

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 from 1995 to 2002—before deportation policies changed significantly—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 detainment and deportation can have strong negative effects not only on deportees themselves but also on their receiving communities.

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JEL Classification: D22, J61, O17

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I Introduction

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

Return migration from developed to developing countries can create 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, forced displacement 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. [Rozo et al. \(2020\)](#) show that repatriation inflows from the United States to Mexico induced higher homicide rates in proximity to 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 here.

We examine the impacts of repatriation inflows from the United States and Mexico on formal firms 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 from the United States intensified during El Salvador'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 from 1999 until 2002, when it increased dramatically after the United States strengthened immigration enforcement in reaction to the terrorist attacks of 2001.¹ Ever since, deportations to

¹As documented by [Rozo et al. \(2020\)](#) after 2001, resources devoted to enforcing immigration law increased

El Salvador have maintained steady growth rates, reaching almost 50,000 individuals per year by 2018.

In principle, repatriation inflows can create a labor supply shock as more workers enter the labor market. However, 76 percent of deportees to El Salvador spend less than one month abroad. Therefore, their effects are more likely to reflect the experience of detention, including trauma, potential exposure to individuals with criminal backgrounds, and stigma because the reason for their deportation is not known by others in the home country. At the same time, repatriation inflows can also impact labor demand 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 on firm wages and employment. In a second step, we study the effects of repatriation inflows on outcomes such as firm entry and growth (measured as number of branches), as well as increased competition from the informal sector.

For our empirical analysis, we use data from El Salvador's migration authorities that include all registered repatriations plus rich socioeconomic information about deportees, and we combine that with administrative information from the Salvadoran Social Security Institute (*Instituto Salvadoreño de Seguridad Social*, ISSS) that contains the universe of firms and workers in the formal sector. Our period of analysis spans 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 chosen by migration authorities, we cannot simply estimate a linear regression of firm outcomes on repatriation inflows. Hence, we use a shift-share instrument that exploits two sources of variation: (i) annual variation from national repatriation inflows, and (ii) municipal variation in birth municipality of individuals repatriated in the period 1995–2002. Based on our 2010–2018 sample, we document that deported individuals overwhelmingly return to their birth municipalities. Individuals who were repatriated between 1995 and 2002

greatly. With the creation of the new Department of Homeland Security (DHS), resources devoted to both border enforcement (Customs and Border Protection, CBP) and interior enforcement (Immigration and Customs Enforcement, ICE) expanded.

came back to El Salvador before the United States drastically strengthened and changed its immigration enforcement following the terrorist attacks of 2001. The changes in the US immigration policies not only included a sudden increase in the number of repatriations, but they also modified the country's deportation strategy.²

We document that repatriation inflows have a negative impact on average wages in the formal sector. Our estimates suggest that an increment of 1 percent in the share of returnees to a municipal population reduces the average monthly salary paid by formal firms by approximately 0.09 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 considering other outcomes, such as firm entry and number of firms, we do not find any significant impacts.

Our findings are consistent with a story in which deportees join the informal sector upon return: this 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 through 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. Research on the effects of large international forced migration inflows in hosting countries has largely focused on the impacts of forced migrants on the local workers,³ although a smaller group of studies has explored the effects of refugee inflows on general prices,⁴ political outcomes,⁵ edu-

²Total US 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 and Monras \(2017\)](#); [Clemens \(2021\)](#); [Mayda et al. \(2017\)](#); [Peri and Yasenov \(2019\)](#).

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 \(2018\)](#).

cation outcomes,⁶ health,⁷ and overall economic growth.⁸

More recently, studies have examined the effect of forced migration flows on firms in developing countries, which receive the lion's share of forced migration and have large informal sectors. [Altındağ et al. \(2020\)](#) examine the effects of Syrian migration on Turkish formal firms. The authors document that firms are positively affected by the Syrian refugee shock, with disproportional effects on firms in the hospitality and construction sectors. The positive effects observed are partly explained by the fact that Syrian refugees reduce labor costs for firms 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 stem from 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 predominantly agricultural experience; as such, they had a harder time joining formal firms.

Our main contribution to these studies is to examine the impacts of repatriated individuals who spent little time abroad and who did not settle there or gain work experience in a foreign firm. As a result, any impacts on Salvadoran firms would likely capture the experience of detention itself, which can have long-lasting impacts on deportees. These include trauma, exposure 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 by [Sviatschi \(2019\)](#). The latter work employs administrative data from El Salvador to examine whether peer effects generate changes in education investments in the areas of Central America where deported criminals are located. Our paper also contributes to the general analysis of how repatriations affect origin locations, with particular focus on firm behavior.

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

⁷See [Ibáñez et al. \(2021\)](#).

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

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): positive supply and demand shocks. Ultimately, the effects 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 could 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 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 could 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 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 they had before departure.

A second, more indirect channel through which repatriated individuals can affect firms' demand for labor is via 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 production technologies. How much change is observed in firms' technologies will depend on how complementary or substitutive repatriated individuals are to other production inputs and also on their skill composition. This channel would be weak if deportees spent very little time working abroad.

Another indirect channel through which deportees can impact firms is by the indirect effects

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

they induce in the firm's local environment including, for example, violence. Those effects are expected to be negative as documented by [Rozo \(2018\)](#) in the case of Colombia. The size of these effects, however, has been shown to be small.

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

All in all, 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 could depend strongly on whether deportees spent a significant amount of time abroad or not.

II.1 Do repatriated individuals join the formal or informal 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 for 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, more likely to engage in criminal activities, or poorer after spending their resources on migration expenses (and are therefore less likely to start a business), they may be more likely to join the informal sector than they were before departure.

If deportees are more likely to join the informal sector, formal firms can still be affected by greater competition from informal economic activity. In such a scenario, the effects on 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

¹⁰The main household survey in El Salvador (*Encuesta de Hogares y Propósitos Múltiples*, EHPM), contains infor-

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 war 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 60 percent of the repatriations to El Salvador are from the United States, the higher levels of US enforcement translated into large increases in 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, but their legal status has always been in question (Menjívar, 2000). Since the 2000s, migrants have predominately been driven out by El Salvador's poor and deteriorating economic conditions, as well as by violence stemming from a rise in gang activity (Cardoso et al., 2016; Menjívar, 2000). In the 2010s, the worsening economy and violence continued to be the main factors, but there was also a rise in the number of unaccompanied minors trying to reach the United States for family reunification (Clemens, 2021). At the same time, Mexico has also increased its enforcement, leading to more

mation on whether individuals' jobs are formal or informal. However, it is representative of only 55 municipalities.

repatriations as the migrants are en route to the United States.¹¹

A large body of anecdotal and empirical evidence shows that forced removal itself can have large and long-lasting effects on deportees and their communities. Deportees often experience traumatic events such as verbal and physical violence plus deprivation of basic needs such as food and water (Phillips et al., 2006; López et al., 2020). This experience can create enduring impacts such as an increase in the incidence of post-traumatic stress disorder (Pena et al., 2017). At the same time, deportees often face stigma in their communities because the reason for their deportation is not known by others, who may be concerned about their potential criminal experience abroad (Wheatley, 2011; Brotherton and Barrios, 2009; Dako-Gyeke and Kodom, 2017). In addition, if they used their savings (or those of their family network) to pay for migration, they might 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 (81 percent) are men. About 76 percent of them spent less than a month abroad. Given that these deportees did not settle and gain work experience abroad, it is unlikely that they would have positive effects (gained through knowledge transfers or large networks abroad) on Salvadoran firms. Instead, it is their exposure during detention—to law enforcement, trauma, stigmatization, and individuals with criminal backgrounds—that may drive their impacts on labor market prospects and firm dynamics upon return.

The education levels 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

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.

of them, respectively, have at least 14 years of education). 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. We also have data on English proficiency for about 45 percent of our sample. These indicate that 51 percent of all returnees do not speak English.¹²

The characteristics of deported individuals suggest that any positive impacts of deportees on Salvadoran firms through knowledge transfer from a developed to a developing country will be hard to find. Instead, since most repatriated individuals returned to El Salvador within a month of arrival in the United States, meaning that they did not get to live and work there, 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 firm outcomes and aggregated repatriation inflows.

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 (separated by gender) per firm, 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, first year of

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, education, and health. In other words, they are more concentrated in skilled services when compared to their counterparts in El Salvador, who are disproportionately concentrated in agriculture.

¹³We exclude firms in public administration, education, health, social work, and utilities (e.g., the 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.

operation, and operating status.¹⁴ Once a firm becomes formal, it is followed over time until it goes out of business.

As described in Table 1, our sample consists 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; male workers receive 20.1 percent more than female ones. 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 0.04 percent of the local population.

2. *Repatriations:* Data on returned migrants come 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 of 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 to collect information on the date of repatriation, date of birth, marital status, level of education, gender, time spent abroad, country in 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. There was no such detailed interview for repatriations between 1995 and 2010. Thus for these years, we observe only information on the reason and date of deportation, intended place of residence after repatriation, and date and place of birth.

These data are the only source of information on all individuals who were returned to El

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

Salvador, shedding light on their motives for fleeing the country and the situation they might face once back there. As the registration and interview are mandatory for all returnees, the data set includes information on the total number of individuals returned in each municipality.

Descriptive statistics for our sample are in Table 2. Around 64 percent of returnees—88 percent of those for whom we have education data—have primary or no education, and around 80 percent of them lived less than one month abroad; that is, they were likely apprehended when entering the United States and subsequently repatriated.

Figure 2 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 0.04, suggesting that, on average, all Salvadoran municipalities received approximately 4 percent of their population due to forced repatriation between 2011 and 2016. Other municipalities experienced a repatriation share of 67 percent, suggesting that returnees almost doubled their populations. 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), whereas socioeconomic and demographic data come from a report compiled by the United Nations Development Programme (UNDP) in 2009.¹⁵

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

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 who arrive in each municipality m at period t . Specifically, $\text{Repatriation Share}_{mt}$ is calculated as the ratio of municipal repatriation inflows at t to municipal population at $t - 1$ times 100. 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 with standard errors 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 location in El Salvador or have it chosen for them by migration authorities for reasons that may be correlated with our outcomes of interest. One concern is that, for example, returnees could disproportionately go to municipalities with more employment opportunities, less labor market competition, or higher wages.

Since we had information on both the municipality of birth and the municipality of return for our 2010–2019 sample, we could document that more than 70 percent of returnees went 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 that are likely exogenous to municipal firm behavior. We chose municipality of birth for individuals repatriated from 1995 to 2002, as these years correspond to the period before the United States significantly strengthened and changed immigration enforcement policy following the terrorist attacks of 2001. These changes included not only a sudden increase in the number of deportations but also a revision in deportation locations and strategies. 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. 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 2 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 that confirm the positive correlation between the endogenous variable and the instrument.

Our empirical strategy will be valid as 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 to our identification strategy. A particularly relevant threat to our identification strategy is that returned migrants fleeing violence may return to areas with presumably lower levels of violence. It is also possible that, upon arrival in their new locations, returned individuals may increase local violence levels or erode 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 Raudales and Winkler, 2020). To account for this, we control in all our estimates for homicide rates (as a proxy for violent crime). We also test the validity of our identification strategy to other threats in section VII.

VI Results

We estimate Equation (1) using (2) as the instrumental variable. We first study the effects of repatriation inflows on the formal labor market. We then 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 the results of 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 Repatriation impacts in wages and employment

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 and D in Table 3. For each outcome, we present two models: one that includes the homicide rate at the municipal level as control, and a second one that does not. 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 Raudales 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 preferred estimations (presented in the even columns) indicate that an inflow of repatriations equivalent to an increment of 1 (or 100 percent) in the repatriation share will reduce the monthly salary paid by the firms by 9.9 percent. Because the repatriation share was multiplied by 100, the estimates imply that an increment of 1 percent in the share of repatriations to municipal population will be reflected in a reduction of wages of 0.099 percent. The sizes of the effects are comparable, albeit smaller, to the impacts of other inflows of forced migrants examined for different countries in the region. For example, [Rozo and Winkler \(2019\)](#) document that when inflows of Internally Displaced Persons increase by 1 percent of population, the average nominal wages drop by approximately 0.6 percent (yet their coefficients are not statistically significant). In terms of the impacts of returned migrants on employment, the estimated coefficient is not statistically significant.

We next explore the differential effects of returned migrants on wages by gender. Considering that most Salvadoran migrants are men (around 80 percent of 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 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 average salaries due to the inflow of deportees is similar for both men and women. Specifically, an inflow of returnees equivalent to a 1 percent increment in the share of population will reduce the average salary paid by the firms to male and female workers by approximately 0.12 and 0.09 percent per month, respectively.¹⁶ After controlling for crime, these estimated effects fall to 0.11 and 0.08 percent, but only the effect on the average salary of men remains statistically significant. 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 males.

VI.2 Repatriation impacts in firm entry

By reducing wages, the shock created by the influx of returned migrants 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.

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. As a result, it may not take into account the substitution between the formal and informal sectors that migrant inflows can cause. 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

¹⁶Because the repatriation share is multiplied by 100, each coefficient represents the change of 1 (or 100 percent) in the repatriation share. For example, column (2) suggests that when the repatriation share to population increases by 1 (or 100 percent), average male wages decline by 11.9 percent.

in [Roza and Winkler \(2019\)](#) and [Altındağ et al. \(2020\)](#).

At least three reasons justify a separate analysis of the impacts of repatriations on the informal sector in the context of El Salvador ([Banegas Raudales 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 microfirms and self-employed in the informal sector. Second, informality limits the growth of formal firms. Formal firms claim that unfair competition from informal businesses is a barrier to growth. 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, microfirms in the informal sector do not tend to grow to become medium-sized firms or to formalize; among the sectors with higher productivity, those that expanded the most have higher informality levels. Third, 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, this figure with respect to formal jobs was only about half that value. Finally, if migrants spend all their savings and/or borrow to finance a migration that results in deportation, then their reservation wage is likely to be lower upon return. As such, this will increase the supply of labor at low wages. But if minimum-wage laws prevent formal firms from lowering wages to hire these workers, this could show up in informal sector employment.

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 into two groups of firms, using the 2011 STEP survey: the first group included firms operating in sectors that tend to have high levels of informality (e.g., agriculture, construction, wholesale and retail commerce, restaurants, and others), and the second encompassed firms operating in sectors with low levels of informality (e.g., financial services, real estate, electricity, gas, water, and manufacturing, among others). If our hypothesis is correct, we should observe that formal firms operating in highly informal sectors are more affected by returned migrant inflows relative to other firms.

The results are 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 1 percent increase in the share of returnees to population reduces average wages by 0.14 percent for formal firms operating in more informal sectors.¹⁷ When we look at the effects on wages separated by gender (Table 7), the estimated impacts are similar for 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 0.16 percent.¹⁸

Finally, we explore differences in the effects of returned migrants on firm entry. The results are 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, by using data of firms in the informal sector, the estimated coefficient suggests that an increase in the share of deportees by 1 percent of population can increase the firm's entry by approximately 0.11 percent.¹⁹

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 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 had 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 in the informal sector.

One important qualification of our analysis is that we identify differences across sectors that are more or less informal, but these are not the only differences among them. They also differ in

¹⁷Because the repatriation share is multiplied by 100, each coefficient represents the change of 1 (or 100 percent) in the repatriation share. For example, column (4) suggests that when the repatriation share to population increases by 1 (or 100 percent), male wages decline by 14.4 percent.

¹⁸Because the repatriation share is multiplied by 100, each coefficient represents the change of 1 (or 100 percent) in the repatriation share. For example, column (4) suggests that when the repatriation share to population increases by 1 (or 100 percent), female wages in the informal sector decline by 16.3 percent.

¹⁹Because the repatriation share is multiplied by 100, each coefficient represents the change of 1 (or 100 percent) in the repatriation share. For example, column (2) suggests that when the repatriation share to population increases by 1 (or 100 percent), firm entry in the informal sector declines by 11.9 percent.

their reliance on less-skilled labor; in whether they sell mainly to a local, national, or international market; and, potentially, also in their exposure to gangs and crime. Therefore, we acknowledge that our finding of sectoral heterogeneity could be consistent with informal competition but could also reflect other sectoral differences.

VII Additional Robustness Tests

VII.1 Addressing issues with our shift-share instrument

An important threat to our identification strategy is the one highlighted by [Goldsmith-Pinkham et al. \(2020\)](#), which in general applies to any shift-share instruments employed to identify the effects of migration. It suggests that the shares we use to construct our instrument need to be exogenous. There could be a violation in the instrument if for instance, preshock differences in municipal characteristics are correlated with the location of historical deportees' networks (measured by birth municipalities). For instance, areas with a higher share of deportees from 1995 to 2002 could also have had lower levels of employment or a greater presence of gangs and violence relative to the rest of the country. If these characteristics affected firms' outcomes through their effect on municipalities' economic performance or security environment, for instance, then our results would be biased. To flexibly account for these potential threats, we include controls in our main estimates for: (i) baseline covariates interacted with time trends; and (ii) in a separate exercise, baseline covariates and year fixed effects. The baseline covariates included were: (i) an indicator variable for districts with homicides higher than the median in 2009, (ii) an indicator variable for districts with extortion rates higher than the median in 2009, (iii) an indicator variable for districts in which firms had high average salaries relative to the median in 2010, (iv) each district's change in homicide rates between 2008 and 2010, and (v) each district's change in night light density index between 2008 and 2010. Our main estimates are robust to these exercises. The results are available in the online Appendix (see Tables [A1](#) to [A8](#)).

An additional critique posed by [Jaeger et al. \(2018\)](#) argues that the effects of migration in both the short and long run could be confounded if migration patterns are clustered in the same locations and stable over time. Our empirical strategy addresses this concern by exploiting the interaction of shares in deportees' municipality of birth before 2001 and a sharp time-aggregate shock in deportation shocks caused by the change in US enforcement after September 2001. In fact, as documented by [Rozo et al. \(2020\)](#) following the September 11 terrorist attacks, resources devoted to immigration law enforcement increased greatly. With the creation of the new Department of Homeland Security, resources for both border enforcement (the responsibility of US Customs and Border Protection) and interior enforcement (the responsibility of the newly created Immigration and Customs Enforcement agency) expanded.

VII.2 Addressing issues of double counting

Since the data we used included individuals who had been repatriated multiple times, it is possible that these repeated migrants might be confounding the true effects of repatriations, to the extent that they are different from the rest of the population. More importantly, the shock could be significantly smaller if we don't consider individuals that leave immediately after arriving. We account for this issue and further disentangle the effect of the shock of repatriations from any push factor that may make individuals leave as soon as they arrive. In separate exercises, we replicate our main estimates excluding (i) repatriation shares where there are at least six months between the first and second repatriation, (ii) repatriation shares where there are at least 12 months between the first and second repatriation, and (iii) a repatriation share that excludes all individuals who were repatriated more than once. Our results are robust to these exercises. The results of all these exercises are in the online Appendix (see Tables [A9](#) to [A11](#)).

VIII 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 suggests that upon return, repatriated individuals join the informal sector.

Our results align with 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 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 formal-informal 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 demand for labor among firms facing more intense competition from informal ones.

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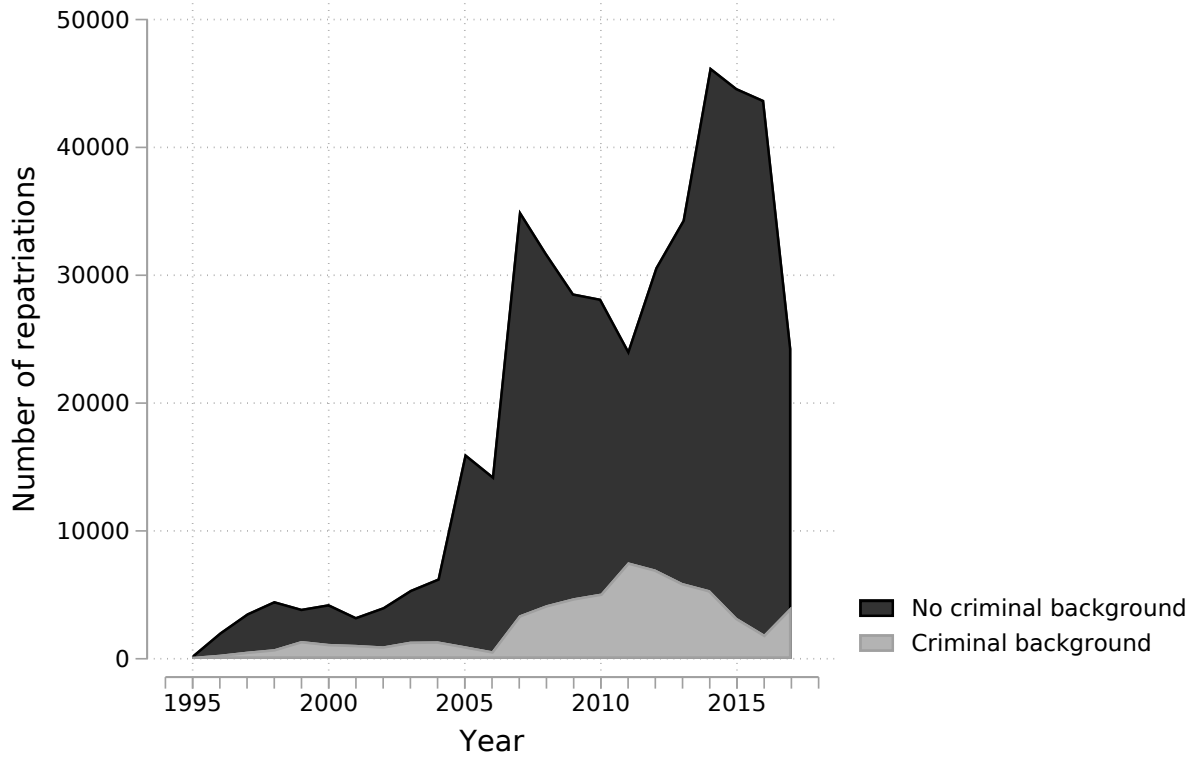
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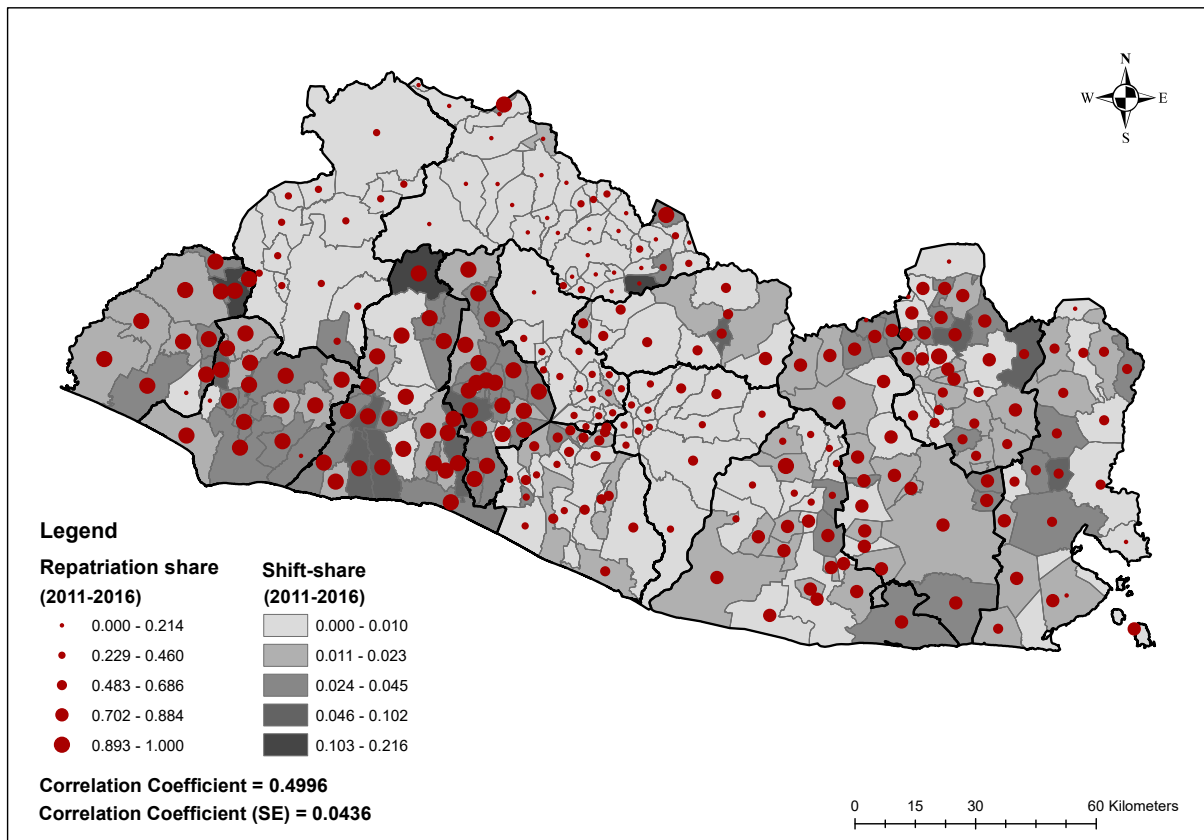
IX Figures and Tables

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



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

Figure 2: Average Repatriation Rate and Standardized Shift-share (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 number 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 number 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: $[\text{Repatriations}_{mt}/\text{Population}_{mt-1}] \times 100$	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				
Shift-share 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			
Shift-share 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 are monthly and come from the 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 parentheses.

*, **, ***, 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				
Shift-share 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			
Shift-share 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 are monthly and come from the 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 parentheses.

*, **, ***, 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 are monthly and come from the 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 and 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 parentheses.

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

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

Dep.variable (<i>in logs</i>)	Number workers		Average wage	
	Formal Sector (1)	Informal Sector (2)	Formal 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				
Shift-share 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			
Shift-share 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 are monthly and come from the 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 parentheses.

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

Table 7: Effect of Repatriation Inflows on Wages by Gender and Sector Type

Dep.variable (<i>in logs</i>)	Average male wages		Average female wages	
	Formal Sector (1)	Informal Sector (2)	Formal Sector (3)	Informal Sector (4)
Panel A. OLS				
Repatriation share	-0.004 (0.022)	0.003 (0.024)	0.035 (0.035)	-0.009 (0.021)
Adjusted R-squared	0.109	0.094	0.084	0.085
Panel B. Reduced Form				
Shift-share 1995–2002 (sd)	-0.004 (0.004)	-0.007*** (0.003)	0.004 (0.006)	-0.008*** (0.002)
Adjusted R-squared	0.109	0.094	0.084	0.085
Panel C. 2SLS				
Repatriation share	-0.088 (0.095)	-0.163** (0.063)	0.078 (0.118)	-0.163*** (0.055)
Panel D. First Stage				
	Dependent variable: Repatriation Share			
Shift-share 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	5.738	5.695	5.732	5.637
Obs. for all panels	412,682	1,031,230	336,236	1,025,206

Notes: Data are monthly and come from the ISSS sample (2011–2016). Analysis excludes firms from public administration, education, health and social work, and electricity, gas, and water sectors. Firms are categorized as formal or informal according to the type of sector they belong to. Sectors are categorized as formal or informal using the 2011 STEP survey. Informal sector includes: (i) Agriculture, hunting, and fishing; (ii) Construction; (iii) Wholesale and retail commerce; (iv) Hotels and restaurants; (v) Professional, administrative, entertainment, and other services; and (vi) Activities of private households. Formal sector includes: (i) Mining and quarrying; (ii) Manufacturing; (iii) Transport, storage, and information and communications; (iv) Financial and insurance activities; (v) Real estate activities; and (vi) Extraterritorial organizations. All panels include controls for municipality, month, and year fixed effects. Clustered standard errors at the municipal level are shown in parentheses.

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

Table 8: Effect of Repatriation Inflows on Firm Entry by Sector Type

Dependent variable	Firm entry	
	Formal 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		
Shift-share 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	
Shift-share 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 are monthly and come from the 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 and 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 parentheses.

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

Online Appendix: Robustness Tests

All the tables in the Online Appendix below include the following notes: All outcomes are estimated using monthly data obtained from the Salvadoran Social Security Administration (ISSS) for the 2011–2016 period. The analysis excludes firms from the following sectors: public administration, education, health, social work, and utilities (electricity, gas, and water). Firms are categorized as formal or informal according to the type of sector they belong to, and using the 2011 STEP survey. Informal sector includes: (i) Agriculture, hunting, and fishing; (ii) Construction; (iii) Wholesale and retail commerce; (iv) Hotels and restaurants; (v) Professional, administrative, entertaining, and other services; and (vi) Activities of private households. Formal sector includes: (i) Mining and quarrying; (ii) Manufacturing; (iii) Transport, storage, and information and communications; (iv) Financial and insurance activities; (v) Real estate activities; and (vi) Extraterritorial organizations. All panels include controls for municipality, month, and year fixed effects, and all control variables are multiplied by year trends. The variable high homicide rate and high extortion rate are indicators that take the value of 1 if the rate in the municipality where the firm is located was greater than the median homicide rate at the country level in 2009. The variable "having high salary" is an indicator at the municipality level that takes the value of 1 if the average wages paid by firms in the municipality is greater than the median at the country level in 2010 (ISSS data). The number of workers is calculated using information from ISSS in 2010. Homicide rate variation at municipal level is estimated as the difference between the number of homicides in 2010 and 2008, divided by the total population in 2008 and multiplied by 100. The night light index variation at the municipal level consists of the difference between the night light index in 2010 and 2008, divided by the night light index in 2008 and multiplied by 100. Clustered standard errors at the municipal level are shown in parentheses. *, **, ***, significant at 10%, 5% and 1%.

A1. Including Baseline Covariates \times Trends as Additional Controls

In this section, we estimate the effects of repatriations on local wages adding covariates measured at baseline and interacted with time trends as controls. The set of controls includes: (a) an indicator equal to 1 if the municipality is above the median homicide rate in 2009, and 0 otherwise; (b) an indicator equal to 1 if the municipality is above the median extortion rate against businesses in 2009, and 0 otherwise; (c) an indicator equal to 1 if the municipality is above the median of salaries in 2009, and 0 otherwise; (d) the normalized difference in the homicide rate at the municipality level between 2009 and 2010; and (e) the normalized difference in the night light index at the municipality level between 2008 and 2010. All results are summarized in Tables [A1](#) to [A4](#).

Table A1: Effect of Repatriation Inflows on the Average Formal Male Wage

Dep.variable (<i>in logs</i>)	Average formal male wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. OLS						
Repatriation share	-0.004 (0.022)	-0.004 (0.022)	0.000 (0.022)	0.001 (0.020)	-0.006 (0.021)	-0.005 (0.022)
Adjusted R-squared	0.109	0.110	0.131	0.109	0.117	0.109
Panel B. Reduced Form						
Shift-share 1995-2002 (sd)	-0.004 (0.004)	-0.004 (0.004)	-0.003 (0.004)	-0.003 (0.004)	-0.004 (0.004)	-0.004 (0.004)
Adjusted R-squared	0.109	0.110	0.131	0.109	0.117	0.109
Panel C. 2SLS						
Repatriation share	-0.088 (0.095)	-0.086 (0.096)	-0.073 (0.089)	-0.060 (0.083)	-0.092 (0.094)	-0.088 (0.093)
Panel D. First Stage						
Shift-share 1995-2002 (sd)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)
First-stage F-statistic	58.091	32.096	29.29	29.987	29.07	28.826
Mean	5.738	5.738	5.738	5.738	5.738	5.738
Obs. for all panels	412682	412682	412682	412682	412641	412186
Dummy of high homicides 2009 x trend	No	Yes	No	No	No	No
Dummy of high extortion 2009 x trend	No	No	Yes	No	No	No
Dummy of high salaries 2010 x trend	No	No	No	Yes	No	No
Var. homicide rate (2008-2010) x trend	No	No	No	No	Yes	No
Var. night light index (2008-2010) x trend	No	No	No	No	No	Yes

Table A2: Effect of Repatriation Inflows on the Average Informal Male Wage

Dep.variable (<i>in logs</i>)	Average informal male wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. OLS						
Repatriation share	0.003 (0.024)	0.003 (0.025)	0.008 (0.026)	-0.001 (0.024)	0.004 (0.025)	0.003 (0.024)
Adjusted R-squared	0.094	0.094	0.108	0.094	0.099	0.094
Panel B. Reduced Form						
Shift-share 1995–2002 (sd)	-0.007*** (0.003)	-0.007*** (0.003)	-0.007** (0.003)	-0.009*** (0.003)	-0.007*** (0.003)	-0.008*** (0.003)
Adjusted R-squared	0.094	0.094	0.108	0.094	0.099	0.094
Panel C. 2SLS						
Repatriation share	-0.163** (0.063)	-0.163*** (0.063)	-0.152** (0.066)	-0.190*** (0.063)	-0.162** (0.063)	-0.164*** (0.063)
Panel D. First Stage						
Shift-share 1995–2002 (sd)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)
First-stage F-statistic	58.091	32.096	29.29	29.987	29.07	28.826
Mean	5.695	5.695	5.695	5.695	5.695	5.695
Obs. for all panels	1031230	1031230	1031230	1031230	1031230	1030269
Dummy of high homicides 2009 x trend	No	Yes	No	No	No	No
Dummy of high extortion 2009 x trend	No	No	Yes	No	No	No
Dummy of high salaries 2010 x trend	No	No	No	Yes	No	No
Var. homicide rate (2008–2010) x trend	No	No	No	No	Yes	No
Var. night light index (2008–2010) x trend	No	No	No	No	No	Yes

Table A3: Effect of Repatriation Inflows on the Average Formal Female Wage

Dep.variable (<i>in logs</i>)	Average formal female wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. OLS						
Repatriation share	0.035 (0.035)	0.035 (0.035)	0.044 (0.036)	0.038 (0.034)	0.032 (0.034)	0.035 (0.035)
Adjusted R-squared	0.084	0.085	0.101	0.084	0.090	0.084
Panel B. Reduced Form						
Shift-share 1995–2002 (sd)	0.004 (0.006)	0.004 (0.006)	0.005 (0.006)	0.005 (0.006)	0.004 (0.006)	0.004 (0.006)
Adjusted R-squared	0.084	0.085	0.101	0.084	0.090	0.084
Panel C. 2SLS						
Repatriation share	0.078 (0.118)	0.075 (0.118)	0.104 (0.110)	0.100 (0.115)	0.076 (0.119)	0.079 (0.120)
Panel D. First Stage						
Shift-share 1995–2002 (sd)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)
First-stage F-statistic	58.091	32.096	29.29	29.987	29.07	28.826
Mean	5.732	5.732	5.732	5.732	5.732	5.732
Obs. for all panels	336236	336236	336236	336236	336195	335933
Dummy of high homicides 2009 x trend	No	Yes	No	No	No	No
Dummy of high extortion 2009 x trend	No	No	Yes	No	No	No
Dummy of high salaries 2010 x trend	No	No	No	Yes	No	No
Var. homicide rate (2008–2010) x trend	No	No	No	No	Yes	No
Var. night light index (2008–2010) x trend	No	No	No	No	No	Yes

Table A4: Effect of Repatriation Inflows on the Average Informal Female Wage

Dep.variable (<i>in logs</i>)	Average informal female wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. OLS						
Repatriation share	-0.009 (0.021)	-0.009 (0.021)	-0.003 (0.023)	-0.010 (0.021)	-0.008 (0.022)	-0.010 (0.020)
Adjusted R-squared	0.085	0.085	0.099	0.085	0.090	0.085
Panel B. Reduced Form						
Shift-share 1995–2002 (sd)	-0.008*** (0.002)	-0.008*** (0.002)	-0.007*** (0.002)	-0.008*** (0.002)	-0.008*** (0.002)	-0.007*** (0.002)
Adjusted R-squared	0.085	0.085	0.099	0.085	0.090	0.085
Panel C. 2SLS						
Repatriation share	-0.163*** (0.055)	-0.164*** (0.055)	-0.144** (0.058)	-0.170*** (0.054)	-0.164*** (0.056)	-0.161*** (0.054)
Panel D. First Stage						
Shift-share 1995–2002 (sd)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)	0.046*** (0.006)
First-stage F-statistic	58.091	32.096	29.29	29.987	29.07	28.826
Mean	5.637	5.637	5.637	5.637	5.637	5.637
Obs. for all panels	1025206	1025206	1025206	1025206	1025206	1024566
Dummy of high homicides 2009 x trend	No	Yes	No	No	No	No
Dummy of high extortion 2009 x trend	No	No	Yes	No	No	No
Dummy of high salaries 2010 x trend	No	No	No	Yes	No	No
Var. homicide rate (2008–2010) x trend	No	No	No	No	Yes	No
Var. night light index (2008–2010) x trend	No	No	No	No	No	Yes

A2. Including Baseline Covariates \times Year FE as Additional Controls

In this section, we estimate the effects of repatriations on local wages adding covariates measured at baseline and interacted with year fixed effects as controls. The set of controls includes: (a) an indicator equal to 1 if the municipality is above the median homicide rate in 2009, and 0 otherwise; (b) an indicator equal to 1 if the municipality is above the median extortion rate against businesses in 2009, and 0 otherwise; (c) an indicator equal to 1 if the municipality is above the median of salaries in 2009, and 0 otherwise; (d) the normalized difference in the homicide rate at the municipality level between 2009 and 2010; and (e) the normalized difference in the night light index at the municipality level between 2008 and 2010. All results are summarized in Tables [A5](#) - [A8](#)

Table A5: Effect of Repatriation Inflows on the Average Formal Male Wage

Dep. variable (<i>in logs</i>)	Average formal male wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. OLS						
Repatriation share	-0.004 (0.022)	0.000 (0.023)	0.000 (0.025)	0.002 (0.020)	-0.010 (0.021)	0.014 (0.019)
Adjusted R-squared	0.109	0.110	0.131	0.109	0.117	0.109
Panel B. Reduced Form						
Shift-share 1995–2002 (sd)	-0.004 (0.004)	-0.004 (0.004)	-0.003 (0.004)	-0.002 (0.004)	-0.006 (0.004)	0.001 (0.004)
Adjusted R-squared	0.109	0.110	0.131	0.109	0.117	0.109
Panel C. 2SLS						
Repatriation share	-0.088 (0.095)	-0.086 (0.096)	-0.078 (0.102)	-0.052 (0.083)	-0.131 (0.090)	0.014 (0.082)
Panel D. First Stage						
Shift-share 1995–2002 (sd)	0.046*** (0.006)	0.046*** (0.005)	0.045*** (0.006)	0.045*** (0.006)	0.045*** (0.006)	0.046*** (0.006)
First-stage F-statistic	58.091	40.89	63.68	55.306	39.471	22.649
Mean	5.738	5.738	5.738	5.738	5.738	5.738
Obs. for all panels	412682	412682	412682	412682	412641	412186
Dummy of high homicides 2009 x year FE	No	Yes	No	No	No	No
Dummy of high extortion 2009 x year FE	No	No	Yes	No	No	No
Dummy of high salaries 2010 x year FE	No	No	No	Yes	No	No
Var. homicide rate (2008–2010) x year FE	No	No	No	No	Yes	No
Var. night light index (2008–2010) x year FE	No	No	No	No	No	Yes

Table A6: Effect of Repatriation Inflows on the Average Informal Male Wage

Dep.variable (<i>in logs</i>)	Average informal male wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. OLS						
Repatriation share	0.003 (0.024)	0.004 (0.026)	0.013 (0.025)	-0.000 (0.025)	0.005 (0.028)	0.003 (0.025)
Adjusted R-squared	0.094	0.094	0.108	0.094	0.099	0.094
Panel B. Reduced Form						
Shift-share 1995–2002 (sd)	-0.007*** (0.003)	-0.008** (0.003)	-0.007** (0.003)	-0.008*** (0.003)	-0.008*** (0.003)	-0.008*** (0.003)
Adjusted R-squared	0.094	0.094	0.108	0.094	0.099	0.094
Panel C. 2SLS						
Repatriation share	-0.163** (0.063)	-0.165*** (0.061)	-0.148** (0.070)	-0.185*** (0.064)	-0.172*** (0.065)	-0.183*** (0.066)
Panel D. First Stage						
Shift-share 1995–2002 (sd)	0.046*** (0.006)	0.046*** (0.005)	0.045*** (0.006)	0.045*** (0.006)	0.045*** (0.006)	0.046*** (0.006)
First-stage F-statistic	58.091	40.89	63.68	55.306	39.471	22.649
Mean	5.695	5.695	5.695	5.695	5.695	5.695
Obs. for all panels	1031230	1031230	1031230	1031230	1031230	1030269
Dummy of high homicides 2009 x year FE	No	Yes	No	No	No	No
Dummy of high extortion 2009 x year FE	No	No	Yes	No	No	No
Dummy of high salaries 2010 x year FE	No	No	No	Yes	No	No
Var. homicide rate (2008–2010) x year FE	No	No	No	No	Yes	No
Var. night light index (2008–2010) x year FE	No	No	No	No	No	Yes

Table A7: Effect of Repatriation Inflows on the Average Formal Female Wage

Dep.variable (<i>in logs</i>)	Average formal female wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. OLS						
Repatriation share	0.035 (0.035)	0.037 (0.037)	0.027 (0.038)	0.040 (0.034)	0.015 (0.030)	0.037 (0.035)
Adjusted R-squared	0.084	0.085	0.101	0.084	0.090	0.084
Panel B. Reduced Form						
Shift-share 1995–2002 (sd)	0.004 (0.006)	0.004 (0.006)	0.002 (0.005)	0.005 (0.006)	-0.000 (0.005)	0.005 (0.006)
Adjusted R-squared	0.084	0.085	0.101	0.084	0.090	0.084
Panel C. 2SLS						
Repatriation share	0.078 (0.118)	0.080 (0.124)	0.042 (0.108)	0.109 (0.116)	-0.004 (0.105)	0.098 (0.109)
Panel D. First Stage						
Shift-share 1995–2002 (sd)	0.046*** (0.006)	0.046*** (0.005)	0.045*** (0.006)	0.045*** (0.006)	0.045*** (0.006)	0.046*** (0.006)
First-stage F-statistic	58.091	40.89	63.68	55.306	39.471	22.649
Mean	5.732	5.732	5.732	5.732	5.732	5.732
Obs. for all panels	336236	336236	336236	336236	336195	335933
Dummy of high homicides 2009 x year FE	No	Yes	No	No	No	No
Dummy of high extortion 2009 x year FE	No	No	Yes	No	No	No
Dummy of high salaries 2010 x year FE	No	No	No	Yes	No	No
Var. homicide rate (2008–2010) x year FE	No	No	No	No	Yes	No
Var. light night index (2008–2010) x year FE	No	No	No	No	No	Yes

Table A8: Effect of Repatriation Inflows on the Average Informal Female Wage

Dep.variable (in logs)	Average informal female wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. OLS						
Repatriation share	-0.009 (0.021)	-0.009 (0.022)	0.005 (0.025)	-0.013 (0.021)	-0.008 (0.024)	-0.010 (0.021)
Adjusted R-squared	0.085	0.085	0.099	0.085	0.090	0.085
Panel B. Reduced Form						
Shift-share 1995–2002 (sd)	-0.008*** (0.002)	-0.008*** (0.002)	-0.006** (0.002)	-0.008*** (0.002)	-0.008*** (0.002)	-0.008*** (0.002)
Adjusted R-squared	0.085	0.085	0.099	0.085	0.090	0.085
Panel C. 2SLS						
Repatriation share	-0.163*** (0.055)	-0.165*** (0.048)	-0.133** (0.062)	-0.181*** (0.053)	-0.175*** (0.056)	-0.164*** (0.054)
Panel D. First Stage						
Shift-share 1995–2002 (sd)	0.046*** (0.006)	0.046*** (0.005)	0.045*** (0.006)	0.045*** (0.006)	0.045*** (0.006)	0.046*** (0.006)
First-stage F-statistic	58.091	40.89	63.68	55.306	39.471	22.649
Mean	5.637	5.637	5.637	5.637	5.637	5.637
Obs. for all panels	1025206	1025206	1025206	1025206	1025206	1024566
Dummy of high homicides 2009 x year FE	No	Yes	No	No	No	No
Dummy of high extortion 2009 x year FE	No	No	Yes	No	No	No
Dummy of high salaries 2010 x year FE	No	No	No	Yes	No	No
Var. homicide rate (2008–2010) x year FE	No	No	No	No	Yes	No
Var. light night index (2008–2010) x year FE	No	No	No	No	No	Yes

A3. Excluding Individuals with Repeated Deportations

Table A9: Effect of Repatriation Inflows on Wages by Gender and Sector Type
Excluding Individuals with Repeated Deportations within 6 Months

Dep.variable (<i>in logs</i>)	Average male wages		Average female wages	
	Formal Sector (1)	Informal Sector (2)	Formal Sector (3)	Informal Sector (4)
Panel A. OLS				
Repatriation share	0.052 (0.072)	-0.070 (0.043)	0.007 (0.029)	0.006 (0.024)
Adjusted R-squared	0.079	0.043	0.111	0.096
Panel B. Reduced Form				
Shift-share 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	-0.243 (0.391)	-0.319* (0.191)	-0.064 (0.128)	-0.192*** (0.062)
Panel D. First Stage				
	Dependent variable: Repatriation Share			
Shift-share 1995–2002 (sd)	0.033*** (0.004)	0.035*** (0.004)	0.033*** (0.004)	0.035*** (0.004)
First-stage F-statistic	69.42	74.809	69.42	74.809
Mean	2.146	1.787	5.713	5.652
Obs. for all panels	437421	1215292	437421	1215292

Notes: This table summarizes the main effects of deportations on wages after restricting the sample to repatriated individuals who were deported more than once within a six-month period. Specifically, the repatriation share excludes those who were deported at least twice within a six-month period.

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

Table A10: Effect of Repatriation Inflows on Wages by Gender and Sector Type
Excluding Individuals with Repeated Deportations within 12 Months

Dep.variable (<i>in logs</i>)	Average male wages		Average female wages	
	Formal Sector (1)	Informal Sector (2)	Formal Sector (3)	Informal Sector (4)
Panel A. OLS				
Repatriation share	-0.003 (0.023)	-0.013 (0.023)	0.003 (0.040)	-0.028 (0.021)
Adjusted R-squared	0.109	0.094	0.084	0.085
Panel B. Reduced Form				
Shift-share 1995–2002 (sd)	-0.004 (0.004)	-0.007*** (0.003)	0.004 (0.006)	-0.008*** (0.002)
Adjusted R-squared	0.109	0.094	0.084	0.085
Panel C. 2SLS				
Repatriation share	-0.129 (0.139)	-0.237** (0.092)	0.114 (0.173)	-0.236*** (0.080)
Panel D. First Stage				
	Dependent variable: Repatriation Share			
Shift-share 1995–2002 (sd)	0.030*** (0.004)	0.032*** (0.004)	0.033*** (0.004)	0.032*** (0.005)
First-stage F-statistic	49.159	49.832	56.224	49.456
Mean	5.738	5.695	5.732	5.637
Obs. for all panels	412,682	1,031,230	336,236	1,025,206

Notes: This table summarizes the main effects of deportations on wages after restricting the sample to repatriated individuals who were deported more than once within a 12-month period. Specifically, the repatriation share excludes those who were deported at least twice within a year.

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

Table A11: Effect of Repatriation Inflows on Wages by Gender and Sector Type
Excluding Individuals with Multiple Deportations

Dep.variable (<i>in logs</i>)	Average male wages		Average female wages	
	Formal Sector (1)	Informal Sector (2)	Formal Sector (3)	Informal Sector (4)
Panel A. OLS				
Repatriation share	-0.003 (0.023)	-0.013 (0.023)	0.003 (0.040)	-0.028 (0.021)
Adjusted R-squared	0.109	0.094	0.084	0.085
Panel B. Reduced Form				
Shift-share 1995–2002 (sd)	-0.004 (0.004)	-0.007*** (0.003)	0.004 (0.006)	-0.008*** (0.002)
Adjusted R-squared	0.109	0.094	0.084	0.085
Panel C. 2SLS				
Repatriation share	-0.129 (0.139)	-0.237** (0.092)	0.114 (0.173)	-0.236*** (0.080)
Panel D. First Stage				
	Dependent variable: Repatriation Share			
Shift-share 1995–2002 (sd)	0.030*** (0.004)	0.032*** (0.004)	0.033*** (0.004)	0.032*** (0.005)
First-stage F-statistic	49.159	49.832	56.224	49.456
Mean	5.738	5.695	5.732	5.637
Obs. for all panels	412,682	1,031,230	336,236	1,025,206

Notes: This table summarizes the effects of deportations on wages after restricting the sample to repatriated individuals who were deported more than once during the period of analysis. Specifically, the repatriation share excludes individuals with repeated deportations.

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