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AND DEVELOPMENT IN ORIGIN COUNTRIES

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Forced Displacement, the Perpetuation of Autocratic Leaders, and Development in Origin Countries

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ABSTRACT

How does forced displacement shape development in origin countries? We examine the case of Venezuela, where over seven million people have been forcibly displaced. Our study compares municipalities with different proportions of foreign-born populations before and after the international oil price shocks that accelerated forced displacement between 2014 and 2019. Our findings show that municipalities with higher foreign-born populations in 1990, exhibiting greater out-migration from Venezuela after 2014, experienced lower economic development and higher inequality. We shed light on a novel mechanism: forced displacement facilitates the perpetuation of autocratic leaders, further hindering development. It does so by weakening the opposition's voices and facilitating the expansion of organized crime and illicit sources of income.

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“Exit has (been) shown to drive out voice.”

Albert O. Hirshman, 1970

1 Introduction

Over the past 50 years, the world has witnessed an unprecedented surge in forced displacement crises, defined as the involuntary relocation of people due to conflict, violence, persecution, disasters, or climate change, leading to the coerced migration of more than 117 million by 2023 (UNHCR, 2024). These trends are expected to intensify with new conflicts and climate change, making forced displacement a pressing global development challenge. While recent research has explored how these flows affect destination countries (e.g. Dustmann et al., 2019; Steinmayr, 2021) and the socioeconomic impacts on displaced individuals (e.g. Becker et al., 2020; Chiovelli et al., 2021), their role in shaping the development paths of origin locations remain less understood. In particular, little is known about how forced displacement affects development in origin countries. This knowledge gap is largely due to the difficulties in collecting reliable data from origin locations, often mired in intense conflict, economic instability, and social crises.

Forced displacement, however, can reshape the development trajectory of origin countries profoundly. Politically, forced displacement can strengthen the hold of ruling parties and leaders if opposition forces are disproportionately represented among the migrants. Economically, forced displacement may severely hinder growth by depleting production factors and reducing consumer demand. Additionally, forced displacement can exacerbate income inequality: the poorest, who are unable to migrate, are left behind, while the middle class departs, and those at the top, who benefit economically the most from the autocratic regime, stay. At the same time, potential positive externalities from migration, such as knowledge diffusion, trade, and higher foreign direct investment (Javorcik et al. 2011; Parsons and Vézina 2018), may not materialize in the context of weak institutions. Instead, negative ex-

ternalities may emerge as forced displacement could also facilitate the expansion of organized crime and dependence on illicit economic resources (Kapur 2014). This could occur when criminal networks rely on the vulnerability of forcibly displaced migrants to help facilitate or inform their activities abroad, which will be more attractive in origin countries with weak democracies or rule of law.

We investigate these hypotheses by assessing the role of forced displacement in shaping Venezuela’s development between 1992 and 2021. In response to the economic and social turmoil under the regimes of Hugo Chávez and Nicolás Maduro, at least 35 percent of the Venezuelan population—7.7 million individuals—have fled the country. Although Chávez was elected president in 1998, and his government introduced constitutional reforms that concentrated power in the executive branch and strongly weakened political accountability, forced displacement from Venezuela only surged significantly after 2013, when his successor, Maduro, faced plummeting international oil prices. The decline in international oil prices was counteracted with detrimental national economic policies that led to hyperinflation and international economic sanctions, that massively pushed Venezuelans out of the country.

Using this setting, we perform a difference-in-difference analysis and exploit two sources of variation. First, municipal variation is based on the share of foreigners living in each municipality in 1990, the last population census before Hugo Chávez’s presidency. Foreigners in Venezuela in 1990 may have facilitated networks and provided information, potentially easing out-migration from Venezuela. Supporting this hypothesis, we find that most foreigners living in Venezuela in 1990 were Colombians, and most Venezuelans who later migrated to Colombia due to the oil shocks originated from municipalities with a higher share of Colombians in 1990 in Venezuela. Furthermore, unique National Surveys on Living Conditions (ENCOVI, for its name in Spanish) from major urban centers in Venezuela collected between 2017 and 2021 reveal that most Venezuelan families have relatives living in Colombia. Indeed, using these household surveys, we find that municipalities in Venezuela with a

higher foreign share in 1990 have a higher likelihood of having a household reporting having a relative in Colombia. Second, annual variation is derived from the sharp reduction in international oil prices after 2013. Our empirical strategy, consequently, compares economic outcomes in municipalities with varying foreign settlement shares in 1990, before and after the reductions in the international oil price, which induced mass forced displacement in Venezuela from 2013 until 2018. In particular, we exploit that while the decline in the international oil price and subsequent economic policies induced a national shock, Venezuelans from municipalities with a more extensive foreign share were more likely to be able to leave.¹

To explore these sources of variation, we use data on night light luminosity, household living conditions, elections and criminal organizations for the period 1992-2021. First, we use night light data as a proxy for economic growth and inequality.² We measure inequality through a novel spatial measure that estimates the dispersion of night light density at the parroquia level (i.e., locality) within each municipality. We find that this measure is positively correlated with traditional income-based inequality metrics, validated using census data from Venezuelan and Colombia. Second, to examine the effects on the perpetuation of political leaders, we utilize unique web-scraped data on the results from the last four presidential and six mayoral elections, as well as National Surveys on Living Conditions in Venezuela and Colombia, and data on the presence of several organized criminal groups from the ACLED.

Our first key result is that municipalities affected by forced displacement experience sharp reductions in development and higher inequality relative to the other areas. Municipalities with a 1 percent higher share of foreign settlements in 1990 experienced nearly 13.5% lower luminosity after 2013, relative to other municipalities.³ We also find an increase in inequality

¹Additionally, looking at previous trends, we are also able to test the identifying assumption—that is, municipalities with a large foreign share and municipalities with a low foreign share would have followed similar trends in economic development if mass migration had not increased after 2013.

²We validate that the night light density measures are correlated with household-level income measures using ENCOVI. Moreover, we also control for oil presence in our estimates to rule out concerns of luminosity driven by gas flares affecting our main results.

³These results account for the possibility of gas flares affecting night light measures. The table [E.19](#) shows

in the municipalities affected by forced displacement. These results are also found when we use per capita income data from nationally representative surveys in Venezuela. In terms of the magnitude of the effects, we show that given that out-migration flows quintupled after 2013, our estimates translate to about a 20 percent decline in GDP for affected municipalities. Regarding the timing of the effects, we observe that the reduction in development is immediate and accentuated in 2017.⁴ Using household surveys in Venezuela, we provide evidence that the most productive and educated individuals are the ones leaving the country especially in the first years after the shock, taking both their physical and human capital with them. This contributes to the immediate decline in economic growth. We also show that remittances do not offset these adverse effects, as these transfers are primarily used for subsistence needs like food and housing rather than for productive investments. In line with these findings, we show that individuals who are left-behind also reduce their human capital investments.

How can a political regime remain in power in such a deep economic and social crisis? Our second key contribution is to document that forced displacement reinforces the perpetuation of autocratic leaders in the medium term in two ways. First, we document that forced migrants are disproportionately represented by the political opposition.⁵ As such, forced displacement obliterates the political opposition, helping to entrench the incumbent regime and reducing momentum for social change. We find that higher levels of forced displacement in affected municipalities led to a significant decline in electoral turnout and opposition votes after 2013. This mirrors the 2024 presidential election, where only 60,000 out of 7 million Venezuelans abroad were allowed to vote.⁶

the estimation controlling by oil fields area from [Sabbatino \(2018\)](#).

⁴While the reduction in international oil prices led to a decline in national economic conditions, this decline accentuated in 2017 when monetary financing to cover its deficit led to hyperinflation.

⁵This is consistent with the evidence provided by [Holland et al. \(2024\)](#) where 12.1 % of the total Venezuelan migrants in Colombia support the left and only 0.1 % support Nicolás Maduro government.

⁶Indeed, our findings hold when using opposition-reported 2024 election data and are consistent with results from five Venezuelan municipal elections analyzed.

Second, we also show that Venezuelan municipalities affected by forced displacement experience an increase in organized crime dedicated to illicit economic activities, which could potentially benefit the perpetuation of the autocratic regime. After 2013, municipalities affected by forced migration experienced a large increase in events associated with criminal organizations that are known to exploit migrants and that have been associated with the regime. These include drug trafficking crime organizations from destination countries, as well as an expansion of local criminal organizations specialized in human trafficking. These criminal groups take advantage of irregular migration to recruit, enroll, and victimize migrants. These quantitative findings are aligned with abundant qualitative evidence from journalists and NGOs working in the region, suggesting that forced displacement in Venezuela reduced the transactional costs of the drug trafficking business and allowed criminal organizations to expand their illegal economic activities while benefiting the regime.⁷

These combined electoral and criminal effects of forced displacement exacerbate the negative impacts on development: with less opposition to push for reforms and increased reliance on illicit activities, the incumbent government faces reduced pressure to improve conditions for private and human capital investment. Leveraging a mediation analysis, we document that these two channels explain approximately one-third of the effect of forced displacement on development.

Our findings are robust to several validity tests. Notably, municipalities with a higher share of foreigners in 1990 showed similar trends in the main outcomes we examine, even before the crisis began (as shown in Figures 8a, 8b, 9a, and 9a). Moreover, our core estimates remain consistent even after accounting for interactions between linear time trends and

⁷There is ample qualitative evidence highlighting that the autocratic Venezuelan government maintains power by leveraging criminal rents, as seen in the Paraguaná Cartel and Cartel of the Sun's cases ([Insight Crime, 2022a,b](#)). Politicians, security forces, and drug traffickers form symbiotic networks where officials shield traffickers from prosecution in exchange for financial support, political influence, and public service provision. Governors and mayors manipulate military and police appointments to ensure loyalty and facilitate the flow of drugs. At the same time, traffickers help finance campaigns, mobilize votes, and fill gaps left by a collapsing state. The interconnection of politics and crime may sustain the regime's power and organized criminal activities across the country.

baseline measures, analyzing smaller geographical units, adjusting for spatial autocorrelation, approximating forced displacement using inverse distance to Colombia’s crossing points, and applying alternative difference-in-difference estimators based on recent methodological advances. Additionally, our findings are not influenced by contemporaneous government actions disproportionately targeting areas with higher foreign settlements in 1990. Even when controlling for novel proxies of government intervention—such as data on expropriations of private firms, social program beneficiaries, or irregularities in electrical provision post-2019—our results hold. More importantly, our results remain consistent when controlling for oil production, indicating that differential trends in oil-rich areas are not driving the findings.

We further validate our findings using an alternative strategy based on a measure of imputed outflows by year and municipality, calculated from the interaction of foreign settlement shares in 1990 and forced migration from Venezuela to Colombia. This imputed outflows measure closely tracks actual migration patterns, as shown by its strong correlation with the origin and arrival dates of Venezuelans interviewed in Colombia in 2018.⁸ Imputed outflows are also positively correlated with the locations of relatives abroad, as seen in the Venezuelan ENCOVI data (2017–2021).⁹ Additionally, using road distances from municipalities to major border crossings to define affected municipalities yields similar results.

One concern is the potential manipulation of electoral data. To address this, we conducted data checks for abnormal patterns and found no evidence of manipulation before 2018, aligning with reports from humanitarian and international organizations validating those elections.¹⁰ However, we do find evidence of manipulation (or the effects of a political boycott from the opposition) in the 2018 presidential election. To validate our findings, we re-estimate the effects of forced displacement using opposition-collected data for the 2024

⁸While the geographic scope of Colombian data limits econometric analysis, it still validates our forced measure.

⁹The ENCOVI data is available between 2014 and 2021, but the migration module is only available after 2017.

¹⁰Carter Center reports (1998–2021) suggest no systematic manipulation before 2018.

presidential election, which indicates Nicolás Maduro lost by a landslide. Additionally, we analyze mayoral elections across 335 municipalities, covering five election years and 1,675 observations. The scale of these elections makes systematic manipulation unlikely. Reassuringly, the estimates remain consistent, supporting the validity of our findings.

This paper contributes to the literature exploring the interactions between migration and development. While the vast majority of research has focused on the effects of migration in destination economies (e.g. [Card, 2001](#); [Borjas, 2014](#); [Abramitzky et al., 2014](#); [Foged and Peri, 2016](#); [Dustmann et al., 2017](#); [Hanson et al., 2018](#)), brain drain (e.g. [Beine et al., 2008](#); [Gibson and McKenzie, 2011](#); [Docquier and Rapoport, 2012](#); [Batista et al., 2012](#); [Anelli et al., 2023](#)), remittances (e.g. [Amuedo-Dorantes and Pozo, 2006](#); [Giuliano and Ruiz-Arranz, 2009](#); [Portes, 2009](#); [Ambler et al., 2015](#)), and workers’ outside option and bargaining power ([Karadja and Prawitz, 2019](#)), our study adds a new dimension by examining the impact of mass forced displacement on economic growth in origin countries, which are often characterized by autocratic regimes. We provide empirical evidence to Hirshman’s hypothesis that in contexts with weak democracies, emigration may reduce pressure for reforms ([Hirschman 1970, 1978](#)), in contrast to the well-documented link between emigration, higher democratization, and political change in well-functioning democracies ([Spilimbergo 2009](#); [Docquier et al. 2016](#); [Karadja and Prawitz 2019](#)).¹¹ Furthermore, we show that in places with weak democracies, the documented positive network effect of brain drain does not materialize ([Gibson and McKenzie 2011](#); [Docquier and Rapoport 2012](#)). This could be the case since individuals are not interested in investing in those places considering the high risks. In fact, “bad investors,” those for which a weak democracy and rule of law might be beneficial, are the ones to move there.

A core contribution of this paper is the combination of unique data sources to document trends in a country experiencing mass forced migration and to explore the impact of these

¹¹See [Kapur \(2014\)](#) for a detailed survey of the literature on international emigration and political outcomes in origin countries.

flows on development outcomes. Such data is rarely available ([Martinez 2022](#)), as origin countries typically face crises that make data collection extremely challenging. We integrate data from multiple unique sources, including annual National Surveys on Living Conditions (ENCOVI) from 2014 to 2021 in Venezuela, which provide insights into national poverty trends, sectoral re-composition, and public service provision despite being limited to the largest urban centers. Additionally, we use night luminosity data at various scales—municipality, locality (parroquia), and 1-square-kilometer—to approximate changes in economic growth and spatial inequality. We also scrape online electoral results from presidential and mayoral elections between 2004 and 2024, combining these with population censuses, web-scraped data on private firm expropriations, international economic sanctions, and surveys of Venezuelan migrants in Colombia. This comprehensive approach allows us to capture the complex dynamics of forced migration and its wide-ranging effects.

Finally, our work also relates to recent studies examining the effects of authoritarian regimes ([González et al., 2023](#)). However, rather than focusing on the effects of the regimes themselves, we investigate the role of forced displacement flows and how forced displacement may reinforce the perpetuation of autocratic political leaders by reducing the voice of the opposition and reliance on illicit activities in the countries of origin.

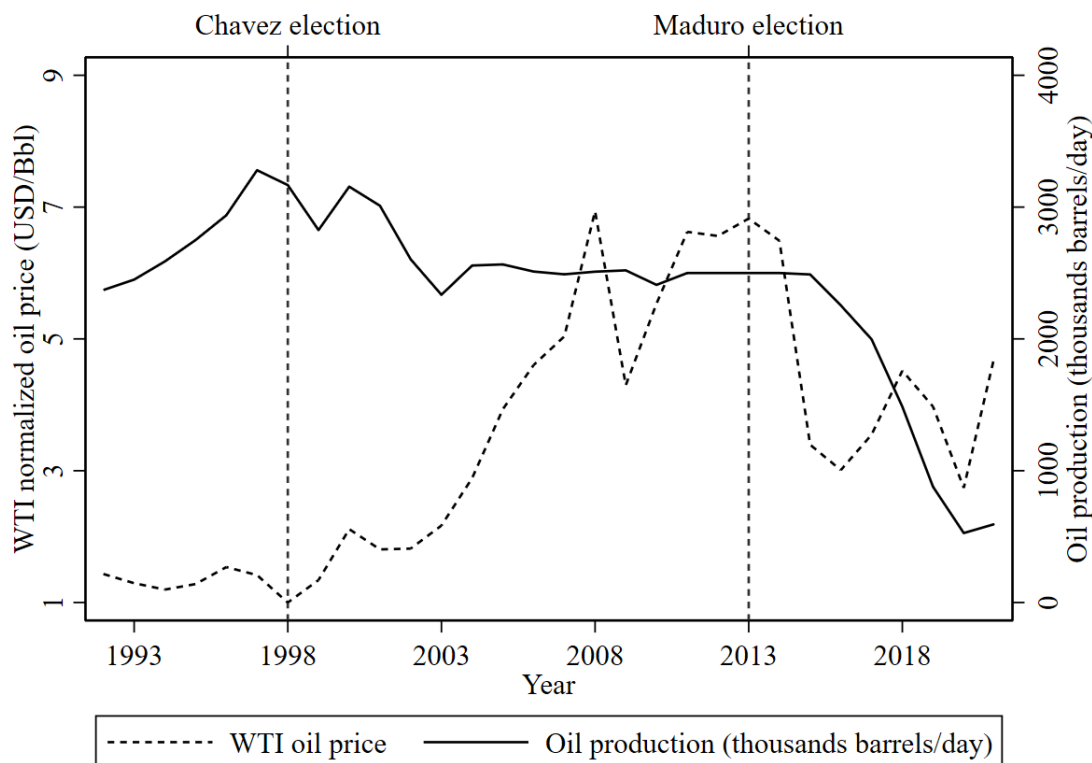
2 Local Context: Venezuela’s Unraveling

Venezuela, historically reliant on oil, entered an economic recession in the late 1990s due to falling oil prices and a downturn in its non-oil sector, which fueled widespread discontent and led to the election of Hugo Chávez in 1998 ([Hausmann and Rodríguez 2014](#)).¹² Chávez’s presidency brought significant political and economic changes, including constitutional reforms that concentrated power in the executive branch and weakened political accountability. His administration also undertook widespread expropriations of private firms, leading

¹²The recession brought by declining oil prices in the 1990s made the rampant inequality of the country more salient and led to the dramatic support of the populist agenda.

to a sharp contraction of the private sector (Panel a, Figure A.1). Despite early political instability—marked by a coup attempt and an oil strike—Venezuela eventually recovered and achieved sustained economic growth, driven by rising oil prices and expansionary government policies during Chávez’ tenure (Figure 1).¹³ These factors helped Chávez maintain widespread popularity until his death in 2013.

Figure 1: Oil Prices and Production in Venezuela, 1992-2021



Notes: Oil prices come from the Global Commodity Prices dataset of the [World Bank \(2024\)](#). Annual oil production comes from [Datosmacro \(2024\)](#).

2.1 Venezuela’s Crisis, 2013-Present

In 2013, Hugo Chávez, terminally ill, appointed Nicolás Maduro as his successor. Following Maduro’s election, Venezuela was hit by a sharp drop in international oil prices, triggering

¹³Government spending, for instance, rose sharply, reaching 30 percent of GDP by 2006 ([Weisbrot and Sandoval 2008](#)).

a severe external shock to the economy (Figure 1). In response, Maduro’s government turned to monetary financing to cover its deficit, leading to hyperinflation (Panel b, Figure A.1). The oil price collapse, combined with preexisting macroeconomic imbalances and continued authoritarian policies, resulted in the complete shutdown of international financing and the imposition of stringent international sanctions on Venezuela (Panel c, Figure A.1). Consequently, the country plunged into a deep crisis, with GDP contracting by over 70% between 2013 and 2018 (Morales-Arilla and Traettino 2023).

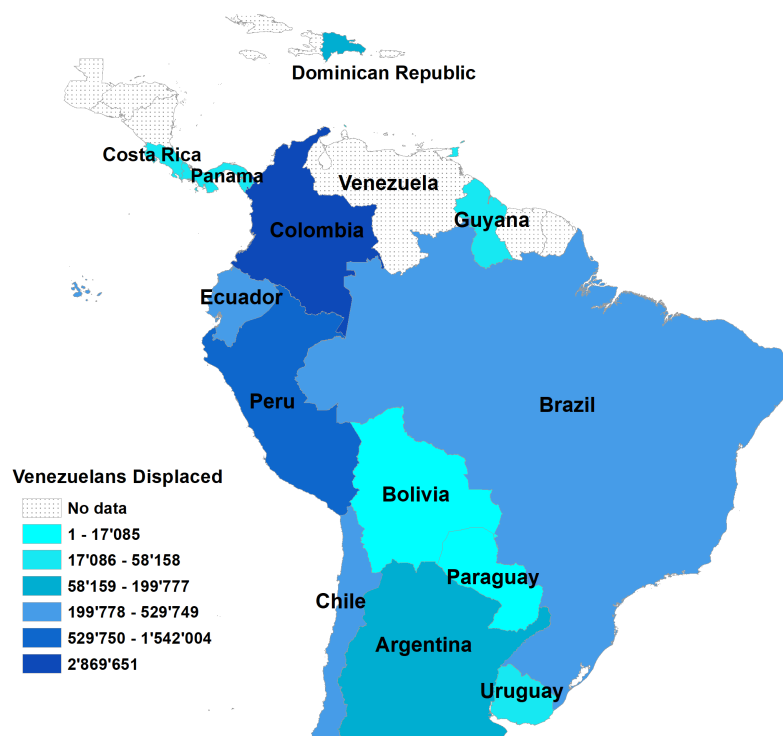
ENCOVI data from 2014 to 2021 show a dramatic rise in poverty rates, with over 94% of the population living under the poverty line and 74% below the extreme poverty line by 2021 (Figure A.2). The crisis extended beyond the economic and political dimensions, also impacting public services. As seen in Figure A.3, power and water supply interruptions became widespread (Panels a and b), and by 2021, at least 75% of the population had ceased maintaining a healthy diet, and was subsisting on a limited variety of foods (Panel c). Health services were also decimated, with coverage dropping from 45.8% to just 3.4%, between 2014 and 2021. By then, roughly 60% of those with chronic illnesses had little to no access to essential medications (Figure A.4).

2.2 Forced Displacement and Colombian Networks

The severe national crisis triggered by the sharp decline in international oil prices after 2013 led to unprecedented mass forced displacement. According to the latest figures from the United Nations Refugee Agency (UNHCR), over seven million individuals have left Venezuela—representing more than 35% of the country’s population in 2013, before Nicolás Maduro’s election. Although Venezuelan migrants are not currently recognized as refugees, they are considered a population of interest and are under UNHCR’s protection. Particularly, given the extremely difficult conditions in Venezuela and the size of the migration outflows, Venezuelans are internationally recognized as a forcibly displaced population.

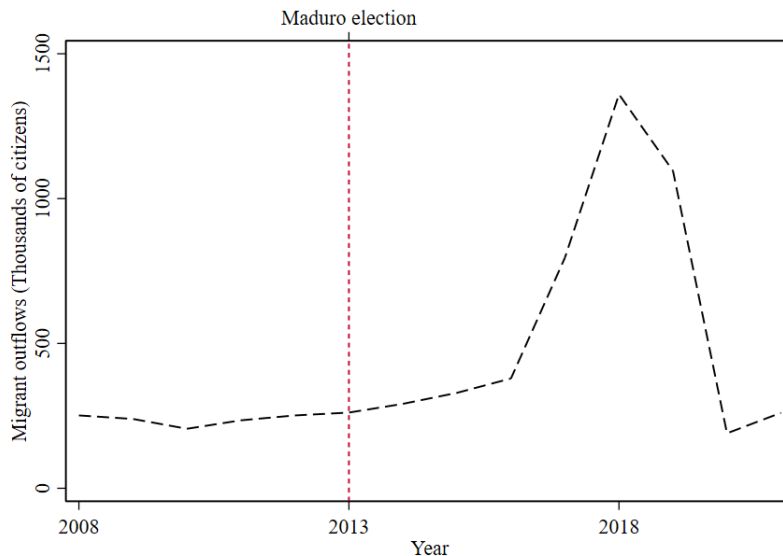
Most Venezuelan migrants have settled in neighboring Colombia, with more than 2.8 million residing there by 2024 (Figure 2). Figure 3 illustrates the annual inflows of migrants from Venezuela to Colombia, which almost quintupled from 2013 until 2018 when they reached their peak. Data from the ENCOVI, which includes a migration module between 2017 and 2021, further confirms that the relatives of Venezuelans living abroad have predominantly settled in neighboring Colombia (Table D.1).

Figure 2: Main Hosting Countries of Venezuelan Migrants in Latin America



Notes: Number of Venezuelan outflows to Latin American countries until May 2024 by host country was obtained from R4V (2024) (downloaded on June 10, 2024).

Figure 3: Venezuelan Migration into Colombia, 2008-2021



Notes: Migration outflows between 2008 and 2021 come from the Colombian migration agency ([Migración Colombia, 2023](#)).

3 Data

This section describes the data sources employed in the study. They can be broadly divided in three groups: remote sensing data, electoral data, and observational data. We describe each of these groups below. Additionally, Appendix B provides details on the outcome construction and Appendix C presents descriptive statistics for the main variables employed in the analysis. Our period of analysis comprises 1992 and 2021 in line with the availability of remote sensing data.

3.1 Municipal Level Data

Foreign settlements 1990. To define which municipalities were affected mainly by out-migration, we use census data for Venezuela to quantify the presence of foreign residents in municipalities during 1990—the last census before the election of Hugo Chávez.

The foreign settlement measure is constructed as the share of foreigners living in each municipality in 1990 as a percentage of the total number of foreigners in Venezuela that year. The year 1990 corresponds to the last population census before the election of Hugo Chávez, and as such, the location of foreigners at that time should be unaffected by the migration crisis.¹⁴ Figure 4 illustrates the geographic distribution of foreign share settlements.

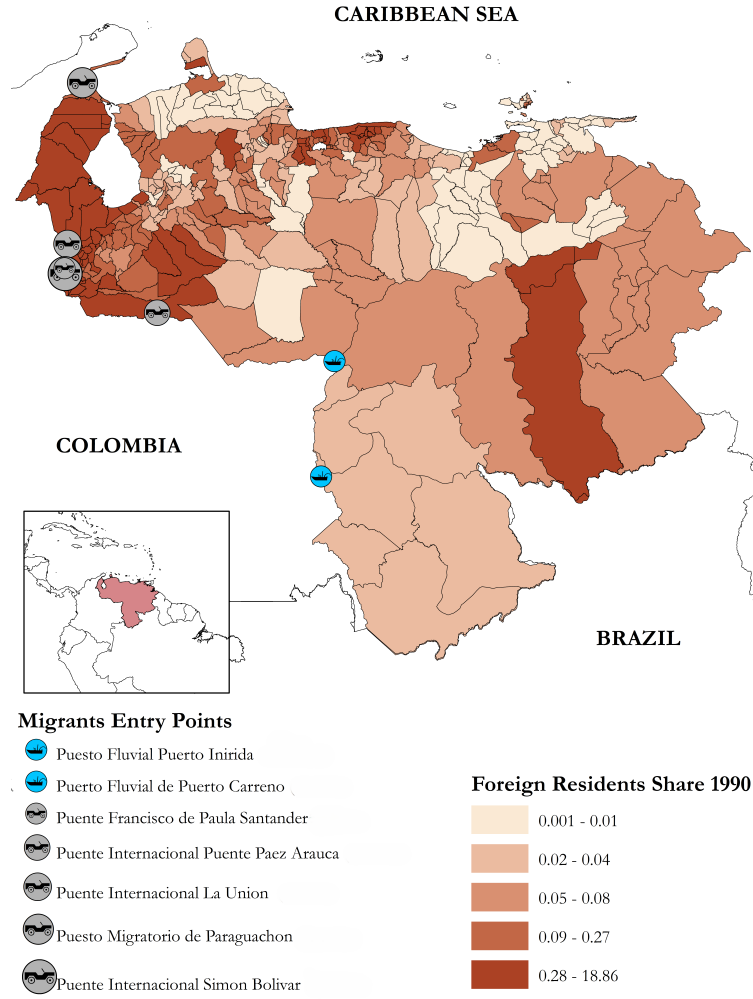
Table D.1 describes the nationality of origin of the foreigners living in Venezuela in 1990 and the hosting countries of relatives abroad of the families interviewed in the ENCOVI between 2017 and 2021. The overwhelming majority of foreigners living in Venezuela in 1990 were living in Colombia five years earlier. Moreover, for the households interviewed in the ENCOVI from 2017 to 2021 (with available data on relatives abroad) the majority of their relatives abroad are hosted in Colombia. As such, our measure of foreign settlements is intended to measure a push factor after 2013 that increases the likelihood of migration in municipalities with a higher share of foreigners through more networks abroad and more information on the migration process from Venezuela to Colombia. In particular, we exploit that most out-migration from Venezuela after 2013 came from municipalities with a larger share of foreigners in the 1990s. Section 4 validates this measure by examining whether Venezuelans arriving in Colombia after 2013 are more likely to belong to those municipalities with a more extensive foreign share.

Tables D.2 and D.3 characterize the foreigners living in Venezuela in 1990. Besides their overwhelming Colombian nationality, these individuals were mostly employed and had higher education and age than Venezuelans (Table D.2). They also had, on average, incomes three times as big as those of the Venezuelan population of 1990 (Table D.3).¹⁵

¹⁴Although the census does not allow to identify foreigners directly, it collects individual information on whether each person was living outside of Venezuela in the last five years. We use this measure as a proxy for foreign nationality.

¹⁵Notice that since the main specification follows a difference-in-difference design, any imbalance in the outcome levels between high and low foreign share municipalities does not represent a threat to the empirical strategy as they are absorbed by the municipality fixed effect in the empirical specification. Nevertheless, to rule out the concern that these characteristics could be trending differently, as robustness, we control for time trends in socioeconomic baseline characteristics.

Figure 4: Geographical Distribution of Foreign Settlements in 1990



Source: Administrative boundaries of Venezuela come from [Instituto Geográfico de Venezuela \(2015\)](#), migration posts location come from [Migración Colombia \(2023\)](#), and foreign residents share data was obtained from [IPUMS \(2023\)](#). Legends express the number of foreign residents per municipality as a percentage of the total national foreign residents in Venezuela in 1990 multiplied by 100.

3.2 Time-level Data

Outflows from Venezuela into Colombia, 1992-2021. We compile data on the annual outflows of Venezuelans into Colombia from 1992 to 2021, combining data from two sources. For the years spanning 1992 to 2002, we use information derived from the 1993 and 2005 Colombian population censuses which inquires about the year in which each Venezuelan migrant arrived

to Colombia. These data represents the number of Venezuelan nationals living in Colombia each year, as reported by respondents in those retrospective censuses. From 2003 to 2021, our data is based on records obtained from official Colombian migration checkpoints.

3.3 Remote Sensing Data

Night light density. In order to create a proxy of Venezuela’s economic growth and inequality, we construct a municipality-year level longitudinal dataset of satellite night light density for the period 1992-2021. This information is processed by the National Oceanic and Atmospheric Administration using the images collected by the U.S Defense Meteorological Satellite Program Operational Linescan System (spanning 1992 to 2013) and the Visible Infrared Imaging Radiometer Suite remote sensor (available from 2012 to 2021). Despite the availability of data, both sources of night light series are inconsistent due to differences in spatial and radiometric resolution, spectral responses, the spread function of the sensors, local overpass time at night, radiance range, and on-board calibration (Li et al. 2017; Sahoo et al. 2020). Hence, we harmonized the night light series for the period 1992-2021 following the process outlined by Li et al. (2020, 2017). Figure 5 shows the spatial distribution of night light density in 2014 (right after the sharp oil price decline) and our last period of analysis (2021). It illustrates a stark reduction in night light density over a remarkably short period of time.¹⁶

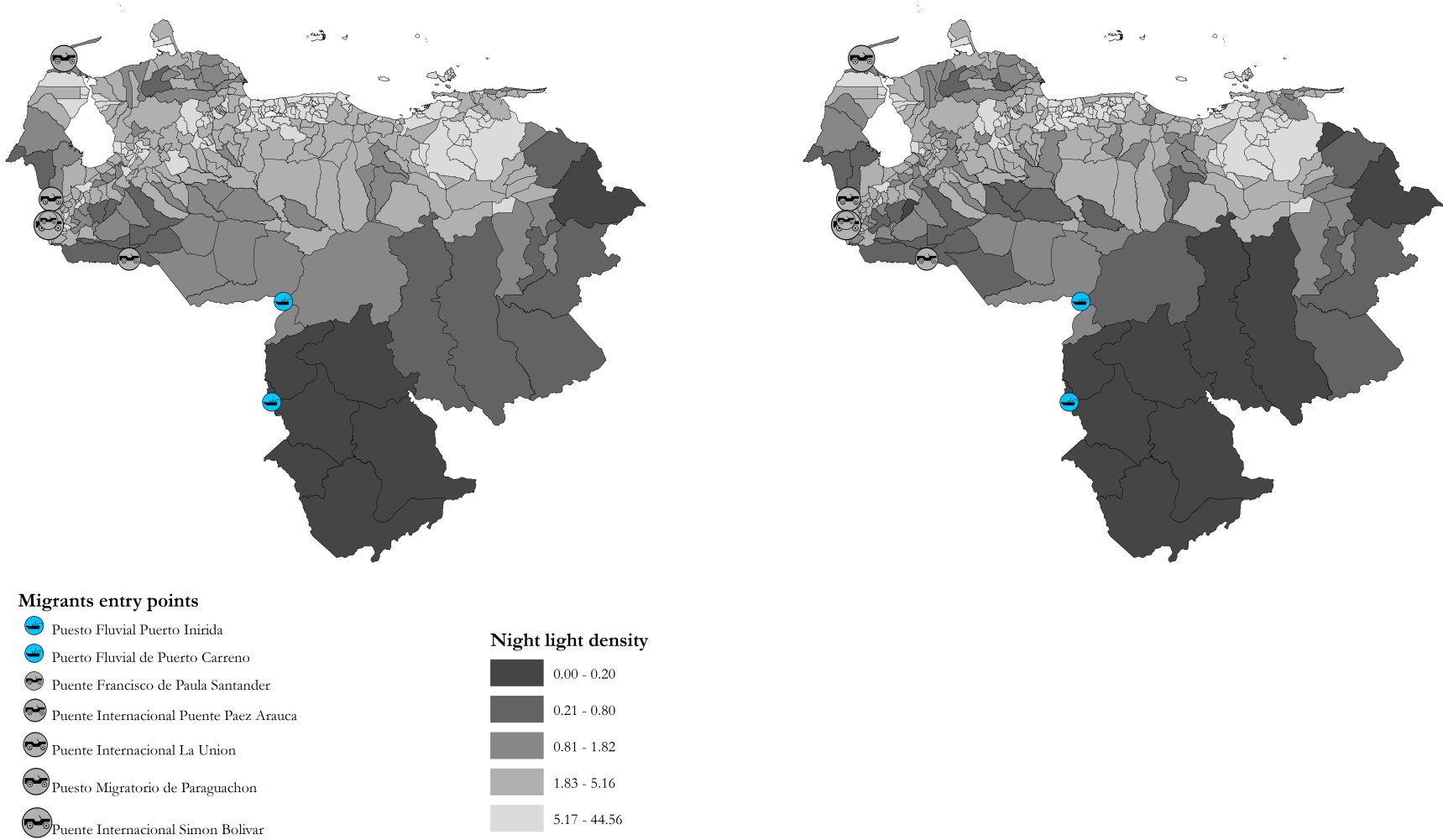
Spatial inequality. We construct a novel spatial Gini index. It corresponds to the traditional Gini formula estimated for each municipality and year using the night light of each parroquia (i.e., county) within each municipality as the unit of observation. Tables B.1 and B.2 show that our spatial measure of inequality is correlated with the traditional measure of income inequality constructed using population censuses for Venezuela (1990) and Colombia (1993 and 2005).

¹⁶We validate the validity of this measure as proxy for economic growth in Table B.2 and also test for the sensitivity of our main results to controlling for oil production to account for potential concerns related to biases introduced by brightness induces by gas flares in the satellite data.

Other remote sensing variables. We also use other remote sensing variables as controls. They are listed in Table C.1. These variables are meant to capture baseline economic characteristics and their linear trajectories. They include forest area from [Global Forest Watch \(2023\)](#), and data regarding urban built-up and areas covered by water from [MODIS Land Cover \(2023\)](#) (see Appendix B for details). All variables are recorded in 2001, the first year in which they were available.

Figure 5: Geographical Distribution of Night Light Density

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Source: Administrative boundaries of Venezuela come from [Instituto Geográfico de Venezuela \(2015\)](#), migration posts location was obtained from [Migración Colombia \(2023\)](#), and night light density data comes from [Li et al. \(2020\)](#).

3.4 Electoral Data

Presidential elections. We web-scraped information to construct longitudinal data at the municipal-election year level with the results of the four presidential elections held between 2006 and 2018. The data originated from the [Consejo Nacional Electoral \(2023\)](#) and the [VE360 \(2023\)](#) project. Specifically, we center our analysis in three outcomes: turnout (total votes divided by the electoral census), incumbent support (votes for Hugo Chávez or Nicolás Maduro as a percentage of electoral census), and opposition support (votes for other candidates as percentage of electoral census).¹⁷

Table [B.3](#) describes the four presidential elections within the study period, the elected candidate and the cause of election and Appendix B gives detailed information on the outcome construction and sources of information. Figure [6](#) and [7](#) shows the geographic distribution of the outcomes in the elections before and after 2013. They document a sharp nationwide reduction in electoral turnout and opposition support.

One relevant concern is the possibility that these data has been manipulated. We search for abnormal data patterns consistent with manipulation following the analysis first proposed by [Klimek et al. \(2012\)](#). The authors proposed a test that consists on making two-way scatter plots of the results of the elections illustrating the relation between electoral turnout and support for the incumbent by municipality, which in this case is the support for Hugo Chávez and Nicolás Maduro. Manipulation is evident graphically when there is a clear linear positive trend with concentration along the diagonal, so that per vote added in the electoral turnout the support for the incumbent increased systematically in one vote as well. Elections showing no manipulation typically show no obvious correlation between variables. The results of this exercise is illustrated in Figure [B.1](#). They suggest there was no systematic manipulation before 2018. In fact, the results are consistent with the international electoral reports from

¹⁷We fixed the electoral census in 2000 to keep the denominator constant in our estimates and facilitate interpretation of the coefficients. Yet, we also verified that our main results were consistent when we use the contemporaneous electoral census.

The Carter Center for the years 1998 to 2021 ([Carter Center, 2024](#)). Yet, there seems to be potential evidence of electoral manipulation for 2018.¹⁸ Consequently, we re-estimate all our specifications for the presidential elections of 2024 to validate our results. The results of the elections of 2024 were collected directly by the opposition, hence, they correct for manipulation concerns by the incumbent government.¹⁹ Reassuringly, this exercise supports our main findings. We complement this exercise with robustness checks using the results of municipal elections as outcomes.

Mayoral elections. We web-scraped data for the municipal elections for 2004 to 2021, for a total of five elections years in 335 municipalities = 1,675 independent election observations. The original data comes from the Consejo Nacional Electoral. We examine effects in the same two outcomes: electoral turnout and support for the opposition. To construct the share of votes for the opposition we classify each candidate based on their party affiliation and policy program. Appendix B describes details on the classification process of each candidate.

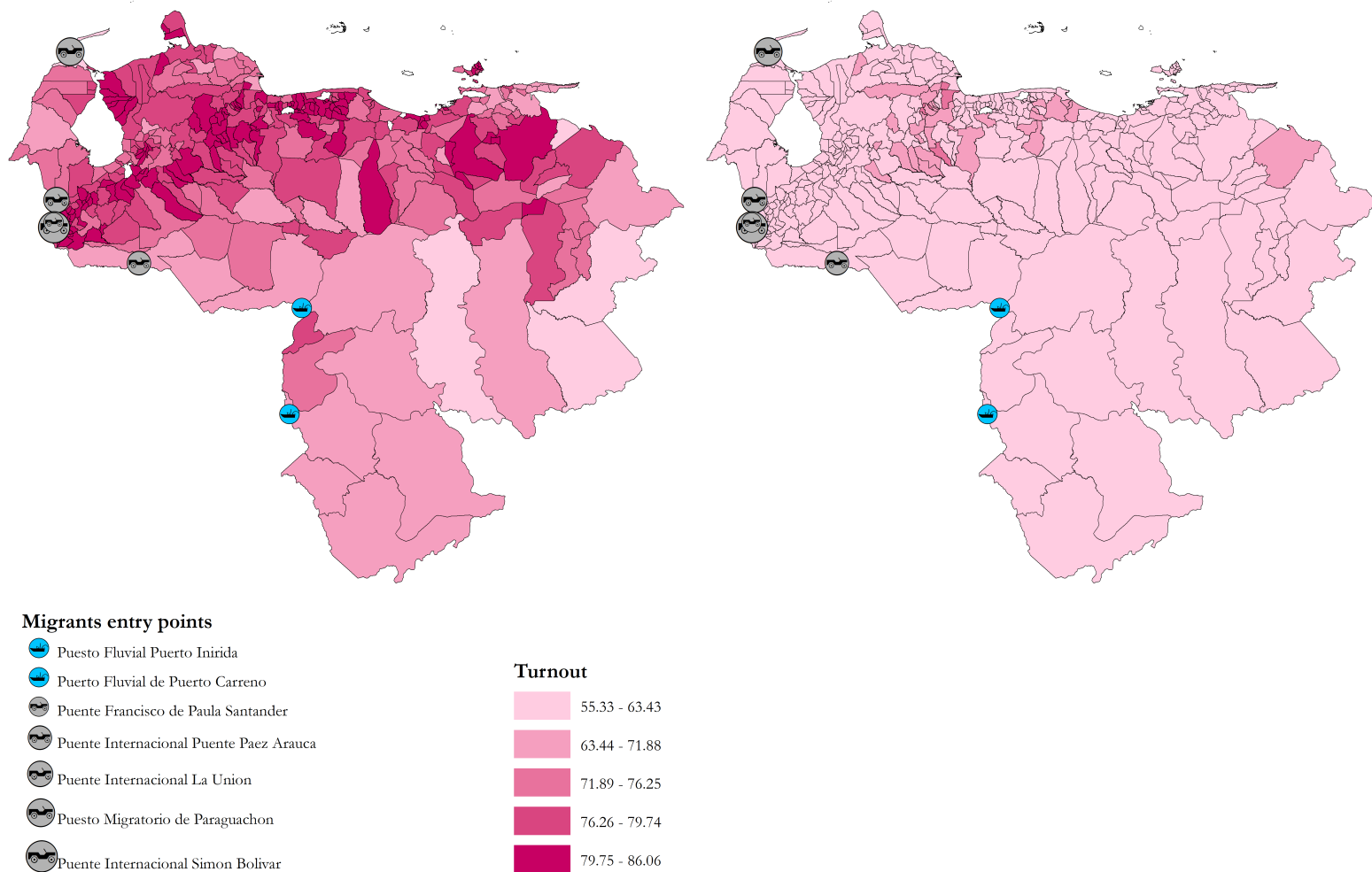
¹⁸These results also align with qualitative evidence from Venezuelans suggesting that there was a boycott from the opposition for those elections.

¹⁹The data is publicly available and can be accessed from [Resultados con VZLA \(2024\)](#).

Figure 6: Geographical Distribution of Electoral Turnout (Presidential Elections)

(a) 2006

(b) 2018

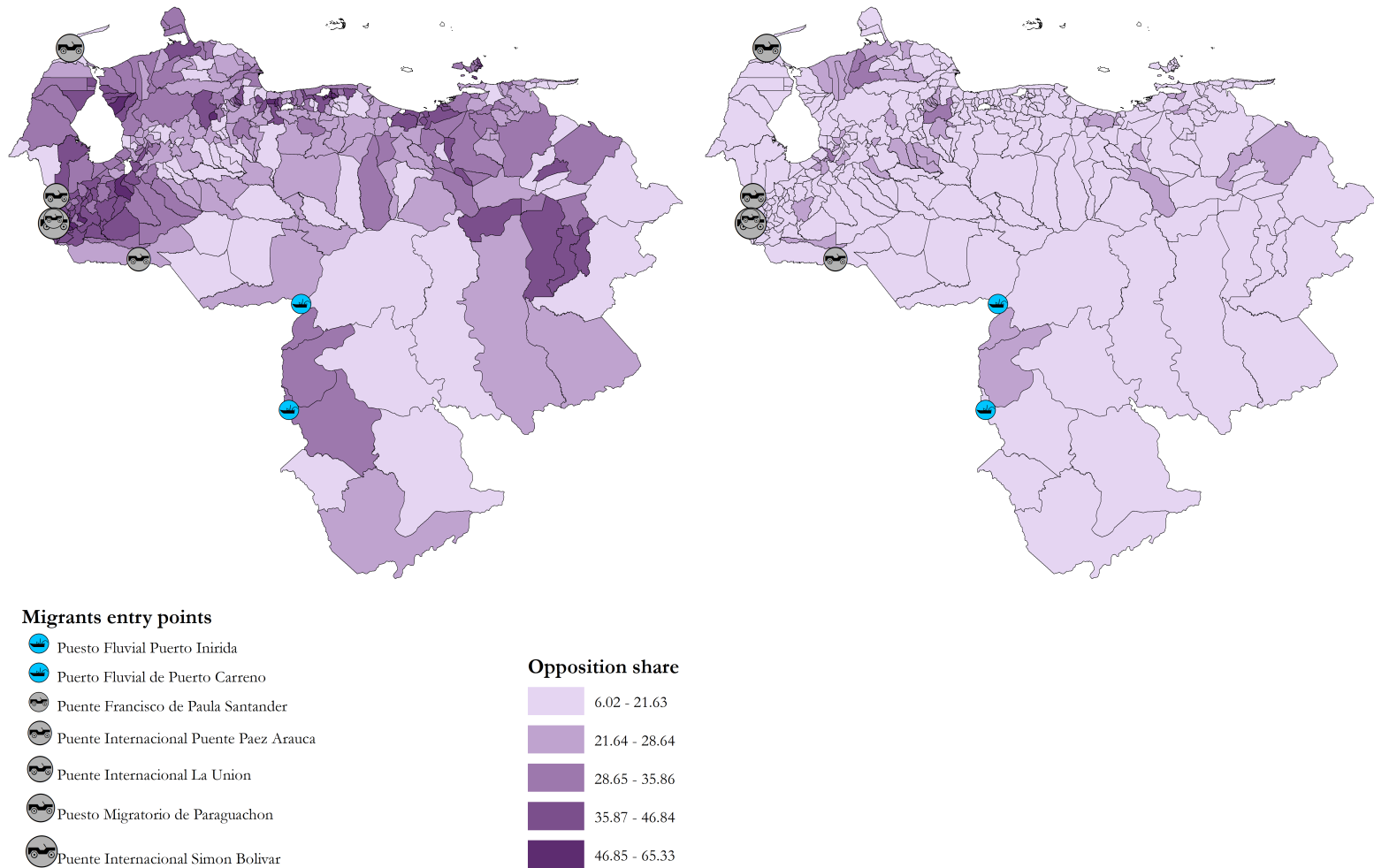


Source: Administrative boundaries of Venezuela come from [Instituto Geográfico de Venezuela \(2015\)](#), migration posts locations come from [Migración Colombia \(2023\)](#), and electoral data was obtained from [Consejo Nacional Electoral \(2023\)](#) and [VE360 \(2023\)](#). Legends express the turnout percentage as a share of the electoral census in Venezuela's presidential elections between 2006 and 2018.

Figure 7: Geographical Distribution of Votes for the Opposition (Presidential Elections)

(a) 2006-2013

(b) 2018



Source: Administrative boundaries of Venezuela come from [Instituto Geográfico de Venezuela \(2015\)](#), migratory posts location come from [Migración Colombia \(2023\)](#), and electoral data was web-scraped from [Consejo Nacional Electoral \(2023\)](#) and [VE360 \(2023\)](#). Legends express the opposition percentage as a share of the electoral census in Venezuela's presidential elections between 2006 and 2018.

3.5 Additional Survey and Observational Data

Colombian survey of Venezuelan migrants, 2018. We use a sample of approximately 3,000 Venezuelan households living in Colombia collected in 2018. The survey is used to determine the migrant’s municipality of origin in Venezuela before migrating to Colombia. This allows to validate the measure of foreign settlements as a pull factor for Venezuelan migration into Colombia. Although the data is not representative for all Venezuelan migrants to be used for the main analysis, it is nonetheless a useful resource to verify our hypothesis.²⁰

Venezuelan ENCOVI, 2014-2021. We also use unique National Survey on Living Conditions (ENCOVI) collected between 2014 and 2021 in Venezuela. These surveys are annual cross sections with independent households drawn each year. These surveys are representative at the national and state level and available for the main urban centers of the country. The surveys include a migration module characterizing the relatives of Venezuelans living abroad between 2017 and 2021.

Organized crime data. We construct a municipal-annual panel spanning the period between 1993 and 2024 which combines information on violent events and presence of organized crime and non-state armed actors from the Armed Conflict Location and Event Data and the Global Terrorism Database.

Other municipal data. We also employ other sources of information collected from multiple sources to examine the validity of the main results. These include municipal measures on the intensity of the energy blackouts of 2019, the coverage of social welfare programs under “*carnet de la patria*” for 2016-2017, and measures of political repression of the Chávez regime against civilians in 2004.²¹ We also use municipal-annual data on private firm expropriations by the government, and annual information on inflation and global sanctions for our whole

²⁰The survey was collected to examine the effects of the regularization program approved by Colombia in 2018 by Ibáñez et al. (2024). The survey was constructed to be representative of irregular migrants in Colombia in 2018 (those who actually were eligible or not for the Colombian regularization program)—i.e., those without the proper documentation to cross from Venezuela to Colombia.

²¹These data comes from Hsieh et al. (2011).

period of analysis. The sources of all data are described in Appendix B.

4 Empirical Design

It is said that migrants vote with their feet. This means that typically migrants attempt to leave places that are fairing poorly, in search for more prosperous and stable areas. These behaviors are likely to be even more pronounced in forcibly displaced settings, where migrants are forced to leave due to sudden and intense political and economic crises. Consequently, we cannot simply compare municipalities that show a higher and lower outflow of forcibly displaced populations. This comparison will be biased and likely suggest large negative impacts of forced displacement in economic activity. Moreover, such a comparison is typically restricted by data limitations, specially in the locations of origin for forcibly displaced populations, which are going through intense social, political, and economic crises.

We circumvent these issues by exploiting quasi-exogenous variation coming from the changes in outcomes observed by municipalities with varying levels of foreign settlements in 1990, before and after the international oil price and migration crisis onset in 2013.

Specifically, we estimate the following equation:

$$y_{mt} = \gamma_m + \alpha_t + \beta \left[I(t \geq 2013) \times \text{Foreigners Share}_{m1990} \right] + \sum_{z \in X'_m} \eta(z \times \alpha_t) + \varepsilon_{mt} \quad (1)$$

where m stands for municipality and t for year. y_{mt} represents the main outcomes of analysis including economic growth, spatial inequality, and electoral outcomes. $I(t > 2013)$ represents an indicator variable equal to one after 2013, and $\text{Foreigners Share}_{m1990}$ are the municipal foreign settlements shares of 1990 constructed as the ratio of foreigners in the municipality over total foreigners in the country and multiplied by one hundred to facilitate interpretation. Additionally, X'_m is a vector of baseline control variables (before the beginning of the Venezuelan crises in 2013). These pre-shock municipal characteristics are

interacted with year fixed effects to flexibly control for differential municipal trends. These variables include baseline night light density measured in 1992; urban coverage, water bodies, forest coverage observed in 2001; and proxies for political repression collected in 2004.²² γ_m , α_t are municipality and year fixed-effects, respectively. Standard errors are clustered at the municipality level to account for potential serial correlation within municipalities.

As such β , our coefficient of interest, measures the change in outcomes when the share of foreign settlements increases in one percent, before and after the onset of the international and migration crises in 2013.

To quantify the magnitude of the effects, we exploit Colombian data on the number of Venezuelan migrants per year. In particular, we estimate the same specification in equation (1) but replace the year dummy by a continuous measure of imputed outflows:

$$y_{mt} = \gamma_m + \alpha_t + \beta \text{Imputed Outflows}_{mt} + \sum_{z \in X'_m} \eta(z \times \alpha_t) + \varepsilon_{mt} \quad (2)$$

where

$$\text{Imputed Outflows}_{mt} = \left[\text{Outflows}_t \times \text{Foreigners Share}_{m1990} \right] \quad (3)$$

Imputed Outflows is our quasi-experimental variation on forced displacement outflows constructed as the interaction of total annual outflows of forcibly displaced migrants from Venezuela to Colombia and the municipal share of foreign settlements living in Venezuela in 1990. Foreigners share was multiplied by one hundred to facilitate interpretation. The variable is scaled by the total population of 1990 to approximate the share of individuals leaving each municipality in Venezuela as a percentage of total population in each municipality in

²²As described in Appendix B these measures correspond to the municipal count on the number of individuals that supported the opposition to the Hugo Chávez regime in an open letter and saw direct reductions in their economic opportunities through lower employment and access to the social welfare system. The data comes from [Hsieh et al. \(2011\)](#).

1990.²³ Our coefficient of interest, β measures the change in outcomes when the share of imputed outflows increases in one percent of the municipal population of 1990.

Our estimates are valid so long as there are no time-varying covariates, that we have not been controlled for, which are correlated with the share of foreign settlements and might also affect our outcomes of interest. We test the validity of this assumption by actually verifying that municipalities with a high and low share of foreign settlements in 1990 were showing a similar time trend in the outcomes of interest before the onset of the Venezuelan crises in 2013. We illustrate this is the case graphically in Figures 8a, 8b, 9a, and 9a.²⁴ In addition, for equations (1) and (2) to identify the effect of forced displacement on the outcomes of interest, the 2013 shock must have significantly increased the number of outflows in municipalities with a more extensive foreign share. We start by examining this issue in the next section.

4.1 Validity of Imputed Outflows

In this subsection, we show our measure of *Imputed outflows* as described in equation (3) approximates correctly the variation in actual forced displacement outflows from Venezuela.

First, we exploit data of Venezuelan migrants in Colombia to show that our measure is positively and statistically significantly correlated with the municipality of origin and dates of arrival of Venezuelans interviewed in Colombia in 2018 (see Panel a in Table D.4).²⁵

Second, we use household data in Venezuela, where individuals report whether they have a member who migrated abroad and in which year. Moreover, the same table shows that our measure of imputed outflows is also correlated with the number of households reporting

²³Even if migrants are not planning to stay in Colombia, they are likely to leave Venezuela through Colombia as the other routes are more difficult (they need to cross the Amazon rain forest).

²⁴We estimate equation 1 but replacing $I(t > 2013)$ with year dummies (the omitted category is the year 2012).

²⁵While the Colombian data on Venezuelan migrants enable us to validate our measure, it does not allow us to make a rigorous econometric analysis due to its limited geographic scope in the number of municipalities covered in Venezuela (in particular PEP data does not cover individuals that enter Colombia from illegal crossings).

having a relative living abroad in the ENCOVI data between 2017 and 2021.²⁶

5 Development and Forced Displacement

Table 1 depicts the results of estimating equations (1) and (2) using three outcomes: night light density (column 1), the logarithm of night light density (column 2), and the spatial Gini measure based on night light (column 3). The table illustrates three panels: Panel A illustrates the estimates of equation (1) and Panel B and C illustrates the estimates of equation (2) with and without controls. Consistently, all estimates show that municipalities with a higher share of foreign settlements saw sharp reductions in night light after the crises onset in 2013.

²⁶As with the other surveys, the ENCOVI only allows to validate the measure of imputed outflows, but have a small number of municipalities to actually be useful for a more rigorous econometric analysis. Moreover, the ENCOVI only included a migration module between 2017 and 2021.

Table 1: Development and Forced Displacement

	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Panel A: Diff-in-diff estimates including controls			
I(Year>2013) $\times$ Foreigners Share	-0.342*** (0.120)	-0.135*** (0.038)	0.012* (0.006)
Panel B: Imputed outflows, including baseline controls $\times$ time trends			
Imputed Outflows	-0.036*** (0.009)	-0.016*** (0.003)	0.001* (0.001)
Panel C: Imputed outflows, excluding controls			
Imputed Outflows	-0.037*** (0.009)	-0.015*** (0.004)	0.001* (0.001)
Additional controls for all panels			
Observations	10,020	9,974	10,020
Dependent Mean 1992	3.77	0.034	0.27
Municipality Fixed Effects	✓	✓	✓
Year Fixed Effects	✓	✓	✓

Notes: The table illustrates the estimated coefficients of equation (1). *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. It is re-scaled by the total municipal population of 1990. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Our preferred results are those presented in column (2) and Panel A. They suggest that municipalities with a one percent higher share of foreign settlements in 1990 saw night light density reduced by 13.5 percent on average after 2013, relative to the previous time-frame. These estimates are consistent with the ones presented in Panels B and C, which suggest that when imputed outflows increase in one percent of the total municipal population, night light density is reduced by approximately 1.6 percent. These are substantial effects. For example, if we consider a municipality with a 10 percent foreign share (which translates into about 5 percent migration flow of Venezuelans to Colombia, see Table E.22) and given that imputed

outflows rose by 500 percent between 2013 and 2018, the total reduction in night light caused by out-migration inflows between 2013 and 2018 is of 80 percent ($=500 \times 0.016 \times 10$). It is equivalent to a contraction of 22% ($=0.8 \times 0.28$) in gross domestic product (Henderson et al. 2012). Additionally, we observe changes in inequality of approximately 0.001 per one percent increase in the imputed outflows as a share of the municipal population.

In terms of the timing of the effects, Figures 8a and 8b show that before 2013 there were no differences in economic development across municipalities with different foreign shares. In line with the idea that out-migration mostly occurred in municipalities with a large foreign network, after 2013 we see an immediate decline in economic conditions. Moreover, we observe that effects are accentuated after 2017 when we observe the peak in out-migration.

Our core results remain consistent to a number of robustness tests including estimating the effects for units of lower size, even 1-squared-kms grids (Table E.1); correcting the standard errors for spatial auto-correlation assuming correlations at different distances including 300, 150 and 50 kms (Tables E.3, E.4, and E.6); approximating the municipal variation of imputed outflows with the linear and road inverse distance of each municipality to the main entry points in Colombia (Tables E.10 and E.8); and using alternative difference-in-difference estimators in line with the latest developments in the methods literature (Table E.18).

Moreover, we also estimate the effects of mass out-migration using annual data from the ENCOVI estimating income per capita and inequality by state and year between 2017 and 2021 to validate our main results.²⁷ The results also point to reduction in real total and per capita income at the household level (Table E.12). The coefficients, however, are smaller considering that real income is extremely low for the period for which micro data was collected (2017 to 2021). In fact, there was a the dramatic decline in income nationwide and a complete generalized loss of purchasing power caused by hyperinflation in this period. As pointed out earlier, most individuals (94%) had an income lower than the poverty line by

²⁷We cannot use the data beginning in 2014 due to the low number of cities covered in the survey for those initial years.

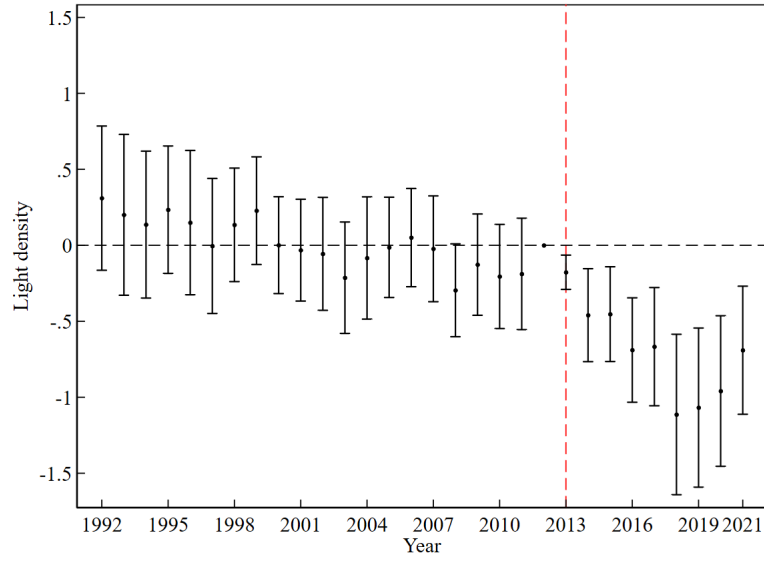
2021 [A.2](#).

Finally, we also demonstrate that the documented effects are not driven by differential trends in municipalities that had higher or lower oil production. We do this by showing that our main estimates remain unchanged when controlling for the location of oil fields interacted with time trends (Table [E.19](#)).²⁸

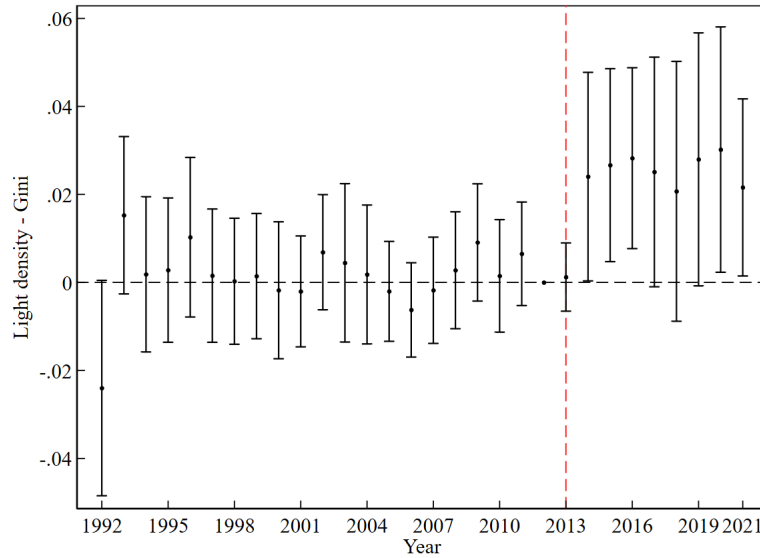
²⁸We use the Global Oil& Gas Features Database which includes information on the development of the Global Oil and Gas Infrastructure from [Sabbatino \(2018\)](#). The data standardizes and integrates disparate oil and gas infrastructure data from over 380 sources worldwide, encompassing more than 4.8 million features for 2018. Controlling by this measure also addresses the concerns about the effect of gas flaring due to oil production on night light density.

Figure 8: Forced Displacement and Development

(a) Night Light Density



(b) Spatial Inequality



Notes: The figure illustrates an event study of the change in night light density and spatial Gini between 1992 and 2021 for municipalities with varying levels of foreign share settlements in 1990. Foreign shares are constructed for each of the 335 municipalities using data from the 1990 population census in Venezuela. It corresponds to the ratio of foreigners living in each municipality to the total number of foreigners living in Venezuela in 1990. All estimates include fixed effects by year and municipality. Bars illustrate 95% confidence intervals. The excluded year is 2012. Standard errors were clustered at the municipality level.

5.1 Who are the Venezuelans Leaving the Country?

The most intuitive explanation of the observed effects of forced displacement in development is that the most educated and productive individuals left Venezuela, which can have significant implications for aggregate productivity and long-term institutional development. For instance, highly educated professionals and academics are often better positioned to challenge the status quo and are typically key capital holders, investors, and the main drivers of innovation and productivity.

ENCOVI data enables us to profile the relatives of Venezuelan households who emigrated each year by age, gender, and education (Table 2). In line with this hypothesis, we document that these migrants have been disproportionately adults of productive age (15-50 years old), predominantly male, and initially included individuals with higher education levels compared to those remaining in Venezuela. However, over time, a growing number of less-educated individuals also began leaving the country.

Table 2: Socio-Demographic characteristics of Migrants (%)

Variables	2017	2018	2019	2021
Age				
0-15	6.55	5.98	6.33	5.68
15-29	53.45	53.06	49.11	48.96
30-49	32.00	31.60	39.64	40.32
50+	4.91	4.16	4.70	4.95
Missing	3.09	5.20	0.22	0.09
Sex				
Female	49.82	46.16	45.03	42.34
Male	49.64	53.84	54.97	57.66
Missing	0.55	0.00	0.00	0.00
Educational attainment				
No Education	0.42	0.61	1.01	1.33
Primary	5.83	6.89	8.85	11.03
Secondary	35.21	45.18	53.00	51.06
Graduate and Post	53.75	43.34	37.15	36.58
Missing	4.79	3.98	0.00	0.00
Country of Migration				
Colombia	35.82	38.10	41.75	44.55
United States	10.55	4.94	2.48	2.30
Ecuador	6.18	7.15	8.74	9.50
Peru	7.09	18.47	22.17	21.44
Panama	8.00	3.77	1.35	0.77
Chile	9.45	8.45	9.94	9.10
Spain	3.82	1.95	2.88	3.20
Mexico	1.45	1.82	0.44	0.50
Argentina	5.09	3.64	3.02	1.89
Brazil	0.00	0.00	4.33	3.87
Other country	11.64	9.23	2.91	2.88
Missing	0.91	2.47	0.00	0.00

Notes: The panels depicting age and sex represent the proportions of migrants categorized by age groups and gender, respectively. The panel on educational attainment considers only migrants over the age of 18, as the majority of this demographic have completed secondary education. Finally, the last table provides a tabulation of migrants according to their country of migration. *Source:* [National Survey on Living Conditions \(2021\)](#).

Moreover, the mass forced displacement of Venezuelans has caused significant shifts in the country's labor force and sector distribution. ENCOVI data from 2019 to 2021 show a sharp decline in the share of Venezuelans with higher education (Table [A.1](#)) and a major

shift from professional and technical jobs to elementary occupations. Nearly every economic sector contracted between 2017 and 2021, except for agriculture and other services, indicating a shift from formal and secondary sectors to informal and primary ones (Table 3). This is further confirmed by Table 4, which shows a steep decline in salaried work, offset by a rise in self-employment. These trends suggest that the mass exodus of Venezuela’s productive labor force has been a key factor in the country’s economic decline.

Table 3: Characterizing Local Labor Force Left in Venezuela, 2017-2021 (%)

Variables	2017	2018	2019	2021
Type of Occupation				
Managers	2.37	2.00	1.52	1.59
Professionals and technicians	27.06	26.62	21.52	18.65
Machine operators and related trades workers	13.54	12.36	9.04	8.70
Service and sales workers	25.54	26.14	24.05	21.71
Elementary occupations	25.68	27.49	41.36	46.90
Armed forces occupations	1.98	2.15	2.51	2.45
Missing	3.83	3.24	0.00	0.01
Economic Sector				
Agriculture, forestry and fishing	6.68	8.09	7.86	12.04
Mining	1.41	1.76	0.71	0.87
Manufacturing	4.79	3.71	2.73	1.88
Electricity, gas and water	1.26	1.29	1.46	1.51
Construction	5.81	5.34	4.64	4.81
Wholesale and retail	22.33	23.92	17.43	19.53
Transportation and communications	11.56	10.03	14.03	11.59
Financial, real estate, and scientific service	6.76	4.07	5.73	5.34
Public administration, education and health	36.77	27.06	19.98	17.20
Other services (*)	-	12.65	25.39	25.20
Missing	2.62	2.10	0.04	0.02

Notes: The panel on the Economic Sector presents a tabulation of the employed population within the 15 to 65 age range, categorized by the main occupation classification according to a modified version of the A10 aggregation in the International Standard Industrial Classification. The A10 aggregation represents an advanced taxonomic classification, fundamentally comprising amalgamations of divisions from the Fourth Revision of the International Standard Industrial Classification of All Economic Activities (ISIC Rev.4). (*) The category "Other services" includes repairs, cleaning, hairdressing, funeral, and domestic services. Additionally, in 2017, the questionnaire introduced the category "other services" within the sectors of Public Administration, Education, and Health. Similarly, the panel on the Type of Occupation shows the classification of main occupations based on aggregations of the major group classification of the International Standard Classification of Occupations (ISCO-08). We have aggregated the categories of professionals, technicians, associate professionals, and clerical support workers into "professionals and technicians." Additionally, we have combined craft and related trades workers, plant and machine operators, and assemblers into "machine operators and related trades workers." Finally, we have consolidated skilled agricultural, forestry, and fishery workers with elementary occupations into the single category "elementary occupations." *Source:* [National Survey on Living Conditions \(2021\)](#).

Table 4: Characteristics of Economically Active Population Left in Venezuela (%)

Variables	2014	2015	2016	2017	2018	2019	2021
Type of Employment							
Employee (public sector)	34.29	27.44	27.16	31.87	31.40	24.60	20.49
Employee (private company)	25.16	32.44	26.77	22.11	22.53	22.10	20.11
Employer	3.12	3.93	3.03	2.87	1.85	2.82	2.85
Self-employed worker	28.92	29.53	37.58	36.21	39.27	44.95	51.37
Member of cooperatives	1.12	1.27	0.94	1.74	0.43	0.73	0.59
Paid / unpaid family	1.77	2.35	1.71	1.65	1.42	2.93	2.93
Domestic service	0.97	1.97	0.78	0.84	1.03	1.87	1.65
Missing	4.65	1.07	2.03	2.71	2.07	0.00	0.00

Notes: The table presents a detailed tabulation of the employed population within the 15 to 65 age range, categorized by type of employment. *Source:* [National Survey on Living Conditions \(2021\)](#).

5.1.1 Remittances are Disproportionately Used for Subsistence Activities

A key question concerns the role of remittances sent by Venezuelans abroad to their families back home ([Amuedo-Dorantes and Pozo 2006](#); [Giuliano and Ruiz-Arranz 2009](#); [Portes 2009](#); [Ambler et al. 2015](#)). While remittances may help offset the economic impact of losing the most productive members of the labor force, their broader effects depend on how recipients use these funds. Using data from the 2019 and 2021 ENCOVI, we analyze how Venezuelan households are utilizing remittances. These are the only two nationally representative surveys that categorize household spending of remittances.

As illustrated in Figure [E.1](#), the vast majority of households use remittances for subsistence needs, such as food and housing, rather than for investment or business activities. Consequently, these remittances are less likely to stimulate long-term economic growth.

5.1.2 Forced Displacement and Human Capital Investments

As forced displacement intensifies and economic opportunities become scarce, investments in human capital at origin locations might be disproportionately discouraged. This could be due to changes in the returns to education locally, the substitution of education into

subsistence activities, or the desire to invest in education abroad only. We explore this possibility employing data from the ENCOVI and assessing the role of imputed outflows on the average years of education for individuals older than 18 years of age and school attendance for children and adolescents (Table 5).²⁹ Our results support the idea that places with higher imputed migrant outflows are also seeing lower education investments and school attendance.

Table 5: Forced Displacement and Reduced Human Capital Investments

	Years of Education	School Attendance
Panel A: Education Outcomes	(1)	(2)
Imputed Outflows	-0.00285*** (0.00036)	-0.00121*** (0.00024)
Observations (State and Year)	73,997	46,813
Dependent Mean 2014	7.93	0.65
State Fixed Effects	✓	✓
Year Fixed Effects	✓	✓

Notes: The term *Imputed Outflows* is defined as explained in Equation (2). Controls in baseline interacted with time trends include: urban, water bodies, forest loss area for year 2001, night light density for 1992, *Carnet de la Patria* holders (between 2016 and 2017), number of *parroquias* with rationed energy at the municipality level (April 2019) and intensity of blackout (March 2019), number of enterprises acquired by the Venezuelan state. Controls from ENCOVI: head of household and member gender, age marital status and number of household members. For column (1) the estimates include only individuals over 23 years old in 2013, for column (2) individuals between 6 and 17 years old in 2013. Bootstrap standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.2 Are Governmental Actions Targeted to Municipalities with Large Foreign Shares?

One relevant concern is that our results might be affected by governmental actions that targeted disproportionately municipalities with more or less foreign settlement share in 1990. For example, the government might have used social programs to gain more political support or alienate disproportionately the private sector in municipalities with more foreigners in 1990. Particularly, there were three salient economic policies and eventualities affecting municipalities with time variation during our period of analysis, they include: the coverage

²⁹We cannot estimate equation 1 because the ENCOVI data only is available after 2014.

of the Venezuelan social welfare program (centralized through an ID called “Carnet de la Patria”), mass energy blackouts, and expropriations to the private sector. We collect approximate municipal temporal variation measures for each of these actions from multiple sources and control for their variation in Tables E.15 and E.16.³⁰ Our main results remain unchanged suggesting the main effects of out-migration outflows are not affected by these policy and events changes and are predominantly driven by migration outflows.

6 Forced Displacement and the Perpetuation of Autocratic Leaders

In this section, we study the conditions for which autocratic leaders may stay in power despite economic and social crisis. In particular, we document that in the medium term forced displacement facilitates the perpetuation of autocratic leaders in power by weakening the political opposition and facilitating the expansion of organized criminal groups and illicit economic activities. These two effects further reduce the pressures for social and economic change.

6.1 The Obliteration of the Political Opposition

Considering that forced migrants leave their origin countries, they are likely to oppose incumbent governments that they might view are responsible of the crises they are fleeing. As they leave, forced migrants might be potentially depleting support for the opposition and reducing pressure for social and economic change.

We explore this hypothesis by examining the effects of forced displacement on electoral turnout and support for the incumbent’s opposition using them as outcomes in the specifications presented in equation (1) and equation (2) (Table 6). Presidential turnout is defined

³⁰All sources of information are described in Appendix B.

as the total votes in each election divided by the electoral turnout of 2000 (the first available before the oil shock crises of 2013). We fixed the electoral turnout as it may be affected by migration flows, hence, we are only measuring changes in the numerator. Opposition support, is defined as the ratio of opposition votes (votes to any candidate other than Hugo Chávez or Nicolás Maduro) and the electoral turnout of 2000.³¹

³¹2000 is the first year available to carry out this exercise. Forced displacement was negligible at this time as oil prices in Venezuela were surging. All the estimates remain unchanged if we use the contemporaneous electoral census. However, in our view, leaving the denominator fixed in 2000 makes interpretation easier and provides a lower bound of the estimates.

Table 6: Forced Displacement Weakens Political Opposition, Presidential Elections

	Turnout (1)	Opposition (2)
Panel A: Diff-in-diff estimates including controls		
I(Year>2013)× Foreigners Share	-4.526*** (1.416)	-2.696*** (0.705)
Panel B: Imputed outflows, including baseline controls × time trends		
Imputed Outflows	-0.663*** (0.158)	-0.358*** (0.073)
Panel C: Imputed outflows, excluding controls		
Imputed Outflows	-0.649*** (0.158)	-0.351*** (0.076)
Additional controls for all panels		
Observations	1,324	1,324
Dependent mean 2006	31.4	10.2
All controls	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Notes: The table illustrates the estimated coefficients of equation (1). Turnout in column (1) is defined as the total votes for each presidential election held in Venezuela between 2006 and 2018 divided by the electoral census of 2000. (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by municipality are presented in parenthesis. ***p<0.01, **p <0.05, *p<0.1.

The results from Panel A suggest that municipalities with a one percent higher share of foreign settlements in 1990 saw electoral turnout and opposition reduced by 4.5 and 2.96 p.p. on average after 2013, relative to the previous time-frame. Similarly, results from Panel B and C suggest that when imputed migration outflows increase in one percent of the population of 1990, presidential turnout and opposition support decrease by approximately 0.6 and 0.3 p.p., respectively.

Considering that there might be concerns of manipulation for the elections of 2018, we also estimate the effects of mass forced migration using the last presidential elections of 2024 for which we have results of over 83.5 percent of the country. These results were collected and published by the opposition to the incumbent government, and as such, should attenuate these concerns.³² The results remain unchanged when we add data from these elections to our main estimates (Table [E.13](#)).

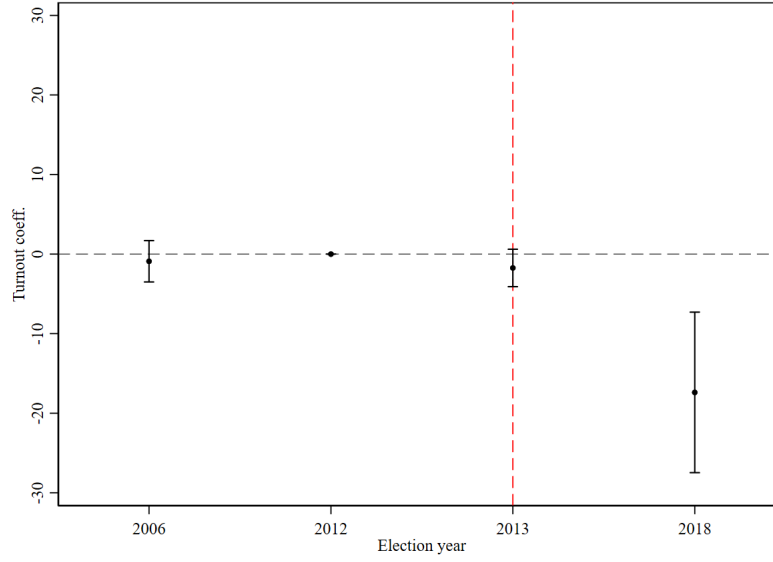
Consistent effects are documented for mayoral elections (see Table [E.14](#)). Although the coefficients point to smaller effects they also are negative and statistically significant. This is a remarkable consistency test as these estimates test the effects of forced displacement outflows in five years of elections in 335 municipalities, for a total of 1,675 independent municipal elections.

All in all, the results consistently suggest that mass forced migration has reduced the opposition to the incumbent regime and political turnout, both of which are key sources of pressure for social change.

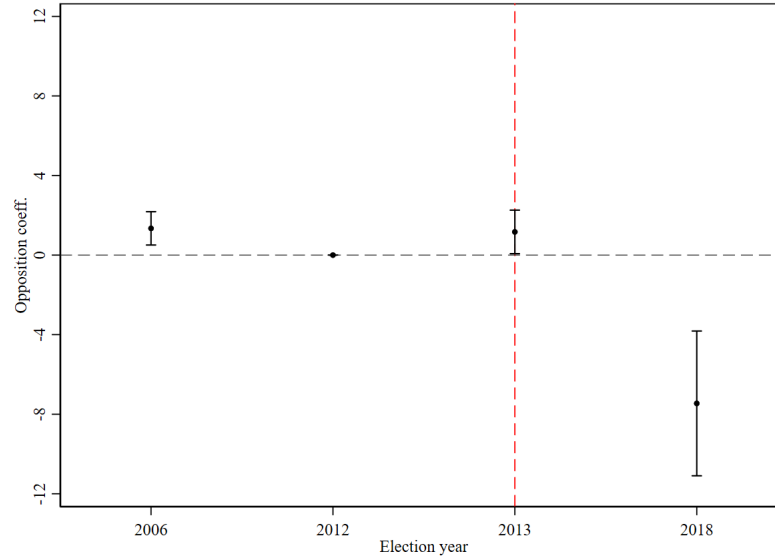
³²The data comes from [Resultados con VZLA \(2024\)](#).

Figure 9: Forced Displacement and Presidential Electoral Outcomes

(a) Electoral Turnout



(b) Opposition Support



Notes: The figure illustrates an event study of the change in turnout and opposition support in the presidential elections (measured in votes for candidates other than Nicolás Maduro or Hugo Chávez over the electoral census of 2000) between 2006 and 2021 for municipalities with varying levels of foreign share settlements in 1990. Foreign shares is constructed for each of the 335 municipalities using data from the 1990 population census in Venezuela. It corresponds to the ratio of foreigners living in each municipality to the total number of foreigners living in Venezuela in 1990. All estimates include fixed effects by year and municipality. Bars illustrate 95% confidence intervals. The excluded year is 2012. Standard errors were clustered at the municipality level.

6.2 The Expansion of Organized Crime and Illicit Economic Activities

Migration typically facilitates connections between individuals left in origin countries, those who leave, and those at destination countries. It has been extensively documented that migration networks can facilitate knowledge diffusion, trade, and foreign direct investment globally ([Javorcik et al. 2011](#); [Parsons and Vézina 2018](#)). Yet, these positive effects are completely closed for origin locations with sufficiently weak institutional stability and rule of law. In these contexts, however, forced migration flows can also facilitate connections for organized criminal networks at origin and destinations ([Kapur 2014](#)). This will occur, for example, when criminals exploit or recruit migrants taking advantage of their vulnerability or if they rely on them to help fund, inform, or expand their activities.

In fact, there is abundant qualitative evidence suggesting that human trafficking has become a significant criminal enterprise in this context, with Venezuelans forced migrants, especially women and children, falling victim to these operations ([Insight Crime, 2023d, 2021b,a](#)). For instance articles suggest that ([Insight Crime 2023b](#)): *“Migrants using irregular border crossings also represent a source of income for armed groups and predatory criminals, who extort the migrants as they cross their territory and, in some cases, also rob or kidnap them or force them into roles such as human couriers for drug trafficking. Human traffickers have also capitalized on the crisis, tailoring their recruitment of Venezuelan women and girls by offering false offers of jobs, scholarships, or even religious charity as bait for what ends up being coerced sexual exploitation.”*

Journalistic reports also extensively suggest that forced displacement outflows have been going hand-in-hand with the expansion of drug trafficking groups from Colombia to Venezuela; often times these expansion comes from the employment of forced migrants in the lower ranks of these organizations or from extortion fees charged to migrants en-route ([Insight Crime, 2023a,c, 2019](#)). For example, reports argue that ([Insight Crime 2018](#)): *“(...) Venezuelans*

have to choose between hunger or joining the ranks of organized crime groups, which is helping them strengthen and reorganize their criminal structures while also facilitating the spread of their illegal activities into Venezuela.”

We examined these hypotheses by putting together longitudinal municipal-level data on violent and crime events by type of actor. The data is sourced from the Global Terrorism Database (1992-2021) and the Armed Conflict Location and Event Data (2018-2024). We use the data to examine the impact of mass forced migration outflows on the expansion of Colombian and Venezuelan organized criminal groups and non-state armed actors (Table 7).³³ The results presented in Panel A largely support these hypotheses, showing that mass forced migration is associated with an increased number of events by the largest non-state armed actors from Colombia, including the Revolutionary Armed Forces of Colombia (FARC) and the National Liberation Army (ELN)—organizations largely involved in drug trafficking—as well as a rise in violent events linked to Venezuelan organized criminal groups including gangs, colectivos, sindicatos, and drug-trafficking cartels. We also examine the effects on irregular armed groups, such as small street gangs and criminal organizations that are not related to drugs and human smuggling or the regime and we find no effects, providing evidence that effects are not driven by an increase in overall crime.

³³We only present the estimates using imputed outflows as the source of quasi-exogenous variation because data is only disaggregated by actor after 2018 in great detail to enable this analysis.

Table 7: Forced Displacement and the Expansion of Organized Crime

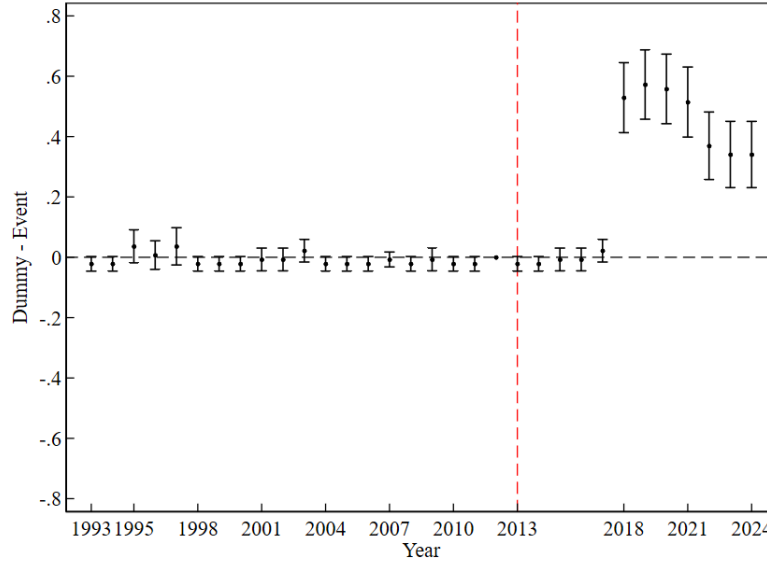
Total Events Associated with	FARC (1)	ELN (2)	Organized Crime (3)
Imputed Outflows	0.002** (0.001)	0.008** (0.004)	0.052** (0.022)
Observations	11,022	11,022	11,022
Dependent mean baseline	0.009	0.003	2.10
Exclude outlier municipality (Libertador)	✓	✓	✓
Municipality FE	✓	✓	✓
Year FE	✓	✓	✓

Notes: In Panel A, column (1) represents the total number of conflict events involving the Revolutionary Armed Forces of Colombia (FARC) in Venezuela from 1992 to 2024. Column (2) shows the total conflict events associated with the Colombian National Liberation Army (ELN) during the same period. Column (3) captures the total conflict events carried out by non-terrorist but criminal armed groups—such as gangs, colectivos, sindicatos, and drug-trafficking cartels—between 2018 and 2024. Clustered standard errors by the municipality are presented in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The validity of the estimated effects are further illustrated in Figure 10, where we aggregate all the sources of data to have a longer time series.³⁴ The figure shows a sharp increase in the likelihood of having an event associated to non-state actors in municipalities with higher concentrations of foreign settlements after 2018, coinciding with the peak of Venezuelan forced displacement to Colombia. It suggest that the expansion of non-state armed actors and criminal networks took time to manifest, emerging notably after the oil price shocks of 2013. This economic downturn, combined with the resulting mass forced displacement, created conditions that allowed these groups to gradually extend their influence, particularly in regions with higher concentrations of foreign settlements following 2018 when migrants were highly vulnerable and less educated.

³⁴Before 2018, the data did not include information on gangs to be able to separate them.

Figure 10: Indicator Variable for Non-State Actors



Notes: The figure illustrates an event study of the change in the probability that an event associated with non-state actors occurred between 1993 and 2024 with varying levels of foreign share settlements in 1990. Foreign shares are constructed for each of the 335 municipalities using data from the 1990 population census in Venezuela. It corresponds to the ratio of foreigners living in each municipality to the total number of foreigners living in Venezuela in 1990. All estimates include fixed effects by year and municipality. Bars illustrate 95% confidence intervals. The excluded year is 2012. Standard errors were clustered at the municipality level.

6.3 How Important are these Channels?

In this subsection we investigate the role of reduced political opposition and the expansion of organized criminal groups in explaining the negative effects of forced migration on development outcomes. To do this, we apply the methodology introduced by [Acharya et al. \(2016\)](#) which estimates the Average Controlled Direct Effect (ACDE) of a treatment. The ACDE is the effect of forced displacement on development after partialing out forced displacement's effect on political opposition and organized crime. This exercise is estimated by partialing out the effect of political opposition and organized crime, and then estimating the ACDE by regressing the de-mediated night light luminosity on imputed outflows. This is done through a two-stage model as follows:

$$Y_{mt} = \delta_0 + \delta_1 \text{Imputed Outflows}_{mt} + \delta_2 \text{Opposition}_{mt} + \delta_3 \text{Organized Crime}_{mt} + \sum_{z \in X'_m} \eta(z \times \alpha_t) + \epsilon_{mt} \quad (4)$$

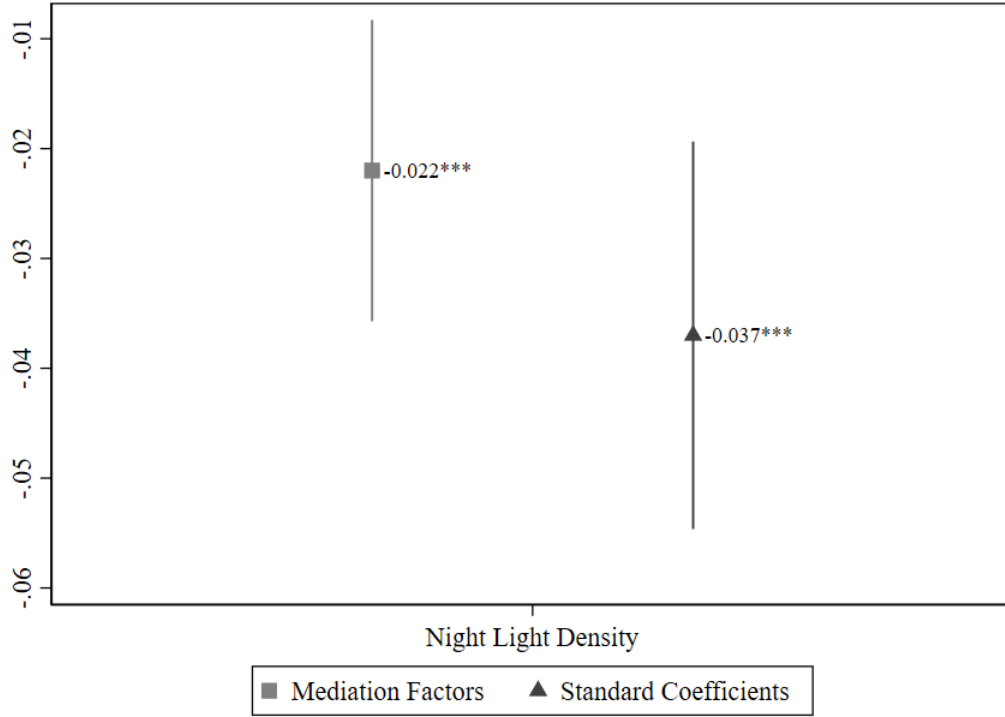
$$\hat{Y}_{mt} = \gamma_0 + \gamma_1 \text{Imputed Outflows}_{mt} + \sum_{z \in X'_m} \eta(z \times \alpha_t) + v_{mt} \quad (5)$$

which follows the same notation as the one used in our main analysis. In the first stage, Y_{mt} stands for night light density, Opposition_{mt} stands for the opposition support (estimated as the share of votes for the opposition), and $\text{Organized Crime}_{mt}$ is an indicator variable for the presence of organized criminal groups. In the second stage, $\hat{Y}_{mt}$ is the de-mediated night light estimated as $\hat{Y}_{mt} = [Y_{mt} - (\hat{\delta}_2 \text{Opposition}_{mt} + \hat{\delta}_3 \text{Organized Crime}_{mt})]$ and v_{mt} is the error term estimated through bootstrapping.

Figure 11 presents the results of this exercise suggesting that the standard estimated effect of imputed outflows on night light falls from -0.037 to -0.022 when the variation explained by the reductions on political opposition and increments in organize crime is accounted for.³⁵ These two channels, therefore, explain approximately one-third of the effect of forced displacement on development.

³⁵The point estimates are presented in Table E.23.

Figure 11: Mediation Analysis - The Role of Political Opposition and Organized Crime



Notes: This figure presents the coefficients for the two mediators, political opposition and organized crime, represented by squares. Additionally, the triangle indicates the direct effect of imputed migration outflows on night light density, excluding controls. Standard errors were clustered at the municipality level.

7 Discussion

This paper examines the role of forced displacement on the development of origin countries, a topic historically constrained by the limited availability of quality data, as these regions often face severe crises. To overcome these challenges in the case of Venezuela, we leverage satellite data, scrape online data, employ observational data, and utilize unique individual surveys. To identify causal changes resulting from mass forced out-migration, we compare municipalities with a higher share of foreign settlements before and after the onset of the oil price crisis after 2013. Our findings show that these areas had a disproportionate number of Colombian foreigners, who provided crucial information and network support, enabling Venezuelans to migrate more easily to neighboring Colombia, where the majority

of Venezuelan migrants are now hosted.

Our first key finding is that municipalities with a higher proportion of foreign settlements, which we also document as having higher outflows of forced displacement, experienced significant reductions in economic growth and increased inequality after 2013, relative to other areas. We document that forced migrants tend to be positively selected and disproportionately represent the productive labor force. Moreover, we document that the country experienced a dramatic shift from formal to informal and illicit activities.

How is it possible for a regime to stay in power in such adverse economic conditions? We document two main ways in which forced migration perpetuates autocratic leaders in power. First, we show that forced displacement is disproportionately represented by the opposition, as such it is reflected in reduced voter turnout and decreased support for the opposition. Second, forced displacement creates fertile ground for the expansion of organized criminal groups and the expansion and growth of illicit sources of income, particularly those involved in drug and human trafficking. Both of these dynamics help perpetuate the political status quo, diminishing pressure for socioeconomic reform in the medium term.

Our results underscore the significant impact of forced displacement on the countries from which these flows originate and the perpetuation of political leaders or regimes. In such contexts, our findings suggest that political leaders or parties may actually benefit from these migration flows, leading them to have little incentive to restrict or prevent them. Yet, since forced displacement depletes factors of production, it comes at a steep costs: it is also reflected in dramatic reductions in economic growth.

Historically, many governments have used the emigration of high-profile individuals or larger groups as a useful valve to relieve political tensions. Examples include Japan encouraging emigration disproportionately from a handful of regions in the southwest in the nineteenth century ([Endoh 2010](#)), the Soviet Union's exile of Alexandr Solzhenitsyn, China's exile of Chen Guangcheng, or Cuba and Zimbabwe's strategy of "venting disgruntled groups" through

emigration (Kapur 2014). Russia provides another example, where 1.1 million individuals left in 1990s and another 1.25 million left in the 2000s, reflecting the alienation of professionals and entrepreneurs, yet the “*Kremlin couldn’t care less if the most talented, the most active Russians are emigrating, because their exodus lifts the social and political tension in the country and weakens the opposition*” (Loiko, 2011). In the words of Hirschman (1970): “*exit has been shown to drive out voice*”. Our study documents, however, that this strategy comes at a steep cost: overall economic growth in these countries is likely to be dramatically lower.

There is still much to learn about the effects of forced displacement on both origin and destination countries. These flows have the power to transform cultural values, economic systems, and political landscapes. As more time passes and additional data becomes available, future research can explore the medium- to long-term impacts of these migration flows, offering valuable insights into their broader consequences for the development paths of affected countries.

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Part

Appendix

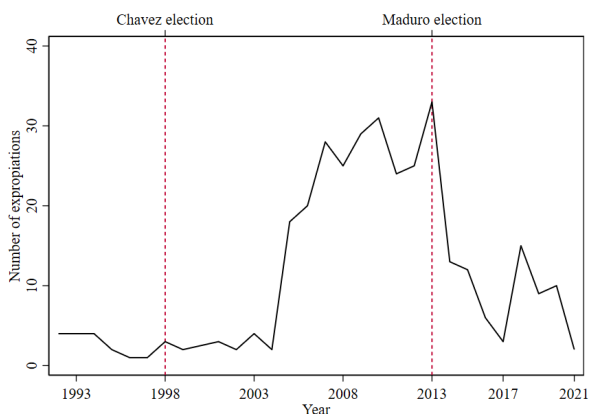
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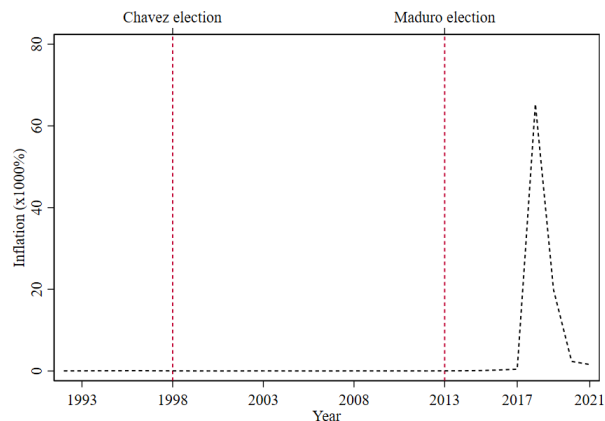
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A Appendix A: Characterizing the Venezuelan Crisis

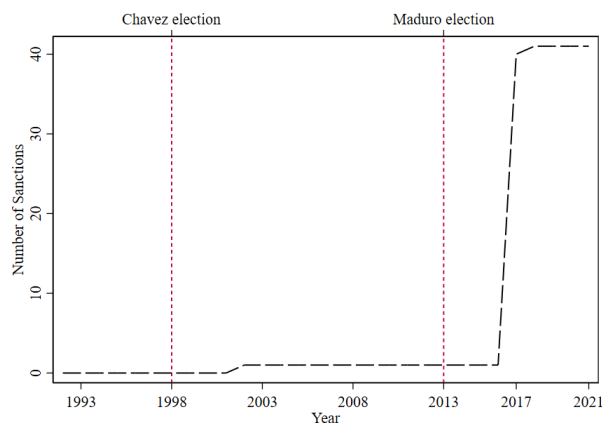
Figure A.1: Expropriations, Inflation Rate, and International Sanctions



(a) Number of expropriations



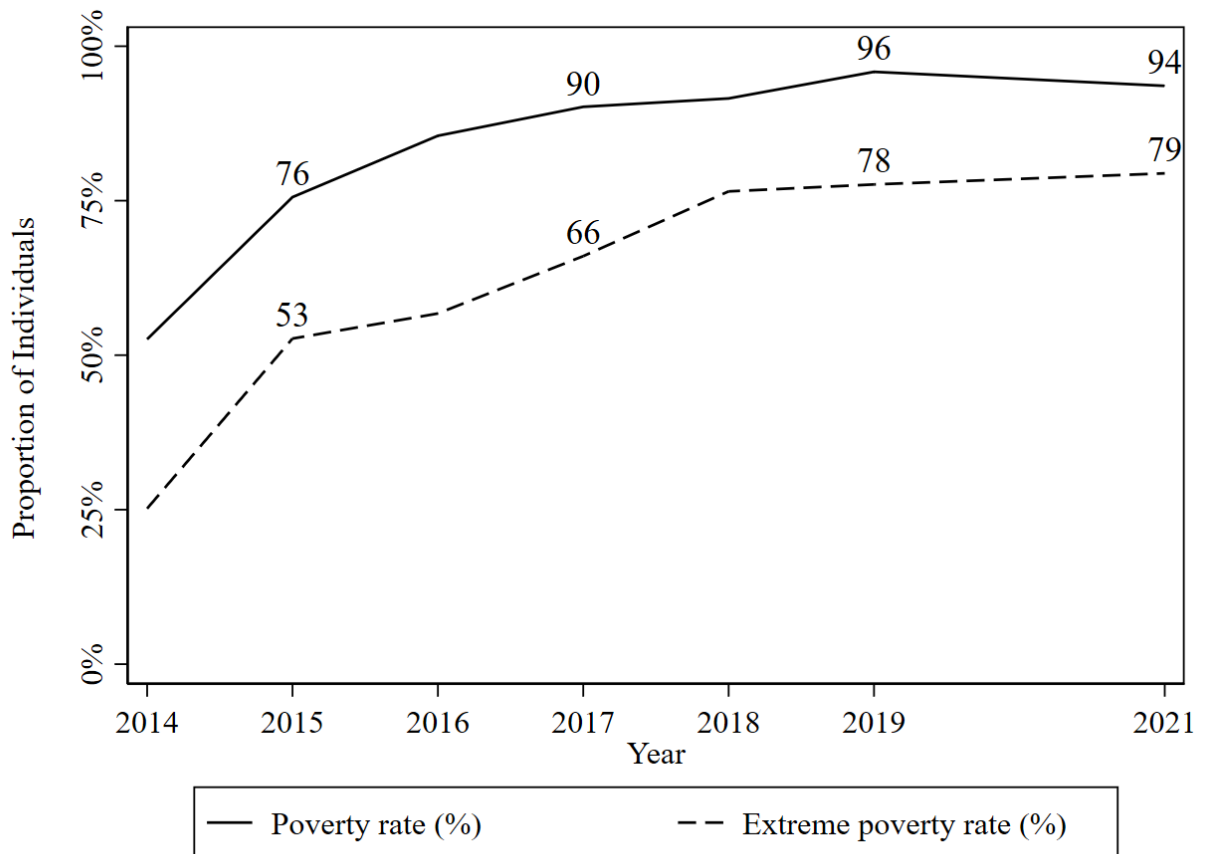
(b) Inflation rate



(c) Sanctions

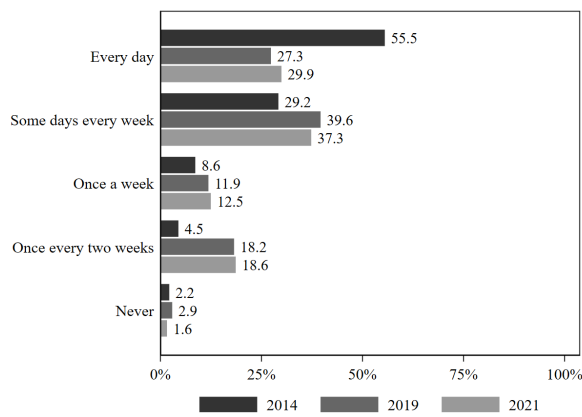
Notes: Records on the number of expropriations to private firms were taken from [Vendata \(2024\)](#). Inflation rate, was estimated as the annual change in the average consumer price taken from [International Monetary Fund \(2024\)](#). Data on the number of international sanctions impose to Venezuela was obtained from the [Global Sanctions Database \(2023\)](#).

Figure A.2: Poverty Rates, 2014-2021

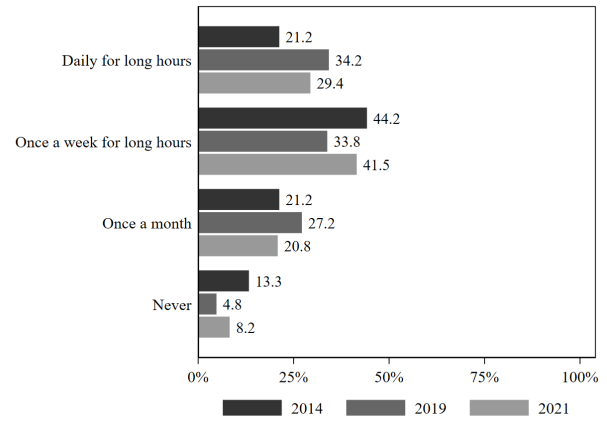


Notes: The figure depicts the proportion of individuals whose per capita household monetary income falls below the official moderate and extreme poverty thresholds over the specified years. The poverty and extreme poverty lines were calculated by the World Bank. *Source:* Authors' estimates using data from ENCOVI.

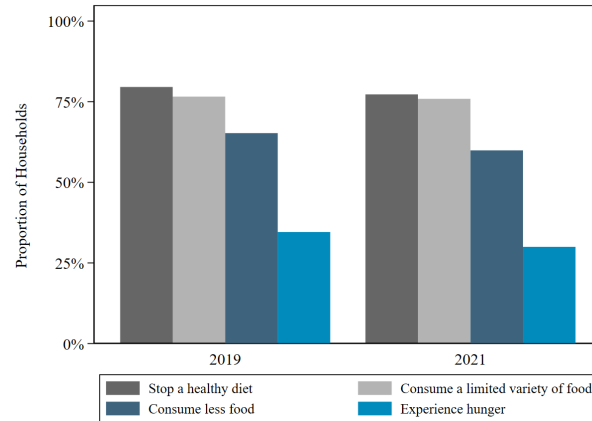
Figure A.3: Public Service Provision and Accessibility, 2014-2021



(a) Frequency of Water Supply



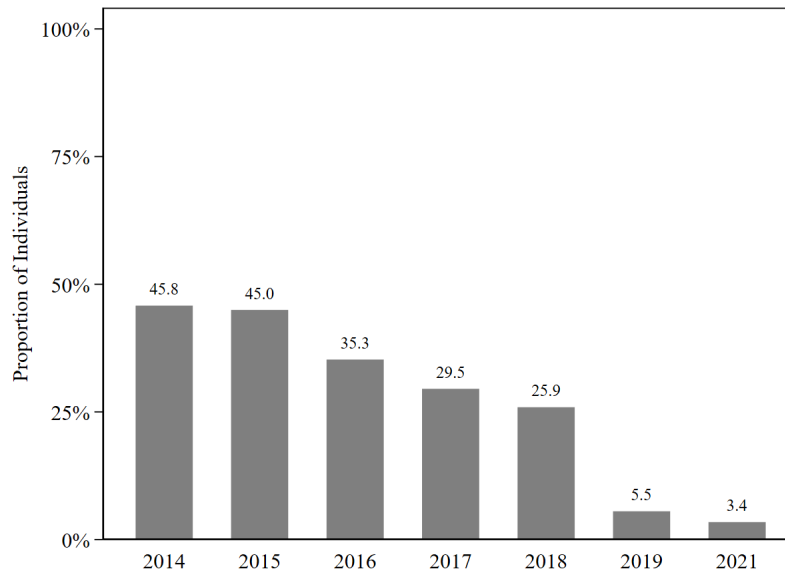
(b) Frequency of Electricity Interruptions



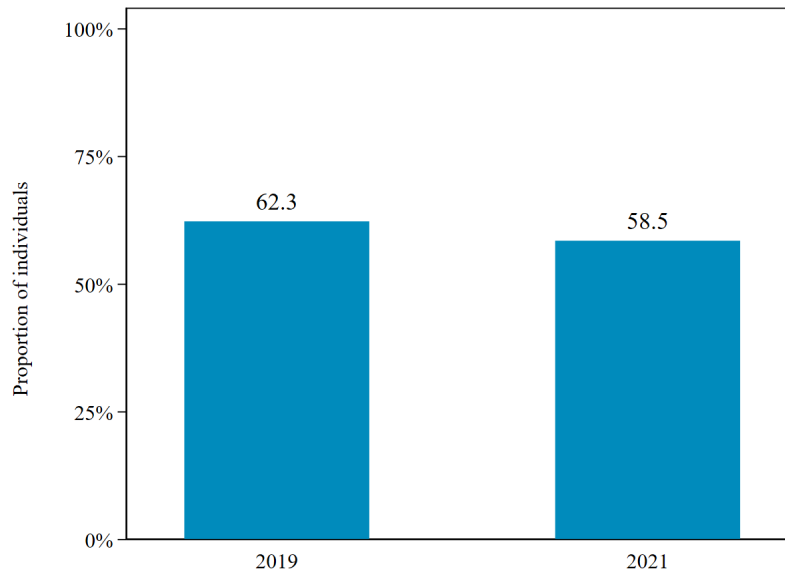
(c) Food Security

Notes: The top panel shows the proportions of households according to the frequency of water supply from the pipeline over the last three months. Similarly, the second panel illustrates the frequency of electric power interruptions during the same period. Finally, the third panel presents the proportions of households in which at least one adult has had to stop a healthy diet, consume a limited variety of food, consume less food, or experience hunger due to a lack of money or resources. *Source:* ENCOVI.

Figure A.4: Health and Medicine Access



(a) Proportion of Individuals with Health insurance



(b) Proportion of Individuals with a Chronic disease

Notes: The top panel displays the proportions of the population affiliated with public or private health insurance. Additionally, the bottom panel depicts the proportion of individuals with chronic diseases who have limited or no access to medication. We examine the following chronic diseases: hypertension, rheumatoid arthritis, hypothyroidism, diabetes, epilepsy, and cardiovascular conditions. *Source:* ENCOVI.

Table A.1: Socio-Demographic characteristics of the Local Population (%)

Variables	2014	2015	2016	2017	2018	2019	2021
Age							
0-15	26.69	28.75	29.59	29.51	29.50	29.01	28.35
15-29	24.42	25.96	25.90	26.29	26.02	21.58	21.90
30-49	27.94	27.23	25.00	24.63	24.67	26.70	26.81
50+	20.95	18.06	19.51	19.57	19.81	22.72	22.95
Sex							
Female	51.25	50.26	49.90	49.90	49.76	51.44	50.84
Male	48.75	49.74	50.10	50.10	50.24	48.56	49.16
Educational attainment							
No Education	4.62	3.33	2.14	2.90	3.03	0.32	0.22
Primary	18.60	18.09	13.65	17.68	17.88	24.70	24.79
Secondary	39.47	38.50	38.33	41.34	43.50	43.57	44.78
Graduate and Post	35.49	38.74	35.36	36.43	33.96	27.25	25.37
Missing	1.82	1.35	10.53	1.65	1.63	4.17	4.85
Employment status							
Unemployed	4.19	4.40	4.51	5.48	5.18	2.34	1.66
Employed	54.21	53.64	56.05	55.08	53.92	58.26	52.15
Inactive	41.60	41.96	39.44	39.44	40.90	39.40	46.19
Mission or Social Program							
No	86.33	71.91	70.86	56.45	37.83	-	-
Yes	7.59	25.39	27.93	42.91	60.17	-	-
Missing	6.08	2.71	1.22	0.63	2.00	-	-
Household with emigrated members							
No	-	-	-	93.20	87.57	81.31	88.44
Yes	-	-	-	6.80	12.43	18.69	11.56

Notes: The first two panels depict the proportions of individuals categorized by age groups and gender, respectively. Additionally, the panel on educational attainment considers only adults over the age of 18, as the majority of this demographic have completed secondary education. In the employment status panel, the labor force is defined as individuals aged between 15 to 65 years. Unemployment is identified as the proportion of individuals who are not currently employed and are not actively seeking employment. Conversely, employment refers to the proportion of individuals who are presently employed. Moreover, inactivity describes those who are neither employed nor actively seeking employment. Finally, the panel on mission or social program indicates the proportion of households with at least one member affiliated with a mission or social program; the last panel displays the proportion of households with at least one member who has emigrated within the past five years. *Source:* ENCOVI.

A.1 Characterizing the Migrants Leaving Venezuela

Table A.2: Occupational Categories of Migrants in 2019 (%)

Before leaving \ After leaving	Managers	Professionals technicians	Machine operators	Service sales workers	Elementary occupations	Armed forces	No Occupation
Managers	33.33	14.29	4.76	19.05	23.81	0.00	4.76
Professionals and technicians	0.40	51.50	4.39	20.16	18.56	0.80	4.19
Machine operators	0.54	3.76	63.98	15.05	14.52	0.54	1.61
Service and sales workers	0.52	3.37	1.55	79.02	11.40	0.52	3.63
Elementary occupations	0.00	2.82	4.58	8.92	77.82	2.11	3.76
Armed forces occupation	1.96	1.96	9.80	15.69	58.82	7.84	3.92
No occupation	0.00	7.43	2.83	27.79	33.63	1.59	26.73

Notes: The table presents a percentage-based comparative analysis of the types of occupations held by individuals before and after migration. The classification of occupations is derived from the major groups in the International Standard Classification of Occupations (ISCO-08). We have aggregated the categories of professionals, technicians, associate professionals, and clerical support workers under "professionals and technicians." Similarly, craft and related trades workers, plant and machine operators, and assemblers are combined into "machine operators and related trades workers." Finally, skilled agricultural, forestry, and fishery workers are grouped with elementary occupations under the category "elementary occupations".
Source: ENCOVI.

Table A.3: Occupational Categories of Migrants in 2021 (%)

Before leaving \ After leaving	Managers	Professionals technicians	Machine operators	Service sales workers	Elementary occupations	Armed forces	No Occupation
Managers	58.62	20.69	6.90	6.90	0.00	0.00	6.90
Professionals and technicians	0.29	57.76	3.74	18.10	12.93	1.44	5.75
Machine operators	0.00	2.46	60.66	7.38	25.41	0.82	3.28
Service and sales workers	0.29	6.92	2.59	71.76	10.95	1.15	6.34
Elementary occupations	0.00	2.31	4.94	11.57	75.62	1.70	3.86
Armed forces occupation	0.00	3.64	7.27	20.00	50.91	14.55	3.64
No occupation	0.00	7.45	3.17	35.57	25.33	0.56	27.93

Notes: The table presents a percentage-based comparative analysis of the types of occupations held by individuals before and after migration. The classification of occupations is derived from the major groups in the International Standard Classification of Occupations (ISCO-08). We have aggregated the categories of professionals, technicians, associate professionals, and clerical support workers under "professionals and technicians." Similarly, craft and related trades workers, plant and machine operators, and assemblers are combined into "machine operators and related trades workers." Finally, skilled agricultural, forestry, and fishery workers are grouped with elementary occupations under the category "elementary occupations".
Source: ENCOVI.

B Appendix B: Data Sources and Variable Construction

B.1 Satellite Data

B.1.1 Night Light Density

Data on nightlight luminosity comes from two sources: the Defense Meteorological Satellite Program Operational Linescan System (DMSP-OLS) and the Visible Infrared Imaging Radiometer Suite (VIIRS). The former spans data from 1992 to 2013; and, the latter, from 2012 to the present. Despite the availability of data, both sources of night light series are inconsistent due to differences in spatial and radiometric resolution, spectral responses, the spread function of the sensors, local overpass time at night, radiance range, and on-board calibration (Li et al., 2017; Sahoo et al., 2020). Further, the DMSP-OLS sensor measures night light intensity annually in digital number (DN), meanwhile the VIIRS sensor measures monthly in radiance (units of nanoWatts/cm²/sr) (Gibson et al., 2021).

Due to the nightlight problem outlined above, we use the harmonized night light series(1992-2021) elaborated by Li et al. (2020). The authors follow four steps to inter-calibrate DMSP-OLS and VIIRS sensors: DMSP-OLS calibration, the annual composition of VIIRS, and VIIRS conversion like DMSP-OLS. In the first step, the authors calibrated the stable DMSP-OLS night lights from 1992 to 2013. This calibration process aimed to ensure consistency and accuracy in the DMSP-OLS data. In the second step, the authors addressed the noise present in the VIIRS data caused by factors such as clouds, auroras, and temporary lights like fires and boats. They applied noise removal techniques to improve the quality of the VIIRS data. In the third step, the authors converted the higher resolution of VIIRS (15 arc-seconds) to match the resolution of DMSP-OLS (30 arc-seconds) using the Kernel density approach, which is similar to the method described in Li et al. (2017). This conversion

ensured consistency between the two datasets. Finally, to convert the processed data into digital numbers (DN), the authors employed a sigmoid function proposed by Zhao et al. (2019). As a result, consistent and calibrated night light data is enabled to be used.

Night light density at various administrative levels for Venezuela. Spatial coordinates for the second administrative level (*municipio*) and the third administrative level (*parroquia*) were obtained from OCHA (2023). The global rasters of harmonized nightlight series, developed by Li et al. (2020), were clipped to the boundaries of Venezuela's administrative levels. This ensured that our analysis focused exclusively on the relevant region of interest. Subsequently, nightlight density was computed by calculating the simple mean of nightlight luminosity across all pixels within each administrative level. This approach enabled the derivation of a consistent and calibrated measure of nightlight luminosity for the period 1992-2021.

The processing of nightlight data at the grid cell level in Venezuela involved two distinct steps. First, grid cells covering the entire territory of Venezuela were created. Then, the nightlight luminosity for each grid cell was calculated. In the initial step, the spatial coordinates of Venezuela's third administrative territories (*parroquia*), were transformed from their original WGS84 degree measurements into metric coordinates using the UTM zone 18N projection. This conversion facilitated the subsequent segmentation of each *parroquia*'s polygon into 4km square grids, which was accomplished using the Geopandas library in Python. As a result, a total of 75,605 grids encompass the entirety of Venezuela's territory. In the second step, the annual global raster dataset of harmonized night lights was clipped to match the boundaries of Venezuela's territory. Finally, the nightlight density for each grid cell was calculated by computing the simple mean of the night light luminosity across all pixels contained within the respective grid cell. This process provided a comprehensive assessment of the night light intensity within each grid cell.

Night light density for Various administrative level for Colombia. The second administrative level in Colombia is known as (*municipio*) while its territorial subdivision as *vereda*. The

spatial information, in the form of shapefile, at municipio level was obtained from [OCHA \(2023\)](#). For the vereda level, spatial data comes from two sources [OCHA \(2023\)](#) and [Colombian Spatial Data Infrastructure \(2023\)](#). Similarly to the previous process described above, the nightlight density was computed by calculating the simple mean of the night light luminosity across all pixels within each (*municipio*) and *vereda*, respectively.

B.1.2 Spatial Inequality

Inequality is approximated at the municipal and annual level by calculating a Gini index for each municipality and year using the NLD at the *parroquia* level as a unit of observation. Particularly, we use the *sgini* user-written Stata command STATA that computes classic relative (scale invariant) Gini indices of inequality by default but can be requested to produce absolute (translation invariant) indices or aggregate welfare S-Gini indices ([Van Kerm, 2020](#)).

Table [B.1](#) shows that the spatial measure of inequality is correlated with the traditional measure of income inequality constructed using the 1990 population census for Venezuela. Moreover, Table [B.2](#) shows that our spatial measure of inequality is also correlated with traditional measure of municipal income inequality constructed using the population censuses of 1993 and 2005 for that country.

Table B.1: Correlation Between Gini and NLD inequality measures

Correlation	(1) Pre-Chávez	(2) Post-Chávez	(3) All years
Income gini using 1990 census data	0.721*** (0.124)	0.722*** (0.056)	0.722*** (0.051)
Observations	2,010	8,040	10,050

Notes: Income Gini is only available for 1990 and is constructed using Venezuela's census data from [IPUMS \(2023\)](#)

Table B.2: Correlation Between Gini and NLD inequality measures

Correlation	NLD Gini (1)
Income Gini (sum all years)	1.486*** (0.158)
Income Gini (first year 1993)	0.442** (0.216)
Income Gini (last year 2005)	2.781*** (0.226)

Notes: Income Gini at the municipal level is only available in Colombia for 1993 and 2005 when population censuses were collected.

B.1.3 Type of Land Cover

Urban land and water bodies areas come from [MODIS Land Cover \(2023\)](#). MODIS Land Cover Type data covers a longer period from 2001 to 2020 and has a coarser resolution of 500 meters ([Friedl et al., 2010](#)). Additionally, this dataset incorporates several supervised classification methodologies, including the International Geosphere-Biosphere Programme (IGBP), University of Maryland (UMD), Leaf Area Index (LAI), BIOME-Biogeochemical Cycles (BGC), and Plant Functional Types (PFT). For the analysis, we computed the area of land type (Hectares units) at the second administrative level (*municipio*) from 2001 to 2020. This process was conducted using the Google Earth Engine code editor.

B.1.4 Deforestation

We downloaded an Excel dataset of annual tree cover loss for the period 2001-2021 from [Global Forest Watch \(2023\)](#). This dataset provides information on annual tree cover loss measured in hectares at both the national and the second administrative level (*municipio*). Finally, we merged this data with the municipality's shapefile using the first and second administrative-level names and fuzzy matching methods.

B.2 Electoral Data

B.2.1 Presidential elections

For electoral outcomes, we use data from all presidential elections held in Venezuela between 1998 and 2018 from the [Consejo Nacional Electoral \(2023\)](#) and the [VE360 \(2023\)](#) project (see Table [B.3](#)). Specifically, we use web-scraping techniques to recover data on the electoral census, total votes, votes for officialism and opposition parties at the municipal level. Data for the period 2000-2013 are from the VE360 project whereas data for the 1998. The current web portal of [Consejo Nacional Electoral \(2023\)](#) does not include data at municipal level for this year, but using WayBackMachine we are able to recover the records except for the electoral census. The elections for 2018 elections are from the CNE.

Table B.3: Presidential elections on Venezuela 1998-2018

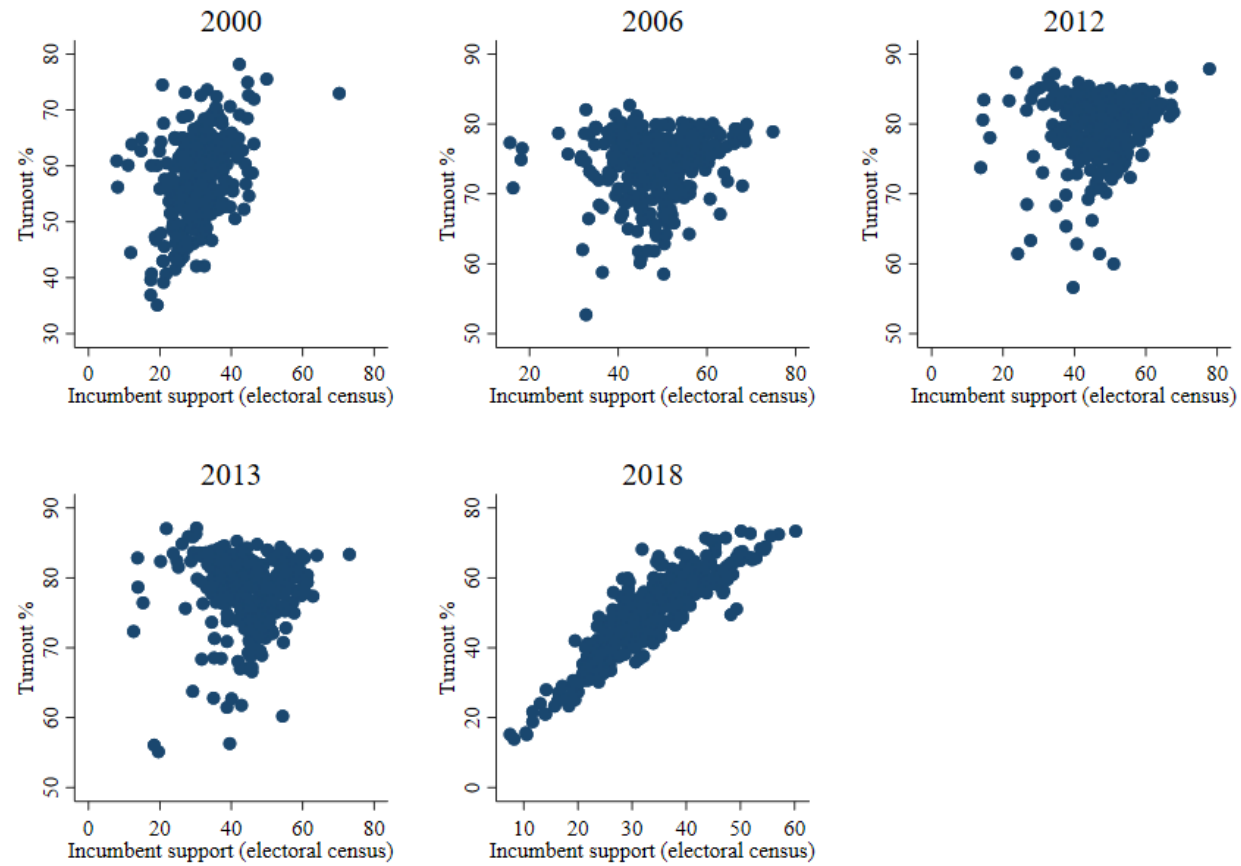
Year	Elected president	Cause of election
2006	Hugo Chávez Frias	Ordinary
2012	Hugo Chávez Frias	Ordinary
2013	Nicolás Maduro Moros	Chávez’s death
2018	Nicolás Maduro Moros	Ordinary

B.2.2 Mayoral elections

We utilized web scraping techniques to extract data from the Venezuelan National Electoral Council (CNE) website, collecting information on total votes and the electoral register at both the candidate and political party levels for mayoral elections held between 2006 and 2021. Afterward, the data was cleaned and classified, with each political party categorized based on whether they supported or opposed the governments of Hugo Chávez or Nicolás Maduro.

B.3 Manipulation test for the presidential elections

Figure B.1: Manipulation test



Notes: This test follows the methodology outlined by [Klimek et al. \(2012\)](#).

B.4 Other municipal data sources

Inflation. Inflation rate, was estimated as the annual change in the average consumer price taken from [International Monetary Fund \(2024\)](#). It corresponds to annual variation for the whole period of analysis.

Sanctions. Data on the number of international sanctions impose to Venezuela was obtained from the [Global Sanctions Database \(2023\)](#). It corresponds to annual variation on the number of sanctions for the whole period of analysis.

Expropriations. Records on the number of expropriations to private firms was taken from [Vendata \(2024\)](#). We have complete records on the location of each firm that we impute to each municipality and the year. The comprises our whole period of analysis.

Energy blackout, 2019. Data on blackouts corresponds to the number of *parroquias* who reported an energy blackout within each municipality in the large blackout that took place in March/April 2019. We have discrete variation in the number of parroquias as well as the average duration of the blackout. The data comes from [Morales-Arilla \(2021\)](#).

Social welfare program coverage, 2016/2017. Data on the coverage by number of individuals of the social protection programs grouped under an ID called “carnet de la patria” by municipality was obtained from [Morales-Arilla and Traettino \(2023\)](#). This ID centralizes all the government welfare programs. It is available only for one time period.

Repression, 2004. Records of repression come from [Hsieh et al. \(2011\)](#). They correspond to a list published in 2004 by the Chavez’ regime with the names of several millions of voters who attempted to remove him from office. The author’s show that these individuals saw a 5 percent drop in earnings and a 1.3 percentage point drop in employment rates after the voter list was released. We have data on the number of individuals listed in each municipality for 2004.

C Appendix C: Descriptive Statistics, Variables Employed in the Main Analysis

Table C.1: Descriptive Statistics, Main Analysis

Variable	Mean	SD	Min	Max	Obs	Years
Outcomes						
Night light density mean	5.19	6.77	0.00	45.13	10050	1992-2021
Log light mean	0.74	1.72	-9.92	3.81	10004	1992-2021
Gini measure from parroquia level 1992-2021	0.21	0.18	0.00	0.86	10050	1992-2021
Turnout %	67.76	14.12	13.87	87.89	1662	2000, 2006, 2012, 2013, 2018
Turnout % calculated by electoral census 2000	39.92	26.21	0.00	591.04	1990	1998, 2000, 2006, 2012, 2013, 2018
Electoral census 2000	92585	175341	848	1700000	9960	1992-2021
Presidential total votes	34824	77726	0	1100000	1996	1998, 2000, 2006, 2012, 2013, 2018
Presidential electoral census	58256	127412	0	1700000	1663	2000, 2006, 2012, 2013, 2018
% Officialism share divided by total votes by year	58.40	12.62	13.01	97.51	1995	1998, 2000, 2006, 2012, 2013, 2018
Presidential votes to chavism	19109	40423	0	584221	1996	1998, 2000, 2006, 2012, 2013, 2018
Opposition votes as % of total votes	38.97	12.05	2.33	83.32	1995	1998, 2000, 2006, 2012, 2013, 2018
Opposition total votes	14879	37204	0	549722	1996	1998, 2000, 2006, 2012, 2013, 2018
Identification variables						
Number of foreign residents in Venezuela (1990)	474	1196	1	10465	10050	1992-2021
Foreign residents in Venezuela 1990/ total foreign residents	0.00	0.01	0.00	0.19	10050	1992-2021
Inflows of venezuelan citizens	225830	317756	947	1400000	10050	1992-2021
Total migrants outflows divided by municipality pop. 1990	10.25	19.12	0.00	178.60	10050	1992-2021
Municipality population in 1990	53997	120325	7614	1800000	10050	1992-2021
Migrants Imputed Outflows	0.01	0.07	0.00	3.78	10050	1992-2021
Interaction of high migration dummy and foreign settlements	0.00	0.00	0.00	0.19	10050	1992-2021
Control and Robustness Variables						
% Venezuelan inflows by year / total inflows of vn migrants	3.33	4.69	0.01	20.07	10050	1992-2021
Rate of venezuelan inflows per 1,000 citizens	7.72	10.69	0.04	45.59	10050	1992-2021
Interaction of inflows share and inverse net distance	0.00	5.75	-24.01	65.33	10050	1992-2021
Interaction of inflows 1k rate and inverse net distance	0.00	13.16	-54.54	148.40	10050	1992-2021
Linear distance mean in km	539.36	210.92	276.36	1115.38	10050	1992-2021
Interaction of high migration dummy and inverse network dist	0.00	0.32	-1.20	3.25	10050	1992-2021
Network distance mean in km	1277.38	421.11	832.39	2477.89	10050	1992-2021
Sumatory of weights k x linear distance m_k	532.05	296.67	118.68	1266.93	10050	1992-2021
Sumatory of weights x network distance	830.00	603.74	172.60	2477.89	10050	1992-2021
1/ Sumatory of weights k x linear distance m_k	0.00	0.00	0.00	0.01	10050	1992-2021
1/ Sumatory of weights k x NETWORK distance m_k	0.00	0.00	0.00	0.01	10050	1992-2021
Standarized: 1/ Sumatory of weights k x linear distance m_k	0.00	1.00	-1.05	3.08	10050	1992-2021
Standarized: 1/ Sumatory of weights k x NETWORK distance m_k	0.00	1.00	-1.20	3.25	10050	1992-2021
Lost forest hectares baseline (2001)	373.31	770.74	0.00	5569.50	10050	1992-2021
Urban and Built-up Lands (square km) into Municipio	15.96	27.09	0.00	259.79	10050	1992-2021
Water Bodies Area (square km) into Municipio	26.83	116.96	0.00	1324.15	10050	1992-2021
Light mean (Baseline 1992)	59.46	116.54	0.00	1228.80	10050	1992-2021

Note: This table presents summary statistics of most raw variables used in the analysis. The information was gathered from diverse sources. See Appendix A for more details.

D Appendix D: Characterizing Foreign Settlements of 1990

Table D.1: Foreign settlements in 1990 vs Migrant's Hosting Countries in 2017-2021

Country	% of total foreigners (Census 1990)	% of total migrants by host country (2017-2021)
Colombia	59.02%	40.87%
Peru	2.48%	19.70%
Chile	1.50%	9.21%
Ecuador	2.38%	8.40%
United States	0.85%	3.35%
Brazil	0.32%	3.19%
Spain	6.90%	2.89%
Argentina	0.64%	2.82%
Panama	0.11%	1.98%
Mexico	0.25%	0.70%
Other	2.78%	4.34%
Unknown	1.02%	3%
No information in both surveys	22%	-

Notes: Authors' estimates using data from [IPUMS \(2023\)](#) and [National Survey on Living Conditions \(2021\)](#).

Table D.2: Characterizing Foreigners in Venezuela 1990

	Mean Foreigners	Mean Nationals	Mean Difference Test (p-value)
Age	36.88	23.68	0.000
Years of schooling	5.91	4.65	0.000
Earned income (\$BOL)	\$ 678,196.00	\$ 223,045.00	0.000

Table D.3: Characterizing Foreigners in Venezuela in 1990 (cont'd)

	Percent of foreigners	Percent nationals
Sex		
Male	53.26%	51.78%
Female	46.74%	48.22%
Employment status		
Employed	55.67%	27.48%
Unemployed	3.25%	4.18%
Inactive	35.23%	35.38%
Missing	5.85%	32.96%
Literacy		
Literate	87.14%	71.28%
Illiterate	10.76%	18.13%
Missing	2.10%	10.59%

Table D.4: Correlation Between Imputed Outflows and Colombian Survey of Venezuelans

Panel A: Correlation by sources at municipality level		Imputed Outflows
Migration records from PEP		0.329***
Panel B: Correlation by sources at state level		
Migration records from ENCOVI 2017 and 2021		0.304***
Migration records from ENCOVI (biannually)		0.272***
Migration records from ENCOVI 2017, 2019 and 2021		0.237***

Notes: Migration records from PEP are defined as the number of Venezuelan migrants in the Colombian Survey of Venezuelans registry per year and municipality since 1992. The Colombian survey of Venezuelans was conducted in 2018 and is representative of the migrants living in Colombia that year. The survey was collected to evaluate the effects of a large regularization program enacted in Colombia in 2018. The data comes from Ibáñez et al. (2024). Migration records from ENCOVI are defined as the number of individuals reported as migrants (living abroad) by their relatives in the ENCOVI surveys (2017–2021). The '2017 and 2021' label indicates that outflows by state and year were reconstructed using ENCOVI 2021 for 2017–2021 and ENCOVI 2017 for 2012–2016. The 'Biannual' label refers to the use of biannual ENCOVI data. The '2017, 2019, and 2021' label means ENCOVI 2017 was used for 2012–2016, ENCOVI 2019 for 2017–2019, and ENCOVI 2021 for 2020–2021.

E Appendix E: Robustness Tests

E.1 Lower grid units

Table E.1: Effects of Outmigration on Economic Growth and Inequality measures
1-Square-Kms-Grid Units

	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Panel A: Difference-in-difference estimates including all controls			
I(Year>=2013)× Foreign Settlements	-0.423*** (0.088)	-0.538*** (0.091)	0.024*** (0.008)
Panel B: Including baseline controls × time trends			
Imputed outflows	-0.034*** (0.006)	-0.036*** (0.004)	0.003*** (0.001)
Observations	2,265,990	2,214,162	2,214,162
Dependent mean 1992	3.84	0.04	0.27
All controls	✓	✓	✓
Exclude outlier municipality (Libertador)	✓	✓	✓
Municipality FE	✓	✓	✓
Year FE	✓	✓	✓

Note: The table illustrates the estimated coefficients of equation (1). *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p <0.05, *p<0.1..

E.2 Conley Standard Errors

E.2.1 Cutoff 250 km

Table E.2: Effects of migration on development and inequality measures (Conley Standard Errors)

	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Panel A: Diff-in-diff estimates including controls			
I(Year $\geq$ 2013) $\times$ Foreign Share	-0.356*** (0.068)	-0.126*** (0.025)	0.012*** (0.002)
Panel B: Imputed outflows, including baseline controls $\times$ time trends			
Imputed Outflows	-0.036*** (0.013)	-0.016*** (0.003)	0.001*** (0.000)
Panel C: Imputed outflows, excluding controls			
Imputed Outflows	-0.037*** (0.013)	-0.015*** (0.004)	0.001*** (0.000)
Observations	10,020	9,974	10,020
Dependent Mean 1992	3.77	0.034	0.27
Conley Standard Errors (cutoff 250km)	✓	✓	✓
Municipality Fixed Effects	✓	✓	✓
Year Fixed Effects	✓	✓	✓

Note: The table illustrates the estimated coefficients of equation (1). *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table E.3: Effects of migration on electoral outcomes (Conley Standard Errors)

	Turnout (1)	Opposition (2)
Panel A: Difference-in-difference estimates including all controls		
I(Year $\geq$ 2013) $\times$ Foreign Share	-4.471* (2.704)	-2.624* (1.517)
Panel B: Including baseline controls $\times$ time trends		
Imputed Outflows	-0.663*** (0.117)	-0.358*** (0.049)
Panel C: Imputed outflows, excluding controls		
Imputed Outflows	-0.649*** (0.129)	-0.351*** (0.058)
Observations	1,324	1,324
Dependent mean 2006	31.4	10.2
All controls	✓	✓
Conley Standard Errors (cutoff 250km)	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Note: The table illustrates the estimated coefficients of equation (1). Turnout in column (1) is defined as the total votes for each presidential election held in Venezuela between 2006 and 2018 divided by the electoral census of 2000. (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

E.2.2 Cutoff 150 km

Table E.4: Effects of migration on development and inequality measures (Conley Standard Errors)

	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Panel A: Diff-in-diff estimates including controls			
I(Year $\geq$ 2013) $\times$ Foreign Share	-0.356*** (0.074)	-0.126*** (0.024)	0.012*** (0.003)
Panel B: Imputed outflows, including baseline controls $\times$ time trends			
Imputed Outflows	-0.036*** (0.011)	-0.016*** (0.003)	0.001*** (0.000)
Panel C: Imputed outflows, excluding controls			
Imputed Outflows	-0.037*** (0.010)	-0.015*** (0.004)	0.001*** (0.000)
Additional controls for all panels			
Observations	10,020	9,974	10,020
Dependent Mean 1992	3.77	0.034	0.27
Conley Standard Errors (cutoff 150km)	✓	✓	✓
Municipality Fixed Effects	✓	✓	✓
Year Fixed Effects	✓	✓	✓

Note: The table illustrates the estimated coefficients of equation (1). *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table E.5: Effects of migration on electoral outcomes (Conley Standard Errors)

	Turnout (1)	Opposition (2)
Panel A: Difference-in-difference estimates including controls		
I(Year $\geq$ 2013) $\times$ Foreign Share	-4.471* (2.674)	-2.624* (1.450)
Panel B: Including baseline controls $\times$ time trends		
Imputed Outflows	-0.663*** (0.144)	-0.358*** (0.054)
Panel C: Imputed outflows, excluding controls		
Imputed Outflows	-0.649*** (0.143)	-0.351*** (0.059)
Observations	1,324	1,324
Dependent mean 2006	31.4	10.2
All controls	✓	✓
Conley Standard Errors (cutoff 150km)	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Note: The table illustrates the estimated coefficients of equation (1). Turnout in column (1) is defined as the total votes for each presidential election held in Venezuela between 2006 and 2018 divided by the electoral census of 2000. (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p <0.05, *p<0.1.

E.2.3 Cutoff 50 km

Table E.6: Effects of migration on development and inequality measures (Conley Standard Errors)

	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Panel A: Diff-in-diff estimates including controls			
I(Year $\geq$ 2013) $\times$ Foreign Share	-0.356*** (0.064)	-0.126*** (0.022)	0.012*** (0.003)
Panel B: Imputed outflows, including baseline controls $\times$ time trends			
Imputed Outflows	-0.036*** (0.007)	-0.016*** (0.002)	0.001*** (0.000)
Panel C: Imputed outflows, excluding controls			
Imputed Outflows	-0.037*** (0.007)	-0.015*** (0.003)	0.001*** (0.000)
Observations	10,020	9,974	10,020
Dependent Mean 1992	3.77	0.034	0.27
Conley Standard Errors (cutoff 50km)	✓	✓	✓
Municipality Fixed Effects	✓	✓	✓
Year Fixed Effects	✓	✓	✓

Note: The table illustrates the estimated coefficients of equation (1). *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table E.7: Effects of migration on electoral outcomes (Conley Standard Errors)

	Turnout (1)	Opposition (2)
Panel A: Difference-in-difference estimates including all controls		
I(Year $\geq$ 2013) $\times$ Foreign Share	-4.471** (2.093)	-2.624** (1.171)
Panel B: Including baseline controls $\times$ time trends		
Imputed Outflows	-0.663*** (0.161)	-0.358*** (0.070)
Panel C: Imputed outflows, excluding controls		
Imputed Outflows	-0.649*** (0.156)	-0.351*** (0.072)
Observations	1,324	1,324
Dependent mean 2006	31.4	10.2
All controls	✓	✓
Conley Standard Errors (cutoff 50km)	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Note: The table illustrates the estimated coefficients of equation (1). Turnout in column (1) is defined as the total votes for each presidential election held in Venezuela between 2006 and 2018 divided by the electoral census of 2000. (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

E.3 Alternative Municipal Variation: Inverse Network and Linear Distance

As an additional exercise, we leverage the fact that migrants often choose destinations where migration costs are lower. Consequently, we concentrate on municipalities located nearer to road and major river networks, as these areas typically witness higher migration rates. We then explore the relationship between this geographical proximity and national migration

from Venezuela to Colombia. Since national migration patterns do not perfectly mirror municipal migration trends, this creates an exogenous factor that we can employ as a shift-share instrument. In particular, we estimate the following specification:

$$y_{mt} = \gamma_m + \alpha_t + \beta Outflows_t \times InvNetDist_m + \sum_{z \in X'_m} \eta(z \times \alpha_t) + \varepsilon_{mt} \quad (6)$$

Where $InvNetDist_m$ is defined by the following equation:

$$InvNetDist_m = \frac{1}{\sum_{i=1}^7 \omega_i * netdist_{mi}} \quad (7)$$

In Equation 6, y_{mt} is the economic growth, inequality or electoral outcome of interest for municipality m in year t , $Outflows_t$ is the outflows of Venezuelans migrants to Colombia for year t , $InvNetDist_m$ is the inverse network distance for each municipality m defined by Equation 7, X'_m is a control variables vector at baseline and γ_m , α_t are municipality and time fixed-effects respectively. Pre-shock municipal characteristics are interacted with the year fixed effects to flexibly control for differential municipal trends. Robust standard errors (ε_{mt}) are clustered at the municipality level to account for potential serial correlation within municipalities.

In Equation 7, ω_i is the weight of Venezuelan migrants entry point i . Calculated with the share of total entries between 2012 and 2022. $netdist_{mi}$ is the network distance from centroid of municipality m to entry point i using the roads lines collected by Instituto Geográfico de Venezuela (2015). This index is standardized by subtracting the mean and dividing it by its standard deviation.

To calculate the network distance $netdist_{mi}$ we use an Origin Destination (OD) cost matrix analysis. This method finds and measures the least-cost paths along a network from multiple origins to multiple destinations. We use the Venezuelan road and major rivers network

shapefile created by [Instituto Geográfico de Venezuela \(2015\)](#) to connect and calculate the minimum distance in kilometers from all centroids of municipalities to each of the seven migrants entry points. Additionally, we calculate the inverse distance using the linear distance from each municipality's centroid to the nearest migrant entry point.

Some municipalities not have a full connected network road from their centroids to each migrants entry point. Thus, we assign the maximum network distance with a penalty of 20% of network distance mean for disconnected municipalities.

This exercise basically amounts to replace our municipal measure of foreign settlements with the invserse distance of each municipality to the main crossing points in Colombia.

E.3.1 Inverse Network Distance

Table E.8: Effects of migration on development and inequality measures

	Night Light (1)	Log(Night Light) (2)
Panel A: Difference-in-difference estimates including all controls		
I(Year $\geq$ 2013) $\times$ Network distance	-0.359*** (0.107)	-0.184*** (0.029)
Panel B: Including baseline controls $\times$ time trends		
Outflows share $\times$ Network distance	-0.032*** (0.008)	-0.016*** (0.002)
Panel C: Using inflows 1k rate, including all controls		
Outflows 1k rate $\times$ Network distance	-0.014*** (0.004)	-0.007*** (0.001)
Observations	10,020	9,974
Dependent Mean 1992	3.77	0.034
Exclude Libertador municipality	✓	✓
Municipality Fixed Effects	✓	✓
Year Fixed Effects	✓	✓

Note: The table illustrates the estimated coefficients of equation (6). *Network distance* is defined in equation (7). Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p <0.05, *p<0.1.

Table E.9: Effects of migration on electoral outcomes

	Turnout (1)	Opposition (2)
Panel A: Difference-in-difference estimates including all controls		
I(Year $\geq$ 2013) $\times$ Network distance	-3.405*** (1.011)	-1.336*** (0.410)
Panel B: Including baseline controls $\times$ time trends		
Outflows share $\times$ Network distance	-0.377*** (0.114)	-0.160*** (0.048)
Panel C: Using inflows 1k rate, including all controls		
Outflows 1k rate $\times$ Network distance	-0.167*** (0.051)	-0.071*** (0.021)
Observations	1,324	1,324
Dependent mean 2006	31.4	10.2
Exclude Libertador municipality	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Note: The table illustrates the estimated coefficients of equation (6). *Network distance* is defined in equation (7). Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p <0.05, *p<0.1.

E.3.2 Inverse Linear Distance

Table E.10: Effects of migration on development and inequality measures (using Inverse Linear Distance)

	Night Light (1)	Log(Night Light) (2)
Panel A: Difference-in-difference estimates including all controls		
I(Year $\geq$ 2013) $\times$ Linear Distance	-0.398*** (0.110)	-0.157*** (0.028)
Panel B: Including baseline controls $\times$ time trends		
Outflows share $\times$ Linear distance	-0.034*** (0.009)	-0.013*** (0.002)
Panel C: Using outflows 1k rate, including all controls		
Inflows 1k rate $\times$ Linear distance	-0.015*** (0.004)	-0.006*** (0.001)
Observations	10,020	9,974
Dependent Mean 1992	3.77	0.034
Exclude Libertador municipality	✓	✓
Municipality Fixed Effects	✓	✓
Year Fixed Effects	✓	✓

Note: The table illustrates the estimated coefficients of equation (6 but using the inverse network distance). *Linear distance* is analogue to the standardized measure of network inverse distance used in Equation 7 but using the linear distance from the municipality's centroid to each entry migratory point. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p <0.05, *p<0.1.

Table E.11: Effects of migration on electoral outcomes

	Turnout (1)	Opposition (2)
Panel A: Difference-in-difference estimates including all controls		
I(Year $\geq$ 2013) $\times$ Linear Distance	-3.874*** (1.081)	-1.564*** (0.429)
Panel B: Including baseline controls $\times$ time trends		
Outflows share $\times$ linear distance	-0.428*** (0.122)	-0.186*** (0.050)
Panel C: Using outflows 1k rate, including all controls		
Outflows 1k rate $\times$ linear distance	-0.189*** (0.054)	-0.082*** (0.022)
Observations	1,324	1,324
Dependent mean 2006	31.4	10.2
Exclude Libertador municipality	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Note: The table illustrates the estimated coefficients of equation (6 but using the inverse network distance). *Linear distance* is analogue to the standardized measure of network inverse distance used in Equation 7 but using the linear distance from the municipality's centroid to each entry migratory point. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p <0.05, *p<0.1.

E.4 Estimates ENCOVI, 2014-2021

Table E.12: Impacts of Mass Out-migration in State-Level Income and Inequality

	Real total Income (IHS) (1)	Real total Income per capita (IHS) (2)
Panel A: No controls		
Imputed Outflows	-0.00131*** (0.00014)	-0.00128*** (0.00013)
Panel B: Including baseline controls		
Imputed Outflows	-0.00155*** (0.00014)	-0.00151*** (0.00013)
Observations (State and Year)	139,328	139,328
Dependent Mean 2014	915.80	0.34
State Fixed Effects	✓	✓
Year Fixed Effects	✓	✓

Notes: The term *Imputed Outflows* is defined as explained in Equation (2). Controls in baseline interacted with time trends include: urban, water bodies, forest loss area for year 2001, night light density for 1992, *Carnet de la Patria* holders (between 2016 and 2017), number of parroquias with rationed energy at the municipality level (April 2019) and intensity of blackout (March 2019), number of enterprises acquired by the Venezuelan state. Controls from ENCOVI: head of household gender, education level, marital status and number of household members. Total and per capita income coefficients were estimated at the state level. Bootstrap standard errors in parenthesis. ***p<0.01, **p <0.05, *p<0.1.

E.5 Electoral outcomes including 2024 presidential election

Table E.13: Effects of Mass Out-migration in Presidential Electoral Outcomes

	Turnout (1)	Opposition (2)
Panel A: Difference-in-difference estimates including all controls		
I(Year>=2013) × Foreign Share	-4.845** (1.913)	-3.623*** (1.370)
Panel B: Including baseline controls × time trends		
Imputed Outflows	-0.612*** (0.140)	-0.330*** (0.060)
Panel C: Imputed outflows, excluding controls		
Imputed Outflows	-0.576*** (0.123)	-0.309*** (0.052)
Observations	1,648	1,648
Dependent mean 2006	31.4	10.2
All controls	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Notes: The table illustrates the estimated coefficients of equation (1). Turnout in column (1) is defined as the total votes for each presidential election held in Venezuela between 2006 and 2018 divided by the electoral census of 2000. (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by municipality are presented in parenthesis. ***p<0.01, **p <0.05, *p<0.1.

Table E.14: Forced Displacement Weakens Political Opposition, Mayoral Elections

Panel A: Diff-in-diff estimates including controls	Turnout (1)	Opposition (2)
I(Year>2013)× Foreigners Share	-2.198*** (0.731)	-1.137* (0.654)
Observations	1,649	1,652
Dependent mean 2004	32.5	14.59
All controls	✓	✓
Exclude outlier municipality (Libertador)	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Notes: Turnout in column (1) is defined as the total votes for each mayoral election divided by the electoral census of 2000, (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by municipality are presented in parenthesis. ***p<0.01, **p <0.05, *p<0.1.

E.6 Robustness to the Inclusion of Additional Control Variables

E.6.1 Carnet de la Patria, Energy Blackouts, and Expropriation records

Table E.15: Development outcomes: controlling for governmental actions

Imputed Outflows	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Imputed Outflows	-0.043*** (0.012)	-0.018*** (0.003)	0.001* (0.0006)
Observations	10,020	9,974	10,020
Dependent mean	5.19	0.74	0.27
All controls	✓	✓	✓
Exclude outlier municipality (Libertador)	✓	✓	✓
Municipality FE	✓	✓	✓
Year FE	✓	✓	✓

Note: NLD in column (1) is defined as Night Light Density, Log NLD in column (2) is the Log Night Light Density, Gini in column (3) is the level of night light concentration using Gini index. The term *Imputed Outflows* is defined as explained in equation 2. Controls in baseline interacted with time trends: urban, water bodies, forest loss area for the year 2001, night light density for 1992, repression records for 2004, Carnet de la Patria holders (between 2016 and 2017), number of parroquias with rationed energy at the municipality level (April 2019) and intensity of blackout (March 2019), number of enterprises acquired by the Venezuelan state. Clustered standard errors by municipality in parenthesis. ***p<0.01, **p <0.05, *p<0.1.

Table E.16: Electoral outcomes: controlling for governmental actions

Imputed Outflows	Turnout (1)	Opposition (2)
Imputed Outflows	-0.699*** (0.181)	-0.371*** (0.082)
Observations	1,324	1,324
Dependent mean 2006	31.4	10.2
All controls	✓	✓
Exclude outlier municipality (Libertador)	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Note: Turnout in column (1) is defined as the total votes for each presidential election held in Venezuela between 2006 and 2018 divided by the electoral census of 2000, (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. The term *Imputed Outflows* is defined as explained in Equation 2. Controls in baseline interacted with time trends: urban, water bodies, forest loss area for the year 2001, night light density for 1992, repression records for 2004, Carnet de la Patria holders (between 2016 and 2017), number of parroquias with rationed energy at the municipality level (April 2019) and intensity of blackout (March 2019), number of enterprises acquired by the Venezuelan state. Clustered standard errors by the municipality are in parentheses. ***p<0.01, **p <0.05, *p<0.1.

E.7 Impacts on crime events share per 100,000 inhabitants

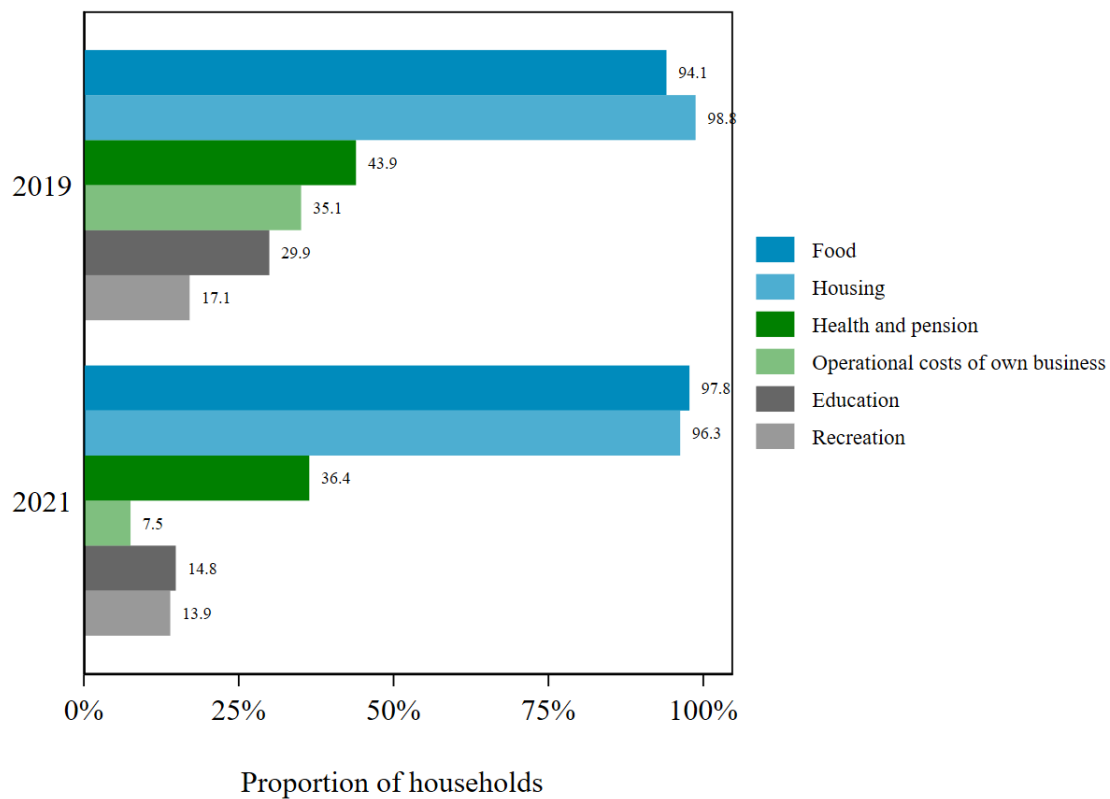
Table E.17: Effects of Mass Out-migration in Crime

Panel A: Total events share per 100,000 inhabitants	FARC (1)	ELN (2)	Organized Crime (3)
Imputed outflows	0.005* (0.003)	0.022* (0.012)	0.155** (0.060)
Panel B: Total events share per 100,000 inhabitants	Protest (1)	Regime (2)	Sindicato (3)
Imputed outflows	-0.017 (0.045)	0.109** (0.0506)	-0.003* (0.001)
Observations	11,022	11,022	11,022
Dependent mean baseline	0.036	0.007	3.68
All controls	✓	✓	✓
Exclude outlier municipality (Libertador)	✓	✓	✓
Municipality FE	✓	✓	✓
Year FE	✓	✓	✓

Notes: In Panel A, column (1) represents the total number of conflict events involving the Revolutionary Armed Forces of Colombia (FARC) in Venezuela from 1992 to 2024, normalized by the Venezuelan municipality population in 1990 and expressed per 100,000 inhabitants. Column (2) reports the total conflict events associated with the Colombian National Liberation Army (ELN) during the same period, also normalized by the 1990 population and presented per 100,000 inhabitants. Column (3) captures the total conflict events carried out by non-terrorist but criminal armed groups—such as gangs, colectivos, sindicatos, and drug-trafficking cartels—between 2018 and 2024, similarly normalized by the 1990 population and expressed per 100,000 inhabitants. In Panel B, column (1) reports the total number of both peaceful and violent protests from 2018 to 2024, adjusted by the 1990 population of Venezuelan municipalities and presented per 100,000 inhabitants. Column (2) records the total number of events involving actors linked to the Venezuelan political regime between 1992 and 2024, also normalized by the 1990 population and expressed per 100,000 inhabitants. Finally, column (3) reflects the total number of events involving irregular armed groups engaged in illegal mining from 2018 to 2024, adjusted by the 1990 population and presented per 100,000 inhabitants. Clustered standard errors by the municipality are presented in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

E.8 The Role of Remittances

Figure E.1: Household Utilization of Remittances, 2019 and 2021



Notes: The table describes the categories of expenditures of remittances by households interviewed in the ENCOVI of 2019 and 2021. The categories are non-exclusionary and households could mention one or more categories in which they spend the majority of the remittances they received from relatives abroad.

E.9 Alternative DiD estimators

Table E.18: Alternative DiD estimators - Development Outcomes

	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Panel A: Doubly Robust Improved Estimator			
$I(\text{Year} \geq 2013) \times I(\text{Imputed Outflows} \geq P_{80})$	-1.264*** (0.17)	-0.178*** (0.05)	0.028*** (0.008)
Panel B: Abadie (2005) IPW Estimator			
$I(\text{Year} \geq 2013) \times I(\text{Imputed Outflows} \geq P_{80})$	-2.852*** (0.59)	-.569*** (0.099)	0.028** (0.012)
Panel C: Standardized IPW estimator			
$I(\text{Year} \geq 2013) \times I(\text{Imputed Outflows} \geq P_{80})$	-1.577*** (0.466)	-0.341*** (0.076)	0.028** (0.012)
Observations	10,020	9,974	10,020
Dependent Mean 1992	3.77	0.034	0.27

Notes: Inverse Probability Weighted (IPW) estimators from [Abadie \(2005\)](#) and [Sant'Anna and Zhao \(2020\)](#). Doubly Robust Improved Estimator from [Sant'Anna and Zhao \(2020\)](#). We use STATA command *drdid* from [Rios-Avila et al. \(2021\)](#) for estimations. ***p<0.01, **p <0.05, *p<0.1.

E.10 Controlling by oil fields

We use the Global Oil& Gas Features Database pertains to the development of the Global Oil and Gas Infrastructure (GOGI) geodatabase from [Sabbatino \(2018\)](#). This dataset standardizes and integrates disparate oil and gas infrastructure data from over 380 sources worldwide, encompassing more than 4.8 million features for 2018. The project employed both manual searches by experts and machine learning algorithms to gather global data on oil and gas infrastructure, including production, transportation, and storage. The result is a comprehensive geodatabase, providing users with spatially explicit data. The GOGI database serves as a unified platform to assess and visualize global oil and gas infrastructure, addressing

key uncertainties and information gaps across more than 40 hydrocarbon-producing and consuming countries.

There are 194 countries represented in the GOGI geodatabase. Below, we present some images showing the data available per country and how it looks. The geodatabase contains physical information such as Fields, Mines, Platforms, Wells, Underground Storage, Pipelines, Ports, Railways, Basins, LNG facilities, Power Plants, Processing Plants, Refineries, Stations, and Storage units.

Table E.19: Effects of Forced Displacement on Development Outcomes
Including controls for oil fields locations

	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Panel A: Diff-in-diff estimates including controls			
I(Year>=2013) × Foreign Share	-0.234** (0.100)	-0.127*** (0.038)	0.011* (0.006)
Panel B: Imputed outflows, including baseline controls × time trends			
Imputed Outflows	-0.025*** (0.008)	-0.017*** (0.003)	0.001 (0.001)
Additional controls for all panels			
Observations	10,020	9,974	10,020
Dependent Mean 1992	3.77	0.034	0.27
Municipality Fixed Effects	✓	✓	✓
Year Fixed Effects	✓	✓	✓

Notes: The table illustrates the estimated coefficients of equation (1). *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in baseline interacted with time trends: urban, water bodies, forest loss area for the year 2001, night light density for 1992, repression records for 2004, Carnet de la Patria holders (between 2016 and 2017), number of parroquias with rationed energy at the municipality level (April 2019) and intensity of blackout (March 2019), number of enterprises acquired by the Venezuelan state and oil fields area as percentage of total in 2018. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p <0.05, *p<0.1.

Table E.20: Effects of Mass Out-migration in Presidential Electoral Outcomes

	Turnout (1)	Opposition (2)
Panel A: Diff-in-diff estimates including controls		
I(Year $\geq$ 2013) $\times$ Foreign Share	-4.445*** (1.419)	-2.621*** (0.702)
Panel B: Imputed outflows, including baseline controls $\times$ time trends		
Imputed Outflows	-0.705*** (0.162)	-0.369*** (0.072)
Additional controls for all panels		
Observations	1,324	1,324
Dependent mean 2006	31.4	10.2
All controls	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Notes: The table illustrates the estimated coefficients of equation (1). Turnout in column (1) is defined as the total votes for each presidential election held in Venezuela between 2006 and 2018 divided by the electoral census of 2000. (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in baseline interacted with time trends: urban, water bodies, forest loss area for the year 2001, night light density for 1992, repression records for 2004, Carnet de la Patria holders (between 2016 and 2017), number of parroquias with rationed energy at the municipality level (April 2019) and intensity of blackout (March 2019), number of enterprises acquired by the Venezuelan state and oil fields area as percentage of total in 2018. All estimates exclude the outlier municipality Libertador. Clustered standard errors by municipality are presented in parenthesis. ***p<0.01, **p<0.05, *p<0.1.

E.11 Electoral outcomes using electoral rolls

Table E.21: Effects of Mass Out-migration in Presidential Electoral Outcomes

	Turnout	Opposition
Panel A: Diff-in-diff estimates including controls	(1)	(2)
I(Year>=2013)× Foreign Share	(0.787)	(0.867)
Panel B: Imputed outflows, including baseline controls × time trends		
Imputed Outflows	-0.706*** (0.075)	-0.591*** (0.069)
Panel C: Imputed outflows, excluding controls		
Imputed Outflows	-0.703*** (0.081)	-0.588*** (0.076)
Additional controls for all panels		
Observations	1,323	1,323
Dependent mean 2006	31.4	10.2
All controls	✓	✓
Municipality FE	✓	✓
Year FE	✓	✓

Notes: The table illustrates the estimated coefficients of equation (1). Turnout in column (1) is defined as the total votes for each presidential election held in Venezuela between 2006 and 2018 divided by the electoral census of 2000. (2) Opposition is the total votes of non Officialism parties divided by the electoral census of 2000. *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by municipality are presented in parenthesis.

E.12 Elasticity between Foreign share and PEP share

Table E.22: Correlation Between Foreigners Share and Colombian Survey of Venezuelans

Panel A: Correlation PEP and foreign residents share	Log Migration records from PEP
Log Foreign Residents Share	0.445***

Notes: The Colombian survey of Venezuelans was conducted in 2018 and is representative of the migrants living in Colombia in that year. The survey was collected to evaluate the effects of a large regularization program enacted in Colombia in 2018. The data comes from [Ibáñez et al. \(2024\)](#).

E.13 Mediation Analysis

Table E.23: Development and Forced Displacement - Mediation Analysis

Panel A: Coefficient Equation 1, excluding controls	Night Light (1)	Log(Night Light) (2)	Spatial Gini (3)
Imputed outflows	-0.037*** (0.009)	-0.015*** (0.004)	0.001* (0.001)
Panel B: Coefficient without the variation explained by crime and opposition			
Imputed outflows	-0.022*** (0.007)	-0.011*** (0.002)	0.001* (0.000)
Observations Panel A	10,020	9,974	10,020
Observations Panel B	1,984	1,976	1,984
Dependent mean	3.77	0.034	0.27

Notes: The table illustrates the estimated coefficients of equation (1). *Imputed Outflows* is defined in equation (3) as the product of municipal foreign settlement shares in 1990 and annual outflows of Venezuelans to Colombia. Controls in the baseline are interacted with time trends. They include: urban coverage, water bodies, and forest loss area for the year 2001; night light density for 1992; and political repression records for 2004. All estimates exclude the outlier municipality Libertador. Clustered standard errors by the municipality are presented in parentheses. ***p<0.01, **p <0.05, *p<0.1.