winkler \(2019\)](#); [Altindag et al. \(2020\)](#). Returnee inflows may be fully absorbed by the informal sector, increasing the informal market share, as informal businesses are able to offer lower wages than the formal sector, as found in [Rozo and Winkler \(2019\)](#) and [Altindag et al. \(2020\)](#).

There are at least three reasons that justify a separate analysis for the informal sector in the context of El Salvador ([Banegas and Winkler, 2020](#)). First, informality in El Salvador is high. About 70 percent of workers are employed in the informal sector and most jobs are created by micro firms and self-employed in the informal sector. Second, informality limits the growth of formal firms. Unfair competition from informal businesses is claimed as a barrier for formal firms to grow. This is part of a vicious cycle that is difficult to break, as informal businesses provide most of the jobs, but still pose a negative externality to firms that are the most productive. Moreover, micro firms in the informal sector do not tend to grow to become medium-sized firms or to formalize and among the higher productivity sectors, those that expanded the most are those with higher informality levels. Finally, informal employment is considerably more sensitive to economic growth than formal employment: while a 1-percent growth in GDP was accompanied by a 0.8 percent increase in the number of informal jobs, such figure with respect to formal jobs was only about half that value.

To test this channel, we separate our sample of formal firms by the probability that a sector is more or less prone to informality competition. We use data from the household surveys and split the sample according to industry codes in two groups of firms using the 2011 STEP survey. If a firm was operating in a sector that tends to have high levels of informality (e.g., agriculture, construction, wholesale and retail, restaurants, and others) or low levels of informality (e.g., financial services, real state, electricity, gas, water, manufacturing, among others). If our hypothesis is correct, we should observe that formal firms operating in highly informal sectors are more affected by the returned migrant inflows relative to the others firms.

The results are presented in Tables [6](#) and [7](#). Estimated effects confirm our hypothesis that the impacts of a positive shock of returned migrants are driven by firms that operate in sectors with

high informality. As shown in Table 6, a one standard deviation increase in the share of returnees reduces average wages by 13.4 percent for formal firms operating in more informal sectors. Then, when we look at the effects on wages separated by gender (table 7), the estimated impacts are similar between wages of men and women working in firms that operate in informal sectors. Overall, our estimations indicate a reduction in both average salaries of around 15 percent.

Finally, we explore the differences in the effects of returned migrants as a demand shock. Since the economic sector can be obtained at the firm level, we document the demand shock using only firm entry as outcome. The results are presented in Table 8. Columns (1) and (2) present results of regressions using the subsets of firms in sectors that are predominantly formal or informal, respectively. We find no statistically significant effects of returned migrants on the extensive margins of firm growth by sector. However, the estimated coefficient using data of firms in the informal sector suggests that an increase in the share of deportees by a standard deviation can increase the firm's entry by approximately 10 percentage points, which corresponds to an increase of 15 percent relative to the mean of the dependent variable.

In sum, our results indicate that most of the results are likely driven by the informal labor market. The larger effects among formal firms operating in predominantly informal sectors are consistent with the characteristics of the returned migrants in El Salvador. Considering that at least 71.3 percent of them have no more than primary education, most of them do not speak English, and around 76 percent of them were caught at the border and thus have to pay the cost of trying to get to the United States (Table 2), it is plausible that upon arrival in El Salvador they take lower tier jobs, which are most likely to be available in the informal sector.

VII Discussion

Our results indicate that large deportation inflows have negative effects on the labor outcomes of the formal sector in El Salvador. We document that these effects are predominantly concentrated

in sectors that face large competition from informal economic activity. This last suggests that upon return repatriated individuals join the informal sector.

Our results are in line with the evidence that migration inflows can increase competition in the labor market, reducing salaries of incumbent workers ([Borjas, 2003](#)). This impact is larger than that found by [Rozo and Winkler \(2019\)](#), who find no impacts of Internally Displaced Persons (IDPs) on average wages paid by firms in Colombia. However, it is smaller than that estimated by [Dustmann and Glitz \(2015\)](#), who find that a 1 percent increase in migration inflows reduces median wages by about 0.41 percent. These findings indicate that despite the informal-formal segmentation of the Salvadoran labor market, average formal wages do seem to respond, albeit marginally, to the inflows of returnees. In contrast with the findings of [Rozo and Winkler \(2019\)](#), we do not find effects on the total number of employees, but only among firms operating in predominantly informal sectors. Despite the reduction in the cost of labor, formal firms do not seem to expand. This suggests that returnees, by expanding the size of the informal sector, may reduce the demand for labor among firms facing more intense competition from informal ones.

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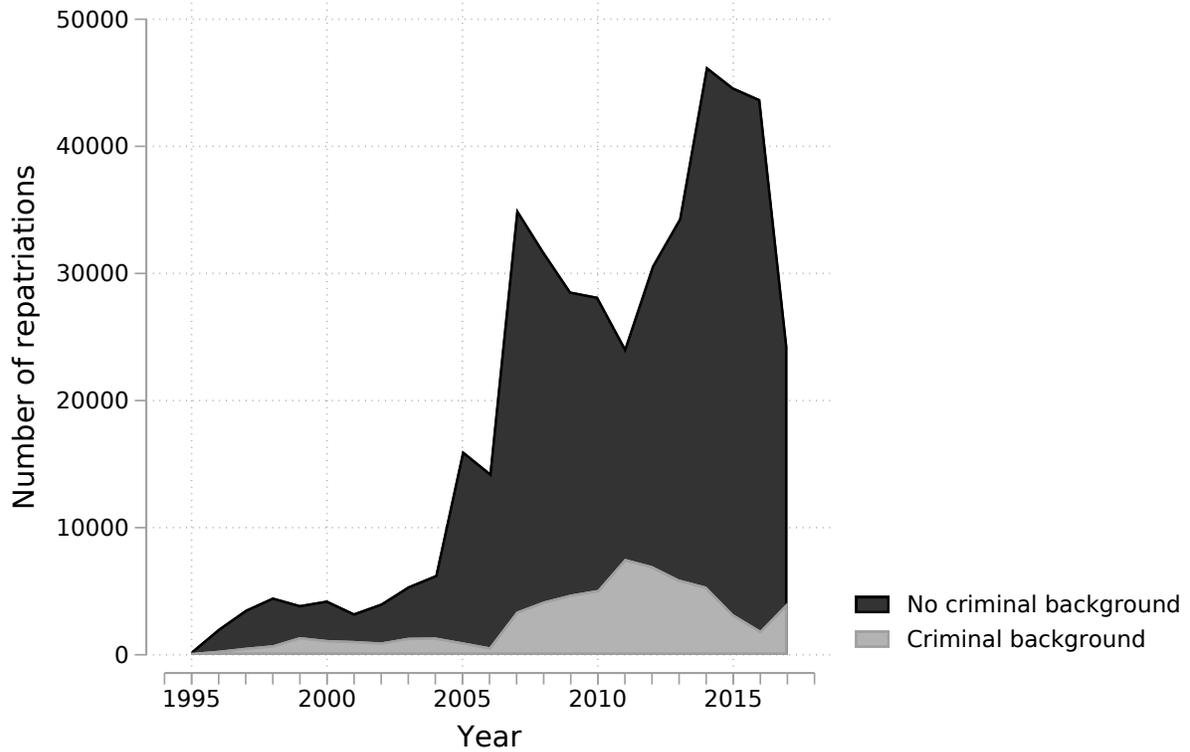
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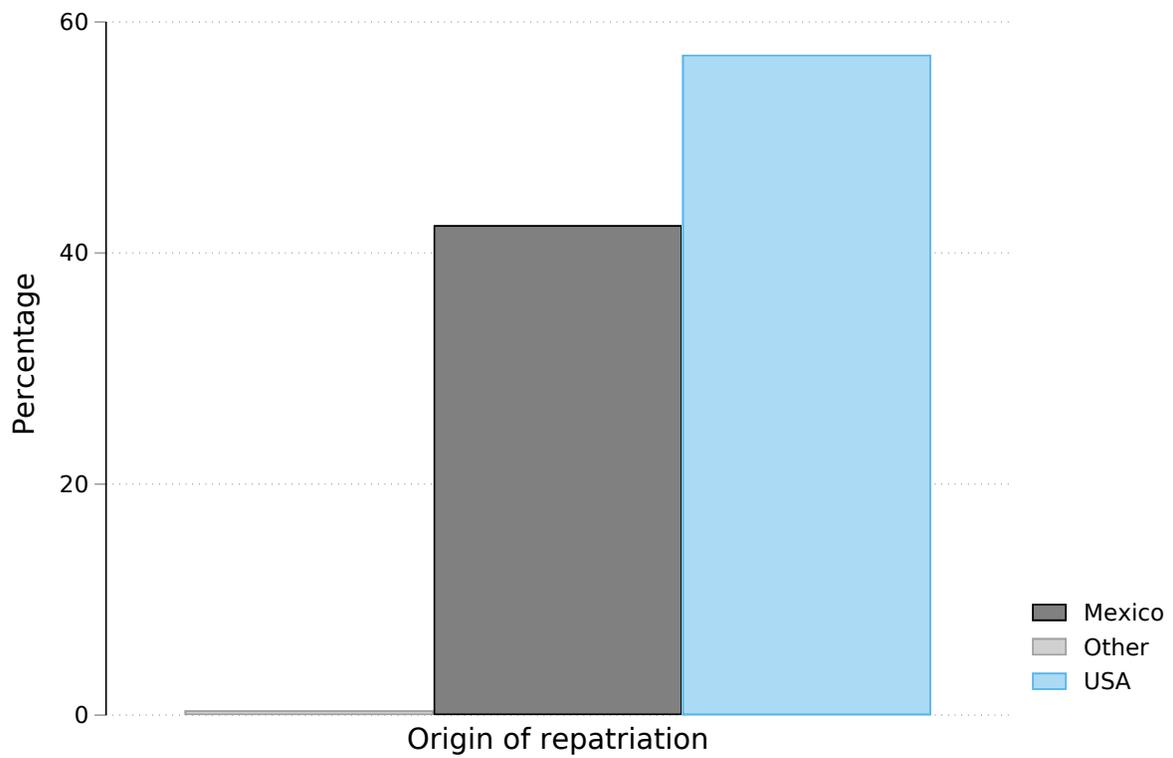
VIII Figures and Tables

Figure 1: Sharp Increment of Repatriations to El Salvador between 1995 and 2018



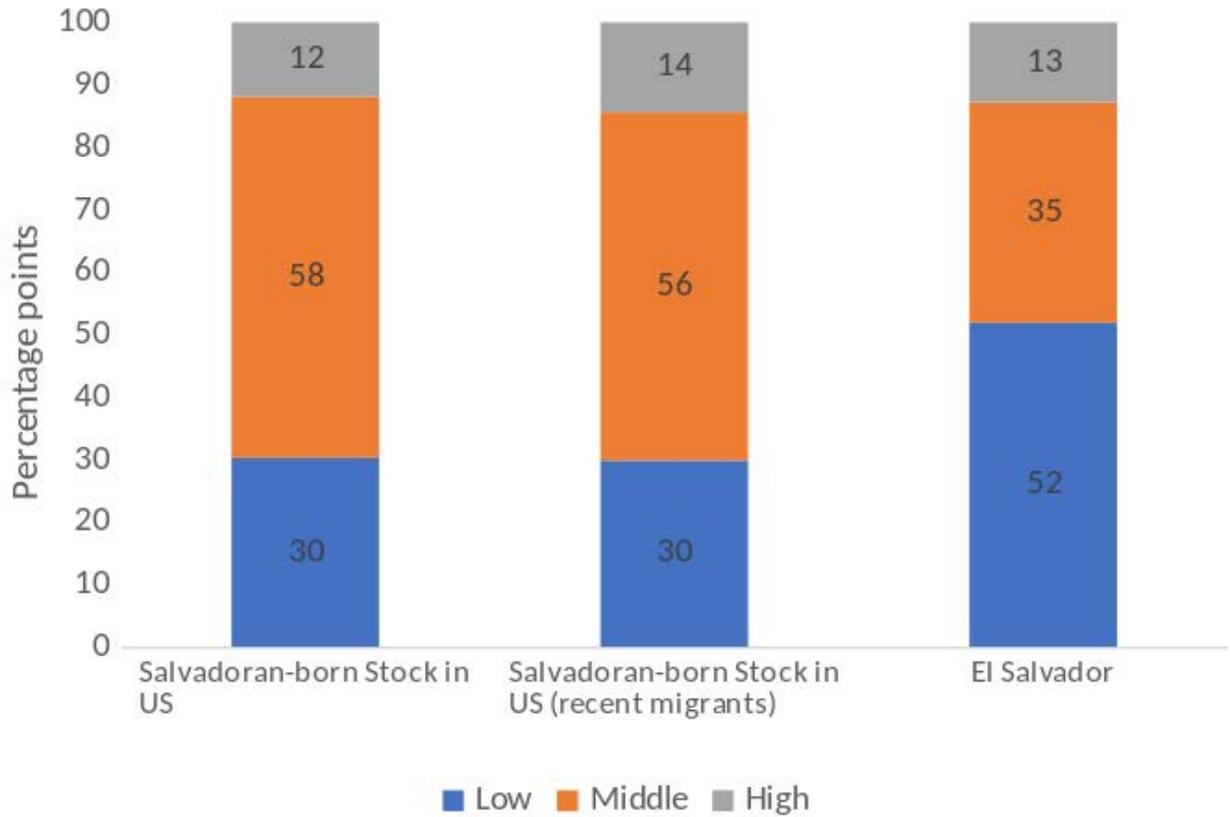
Notes: Data on criminal background is self-reported unless the individual is repatriated from the United States, in which case DHS provides DGME with the information. **Source:** DGME.

Figure 2: U.S. and Mexico Account for the Majority of Repatriated Salvadorans



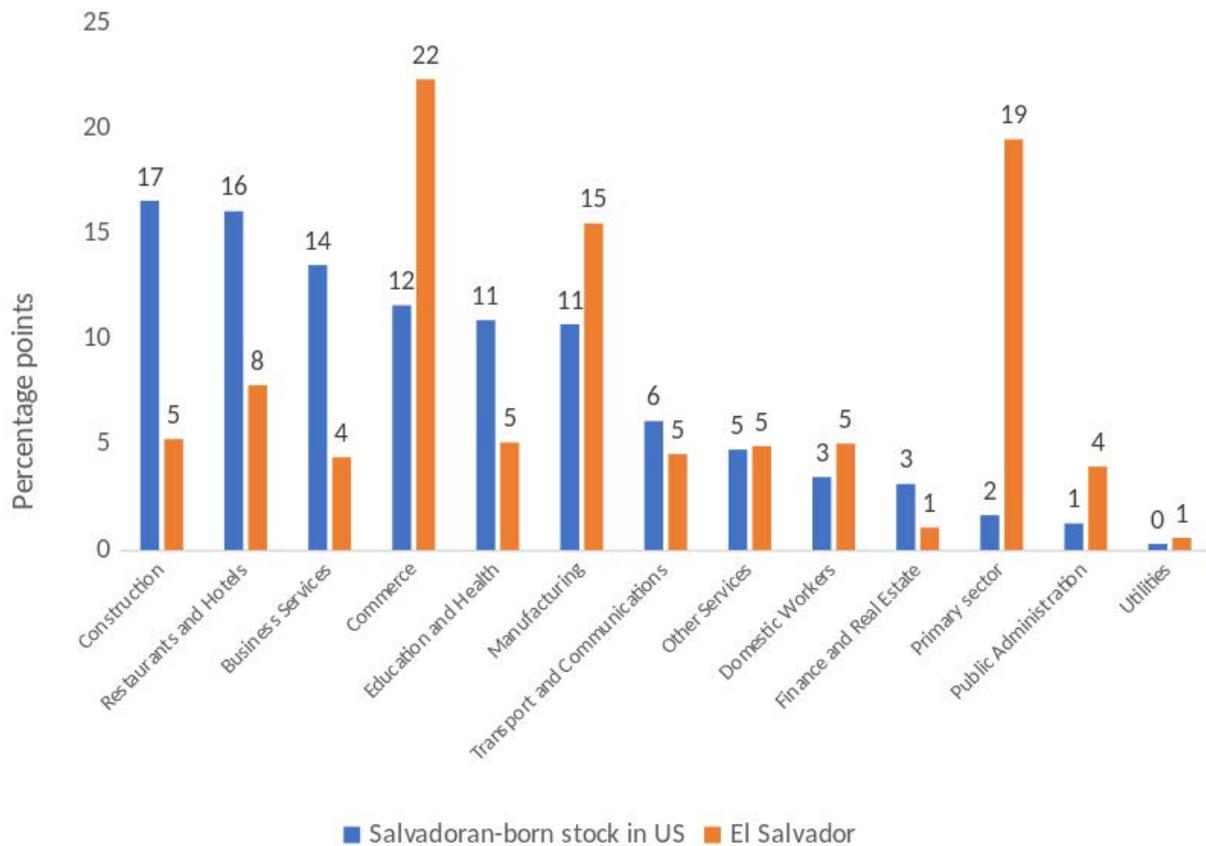
Source: DGME

Figure 3: Education of Salvadoran migrants is Higher than that of the Local Population



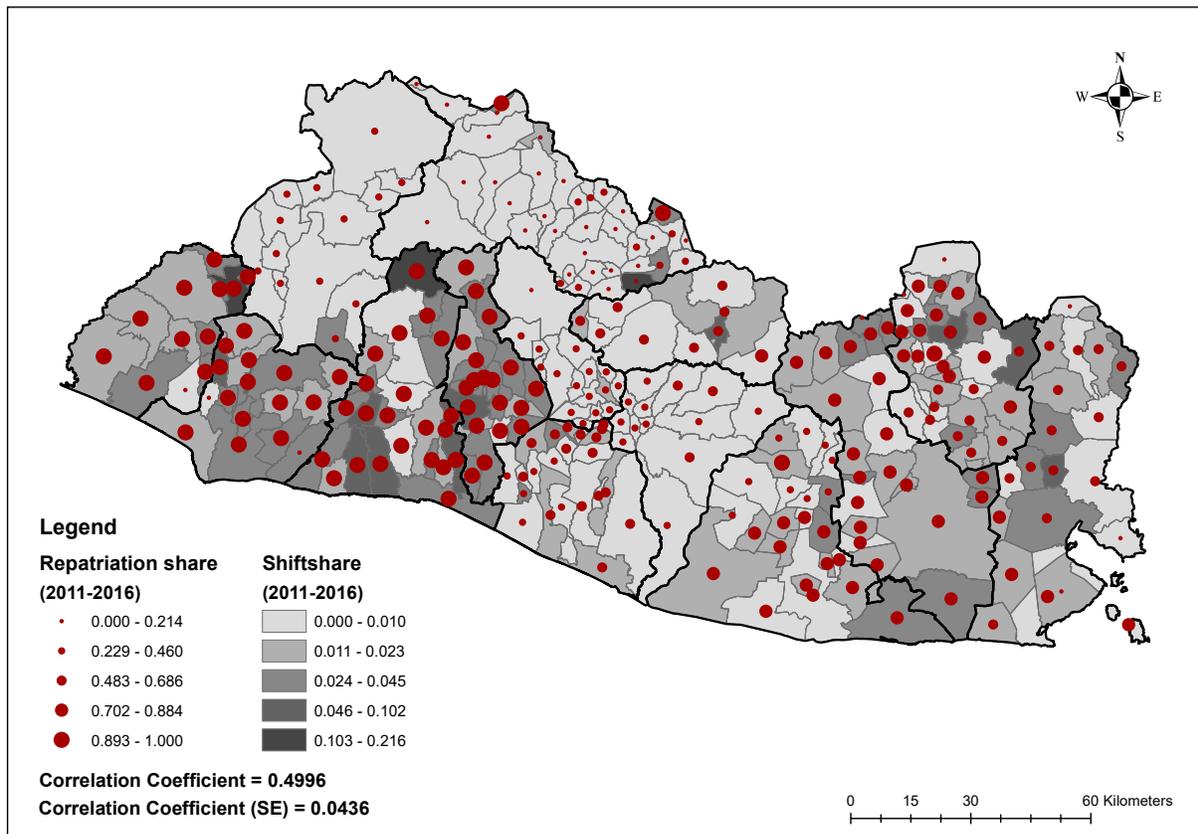
Notes: Educational structure of Salvadoran migrants in the US was estimated using the ACS for 2017. Recent migrants are those who migrated to the US within the last 5 years. The skill groups are classified in low (less than 9 years of education), middle (9 to 13 years of education), and high (14 years of education or more). Sample includes people aged 25 to 64 years. **Source:** Banegas and Winkler (2020). The data for migrants come from the American Community Survey (ACS), US Census Bureau. The data for the educational structure of Salvadorans in El Salvador comes from the EHPM 2017

Figure 4: Sector of employment for Salvadorans at El Salvador and in the United States



Source: The data for migrants come from the American Community Survey (ACS), US Census Bureau. The data for the educational structure of Salvadorans in El Salvador comes from the EHPM 2017

Figure 5: Average Repatriation Rate and Standardized Shiftshare (2011-2016)



Source: DGME.

Table 1: Salaries and Employment in the formal sector

| | N | Mean | Standard Deviation | Min | Max |
|---------------------------------------|-----------|-----------|-----------------------|-------|---------------|
| | (1) | (2) | (3) | (4) | (5) |
| Branch level | | | | | |
| Total amount of workers | 1,652,713 | 25.14 | 128.67 | 1.00 | 7,379.00 |
| Total wages paid to workers (USD) | 1,652,713 | 11,195.10 | 68,008.29 | 7.47 | 11,736,899.00 |
| Mean salary per worker (USD) | 1,652,713 | 310.57 | 331.91 | 2.78 | 135,099.69 |
| Mean salary per male worker (USD) | 1,652,713 | 333.19 | 403.66 | 0.00 | 187,565.03 |
| Mean salary per female worker (USD) | 1,652,713 | 274.21 | 298.84 | 0.00 | 108,867.02 |
| Total amount of workers (Log) | 1,652,713 | 1.88 | 1.26 | 0.00 | 8.91 |
| Total wages paid to workers (Log) | 1,652,713 | 7.55 | 1.49 | 2.01 | 16.28 |
| Mean salary per worker (Log) | 1,652,713 | 5.67 | 0.47 | 1.02 | 11.81 |
| Mean salary per male worker (Log) | 1,443,912 | 5.71 | 0.50 | 1.01 | 12.14 |
| Mean salary per female worker (Log) | 1,361,442 | 5.66 | 0.49 | 0.69 | 11.60 |
| Firm level | | | | | |
| Firm presence | 1,952,496 | 0.68 | 0.46 | 0.00 | 1.00 |
| District level | | | | | |
| Number of firms | 16,632 | 80.28 | 525.72 | 0.00 | 7,939.00 |
| Number of firms (Log) | 15,393 | 2.26 | 1.73 | 0.00 | 8.98 |
| Homicide rate per 100,000 inhabitants | 1,652,713 | 67.36 | 51.77 | 0.00 | 462.79 |
| Repatriation share | 1,652,713 | 0.05 | 0.04 | 0.00 | 0.67 |
| Standardized shift-share 1995-2002 | 1,652,713 | -0.02 | 0.67 | -0.74 | 15.84 |

Source: Social Security Office (*Instituto Salvadoreño del Seguro Social* ISSS) monthly data (2011-2016). Data set does not include information from public administration, education, health and social work, and electricity, gas and water sectors.

Table 2: Characteristics of returned migrants

| | Female (%) (1) | Male (%) (2) | Total (%) (3) |
|---------------------------------|-------------------|-----------------|------------------|
| <i>English proficiency</i> | | | |
| Good | 0.45 | 1.98 | 1.69 |
| Regular | 1.05 | 3.28 | 2.85 |
| Does not speak | 42.95 | 53.18 | 51.23 |
| No data | 55.55 | 41.57 | 44.22 |
| <i>Education level achieved</i> | | | |
| None | 0.13 | 0.20 | 0.19 |
| Primary | 63.67 | 72.85 | 71.11 |
| Secondary | 3.69 | 4.53 | 4.37 |
| Technical education | 4.12 | 1.81 | 2.24 |
| University | 0.50 | 0.63 | 0.60 |
| No data | 27.90 | 19.97 | 21.48 |
| <i>Time of residence abroad</i> | | | |
| Recently | 79.52 | 75.29 | 76.09 |
| 1 to 11 months | 8.22 | 9.25 | 9.05 |
| 1 to 8 years | 12.16 | 15.02 | 14.48 |
| 9 to 16 years | 0.07 | 0.37 | 0.32 |
| >17 years | 0.03 | 0.07 | 0.06 |
| <i>Marital status</i> | | | |
| Lives with someone | 16.13 | 22.91 | 21.62 |
| Married | 14.24 | 14.95 | 14.81 |
| Divorced or separated | 3.96 | 1.68 | 2.11 |
| Single | 64.54 | 60.30 | 61.11 |
| Widow | 1.10 | 0.12 | 0.30 |
| N/A | 0.04 | 0.04 | 0.04 |
| N (migrants) | 37,801 | 161,417 | 199,218 |

Source: DGME.

Table 3: Effect of Repatriation Inflows on Wages and Employment

| Dep.variable (<i>in logs</i>) | Number workers | | Average wage | |
|--|---|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) |
| Panel A. OLS | | | | |
| Repatriation share | -0.033 (0.037) | -0.030 (0.033) | 0.006 (0.019) | 0.006 (0.020) |
| Adjusted R-squared | 0.041 | 0.041 | 0.095 | 0.095 |
| Panel B. Reduced Form | | | | |
| Shiftshare 1995-2002 (sd) | -0.006 (0.006) | -0.004 (0.005) | -0.005** (0.002) | -0.005** (0.002) |
| Adjusted R-squared | 0.041 | 0.041 | 0.095 | 0.095 |
| Panel C. 2SLS | | | | |
| Repatriation share | -0.139 (0.145) | -0.095 (0.122) | -0.105** (0.049) | -0.099* (0.050) |
| Panel D. First Stage | | | | |
| | Dependent variable: Repatriation Share | | | |
| Shiftshare 1995-2002 (sd) | 0.046*** (0.006) | 0.046*** (0.006) | 0.046*** (0.006) | 0.046*** (0.006) |
| First stage F-statistic | 58.091 | 57.812 | 58.091 | 57.812 |
| Mean | 1.882 | 1.882 | 5.668 | 5.668 |
| Obs. for all panels | 1,652,713 | 1,652,713 | 1,652,713 | 1,652,713 |
| Control: homicide rate | No | Yes | No | Yes |

Notes: Each coefficient corresponds to a separate regression. Data is monthly, and comes from ISSS sample (2011-2016). Analysis excludes firms from public administration, education, health and social work, and electricity, gas and water sectors. All panels include controls for municipality, month and year fixed effects. Clustered standard errors at the municipal level are shown in parenthesis.

*, **, ***, significant at 10%, 5% and 1%.

Table 4: Effect of Repatriation Inflows on Wages by Gender

| Dep.variable (<i>in logs</i>) | Average male wages | | Average female wages | |
|--|---|---------------------|----------------------|---------------------|
| | (1) | (2) | (3) | (4) |
| Panel A. OLS | | | | |
| Repatriation share | 0.005 (0.020) | 0.005 (0.021) | 0.003 (0.021) | 0.004 (0.022) |
| Adjusted R-squared | 0.093 | 0.093 | 0.080 | 0.080 |
| Panel B. Reduced Form | | | | |
| Shiftshare 1995-2002 (sd) | -0.006** (0.002) | -0.005** (0.002) | -0.004** (0.002) | -0.004* (0.002) |
| Adjusted R-squared | 0.093 | 0.093 | 0.080 | 0.080 |
| Panel C. 2SLS | | | | |
| Repatriation share | -0.123** (0.054) | -0.119** (0.054) | -0.095* (0.056) | -0.086 (0.057) |
| Panel D. First Stage | | | | |
| | Dependent variable: Repatriation Share | | | |
| Shiftshare 1995-2002 (sd) | 0.046*** (0.006) | 0.046*** (0.006) | 0.046*** (0.006) | 0.046*** (0.006) |
| First stage F-statistic | 58.091 | 57.812 | 58.091 | 57.812 |
| Mean | 5.707 | 5.707 | 5.661 | 5.661 |
| Obs. for all panels | 1,443,912 | 1,443,912 | 1,361,442 | 1,361,442 |
| Control: homicide rate | No | Yes | No | Yes |

Notes: Each coefficient corresponds to a separate regression. Data is monthly, and comes from ISSS sample (2011-2016). Analysis excludes firms from public administration, education, health and social work, and electricity, gas and water sectors. All panels include controls for municipality, month and year fixed effects. Clustered standard errors at the municipal level are shown in parenthesis.

*, **, ***, significant at 10%, 5% and 1%.

Table 5: Effect of Repatriation inflows on Firm Entry and Number of Firms

| Dependent variable | Firm entry (1) | Number of firms (log) (2) |
|------------------------------|---|------------------------------|
| Panel A. OLS | | |
| Repatriation share | -0.014 (0.017) | -0.058 (0.053) |
| Adjusted R-squared | 0.010 | 0.991 |
| Panel B. Reduced Form | | |
| Predicted repatriations | -0.003 (0.003) | -0.011 (0.018) |
| Adjusted R-squared | 0.010 | 0.991 |
| Panel C. 2SLS | | |
| Repatriation share | -0.062 (0.075) | -0.529 (0.946) |
| Panel D. First Stage | | |
| | Dependent variable: Repatriation Share | |
| Predicted repatriations | 0.044*** (0.006) | 0.019*** (0.005) |
| R-squared | 0.685 | 0.514 |
| First stage F-statistic | 59.048 | 12.716 |
| Mean | .684 | 2.261 |
| Obs. for all panels | 1,952,496 | 15,393 |

Notes: Data is monthly, and comes from ISSS sample (2011-2016). Analysis excludes firms from public administration, education, health and social work, and electricity, gas and water sectors. Column (1) is at branch level, while Column (2) is at municipality level. All panels include controls for municipality, month and year fixed effects. For cases where the branches of a firm are located in different municipalities, the firm was located in the municipality of the main branch, defined as the one with the highest number of workers. Clustered standard errors at the municipal level are shown in parenthesis.

*, **, ***, significant at 10%, 5% and 1%.

Table 6: Effect of Repatriation Inflows on Wages and Employment by Sector's Type

| Dep.variable (<i>in logs</i>) | Number workers | | Average wage | |
|--|---|------------------------|---------------------|------------------------|
| | Fomal Sector (1) | Informal Sector (2) | Fomal Sector (3) | Informal Sector (4) |
| Panel A. OLS | | | | |
| Repatriation share | 0.036 (0.059) | -0.068 (0.043) | 0.004 (0.025) | 0.003 (0.020) |
| Adjusted R-squared | 0.079 | 0.043 | 0.111 | 0.096 |
| Panel B. Reduced Form | | | | |
| Shiftshare 1995-2002 (sd) | -0.008 (0.013) | -0.011* (0.007) | -0.002 (0.004) | -0.007*** (0.002) |
| Adjusted R-squared | 0.079 | 0.043 | 0.111 | 0.096 |
| Panel C. 2SLS | | | | |
| Repatriation share | -0.181 (0.293) | -0.240* (0.144) | -0.047 (0.096) | -0.144*** (0.048) |
| Panel D. First Stage | | | | |
| | Dependent variable: Repatriation Share | | | |
| Shiftshare 1995-2002 (sd) | 0.046*** (0.006) | 0.046*** (0.006) | 0.046*** (0.006) | 0.046*** (0.006) |
| First stage F-statistic | 58.091 | 58.091 | 58.091 | 58.091 |
| Mean | 2.146 | 1.787 | 5.713 | 5.652 |
| Obs. for all panels | 437,421 | 1,215,292 | 437,421 | 1,215,292 |

Notes: Each coefficient corresponds to a separate regression. Data is monthly, and comes from ISSS sample (2011-2016). Analysis excludes firms from public administration, education, health and social work, and electricity, gas and water sectors. All panels include controls for municipality, month and year fixed effects. Clustered standard errors at the municipal level are shown in parenthesis.

*, **, ***, significant at 10%, 5% and 1%.

Table 8: Effect of Repatriation inflows on Firm Entry by Sector's Type

| Dependent variable | Firm entry | |
|------------------------------|---|-------------------------------|
| | Fomal Sector (1) | Informal Sector (2) |
| Panel A. OLS | | |
| Repatriation share | -0.001 (0.022) | -0.020 (0.021) |
| Adjusted R-squared | 0.024 | 0.014 |
| Panel B. Reduced Form | | |
| Shiftshare 1995-2002 (sd) | 0.002 (0.005) | -0.005 (0.004) |
| Adjusted R-squared | 0.024 | 0.014 |
| Panel C. 2SLS | | |
| Repatriation share | 0.049 (0.113) | -0.119 (0.088) |
| Panel D. First Stage | | |
| | Dependent variable: Repatriation Share | |
| Shiftshare 1995-2002 (sd) | 0.043*** (0.006) | 0.045*** (0.006) |
| R-squared | 0.690 | 0.683 |
| First stage F-statistic | 61.9 | 56.129 |
| Mean | 0.708 | 0.674 |
| Obs. for all panels | 571,320 | 1,381,176 |

Notes: Data is monthly, and comes from ISSS sample (2011-2016). Analysis excludes firms from public administration, education, health and social work, and electricity, gas and water sectors. Column (1) is at branch level, while Column (2) is at municipality level. All panels include controls for municipality, month and year fixed effects. For cases where the branches of a firm are located in different municipalities, the firm was located in the municipality of the main branch, defined as the one with the highest number of workers. Similarly, in cases where there are discrepancies between the sectors to which the branches of the firm belong, the sector of the main branch is assigned. Clustered standard errors at the municipal level are shown in parenthesis.

*, **, ***, significant at 10%, 5% and 1%.