Why Economic Sanctions Backfire: The Role of Emigration in the Venezuelan Case*

Nicolás Idrobo†

September 29, 2024
Click here for the latest version

Abstract

Economic sanctions are often imposed to bring about regime change or induce policy changes. In Iraq, Venezuela, Cuba, Nicaragua, Chile, and Russia, for example, economic sanctions were meant to starve the ruling regime of resources and foment protests and unrest. Critics posit that such sanctions are ineffective and may even backfire by creating a rally-around-the-flag effect. I argue that this debate misses a fundamental pitfall of economic sanctions as tools of regime change: the cost of sanctions falls disproportionately on populations opposed to the government, leading them to emigrate; sanctions, then, not only restore but can even bolster the regime's strength. I develop a formal model to understand the mechanisms, and I use original data sets to document this dynamic in the Venezuelan case. Sanctions meant to topple Nicolás Maduro instead accelerated the opposition exodus, thereby strengthening the Maduro regime.

*I am grateful to Guy Grossman, Dorothy Kronick, Marc Meredith, and Alex Weisiger for their continued support and guidance. For their comments and helpful discussions, I thank Alberto Arredondo, Konstantin Ash, Nejla Asimovic, Apurva Bamezai, Chris Blair, Sarah Bush, Stephanie Char, Menevis Cilizoglu, Fiona Cunningham, Gemma Dipoppa, Daniel Drezner, Jane Esberg, Julia Gray, Jason Hartwig, Daniel Hopkins, Yue Hou, Rachel Hulvey, Ed Mansfield, Ana María Martínez, Gino Pauselli, Liana Eustacia Reyes, Liliana Rincón, Francisco Rodríguez, Rashi Sabherwal, Yajna Sanguhan, Carlos Schmidt-Padilla, Paul Silva, Daniel M. Smith, Tariq Tachil, Rocío Titiunik, Carolina Torreblanca, Tanya Vaidya, Gonzalo Vazquez-Bare, and Erik Wibbels. I gratefully acknowledge funding from the Browne Center and the PDRI/Devlab at Penn. I also thank the participants at APSA 2023 and 2024, the 2024 pre-APSA conference on sanctions, and the CP, IR, and PDRI/Devlab workshops at Penn for their valuable feedback.

†Ph.D. candidate in Political Science, University of Pennsylvania. Contact: idrobo@sas.upenn.edu.

Countries and international organizations, such as the United Nations, frequently impose sanctions on other nations, companies, and individuals to exert economic and political pressure, and the use of these sanctions has only increased over time (Felbermayr et al., 2020; Jentleson, 2022). Just since the start of the century, Iran, North Korea, Russia, Syria, and Venezuela (to name a few countries) have been targeted with sanctions aimed at derailing nuclear programs, deterring or stopping invasions of other countries, stopping mass human rights violations, and overall democratic erosion. The logic was perfectly explained in now-declassified correspondence between two high US officials in 1960 discussing the situation in Cuba:

> "The only foreseeable means of alienating internal support is through disenchantment and disaffection based on economic dissatisfaction and hardship ... If the above are accepted or cannot be successfully countered, it follows that every possible means should be undertaken promptly to weaken the economic life of Cuba. If such a policy is adopted, it should be the result of a positive decision which would call forth a line of action which, while as adroit and inconspicuous as possible, makes the greatest inroads in denying money and supplies to Cuba, to decrease monetary and real wages, to bring about hunger, desperation, and overthrow of government." Mallory (1960). The full text is provided in Figure A1.

I argue that sanctions-induced hunger and desperation typically do not lead to overthrow but rather to opposition exodus and, thereby, regime strengthening. Opponents are more likely to emigrate because the regime tries to shield its supporters from the effects of sanctions and because supporters have some loyalty to the regime (Hirschman, 1970). This outmigration can effectively export a large portion of the regime's political opposition, strengthening it and increasing its chances of survival in the medium and short run, even if the economy is smaller due to emigration and sanctions.

I provide a formal theory explaining how and when sanctions on non-democratic states can lead to emigration waves, with political opponents being the most likely to emigrate. The theory generates two main testable implications, which I evaluate in the Venezuelan case: (i) the negative economic effects of sanctions will be more severe in opposition strongholds, and (ii) political opponents are more likely to emigrate due to the economic collapse produced by sanctions.

Using administrative data on formal employment in Venezuela, I document how the sanctions-induced economic collapse was more pronounced in places where the opposition used to be strong in 2013, likely because opponents were not protected by the regime from the

consequences of sanctions and preferred to emigrate in larger numbers. Given that Venezuela is under an authoritarian regime with the appearance of a hybrid one (Levitsky and Way, 2020), in which regular elections are frequently held, I use electoral outcomes to show that turnout decreased much more in previous opposition strongholds, meaning that sanctions and general economic decay effectively exported a significant part of the political opposition. Taken together, the results show that the huge emigration wave–it is estimated that close to 25% of the population left in less than a decade (UNHCR, 2024)–was partly a consequence of the economic sanctions and that the regime benefited politically from this.

This paper is the first to examine the subnational economic and political effects of sanctions in Venezuela. It reveals that formal employment contracted by nearly 60% in the median parish between 2014 and 2020, with a more severe impact in parishes where the regime won the popular vote in 2013. Using a two-way fixed effects model, I estimate that pro-regime parishes had formal employment rates between 7.5% and 14% higher than pro-opposition parishes following the imposition of sanctions, depending on the model specification. Additionally, voter turnout has declined almost universally, with a more pronounced drop in former opposition areas. While the regime's vote share has also decreased, it has done so less significantly in these areas, suggesting potential political gains due to the emigration of opposition supporters.

Furthermore, I discuss the presidential election held on July 28, 2024, analyzing the vote counts published by the opposition, which account for roughly 80% of the tally sheets. While credible allegations of electoral fraud by the regime exist for this election—and there are many reasons to believe the opposition's vote counts are valid (Kronick, 2024; Mebane, 2024)—such tampering is unlikely in previous elections. This is because bypassing the numerous checks and balances within the system, which appears to have occurred only in 2024, would have been necessary (Toro, 2012).

I argue that emigration can serve as a way to relieve economic and political pressure following sanctions. However, I acknowledge that comprehensive sanctions can cause enough suffering in the long run to prompt regime supporters to switch sides and become opponents, potentially offsetting the political benefits of exporting part of the opposition. These two mechanisms may operate at different times: emigration could provide net political gains for the regime in the short and medium term, but over time, the switching mechanism might grow stronger, rendering emigration insufficient. This argument helps explain the regime's massive defeat in the 2024 presidential election. The remainder of the paper discusses the conditions under which the emigration mechanism works, but future research should explore

the dynamics of the switching mechanism in greater detail.

This paper contributes to three distinct academic literatures. First, it adds to the literature on economic sanctions. The effectiveness of sanctions has been a subject of long-standing debate among scholars. Some argue that sanctions can compel the target to comply, especially when the sender is a major trading partner, as this increases the costs and pressures the target to make concessions (Hufbauer, Schott and Elliott, 1990; Morgan, Bapat and Krustev, 2009; Whang, McLean and Kuberski, 2013; Walentek et al., 2021). Sanctions can also strengthen local opposition groups by drawing support towards them (Liou, Murdie and Peksen, 2022). On the other hand, critics contend that sanctions are often ineffective due to the resilience of target economies and political regimes (Pape, 1997). These regimes often find ways to mitigate the additional costs, such as by trading with alternative partners (Drezner, 1999) or by fostering nationalistic sentiments (Kaempfer and Lowenberg, 1988). Furthermore, research focused on the impact of sanctions on authoritarian regimes shows that these regimes tend to respond by increasing public spending or resorting to repression, depending on the regime type (e.g., single-party, military regimes), as shown by Escribà-Folch (2011); Escribà-Folch and Wright (2010). I propose a novel mechanism, suggesting that sanctions can not only be ineffective but even counterproductive, as they may trigger emigration waves that decrease the number of political opponents and ultimately entrench the autocratic regime—an outcome contrary to the intended effect.

Second, this paper complements the literature that studies the survival tools at the disposal of autocrats. Authoritarian regimes have many tools at their disposal to tame discontent and increase their chances of survival (Ghandi, 2008; Svolik, 2012; Geddes, Wright and Frantz, 2018). For example, they can use repression (Rozenas and Zhukov, 2019; Blaydes, 2018) or economic redistribution (Acemoglu and Robinson, 2009; Boix, 2003; Ansell and Samuels, 2014) to avoid a popular uprising that could produce a regime change. They can also redistribute resources by targeting very specific groups or actors in society to offset the risk of being overthrown (Reuter and Szakonyi, 2019; Albertus, 2015; Blaydes, 2010; Hong, 2018; Pepinsky, 2009). Authoritarian regimes can also punish their opponents by targeting their income and wealth directly, as Hugo Chávez did in Venezuela in the aftermath of the 2004 recall referendum (Hsieh et al., 2011). My work extends the classical framework of Hirschman (1970), which posits that citizens in a regime can either remain loyal, voice their discontent, or exit, applying it to authoritarian regimes experiencing economic downturns due to sanctions. Recent literature has highlighted how emigration—an exit option in Hirschman's framework—can act as a safety valve for authoritarian regimes (Lueders, 2024; Miller and Peters, 2020, 2024; Sellars, 2017, 2023; Tsourapas, 2018). I

investigate this within the context of economic sanctions on authoritarian regimes, offering a formal theory that elucidates the mechanisms and conditions under which sanctions are likely to trigger significant emigration flows, potentially bolstering the regime politically. The model has different testable implications and, based on its comparative statics, elucidates how the repressive capabilities of the regime, among other features, play into the decisions of autocrats and citizens. Additionally, I utilize highly disaggregated data across time and space from Venezuela to empirically test some aspects of the theory, a country currently grappling with the impacts of sanctions and authoritarian governance.

Finally, my work contributes to the literature on the political consequences of migration, a field that has predominantly examined the effects on destination countries, often overlooking the implications for source countries. While emigration generates a flow of remittances, much of the existing research has concentrated on this economic aspect. Remittances enhance the well-being of those who remain behind (Ivlevs, Nikolova and Graham, 2018) and, in the political sphere, can empower opposition movements by providing resources that are independent of the regime (Escribà-Folch, Meseguer and Wright, 2018, 2022). Although some studies suggest that emigration can strengthen democracy (Docquier et al., 2016), establishing a clear causal link remains challenging. The studies most closely related to mine include Grossman, Manekin and Margalit (2018), which examines the domestic consequences of sanctions and finds a backlash effect against the sender rather than the target, and Lim (2022), which investigates central and western European countries and finds that emigration alters the political composition of source countries. Specifically, since migrants tend to be more progressive, their departure often results in a more conservative electorate in their countries of origin.

The rest of the paper discusses the above arguments in detail. Section 2 provides a theory for how and when sanctions can induce emigration and strengthen authoritarian regimes. Section 3 discusses the Venezuelan context under the rule of Nicolás Maduro, which corresponds to when sanctions were imposed. The empirical results supporting the theory are presented in Section 4, and finally, Section 5 provides some discussion to conclude.

2 Theory

I develop a model to explain under what conditions sanctions can strengthen or weaken the incumbent regime in an electoral autocracy setting. The model features a game in which elites and voters interact once sanctions are imposed. The elites own the economic production

means, and the voters work for a wage. Sanctions reduce wages by crippling production technology, leading to voter discontent. Voters are either regime supporters or opponents, with the latter deciding whether to organize a revolution. Revolutions are successful with a certain probability that depends on the share of voters in the opposition and a parameter that captures the repressive capabilities of the regime. Elites decide whether to open the borders after sanctions are imposed or keep them closed.

The model clarifies the logic under which sanctions are often imposed. In the absence of emigration, sanctions increase the probability of regime overthrow by weakening the economy and increasing voter discontent. However, the model also clarifies that when emigration is available to the regime, the regime will choose to allow emigration in the absence of a strong repressive apparatus. In that case, sanctions can paradoxically strengthen the regime politically because of the differential emigration of supporters and opponents.

2.1 Setup

The model has three actors, but only two make decisions. The elites (E) and the opposition voters (O) make choices, and the regime's supporters (S) do not, even though they are an essential part of the economy. The elites own the representative firm and the physical capital that is used as an input of production. Voters work for a wage endogenously determined by standard market economy conditions as the marginal product of labor. Their decision to emigrate is simplified and based on comparing the domestic wage (w) to an exogenous wage abroad (w_A). In reality, a more complex decision takes place, one in which psychological and monetary costs take an important part (Massey et al., 1993; McKenzie, 2023). Given this simplification, in the model, opponents have incentives to emigrate if:

$$w_i = w < w_A, \quad i \in O \tag{1}$$

I assume workers who support the regime have the same production skills as workers in the opposition so that they earn the same domestic wage. Nevertheless, supporters also get a lump-sum transfer $T_i = B/N_s$, where $B \geq 0$ is an exogenous cash stock available to the regime, and N_s is the number of supporters. Finally, supporters derive a loyalty payoff from being aligned to the regime and given by $\ell_i = Q \cdot z_i$, where $Q \geq 0$ is a scale parameter, and z_i is a random variable with a known distribution. Given this, regime supporters have

incentives to emigrate when:

$$w_i + T_i + \ell_i < w_A, \quad i \in S \tag{2}$$

That is, voters who support the regime are willing to withstand a lower domestic wage before attempting to emigrate, given that they potentially receive a transfer from the government and derive a loyalty payoff from being aligned with the regime.

The elites own the representative firm that produces an output $Y = AF(L, K)$, where A is a technology parameter, and $F(\cdot)$ is the production function of the economy, which depends on labor (L), and capital (K). The domestic wage is equal to the marginal product of labor and, crucially, depends on A, the technology parameter. A more detailed setup is provided in Appendix B.1.

2.2 The Game

I assume that initially, citizens do not have incentives to emigrate, which means that conditions 1 and 2 are not satisfied. The regime is targeted with sanctions, and this cripples the technology of production, making the new parameter $\tilde{A} < A$. Given that wages are equal to the marginal product of labor ($\tilde{A}F_L(L, K)$), sanctions lower the wage to opponents and supporters of the regime equally. A lower wage makes condition 1 true, meaning that opponents have incentives to emigrate to obtain a larger wage abroad. Depending on the size of the transfer (T_i) and the individual loyalty of supporters (ℓ_i), condition 2 will be true for some of them, meaning that they might have incentives to emigrate too.

Lower wages for all voters as a consequence of sanctions imply that, in the absence of emigration, all workers are worse off and have incentives to put pressure on the regime to resolve this situation. Political opponents have two possible actions in the game. They decide whether to pursue a revolution (R) or not (NR). If a revolution is sought, it is successful with probability $p(\theta, \psi)$, where θ is the share of opponents in society, and ψ is a parameter that captures the repressive capabilities of the regime. Crucially, $p(\cdot)$ depends positively on θ and negatively on ψ, meaning that in a society in which the opposition is a large group, a revolution is more likely to succeed than one in which the opposition is a small group. It also means that the stronger the repressive apparatus of the regime, the lower the chances of overthrowing it.

The elites, on the other hand, move first and decide whether to allow emigration ($\eta = 1$)

or keep the borders closed ($\eta = 0$). Allowing emigration releases political pressure since opponents are more likely to leave given conditions 1 and 2, and this, in turn, produces a smaller fraction of opponents in society (I call this value $\tilde{\theta}$ under the emigration scenario), which in turn lowers the probability that a revolution can overthrow the regime. Nevertheless, if a fraction of the population emigrates, the economy shrinks since the labor supply is smaller, too. This means that the elite's payoffs are smaller, too. The potential benefit is avoiding a revolution, a case in which they lose all power and economic rents. If they choose not to allow emigration, economic pressure is not released since all citizens must bear the cost of sanctions via a lower wage. Under some scenarios, this could be an optimal choice for the regime, as I discuss below. Figure 1 depicts the game.

If opponents choose NR, the elites' emigration policy is enacted without resistance, and payoffs are realized. If opponents choose R, all payoffs are immediately discounted by $\mu \in (0, 1)$ since revolutions are costly and resources are destroyed. Under a successful revolution, the elites are expropriated, and voters as a whole become the owners of the economy (means of production and the government's cash stock). If the revolution is unsuccessful, all actors obtain payoffs equal to the ones they would have obtained had they chosen NR but discounted by the destruction caused by pursuing a revolution. The payoffs are derived in detail in Appendix B.2 and B.3.

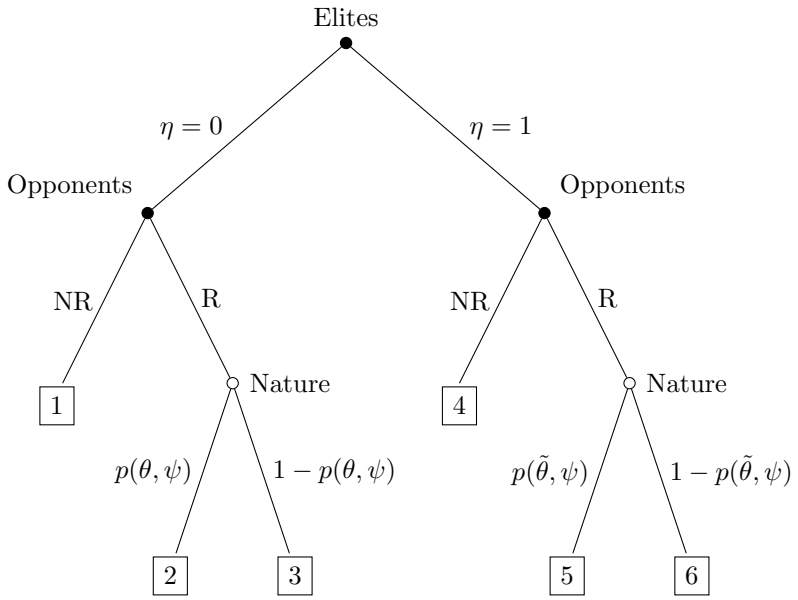
2.3 Results

The game is solved by backward induction, meaning that since elites move first and there is perfect information, they try to understand whether opponents will pursue a revolution and then decide whether to open the borders. I start by presenting auxiliary results needed to understand the main result of the model.

The first result is that independent of the emigration policy they choose, the elites prefer it if opponents do not pursue a revolution. This is because, with some probability, a revolution is successful, and the elites are expropriated. With some probability, it is unsuccessful, and their income is equal to the one in the absence of a revolution but discounted by the destruction rate of a revolution. This means that, under a revolution, in the worst-case scenario, they lose everything; in the best-case scenario, they keep a fraction of what they had had opponents not tried a revolution. For details, see Proposition 1 in Appendix B.4.

The second result is that conditional on opponents' action being NR or R, elites prefer the payoffs on the no-emigration branch. This is because, in the presence of emigration, the

Figure 1: Extensive-form game



This figure depicts the extensive-form game between the ruling elite (elites) and the citizens in the opposition (opponents). The game is sequential, and the elites choose first whether to allow emigration ($\eta = 1$) or not ($\eta = 0$). Subsequently, opponents decide whether to attempt a revolution (R) or not revolt at all (NR). If a revolution is attempted, it is successful with a certain probability $p(\theta, \psi)$, where θ is the share of opponents in society, and ψ is a parameter that captures the technology of repression of the regime. There are six possible scenarios, numbered 1-6 in the figure. Each of these scenarios has different payoffs for the elites, the opponents, and the supporters, and these are derived in detail in Appendix B.

economy is smaller, given that a fraction of the labor force emigrates. Since the elites own the representative firm and the stock of capital, their payoff decreases when the labor supply is smaller (labor and capital are complements). Therefore, in principle, they prefer a larger labor force and the branch with no emigration. For details, see Proposition 2 in Appendix B.4.

The third and main result of the model is that if the probability of a revolution is not too low and the destruction rate is not too high, there is a sanction severity threshold ($\delta = A - \tilde{A}$) such that a revolution is preferred for the opponents, and this forces the elites to choose an open emigration policy. This is because once sanctions sufficiently damage the economy and wages are sufficiently low, a revolution–even not guaranteed to succeed–becomes more appealing to the opponents. The elites know this and prefer to move away from the no-emigration branch, which they preferred if opponents chose NR (which is not the case), to the emigration branch. With open borders, some opponents emigrate, and the probability of a revolution decreases substantially, given that revolutions require opponents to push them through. The regime is worse off since it prefers the no-emigration branch (the second result

above), but it is better off than in the no-emigration branch with a revolution (first result). They might have a lower payoff since the economy is smaller, but at least they survived in the short run. For details, see Propositions 3a and 3b in Appendix B.4.

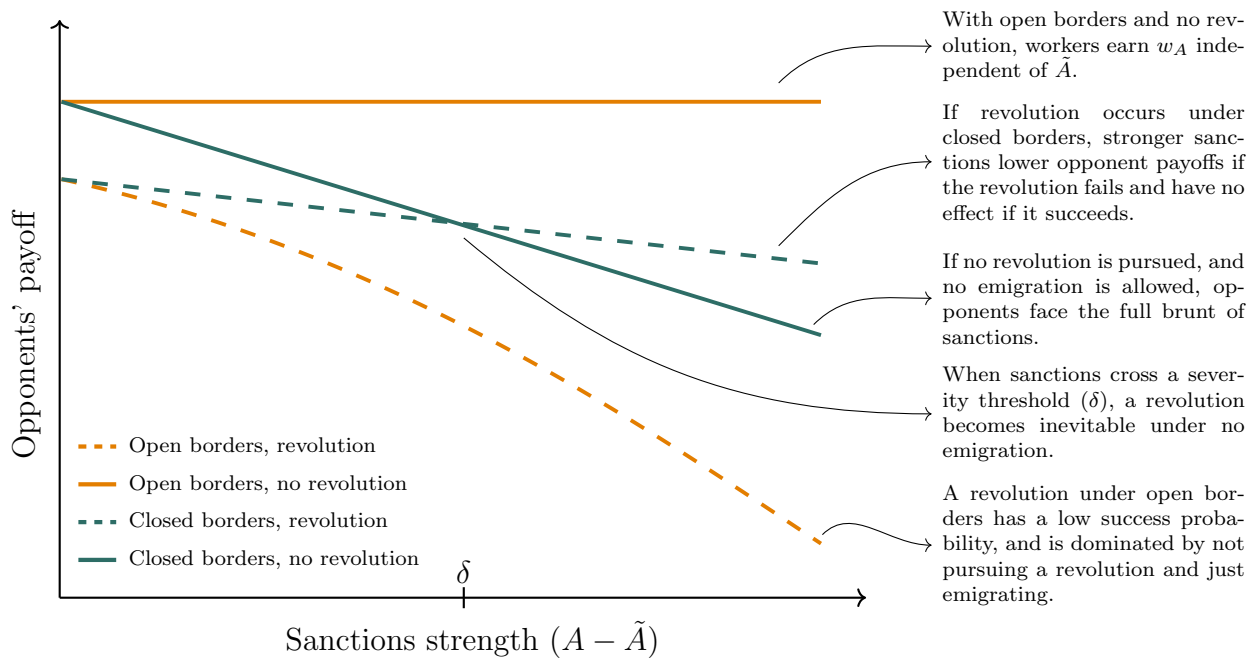
Figure 2 illustrates the core result of the model. The horizontal axis measures the intensity of the sanctions, and the vertical axis measures the payoff received by the opponents. Consider first how sanctions affect the payoff of the opposition citizens *in the absence of an emigration option* (green lines). As is to be expected, their payoff declines with sanctions; it declines faster if they do not attempt to overthrow the government since opponents face the full brunt of sanctions without risking a regime change. On the other hand, the payoff to attempt an overthrow without emigration declines less since, with some positive probability, the revolution is successful, and citizens–both opponents and supporters–gain access to an unrestricted economy. At the point marked δ, opposition citizens' payoff from attempting to overthrow the government exceeds their payoff from not trying to overthrow the government. This is precisely the logic articulated by John Bolton when the United States imposed sanctions on Venezuela in 2019: "The United States will use its economic tools to the maximum capacity to constrict Maduro and ensure that his cronies no longer pilfer what rightfully belongs to the people of Venezuela ... The walls are closing in. There is no turning back. The people will prevail" (Bolton, 2019).

Yet, Figure 2 exemplifies why this logic is flawed. If sanctions exceed δ and emigration is restricted, opponents prefer a coup, prompting the regime to open borders. The orange lines become relevant at the right of δ. When emigration is an option, the probability of success in an overthrow attempt *declines* with sanction severity, as opposition members emigrate at higher rates. That is why, if they attempt to overthrow the government, opposition citizens' payoff declines *faster* in sanction severity when the borders are open (orange dashed line) than when the borders are closed (green dashed line). That is also why, when emigration is allowed, opposition citizens' payoff from overthrowing the government (orange dashed line) never exceeds their payoff from not attempting to overthrow (solid orange line). In fact, with open borders, sanction severity only makes revolution *less* likely since opponents leave. That is the result that so many advocates of sanctions have failed to appreciate.

2.4 Additional Results

In some cases, like Cuba or North Korea, the regimes were targeted with comprehensive sanctions, and even with closed borders, the regimes managed to survive. This can be explained by the model, too. If the technology of repression (ψ) is sufficiently high–as in

Figure 2: Opponent's payoffs in every branch



North Korea (Greitens, 2023)–so that the probability of a revolution is low, even in the presence of strong sanctions, opponents know they are better off by not trying to overthrow the regime. This is simply because if the regime has a strong repressive apparatus, the probability of a successful revolution is too low, and the opponents are better off by not pursuing a revolution. This result can also be achieved if the destruction rate of a revolution is sufficiently high since the final payoff, even if the revolution succeeds, is vastly reduced.

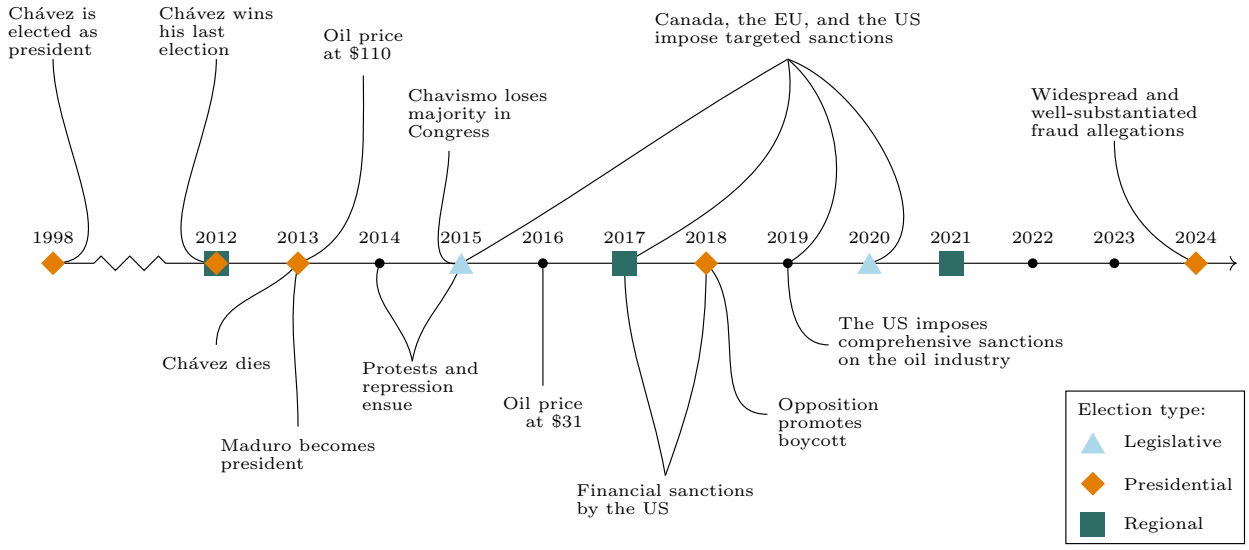
In general, the severity threshold of sanctions under which autocratic regimes are willing to open the borders is higher the stronger their repressive capabilities are ($\partial\delta/\partial\psi > 0$). Nevertheless, the crucial point is that when a revolution becomes inevitable (the area to the right of δ in Figure 2), the regime simply prefers to open the borders, releasing economic pressure so the regime is able to live for another day. When the regime's repressive apparatus is extremely weak, a revolution becomes inevitable. Conversely, when it is extremely strong, a revolution is nearly impossible. This is discussed in detail in Appendix B.5.

3 A Brief History of Maduro's Tenure

Hugo Chávez was elected president in 1998, supported by a cross-class coalition that was only present during his first election (Kronick, Plunkett and Rodriguez, 2023). From 2004

to 2013, his government benefited from a decade of high oil prices (see Figure 4a below), generating at least 750 billion dollars in revenue (Lizarralde, 2024). These funds bolstered his popularity and allowed him to buy the support needed to consolidate his power. Under his rule, Venezuela transformed into a hybrid regime, maintaining a democratic facade while systematically dismantling behind-the-scenes checks and balances (Norris, 2017; Levitsky and Way, 2020). Chávez changed the constitution, removed term limits, and amassed enormous power in the executive branch by taking full control of the national oil company (PDVSA), packing the courts, stripping power from institutions, and replacing them with more direct forms of citizen interaction. He also threatened members of Congress, the media, and private sector actors who opposed him (Corrales and Penfold, 2015). Additionally, he imposed a dual exchange rate system that could be exploited by those connected to the regime (Gulotty and Kronick, 2022). After nearly 15 years in power, Chávez's life was cut short by aggressive cancer in 2013. A few months before his death, he urged Venezuelans to support Nicolás Maduro, his Secretary of Foreign Relations and long-time political ally. Figure 3 summarizes the main economic and political events since 1998.

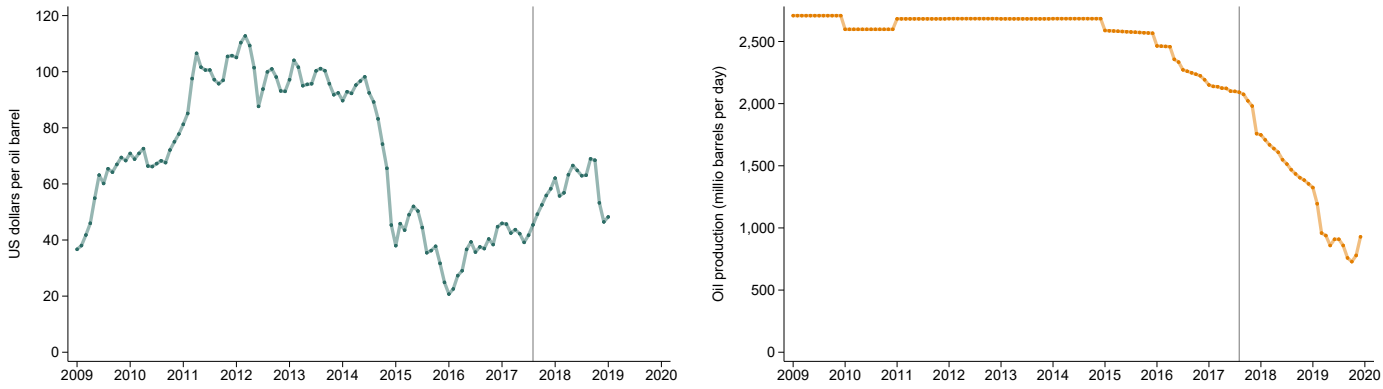
Figure 3: Timeline of elections and sanctions since 2012



Maduro won the 2013 presidential election by a margin of less than 2%, highlighting the stark contrast between his political appeal and that of Chávez, who had secured an 11-point victory just a year before in the 2012 presidential election. In 2014, a slowdown in the world's demand for oil and the Organization of the Petroleum Exporting Countries (OPEC) 's refusal to curb supply caused international oil prices to plummet. In June of 2014, Venezuela's oil

barrel was around $98.19, and by the end of the year, the price had fallen to half of that amount, as shown in Figure 4a. Chávez had created a state that used oil revenues to buy off influence on the public and the elites–a common feature of oil-rich countries (Ross, 2012)–, and this was supported by a decade of high oil prices. In the absence of Chávez and with plummeting oil prices, Maduro struggled to maintain stability. Oil production and revenues contracted (see Figure 4b), and the economy as a whole, too. In an export-intensive economy like the Venezuelan, the revenue from exporting oil is used to buy imports of basic goods that are not produced domestically. If exports decrease, imports must do so too. Figure E1b documents how GDP started declining at the beginning of Maduro's tenure. In fact, 2014 was the last year that Venezuela published GDP figures, and after that point we have had to rely on estimates or other time series to gauge the decline in economic activity.

Figure 4: The collapse of the Venezuelan oil industry



(a) Oil price (Venezuelan basket)

(b) Oil production

These figures plot monthly data on the price of Venezuelan oil in current US dollars (on the left) and the production in million barrels per day of Venezuelan oil. The vertical line is in August of 2017 and marks the imposition of financial sanctions on the country. Subsequent sanctions on the Venezuelan oil industry were placed after 2017 but are not marked in the figures for presentational purposes. Figure 4a clearly shows how the price plummeted in 2014, also driving production down, as seen in Figure 4b. Nevertheless, the price of oil began to recover in 2016, and oil production never did. This is a consequence of the poor management of PDVSA and the sanctions placed in the country starting in 2017, which effectively closed international markets for Venezuelan oil. The data comes from the U.S. Energy Information Administration.

Due to a contracting economy and the political void left by Chávez's death, citizens were discontent and protested during 2014 and 2015 (Said-Hung and Segado-Boj, 2018; Briceño-Ruiz, 2019; Morselli, Passini and McGarty, 2020). In line with the predictions of Escribà-Folch (2011), the Maduro regime, short on cash and trying to balance power threats from within, responded with repression. The country was scheduled to hold an election for the legislative body in December of 2015, and for the first time in 16 years, the Chavismo lost the majority of the National Assembly. The opposition coalition, Mesa de la Unidad Democrática

(MUD), secured 112 out of the 167 seats of the assembly. These results, coupled with the protests observed in the months before the election, showed the regime clearly that it was losing popular support. The support of the Chavismo movement depended on a constant stream of cash, and the decade of high oil prices had ended.

The regime responded not only with repression but also through judicial means. After losing the majority in the National Assembly at the end of 2015, Maduro used the highest court in the country, the Tribunal Supremo de Justicia (TSJ), to progressively strip the Assembly of its powers. This effort culminated in 2017 when the TSJ transferred all legislative powers to the Asamblea Nacional Constituyente, a body controlled by Chavismo, effectively sidelining the opposition-controlled National Assembly. Maduro did not have the unifying force of Chávez, meaning he had to share power with other factions inside Chavismo. This, coupled with the crashing oil prices, pushed him to react with repression and grab even more power from other institutions, in a clear sign of democratic backsliding (Levitsky and Ziblatt, 2019).

Sanctions started in 2015, under the Obama administration, albeit at that time, they were targeted against high-ranking officials who repressed and prosecuted many who protested against the regime in 2014 and 2015 (The White House, 2015). The Trump administration ramped up sanctions and targeted the government and PDVSA, the state-owned oil company. In 2017, the US government imposed financial sanctions that closed the US financial market for the US government and PDVSA to finance themselves (The White House, 2017). During 2018, the US continued tightening the financial sanctions. Still, the big blow came in 2019, when the US effectively closed international oil markets for Venezuela, forbidding any transactions with the country (The White House, 2019*a*,*b*). Western European countries followed suit and imposed similar sanctions over the years. Sanctions effectively pushed oil production to the abyss, as shown in Figure 4b, and discussed at length by Rodríguez (2019, 2021, 2024). Given the structure of the Venezuelan economy, which mainly consisted of exporting oil and using the revenue to import food and essential goods, closing the international oil markets was a sure way to push the population into hunger (Weisbrot and Sachs, 2019; Rodríguez, 2022). Others argue that sanctions are not the main cause behind the collapse of the oil industry and the lower caloric intake of the Venezuelan population (Hausmann and Muci, 2019). In any case, the debate has focused mainly on analyzing aggregate time series and needs evidence of the subnational effects of sanctions using more comprehensive data sources.

Emigration from Venezuela surged dramatically due to the economic decline beginning in 2014 and the impact of sanctions after 2017. Estimates suggest that a quarter of the

population emigrated within less than a decade (UNHCR, 2024). Despite this, Venezuela does not release detailed emigration data, and the regime even denies that emigration has occurred (Associated Press, 2024). However, the number of Venezuelans entering Colombia skyrocketed from 291,539 in 2014 to 796,234 in 2017 and nearly 1.4 million by 2018 (see Figure C1a). The refugee population also increased exponentially (see Figure C1b), straining the social safety nets of neighboring countries. While these figures capture the overall situation, there is no evidence of how emigration has varied across different regions within Venezuela. The following section sheds light on this issue.

4 Venezuela's Economic Collapse and the Dynamics of Emigration

While the aggregate economic effects discussed in the previous section are apparent and have been well-documented, there is scarce evidence of the subnational economic effects produced by economic sanctions. Measuring economic activity subnationally and over a long period of time in a country like Venezuela, with a collapsing economy and a hybrid political regime, is difficult. As mentioned, Venezuela stopped publishing its GDP figures in 2015 when the economy started contracting. The state no longer produces yearly representative surveys to measure socioeconomic patterns and inform policymaking. Hiding information that would show the economic collapse is a strategic decision taken to avoid responsibility and the potential political consequences.

This section provides a test for the theory using the Venezuelan case. In particular, I use a parish-year panel data set to document how formal employment decreased more in areas where the opposition used to be strong before sanctions, implying that the regime likely tried to protect the firms and workers in their strongholds from the negative effects of sanctions. I also match at the individual level the list of those who signed to petition a recall referendum against Maduro in 2016 with formal employment data at the individual level to show how signers (i.e., opponents) exited the formal labor market at higher rates than non-signers. The differential trend in formal employment is also indirect evidence of emigration, given that lower formal employment in opposition areas is likely due to emigration, at least in part. A decrease in formal employment can also result from workers shifting to the informal economy, and there is no current way to disentangle the two effects completely. I argue that turnout can also serve as an indirect measure of emigration, given that only 1% of the Venezuelan diaspora is allowed to vote abroad–an action from the regime that further reinforces the

claim that those who emigrated are likely political opponents–. Using electoral returns at the parish level–a geographic unit below municipalities–, I document how turnout fell more in previous opposition strongholds after sanctions were imposed. The turnout result further complements the view that emigration was higher in the former opposition areas.

4.1 Differential Formal Employment Trends

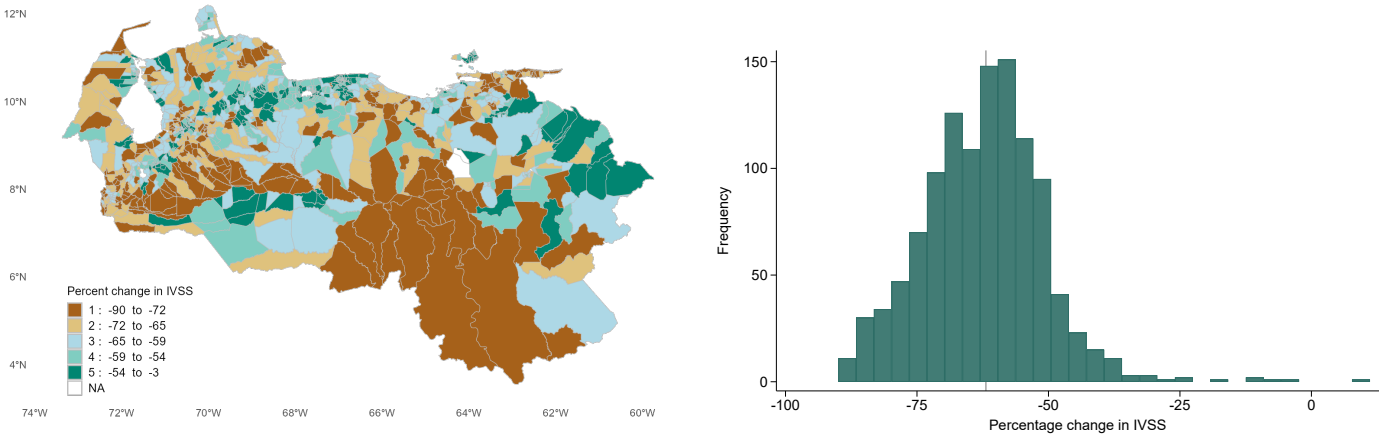
One of the most comprehensive measures of economic activity available is the data set of formal labor employment produced by the Institute of Social Security (IVSS henceforth) of Venezuela, which contains information on all formal workers in the economy who paid taxes and social security in a year. This data was previously used to study how Chávez punished referendum recall signatories in 2004 (Hsieh et al., 2011), and how Chávez's winning coalition in 1998 was more homogeneous in socioeconomic terms than in the years after (Kronick, Plunkett and Rodriguez, 2023). I use this data to understand the geography and intensity of the economic collapse and emigration wave generated by the sanctions.

Given that this measure is available at the individual level, I use the electoral census (which maps voters to voting booths) to infer the parish where people live and aggregate the measure at the year and parish level to count the number of formal workers. I produce a strongly balanced panel data set of 1,142 parishes from 2006 until 2020. Since parishes with a larger population are more likely to have more formal workers, I use the 2011 population–when the last census was conducted–to produce the rate of formal employment per 100,000 inhabitants at the parish and year level, which is my main outcome in the analysis below.

The number of formal workers broadly tracks Venezuela's GDP, as shown by Figure E1. From 2006 to 2014, during the oil boom, the number of formal workers grew from 4.2 million to 6.18 million, an increase of 46.9%. However, following this period of growth, the economic crisis beginning in 2014, exacerbated by sanctions from 2017 onwards, caused the number of formal workers to drop to 2.67 million by 2020, a decline of 56.82% since 2014. In the median parish, the number of formal workers between 2014 and 2020 contracted by 60%, and only one parish out of more than 1,100 didn't experience a decrease in its formal economic activity between these years, as shown in Figure 5b.

As Figure 5a shows, the decline in formal employment was geographically heterogeneous. Areas like Caracas, the country's capital, located at the center of the northern part of the map, suffered smaller declines than more rural areas in the south. When comparing to a map of Maduro's electoral strength in Figure D1a, there seems to be a spatial correlation showing that the decline was steeper in pro-opposition areas. I study that exact relationship

Figure 5: The collapse of formal employment



(a) Geography of the collapse

(b) Histogram

For graphical purposes, the map in Figure 5a excludes Amazonas, a large and rural state in the south. Figure E2 in the Appendix contains the full map. Figure 5b presents a histogram of the change in the formal employment rate between 2014 and 2020, at the parish level. The vertical grey line marks the median of the distribution.

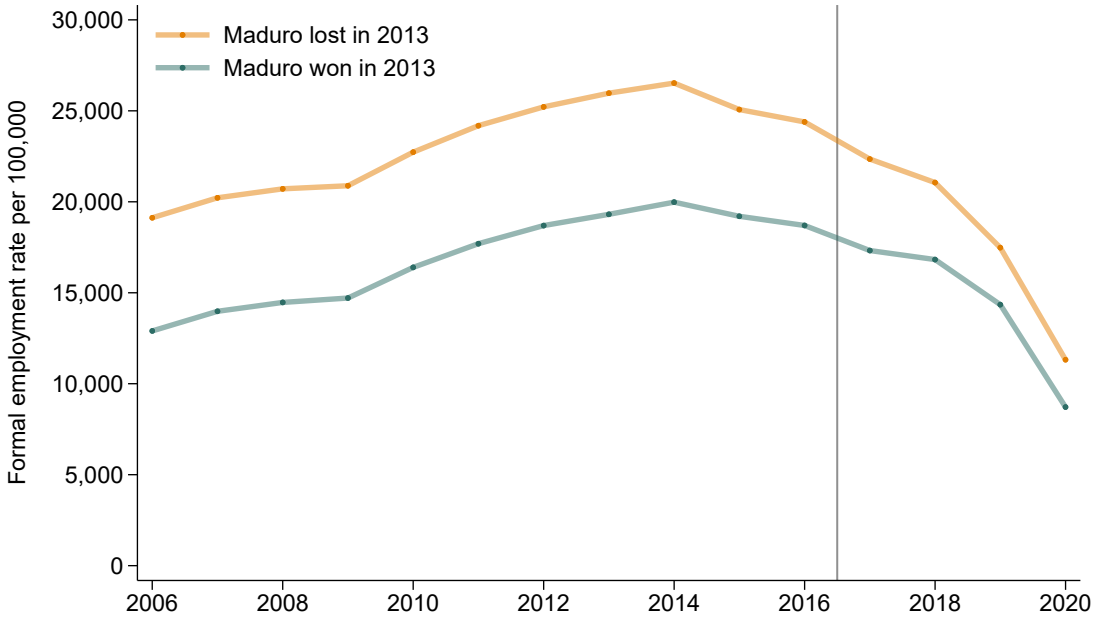
more formally in the rest of the section.

The theory discussed in Section 2 focuses on economic sanctions that are strong enough to produce major economic suffering. If that is not the case, then it is unlikely that people will have incentives to emigrate since their economic well-being might not be directly affected, or the emigration costs simply outweigh the effects caused by mild sanctions. Sanctions imposed on Venezuela since 2017 had severe economic effects, as shown in Figures 4 and E1. Between 2014 and 2021, oil production shrunk by more than 50%, and GDP by about 75%. At the same time, formal employment fell by more than 50%, and roughly a quarter of the population emigrated. These rough aggregate findings show how strong the sanctions imposed on Venezuela were.

Nevertheless, evidence on the subnational effects is scarce, and in principle, there are no clear expectations as to why there should be differential effects. My theory argues that at the subnational level, not all areas should be impacted equally, given that the regime might try to shield its supporters from the full brunt of sanctions. Figure 6 shows the difference in the formal employment rate, aggregating the parishes where Maduro won the popular vote in the 2013 presidential elections and the parishes where he lost. This figure shows a known fact: formal employment used to be higher in pro-opposition parishes (Kronick, Plunkett and Rodriguez, 2023). It also shows that the decline after sanctions was steeper in

places not aligned with Maduro, which is likely due to a strategic action by the regime in protecting the parishes where their voters are located. However, this relationship could also be a consequence of a regression-to-the-mean problem, given that Chavismo was stronger in rural areas, where formal employment rates tend to be lower. For example, in 2013, the formal employment rate in Chavista places was close to 18,000 per 100,000 inhabitants, while it was close to 25,000 in the opposition strongholds, which means that a decline was more likely to happen in opposition parishes. To deal with this and formally estimate the dynamic effects of sanctions on formal employment differentially, I use an event study design.

Figure 6: The rate of formal employment decreased more in pro-opposition parishes



This figure shows the aggregate formal employment rate per 100,000 by grouping all parishes where Maduro lost in 2013 and compares them to the parishes where he won. The population used to normalize corresponds to the same parishes and comes from the 2011 census. The vertical line marks the midpoint between 2016 and 2017, given that financial sanctions were imposed in 2017.

The event study is set up by defining two groups to compare over time and a time threshold marking when the event of interest occurs. Since the first round of comprehensive sanctions was imposed in 2017, this year serves as the time threshold. To understand how pro-regime and pro-opposition places fared after sanctions, I define the groups based on the electoral results from the 2013 presidential election. Specifically, I compare parishes where Maduro won the popular vote with those where he lost. In alternative specifications, I compare parishes in the top quintile of the 2013 vote share with those in the bottom quintile. Because sanctions affected all parishes simultaneously, potential methodological issues such as forbidden comparisons and negative weighting are not present in this design

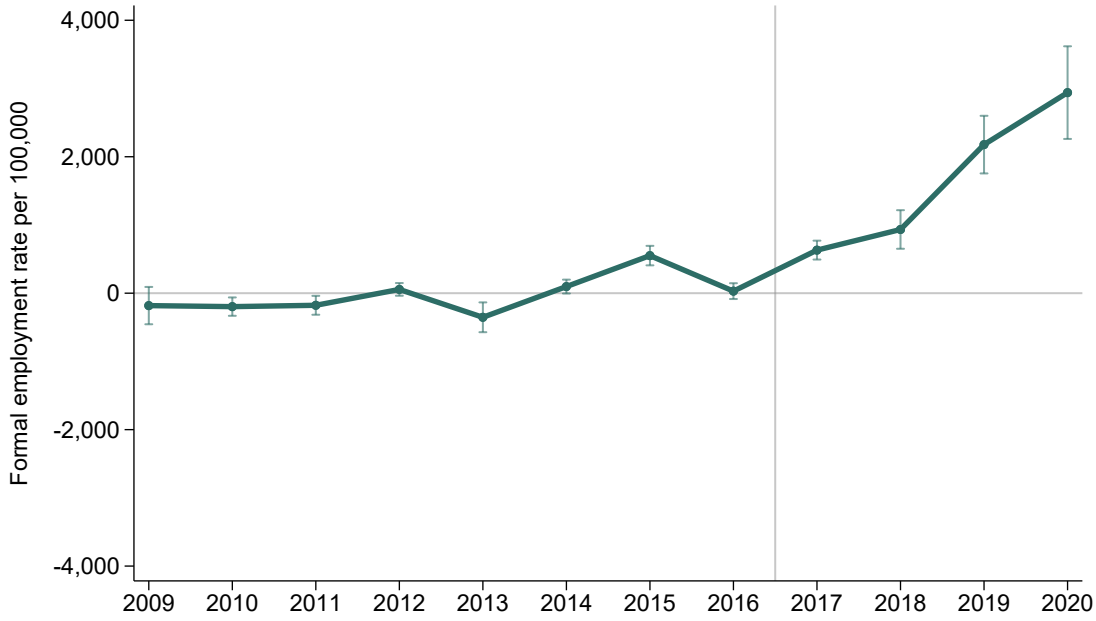
(see comprehensive reviews on this topic by de Chaisemartin and D'Haultfœuille, 2022; Roth et al., 2023; Steigerwald, Vazquez-Bare and Maier, 2021). This means that, in principle, I could use standard two-way fixed effects (TWFE) models to understand the effects of sanctions by previous political alignment. Nevertheless, for the main specifications below, I use the estimators proposed by Callaway and Sant'Anna (2021) due to their ability to incorporate control variables–in a non-trivial way–, which is helpful to conduct robustness checks on the main specifications.

The goal is to estimate the impact of being a pro-Maduro parish on formal employment across different time periods. The expectation is that, prior to the imposition of sanctions in 2017, pro-Maduro and pro-opposition parishes were relatively similar, allowing us to attribute any post-2017 differences between these groups to the effect of economic sanctions. My preferred specifications are estimated using Callaway and Sant'Anna (2021), given their ability to include control variables if desired. In particular, Callaway and Sant'Anna (2021) offer a doubly robust estimation method that allows the use of control variables to model the treatment and the outcome separately. The treatment model estimates the propensity score and reweights control observations using an inverse probability weighting scheme (in the spirit of Abadie, 2005), assigning higher weights to control observations (pro-opposition parishes in my design) with high propensity scores (i.e., those more similar to pro-Maduro parishes) and lower weights to those with low propensity scores. The estimator is considered doubly robust because it also models the outcome differences by partiallying out (in the spirit of Heckman, Ichimura and Todd, 1997; Heckman et al., 1998) using a potentially different set of covariates from the ones used in the treatment model. The crucial point is that this approach enables estimating an event study or a pooled difference-in-differences design while using control variables to improve pretrends.

I present the effects from the main event study specification in Figure 7. Before 2017, when financial sanctions were imposed, the difference in the formal employment rate between pro-regime and pro-opposition parishes was very close to zero, with relatively minor deviations. Starting in 2017, the trend in formal employment rates between the two groups of parishes started to diverge in favor of pro-Maduro places. The result is consistent if I focus on the parishes at the top and bottom quintiles in the 2013 presidential election instead of parishes where Maduro won or lost in 2013, as Figure F1c shows. Finally, Figures F1b and F1d present the result for the number of formal workers (instead of the rate). Using the number of formal workers as an outcome is informative, but also not my preferred specifications given that the groups of interest could differ in the number of formal workers just because the pro-opposition parishes used to have a higher population. The results presented in Figure

7 are conservative, and including control variables produces even stronger results, as shown in Figure F1. Finally, I also report consistent event study results using TWFE models in Figure F2.

Figure 7: Formal employment rate decreased less post-sanctions in the regime strongholds



This figure plots the results from estimating an event study using the estimators proposed by Callaway and Sant'Anna (2021). The outcome is the formal employment rate per 100,000 at the parish-year level, using the 2011 census population to normalize. The vertical line marks the middle between 2016 and 2017, given that financial sanctions were imposed in 2017. Standard errors are clustered at the parish level, and 95% confidence intervals are reported.

While the disaggregated effects over time reported in Figure 7 are informative and critical to assess the pretrends, calculating pooled effects is a valuable practice, too, as they summarize the effects in one concrete quantity, easier to benchmark to understand the substantive effect size. To that end, I calculate pooled difference-in-difference effects using Callaway and Sant'Anna (2021) and compile the results in Table 1. The first two columns use all parishes and classify pro-regime parishes as those in which Maduro won the popular vote in 2013 for the presidential election. The last two columns use the top and bottom quintile parishes in the vote share distribution for the same election. My preferred specifications are the ones in columns 1 and 3, which use the rate of formal employees per 100,000 inhabitants as an outcome.

The results show that the formal employment rate is between 10.5 and 14% higher (depending on the specification and compared to the pro-opposition mean before sanctions) in the aftermath of sanctions in parishes where Maduro was strong in 2013. This does not mean

Table 1: Formal employment declines more in opposition districts post-sanctions

	Maduro 2013 won v. lost		Maduro 2013 top v. bottom quintiles	
	Rate	Level	Rate	Level
Difference-in-difference estimate	1,670.57	1,547.33	2,372.21	2,081.00
	(182.23)	(196.21)	(248.08)	(219.48)
Number of observations	16,855	17,042	6,675	6,795
Number of parishes	1,125	1,138	445	453
Control mean in pre-period	15,886.42	4,857.34	16,978.93	5,492.08
Effect as percent of control mean	10.52	31.86	13.97	37.89
Control std. deviation in pre-period	8,739.42	9,335.60	9,877.99	9,774.97
Effect as percent of control std. deviation	19.12	16.57	24.02	21.29

This table contains the results from estimating a pooled difference-in-difference design using Callaway and Sant'Anna (2021). Columns 1 and 3 use the formal employment rate as the outcome variable, while columns 2 and 4 use the number of formal workers without normalization. In columns 1 and 2, I compare parishes where Maduro won the popular vote in 2013 with those where he lost. In columns 3 and 4, I compare the parishes at the top and bottom quintiles of the 2013 presidential vote share distribution. All columns include parish and year fixed effects. Standard errors are clustered at the parish level.

that pro-Maduro parishes did not suffer from an economic collapse. As Figure 6 shows, formal employment fell for both groups; the results in Table 1 show that formal employment fell more in pro-opposition parishes than it did in the regime strongholds. The results are stronger when including control variables, as shown in Table F1. They are also consistent when using TWFE models (see Table F2 for details).

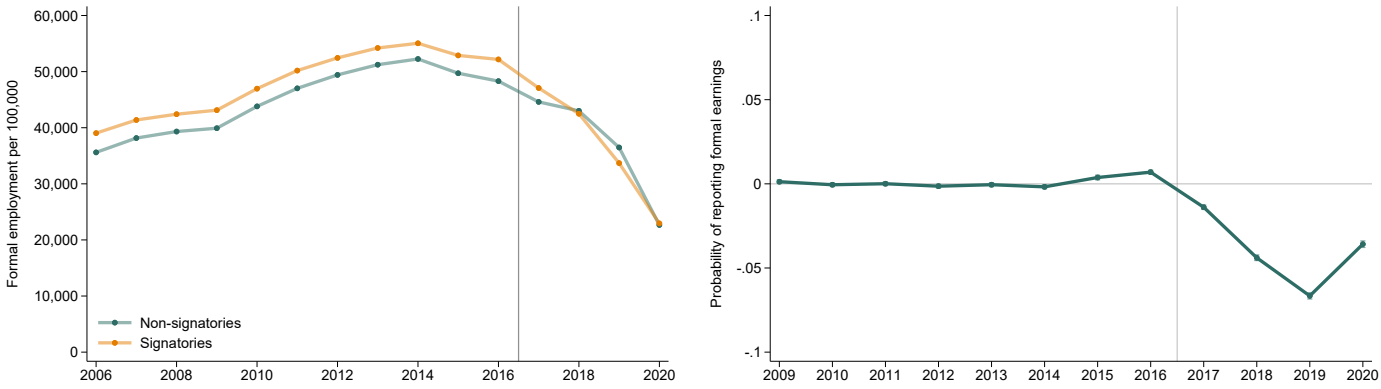
4.1.1 Individual-level analysis

Article 72 of the 1999 Venezuelan Constitution allows citizens to initiate a recall referendum against the president if they gather signatures from 20% of registered voters, provided the president has served at least half of their term. In April 2016, when Nicolás Maduro had been in power for three years (half of the six-year presidential term), the opposition began the recall process. The electoral authority–controlled by members of Chavismo–initially required signatures from 1% of the registered voters, which amounted to roughly 200,000 signatures. By the end of May, the opposition had gathered 1.8 million signatures, far exceeding the requirement. Despite invalidating thousands of signatures, the electoral authority confirmed the threshold was met. The next phase of the process required the opposition to provide signatures from 20% of the registered voters (about 4 million signatures), but in October 2016, the process was suspended by the authorities, citing alleged fraud, which ended the possibility of a referendum.

I use individual-level data on the signatories of the recall referendum petition matched with individual-level data on formal earnings from 2006 to 2020 to examine participation in the formal labor market between the group of signatories compared to the non-signatories. The

motivation is to understand if those who signed, who clearly opposed the regime, were more likely to leave the formal labor market because their parishes, employers, or themselves were not being protected by the regime in the aftermath of sanctions or because emigration was more appealing. I identify 1,702,486 individuals who signed the recall referendum petition. Using this, I construct a panel dataset consisting of 11.79 million individuals and 176.84 million observations that allow me to study the effects of sanctions on participation in the formal labor market. Figure 8a shows how formal labor market participation increased over time for signatories and non-signatories until 2014. It also shows a steeper decrease for those who signed the recall petition. This is corroborated by the event study in Figure 8b, which estimates a linear probability model at the individual level, where the outcome is 1 if a person reports formal earnings in a given year and 0 otherwise, and the 'treatment' is having signed the petition. The results show that starting in 2017, signatories exited the formal labor market at a significantly higher rate than non-signatories.

Figure 8: Recall Referendum Signers Exited Formal Labor Market More After Sanctions



(a) Descriptive collapse

(b) Event study

For computational reasons, both figures are constructed using only a random sample of 30% of the individuals in the dataset. This amounts to approximately 3.5 million individuals in total, and a strongly balanced panel dataset of approximately 53 million observations. Figure 8a shows the rate of formal employment in the group by counting at every point in time those who report formal earnings and dividing by the size of the group (i.e., number of signatories or number of non-signatories). Figure 8b reports the results from an event study using the estimator proposed by Callaway and Sant'Anna (2021). Standard errors are clustered at the individual level, and 95% confidence intervals are reported.

To benchmark the effect, I estimate a pooled difference-in-difference design using the estimator proposed by Callaway and Sant'Anna (2021). The results reported in Table 2 show that the probability of reporting formal earnings for the signatories decreased by four percentage points in the aftermath of sanctions. This amounts to roughly 9.3% of the probability mean before sanctions for those who did not sign. Column 2 includes a control for age, which is used in the estimating procedure to linearly partial out the effects on the outcome, but also

to reweight the control observations by following standard inverse-probability reweighting schemes (Sant'Anna and Zhao, 2020). The results in columns 1 and 2, consistent with the event studies in Figures 8b and F3, indicate a robust differential effect, suggesting that political opponents exited the formal labor market, and arguably the country too, at higher rates than non-signatories.

Table 2: Signers exit the labor market in greater numbers after sanctions

	(1)	(2)
Difference-in-difference estimate	-0.04	-0.04
	(0.00)	(0.00)
Number of observations	53,052,584	53,052,584
Number of individuals	3,536,839	3,536,839
Control mean in pre-period	0.43	0.43
Effect as percent of control mean	9.28	9.27
Control std. deviation in pre-period	0.50	0.50
Effect as percent of control std. deviation	8.09	8.08
Controlling for age		X

This table contains the results from estimating a pooled difference-in-difference design using Callaway and Sant'Anna (2021) using a 30% random sample of the individual ID numbers. The outcome in both columns equals one if the individual reports formal earnings in a given year and 0 otherwise. Both columns compare individuals who signed the recall referendum petition with those who did not, and the time cutoff is 2017 when financial sanctions were imposed on the country. Column 2 includes a control for age, which is used to linearly partial out the outcome, but also to estimate a treatment model used to reweight control observations (see Callaway and Sant'Anna, 2021, for details). Standard errors are clustered at the individual level.

The results are informative, but a few clarifications are needed. First, they indicate a decline in formal economic activity, but I cannot observe the impact on informal labor markets. It may be the case that many workers who left the formal sector transitioned to informal economic activities, for example, because formal companies were shutting down. At this point, however, it is not possible to disentangle this. Second, I argue that such a dramatic fall in formal employment partly reflects emigration. It is estimated that more than 7.7 million Venezuelans have emigrated in the past decade (UNHCR, 2024), and I observe approximately 4 million individuals exiting the formal labor market during the same period (see Figure E1a). Considering that many of the 7.7 million migrants are children or elderly and that the formal labor market before the collapse accounted for roughly 60% of the total labor market, it does not seem far-fetched to argue that a large part of the collapse in formal employment is attributable to emigration.

The results show that the formal employment rate declined everywhere but did more in pro-opposition places. This is likely due to different factors, such as a real contraction

in formal economic activity, emigration due to the crisis, and some workers moving to informal economic activities. This is also consistent with the theoretical model, which predicted higher incentives to emigrate from political opponents due mainly to the fact that they were not shielded by the regime and are not loyal and willing to withstand the economic burden of sanctions if they have the means to emigrate. This is also consistent with Morales-Arilla (2023), which demonstrates how the government strategically imposed more electrical blackouts in opposition areas, trying to allocate scarce electric resources to protect its supporters. This exemplifies one of the mechanisms through which strategic shielding arguably impacted formal employment differentially.

4.2 Turnout as a Measure of Emigration

This section explores changes in turnout patterns as an alternative approach to shed light on emigration. To this end, I use electoral outcomes from gubernatorial elections from 2004 to 2021. In particular, I study turnout at the parish level for gubernatorial elections, the second most important executive office after the president. Using presidential elections to measure the effects of sanctions presents challenges, mainly because there have been only two elections after 2017 (when sanctions were imposed), the 2018 and the 2024 presidential elections. In 2018, the political opposition pushed for a boycott, asking voters not to participate. Therefore, changes in turnout in this election are likely due to the boycott campaign and not the actual effect of sanctions. In 2024, the government refused to publish the tally sheets and disaggregated voting results soon after the election, generating widespread fraud allegations. In the first part of this section, I discuss turnout patterns in gubernatorial elections, and at the end, I present some exploratory analysis using results from 2024.

The 2017 elections were held on October 15th, and the Trump administration imposed financial sanctions in August (The White House, 2017). This means that only two months had passed since the elections were held, and the full impact of sanctions had yet to be seen by that point. The total number of votes for the 2008 and 2017 elections was close to 11 million, with a turnout above 60% in both cases, as seen in Table 3 below. In 2021, the total number of votes fell to almost 9.2 million, a decrease of 16.14% from 2017.

Given that 25% of the population emigrated since 2014 (UNHCR, 2024) and turnout fell by 16.14% from 2017 to 2021, turnout changes may partially reflect emigration. My theory argues that emigration is more likely to occur where the opposition is stronger since the regime has incentives to protect its strongholds. Figure 9a plots the difference in turnout

Table 3: Aggregate gubernatorial results 2004-2021

Year	Votes		Chavismo	Turnout (%)	Seats
	Chavismo	Total	Vote Share (%)		Won
2004	3,761,129	6,813,536	58.31	45.70	20
2008	5,758,494	11,052,674	52.10	65.45	17
2012	4,853,494	9,233,631	56.22	53.94	20
2017	5,814,903	11,035,898	55.07	61.03	18
2021	3,725,653	9,254,281	41.67	42.51	20

The counts come from electoral returns published by the Consejo Nacional Electoral (CNE), Venezuela's electoral organ. In 2021, the regime (via the Supreme Court) annulled the election for the state of Barinas, which had been won by an opposition candidate, alleging the candidate should have been banned in the first place because of wrongdoing charges. The election was repeated in 2022, and the opposition won again. The counts for 2021 in the table include the 2022 counts for Barinas, as those are the official ones to this date.

between the 2017 and the 2021 gubernatorial elections at the parish level on the vertical axis and Maduro's vote share for the presidential election in 2013 on the horizontal axis. Most of the points are below zero, given that turnout fell almost everywhere, but the important point to highlight is that it fell less in places where the Maduro regime was strong back in 2013 and fell more in places where the opposition used to be strong. This pattern was not present in previous elections, as shown by Figure 9b, which compares the changes in turnout between 2008 and 2012 as a function of Chávez's turnout in 2006. Back then, turnout fell less in places where the opposition was strong.

Figure 9: Turnout decreased more in pro-regime places after sanctions

(a) 2017-2021 (b) 2008-2012 (Placebo)

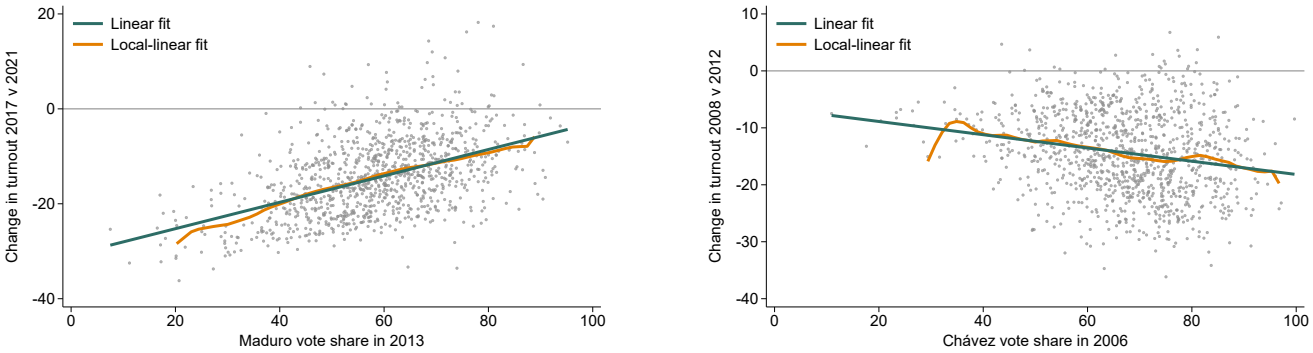


Figure 9a plots the change in turnout between 2017 and 2021 (vertical axis) against Maduro's vote share in 2013 and shows that turnout decreased *more* in the old opposition strongholds, likely pointing to more emigration happening in those places. On the other hand, Figure 9b plots the change in turnout between 2008 and 2012, as a function of Chávez's vote share in 2006, and shows that turnout was *larger* in places where the opposition was strong. This serves as a placebo exercise to show that the pattern seen in Figure 9a is atypical and likely due to the effect of sanctions.

4.2.1 Election Integrity and the 2024 Election

The first presidential election after sanctions were imposed took place on May 20, 2018. Maduro, who had been in power for five years at that point, faced Henri Falcón and other less well-known candidates and won by a margin of more than 45%. According to the government, the total number of votes was close to 9.4 million, a steep decline from the almost 15 million votes in 2013. While probably millions of Venezuelans had already emigrated by 2018, empirically analyzing this election is problematic since the opposition promoted a boycott and asked voters not to participate. This implies that the first election, after sanctions, in which vote shares and participation could be thoroughly analyzed, was the one that took place on July 28, 2024.

Elections in Venezuela are not free and fair in the typical sense. In many cases, the regime disqualifies salient candidates from the opposition by making up random judiciary processes that make them look like corrupt or felons. The regime also makes campaigning as difficult as possible for political opponents by putting roadblocks so that candidates cannot travel and by closing businesses that dare to serve a meal to the opponents, as happened in the 2024 presidential campaign. Ultimately, they create an uneven playing field in which the chances of winning are severely affected for political opponents. Nevertheless, tampering with electoral counts is an almost impossible process in Venezuela. This is due to the fact that vote counts are checked at many points in the process in front of observers from the opposition and the regime. Voting machines print tally sheets (*actas*) when polls are closed, and they also print a receipt for each voter when they cast their votes. After the election takes place, a large share of the booths are audited by groups in which the opposition is represented. Therefore, tampering with the vote counts is very difficult since they are verified at three different points, and they must coincide (Kronick, Plunkett and Rodriguez, 2023; Toro, 2012). The trust in Venezuela's vote counts, present in previous elections, evaporated in 2024 when the regime likely tampered with the results by breaking the three-prong basis that supported the trust in previous elections.

In 2024, the regime disqualified María Corina Machado, arguably the most salient figure in the opposition still living in Venezuela, thinking that this would pave the way to an easier election. Nevertheless, Machado and the opposition were quick to gather around a less well-known diplomat named Edmundo González. With Machado's support and almost all factions of the opposition backing him, González became a well-known figure and was able to produce massive campaign rallies. The enthusiasm was apparent on the streets, as people thought they were finally going to be able to take Maduro out of office. At 6 p.m.

on election day, precincts closed, and the counting process began. People started posting in social media tally sheets from random booths across the country, pointing to what seemed to be a landslide election in favor of González. Around midnight, the electoral authority went on television to state that after counting the votes from 80% of the booths, Maduro had 51.2% of the votes, while González had 44.2%. This, according to the electoral authority, marked an irreversible trend, which implied that Maduro had won the 2024 presidential election.

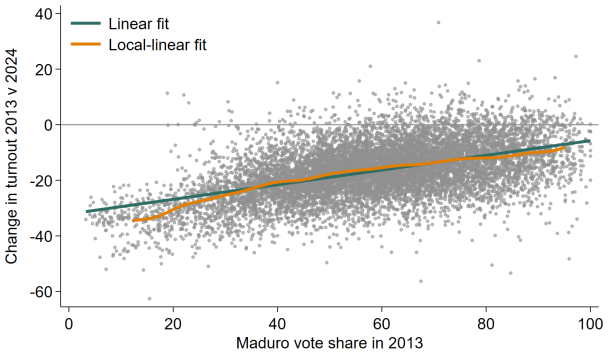
The aftermath of the 2024 election has been marked by massive protests on the streets, brutal repression, and the refusal of the electoral authority to publish disaggregated vote counts, together with images of the tally sheets produced by the voting machines, to corroborate their claims that Maduro won. On the other hand, the opposition quickly gathered close to 25,000 tally sheets (approximately 83.5% of all booths), built a website in which citizens could verify the vote counts at the booth level (ResultadosConVzla, 2024), and even download the tally sheet images. According to the numbers produced by the opposition, González obtained 7.3 million votes (67% vote share), while Maduro only obtained 3.3 million votes (30% vote share). Even if the votes from the remaining 16.5% of the booths (which the opposition does not know) went to Maduro, González would still be the winner of the election. The counts quickly published by the opposition are at the highest level of disaggregation (booth level), have a corresponding tally sheet image to back them up–and these images have unique keys produced by the machines at the moment of printing the image–, and have been analyzed by electoral forensics and country experts that have found no evidence of anomalies (Kronick, 2024; Mebane, 2024).

I use the electoral counts published by the opposition to document two patterns. First, as shown in Figure 10a, turnout decreased much more between 2013 and 2024 in electoral precincts where the opposition received high vote shares in 2013, which is indirect evidence pointing to higher emigration from former pro-opposition areas. Second, as shown in Figure 10b, Maduro's vote share decreased sharply almost everywhere between 2013 and 2024, but it has decreased less in the former opposition strongholds. Some of this effect is mechanical, in the sense that if he obtained low vote shares in 2013, there was no room to obtain much less in 2024. Nevertheless, Figure 10b does show that Maduro lost vote share in places where he was strong, but again, lost much less in places where he was not so dominant back in 2013, likely because when political opponents emigrate, even with less turnout, his vote shares tend to not fall that much.

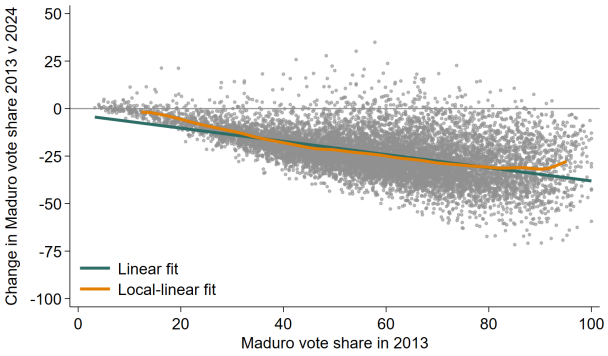
Taken together, the results show that turnout decreased in areas dominated by the opposition

Figure 10: Opponents likely emigrated, and the regime lost less ground there in 2024

(a) Change in turnout: 2013-2024



(b) Change in Maduro's vote share: 2013-2024



Each dot in the two plots corresponds to one of the 10,220 precincts that existed in both 2013 and 2024. I exclude precincts in which the opposition does not have at least 80% of the tally sheets of the precinct (there are 608 precincts that do not satisfy this ad-hoc rule). In conclusion, out of the 12,817 precincts available in 2024, the plots above use only 10,220 of them. Figure 10a uses as the vertical axis the difference in turnout rate between 2024 and 2013, while Figure 10b uses the difference in Maduro's vote share between the two elections. The horizontal axis is common to both figures and is Maduro's vote share in 2013.

in 2013, when Maduro rose to power and before the economic collapse because of oil prices and sanctions. This, I argue, is evidence of uneven emigration. Also, the regime's vote share has decreased almost everywhere as the economic collapse has destroyed the wealth and income of virtually all Venezuelans. Still, this decrease in vote share has been less pronounced in areas previously controlled by the opposition. Some of this effect is mechanical, but some of it is not. These results should also be interpreted by thinking about the counterfactual scenario, which is one that, unfortunately, cannot be analyzed statistically in this case. The regime's vote share fell almost everywhere, but if political opponents had not emigrated, it would have decreased much more, and the regime would likely have collapsed because of social unrest against its disastrous policies.

5 Discussion

For decades, Western powers and international organizations have used economic sanctions against non-democratic and non-aligned regimes with the intent of "making the economy scream," as Richard Nixon infamously instructed his aides in 1970 regarding Chile, where President Salvador Allende was viewed as a leftist threat to U.S. interests. In this paper, I argue that sanctions can indeed cause the economy to "scream," leading to severe economic hardships for citizens, regardless of their social standing. However, I also contend that the prevailing belief among policymakers—and some prominent Venezuelan exiles (Esberg and

Siegel, 2022)—that inflicting suffering through sanctions will trigger a social uprising to topple the regime is flawed. While sanctions do depress the economy and increase incentives for emigration, it is more likely that political opponents, especially those not benefiting from the state and lacking loyalty to the regime, will be the first to emigrate. This dynamic of differential emigration suggests that sanctions may inadvertently strengthen the regime by altering the political landscape, as waves of emigration remove segments of the opposition, thereby consolidating the regime's power, at least in the short to medium term.

I formally examine these mechanisms by introducing a sequential game in which elites decide whether to allow discontented citizens to emigrate or to keep the borders closed, and opposition citizens decide whether to attempt a revolution. The model demonstrates that sanctions do increase the incentives for opponents to attempt a revolution in the absence of emigration, aligning with the views of policymakers who advocate for sanctions. However, the model also reveals that when a revolution becomes inevitable, regimes can strategically allow or even encourage emigration. This approach alleviates economic pressure, exports a portion of political opponents, and significantly reduces the likelihood of a successful revolution in the future.

Using individual-level administrative data on formal employment in Venezuela since 2006, I document how formal employment has declined since 2014, with an accelerated decrease following the imposition of sanctions in 2017. This decline was uneven, as parishes aligned with the regime before sanctions experienced a less steep reduction in formal employment. This pattern is consistent with evidence that the regime protected its supporters through subsidies, food assistance programs, and fewer electric blackouts. The sharper decline in the formal labor market may also indicate that political opponents are emigrating, although this cannot be directly tested due to the lack of local-level emigration data.

Using highly disaggregated data from multiple elections, I also document how voter turnout has decreased more significantly in former opposition strongholds, suggesting higher levels of emigration from these areas. Although the regime's vote share has declined across the board, it has declined less in areas previously controlled by the opposition, indicating that the regime has become relatively stronger in those regions. These findings are consistent with the 2024 vote counts published by the opposition after the controversial presidential election held on July 28, 2024, which has been marred by credible and widespread allegations of fraud. While the official aggregate vote count for 2024 appears to have been tampered with, the electoral counts from previous elections used in this paper are likely reliable, as the Venezuelan electoral system has numerous safeguards that would need to be bypassed

for tampering to occur, as seemingly happened in 2024.

While the formal model does not account for the possibility of citizens switching from being supporters to opponents or vice versa, it is possible that in the long run, supporters might become opponents just because the declining economic situation persists and shielding becomes untenable. This switching effect is always possible and could counteract the pressure released from emigration in the long run. It is likely that in the 2024 presidential election, when Maduro's vote share was doubled by his opponent, enough supporters switched and became opponents, offsetting the advantage the regime had achieved with the massive emigration from his opponents, as documented in this paper. Future research should explore this switching mechanism and how, at different points in time, it can counteract and even offset the emigration mechanism documented here.

Taken together, the theoretical and empirical findings point to a previously unexplored mechanism by which sanctions can not only be ineffective but may also be counterproductive, as they entrench the regime. The suffering caused by sanctions falls primarily on the lay population, which is then forced to emigrate under dire conditions, overwhelming the safety net of neighboring countries and making a regime transition less likely in the short run.

References

Abadie, Alberto. 2005. "Semiparametric Difference-in-Differences Estimators." *The Review of Economic Studies* 72(1):1–19.

Acemoglu, Daron and James Robinson. 2009. *Economic Origins of Dictatorship and Democracy*. Cambridge University Press.

Albertus, Michael. 2015. *Autocracy and Redistribution*. Cambridge University Press.

Ansell, Ben and David Samuels. 2014. *Inequality and Democratization: An Elite-Competition Approach*. Cambridge University Press.

Associated Press. 2024. "As Maduro shifts from migration denier to defender, Venezuelans consider leaving if he is reelected.". Accessed: 2024-08-13.
URL: *https://apnews.com/article/venezuela-election-migrants-maduro-9ba01c2cd7246adb9369bf69941d986a*

Blaydes, Lisa. 2010. *Elections and Distributive Politics in Mubarak's Egypt*. Cambridge University Press.

Blaydes, Lisa. 2018. *State of Repression: Iraq under Saddam Hussein*. Princeton University Press.

Boix, Carles. 2003. *Democracy and Redistribution*. Cambridge University Press.

Bolton, John R. 2019. "National Security Advisor Ambassador John R. Bolton Delivers Remarks at Bay of Pigs Veterans Association Brigade 2506.". Accessed: 2024-08-04.
URL: *https://ni.usembassy.gov/national-security-advisor-ambassador-john-r-bolton-delivers-remarks-at-bay-of-pigs-veterans-association-brigade-2506/*

Briceño-Ruiz, José. 2019. "The Crisis in Venezuela: A New Chapter, or the Final Chapter?" *Latin American Policy* 10(1):180–189.

Callaway, Brantly and Pedro H. C. Sant'Anna. 2021. "Difference-in-Differences with Multiple Time Periods." *Journal of Econometrics* 225(2):200–230.

Corrales, Javier and Michael Penfold. 2015. *Dragon in the Tropics: Venezuela and the Legacy of Hugo Chavez*. Brookings Institution Press.
URL: *http://www.jstor.org/stable/10.7864/j.ctt7zsw23*

de Chaisemartin, Clément and Xavier D'Haultfœuille. 2022. "Two-way fixed effects and differences-in-differences with heterogeneous treatment effects: a survey." *The Econometrics Journal* 26(3):C1–C30.

Docquier, Frédéric, Elisabetta Lodigiani, Hillel Rapoport and Maurice Schiff. 2016. "Emigration and democracy." *Journal of Development Economics* 120:209–223.

Drezner, Daniel W. 1999. *The Sanctions Paradox: Economic Statecraft and International Relations*. Cambridge University Press.

Esberg, Jane and Alexandra A. Siegel. 2022. "How Exile Shapes Online Opposition: Evidence from Venezuela." *American Political Science Review* 117(4):1361–1378.

Escribà-Folch, Abel. 2011. "Authoritarian Responses to Foreign Pressure: Spending, Repression, and Sanctions." *Comparative Political Studies* 45(6):683–713.

Escribà-Folch, Abel and Joseph Wright. 2010. "Dealing with Tyranny: International Sanctions and the Survival of Authoritarian Rulers1: Dealing with Tyranny." *International Studies Quarterly* 54(2):335–359.

Escribà-Folch, Abel, Covadonga Meseguer and Joseph Wright. 2018. "Remittances and Protest in Dictatorships." *American Journal of Political Science* 62(4):889–904.

Escribà-Folch, Abel, Covadonga Meseguer and Joseph Wright. 2022. *Migration and Democracy: How Remittances Undermine Dictatorships*. Princeton University Press.

Felbermayr, Gariel, Aleksandra Kirilakha, Constantinos Syropoulos, Erdal Yalcin and Yoto V. Yotov. 2020. "The Global Sanctions Database." *European Economic Review* .

Geddes, Barbara, Joseph Wright and Erica Frantz. 2018. *How Dictatorships Work: Power, Personalization, and Collapse*. Cambridge University Press.

Ghandi, Jennifer. 2008. *Political Institutions under Dictatorship*. Cambridge University Press.

Greitens, Sheena Chestnut. 2023. *Politics of the North Korean Diaspora*. Cambridge University Press.

Grossman, Guy, Devorah Manekin and Yotam Margalit. 2018. "How Sanctions Affect Public Opinion in Target Countries: Experimental Evidence From Israel." *Comparative Political Studies* 51(14):1823–1857.

Gulotty, Robert and Dorothy Kronick. 2022. "The Arbitrage Lobby: Theory and Evidence on Dual Exchange Rates." *International Organization* 76:105–25.

Hausmann, Ricardo and Frank Muci. 2019. "Don't Blame Washington for Venezuela's Oil Woes: A Rebuttal." Americas Quarterly.
URL: *https://www.americasquarterly.org/article/dont-blame-washington-for-venezuelas-oil-woes-a-rebuttal/*

Heckman, J. J., H. Ichimura and P. E. Todd. 1997. "Matching As An Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme." *The Review of Economic Studies* 64(4):605–654.

Heckman, James, Hidehiko Ichimura, Jeffrey Smith and Petra Todd. 1998. "Characterizing Selection Bias Using Experimental Data." *Econometrica* 66(5):1017.

Hirschman, Albert O. 1970. *Exit, Voice, and Loyalty: Responses to Declines in Firms, Organizations, and States*. Harvard University Press.

Hong, Ji Yeon. 2018. "How Natural Resources Affect Authoritarian Leaders' Provision of Public Services: Evidence from China." *Journal of Politics* 80(1).

Hsieh, Chang-Tai, Edward Miguel, Daniel Ortega and Francisco Rodríguez. 2011. "The Price of Political Opposition: Evidence from Venezuela's Maisanta." *American Economic Journal: Applied Economics* 3(2):196–214.

Hufbauer, Gary Clyde, Jeffrey J. Schott and Kimberly Ann Elliott. 1990. *Economic Sanctions Reconsidered: History and Current Policy*. Second edition ed. Institute for International Economics.

Ivlevs, Artjoms, Milena Nikolova and Carol Graham. 2018. "Emigration, remittances, and the subjective well-being of those staying behind." *Journal of Population Economics* 32(1):113–151.

Jentleson, Bruce W. 2022. *Sanctions: What Everyone Needs to Know*. 1st edition ed. Oxford University Press.

Kaempfer, William H. and Anton D. Lowenberg. 1988. "The Theory of International Economic Sanctions: A Public Choice Approach." *The American Economic Review* 78(4):786–793.

Kronick, Dorothy. 2024. "On the validity of vote counts published by the Venezuelan opposition." *Working paper* .

Kronick, Dorothy, Barry Plunkett and Pedro L. Rodriguez. 2023. "Backsliding by surprise: the rise of Chavismo." *Political Science Research and Methods* 11(4):838–854.

Levitsky, Steven and Daniel Ziblatt. 2019. *How Democracies Die*. Penguin Random House.

Levitsky, Steven and Lucan Way. 2020. "The New Competitive Authoritarianism." *Journal of Democracy* 31(1):51–65.

Lim, Junghyun. 2022. "The Electoral Consequences of International Migration in Sending Countries: Evidence from Central and Eastern Europe." *Comparative Political Studies* 56(1):36–64.

Liou, Ryan Yu-Lin, Amanda Murdie and Dursun Peksen. 2022. "Pressures From Home and Abroad: Economic Sanctions and Target Government Response to Domestic Campaigns." *Journal of Conflict Resolution* 67(2–3):297–325.

Lizarralde, Carlos. 2024. *Venezuela's Collapse: The Long Story of How Things Fell Apart*. Independently published.

Lueders, Hans. 2024. "A Little Lift in the Iron Curtain: Emigration Restrictions and the Stability of Closed Regimes." *Working paper* .

Mallory, Lester D. 1960. "Memorandum From the Deputy Assistant Secretary of State for Inter-American Affairs (Mallory) to the Assistant Secretary of State for Inter-American Affairs (Rubottom)." Foreign Relations of the United States, 1958–1960, Cuba, Volume VI, Document 499. Accessed: 2024-08-08.
URL: *https://history.state.gov/historicaldocuments/frus1958-60v06/d499*

Massey, Douglas S., Joaquin Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino and J. Edward Taylor. 1993. "Theories of International Migration: A Review and Appraisal." *Population and Development Review* 19(3):431–466.

McKenzie, David. 2023. "Fears and Tears: Should More People Be Moving within and from Developing Countries, and What Stops this Movement?" *The World Bank Research Observer* 39(1):75–96.

Mebane, Walter R. 2024. "*eforensics* Analysis of the Venezuela 2024 Presidential Elections." *Working paper* .

Miller, Michael K. and Margaret E. Peters. 2020. "Restraining the Huddled Masses: Migration Policy and Autocratic Survival." *British Journal of Political Science* 50(2):403–433.

Miller, Michael K. and Margaret E. Peters. 2024. *Restraining the Huddled Masses*.

Morales-Arilla, Jose. 2023. "Autocrats in crisis mode: Strategic favoritism during economic shocks." *Working paper* .

Morgan, T. Clifton, Navin Bapat and Valentin Krustev. 2009. "The Threat and Imposition of Economic Sanctions, 1971-2000." *Conflict Management and Peace Science* 26(1):92–110.

Morselli, Davide, Stefano Passini and Craig McGarty. 2020. "Sos Venezuela: an analysis of the anti-Maduro protest movements using Twitter." *Social Movement Studies* 20(5):509–530.

Norris, Pippa. 2017. "Is Western Democracy Backsliding? Diagnosing the Risks." *Working paper* .
URL: *https://www.hks.harvard.edu/publications/western-democracy-backsliding-diagnosing-risks*

Pape, Robert A. 1997. "Why Economic Sanctions Do Not Work." *International Security* 22(2):90–136.

Pepinsky, Thomas B. 2009. *Economic Crises and the Breakdown of Authoritarian Regimes: Indonesia and Malaysia in Comparative Perspective*. Cambridge University Press.

ResultadosConVzla. 2024. "ResultadosConVzla.". Accessed: 2024-08-07.
URL: *https://resultadosconvzla.com/*

Reuter, Ora John and David Szakonyi. 2019. "Elite Defection under Autocracy: Evidence from Russia." *American Political Science Review* 113(2):552–568.

Rodríguez, Francisco. 2019. "U.S. oil sanctions are hurting Venezuelans. Time for a new approach to pressure Maduro." Washington Post.
URL: *https://www.washingtonpost.com/opinions/2019/12/04/us-oil-sanctions-are-hurting-venezuelans-time-new-approach-pressure-maduro/*

Rodríguez, Francisco. 2021. "Sanctioning Venezuela." *Working paper* .

Rodríguez, Francisco. 2022. "The Economic Determinants of Venezuela's Hunger Crisis." *Working paper* .

Rodríguez, Francisco. 2024. "Quantifying Venezuela's Destructive Conflict." *Working paper* .

Ross, Michael L. 2012. *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*. Princeton University Press.

Roth, Jonathan, Pedro H.C. Sant'Anna, Alyssa Bilinski and John Poe. 2023. "What's trending in difference-in-differences? A synthesis of the recent econometrics literature." *Journal of Econometrics* 235(2):2218–2244.

Rozenas, Arturas and Yuri Zhukov. 2019. "Mass Repression and Political Loyalty: Evidence from Stalin's Terror by Hunger." *American Political Science Review* .

Said-Hung, Elías and Francisco Segado-Boj. 2018. "Social Media Mobilization in Venezuela: A Case Study." *Social and Economic Studies* 67(4):235–259.
URL: *http://www.jstor.org/stable/45204460*

Sant'Anna, Pedro H.C. and Jun Zhao. 2020. "Doubly robust difference-in-differences estimators." *Journal of Econometrics* 219(1):101–122.

Sellars, Emily. 2017. "Does Emigration Inhibit Reform? Evidence from the Mexican Agrarian Movement, 1916-1945." *Unpublished manuscript* .

Sellars, Emily. 2023. *The Politics of Exit: Emigration, Collective Action, and Agrarian Reform in Mexico*.

Steigerwald, Douglas G., Gonzalo Vazquez-Bare and Jason Maier. 2021. "Measuring Heterogeneous Effects of Environmental Policies Using Panel Data." *Journal of the Association of Environmental and Resource Economists* 8(2):277–313.

Svolik, Milan. 2012. *The Politics of Authoritarian Rule*. Cambridge University Press.

The White House. 2015. "Executive Order 13692 of March 8, 2015: Blocking Property and Suspending Entry of Certain Persons Contributing to the Situation in Venezuela.". Accessed: 2024-08-13.
URL: *https://ofac.treasury.gov/media/5906/download?inline*

The White House. 2017. "Executive Order 13808 of August 24, 2017: Imposing Additional Sanctions With Respect to the Situation in Venezuela.". Accessed: 2024-08-04.
URL: *https://ofac.treasury.gov/media/5476/download?inline*

The White House. 2019*a*. "Executive Order 13857 of January 25, 2019: Taking Additional Steps to Address the National Emergency With Respect to Venezuela.". Accessed: 2024-08-13.
URL: *https://ofac.treasury.gov/media/5491/download?inline*

The White House. 2019*b*. "Executive Order 13884 of August 5, 2019: Blocking Property of the Government of Venezuela.". Accessed: 2024-08-13.
URL: *https://ofac.treasury.gov/media/26786/download?inline*

Toro, Francisco. 2012. "About Fraud.". Accessed: 2024-08-06.
URL: *https://www.caracaschronicles.com/2012/08/13/about-fraud/*

Tsourapas, Gerasimos. 2018. *The Politics of Migration in Modern Egypt*. Cambridge University Press.

UNHCR. 2024. "Venezuela Situation.". Accessed: 2024-08-04.
URL: *https://reporting.unhcr.org/operational/situations/venezuela-situation*

Walentek, David, Joris Broere, Matteo Cinelli, Mark M. Dekker and Jonas M. B. Haslbeck. 2021. "Success of economic sanctions threats: coercion, information and commitment." *International Interactions* 47(3):417–448.

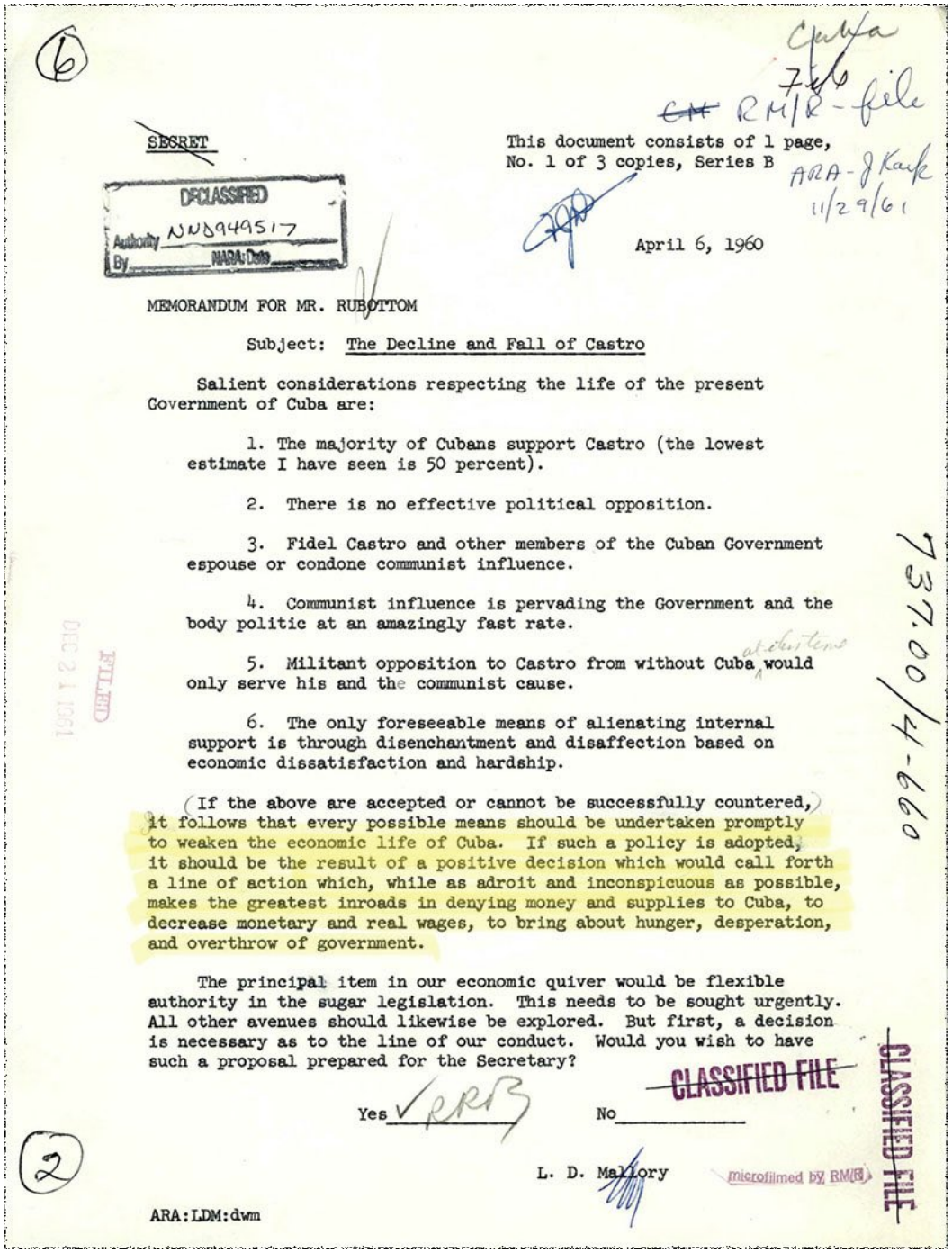
Weisbrot, Mark and Jeffrey Sachs. 2019. "Economic Sanctions as Collective Punishment: The Case of Venezuela." *Working paper* .

Whang, Taehee, Elena V. McLean and Douglas W. Kuberski. 2013. "Coercion, Information, and the Success of Sanction Threats." *American Journal of Political Science* 57(1):65–81.

Appendix

A Historical

Figure A1: The U.S. objective of causing economic hardship and political instability in Cuba



Cuba
7 6
~~CM~~ RM/R - file

~~SECRET~~

This document consists of 1 page,
No. 1 of 3 copies, Series B

ARA - J Kaysk
11/29/61

DECLASSIFIED
Authority NND949517
By NARA, Date

April 6, 1960

MEMORANDUM FOR MR. RUBOTTOM

Subject: The Decline and Fall of Castro

Salient considerations respecting the life of the present Government of Cuba are:

1. The majority of Cubans support Castro (the lowest estimate I have seen is 50 percent).

2. There is no effective political opposition.

3. Fidel Castro and other members of the Cuban Government espouse or condone communist influence.

4. Communist influence is pervading the Government and the body politic at an amazingly fast rate.

5. Militant opposition to Castro from without Cuba, at this time, would only serve his and the communist cause.

6. The only foreseeable means of alienating internal support is through disenchantment and disaffection based on economic dissatisfaction and hardship.

If the above are accepted or cannot be successfully countered, it follows that every possible means should be undertaken promptly to weaken the economic life of Cuba. If such a policy is adopted, it should be the result of a positive decision which would call forth a line of action which, while as adroit and inconspicuous as possible, makes the greatest inroads in denying money and supplies to Cuba, to decrease monetary and real wages, to bring about hunger, desperation, and overthrow of government.

The principal item in our economic quiver would be flexible authority in the sugar legislation. This needs to be sought urgently. All other avenues should likewise be explored. But first, a decision is necessary as to the line of our conduct. Would you wish to have such a proposal prepared for the Secretary?

~~CLASSIFIED FILE~~

Yes ✓ RRB No

L. D. Mallory

microfilmed by RM/R

ARA:LDM:dwm

737.00/4-660

DEC 2 1 1961 FILED

~~CLASSIFIED FILE~~

This document is a memorandum from the Deputy Assistant Secretary of State for Inter-American Affairs (Lester D. Mallory) to the Assistant Secretary of State for Inter-American Affairs (Roy R. Rubottom Jr.), dated in 1960, and declassified in 1991 (Mallory, 1960). Mallory states how it is key to make the Cuban economy suffer so that its citizens have more incentives to overthrow the Castro regime.

B Formal theory

B.1 Setup

B.1.1 Workers

Let $i \in [0,1]$ index workers in society. Workers have a political affiliation: they can be opponents ($i \in O$) or supporters of the regime ($i \in S$), such that $O \cup S = [0,1]$, and $O,\ S \neq \emptyset$, and $O \cap S = \emptyset$. Also, in an electoral regime, it makes sense to think that $N_S := |S| > 1/2$. Let $N_O = 1 - N_S$ be the size of the opposition.

All individuals work in a competitive labor market where they earn the same wage, regardless of whether they are supporters or opponents. Their abilities are homogeneous, and their labor supply is inelastic (i.e., they work no matter the wage). They earn a wage $w_i = w > 0\ \forall i$ determined endogenously as the marginal product of labor in a competitive market economy (more on this below). There is an exogenously determined wage abroad $w_A > 0$, and workers compare their domestic wage to the one abroad to determine if they would benefit from emigrating.

Workers in the political opposition
Regime opponents have incentives to emigrate if:

$$w_i = w < w_A, \quad i \in O$$

That is, if the domestic wage is lower than the wage abroad ($w < w_A$), opponents want to emigrate to seek better opportunities, and if $w \geq w_A$, they prefer to stay in their home country.

Workers that support the regime
The incentives for regime supporters are different since they can receive a lump-sum transfer $T_i \geq 0$ from the government, and they have loyalty to the regime given by $\ell_i = Q \cdot z_i$, where $Q \geq 0$ is a scale parameter, and z_i is a random variable with a known distribution. The regime has exogenous resources for transfers, given by $B \geq 0$, and they distribute these resources homogeneously so that each supporter receives $T_i = B/N_S\ \forall i \in S$. Regime supporters have incentives to emigrate if:

$$w + T_i + \ell_i < w_A$$

That is, if the wage abroad is larger than the domestic wage, plus the transfer and loyalty payoff, they have incentives to emigrate.

B.1.2 Elites

A ruling elite owns the representative firm in the economy and the stock of physical capital. The representative firm maximizes profits by solving the following problem:

$$\max_{\{L,K\}} \quad AF(L,K) - wL - rK$$

where A is a technological parameter, F is the production function, L is labor, K is the stock of capital, and r is the rental price of capital. The production technology exhibits constant returns to scale so that in equilibrium, profits are zero. The demand for factors is given by the first-order conditions:

$$w = AF_L(L,K) \tag{3}$$
$$r = AF_K(L,K) \tag{4}$$

Which determine wages and the rental price of capital.

B.1.3 Initial conditions

Suppose that initially, the conditions are such that there are no incentives to emigrate because even political opponents make a wage equal to the wage abroad:

$$w_i = w = w_A, \quad \forall i \in O \tag{5}$$

Political supporters of the regime might even be better off than opponents since they receive a transfer and a loyalty payoff:

$$w_i + T_i + \ell_i \geq w_A, \quad \forall i \in S \tag{6}$$

The conditions above imply that no one has incentives to emigrate initially.

B.1.4 Sanctions

For reasons not modeled here, the regime is sanctioned by external powers. I will assume here that sanctions affect the production technology A by crippling it so that the new technology parameter is $\tilde{A} < A$. Replacing this in conditions 3 and 4 means that wages and the rental price of capital will be lower compared to the pre-sanctions world.

A lower wage for everyone means that conditions 5 and 6 might no longer be true for every worker. That is, some workers will have incentives to emigrate, given that their wages are now lower due to the effect of economic sanctions on the economy. In particular, all opponents will have incentives to emigrate:

$$w_i = \tilde{A}F_L(L,K) < w_A \quad \forall i \in O$$

Also, some supporters might have incentives to emigrate. Particularly if the transfer is small,

and their loyalty too.

B.1.5 The game

In this society, there are three actors: the elites (who constitute the ruling regime), the workers in the opposition, and the workers who support the regime. Only the first two actors take action in the game, but supporters are also part of the economy.

The regime moves first and sets an emigration policy $\eta \in \{0, 1\}$. Choosing η implies that no workers are allowed to leave the country, and choosing $\eta = 1$ means that any worker can leave. Notice that $\eta = 1$ expresses a possibility but does not mean that, in practice, all workers would emigrate.

Workers in the opposition decide between pursuing a revolution (action R) or not (action NR). If opponents choose NR, the regime's policy is implemented, and payoffs are realized. If opponents decide to pursue a revolution, the revolution is successful with probability $p(\theta, \psi)$ and is unsuccessful with probability $1 - p(\theta, \psi)$. The likelihood of success depends positively on θ, the share of opponents in the society, and negatively on ψ, a parameter that captures the regime's repression technology.

The rest of this section derives the payoffs of all actors under all possible actions and, finally, analyzes the game's equilibrium conditions. Figure 1 depicts the extensive form of the game, which is useful to understand the payoff structure derived below.

B.2 Payoffs in the no emigration branch ($\eta = 0$)

No one is allowed to emigrate on this branch, even though sanctions are imposed on the economy, lowering wages for all voters. This section calculates the payoffs associated with scenarios $\boxed{1}$ - $\boxed{3}$ in Figure 1.

B.2.1 No revolution (NR)

This subsection calculates the payoffs associated with $\boxed{1}$.

- The elites own the firms in the economy and the physical capital. Nevertheless, firms make 0 profits in equilibrium, and so the elites have an income that comes from the returns of renting their capital to firms:

$$Y_E(\eta = 0, \text{NR}) = rK = \tilde{A}F_K(L, K)K$$

- Opponents only receive their wage, which comes from the firm's FOC:

$$Y^i_{W,O}(\eta = 0, \text{NR}) = w = \tilde{A}F_L(L, K)$$

  Since there are N_O workers in the opposition, as a group, they get:

$$Y_O(\eta = 0, \text{NR}) = wN_O = \tilde{A}F_L(L, K)N_O$$

- Supporters receive a wage, a transfer ($T_i = B/N_S$), and their loyalty payoff (ℓ_i):

$$Y^i_{W,S}(\eta = 0, \text{NR}) = \tilde{A}F_L(L, K) + \frac{B}{N_S} + \ell_i$$

  As a group, they get:

$$\begin{aligned} Y_S(\eta = 0, \text{NR}) &= \int_S Y^i_{W,S}(\eta = 0, \text{NR}) di \\ &= \int_S \left(\tilde{A}F_L(L, K) + \frac{B}{N_s} + \ell_i \right) di \\ &= \tilde{A}F_L(L, K)N_s + B + Q \end{aligned}$$

- To summarize, the three payoffs associated with scenario $\boxed{1}$ in Figure 1 are:

$$Y_E(\eta = 0, \text{NR}) = \tilde{A}F_K(L, K)K \tag{7}$$
$$Y_O(\eta = 0, \text{NR}) = \tilde{A}F_L(L, K)N_o \tag{8}$$
$$Y_S(\eta = 0, \text{NR}) = \tilde{A}F_L(L, K)N_s + B + Q \tag{9}$$

B.2.2 Revolution (R)

Under this branch, workers in the opposition pursue a revolution. This revolution attempt will succeed with probability $p(\theta, \psi)$ and will fail with $1 - p(\theta, \psi)$. The elites and the workers don't know if the revolution will succeed. Still, they know the probability $p(\cdot)$ and use this probability to calculate their expected payoff from pursuing a revolution.

This section calculates the payoffs associated with scenarios $\boxed{2}$ and $\boxed{3}$ in Figure 1 and then calculates the expected payoffs using $p(\cdot)$.

Successful revolution
Revolutions cause destruction, so all payoffs are discounted by $(1 - \mu)$, where $\mu \in (0, 1)$ is the destruction rate.

I also assume that under a successful revolution, sanctions are lifted since the regime is no longer in power. This means that the production technology is $AF(L, K)$, instead of $\tilde{A}F(L, K)$, with $\tilde{A} < A$.

- The elites are confiscated from their physical capital and the firm they owned and have an income of 0 under a successful revolution:

$$Y_E(\eta = 0, \text{R} \mid \text{successful}) = 0$$

- Opponents (as a group) get a fraction N_O of the wages ($AF_L(L, K)L$), the returns of capital ($AF_K(L, K)K$), and the government's cash stock (B). The payoff is discounted

by the destruction rate from a successful revolution $(1-\mu)$. In conclusion:

$$\begin{aligned} Y_O(\eta=0,\mathrm{R}\mid\text{successful}) &= (1-\mu)N_O\left(AF_L(L,K)L+AF_K(L,K)K+B\right) \\ &= (1-\mu)N_O\left(Y(L,K)+B\right) \end{aligned}$$

Where the last equality follows because of the zero profits condition of the firm.

- Supporters (as a group) get the same as workers in the opposition, but weighted by N_S and not by N_O. They also continue getting the aggregate loyalty payoff (Q) even though the regime is no longer in power (this is irrelevant since supporters take no action in the game).

$$Y_S(\eta=0,\mathrm{R}\mid\text{successful}) = (1-\mu)N_S\left(Y(L,K)+B+\frac{Q}{N_S}\right)$$

- To summarize, the three payoffs associated with scenario $\boxed{3}$ in Figure 1 are:

$$\begin{aligned} Y_E(\eta=0,\mathrm{R}\mid\text{successful}) &= 0 && (10)\\ Y_O(\eta=0,\mathrm{R}\mid\text{successful}) &= (1-\mu)N_O\left(Y(L,K)+B\right) && (11)\\ Y_S(\eta=0,\mathrm{R}\mid\text{successful}) &= (1-\mu)N_S\left(Y(L,K)+B+\frac{Q}{N_S}\right) && (12) \end{aligned}$$

Unsuccessful revolution

If the revolution is unsuccessful, workers and elites get the same payoffs they would get in the $\eta=0$ and NR branch, but discounted by $1-\mu$, given that resources are destroyed while pursuing a revolution, even if it turned unsuccessful.

Multiplying payoffs 7-9 by $(1-\mu)$ we obtain the payoffs under scenario $\boxed{2}$:

$$\begin{aligned} Y_E(\eta=0,\mathrm{R}\mid\text{unsuccessful}) &= (1-\mu)\tilde{A}F_K(L,K)K && (13)\\ Y_O(\eta=0,\mathrm{R}\mid\text{unsuccessful}) &= (1-\mu)\tilde{A}F_L(L,K)N_O && (14)\\ Y_S(\eta=0,\mathrm{R}\mid\text{unsuccessful}) &= (1-\mu)\left(\tilde{A}F_L(L,K)N_S+B+Q\right) && (15) \end{aligned}$$

Expected payoffs from a revolution

The elites and the voters don't know if the revolution will be successful, so they base their decisions on expected payoffs that arise from adding up the product of each respective payoff by the probability of occurrence.

- The elites' expected payoff under a revolution is obtained by combining 10 and 13:

$$\begin{aligned} Y_E(\eta=0,\mathrm{R}) &= p(\theta,\psi)Y_E(\eta=0,\mathrm{R}\mid\text{successful})+(1-p(\theta,\psi))Y_E(\eta=0,\mathrm{R}\mid\text{unsuccessful}) \\ &= p(\theta,\psi)\cdot 0+(1-p(\theta,\psi))(1-\mu)\tilde{A}F_K(L,K) \\ &= (1-p(\theta,\psi))(1-\mu)\tilde{A}F_K(L,K)K \end{aligned}$$

- To obtain the expected payoff of opponents, we combine 11 and 14:

$$\begin{aligned} Y_O(\eta=0,\mathrm{R}) &= p(\theta,\psi)Y_O(\eta=0,\mathrm{R}\mid\text{successful}) + (1-p(\theta,\psi))Y_O(\eta=0,\mathrm{R}\mid\text{unsuccessful}) \\ &= p(\theta,\psi)(1-\mu)N_O\left(Y(L,K)+B\right) + (1-p(\theta,\psi))(1-\mu)\tilde{A}F_L(L,K)N_O \\ &= (1-\mu)N_O\left[p(\theta,\psi)\left(Y(L,K)+B\right) + (1-p(\theta,\psi))\tilde{A}F_L(L,K)\right] \end{aligned}$$

- The payoff of supporters is obtained by combining 12 and 15:

$$\begin{aligned} Y_S(\eta=0,\mathrm{R}) &= p(\theta,\psi)Y_S(\eta=0,\mathrm{R}\mid\text{successful}) + (1-p(\theta,\psi))Y_S(\eta=0,\mathrm{R}\mid\text{unsuccessful}) \\ &= p(\theta,\psi)(1-\mu)N_S\left(Y(L,K)+B+\frac{Q}{N_S}\right) \\ &\quad + (1-p(\theta,\psi))(1-\mu)\left(\tilde{A}F_L(L,K)N_S+B+Q\right) \\ &= (1-\mu)N_S\Bigg[p(\theta,\psi)\left(Y(L,K)+B+\frac{Q}{N_S}\right) \\ &\quad + (1-p(\theta,\psi))\left(\tilde{A}F_L(L,K)+\frac{B}{N_S}+\frac{Q}{N_S}\right)\Bigg] \end{aligned}$$

- To summarize, the expected payoffs on the $(\eta=0,\mathrm{R})$ branch are:

$$Y_E(\eta=0,\mathrm{R}) = (1-p(\theta,\psi))(1-\mu)\tilde{A}F_K(L,K)K \tag{16}$$

$$Y_O(\eta=0,\mathrm{R}) = (1-\mu)N_O\left[p(\theta,\psi)\left(Y(L,K)+B\right) + (1-p(\theta,\psi))\tilde{A}F_L(L,K)\right] \tag{17}$$

$$\begin{aligned} Y_S(\eta=0,\mathrm{R}) &= (1-\mu)N_S\Bigg[p(\theta,\psi)\left(Y(L,K)+B+\frac{Q}{N_S}\right) \\ &\quad + (1-p(\theta,\psi))\left(\tilde{A}F_L(L,K)+\frac{B}{N_S}+\frac{Q}{N_S}\right)\Bigg] \end{aligned} \tag{18}$$

B.3 Payoffs in the emigration branch ($\eta = 1$)

Given the standard technical conditions imposed on the production function $F(L,K)$[1], there exists $\eta^* \in (0,1)$ such that:

$$\tilde{A}F((1-\eta^*)L,K) = w_A$$

That is, if a fraction η^* of the population emigrates, the domestic wage rises to match the wage abroad, even in the presence of the productivity shock produced by sanctions. Intuitively, this happens because when some workers emigrate, the labor supply decreases, and employers must pay a higher wage to compensate for a lower labor supply.

For now, I will assume that $\eta^* < N_O$, which means that when a portion of the workers in the opposition emigrate (but not all of them), the domestic wage is restored and equal to the

[1] In particular, decreasing marginal returns to labor: $F_L(\cdot) > 0$, $F_{LL}(\cdot) < 0$, and an Inada condition: $\lim_{L\to 0^+} F_L(L,K) = +\infty$. Also, I assume this holds for both factors.

salary abroad. For example, if 20% of the population is in opposition, the assumption means that no more than 20% of the population would have to emigrate so that the domestic wage rises to match the wage abroad.

Another key point is that, as it was discussed in Section B.1, workers in the opposition will have incentives to emigrate when:

$$w < w_A$$

And workers that support the regime will have incentives to emigrate when:

$$w + T_i + \ell_i < w_A$$

Given that $T_i \geq 0$ and $\ell_i \geq 0$, the model implies that political opponents will emigrate first since they receive no transfer and have no loyalty payoff to compensate for a low wage.

B.3.1 No revolution (NR)

In this branch, η^* workers emigrate from the opposition group O. This means that the size of the domestic opposition shrinks to $N_O - \eta^*$, while the size of the supporters remains constant at N_S. The share of opponents in the country ($\tilde{\theta}$) decreases, compared to the same share when there was no emigration (θ):

$$\tilde{\theta} = \frac{N_O - \eta^*}{N_O + N_S - \eta^*} = \frac{N_O - \eta^*}{1 - \eta^*} \quad < \quad N_O = \frac{N_O}{N_O + N_S} = \theta$$

This means that for a given repression technology ψ, the probability of a revolution is lower in the emigration branch:

$$p(\tilde{\theta}, \psi) < p(\theta, \psi)$$

This is because revolutions require political opponents, and in the emigration branch, the share of opponents is lower ($\tilde{\theta} < \theta$).

The payoffs in scenario $\boxed{4}$ of Figure 1 can be easily calculated, remembering that when emigration occurs, the domestic wage and the wage abroad coincide, and the domestic labor force is now $(1 - \eta^*)L$.

- The payoff of the elites is given by:

$$Y_E(\eta = 1, \text{NR}) = \tilde{A} F_K((1 - \eta^*)L, K)K$$

- The payoff of opponents (as a group) comes from two sources: the wages abroad from those who emigrated and the domestic wages from those who stayed:

$$\begin{aligned} Y_O(\eta = 1, \text{NR}) &= w_A \eta^* + \tilde{A} F_L((1 - \eta^*)L, K)(N_O - \eta^*) \\ &= w_A N_O \end{aligned}$$

Where the last equality follows because $\tilde{A}F((1-\eta^*)L, K) = w_A$, by definition of η^*.

- The payoff of supporters (as a group) comes from the domestic wage, the transfer, and the loyalty payoff:

$$\begin{aligned} Y_S(\eta = 1, \text{NR}) &= \tilde{A}F_L((1-\eta^*)L, K)N_S + B + Q \\ &= w_A N_S + B + Q \end{aligned}$$

- Summarizing, the payoffs associated to scenario $\boxed{4}$ are given by:

$$Y_E(\eta = 1, \text{NR}) = \tilde{A}F_K((1-\eta^*)L, K)K \tag{19}$$
$$Y_O(\eta = 1, \text{NR}) = w_A N_O \tag{20}$$
$$Y_S(\eta = 1, \text{NR}) = w_A N_S + B + Q \tag{21}$$

B.3.2 Revolution (R)

Successful revolution
If the revolution is successful, the elites are expropriated from their firms and capital, and the workers as a whole (supporters and opponents) get the returns of labor and capital (the total output of the economy), according to their shares in the population. Also, since the regime is no longer in power, sanctions are lifted (i.e., the technology parameter goes back to $A > \tilde{A}$). Also, a share $(1-\mu)$ of all income is destroyed because of the revolution.

- The elites' payoff is given by:

$$Y_E(\eta = 1, \text{R} \mid \text{successful}) = 0$$

- Opponents have a payoff given by:

$$Y_O(\eta = 1, \text{R} \mid \text{successful}) = w_A\eta^* + (1-\mu)\tilde{\theta}(AF((1-\eta^*)L, K) + B)$$

Where the first part comes from the wages abroad for those who emigrated, and the second part comes from the share of income in the economy that goes to the opponents who stayed in the country.

- Supporters have a payoff given by:

$$Y_S(\eta = 1, \text{R} \mid \text{successful}) = (1-\mu)\left(\frac{N_S}{1-\eta^*}\right)\left[AF((1-\eta^*)L, K) + B + Q\left(\frac{1-\eta^*}{N_S}\right)\right]$$

Which corresponds to the share of income in the economy that goes to them, plus their loyalty payoff (in full), all discounted by the destruction rate.

- To summarize, the payoffs associated to scenario 5 in Figure 1 are given by:

$$Y_E(\eta = 1, \mathrm{R} \mid \text{successful}) = 0 \tag{22}$$
$$Y_O(\eta = 1, \mathrm{R} \mid \text{successful}) = w_A\eta^* + (1-\mu)\tilde{\theta}(AF((1-\eta^*)L, K) + B) \tag{23}$$
$$Y_S(\eta = 1, \mathrm{R} \mid \text{successful}) = (1-\mu)\left(\frac{N_S}{1-\eta^*}\right)\left[AF((1-\eta^*)L, K) + B + Q\left(\frac{1-\eta^*}{N_S}\right)\right] \tag{24}$$

Unsuccessful revolution

If the revolution is unsuccessful, all actors get the same payoff as they would get in the NR branch (conditions 19-21), but discounted by $1-\mu$. Therefore, the payoffs associated with scenario 6 in Figure 1 are given by:

$$Y_E(\eta = 1, \mathrm{R} \mid \text{unsuccessful}) = (1-\mu)\tilde{A}F_K((1-\eta^*)L, K)K \tag{25}$$
$$Y_O(\eta = 1, \mathrm{R} \mid \text{unsuccessful}) = (1-\mu)w_A N_O \tag{26}$$
$$Y_S(\eta = 1, \mathrm{R} \mid \text{unsuccessful}) = (1-\mu)(w_A N_S + B + Q) \tag{27}$$

Expected payoffs from a revolution

- The elites' expected payoff under a revolution is obtained by combining 22 and 25:

$$\begin{aligned} Y_E(\eta = 1, \mathrm{R}) &= p(\tilde{\theta}, \psi)Y_E(\eta = 1, \mathrm{R} \mid \text{successful}) + (1 - p(\tilde{\theta}, \psi))Y_E(\eta = 1, \mathrm{R} \mid \text{unsuccessful}) \\ &= p(\tilde{\theta}, \psi) \cdot 0 + (1 - p(\tilde{\theta}, \psi))(1-\mu)\tilde{A}F_K((1-\eta^*)L, K)K \\ &= (1 - p(\tilde{\theta}, \psi))(1-\mu)\tilde{A}F_K((1-\eta^*)L, K)K \end{aligned}$$

- To obtain the expected payoff of opponents, we combine 23 and 26:

$$\begin{aligned} Y_O(\eta = 1, \mathrm{R}) &= p(\tilde{\theta}, \psi)Y_O(\eta = 1, \mathrm{R} \mid \text{successful}) \\ &\quad + (1 - p(\tilde{\theta}, \psi))Y_O(\eta = 1, \mathrm{R} \mid \text{unsuccessful}) \\ &= p(\tilde{\theta}, \psi)\left[w_A\eta^* + (1-\mu)\tilde{\theta}(AF((1-\eta^*)L, K) + B)\right] \\ &\quad + (1 - p(\tilde{\theta}, \psi))(1-\mu)w_A N_O \end{aligned}$$

- To obtain the expected payoff of supporters, we combine 24 and 27:

$$\begin{aligned} Y_S(\eta = 1, \mathrm{R}) &= p(\tilde{\theta}, \psi)Y_S(\eta = 1, \mathrm{R} \mid \text{successful}) \\ &\quad + (1 - p(\tilde{\theta}, \psi))Y_S(\eta = 1, \mathrm{R} \mid \text{unsuccessful}) \\ &= p(\tilde{\theta}, \psi)(1-\mu)\left(\frac{N_S}{1-\eta^*}\right)\left[AF((1-\eta^*)L, K) + B + Q\left(\frac{1-\eta^*}{N_S}\right)\right] \\ &\quad + (1 - p(\tilde{\theta}, \psi))(1-\mu)(w_A N_S + B + Q) \end{aligned}$$

- To summarize, the expected payoffs on the $(\eta = 1, \mathrm{R})$ branch are:

$$Y_E(\eta = 1, \mathrm{R}) = (1 - p(\tilde{\theta}, \psi))(1 - \mu)\tilde{A}F_K((1 - \eta^*)L, K)K \tag{28}$$

$$\begin{aligned} Y_O(\eta = 1, \mathrm{R}) = {} & p(\tilde{\theta}, \psi)\left[w_A\eta^* + (1 - \mu)\tilde{\theta}(AF((1 - \eta^*)L, K) + B)\right] \\ & + (1 - p(\tilde{\theta}, \psi))(1 - \mu)w_A N_O \end{aligned} \tag{29}$$

$$\begin{aligned} Y_S(\eta = 1, \mathrm{R}) = {} & p(\tilde{\theta}, \psi)(1 - \mu)\left(\frac{N_S}{1 - \eta^*}\right)\left[AF((1 - \eta^*)L, K) + B + Q\left(\frac{1 - \eta^*}{N_S}\right)\right] \\ & + (1 - p(\tilde{\theta}, \psi))(1 - \mu)(w_A N_S + B + Q) \end{aligned} \tag{30}$$

B.4 Equilibrium

Proposition 1: Conditional on having made an emigration choice $\eta \in \{0, 1\}$, the elites are better off if the opponents choose NR, rather than R.

Proof: I prove this for the case $\eta = 0$, but the proof for the case $\eta = 1$ is very similar. The payoffs of the elite under $\eta = 0$ are given by conditions 7 and 16 above:

$$\begin{aligned} Y_E(\eta = 0, \mathrm{NR}) &= \tilde{A}F_K(L, K)K \\ Y_E(\eta = 0, \mathrm{R}) &= (1 - p(\theta, \psi))(1 - \mu)\tilde{A}F_K(L, K)K \end{aligned}$$

From here it is straightforward to see that for any $p(\theta, \psi) > 0$ and $\mu \in [0, 1]$ the following inequality holds:

$$Y_E(\eta = 0, \mathrm{NR}) > Y_E(\eta = 0, \mathrm{R}) \quad \blacksquare$$

Proposition 2: Conditional on the choice of the opponents being NR or R, the elites are better off in the no emigration branch ($\eta = 0$) rather than in the emigration branch ($\eta = 1$).

Proof: I prove this for the case when opponents choose NR, but the proof for R is very similar. The payoffs of the elite, when opponents choose NR, are given by conditions 7 and 19 above:

$$\begin{aligned} Y_E(\eta = 0, \mathrm{NR}) &= \tilde{A}F_K(L, K)K \\ Y_E(\eta = 1, \mathrm{NR}) &= \tilde{A}F_K((1 - \eta^*)L, K)K \end{aligned}$$

Given that $\eta^* > 0$, we have that $(1 - \eta^*)L < L$. But $F_K(\cdot)$ is increasing in L, given that labor and capital are complements ($F_{KL} > 0$). This implies that $F_K((1 - \eta^*)L, K) < F_K(L, K)$, which finally implies:

$$Y_E(\eta = 1, \mathrm{NR}) < Y_E(\eta = 0, \mathrm{NR}) \quad \blacksquare$$

Proposition 3a: A revolution becomes inevitable in the no-emigration branch if the probability of a successful revolution, $p(\theta, \psi)$, is high enough. Specifically, if the following condition

is satisfied:

$$p(\theta,\psi) > \frac{\mu\tilde{A}F_L(L,K)}{(1-\mu)(Y(L,K)+B-\tilde{A}F_L(L,K))} \tag{31}$$

Proof: I prove this by transforming the above inequality until the quantities on the left and right are $Y_O(\eta=0,\mathrm{R})$ and $Y_O(\eta=0,\mathrm{NR})$, respectively. We have:

$$\begin{aligned}
&p(\theta,\psi) > \frac{\mu\tilde{A}F_L(L,K)}{(1-\mu)(Y(L,K)+B-\tilde{A}F_L(L,K))} \\
\iff &p(\theta,\psi)(1-\mu)N_O(Y(L,K)+B-\tilde{A}F_L(L,K)) > \mu N_O\tilde{A}F_L(L,K) \\
\iff &p(\theta,\psi)(1-\mu)N_O(Y(L,K)+B-\tilde{A}F_L(L,K)) + (1-\mu)N_O\tilde{A}F_L(L,K) > N_O\tilde{A}F_L(L,K) \\
\iff &(1-\mu)N_O\left[p(\theta,\psi)(Y(L,K)+B) + (1-p(\theta,\psi))\tilde{A}F_L(L,K)\right] > N_O\tilde{A}F_L(L,K) \\
\iff &Y_O(\eta=0,\mathrm{R}) > Y_O(\eta=0,\mathrm{NR}) \quad \blacksquare
\end{aligned}$$

Proposition 3b: If the probability of a successful revolution is very high in the no-emigration branch (i.e., the condition on Proposition 3a) and not very high in the emigration branch, then the elites prefer to allow emigration ($\eta=1$) rather than keeping the borders closed ($\eta=0$). Specifically, if condition 31 holds, and also:

$$p(\tilde{\theta},\psi) < \frac{\mu w_A N_O}{w_A\eta^* + (1-\mu)\tilde{\theta}\left(AF((1-\eta^*)L,K)+B\right) - (1-\mu)w_A N_O} \tag{32}$$

Proof: I prove this by transforming the above inequality until the quantities on the left and right are $Y_O(\eta=1,\mathrm{R})$ and $Y_O(\eta=1,\mathrm{NR})$, respectively. We have:

$$\begin{aligned}
&p(\tilde{\theta},\psi) < \frac{\mu w_A N_O}{w_A\eta^* + (1-\mu)\tilde{\theta}\left(AF((1-\eta^*)L,K)+B\right) - (1-\mu)w_A N_O} \\
\iff &p(\tilde{\theta},\psi)\left[w_A\eta^* + (1-\mu)\tilde{\theta}\left(AF((1-\eta^*)L,K)+B\right) - (1-\mu)w_A N_O\right] + (1-\mu)w_A N_O < w_A N_O \\
\iff &p(\tilde{\theta},\psi)\left[w_A\eta^* + (1-\mu)\tilde{\theta}\left(AF((1-\eta^*)L,K)+B\right)\right] + (1-p(\tilde{\theta},\psi))(1-\mu)w_A N_O < w_A N_O \\
\iff &Y_O(\eta=1,\mathrm{R}) < Y_O(\eta=1,\mathrm{NR}) \quad \blacksquare
\end{aligned}$$

Proposition 3b builds on the first three propositions, and taken together, all of the propositions show that under specific conditions (the ones established in 31 and 32), the regime is better off by opening the borders, rather than keeping them closed when a revolution is unavoidable. Specifically, the conditions imply that the probability of a successful revolution when the borders are closed, $p(\theta,\psi)$, must be sufficiently high and that the probability of a successful revolution when the borders are open, $p(\tilde{\theta},\psi)$, must be sufficiently low. The next section explores different scenarios under which the regime's repressive apparatus varies, making the probability of a successful revolution vary, too.

B.5 Numerical exercises

In this section, I give specific functional forms to the production and probability of a successful revolution function and also show the model's behavior under different combinations of the parameters. Let:

$$\begin{aligned} F(L,K) &= L^{\alpha}K^{1-\alpha} \\ p(\theta,\psi) &= \frac{\theta}{\theta+\psi} \end{aligned}$$

These functions satisfy the conditions discussed above.

I analyze the model under three different scenarios. The first one is one in which the repressive apparatus of the regime is average, in the sense that it is not extremely strong but also not extremely weak. In the second scenario, the regime has a very strong repressive apparatus, which makes the probability of conducting a successful revolution much smaller. In the final one, the repressive apparatus is very weak, which implies that the probability of a successful revolution is much higher (for any given value of θ). The parameters used for each scenario are:

Scenario	A	α	B	K	μ	N_O	N_S	ψ
1. Average repressive apparatus	1	0.6	0.2	1	0.35	0.4	0.6	0.5
2. Very strong repressive apparatus	1	0.6	0.2	1	0.35	0.4	0.6	1.5
3. Very weak repressive apparatus	1	0.6	0.2	1	0.35	0.4	0.6	0.1

The first column of Figure B1 below summarizes the payoffs for opponents, while the payoffs for the elites are in the second column. Each row corresponds to one of the scenarios from the table above.

Under scenario 1, the repressive apparatus is not extremely weak or strong. Figure B1a, also reported in the main text, shows that there is a severity threshold of sanctions after which it becomes optimal for the opponents to revolt (green and dashed lines). If a revolution becomes inevitable under the no emigration branch, the elites prefer to allow emigration since their payoff is higher under no revolution and emigration (solid orange line), as seen in Figure B1b. This implies that if η is the optimal strategy for the elites, and σ_O is the optimal strategy of opponents, the Nash equilibrium under scenario 1 is given by:

$$(\eta,\sigma_O) = \begin{cases} (0,\text{NR}) & \text{if } A-\tilde{A} \leq \delta \\ (1,\text{NR}) & \text{if } A-\tilde{A} > \delta \end{cases}$$

Under scenario 2, the repressive apparatus is very strong, which implies that the probability of carrying out a successful revolution is small. Given this, the opponents' payoff under no emigration (solid green line in Figure B1c) is always above the expected payoff under a revolution (green dashed line). This happens because a successful revolution is very unlikely. On the other hand, the payoff of the elites is always higher under no emigration and no

revolution (green solid line), as seen in Figure B1d and discussed in Propositions 1 and 2 above. Since the elites know that opponents will play NR in the no emigration branch, they will choose this branch, given the highest payoff for the elites is always under no emigration and no revolution. Therefore, the Nash equilibrium under scenario 2 is given by $(\eta, \sigma_O) = (0, \text{NR})$ for any $\tilde{A} < A$.

Finally, under scenario 3, the repressive apparatus is very weak, which implies that the probability of carrying out a successful revolution is very high. Given this, opponents' payoff from a revolution is higher than that of no revolution under no emigration (green dashed and green solid lines in Figure B1e, respectively). This means that a revolution is inevitable if the elites choose to keep the borders closed. If the elites allow emigration, a revolution is also the best response for opponents (dashed orange line above solid orange line in Figure B1e), unless the sanctions are extremely severe (the end of the spectrum of the horizontal axis). On the other hand, if sanctions are not extremely harsh, the elites know that opponents will play R, and so they are better off allowing emigration (Proposition 2, and dashed lines in Figure B1f). Therefore, if the repressive apparatus is extremely weak, they are always better off by playing $\eta = 1$. Given this, the Nash equilibrium is given by:

$$(\eta, \sigma_O) = \begin{cases} (1, \text{R}) & \text{if } A - \tilde{A} \leq \bar{\delta} \\ (1, \text{NR}) & \text{if } A - \tilde{A} > \bar{\delta} \end{cases}$$

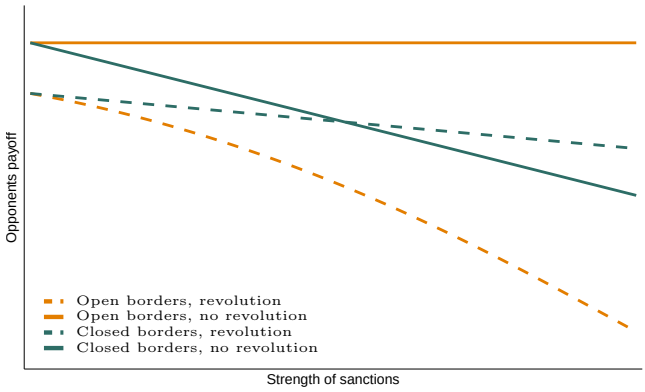
Where $\bar{\delta}$ is the threshold that makes a revolution undesirable for opponents in the emigration branch. That is, is the minimum severity threshold such that:

$$Y_O(\eta = 1, \text{R}) < Y_O(\eta = 1, \text{NR})$$

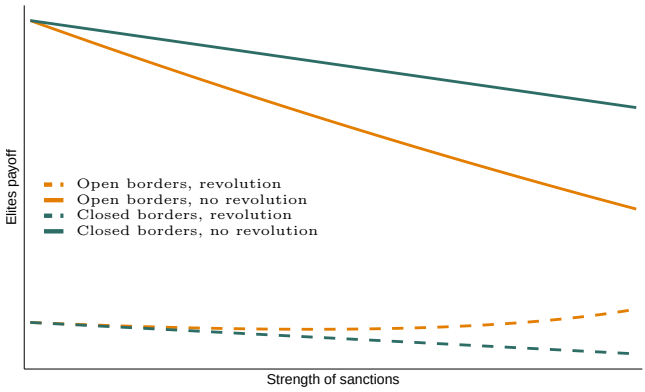
Graphically, after the severity threshold, the orange dashed line is below the solid orange line in Figure B1e.

Figure B1: Payoffs for opponents and the elites under different scenarios

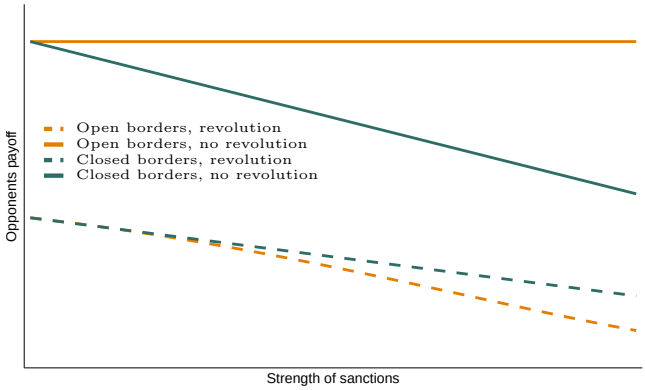
(a) Opponents (scenario 1)



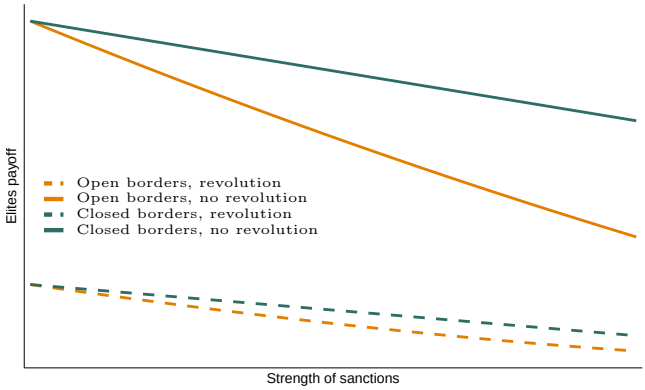
(b) Elites (scenario 1)



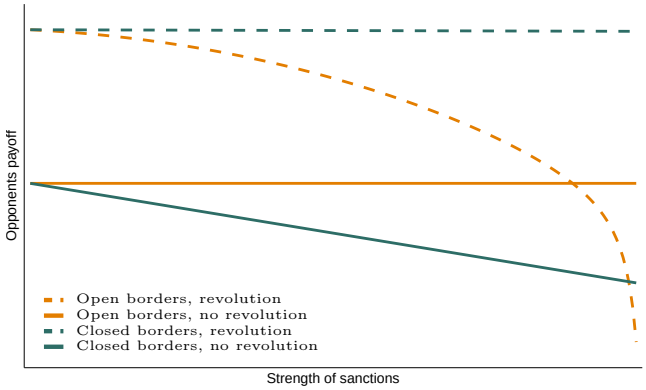
(c) Opponents (scenario 2)



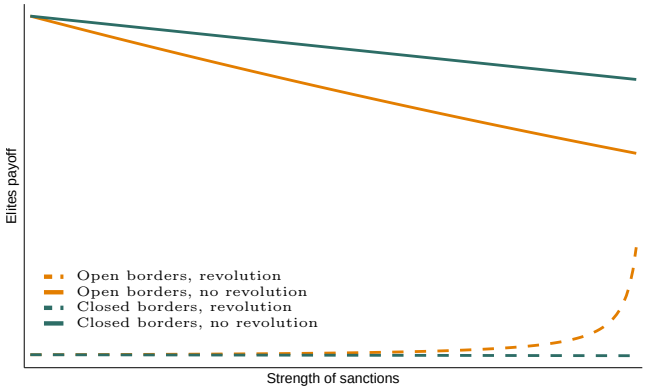
(d) Elites (scenario 2)



(e) Opponents (scenario 3)

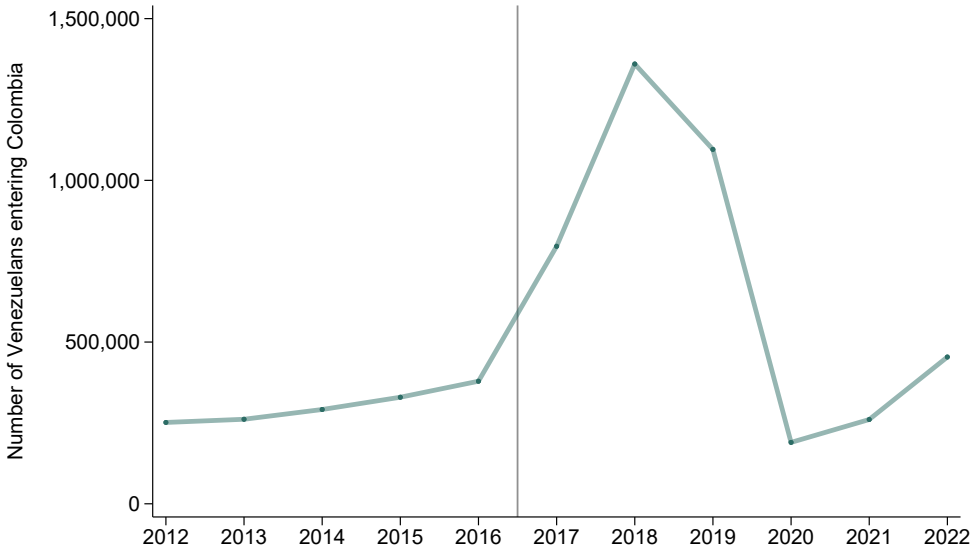


(f) Elites (scenario 3)

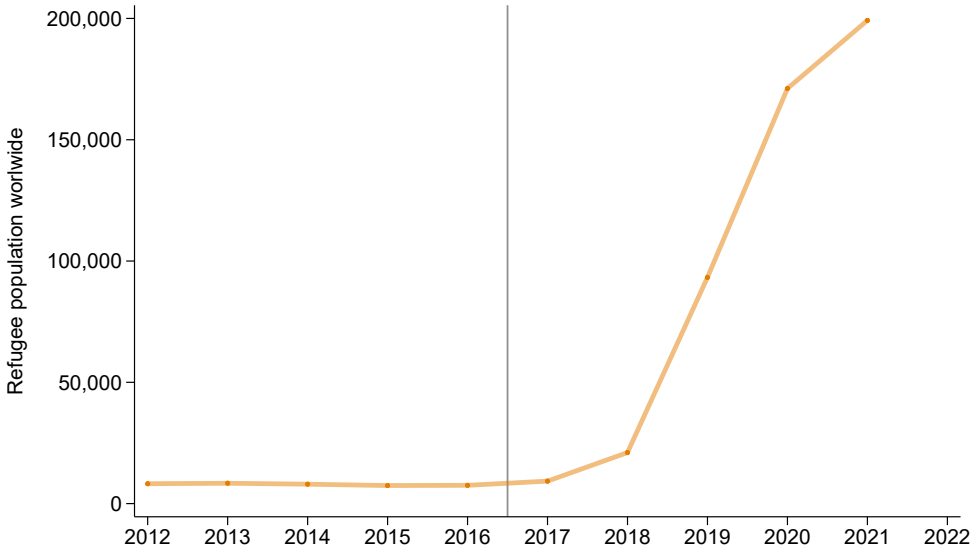


C Aggregate Emigration from Venezuela

Figure C1: Emigration accelerated after sanctions were imposed in 2017



(a) Entries to Colombia

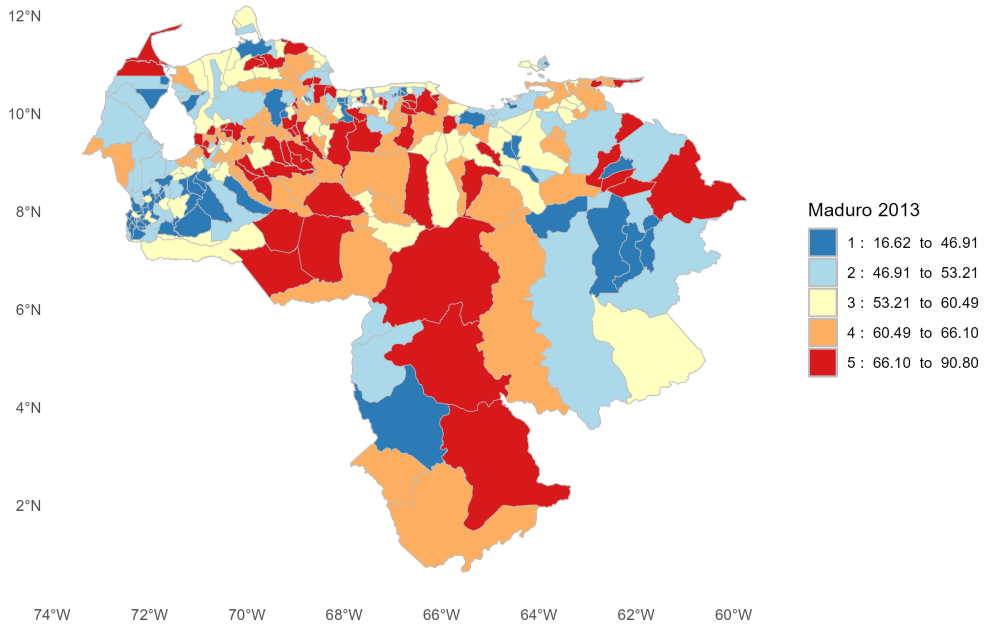


(b) Venezuelan refugees

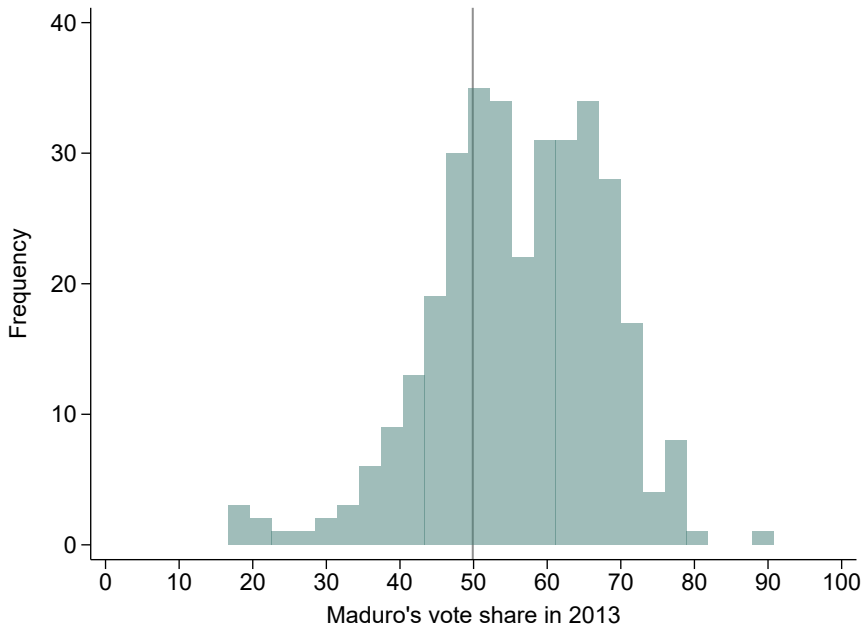
Data on the numbers of Venezuelans entering Colombia over time is available online from Migración Colombia. The Venezuelan refugee population comes from World Development Indicators (WDI). Given that the data is available at the year level, I place a vertical line between 2016 and 2017 since financial sanctions were imposed in August of 2017, and so the 2017 point in both series is already affected by the effects of sanctions.

D The 2013 presidential election

Figure D1: Support for Maduro in 2013



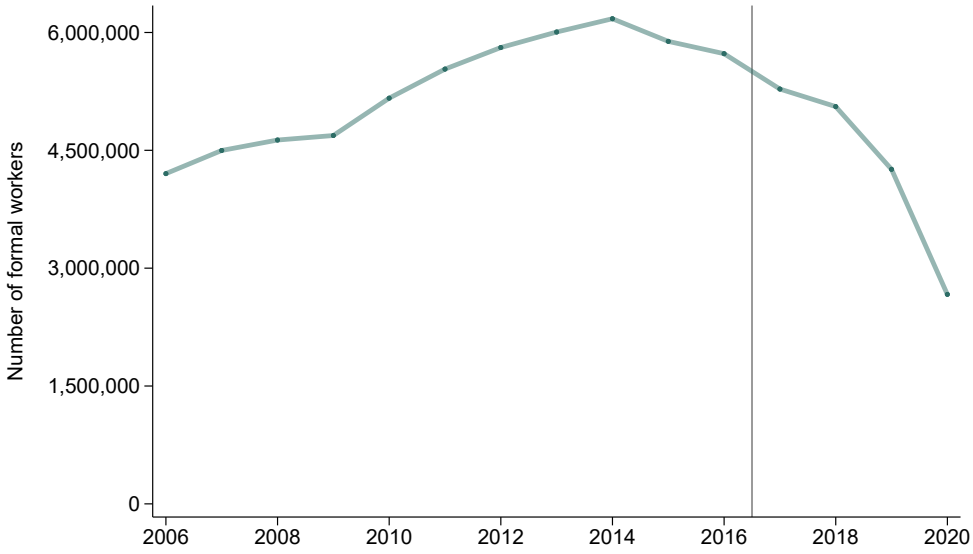
(a) Map of Municipalities



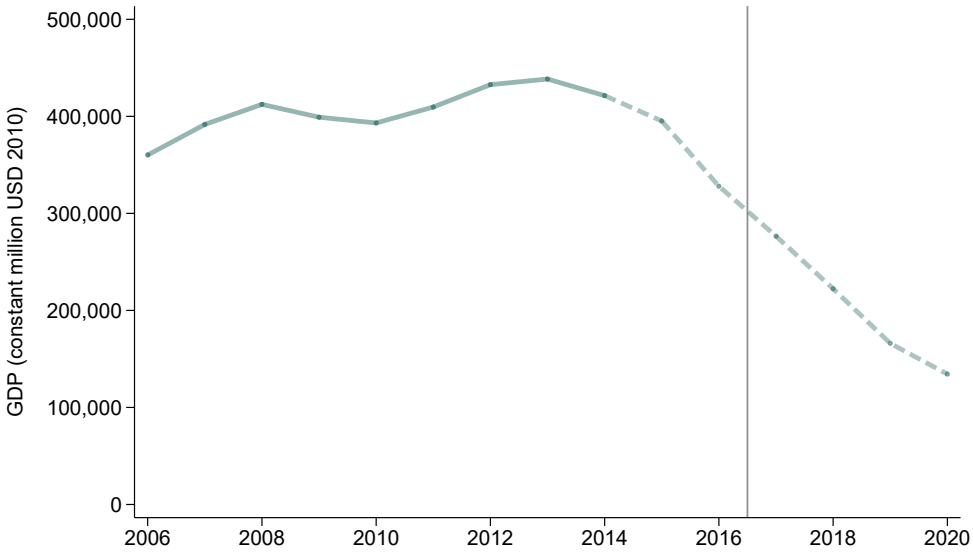
(b) Distribution of Maduro's vote share

E The distribution of IVSS

Figure E1: Formal workers and GDP over time



(a) Number of formal workers over time



(b) GDP

Figure E2: Geographical Collapse of Formal Employment

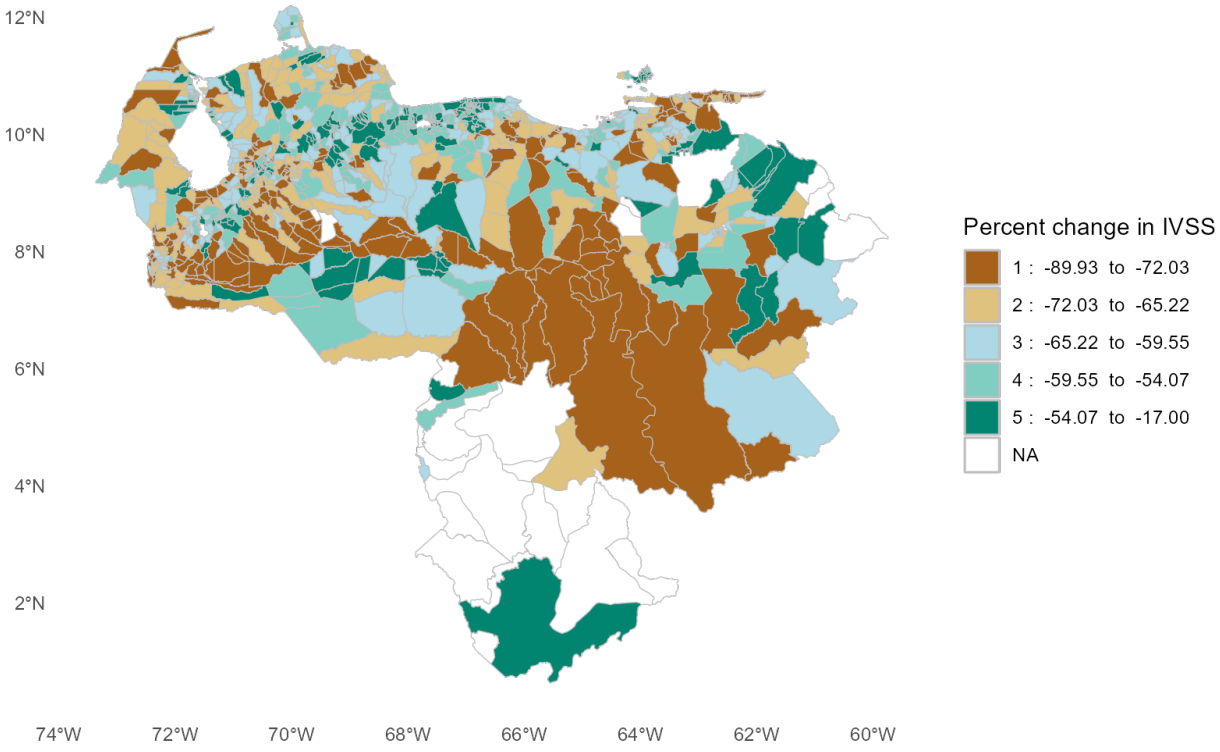
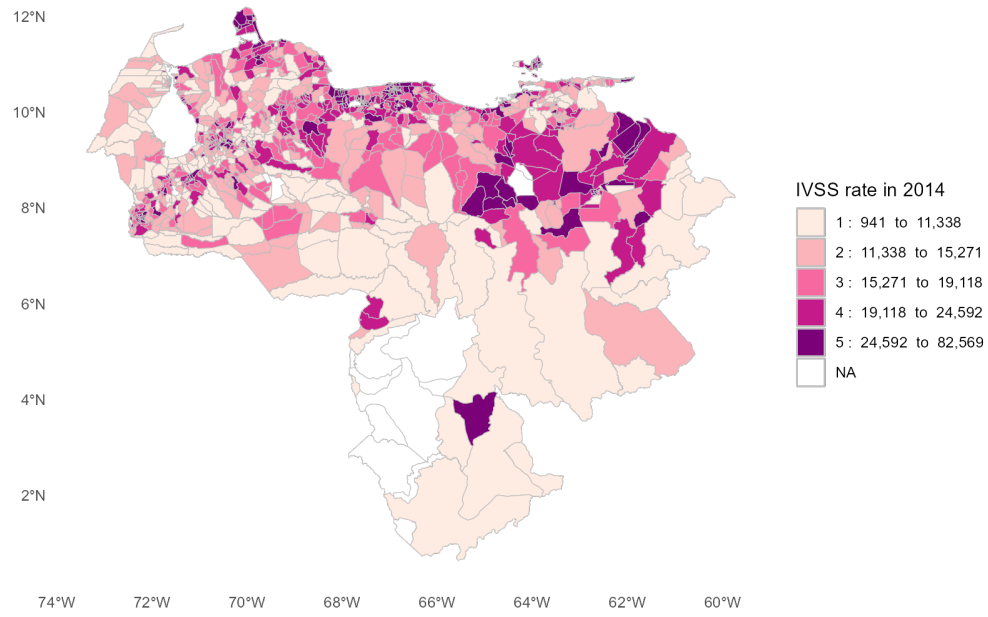
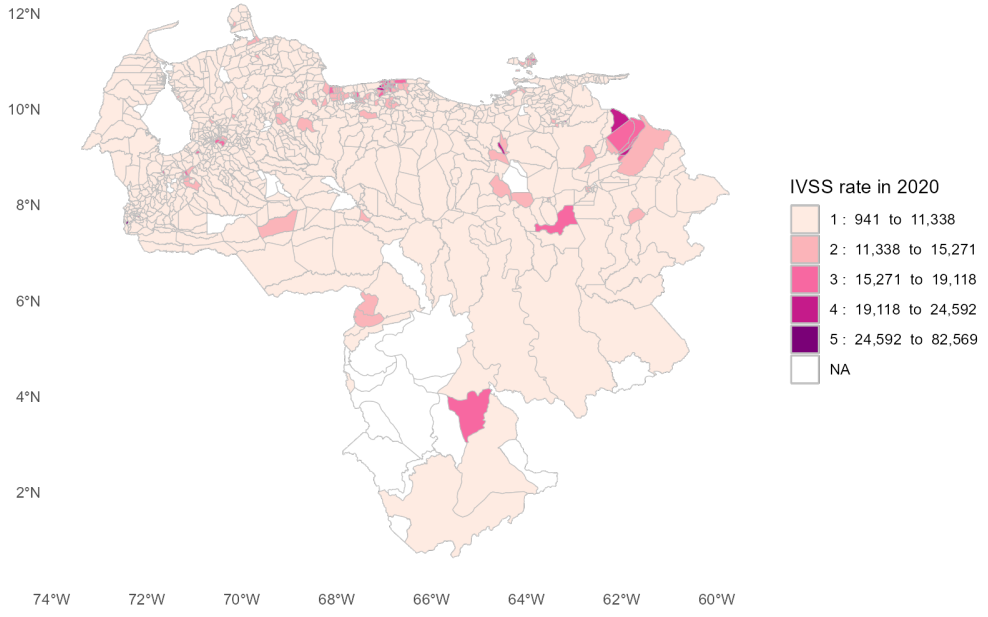


Figure E3: Formal employment decreased almost everywhere



(a) IVSS rate in 2014



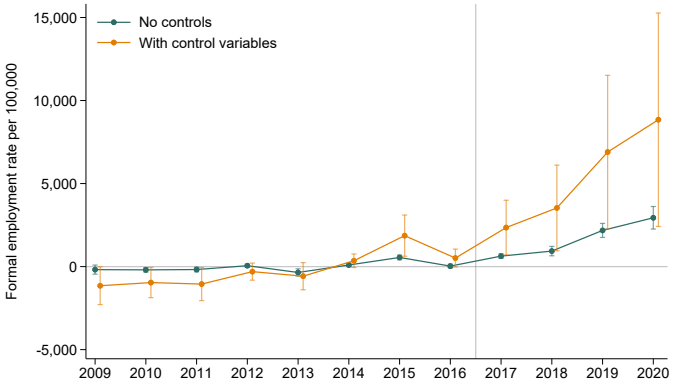
(b) IVSS rate in 2020

F Robustness on IVSS exercises

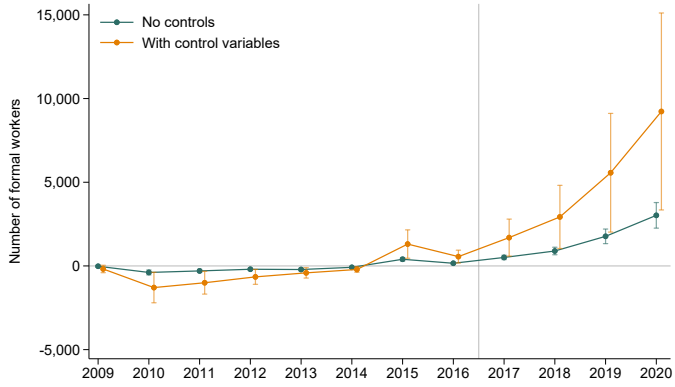
F.1 Estimating Different Specifications using Callaway and Sant'Anna (2021)

This section presents the complete set of event study plots analogous to the one presented in Figure 7. Those results are shown in green below and do not include any control variables. Additionally, I provide alternative specifications that control for the percentage of households in the parish with earthen-type floors, as this metric effectively captures a great deal of the socioeconomic background of the parish. I use this control in both, the outcome and the treatment model, as this approach is more robust to misspecification.

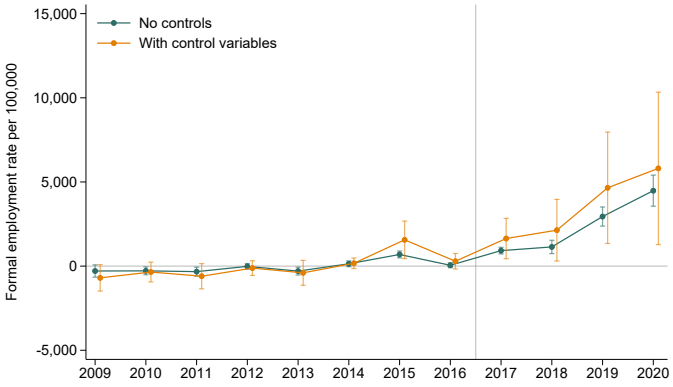
Figure F1: Event studies for IVSS using Callaway and Sant'Anna (2021)



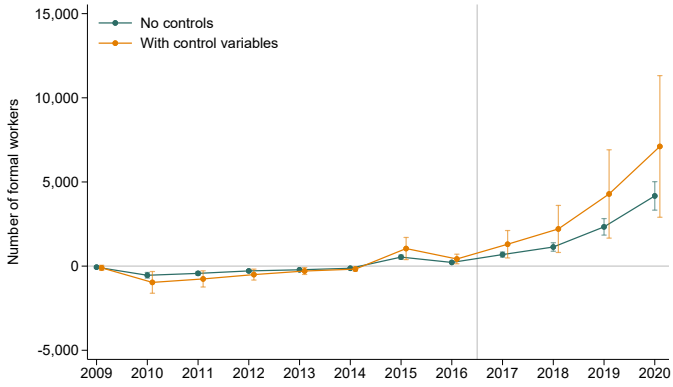
(a) IVSS rate, Maduro won/lost



(b) IVSS level, Maduro won/lost



(c) IVSS rate, Maduro top/bottom quintiles



(d) IVSS level, Maduro top/bottom quintiles

Finally, I produce pooled difference-in-difference estimations that extend the ones presented in Table 1 to the case where I use a control variable, as explained above.

Table F1: Formal employment declines more in opposition districts post-sanctions

	Maduro 2013 won v. lost		Maduro 2013 top v. bottom quintiles	
	Rate	Level	Rate	Level
Panel A: Results without control variables				
Difference-in-difference estimate	1,670.57	1,547.33	2,372.21	2,081.00
	(182.23)	(196.21)	(248.08)	(219.48)
Number of observations	16,855	17,042	6,675	6,795
Number of parishes	1,125	1,138	445	453
Control mean in pre-period	15,886.42	4,857.34	16,978.93	5,492.08
Effect as percent of control mean	10.52	31.86	13.97	37.89
Control std. deviation in pre-period	8,739.42	9,335.60	9,877.99	9,774.97
Effect as percent of control std. deviation	19.12	16.57	24.02	21.29
Panel B: Results with control variables				
Difference-in-difference estimate	5,405.71	4,853.91	3,558.42	3,725.84
	(1,933.04)	(1,582.06)	(1,369.29)	(1,151.72)
Number of observations	16,575	16,575	6,570	6,570
Number of parishes	1,105	1,105	438	438
Control mean in pre-period	16,027.93	4,978.56	17,146.62	5,666.45
Effect as percent of control mean	33.73	97.50	20.75	65.75
Control std. deviation in pre-period	8,674.80	9,438.11	9,827.89	9,883.28
Effect as percent of control std. deviation	62.32	51.43	36.21	37.70

This table contains the results from estimating a pooled difference-in-difference design using Callaway and Sant'Anna (2021). Columns 1 and 3 use the formal employment rate as the outcome variable, while columns 2 and 4 use the number of formal workers without normalization. In columns 1 and 2, I compare parishes where Maduro won the popular vote in 2013 with those where he lost. In columns 3 and 4, I compare the parishes at the top and bottom quintiles of the 2013 presidential vote share distribution. Panel A contains the same results as the ones reported in Table 1, which do not include any control variables. The results in panel B control for the percentage of households in the parish with earthen-type floors, as this metric effectively captures a great deal of the socioeconomic background of the parish. I use this control in both, the outcome and the treatment model, as this approach is more robust to misspecification. All columns include parish and year fixed effects. Standard errors are clustered at the parish level.

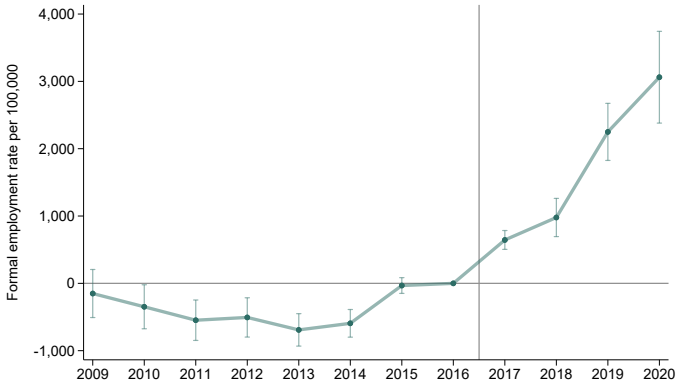
F.2 Estimating Different Specifications Using Two-Way Fixed Effects (TWFE)

In this section, I present the results from using standard two-way fixed effects models to investigate the robustness of the empirical findings discussed in Section 4. Specifically, I start by estimating an event study using parish and year-fixed effects:

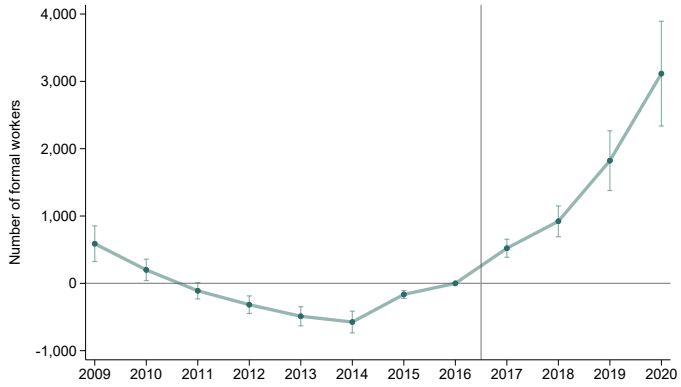
$$y_{it} = \gamma_i + \gamma_t + \sum_{t \neq 2016} \beta_t \cdot \text{Maduro}_{i,2013} \cdot D_t + \varepsilon_{it}$$

As in the main text, I estimate the model for two outcomes: the rate of formal employment per 100,000 and the number of formal employees without normalization. Finally, I define the parishes of interest ($\text{Maduro}_{i,2013}$ in the equation) in two ways. The first is the parishes where Maduro won the popular vote in 2013, and the second compares the parishes in the top quintile of the vote share distribution for 2013 against the ones at the bottom quintile. Finally, D_t is an indicator that takes the value of 1 for years after 2017 and 0 otherwise. The results are plotted below.

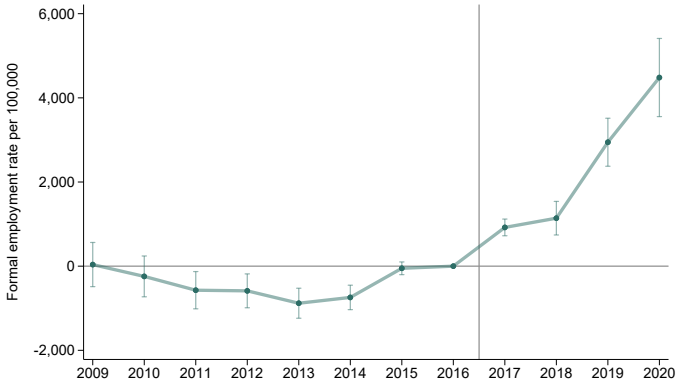
Figure F2: Event studies for IVSS using TWFE



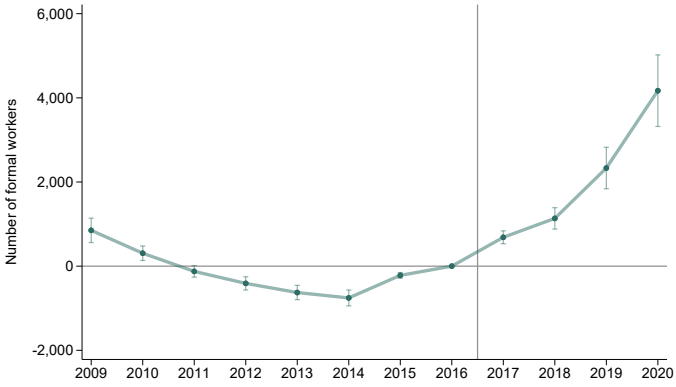
(a) IVSS rate, Maduro won/lost



(b) IVSS level, Maduro won/lost



(c) IVSS rate, Maduro top/bottom quintiles



(d) IVSS level, Maduro top/bottom quintiles

I also estimate a standard difference-in-difference design with two-way fixed effects, to understand the pooled effects without disaggregating by year. To that end, I estimate:

$$y_{it} = \gamma_i + \gamma_t + \beta \cdot \text{Maduro}_{i,2013} \cdot \text{Sanctions}_t + \varepsilon_{it} \tag{33}$$

Where Sanctions_t takes the value of 1 for the years after 2017 and 0 otherwise. The results are below.

Table F2: Difference-in-difference models using TWFE

	Maduro 2013 won v. lost		Maduro 2013 top v. bottom quintiles	
	Rate	Level	Rate	Level
Difference-in-difference estimate	1,953.86	1,470.91	2,517.19	1,866.82
	(219.05)	(175.72)	(278.67)	(200.85)
Observations	16,800	16,965	6,675	6,795
R-squared	0.94	0.97	0.94	0.97
Control mean in pre-period	19,519.67	8,349.36	20,536.62	8,492.47
Effect as percent of control mean	10.01	17.62	12.26	21.98
Control std. deviation in pre-period	10,096.58	11,686.73	10,169.73	11,625.80
Effect as percent of control std. deviation	19.35	12.59	24.75	16.06

This table contains the results from estimating equation 33. Columns 1 and 3 use the rate of formal employment as the outcome variable, while columns 2 and 4 use the number of formal workers without normalization. In columns 1 and 2, Maduro_i is a binary variable equal to 1 in parishes where Maduro won the popular vote in 2013 and 0 otherwise. In columns 3 and 4, Maduro_i takes the value of 1 for parishes in the top quintile of the 2013 presidential vote share distribution and 0 for parishes in the bottom quintile of the same distribution. All columns include parish and year fixed effects. Standard errors are clustered at the parish level.

F.3 Individual-level event study controlling by age, based on Callaway and Sant'Anna (2021)

Figure F3: Individual level event study controlling for age