# Dynamics of Violence, Governance, and Change: How Violent Non-State Actors Adapt to Shifting Social Orders

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## Abstract

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Violent non-state actors must endure large-scale shocks to the environment in which they operate, thereby transforming how they use violence, govern civilians, engage in the economy, or relate to the state. Economic, social, or political shifts change relationships among licit and illicit actors, generating different incentives for how these organizations engage with the world around them. In areas where the state is weak, non-state actors can take advantage of the power vacuum and fill in for the state in places where it is unable to reach. The transformational power of major events such as expanding markets due to free trade agreements, natural disasters, changes in leadership or regime type, or even the end of conflict itself thus demands consideration to further our understanding of how different groups continue to reproduce violence in diverse contexts. In this dissertation, I seek to explore these processes by examining how non-state actors use violence, adapt to shifting social orders, and exercise control in the context of political violence and organized crime.

Chapter 2, "Blood Avocados? Trade Liberalization and Cartel Violence in Mexico" (co-authored with Lucas Owen), explores this phenomenon in the context of trade liberalization policies with the Mexican avocado market. Several prominent studies predict that expanding markets in areas of low state capacity may decrease organized crime due to the opportunity cost mechanism, holding that booms in licit markets shift labor away from illicit markets. We posit an additional mechanism to explain the decrease in criminal violence –

an influx in capital allows market actors to invest in self-defense forces to combat criminal incursions. We test this logic using the case of the Mexican avocado industry with a staggered difference-in-differences design and find that trade liberalization throughout the 2010s has a significant negative effect on cartel-related homicides compared to other violence-prone areas. Robust qualitative evidence highlighting the emergence of self-defense groups to deter criminal actors in the avocado industry supports the vigilante mechanism. By using a unique empirical case to test a novel mechanism, this article therefore contributes to the literature on the consequences of trade liberalization on organized crime.

In Chapter 3, "Not So Sweet: External Price Shocks, State Capacity, and Violence from Madagascar's Vanilla Industry," I explore this phenomenon in the context of shifts in the price and demand of Malagasy vanilla by posing the following question: to what extent do adjustments to Western consumer markets drive cycles of crime and civil resistance in areas of virtually no state capacity? As Chapter 2 explores, an expanding literature holds that shocks to labor-intensive industries lead to a decrease in crime and violence. However, these studies assume at least a nominal level of state capacity. In areas of little to no state capacity, there are no structures to protect those who gain and lose from an influx of capital. As such, I posit two hypotheses – first, a positive shock to labor-intensive commodities will lead to an increase of crime in areas most impacted by the shock; and second, an increase of crime will lead to an increase of vigilante violence to fill the power vacuum of the state. To test these conjectures, I leverage the case of the vanilla industry in Madagascar, which experienced a 12-fold increase in prices when Nestlè announced it would no longer use synthetic vanilla in 2015. I pursue a mixed-method approach by first introducing novel data on local crime in Madagascar. Using a synthetic control design, I find that the 2015 policy led to a strong positive effect on crime in vanilla-producing regions. I then use qualitative data from interviews with vanilla farmers to demonstrate that vigilante violence is on the rise as a form of retribution, protection, and justice. This research is significant because it explores an unique empirical case by introducing novel data on crime in an area where data

availability is limited.

Chapter 4, "Getting to the Hereafter: Variation in the Survival and Transformation of Pro-Government Militias," is a thematic parallel to the earlier studies in the dissertation on economic shocks and subsequent cycles of criminal and vigilante violence. It explores how socio-political shocks brought on by the end of conflict or crisis creates incentives for violent non-state actors to alter their group identity and behavior to adapt to the world around them. I specifically examine the conditions under which pro-government militias (PGMs) survive after they are meant to formally terminate; and, of those that survive, what explains the variation in the type of group they become. Using inductive theory-building, I hypothesize the role of six explanatory frameworks – organizational structure, power sharing, government relation, group identity, conflict characteristics, and state capacity. I test the effect of these six explanatory frameworks by developing a multi-methods program called the PGM Transformation Project, a quantitative and qualitative dataset accounting for the post-termination identities of 325 PGMs from 1982 to 2017. First, using a logistic regression, I find that two primary conditions driving PGM survival: group networks in terms of identity-based recruitment strategies, and ties to the state in terms of power-sharing measures. Second, using a multinomial logistic regression, I find that that organizational structure and state capacity dictate the conditions under which groups turn to local defense, politics, states forces, or counter-state operations. The contribution of this research is the advancement of an original data program accounting for the afterlife of PGMs, a novel resource for those studying the impact these actors have on the causes and consequences of political violence.

I conclude in Chapter 5. In addition to suggesting limitations to my studies as well as avenues for future research, I discuss the collective implications of my research for theory, empirics, and policy. This dissertation speaks to the effect of varying levels of group organization and state capacity on the likelihood that different non-state groups will use violence as they adapt to large-scale shocks to the environment in which they operate. It investigates the multiple pathways groups may take to pursue such violence; in particular,

it illuminate the various ways in which groups turn to vigilantism following economic or socio-political shocks. To understand these processes, I utilize a diverse set of data – from publicly-available government sources, from interviews conducted during fieldwork, and from a novel hand-collected dataset – to test how violent non-state actors adapt to the world around them.

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# Dedication

for my family

# Chapter 1

# Introduction

## 1 Questions of Cycles of Violence

Violent non-state actors must endure large-scale shocks to the environment in which they operate, thereby transforming how they use violence, govern civilians, engage in the economy, or relate to the state. Economic, social, or political shifts change relationships among licit and illicit actors, generating different incentives for how these organizations decide engage with the world around them. In areas where the state is especially weak, groups can take advantage of the power vacuum and fill in for the state in places where it is unable to reach. This is why, for example, we see cartels expand beyond drug trafficking and instead corner licit markets, or vigilante groups emerge to provide communities with extralegal protection, or pro-government militias change their allegiance and transform into counter-state groups.

The transformational power of major events such as expanding markets due to free trade agreements, natural disasters, changes in leadership or regime type, or even the end of conflict itself demands consideration to further our understanding of how different groups continue to reproduce violence in diverse contexts. Violent non-state actors are resilient, and often find ways to adapt to these shifting social orders.

This dissertation explores questions related to cycles of violence, peace, and civil resistance in areas of little to no state capacity. How do violent non-state actors adapt to changes to the environment in which they operate? What informs their decision to re-mobilize and pick up arms or to put them down? When do they engage in the licit versus

illicit economy? How do they interact with civilians? What instruments of control do they use within and outside of their organizations? I seek to answer these questions by examining how non-state actors use violence, adapt to shifting social orders, and exercise control in the context of political violence and organized crime.

# 2 Guiding Literature

Yet there is significant variation in when, how, and why we see violent non-state actors pursue different behavioral trajectories in the face of large-scale shocks. I advance this agenda in the context of four varying scope conditions – different levels of state capacity, different types of shocks, different types of non-state actors, and different types of outcomes – which give rise to the depth and breadth of this dissertation. The dissertation's broad scope allows me to speak to a range of literature across the fields of international relations, comparative politics, political economy, and conflict studies.

## 2.1 Variation in State Capacity

First, I consider contexts of varying levels of state capacity. Robust institutions and bureaucracy allow states to maintain the Weberian sense of their defining features (Weber, Gerth and Mills, 1946); that is, their ability to successfully claim a monopoly of force over a given territory. The state is meant to rein in violence among powerful individuals through its use of institutions and organizations (Bates, 2001; North, Wallis and Weingast, 2009). Although state capacity can take on several meanings, I understand state capacity in terms of the ability to offer public goods and services, credibly commit to and uphold contracts, and to maintain institutions for security provision. This reflects Cárdenas's (2010) understanding of state capacity, characterized by a reliance on clientelism, incomplete private property rights protections, the failure of making credible commitments to private investors, and difficulties in raising revenue from the population.

I am situated in the literature that examines violence in areas of low state capacity where we see order imposed at the margins by non-state actors, in peripheral areas where the state is too weak to reach. These areas often see criminal actors emerge to fill in for the state (Gambetta, 1996; Reuter, 2009; Dimico, Isopi and Olsson, 2017). With more opportunities for rent appropriation, criminal organizations may integrate within market or political structures in these areas – and even become the suppliers of order – to engage in the licit economy or mediate relationships among individuals as third-party enforcers of contracts.

However, we also see non-state actors emerge in areas of strong state capacity, and thus I situate my studies in these contexts as well. A particularly salient example of this is in the Los Angeles prison system, where prisoners create extralegal order *within* an institution of the state itself by using a combination of norms and organizations to provide governance to members within the same gang (Skarbek, 2014). We even see non-state groups function parallel to strong states, such as state-manipulated Gladio militias operating during the Cold War, pro-Russian Chechen Kadyrovtsy militias, or Northern Ireland's Loyalist paramilitaries (Aliyev, 2016).

## 2.2 Variation in Types of Shocks

Second, I consider contexts of different types of shocks. As conflict disrupts systems, pre- or -post-conflict transitions may agitate the established order and force groups to find ways to maintain peace. The actors that are sustained by violence must find new ways to operate in the post-conflict world. Some groups may find pathways to become political parties (e.g., Zaks, 2023; de Zeeuw, 2008; Manning and Smith, 2016; Matanock, 2017), some groups may successfully engage in Demobilisation, Disarmament and Reintegration while others do not (e.g., Berdal and Ucko, 2009; Humphreys and Weinstein, 2007; Cardenas, Gleditsch and Guevara, 2018), and, ultimately, some groups may become spoilers of peace and recreate the very conditions that led to conflict (e.g., Nilsson and Söderberg Kovacs, 2011; Stedman, 1997;

Pearlman, 2009; Findley, 2007). This work situated in the literature studying transitions from conflict to peace, where new structural considerations force groups to adapt to the new environment.

That said, large-scale shocks do not necessarily need to be as salient as the cessation of conflict. Economic shocks, for example, are sometimes more difficult to discern because they can introduce big shifts for individuals at the local level rather than fully disrupting the entire country or region. These economic shocks can come from events such as pressures on commodities due to globalization, climate change, and natural resource endowments. Therefore, in addition to examining the widespread effects that the cessation of conflict may generate across an entire state, I align myself with the literature that explores the relationship between economics and conflict (e.g., Grossman, 1991; Hirshleifer, 1991; Skaperdas, 1992; Bates, Greif and Singh, 2002; Fearon, 2008). Specifically, I situate myself in this research agenda by examining the effect of economic shocks on local communities (Dube and Vargas, 2013; Dal Bó and Dal Bó, 2011; Blair, Christensen and Rudkin, 2021; Bazzi and Blattman, 2014; Laville and Mandon, 2019; Besley and Persson, 2010).

## 2.3 Variation in Non-State Groups

Third, I consider different types of non-state groups, including criminal organizations, pro-government militias (PGMs), and vigilante groups. In terms of criminal groups, recent scholars have built on the seminal studies of criminal violence (Gambetta, 1996; Schelling, 1971) to understand how organized criminal groups emerge and use violence in certain contexts. For example, Skarbek (2014) and Lessing and Willis (2019) account for how mass incarceration policies can explain the emergence of prison gangs that use violence to maintain order behind bars; Alesina, Piccolo and Pinotti (2018), Trejo and Ley (2021), Blume (2017), and Daniele and Dipoppa (2017) account for how election cycles may lead to cartel-driven politician assassinations; and Barnes (2022) and Lessing (2021) account for how territorial control alters incentives for criminals to use coercion for control. I am situated in this lit-

erature by examining contexts where various highly-organized criminal groups use violence. Furthermore, I examine the use of violence from *un*organized criminal actors. Robust group organization underlies many of the assumptions derived from the prominent studies of how criminal groups use violence. These trajectories may differ for unorganized criminal actors, which do not have the organizational means to generate the same expectations that we otherwise have for the mafia, cartels, prison gangs, and so on.

In terms of PGMs, scholars and policymakers have often viewed civil wars as a dichotomous phenomenon, reduced to a bilateral conflict between the state and insurgents. This simplification disregards the complex network of actors that may be involved in conflict; many empirical studies tend to ignore the proliferation of groups that operate parallel to the state. These actors, known as PGMs, militias, paramilitaries, or civil defense forces, "emerge during an armed conflict to fight on behalf of the state and/or against the rebels" (Jentzsch, Kalyvas and Schubiger, 2015, 755). Scholars are increasingly grasping the impact such actors have on conflict dynamics, especially their effect on violence and security in regions of active conflict where states exploit them as a means of plausible deniability (Carey, Colaresi and Mitchell, 2015; Mitchell, Carey and Butler, 2014; Aliyev, 2019). I am situated in this literature by examining the evolution of PGMs after they are meant to formally terminate, and how this evolution impacts enduring cycles of violence.

In terms of vigilante groups, scholars have recently accounted for difference across groups when theorizing long-term effects on crime and violence. For example, Bateson (2021) identifies five dimensions on which vigilantism may vary (including individual or collective, violent or nonviolent, public or private, spontaneous or institutionalized, and offensive or defensive) and Cohen, Jung and Weintraub (2023) conceptualize an ideal-typical two-by-two typology for vigilante groups based on the extent of organization and group aims. I am situated in the literature on vigilantism by investigating the ways that such groups, including local-defense groups and self-defense groups, emerge as a way to combat criminal actors in areas such as Mexico (Moncada, 2021; Herrera, 2021; Del Rio, 2022; Osorio, Schubiger and

Weintraub, 2021) and Madagascar (Osterhoudt, 2020). However, vigilante groups do not commonlu emerge out of nothing – for example, certain groups mobilizing against criminal actors in Mexico come from the same communities that organized against the state during the 20th-century *Cristero* rebellion (Osorio, Schubiger and Weintraub, 2021). I thus also seek to understand how vigilante groups evolve from other types of non-state actors – specifically, PGMs – to reproduce violence.

An important and underlying theme in this dissertation is how these groups change over time. On one hand, this can mean how, given various incentives, groups can modify their use of violence or the way in which they create order to control civilians, ultimately becoming more or less predatory. On the other hand, this can mean how groups literally change their identity to adapt to the world around them. While I examine cases of variation *across* non-state groups, I also observe how this variation manifests *within* groups over time. FPGMs can not only turn into criminal groups and vigilante groups, the primary non-state actors I examine in this dissertation, but also political, state, and counter-state groups. I seek to understand this variation in non-state actors both across and within groups.

## 2.4 Variation in Outcomes

Fourth, I consider different types of outcomes. Because of the complex nature of studying conflict and crime, scholars must ask themselves a set of ethical questions when carrying out empirical assessments of violence: how should researchers address "particularly thorny issues that include access and trust, positionality and power, ensuring physical safety of respondents, the possibility of retraumatization, the need to protect data, the degree to which data can be shared, and the safety of the researcher and the research team" (Eck and Cohen, 2020, 855)? While practical and ethical limitations close certain doors through which we can study the causes and consequences of violence, it also opens other doors for creative ways to study these complex phenomena.

I utilize available data and resources to operationalize my dependent variables so I

may investigate how actors use crime and violence. I use government data to approximate cartel-related homicides and secondary-source material to explore violence from self-defense forces in Mexico; I use novel police and gendarme data to measure incidents of crime and interview data to evaluate vigilante violence in Madagascar; I create a novel cross-national dataset on the evolution of PGMs to determine the pathways through which they reproduce violence. Ultimately, I situate myself in the breadth of studies that evaluate the causes and consequences of violence in the context of political violence and organized crime by drawing on various outcomes to approximate these hard-to-measure phenomena.

# 3 Violent Non-State Actors and Shifting Social Orders

This dissertation explores how different types of violent non-state actors adapt to shifting social orders in the face varying levels of state capacity. The first two articles in this dissertation examine this phenomenon in the context of economic shocks driven by globalization, whereas the third article examines this phenomenon in the context of socio-political shocks in the form of transitions from conflict. The first article examines how economic shocks in areas of low state capacity impact levels of organized criminal violence. The second article examines how economic shocks in areas of practically no state capacity impact levels of both unorganized criminal violence and vigilante violence. The third article examines how socio-political shocks in areas of varying state capacity impact how PGMs reproduce cycles of violence.

## 3.1 Blood Avocados? Trade Liberalization and Cartel Violence in Mexico

The first article in this dissertation, co-authored with Lucas Owen, asks how expanding markets shape organized crime and violence in the developing world. As globalization incites organized criminal groups to broaden operations in existing markets or pursue opportunities

in new markets, we question the impact of such external shocks on levels of violence in the developing world.

Though it is clear that criminal organizations emerge in environments of weak state capacity (Gambetta, 1996), literature on the effect of external market shocks on violence in these contexts provides two diverging predictions based on the type of market good in question. On one hand, the increase in demand and value of *illicit* goods leads to an increase in violence given logic from the rapacity hypothesis (Dube and Vargas, 2013; Blair, Christensen and Rudkin, 2021). The rapacity hypothesis holds that exogenous shocks increase the amount and value of a "prize" to be won, thereby inducing market actors to fight in an attempt to control these resources. On the other hand, the increase in demand and value of *licit* goods leads to an increase in violence given logic from the opportunity cost hypothesis (Dal Bó and Dal Bó, 2011; Becker, 1968; Mejia and Restrepo, 2015). The opportunity cost hypothesis holds that because external market shocks bring more wealth to labor-intensive industries, like that of agriculture, we should expect to see less violence in places producing these commodities as it becomes more appealing to participate in the licit economy rather than the illicit economy. The opportunity cost argument widens an existing debate on the effects of "resource wealth" on armed conflict, and tells us the conditions through which we should expect to see price increase in goods like flowers (Hernandez, 2014) and coffee (Dube and Vargas, 2013) lead to less violence.

However, the opportunity cost hypothesis assumes that market participants will allocate resources solely to productive opportunities, leading to a decrease in violence. What this ignores are the variety of ways in which actors can seek an advantage in market exchanges, which can range from productive means to appropriative means (Hirshleifer, 1988; Skaperdas, 1992; Baumol, 1990). In this article, we theorize an alternative pathway through which we may see violence as a result of how people may allocate the gains from expanding markets: collective vigilantism. Market participants can invest in protective measures by funding vigilante groups to deter crime in areas of high productivity. Thus, in what we call

the vigilante mechanism, we posit that agents may divert resources towards defense measures to protect their goods and property, effectively deterring incursions from organized criminal groups.

To conduct an empirical test of the vigilante mechanism, we look to the avocado industry in Mexico and assess the extent to which trade liberalization by the United States impacts criminal violence. Avocado production is most robust in the Pacific state of Michoacán, accounting for 80% of total production in Mexico and 43% of the global avocado supply (Foreign Agricultural Service, 2018). However, certain countries have imposed restrictions on avocado exports to limit the spread of avocado diseases and pests. Restrictions on the international trade of Mexican avocados have origins in an import ban imposed by the United States in 1914, which only slightly relaxed in 1994 following regulations set forth by the North American Free Trade Agreement (NAFTA). NAFTA allowed Mexican municipalities to export avocados to the continental United States after gaining certification from Mexico's Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA; now the Secretariat of Agriculture and Rural Development [SADER] since 2018). This certification includes accordance with strict phytosanitary regulations. Although SAGARPA had expanded the municipalities allowed to export internationally since 2005, only 24 municipalities of almost 2,500 municipalities in Mexico were authorized to export avocados to the continental United States. Motably, all of these municipalities were in Michoacán.

In February 2015, the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service announced a new policy that allowed for broadening the areas that could export to the United States from Michoacán to all other Mexican states, provided they meet strict guidelines to reduce the risk of transmitting quarantine pests (Animal and Plant Health Inspection Service, USDA, 2016). When the USDA fully enacted the Hass Avocado Import Program in June 2016, growers opened up other production sites that met regulatory compliance, and other municipalities within and outside Michoacán then had the

opportunity to compete in the international market by increasing production.

As the avocado industry has evolved, organized crime has done so in parallel. Notably, a shock to the criminal market itself occurred in December 2006 when President Felipe Calderòn initiated a mass crackdown on cartels. Calderòn touted that the Mexican Drug War would create a blanket crackdown on all cartels, though violence only intensified and became more lethal and brazen as large syndicates fragmented and dozens smaller groups emerged (Signoret et al., 2021). In addition to leading to the proliferation of many smaller and fragmented criminal groups, the Mexican War on Drugs changed the market landscape for these organizations. Where large cartels, such as the Milenio Cartel and the Zetas, had previously focused on drug trafficking, these smaller groups turned to local extortion as they have attempted to control markets other than drugs. This has led to predatory behavior within markets such as timber, iron ore, and, for the purposes of this article, avocados.

Because differences across municipalities may confound the relationship between avocado production and cartel-related violence, we employ a difference-in-differences (DID) design to identify the causal effect of market shocks on cartel-related violence. We specifically leverage changes in export ability within the Mexican avocado industry to proxy for increases in the demand for avocados from various municipalities in Mexico. The DID design takes advantage of two certification and export changes for avocados according to the prevalence of pests at the municipal level – first, SAGARPA-granted municipal export certification between 2011 and 2019; and second, the USDA Hass Avocado Import Program, a change in U.S. import policy in June 2016.

We ultimately find that positive demand shocks to the avocado industry have had a significant and large negative effect on cartel homicides and missing persons in municipalities allowed to export avocados following pest-free declaration by the Mexican government and access to trade with the United States. This means that, although there may not be an absolute decrease in crime in these areas, there are fewer homicides relative to areas that did not experience market expansion. While the opportunity cost mechanism can indeed help

explain this finding, we posit that the vigilante mechanism further explains why criminal violence decreases with an influx of capital in licit industries. Conducting an empirical test of the vigilante mechanism is difficult because the DID results cannot shed light on the underlying causal mechanisms driving results, and furthermore data on vigilantism are scarce and collection would pose significant risks to researchers (Bateson, 2021). However, qualitative evidence from notable studies in the field of vigilantism in Mexico – notably, from Moncada (2021) – helps shed light on the alternative mechanism we posit.

## 3.2 Not So Sweet: External Price Shocks, State Capacity, and Violence from Madagascar's Vanilla Industry

The second article in this dissertation examines the extent to which price shocks to licit industries drive cycles of violence in areas of extremely low state capacity. I examine conditions under which shifts to Western consumer markets drive prices for commodities in other parts of the world where the state may be virtually absent. While the first article contributes to the expanding literature that holds that shocks to labor-intensive industries lead to a decrease in crime and violence, I posit that these studies assume at least a nominal level of state capacity in order for the mechanisms to hold true. However, in areas of little to no state capacity, there are no structures to protect those who gain and lose from an influx of capital. I thus situate this article within the scope condition of examining positive price shocks in areas of virtually no state capacity where relatively unorganized groups of bandits and vigilantes emerge.

This article again starts with the opportunity cost hypothesis, which tells us that positive shocks to labor-intensive licit commodities lead to greater employment opportunities and wage increases, thereby reducing the returns to appropriation (Mejia and Restrepo, 2015; Becker, 1968; Dube and Vargas, 2013; Dal Bó and Dal Bó, 2011; Blair, Christensen and Rudkin, 2021). However, these studies assume at least a nominal level of state capacity, where the government can offset the potentially negative consequences of a capital influx. In

areas where the state is virtually absent and cannot reallocate production, effectively impose and collect taxes, and enforce contracts to protect property, I claim that violent actors emerge to prey on those who are gaining more wealth. At the same time, vigilante actors step in as third party enforcers to fill in the vacuum of the state (Gambetta, 1996; Dimico, Isopi and Olsson, 2017; Bandiera, 2003; Reuter, 2009). I therefore posit two hypotheses. First, I expect that in areas of virtually no state capacity, a positive shock to prices of labor-intensive commodities will lead to an increase in crime in regions most impacted by the shock; and second, I expect that an increase in crime in areas of virtually no state capacity will lead to an increase of vigilante violence as a form of protection, retribution, and justice.

I test these hypotheses using the case of the vanilla industry of Madagascar. Madagascar has little to no state capacity, characterized by its reliance on clientelism, its incomplete private property rights protections, its failure of making credible commitments to private investors, and its difficulties in raising revenue from the population (Cárdenas, 2010). At the same time, Malagasy vanilla accounts for over 85% of the global supply, constituting the largest share of exports from Madagascar at 22%, approximately $619 million (Hending et al., 2020). The northeast region of SAVA (an abbreviation of its four composite districts Sambava, Antalaha, Vohemar, and Andapa) is the primary producer of vanilla because of its humid climate, forested terrain, and high levels of annual rainfall – an estimated 70,000 of Madagascar's 80,000 vanilla farmers operate from SAVA (U.S. Department of Labor, 2023).

Nestlè, the world's largest food and beverage corporation, has struck several agreements related to the production of vanilla, with the company establishing corporate rights to a large share of SAVA's vanilla output through deals with farmers (Sustainable Vanilla Initiative, 2020). In 2015, Nestlè announced it would only use natural vanilla in its products, and other large food and beverage companies followed suit. This policy announcement led to the price of vanilla skyrocketing – the global price of vanilla went from an average of $50 per kilogram before 2015 to $100 per kilogram at the beginning of 2015, and reached a record high of almost $600 per kilogram in 2018. In the aftermath of Nestlè's adoption of natural

vanilla in 2015, many land-owning producers have seen their lives improved dramatically (Boone, Kaila and Sahn, 2022). At the same time, these economic gains have not been equally distributed, and resulting crime in the Malagasy vanilla industry has anecdotally appeared to be on the rise (Osterhoudt, 2020). Due to opportunities to gain wealth through speculation, thieves have stolen so much green vanilla that upwards of 15% of the annual crop could be stolen each year (Steavenson, 2019). Reports from the region document how farmers have needed to bolster security to minimize the potential risk posed by criminal activity to the vanilla trade in SAVA because the state has been unable to sufficiently protect farmers from predation (Reuters, 2019; The East African, 2021; Daily Maverick, 2021).

I conduct an empirical test to investigate if crime in Madagascar has indeed increased relatively more in regions that produce vanilla after the price shock driven by Nestlè's policy. However, data on Madagascar is problematic to come by – low state capacity means that accurate data on economic and social outcomes is fairly inadequate. I therefore draw on two unique data sources to pursue a multi-methods approach in assessing my hypotheses.

To assess the effect of the positive price shock of vanilla on crime, I conduct a synthetic control analysis using novel data from Madagascar's gendarmerie, which I call the MADACRIME dataset. Madagascar's local gendarmerie, in partnership with representatives from the Malagasy National Ministry of Police, granted me unique access to data on various types and aspects of crime including acts of banditry, zebu crime, and vanilla crime. MADACRIME thus provides a panel dataset on local levels of crime for the years 2010 to 2020 across all of Madagascar's 22 regions, yielding 242 region-year units. I use MADACRIME to conduct a synthetic control analysis to estimate the effect of the increased price of vanilla on crime by comparing the SAVA region with a control group of regions not (or less) affected by the price shock. To reduce the scope for omitted variable bias, I weight units in the control group to construct a synthetic counterfactual that replicates the initial conditions of criminality of the SAVA region before exposure the price shock. I find that from 2015 to 2018, crime rates rose an average of two cases per 10,000 people in SAVA

compared to the synthetic control. This translates approximately to an additional 200 cases of crime a year in SAVA, with a peak of approximately 600 additional cases of crime in 2018.

To assess the effect of the increase in crime on vigilantism in the SAVA region, I draw on unique insights derived from fieldwork I conducted during September 2023. I specifically draw on interviews with vanilla farmers conducted in a fokontony (the smallest administrative unit in Madagascar) in the district of Andapa to address three main questions – first, did vigilante justice increase at the height of vanilla prices?; second, if vigilante justice did increase, why was it on the rise?; and third, if vigilantism increased due to low state capacity, how does vigilantism function as a substitute for the state? Fieldwork evidence generate three main findings that lends credence to the claim that vigilante violence is on the rise as a form of protection, retribution, and justice in response to vanilla crime. First, vigilantism is indeed on the rise in SAVA, as other passive ways to administer justice are ineffective. Second, villagers support the use of violent vigilantism because of the lack of trust in government, for the formal hierarchy of justice is incoherent and ineffective. Third, vigilantism fills the vacuum of the state by promoting fairness when government structures fail to do so.

## 3.3 Getting to the Hereafter: Variation in the Survival and Transformation of Pro-Government Militias

While the first two articles examine how economic shocks impact how non-state actors use violence, the third article examines conditions of non-state actor survival and transformation with socio-political shocks driven by the end of conflict or crises. Specifically, I examine the survival and trajectories of pro-government militias (PGMs) in conflict by exploring the conditions under which PGMs persist after they are intended to formally terminate and, of those that persist, what explains the variation in the type of group they become.

Drawing heavily on rebel literature, I engage in inductive reasoning to theorize the effect of six explanatory frameworks on the afterlife of PGMS – organizational structure,

power sharing, government relation, group identity, conflict characteristics, and state capacity:

*Organizational structure:* Non-state actors forge unique structures to maintain control within (Gutiérrez-Sanín, 2008; Gutiérrez-Sanín and Giustozzi, 2010; Staniland, 2014) and outside (Arjona, 2014; Mampilly, 2011; Mampilly and Stewart, 2021) their organizations to confront challenges related to recruitment, control, governance, violence, and resilience (Weinstein, 2007, 40).

*Power sharing:* Because power sharing can transform relations from zero-sum to positive-sum in nature (Ottmann and Vülelrs, 2019), states can choose to reinforce their monopoly of violence by excluding PGMs from postwar peace processes (Mehler and Hartzell, 2019). Conversely, they can attempt to consolidate power at the local level by "cutting deals" with PGM leaders (Migdal, 1988, xv).

*Government relation:* Because PGMs maintain a strategic relationship with states, they may either hold a semi-official status whereby states can more easily delegate violence (Carey, Colaresi and Mitchell, 2015; Bolte, Joo and Mukherjee, 2021) or they may hold an informal status where the principal-agent relationship between the state and PGM can more easily break down (Nelson and Petrova, 2023).

*Group identity:* Recruitment from identity-based groups can spur mobilization for violence (Daly, 2016). A shared understanding of moral commitments, resentment of subordination, and pleasure of agency (Wood, 2003, 2008) can spark the continuation of affective mobilization both during and after conflict.

*Conflict characteristics:* Because the nature of conflict can transform a group's goals and level of internal cohesion (Seymour, 2014; Kenny, 2010; Kalyvas, 2008; Staniland, 2012), protracted and intense conflicts can serve to alter incentives for PGMs to fully dissolve (Aliyev, 2019).

*State capacity:* PGMs can either be an outcome of weak states or they can be a tool for strong states to project their power Aliyev (2016). Both the emergence and dissolution of PGMs is a function the permissive environments that allow PGMs to thrive in terms of state capacity.

To assess the effect of these explanatory frameworks, I advance a novel data collection program called the PGM Transformation (PGMT) Project. The PGMT Project offers a unique multi-methods contribution to the study of political violence by advancing a quantitative dataset accompanied by a qualitative handbook on the post-termination identities of PGMs. Primarily, the PGMT Project builds upon Carey, Mitchell and Paula's (2022) Pro-Government Militia Database (PGMD) 2.0 (hereafter the "PGMD"). The PGMD identifies over 500 PGMs in a cross-national dataset accounting for PGMs that existed from 1981 to 2014. Of these PGMs, I identify 325 PGMs with termination years 1982 to 2017. For these 325 PGMs, I account for how a group's functions may be repurposed post-termination in a way that allows it to persist yet behave in an operationally different manner from its pre-termination identity. In addition to dissolution, I record the identities of PGMs yearly for the five years after a group formally terminates by classifying five post-termination identities: criminal groups, local defense groups, political groups, state forces, and counter-state groups. As such, I record a total of 1,625 PGM-year post-termination identities. In addition to the quantitative dataset for the PGMT Project, I advance the PGMT Repository, an archive of qualitative case notes for all PGMs in the PGMT Project. The PGMT Repository therefore offers not only a qualitative archive for all the cases in the PGMT Project, but it provides transparency for the coding decisions in the dataset by highlighting areas of uncertainty or assumptions made in the data collection process.

Using the PGMT Project together with existing data from sources such as Government and Armed Actors Relations Dataset (Otto, Scharpf and Gohdes, 2020), the Uppsala Conflict Data Program (UCDP) Conflict Termination Dataset (Kreutz, 2010), the UCDP Peace Agreement Database (Pettersson and Öberg, 2020), the Peace Agreement database and

dataset (Bell and Badanjak, 2019; Bell et al., 2019), and Varieties of Democracy (Coppedge et al., 2024; Pemstein et al., 2024), I pursue a two-part analysis to address my research question. To understand the conditions under which PGMs survive despite termination attempts, I use a logistic regression. I find that the primary conditions driving PGM dissolution are a centralized command structure and increased state control over territory. However, PGM networks in terms of identity-based recruitment strategies and ties to the state in terms of power-sharing measures determines their survival.

To understand the conditions that inform the post-termination identity of those PGMs that survive, I use a multinomial logistic regression. I find that various explanatory factors illuminate the conditions under which we see groups turn to local defense, politics, states forces, or counter-state operations. PGMs that become local defense groups are more likely to draw on existing hierarchical structures within the group and operate in peripheral regions as the state consolidates control at the center. PGMs that become political groups are more likely to maintain many governing institutions and operate within long conflicts. PGMs that become part of the state forces are less likely to maintain many governing institutions yet are more likely to have a semi-official relationship with the state. PGMs that become counter-state groups are more likely to emerge where the state maintains uncontested control over most of its territory.

# 4 Article Innovations

Each article in this dissertation advances unique theoretical and empirical innovations. The innovation of the first article is identifying and testing a new mechanism that drives the relationship between a positive price shock and criminal violence – the vigilante mechanism, whereby self-defense groups mobilize to effectively counter criminal incursions in lucrative industries. I conduct a novel empirical test on the existing opportunity cost hypothesis using a case not yet used in this context – the Mexican avocado industry. The innovation of the

second article is empirical as I pursue a mixed-methods approach using two unique sources of data. First, I use novel time-series data on crime in Madagascar to conduct a synthetic control analysis and find that crime comparatively increased in vanilla-producing regions following the price spike. Second, I use interview data with vanilla farmers from fieldwork in September 2023 and find that vigilantism provides a means for communities to fill the power vacuum of the state. The innovation of the third article is the data collection effort driving the PGMT Project to capture the behavioral changes of PGMs throughout conflict. I created the dataset through monitoring a team of seven undergraduate research assistants over an academic year, which underlies the pedagogical contribution of the project. Lessons learned from leading this team of researchers to create both a quantitative and qualitative dataset can inform other scholars in their own data collection undertaking.

To that end, this dissertation proceeds as follows. Chapter 2 presents my first article, co-authored with Lucas Owen: "Blood Avocados? Trade Liberalization and Cartel Violence in Mexico." This article sets up the debate on the effect of economic shocks to licit industries on cartel-related homicides in areas of low state capacity. In tests the opportunity cost hypothesis using a novel empirical case, the avocado industry in Mexico, and introduces an alternative pathway that leads to decreases in cartel-related violence. In Chapter 3, I further relax the assumption of state capacity in my second article: "Not So Sweet: External Price Shocks, State Capacity, and Violence from Madagascar's Vanilla Industry." I explore the case of economic shocks in licit industries, though in the context of vanilla in Madagascar, which I claim is an area with virtually no state capacity. I am able to examine the prevalence of criminal activity as well as vigilante violence in this case by using novel data from local connections as well as from fieldwork. In Chapter 4, I pivot and explore how socio-political shocks impact violence in the case of varying levels of state capacity in my third article: "Getting to the Hereafter: Variation in the Survival and Transformation of Pro-Government Militias." I create a novel dataset to analyze the conditions under which PGMs reproduce violence despite formally terminating. I conclude in Chapter 5 where I discuss the collective

implications of my findings in terms of theory and empirics, limitations to the studies I present, avenues for further research that scholars can ponder, and policy implications in addressing political and criminal violence.

Ultimately, as the articles in this dissertation demonstrate, I contribute to a wider dialogue on the effects of state capacity and globalization on political and criminal violence. I specifically seek to illuminate how the ways in which people decide to engage with the world around them – such as by the food we consume, the goods we purchase, or the movements we support – may impact other parts of the world where the state is too weak to protect vulnerable people. This dissertation helps to explain how and why.

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# Chapter 2

## Blood Avocados?
## Trade Liberalization and Cartel Violence in Mexico

*with Lucas Owen**

## 1 Introduction

How do expanding markets shape organized crime and violence in the developing world? Globalization creates new economic opportunities that criminal groups can exploit, driving them to expand or even diversify operations. This is why, for example, the Mafia occupied a central role in the protection industry within expanding legitimate markets in Sicily such as those for lemons (Dimico, Isopi and Olsson, 2017) and sulphur (Buonanno et al., 2015), or why drug cartels diversify by engaging in large-scale illegal oil taps (Battiston et al., 2022) or iron ore theft (Stevenson, 2013) as the Mexican War on Drugs disrupted illicit markets. As globalization incites organized criminal groups to broaden operations in existing markets or pursue opportunities in new markets, we question the impact of such external shocks on levels of violence in the developing world.

Recent research has shown the various ways in which external shocks have fueled criminal violence in areas of low state capacity. In Colombia for example, studies have shown that the increase in the demand for cocaine leads to more homicides in areas that serve these

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specific markets, such as those municipalities located on trafficking networks (Millán-Quijano, 2020) or those regions more suitable for cultivating coca (Angrist and Kugler, 2008; Mejia and Restrepo, 2015). But Mejia and Restrepo (2015) simultaneously reveal a contrasting finding – while external shocks in illicit markets lead to an increase in criminal violence, booms in certain licit markets seem to reduce criminal violence. This finding remains consistent with other studies that similarly explore the nexus of expanding licit markets and violence, such as how booms in the coffee (Dube and Vargas, 2013) and flower (Hernandez, 2014) industries have reduced violence in rural areas of Colombia. Generally, these studies tell us that there is, on average, a decrease in violence in these areas of agricultural productivity, though the effect is more acute in areas where institutions are more resilient.

We focus specifically on the effect of expanding licit markets on levels of criminal violence, and thus we predict a decrease of criminal violence when there are positive shocks to labor-intensive licit commodities. The logic underlying this outcome is what scholars call the opportunity cost mechanism, which holds that such shocks lead to greater employment opportunities and wage increases, thereby reducing the returns to appropriation (Becker, 1968; Dal Bó and Dal Bó, 2011; Mejia and Restrepo, 2015; Dube and Vargas, 2013). However, this hypothesis accounts for only two strategies in which actors can gain a market advantage – seizure or production; we claim that actors can engage in a third strategy to gain a market advantage – defense. In what we call the vigilante mechanism, we claim that violence can decrease with positive shocks to labor-intensive licit commodities because market participants invest in defensive measures to protect the industry, thereby effectively deterring criminal actors from violently seizing assets.

In this article, we conduct an innovative empirical test of this prediction in an area not yet explored – the avocado industry in Mexico. We take the case of avocados in Mexico to be a most-likely case for revealing how markets shape organized crime in the developing world. Immobile production, slow responsiveness of supply,[1] low technological barriers to

[1]Starting from a seed, it takes about 10-15 years before an avocado tree will begin to bear fruit (or 3-5 years for a nursery-grown tree). This means that producers are largely bound to their pre-existing supply

entry, small firm sizes, labor intensity,[2] and perishability make the avocado industry vulnerable to predation by organized crime. Low state capacity in Mexico – characterized by its reliance on clientelism, its incomplete private property rights protections, its failure of making credible commitments to private investors, and its difficulties in raising revenue from the population (Cárdenas, 2010) – makes this phenomenon even more acute. Media reports have us handwringing over the seemingly disproportionate increase of violence in avocado-cultivating areas over those regions that do not export avocados; alternatively, some studies assuage us by telling us that such booms may actually reduce violence in the producing regions despite the heightened presence of organized crime. Thus, this article fits within existing literature by exploring the effects of trade liberalization on organized crime, specifically the impact of an expanding avocado market on cartel-related homicides in Mexico.

We adopt a multi-method approach to test our predictions in the Mexican setting. First, we use a staggered difference-in-differences (DID) design to leverage changes in pest-free declarations that have granted certain municipalities the ability to export avocados. Specifically, we exploit changes in municipal export certification, driven both by pest-free certification from Mexican authorities as well as changes in U.S. import policy. Using data on cartel-related violence, we find that both the pest-free declarations from Mexican authorities as well as the U.S. import policy have significant and large negative effects on cartel-related violence. Second, we use qualitative support to explore the mechanisms underlying this finding. We highlight how, as the opportunity cost mechanism suggests, booms in the avocado market have increased the opportunity cost of participating in illicit markets, thereby shifting labor from illicit to licit industries. Simultaneously, market participants have increasingly invested in defensive measures to protect those in the avocado sector from predatory criminal actors. We draw on evidence from the town of Tancìtaro, and the effort of market actors

in the short to medium term, and therefore are limited in their ability to adjust to sudden changes in the market.

[2]Per acre, almost 60% of operating costs come from labor, with other costs including those associated with fertilizers, insecticides, and machinery. Harvesting and packing are the most labor-intensive phase of avocado production, with most workers putting in at least 12-hour days (Arana Coronado, 2010).

to create and sustain self-defense forces, or *autodefensas*, to effectively protect the avocado industry from cartel encroachment.

This article's primary contributions are therefore both empirical and theoretical. Empirically, we take advantage of a natural experiment in Mexico to interrogate how licit markets shape organized crime and violence in the developing world. Because demand and supply, prices, and ultimately revenue and profits may be endogenous to cartel-related violence, we exploit a DID design to estimate the causal effect of an expanding avocado market on cartel-related violence. We demonstrate that municipalities formerly unable to export avocados internationally experienced significantly lower cartel-related homicide rates and missing persons rates after being granted the ability to export compared to municipalities that were unaffected by trade liberalizing policy. In doing so, we also pinpoint strong proxies for cartel violence, which are especially valuable given data scarcity in studies of organized crime.

This novel empirical strategy thus sheds light on how licit markets shape organized crime and violence in the developing world in a case not yet explored, our second contribution. We ultimately find evidence supporting the primary prediction from the opportunity cost hypothesis, and we subsequently contemplate the mechanisms driving our empirical results to explore if the pathways that lead from positive shocks in licit industries to a reduction in organized criminal violence remain consistent with the theoretical expectations of the opportunity cost argument. Though we are unable to fully rule out alternative mechanisms that may explain this finding, our quantitative results, qualitative observations, and existing scholarship suggest that community organization for armed resistance is a driving mechanism leading to a decrease in violence.

We first discuss the theoretical foundations of the effect of positive market shocks on organized criminal violence. The following section then outlines the case of Mexico by identifying the political economy of avocados as well as the evolution of cartels in producing regions. We then describe our empirical strategy and the data we use to examine the

relationship between expanding markets and organized crime and violence. The subsequent sections present the results of our analysis, followed by a discussion of the potential mechanisms that explain these findings. We conclude by discussing the implications of our study and avenues for future research.

## 2 The Effect of Market Shocks on Organized Crime

Weakly institutionalized environments serve as a power vacuum for organized criminal groups to emerge. Common accounts of organized crime liken such groups to firms that integrate within legitimate markets in areas of newfound growth where formal state institutions are weak (Gambetta, 1996). Because of the increase in opportunities for rent appropriation through extortion, mafia-type organizations become the legitimate suppliers of order and protection in these areas of low state capacity where trust among actors is low and thus interactions must be mediated by third-party enforcers (Gambetta, 1996; Dimico, Isopi and Olsson, 2017; Bandiera, 2003; Reuter, 2009).

Though it is clear that criminal organizations emerge in these weakly institutionalized contexts, literature on the effect of external market shocks on violence in these environments provides two diverging predictions based on the type of market good in question. Indeed, as criminal organizations enter either illicit or licit industries, the onset of liberalizing policies may stimulate competition and contestation through attempts to control markets and territory. But the effect of these policies on violence can be either positive or negative.

On one hand, a widely-held assumption is that market shocks resulting in an increase in the amount or value of a commodity lead to more violence (Ross, 2004; Fearon and Laitin, 2003). In what can be called the rapacity hypothesis (Dube and Vargas, 2013; Blair, Christensen and Rudkin, 2021), exogenous shocks increase the amount and value of a "prize" to be won, thereby inducing market actors to fight in an attempt to control these resources. These predictions hold true with the increase in demand and value of *illicit* goods. On

the other hand, while Mejia and Restrepo (2015) note that booms in *illicit* markets lead to more violence, they simultaneously theorize that booms in *licit* markets will conversely lead to a decrease of violence by showing how cocaine booms increase violence because of its illegality, though on the contrary licit booms such as those in minerals or agriculture actually reduce violence. These findings reinforce what some scholars label the opportunity cost hypothesis (Becker, 1968). Dal Bó and Dal Bó (2011) prominently predict that, while positive shocks to capital-intensive industries increase armed violence, positive shocks to labor-intensive industries diminish it.

The logic behind the opportunity cost hypothesis is threefold. First, production may be reallocated to more highly institutionalized areas, reducing rapacity over turf. Second, the state has more incentive to neutralize the effects of criminal actors because it can tax the legal commodity. Third, market participants would be able to use the state to some extent, even if weak, to enforce contracts and protect property. Thus, the fundamental implication of the opportunity cost argument for labor-intensive goods would be higher returns in terms of wages net of appropriation loss (Dal Bó and Dal Bó, 2011; Becker, 1968). As external market shocks bring more wealth to labor-intensive industries, like that of agriculture, there will be an increase in wages and employment. Though this may stimulate more opportunities for appropriation, the returns should be greater post-market shock than pre-market shock. Therefore, we should expect to see less violence in places producing these commodities as it becomes more appealing to participate in the licit economy relative to the illicit economy.

However, the opportunity cost hypothesis assumes that market participants will allocate resources solely to productive opportunities, leading to a decrease in violence. What this ignores are the variety of ways in which actors can seek an advantage in market exchanges, which can range from productive means to appropriative means (Hirshleifer, 1988; Skaperdas, 1992; Baumol, 1990). At a basic level, in areas of low state capacity where government structures cannot enforce property rights, agents have three ways in which they can use income: 1) produce economic and social goods; 2) seize what other parties have pro-

duced; and/or 3) defend against such invasions. The opportunity cost hypothesis assumes production and seizure are the only means in which actors can utilize income, therefore positing that violent seizure will decrease because of the falling opportunity cost of peaceful production.

The third way in which market actors can use income – through defending goods and property – provides insight for an overlooked mechanism explaining the decrease in violence following a positive shock to labor-intensive industries. Indeed, a growing literature recounts how communities invest in organizing extralegal groups for the purpose of providing protection and even extrajudicial justice.[3] Here we focus on collective vigilantism, defined by Cohen, Jung and Weintraub (2023, 243) as "group violence to punish perceived offenses to the community." What is particularly difficult to gauge is the long-term effects of collective vigilantism in terms of crime and violence due to challenges in obtaining reliable longitudinal data for long time periods to adequately understand the enduring downstream effects of vigilantism.[4]

Because collective vigilantism varies across several dimensions, scholars must account for differences across groups when theorizing long-term effects on crime and violence.[5] Here we focus on durable organizations that use coercion with the aim of reducing violence through defensive measures, which we claim are most relevant to the opportunity cost argument. Indeed, an influx of capital in a particular industry will increase wages and employment opportunities in that market, though it simultaneously increases the potential of predatory actors to violently capture capital. We consequently would expect to see stakeholders invest in protective measures by funding vigilante groups to deter crime in areas of high productivity. These vigilante groups can then become an institutionalized fixture in

[3]On vigilantism more generally, see Bateson (2021) and Cohen, Jung and Weintraub (2023).

[4]Recent studies examining this phenomenon include Herrera (2021), Del Rio (2022), and Osorio, Schubiger and Weintraub (2021).

[5]For example, Bateson (2021) identifies five dimensions on which vigilantism may vary, including individual or collective, violent or nonviolent, public or private, spontaneous or institutionalized, and offensive or defensive; Cohen, Jung and Weintraub (2023) conceptualize an ideal-typical two-by-two typology for vigilante groups based on the extent of organization and group aims.

the market, earning wages in exchange for providing security when the state is unable to provide these services.

In summary, the theoretical expectation is that organized criminal violence will decrease following an external market shock that generates an increase of capital to labor-intensive industries in areas of low state capacity. While this outcome can be a result of the opportunity cost mechanism whereby agents divert resources towards productive means, we advance a second mechanism for the decrease in violence. In what we call the vigilante mechanism, we posit that agents additionally divert resources towards defense measures to protect their goods and property, thereby effectively deterring incursions from organized criminal groups. We do not claim this mechanism is incompatible with the opportunity cost mechanism. Instead, the vigilante mechanism may complement the opportunity cost mechanism – with increasing employment opportunities and wages, individuals have more resources to invest in defensive measures that allow them to protect licit market gains. We summarize this theory in Figure 1.

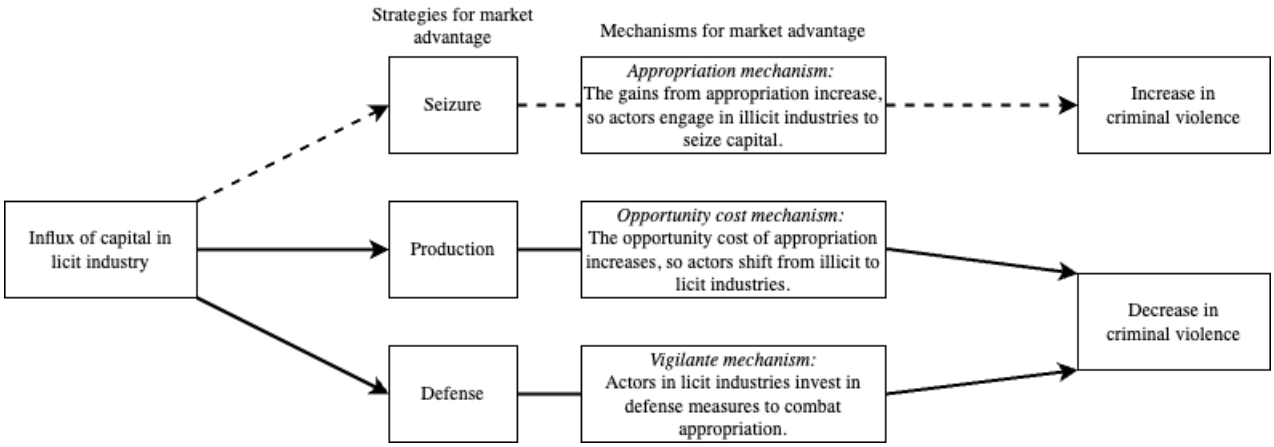


Figure 1: Strategies and mechanisms explaining how an influx of capital impacts levels of criminal violence. Existing literature posits the opportunity cost mechanism. We posit the vigilante mechanism as an alternative pathway for an influx of capital leading to a decrease in criminal violence. The appropriation mechanism and the resulting increase in criminal violence is the alternative hypothesis, highlighted by the dashed line.

# 3 The Mexican Avocado Industry and Organized Crime

To conduct an empirical test of the mechanisms we specify, we look to the avocado industry in Mexico. Mexican avocado production is primarily situated in the Trans-Mexican Volcanic Belt, where environmental conditions for growth are ideal. Production is most robust in the Pacific state of Michoacán, accounting for 80% of total production in Mexico and almost half of the global avocado supply at 43% (Foreign Agricultural Service, 2018). However, a variety of diseases and pests specific to the avocado plant and its close relatives has long burdened the avocado industry in Mexico and elsewhere in Latin America. As a result, certain countries have imposed various restrictions on avocado exports from this region to limit the spread of avocado diseases and pests. Specifically, restrictions on the international trade of Mexican avocados have origins in an import ban imposed by the United States in 1914.[6] This ban lasted in its original form until 1993, when the Animal and Plant Health Inspection Service (APHIS), a division of the U.S. Department of Agriculture (USDA), began allowing the importation of Mexican avocados to Alaska (Bellamore, 2002).

U.S. import restrictions began to relax even further following the creation of the North American Free Trade Agreement (NAFTA) in 1994, which imposed significant responsibilities relating to avocado regulations for both parties to facilitate cross-border trade by 1997. For the United States, NAFTA increased pressure on APHIS to develop less blunt and inflexible regulations for agricultural imports, which led to the development of more refined procedures for quality control and continued relaxations of the outright ban. For Mexico, Chapter 7 of NAFTA established clear guidelines and expectations for the refinement of phytosanitary standards, which induced officials to develop their own phytosanitary regulations for avocado production and exportation. Mexico's Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA; now the Secretariat of Agriculture and Rural Development [SADER] since 2018) developed and subsequently enacted

[6]This ban primarily sought to control the five avocado-specific pests that are prevalent in Mexico but generally not found in the United States: stem weevils *(Copturus aguacatae)*; seed weevils *(Conotrachelus aguacatae, Conotrachelus perseae,* and *Heilipus lauri)*; and seed moths *(Stenoma catenifer).*

these regulations and the associated procedures in 2005.

These regulations and procedures include: requirements for inspection, cleaning, and quarantine capabilities at collection centers and packing houses; criteria for shipment rejection and disposal; documentation and storage procedures required for transportation; and regular and codified pest and compliance inspections at various points along the supply chain (SAGARPA, 2005). In accordance with SAGARPA's 2005 regulation, municipalities that do not comply with these procedures and demonstrate a lack of disease and pests are not allowed to export avocados outside of the country. However, once an avocado-growing municipality demonstrates a consistently sufficient handle on pests and disease, SAGARPA officially declares them free of avocado pests. This declaration then effectively certifies the municipality to export avocados internationally. Although SAGARPA has been gradually expanding the municipalities allowed to export internationally since 2005, only 24 municipalities[7] of almost 2,500 municipalities in Mexico were authorized to export avocados to the continental United States,[8] Hawaii, and Puerto Rico until 2016. Notably, all of these municipalities that were allowed to export to the United States were in the Pacific state of Michoacán.

Thus, concentrated in Michoacán, the main domestic actors in the international supply chain include *productores* (producers) and *empacadores* (packing houses) (Moncada, 2021, 125).[9] The supply chain starts with the *productores*, who plant and harvest crops. By the early-2000s, Michoacán had approximately 11,700 producers, each having approximately five to ten hectares of orchard and yielding 10.5 tons of fruit per hectare (Arana Coronado, 2010). However, almost 75% of these orchards were not in compliance with the phytosanitary regulations, and so approximately 2,290 producers (28% of the share of total producers) were

[7]Acuitzio, Tancitaro, Uruapan, Tingüindin, Salvador Escalante, Nuevo Parangaricutiro, Periban de Ramos, Ario, Los Reyes, Apatzingan, Taretan, Tacambaro, Tingambato, Madero, Cotija de la Paz, Erongaricuaro, Tocumbo, Tuxpan, Irimbo, Hidalgo, Turicato, Ziracuaretiro, Paracuaro, and Tangamandapio.

[8]Per the Code of Federal Regulations (7 CFR 319.56-2), the continental United States includes the 48 contiguous states, the District of Columbia, and Alaska.

[9]Other actors include: nurseries, which provide plants to the producers; vendors, who sell fertilizer and equipment to producers; the *jornaleros* (laborers) who harvest avocados in the field or work in the packing houses; and drivers, who transport the produce (Moncada, 2021, 125).

certified to export to U.S. markets. From the *productores*, packers transport the avocados from orchards to the *empacadores*, which sort and clean the fruits and store them in climate-controlled facilities. In the early-2000s, Mexico had 382 packing houses, though only 60 exported produce internationally, and of these only 26 exported avocados to the United States (Arana Coronado, 2010). Packers organize themselves into different collectives, primarily based on destination markets. Specifically, the Avocado Producers and Export Packers Association (APEAM) encompassed the 26 packers servicing U.S. markets, as well as the 2,290 producers. The *empacadores* work with international brokers and traders to transport the produce internationally – the majority of avocados from Michoacán are transported to the United States by land via trucks going through border crossings in Texas.

In February 2015, however, a USDA policy proposal altered the landscape of avocado production and export in Mexico. APHIS announced a new policy that allowed for broadening the areas that could export to the United States from Michoacán only to all other Mexican states, provided they meet strict guidelines to reduce the risk of transmitting quarantine pests. Such guidelines included "requirements for orchard certification, traceback labeling, pre-harvest orchard surveys, orchard sanitation, post-harvest safeguards, fruit cutting and inspection at the packinghouse, port-of-arrival inspection, and clearance activities" (Animal and Plant Health Inspection Service, USDA, 2016). Notably, in this announcement, officials stated that trade would initially extend only to the remaining municipalities in Michoacán as well as Jalisco, the northern neighbor of Michoacán.

At the end of 2015, Michoacán dominated the market, while Jalisco trailed behind in a far second place at 6% of total avocado production in Mexico (Foreign Agricultural Service, 2018). However, when the USDA fully enacted the Hass Avocado Import Program in June 2016, growers were then able to open up other production sites as long as they complied with phytosanitary regulations. Other municipalities within and outside Michoacán then had the opportunity to become competitive in the international market by increasing production.

As the avocado industry in the Trans-Mexican Volcanic Belt has evolved, so too has

organized crime. As with avocado production, Michoacán's long narco tradition is partially a function of geography, with "territories of difficult access without the presence of public authority, the agricultural vocation of its economy, the availability of land for illicit crops, and its offer of ports to transport goods on a large scale, [making] it a region suitable for the drug business" (Guerrero Gutiérrez, 2014). From the 1980s to the 1990s, the Milenio Cartel of the Valencia family transformed their initial cocaine business into a drug empire involved in the production and trafficking of cocaine, marijuana, opium poppy, and methamphetamines (Ornelas, 2018, 766).

The Milenio Cartel maintained relatively uncontested control of these markets until the early 2000s, when the Zetas rose to prominence and displaced them. The Zetas relied on extreme forms of violence and "introduced predatory techniques mainly in the tertiary and agricultural sectors; the avocado producers, their favorite target" (Ornelas, 2018, 765). However, in-fighting among Zetas leadership led to the emergence of La Familia Michoacana in 2006, which rapidly became successful in undercutting the Zetas (Guerrero Gutiérrez, 2014). In areas of state weakness, La Familia Michoacana provided protection to the producers and exporters in the agricultural markets that were prey to the Zetas (Moncada, 2021, 61). Initially La Familia Michoacana offered these services for free, though eventually demanded criminal taxes in exchange for protection from other predatory actors.

Another shock to the market occurred in 2006 when Felipe Calderòn won the presidential election and claimed that organized crime and the drug trade posed the primary threats to Mexico (Moncada, 2021, 124). Operation Michoacán, the first large-scale counter-narcotics operation, began in December 2006 when the federal government deployed more than 7,000 police and military forces to neutralize drug cartels in the Pacific region (Finnegan, 2010). Calderòn touted that the Mexican Drug War would create a blanket crackdown on all cartels, though violence only intensified and became more lethal and brazen as large syndicates fragmented and dozens smaller groups emerged (Signoret et al., 2021).

Consequently, as the Mexican Drug War destabilized the drug market, cartels have

sought to corner licit markets. Schelling (1971) outlines four primary traits that attract organized crime to agricultural markets in particular: "1) businesses in traditional sectors of the economy with a high degree of territorial specificity; 2) a relative small size of firms; 3) a relatively low technological level; and 4) a region where the public sector is relatively large and legal institutions are weak" (Ornelas, 2018, 762). Avocados specifically are a unique commodity because they are highly perishable – the fruit has such a high metabolic rate that their shelf-life is only about three to four weeks (Arana Coronado, 2010). This ultimately means that the industry is exceptionally vulnerable to extortion because the fruit cannot be stored in order to avoid weak points on the commodity chain that are susceptible to more episodic violence.

Indeed, organized criminal groups have turned to local extortion, making the avocado sector more predatory. This dynamic is in part driven by the fragmentation of drug trafficking organizations following the Mexican Drug War, fueling criminal competition and compelling groups to seek control of markets other than drugs. Specifically, the death of the leader of La Familia Michoacana led to an internal power struggle, from which the Knights Templar emerged (Moncada, 2021, 125). The Knights Templar extorted actors at almost all points in the commodity chain by violently forcing information from avocado collectives in order to more efficiently identify and collect taxes from orchards, packing houses, and transport checkpoints. They charged nurseries for each plant sold; they charged producers MXN 1-3 for every plant they bought, and they initially charged them up to MXN 1,000 (and later MXN 2,000) annually per hectare they owned; and they charged packers a tax per carton leaving the packing house. Eventually, the Knights Templar integrated with avocado market beyond just imposing criminal taxes:

> Likewise the DTO [drug-trafficking organization] interfered in harvesting and sales processes by forcing producers to sign over their lands to members of the cartel group, who then threatened other producers to delay or completely abandon harvesting so as to both generate upward pressure on prices and secure

optimal windfalls for the harvests on the lands that they now owned. (Moncada, 2021, 126-127)

*Clarín* (2019) reported the accounts of three anonymous farmers claiming that failure to obey cartel demands put them at risk for confrontation by *sicarios* who enforce compliance through beatings, torture, or killings. These farmers additionally corroborated the monthly quotas they pay to the crime syndicates, based on the number of hectares planted. Specifically, some farmers have claimed that cartels have hijacked avocado shipments of up to 48 tons (or four truckloads) daily, oftentimes kidnapping the drivers and family members (Trilling, 2019).

Since the mid-2010s, two cartels have vied for control within Michoacán – Los Viagras and Jalisco New Generation. Los Viagras evolved from a self-defense force in the Tierra Caliente region of Michoacán in 2014 to then become a larger crime syndicate; Jalisco New Generation, founded in 2009 and primarily based in the state of Jalisco, has swiftly climbed the ranks of cartels in Michoacán and became one of the most notorious and violent criminal organizations in Mexico and beyond (Jorgic and Hosenball, 2020). As these groups have expanded, violence between them has flared. In August of 2019, Jalisco New Generation members shot nine Los Viagras members in an amusement arcade in Uruapan (Linthicum, 2019). Authorities found the nine members of Los Viagras hanging from an overpass, and ten more bodies dismembered and dumped by the side of the road. On the overpass, Jalisco New Generation hung a banner reading: "Lovely people, carry on with your routines. Be a patriot, kill a Viagra."

# 4 Empirical Strategy

Differences across municipalities may confound the relationship between avocado production and cartel-related violence. A drawback to directly using avocado production as the independent variable is that agricultural yields may be endogenous to the outcome of interest.

For example, producers may grow more avocados in municipalities where there is already a strong presence of organized crime – perhaps these municipalities are on a major drug trafficking route and fruit provides the licit means by which to conceal and transport illicit goods to the United States. A regression analysis would be inadequate for controlling for unobservable municipality-level confounders, for it would struggle to capture the true relationship between avocado production and cartel-related violence and could instead show a correlation between these two variables that is not necessarily due to market shocks — to be sure, a correlation could be a result of the strategic location of municipalities in which fruit is grown and exported.

We therefore employ a difference-in-differences design to identify the causal effect of market shocks on cartel-related violence.[10] This design allows us to measure changes in cartel violence over time for each municipality, eliminating all time-invariant differences across municipalities that may influence the propensity for organized crime to operate within these different areas. We leverage changes in export ability within the Mexican avocado industry to proxy for increases in the demand for avocados from various municipalities in Mexico. Specifically, our DID design takes advantage of two certification and export changes for avocados according to the prevalence of pests at the municipal level – first, SAGARPA-granted municipal export certification between 2011 and 2019; and second, the USDA Hass Avocado Import Program, a change in U.S. import policy in June 2016. Because Mexican avocado producers have historically struggled with pest control, localized variation in pests should be largely due to exogenous factors.

## 4.1 Treatment

The first change in avocado export ability we leverage is domestic, issued by Mexican authorities. We compare the change in cartel-related homicides across municipalities following

[10]Similar studies that employ a DID design when examining the impact of economic or political shocks on organized crime include Dube, García-Ponce and Thom (2016), Dix-Carneiro, Soares and Ulyssea (2018), Brown et al. (2022), and Kronick (2020).

SAGARPA-granted pest-free declarations at the municipality level between 2011 and 2019. SAGARPA makes declarations for newly-certified municipalities monthly in the Official Journal of the Federation, which then exposes avocado producers in those municipalities to the world market by allowing them to export avocados internationally. In order to export, producers must comply with a series of benchmarks: requirements for inspection, cleaning, and quarantine capabilities at collection centers and packing houses; criteria for shipment rejection and disposal; documentation and storage procedures required for transportation; and regular and codified pest and compliance inspections at various points along the supply chain (SAGARPA, 2005).

Members of APEAM conduct inspections in accordance with procedures developed by the National Service for Agricultural Food Safety, Health, and Quality (SENASICA) and in partnership with the USDA (Avocado Institute, 2020*a*). At orchards, inspection officers check trees and avocados for pests and confirm proper shipment tracking procedures; at packing houses, officers again check tracking labels and the avocados themselves to ensure they are free of pests and infections and monitor packing procedures as shipments are prepared for export.

The second change in avocado export ability we leverage is international, issued by U.S. officials. In addition to the changes in certification and export ability from Mexican authorities, we account for a fundamental change in U.S. import policy between 2011 and 2019 with the USDA Hass Avocado Import Program. In June 2016, this program expanded trade from 24 municipalities in Michoacán to any municipality that meets similarly strict guidelines to reduce the risk of transmitting quarantine pests.[11] Given that the United States accounts for roughly 80% of Mexican avocado exports (Statista, 2022), these changes in export ability represent exposure to a much larger market than those granted by domestic certification alone.

[11]Because of the Mexican government's restrictions on exports, the U.S. program effectively only applies to municipalities that are also certified by the Mexican government. For this reason we combine non-exposure to U.S. import restrictions with Mexican certification to develop our indicator of U.S. treatment, the intended effect of which is to indicate exposure to the U.S. market.

Using this U.S. policy as a treatment provides us with a further robustness check for certification procedures in at least three ways (Avocado Institute, 2020*a*). First, U.S. officials conduct their own regular inspections both in Mexico and at the border – APHIS of the USDA conducts inspections in Mexico, and Customs and Border Protection conducts inspections upon entry to the United States. Second, to ensure quality and consistency in inspections, the USDA requires all inspection officers to be Mexican citizens in addition to having a degree in agricultural engineering, a high level of proficiency in English, and a noncriminal background. Third, the USDA regularly rotates inspection officers between municipalities to ensure consistency and fairness in inspection officer-producer relationships.

In the 2015 policy announcement, U.S. officials stated they expected initially only Michoacán and Jalisco to be compliant with their inspection criteria (Animal and Plant Health Inspection Service, USDA, 2016). However, Michoacán remained the only state to export avocados to the United States until 2022 (Stevenson, 2022). For this reason, we consider only Michoacán as treated by the relaxing of U.S. import restrictions during the period of our study. Further, because municipalities require certification from the Mexican government to export at all, Mexican certification and U.S. certification combined are necessary to export to the United States. Therefore, we combine U.S. trade expansion and Mexican domestic certification to create our measure of access to the U.S. market. After taking this into account, there are 13 municipalities in Michoacán which become exposed to the U.S. market at different times during the period of our study.

Despite the presence of cartels in the areas of our study, we remain confident that the inspection and certification process is impartial and unaffected by cartels. This is particularly the case when U.S. officials are involved, as multiple attempts by cartels to use violence to influence the export process have backfired. In 2019, cartel members threatened U.S. inspectors in Michoacán at gunpoint, to which the USDA responded by issuing a statement warning that further attempts to influence officers would be met with a suspension of inspections and an import ban (Miller, 2022). Later, in February 2022, an unidentified

criminal group threatened a U.S. inspector when he rejected a consignment of cartel avocados (Creswell, 2022). This led to a week-long import ban in the United States leading up to the Super Bowl, the biggest day of avocado consumption of the year in the United States at 105 million pounds. While this unprecedented event demonstrates that cartels are becoming more audacious, it also demonstrates the firm resistance of agricultural officials to cartel incursions and other violent attempts at exerting undue influence on the export process.

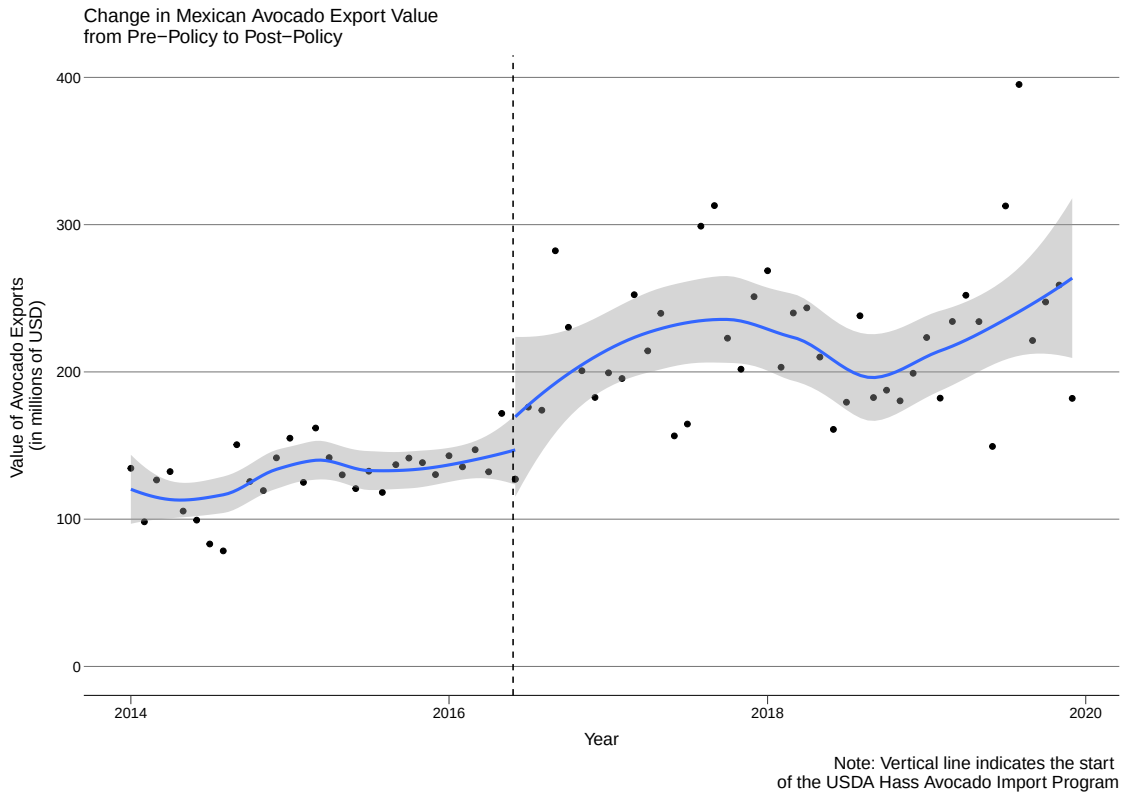


Figure 2

While the varied timing of municipal-level certification from SAGARPA makes it difficult to visualize the impact of the Mexican certification process on trade, the sudden and broad change in U.S. import policy in June 2016 provides a useful large-scale discontinuity for evaluating this impact visually. Figure 2 demonstrates the extent to which the USDA Hass Avocado Import Program impacted Mexican avocado exports, which lends credence to the immediate and significant economic impact of trade liberalization for the Mexican

avocado industry.

## 4.2 Data

Our outcome of interest is cartel violence, which we operationalize using three separate proxy measures at the municipality-month level of analysis – intentional homicides, cartel-related homicides, and missing persons. We utilize these three proxies because data on cartel-related homicides is unavailable during the period of our study, though we are able to reasonably impute this data given the availability of earlier data on cartel-related homicides. First, we draw on data on *homicidios dolosos*, or "intentional homicides," from Mexico's Secretariat of Public Security, which we demonstrate is highly correlated with cartel-related homicides. Second, we develop a proxy for cartel-related homicides, which we manually impute based on the estimated relationship between cartel-related homicides and intentional homicides. Third, we use data on missing persons as our final proxy for cartel violence. Using only homicides may undercount the prevalence of cartel violence, for cartels often disappear victims that are later presumed murdered though are not captured in homicide data.

We start with data the Mexican Attorney General collected and published on cartel-related homicides between December 2006 to September 2011 at municipal-year level. Formally titled "Deaths Presumably Related to Criminal Rivalry," the Attorney General intended this project to capture drug trafficking organization (DTO)-related homicides. Throughout this period, a council composed of the Mexican armed forces, the federal police, the ministry of the interior, and the general public prosecutor's office determined the extent to which each case was DTO-related (Secretaría de Gobernación, 2011).

While this data is not available for the period of our study, other government-provided measures of homicides are strongly correlated with DTO-related homicides. Specifically, we leverage homicide and missing persons data provided by Mexico's Executive Secretariat of the National Public Security System (SESNSP).[12] Before 2011, this data is only

[12]Data available at: https://www.gob.mx/sesnsp/.

publicly available at the state-year level of analysis. Therefore, in order to match these datasets, we aggregate the Attorney General's DTO-related homicides data up to the state-year. We also only use the data from 2007–2010, the period for which there are complete years of cartel-related homicide data. We test other existing sub-measures for homicides – including homicides with a firearm, intentional homicides with a firearm, and intentional homicides – and ultimately find intentional homicides to be the best predictor of DTO-related homicides. Table 1 and corresponding Figure 3 demonstrate this relationship.

| | ln(cartel homicides) |
|---|---|
| (Intercept) | −1.67 |
| | (0.80) |
| ln(intentional homicides) | 1.08* |
| | (0.15) |
| $R^2$ | 0.85 |
| Adj. $R^2$ | 0.85 |
| Num. obs. | 128 |
| F statistic | 54.70 |
| N Clusters | 32 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 1: The relationship between cartel homicides and intentional homicides in Mexico, 2007-2010.

Thus, our first proxy measure is intentional homicides. Beginning in 2011, data from the state on homicides is available at the municipal level and on a monthly basis. It is this municipal-month data, therefore, that we use for our main analysis. Although they provide data for more recent years, we end our analysis in 2019 to avoid complications driven by the COVID-19 pandemic.[13] Finally, for unknown reasons, some municipalities do not enter the data set until 2014. We therefore create two balanced panels, one from 2011 to 2019, and

[13]For example, some cartels in Mexico provided COVID-19 assistance to local communities (Felbab-Brown, 2020). In these instances, cartels were forced to negotiate their "capacity to calibrate coercion with responsiveness to and pushback from local communities." At the same time, avocado production and export did not appear to decrease during the pandemic (Reuters, 2020). Thus, holding avocado production and export constant, changes in cartel violence in the avocado industry throughout the pandemic arguably could have been driven by COVID-19 assistance rather than market rents.

the other from 2014 to 2019, and combine them for our main model.

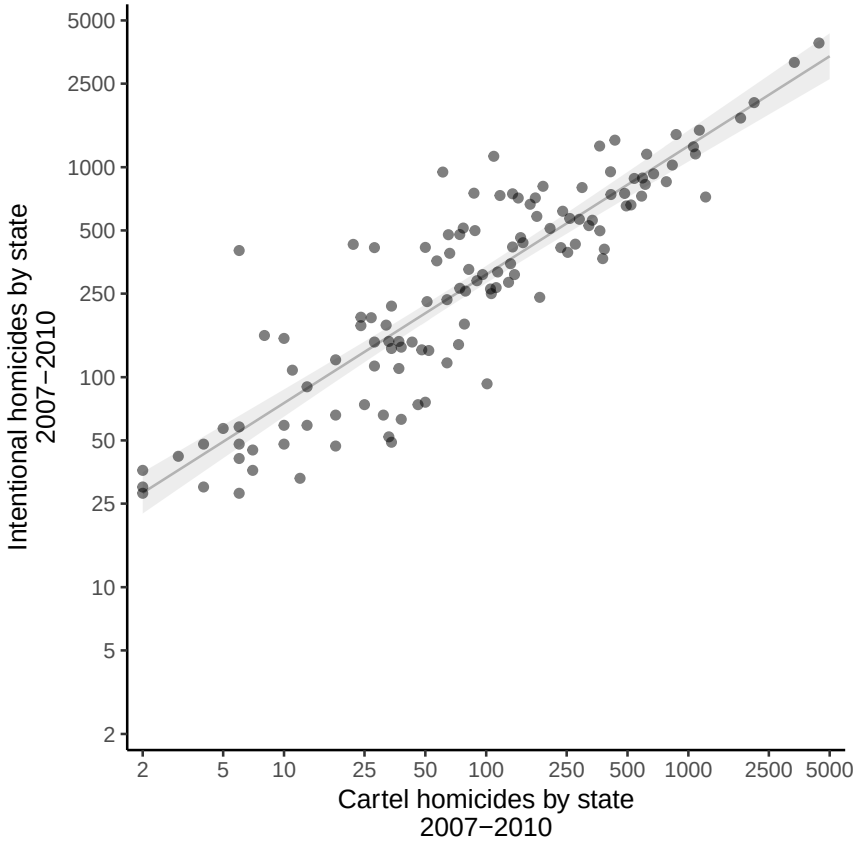


Figure 3

Our second proxy measure is an imputed measure of cartel homicides. To develop this measure, we first estimate the relationship between cartel homicides and intentional homicides using the 2007 to 2010 data, for which data on both measures is available. The model we use is the one in Table 1. Because the relationship between these two measures is most linear and clear when they are logged (see Figure 3), we use log transformations to estimate the relationship between them. Next, we use the estimates from this model to calculate the predicted values of cartel homicides during the period of our study given the values of intentional homicides. To finally arrive at cartel homicides, we take the following three steps: first, we log intentional homicides; second, we use those values to predict values of logged cartel homicides; and lastly we undo the log transformation to arrive at the predicted value of cartel homicides.

Our third proxy measure is missing persons. Criminal organizations often disappear individuals after murdering them to cover up the crime – Moncada (2021) evidences how cartels use this repertoire of violence as a punishment strategy when individuals do not pay criminal taxes, for example. Thus, using only homicides as an outcome variable may lead to bias in our results. Given this logic, we could expect to see a decrease in missing persons after the expansion of the avocado market should the opportunity cost hypothesis hold true. SESNSP provides individual-level data on the date and location of disappearances, which we use to develop a municipal-month measure of missing persons.

From the full set of municipalities in Mexico, we then subset our data to nearby municipalities before arriving at our final sample. We subset our data by geography to produce comparable treatment and control groups, so that our control group may serve as a relevant counterfactual for certified municipalities. Using municipality centroids, we subset our data to only municipalities within 63 miles,[14] the median in our data, of a municipality in the opposite group (treatment/control). We do this separately for each of the two time cohorts, 2011 to 2019 and 2014 to 2019. We additionally considered subsetting by municipalities with high avocado production, but we were unable to find municipal-level data on avocado production which wasn't plagued by large amounts of missingness, which prevented us from using it in this regard or in another role in our analysis.

From 2005 through 2019, SAGARPA declared 64 municipalities free of avocado pests and thereby clearing them for international export. Of these 64 municipalities, 12 municipalities in the state of Michoacán had been free of avocado pests and exporting avocados prior to the 2005 regulation. From 2011 to 2019, the time period that this article examines, 47 municipalities were declared free of avocado pests. Missing data[15] combined with the above process of subsetting by geography results in the following three groups: 39 municipalities that become certified between 2011 and 2019 in our final dataset; 25 municipalities that were

[14]These results are robust to alternative cutoffs.

[15]We expect missing data to be uncorrelated with the treatment. SIAP claims that missing data is a result of technological errors from the data-generating processes. In these cases, SIAP logs no data.

certified before 2011, which are coded as always treated in our data; and 171 municipalities that had yet to become certified as of 2019, which serve as our control group. Figure 4 shows all of these municipalities geographically. There are 108 observations for each municipality with data from 2011 to 2019, and there are 72 observations for each municipality with data from 2014 to 2019. The final dataset has 23,220 observations.

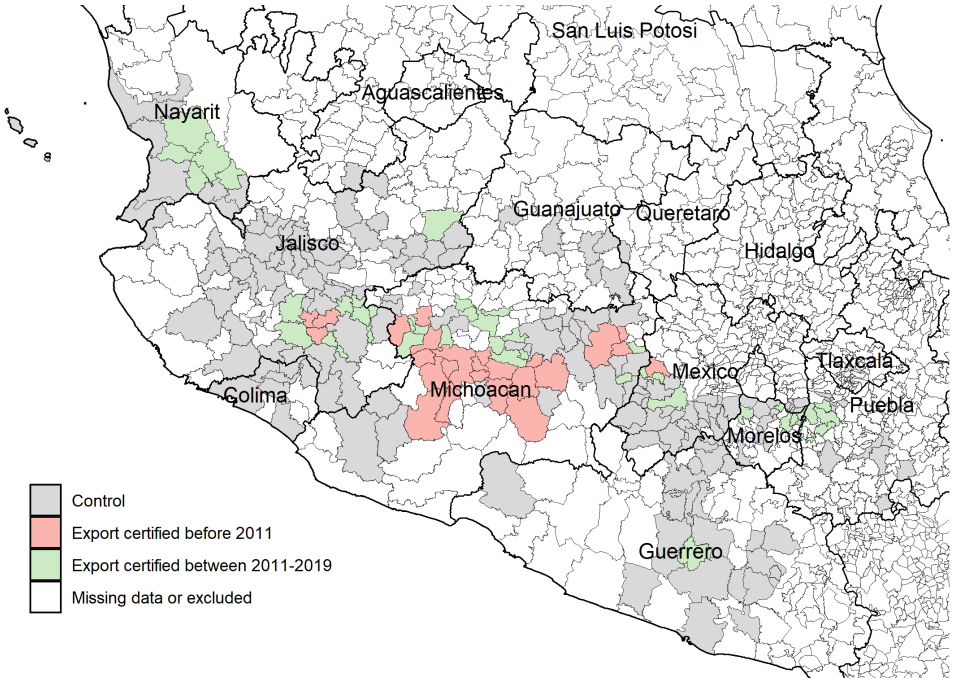


Figure 4

## 4.3 Model

We construct our models as follows:

$$Y_{it} = \beta_1 M_{it} + \beta_2 US_{it} + \delta_i + \alpha_t + \tau_i t_i + \epsilon_{it} \tag{1}$$

where $Y_{it}$ represents the outcome variable for municipality $i$ in time period $t$; $M_{it}$ is a binary variable representing pest-free status, as declared by the Mexican government; $US_{it}$ is a binary indicator of U.S. trade status given changes from the USDA Hass Avocado Import Program; $\delta_i$ is a vector of municipality fixed effects; $\alpha_t$ is a vector of time fixed effects; $\tau_i$ is

a vector of municipality-specific time trends; and $\epsilon_{it}$ is the error term. We also supplement this two-way fixed effects model with a model that uses doubly robust estimands (Callaway and Sant'Anna, 2021).[16]

The DID design rests on the parallel trends assumption such that, absent the treatment, the differences among treated and control units remain the same over time. Though this assumption cannot be formally tested, researchers often look to the behavior of treated and control groups before any treatment as one way to check if this assumption is likely to hold true. The assumption is that, if groups appear to move in tandem before treatment, then the control group serves as a relevant counterfactual for the treated group post-treatment. However, the conventional way of checking for parallel pre-trends visually relies on treatment occurring at a single point in time, and therefore is not possible with this study given the staggered treatment of Mexican certification.

We therefore employ other ways of checking for parallel pre-trends by running an event study model where units are shifted in time such that treatment occurs at $t = 0$ for all treated units. This model is the same as equation 1, except that $\beta_1 T_{it}$ is a vector of time-to-treatment fixed effects. Therefore, one variable takes the value of one time period before treatment, another takes the value of two time periods before treatment, and so on, with each having its own coefficient. In this model, we code $time - to - treatment = 0$ as the reference category, and we code all control units as $time - to - treatment = 0$. With this method, we compare the difference between treated and control units – controlling for time- and unit-specific effects – both before *and* after treatment, whereas the standard single-treatment DID model estimates only the post-treatment difference between treated and control groups. We estimate our standard errors using the methods described in Callaway and Sant'Anna (2021), which do not suffer from the drawbacks associated with two-way fixed effects regressions when there is variation in treatment timing. For this reason, we have to

[16]Goodman-Bacon (2021) shows that under varying treatment timing across units, unbiased two-way fixed effects requires the assumption of a time-invariant within-unit treatment effect. Doubly robust estimands relaxes this assumption but at the cost of precision. Results for these models are in Table A1 and Table A2 in the appendix.

separate our data into two balanced panels: the 2011–2019 panel and the 2014–2019 panel.

We plot these coefficients in Figure 5, Figure 6, and Figure 7 for changes in Mexican certification and Mexican and U.S. certification combined,[17] respectively. The difference between treatment and control groups pre-treatment is centered around zero and displays no pattern over time. These figures also display results consistent with our main models: a potential reduction in homicides due to Mexican certification, and a fairly robust reduction in homicides due to trade with the United States. Importantly, because units have been shifted in time, the number of observations differs for each coefficient. Most of our observations are around $t = 0$ and decline as we move further away from $t = 0$. We are therefore less confident in estimates driven by fewer observations, particularly those furthest from the treatment. With these figures we can assess identification concerns, such as differing trends in incomes over time leading to both reductions in pests and homicides for the treatment group. While we cannot control for such factors in our models because doing so would introduce post-treatment bias, these figures suggest such alternate explanations are unlikely.

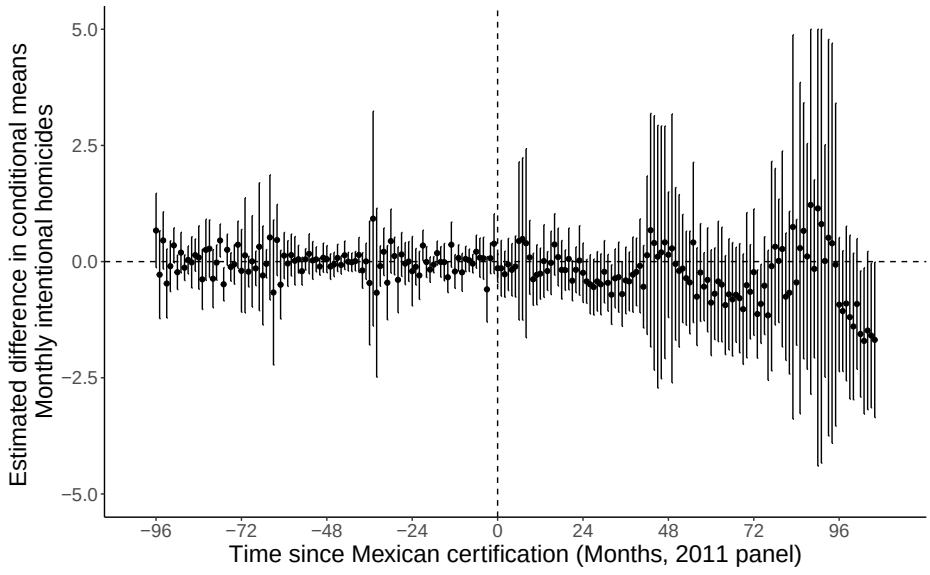


Figure 5: Event study estimates for Mexican certification effect, 2011 panel.

[17]Because municipalities require certification from the Mexican government to export at all, Mexican certification and U.S. certification combined are necessary to export to the United States.

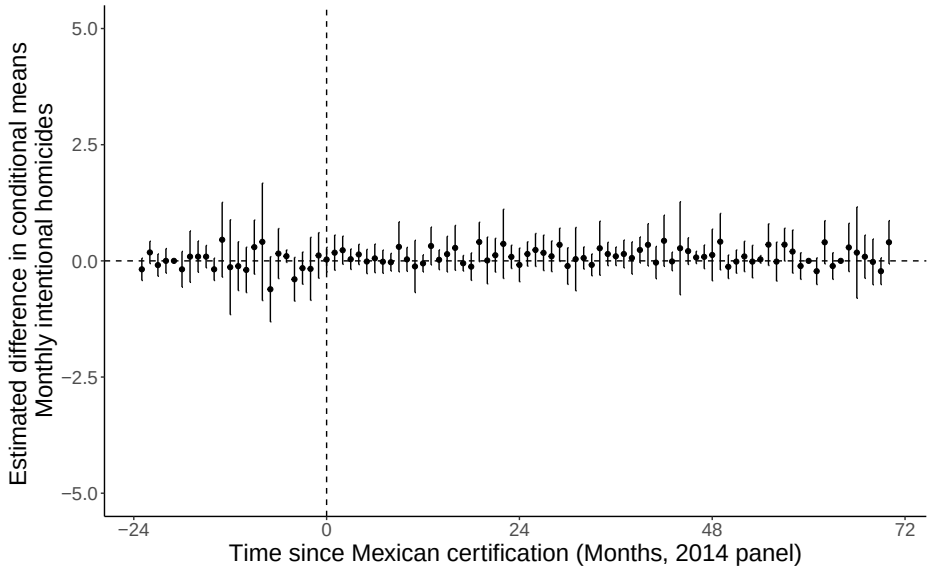


Figure 6: Event study estimates for Mexican certification effect, 2014 panel.

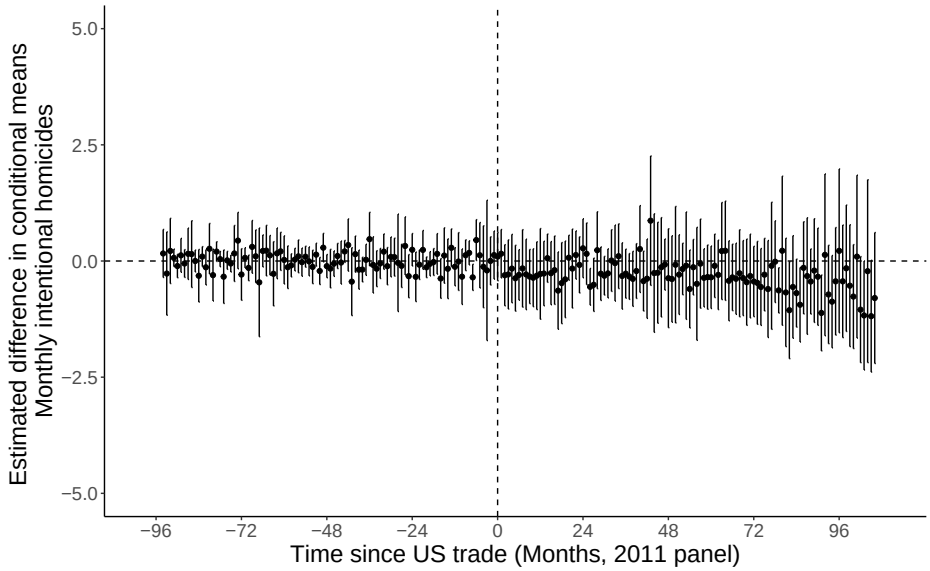


Figure 7: Event study estimates for Mexican and U.S. certification effect, 2011 panel.

# 5 Results

Table 2 presents regression results for each of our three outcome variables. Before the inclusion of separate time trends by municipality, we find that both pest-free declaration by the Mexican government and a subsequent ability to export avocados, as well as exposure

to the U.S. market driven by the USDA Hass Avocado Import Program, have significant and substantively large effects on each measure of cartel violence. In these models, Mexican certification and exposure to the U.S. market led to 43% and 30% reductions in cartel-related homicides relative to the mean, respectively, when using intentional homicides as a proxy. Similarly, Mexican certification and exposure to the U.S. market led to 46% and 32% reductions in cartel homicides, respectively, compared to the mean value of our imputed proxy. Finally, the effect of U.S. market exposure equates to a near 100% reduction in missing persons relative to the mean.

| | Int. hom. | Int. hom. | Car. hom. | Car. hom. | Mis. per. | Mis. per. |
|---|---|---|---|---|---|---|
| Mexican cert. | $-0.51^{**}$ | $-0.05$ | $-0.12^{**}$ | $-0.01$ | 0.08 | $-0.11$ |
| | (0.19) | (0.18) | (0.04) | (0.04) | (0.14) | (0.14) |
| U.S. trade | $-0.35^{*}$ | $-0.39^{*}$ | $-0.09^{*}$ | $-0.10^{*}$ | $-0.24^{*}$ | $-0.12$ |
| | (0.17) | (0.17) | (0.04) | (0.04) | (0.11) | (0.07) |
| Mun. time trends | N | Y | N | Y | N | Y |
| $R^2$ | 0.79 | 0.84 | 0.79 | 0.84 | 0.34 | 0.43 |
| Adj. $R^2$ | 0.78 | 0.84 | 0.78 | 0.83 | 0.32 | 0.42 |
| Num. obs. | 23220 | 23220 | 23220 | 23220 | 14312 | 14312 |
| N Clusters | 235 | 235 | 235 | 235 | 187 | 187 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 2: Difference-in-differences models with time and municipality fixed effects. Int. hom. is intentional homicides; Car. hom. is our imputed measure of cartel homicides; and Mis. per. stands for missing persons. Standard errors are clustered by municipality.

After the inclusion of separate municipal time trends, however, only exposure to the U.S. market from the USDA Hass Avocado Import Program is significant. This is not particularly surprising given that the United States accounts for nearly 80% of Mexican avocado exports (Statista, 2022). Thus, domestic certification alone – in other words, exposure to the international market without the ability to trade with the United States – exposes producers to just 20% of the international market for Mexican avocados. Further, U.S. exposure also entails involvement from USDA inspection officers in certification processes, who may be more impartial when conducting inspections and determining which producers are allowed to export. In these most conservative models, the effect remains similar and substantively

large. U.S. market exposure led to the equivalent of a 33% reduction in intentional homicides relative to the average; the effect on our manually imputed proxy is a similar 36% reduction in cartel homicides relative to the mean; lastly, though statistically insignificant, U.S. exposure led to the equivalent of a 50% reduction in missing persons.

# 6 Discussion

Thus far, we have conducted a novel empirical test of the prediction that organized criminal violence decreases following positive shocks in licit markets in the context of the Mexican avocado market. Using a DID design, we have found that positive demand shocks have had a significant and large negative effect on cartel homicides and missing persons in municipalities allowed to export avocados following pest-free declaration by the Mexican government and access to trade with the United States. This means that, although there may not be an absolute decrease in crime in these areas, there are fewer homicides relative to areas that did not experience market expansion. There are two mechanisms that we specify in our theoretical predictions that may explain these results – the opportunity cost mechanism and the vigilante mechanism. The opportunity cost mechanism is a widely accepted hypothesis from pioneering studies such as Dube and Vargas (2013), Dal Bó and Dal Bó (2011), Becker (1968), and Mejia and Restrepo (2015). We posit a new mechanism, however, that may serve to further explain why criminal violence decreases with an influx of capital in licit industries – the vigilante mechanism.

Conducting an empirical test of the vigilante mechanism is difficult for two main reasons. First, although quasi-experimental designs may shed light on the average causal effect of a treatment on outcomes, results fall short of illuminating the underlying causal mechanisms at play. Such designs do not allow researchers to manipulate mediators to explore the intervening factors through which the effect of a treatment on an outcome comes about. Scholars oftentimes instead attempt to rule out alternative mechanisms. However,

we do not necessarily need to rule out the opportunity cost mechanism for we believe both mechanisms may be simultaneously present, and there is indeed initial evidence that the opportunity cost mechanism is at play. The observable implication of this mechanism is that the expansion of the avocado market has generated more employment opportunities and income for those in the industry, thereby increasing the cost of using violence and instead inducing individuals to participate in licit markets. Although we cannot directly observe labor shifting from illicit markets to avocado production, data from SENASICA indicates that employment in the avocado industry has surged with the increase in demand and production (SENASICA, 2020). Formal employment in Michoacán's agricultural sector increased 106% from 2010 to 2020. SENASICA holds that, as production has surged, every 1,000 tons harvested generates some 160 jobs. This employment is largely in picking and packing, as growers often contract out the actual picking of avocados from their orchards.

The second difficulty in conducting an empirical test of the vigilante mechanism is data availability. Although there is an emerging scholarship that explores the causes (Osorio, Schubiger and Weintraub, 2021; Wolff, 2020; Moncada, 2021) and consequences (Del Rio, 2022; Herrera, 2021; Moncada, 2021) of community organization for armed resistance against organized crime in Mexico, vigilante groups may often be clandestine, and collecting accurate data on them poses significant risks to researchers (Bateson, 2021). Nonetheless, several recent studies have explored the role of self-defense forces in Michoacán by using innovative data to identify the municipalities in which *autodefensas* are present. Using data extracted from a Comisión Nacional de los Derechos Humanos (CNDH) report on *autodefensas*, Herrera (2021) identifies the municipalities in Michoacán in which a vigilante group emerged between February 2013 and May 2014 using a binary indicator. Similarly, Fuentes-Díaz (2015) derives a binary measure for *autodefensa* emergence in municipalities in Michoacán using evidence from ethnographic interviews carried out from February through July 2014.

Using data derived from the CNDH report in the Herrera (2021) study and data derived from Fuentes-Díaz's (2015) study, we examine the cross sectional correlations between

pest-free certification and *autodefensas*. To do this, we determine which Michoacán municipalities the Mexican government certified for international trade and the United States government permitted imports from at the time of each study. The results in Table 3 show the differences in conditional means of *autodefensa* existence between trade-certified and uncertified municipalities using only the municipalities included in our main DID models. Table A3 in the appendix includes all municipalities in the state of Michoacán. The results indicate that municipalities which are certified for trade are much more likely to have *autodefensas*, with the U.S. trade correlation being most robust. This association aligns with our DID models, suggesting that *autodefensas* may be the key mechanism driving a reduction in homicides with increased trade.

| | $\text{Def}_{FD}$ | $\text{Def}_{FD}$ | $\text{Def}_{FD}$ | $\text{Def}_{CNDH}$ | $\text{Def}_{CNDH}$ | $\text{Def}_{CNDH}$ |
|---|---|---|---|---|---|---|
| (Intercept) | 0.10 | 0.08 | 0.10 | 0.16* | 0.14* | 0.16* |
| | (0.07) | (0.06) | (0.07) | (0.08) | (0.07) | (0.07) |
| Mexican cert. (c. 7/2014) | 0.32** | | −0.10 | | | |
| | (0.11) | | (0.19) | | | |
| U.S. trade (c. 7/2014) | | 0.42*** | 0.50* | | | |
| | | (0.10) | (0.19) | | | |
| Mexican cert. (c. 5/2014) | | | | 0.36** | | −0.16 |
| | | | | (0.11) | | (0.20) |
| U.S. trade (c. 5/2014) | | | | | 0.49*** | 0.62** |
| | | | | | (0.11) | (0.20) |
| $R^2$ | 0.13 | 0.22 | 0.23 | 0.14 | 0.26 | 0.26 |
| Adj. $R^2$ | 0.12 | 0.21 | 0.20 | 0.13 | 0.24 | 0.24 |
| Num. obs. | 60 | 60 | 60 | 60 | 60 | 60 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 3: $\text{Def}_{FD}$ stands for *autodefensas* as observed by the Fuentes-Díaz (2015) study, while $\text{Def}_{CNDH}$ stands for *autodefensas* as observed by the Comisión Nacional de los Derechos Humanos (CNDH) study (Herrera, 2021). These models are restricted to the same Michoacán municipalities as included in our difference-in-differences models in Table 2.

Robust qualitative evidence highlighting the emergence of vigilante groups to effectively deter criminal actors in the avocado industry supports these results. Organized self-defense forces tasked with protecting avocado farmers have origins in Local Plant Health Boards (Juntas Locales de Sanidad Vegetal, or JLSVs) (Moncada, 2021). Following NAFTA's

expansion of cross-border trade between the United States and Mexico between 1992 and 1994, federal and state authorities needed municipal-level data of the avocado sector to ensure producers and packing plants were adhering to USDA-approved pest regulations. Thus, federal and state authorities created the JLSVs, or autonomous local boards of avocado producers, to oversee avocado production, harvest, and certification. By early 2023, there were 19 JLSVs that each operate as an auxiliary agency of SADER, which in turn trains JLSV members to conduct local inspections (Avocado Institute, 2020*b*). All producers that export avocados must be a member of their local JLSV – members pay dues based on hectares of land they use for avocado production, which ultimately accounts for the majority of the JLSVs' budget, with the remainder coming from funding from the federal and state government.

The history of organized resistance to cartels in the Tierra Caliente region spans back to 2013, when the *autodefensa* movement emerged to combat Knights Templar criminal governance (Fuentes-Díaz, 2015). Avocado producers in Tancítaro, Michoacán's largest avocado-producing town, saw the success of the *autodefensas* operating in the Tierra Caliente municipalities of Tepalcatepec and La Ruana. Members of the local JLSV traveled to Tepalcatepec see if forces there would help those in Tancítaro develop their own self-defense group. Using dues from the producers, the JLSV paid members of the Tepalcatepec self-defense group to assist them in catalyzing their own collective vigilante movement in Tancítaro (Moncada, 2021).

Indeed, mobilization via the JLSV allowed the vigilante movement within the avocado sector to be coordinated through an encompassing political economy, which Moncada (2021, 30) defines as "featur[ing] a single organization that encompasses all sectoral actors and thus fosters sustained horizontal ties among them while serving as the main coordinator for sectoral activities." Intra-sectoral actors pooled assets to, first, fund vigilante forces from Tierra Caliente to train those in Tancítaro and, second, to sustain members of the avocado industry as a self-defense force through financing wages, weapons, trucks, and other equipment. The vigilante group in Tancítaro has since evolved to be a robust quasi-police force

called the Public Security Corps (Cuerpos de Seguridad Pùblica de Tancítaro, or CUSEPT), a militarized force operating exclusively as an "avocado army" (Fisher and Taub, 2018). Municipal authorities claimed to provide an initial $618,000 to sustain the group, augmented by avocado producers' $540,000 contribution, making CUSEPT more of a private entity to protect farmers rather than a public police force (Corchado, 2018). Now, avocado producers in Tancítaro funnel a portion of their profits to continue funding CUSEPT, which operates on $1.2 million annually. This demonstrates how the opportunity cost mechanism functions simultaneously with the vigilante mechanism – the avocado sector collectively has millions of dollars in earnings from production and export, and individuals are able to divert a portion of their wages to fund and sustain extralegal forces.

CUSEPT is only one example of collective vigilantism in the avocado industry. In Nuevo San Juan Parangaricutiro, *autodefensas* emerged and organized to form Moviemiento de Vigilancia to contest the power of El Gastòn, the local Jefe de la Plaza and affiliate of Los Viagras (Wolff, 2020). El Gastòn previously vowed to end the extortion of avocado producers in the area, though reneged on his promise and eventually began again to charge local avocado growers a protection fee for each acre under cultivation. What started out as eight men, Moviemiento de Vigilancia eventually encompassed all of Nuevo San Juan who "organised themselves into special neighbourhood watch groups, created scheduling mechanisms to manage an expanding web of checkpoints, and developed a communications system to facilitate mass collective action in case of need" (Wolff, 2020, 46), eventually driving out El Gastòn.

Despite the rise of self-defense forces within the avocado industry, the long term impact of collective vigilantism on cartel-related violence remains uncertain. The rise of violent actors has created the conditions for their displacement by other violent actors, leading to a regional cycle of violence in Tierra Caliente since the early rise of *autodefensas* between 2013 and 2014 (Herrera, 2021). Del Rio (2022) accounts how, with the onset of vigilantes in Michoacán, members took a confrontational approach to violently eradicate areas of the

Knights Templar cartel. Following the initial spike in violence, homicides subsided and vigilante control remained relatively uncontested. Government forces eventually attempted to remove vigilantes from their strongholds, thereby creating a power vacuum for other violent actors to fill. Therefore, areas with a vigilante presence represent a highly fragmented and competitive criminal landscape with cyclical violence.

However, we should not generalize these findings to what is specifically happening in the avocado industry. These studies tell us how *autodefensas*, broadly defined, serve to increase or decrease cartel violence in the short and long run. But, as stated earlier, such groups vary across multiple dimensions such as being individual or collective, violent or nonviolent, public or private, spontaneous or institutionalized, and offensive or defensive Bateson (2021). We claim that the collective vigilantism within the avocado industry in Mexico are durable organizations that use coercion with the aim of reducing violence through defensive measures. This differs, for example, from citizen mobs that spontaneously rise up to lynch alleged violators of social norms – such as kidnappers, thieves, or rapists – when the police fails to implement justice. In fact, lynchings has been on the rise yearly (Ahmed and Villegas, 2016; Phillips, 2019) – in 2014 there were approximately 35, in 2015 there were 78, in 2016 there were 60, and in 2017 there were 174. This form of vigilantism may in part account for the rise of violence stemming from self-defense groups, a distinct form of extralegal justice from the *autodefensas* within the avocado industry.

Collective vigilantism within the avocado industry feasibly can lead to a relatively less cartel-related violence compared to other violence-prone areas as producers invest more to maintain efforts to effectively deter cartel violence. Efforts of the vigilante groups in Tancìtaro, for example, include both carrots and sticks to expel criminal actors from the industry (Moncada, 2021). Intra-sectoral members use their pooled assets to pay off criminals in a bid to entice them to leave specific territories. However, this does not necessarily ensure criminals could not re-enter the territory or prevent incursions from rival cartels, which might pressure self-defense forces to threaten coercive force to maintain security. This strategy has

appeared effective, as various news accounts claim that *autodefensas* have eradicated areas such as Tancìtaro of organized crime (Fisher and Taub, 2018; Woody, 2017; Flannery, 2017).

Tancìtaro officials attribute the sustained reduction of crime to joint efforts between *autodefensas* and the government (Moncada, 2021). The durability and the effectiveness of self-defense groups in the avocado industry can thus be attributed to what Moncada (2021) calls the coproduction of order, or the process of public-private (or state-society) coordination to produce security. Moncada (2021) details at least two main ways in which the coproduction of order served the initial and long-term success of the *autodefensas*. First, to ensure the early success of the self-defense forces, coordination among the avocado sector and the municipal government was crucial to expel cartels from the municipality. Because criminal capture of police forces posed a significant threat to vigilante efforts, members of the avocado sector would notify the municipal mayor when self-defense forces planned to mobilize, and in turn the mayor ensured the police would not warn cartel members or turn against the *autodefensas*.

Second, to ensure the long-term success of maintaining security in Tancìtaro, coordination between self-defense forces and the mayor has been necessary to evade criticism and interdiction from the federal and state governments. In 2014, President Enrique Peña Nieto pledged to grant vigilante groups temporary legal status – in this transitional period, the federal government ordered self-defense forces to disband or to register with the government and become incorporated into the Rural Defense Corps (BBC, 2014). However, coordination among the avocado sector and the mayor allowed the self-defense forces in Tancìtaro to be discreet by not disrupting everyday activities in the municipality and to allow the continuation of economic pursuits. As such, with the eradication of cartels from the municipality, the JLSV was able to continue activities such as communicating practices to prevent pest invasion, conducting local inspections, and coordinating export with the USDA.

# 7 Conclusion

In this article, we have aimed to test the dominant prediction for how shocks to licit markets effect criminal violence. Specifically, the opportunity cost hypothesis predicts that actors will attempt to gain a market advantage through production, whereby positive changes in demand for a licit good compels individuals to shift from illegal to legal markets, therefore reducing violence. However, this hypothesis overlooks another way by which actors can seek market advantage – defense. We therefore posit that an alternative mechanism explains why criminal violence can decrease following a positive shock to licit industries. In what we call the vigilante mechanism, we claim that increases in employment and wages can afford market actors the resources to invest in defensive measures to protect the industry, specifically through funding self-defense forces to combat criminal incursions.

The avocado industry in Mexico is a novel and appropriate context with which to examine these predictions – demand for this good has surged, and cartels that have overwhelmingly focused on drug trafficking have shifted and become more prevalent in this market in the last couple of decades. We test the effect of expanding access to international markets for avocado producers on cartel violence using a staggered difference-in-differences design. Our results show that demand shocks have had a significant and substantively large negative effect on cartel homicides and missing persons in municipalities allowed to export avocados following pest-free declaration by the Mexican government and access to trade with the United States. This finding largely supports the expectations of the opportunity cost mechanism. We indeed find qualitative evidence of increased employment in the avocado industry, implying that labor is shifting from illicit to licit markets as the returns of appropriation decrease. We additionally observe evidence in support of the vigilante mechanism – as avocado producers have been exposed to demand shocks, some communities have pooled resources to create and support bodies for armed resistance against criminal organizations.

This article thus speaks to at least two broad literatures on organized crime. First, it fits within the literature on crime in licit markets, specifically related to trade liberalization

in areas of low state capacity. We build upon the common assumption held by Dal Bó and Dal Bó (2011), Mejia and Restrepo (2015), Becker (1968), and Dube and Vargas (2013), among others, stemming from the opportunity cost hypothesis. This theory holds that positive shocks to licit markets lead to greater employment opportunities and wage increases, thereby reducing the returns to appropriation and, in turn, violence. We demonstrate this in a novel case of the Mexican avocado industry.

Second, this article fits within a more recent literature on collective resistance against organized crime (Osorio, Schubiger and Weintraub, 2021; Moncada, 2021; Del Rio, 2022; Herrera, 2021; Wolff, 2020). We identify instances of communities pooling resources and forming bodies to combat cartels in areas where avocado wealth is more salient, particularly in municipalities that produce avocados and therefore present more opportunities for increased employment and income (Moncada, 2021). We take this as evidence that could suggest that these extralegal groups could serve as an effective deterrent to violence. However, this claim may contrast with other studies on the consequences of self-defense groups – Del Rio (2022) finds that certain kinds of violence initially increases with vigilante presence but later decreases, and Herrera (2021) finds that vigilante groups reproduce conditions for violence and therefore reinforce cycles of violence. Our findings do not necessarily contradict this research, but instead they suggest that future studies should focus on variation in the emergence and objectives of collective resistance movements. Perhaps vigilante movements that emerge to combat extortion in the agricultural sector have different consequences on cartel violence than movements that emerge to combat state capture of local police forces, for example.

As such, the implications of this analysis are twofold. First, empirically, we provide evidence of a phenomenon that goes against media expectations. Indeed, sensationalist media headlines have us distressed over buying luxuries such as chocolate, vanilla, and watermelons. It is thus justifiable to assume that violence increases in areas of low state capacity where we see growing wealth from liberalizing policies. However, this analysis finds the opposite. We find that trade liberalization can lead to a decrease of violence even in areas of low state

capacity.

Second, this article offers a fundamental contribution in terms of policy. Although there was less violence in areas that were granted access to international markets compared to other violence-prone areas, this is not to say there was an overall decrease in violence during the period of our study. Indeed, areas of low state capacity create a permissive environment for violence, for criminal groups are able to emerge and fill the power vacuum left by weak states. This becomes particularly appealing in areas that are positively impacted by globalization due to the influx of capital. Policymakers should therefore pursue policy interventions to mitigate adverse domestic consequences of globalization. But, as Mexico's War on Drugs has taught us, hard-line top-down strategies to address cartels only exacerbate crime and violence, implying that bottom-up strategies may instead be more effective. This not only involves reinforcing security and reducing corruption at the local level, but it also means allowing local communities to themselves acquire the resources and develop the institutions necessary to challenge organized crime.

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# A Co-Author Statement

Lucas Owen co-authors this article. The origins of this article can be traced to classwork I took at the University of Washington; specifically, Pol S 427: International Political Economy, which I took in Winter 2020. I first drafted the proposal for this article in this class. This proposal included developing and articulating the concept for research, developing the proposal to pursue this idea, and conceptualizing a research design.

I took Pol S 512: Time Series and Panel Data for the Social Sciences the next quarter, Spring 2020. The final project for the class involved partnering with one or more people and carrying out a research proposal. Lucas had similar interests in the political economy of Latin America, and we decided to be partners on the project. This evolved to a longer term co-author partnership.

I conducted the research and analysis, interpreted results, and wrote the manuscript for the my master's paper. It is from this original draft that this final article originated. After I defended the original draft as my master's thesis, Lucas again re-entered the project.

Since then, the paper has gone through many iterations as we have sent it in for publication. I remain the first author, as I have formulated the research idea, developed the theory, contributed to the quantitative analysis, compiled and interpreted qualitative data, and written the majority of the manuscript. Lucas is responsible for the analyses in the current iteration of the manuscript in this dissertation. In the current design, this article accounts for both Mexican and U.S. certification timing. Earlier iterations only accounted for one-sided certification – that is, from the United States – and Lucas realized that was only part of the story. He thus formulated the current design, a departure from the original design that was my MA thesis.

# B Average treatment effect in the treated (ATT) results for doubly robust estimands

| | Int. hom. | Int. hom. | Car. hom. | Car. hom. | Mis. per. | Mis. per. |
|---|---|---|---|---|---|---|
| Mexican cert. | −0.43 | | −0.11 | | 0.05 | |
| | (0.29) | | (0.08) | | (0.24) | |
| U.S. trade | | −0.38* | | −0.10* | | −0.51 |
| | | (0.19) | | (0.05) | | (0.39) |
| Num. obs. | 18900 | 18900 | 18900 | 18900 | 11400 | 11400 |
| N Clusters | 175 | 175 | 175 | 175 | 131 | 131 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A1: ATTs for the 2011-2019 balanced panel estimated using the methods described in Callaway and Sant'Anna (2021), which do not suffer from any of the drawbacks associated with two-way fixed effects regressions when there is variation in treatment timing.

| | Int. hom. | Int. hom. | Car. hom. | Car. hom. | Mis. per. | Mis. per. |
|---|---|---|---|---|---|---|
| Mexican cert. | 0.06 | | 0.01 | | 0.004 | |
| | (0.07) | | (0.01) | | (0.11) | |
| U.S. trade | | NA | | NA | | NA |
| | | NA | | NA | | NA |
| Num. obs. | 4320 | 4320 | 4320 | 4320 | 2912 | 2912 |
| N Clusters | 60 | 60 | 60 | 60 | 56 | 56 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A2: ATTs for the 2014-2019 balanced panel estimated using the methods described in Callaway and Sant'Anna (2021), which do not suffer from any of the drawbacks associated with two-way fixed effects regressions when there is variation in treatment timing. Treatment estimates for the 2014-2019 panel are NA because no units which become treated by the U.S. trade policy enter the data in 2014.

# C Differences in conditional means of *autodefensas* between trade-certified and uncertified municipalities using all municipalities in Michoacán

| | $\text{Def}_{FD}$ | $\text{Def}_{FD}$ | $\text{Def}_{FD}$ | $\text{Def}_{CNDH}$ | $\text{Def}_{CNDH}$ | $\text{Def}_{CNDH}$ |
|---|---|---|---|---|---|---|
| (Intercept) | $0.20^{***}$ | $0.19^{***}$ | $0.20^{***}$ | $0.21^{***}$ | $0.20^{***}$ | $0.21^{***}$ |
| | (0.05) | (0.04) | (0.05) | (0.05) | (0.04) | (0.05) |
| Mexican cert. (c. 7/2014) | $0.21^{*}$ | | $-0.20$ | | | |
| | (0.09) | | (0.19) | | | |
| U.S. trade (c. 7/2014) | | $0.31^{**}$ | $0.50^{*}$ | | | |
| | | (0.10) | (0.21) | | | |
| Mexican cert. (c. 5/2014) | | | | $0.30^{**}$ | | $-0.21$ |
| | | | | (0.09) | | (0.20) |
| U.S. trade (c. 5/2014) | | | | | $0.42^{***}$ | $0.63^{**}$ |
| | | | | | (0.10) | (0.21) |
| $R^2$ | 0.04 | 0.08 | 0.09 | 0.08 | 0.14 | 0.15 |
| Adj. $R^2$ | 0.04 | 0.08 | 0.08 | 0.08 | 0.14 | 0.14 |
| Num. obs. | 113 | 113 | 113 | 113 | 113 | 113 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A3: $\text{Def}_{FD}$ stands for *autodefensas* as observed by the Fuentes Diaz study (Fuentes-Díaz, 2015), while $\text{Def}_{CNDH}$ stands for *autodefensas* as observed by the CNDH study (Herrera, 2021). These models use all of the 113 municipalities of Michoacán.

# Chapter 3

## Not So Sweet: External Price Shocks, State Capacity, and Violence from Madagascar's Vanilla Industry

## 1 Introduction

Vanilla thieves in Anjahana pushed notes under the doors of farming structures among the vanilla orchids on hillside fields: "We are coming tonight, prepare what we want." In Anjahana, as in many other vanilla-producing areas in Madagascar, thieves became so confident and brazen they would forewarn their victims of the crime they were about to commit to avoid resistance. Exhausted from the years of victimization, farmers eventually formed a mob to locate the thieves and dragged them into the village square. An onlooker recounted, "They hacked and stabbed them to death with machetes and harpoons. I think it's good. The police did nothing. Now the gangsters will be afraid of stealing from us" (Watts, 2018).

The price of Malagasy vanilla sharply increased in 2015 when multinational food and beverage corporations pledged to use only natural vanilla in their products. As the supply chains that sustain these multinational operations span the globe, even minor changes in ingredient selection influence local economies and welfare. More wealth increases prosperity in local economies, often leading to higher living standards for producers and their communities. However, as in Anjahana, it appears that the influx of capital may simultaneously

increase rapacity, driving criminals to violently steal vanilla and compelling communities to organize for vigilante justice in response. I thus pose the following question: to what extent do adjustments to Western consumer markets drive cycles of crime and civil resistance in areas of virtually no state capacity?

I draw on research on trade, globalization, and crime to hypothesize the effects of market shocks on local levels of crime, specifically the expanding literature that explores the effect of booms within licit markets on criminal or civil war violence (Mejia and Restrepo, 2015; Becker, 1968; Dube and Vargas, 2013; Dal Bó and Dal Bó, 2011; Blair, Christensen and Rudkin, 2021). Generally, these studies tell us that there is, on average, a decrease in violence in areas that are dominated by labor-intensive goods, such as those that have high levels of agricultural productivity. In what is called the opportunity cost argument, scholars hold that positive shocks to labor-intensive licit commodities lead to greater employment opportunities and wage increases, thereby reducing the returns to appropriation.

However, I hold that these studies assume there is at least a nominal level of state capacity, where the government can offset the potentially negative consequences of a capital influx. In areas where the state is virtually absent and cannot reallocate production, effectively impose and collect taxes, and enforce contracts to protect property, I claim that violent actors emerge to prey on those who are gaining more wealth. At the same time, vigilante actors step in as third party enforcers to fill in the vacuum of the state (Gambetta, 1996; Dimico, Isopi and Olsson, 2017; Bandiera, 2003; Reuter, 2009). Given this logic, I posit two hypotheses – first, I expect that in areas of virtually no state capacity, a positive shock to prices of labor-intensive commodities will lead to an increase in crime in regions most impacted by the shock; and second, I expect that an increase in crime in areas of virtually no state capacity will lead to an increase of vigilante violence as a form of protection, retribution, and justice.

To test these hypotheses, I use the case of the vanilla industry in Madagascar. Madagascar is the center of worldwide vanilla production, accounting for over 85% of the

global supply (Hending et al., 2020). This production is further concentrated in the northern region of SAVA, which accounts for almost 90% of the vanilla producers in Madagascar (U.S. Department of Labor, 2023). A shock to the vanilla market happened in 2015 when Nestlè, the world's largest food and beverage company, announced that it would transition away from synthetics and toward the use of all-natural vanilla across all of its products. Following the shift by Nestlè – which prompted several other multinationals, including General Mills, Hershey's, and Kellogg's to adopt natural vanilla – the global price of natural vanilla rose from $30 per kilogram in 2013 to over $600 per kilogram in 2017, a price higher than that of silver (O'Reilly, 2018).

To explore whether this price shock has led to a disproportionate increase in crime in vanilla-producing regions, I adopt a mixed-methods approach. To test my first hypothesis, I use a synthetic control design using novel crime data from Madagascar's local gendarme stations. I exploit the policy change and estimate the effect of the increased price of vanilla on crime by comparing vanilla-growing regions with a control group of regions not affected by the price shock. To test my second hypothesis, I use data gathered from interviews carried out during fieldwork in September 2023. Through interview data, I am able to explore if vigilante justice mirrored changes in crime, and how mobs function to fill the power vacuum of the state.

Results from the synthetic control show that the price shock had a strong positive effect rates of crime in the SAVA region, which was most impacted by Nestlè's all-natural vanilla policy. From 2015 to 2018, crime rates rose an average of two cases per 10,000 people in SAVA compared to the synthetic control. This translates to an additional 200 cases of crime a year in SAVA, with a peak of approximately 600 additional cases of crime in 2018. Using evidence from interviews with vanilla farmers in the Andapa district in SAVA, I find that, due to the overall lack of trust in the corrupt police and ineffective justice system, vigilantism is indeed on the rise in SAVA in response to the increase of crime. Vigilantism serves to fill the vacuum of the state by promoting fairness when government structures fail

to do so.

Thus, the contribution of this article is primarily empirical. To test my two hypotheses, which challenge and expand upon the common opportunity cost argument, I introduce and utilize two unique sources of data. First, in what I call MADACRIME, I introduce novel data on crime in Madagascar obtained from local gendarme stations. This dataset features a variety of measures for crime at the region-year level of analysis, which is the most precise data on crime we have to date. It has not been made publicly available before now. This article highlights one of the innovative way to utilize this new dataset by using a synthetic control design to test the impact of price shocks on crime. Second, I introduce findings obtained from interview data with vanilla farmers and leaders within various committees of vanilla producers. This data allows me to test my theoretical conjectures relating to vigilantism – which lacks quantitative data – and thus presents a valuable opportunity to collect important qualitative data. Through these innovations, I conduct a rigorous empirical test of my hypotheses using this unique data on crime in Madagascar.

# 2 Price Shocks, Crime, and Resistance in Areas of Low State Capacity

Much has been written on the "resource curse" plaguing resource-rich nations. Since the 1990s, large-$N$ analyses have explored the role of resource wealth on economic development, the common argument being that institutional barriers have often prevented these poorer countries from responding effectively to the basic welfare needs of their population (Ross, 1999; Karl, 1999; Sachs and Warner, 2001). In the early-2000s, scholarship on the effect of commodity dependence on state capacity (Mahdavy, 1970) and macroeconomic outcomes (Gelb et al., 1988) shifted to explore its impact on armed civil conflict (Fearon and Laitin, 2003; Weinstein, 2007; Ross, 2004; Collier and Hoeffler, 2004). Prominent studies explore the roll that opportunity plays in the uses of violence in armed conflict, claiming that lucrative

material resources and their degree of lootability and obstructability (Weinstein, 2007) in areas of poverty and political instability (Fearon and Laitin, 2003) can explain patterns of armed group behavior.

By the 2010s, scholars identified several important sources of variation when examining the relationship between resource wealth and conflict – specifically, differences in commodities and differences in local outcomes. On one hand, a set of literature examines how plausibly exogenous shocks to prices and the demand of *illicit* goods impact the prevalence of crime and violence (Dube and Vargas, 2013; Blair, Christensen and Rudkin, 2021). These shocks in the prices and demand of illicit goods fuel rapacity and induce actors to fight to secure more of the expanding prize to be won. On the other hand, another set of literature examines how plausibly exogenous shocks to prices and the demand of *licit* goods impact the prevalence of crime and violence (Becker, 1968; Dal Bó and Dal Bó, 2011; Mejia and Restrepo, 2015; Dube and Vargas, 2013). This article fits within this second set of scholarship examining how exogenous shocks to licit commodities impact local levels of crime.

In what is often called the opportunity cost argument, studies predict that, while positive shocks to capital-intensive industries increase armed violence, positive shocks to labor-intensive industries diminish it (Dal Bó and Dal Bó, 2011; Dube and Vargas, 2013). Higher prices in labor-intensive commodities such as products in the agricultural sector like cacao, sugar cane, and palm oil reduce conflict by generating more opportunities for employment in licit industries (Mejia and Restrepo, 2015). Employment and wealth in turn raise the opportunity cost of violence and appropriation through three mechanisms (Mejia and Restrepo, 2015; Blattman and Annan, 2016; Dube and Vargas, 2013; Dal Bó and Dal Bó, 2011) – first, production may be reallocated to more highly institutionalized areas, thereby reducing rapacity over turf; second, the state has more incentive to neutralize the effects of criminal actors because it can tax the legal commodity; and third, market participants would be able to use the state to some extent, even if weak, to enforce contracts and protect property.

However, these mechanisms assume that there is at least a nominal level of state capacity at the local level. The state must be present to reallocate production, effectively impose and collect taxes, and enforce contracts to protect property. When the state lacks the power to impose such rules and regulations, the logic of the opportunity cost argument unravels. In fact, in regions dominated by labor-intensive commodities, the opportunity cost of cultivating such goods is high due to the prolonged time frame of seeing returns to investment. This means that actors are further induced to engage in violent activity such as extortion or stealing valuable goods and selling them directly to middlemen or exporters in order to more efficiently see the gains from positive price shocks without actually becoming licit market actors themselves. As such, my first hypothesis is as follows:

**Hypothesis 1 (H1):** *In areas of virtually no state capacity, a positive shock to prices of labor-intensive commodities will lead to an increase in crime in regions most impacted by the shock.*

Moreover, because of the absence of strong state institutions, market actors cannot rely on the police or courts to enforce contracts and ensure justice. Though protection from violence is often seen as the *raison d'etre* of the state (Weber, Gerth and Mills, 1946; Bates, 2001), states often possess insufficient capacity to prevent or persecute violations of person and property (Besley and Persson, 2010; Hendrix, 2010), particularly in rural areas (Pelser, Louw and Ntuli, 2000). In the absence of state enforcement, alternative sources of protection are common – including organized forms of protection such as gangs or cartels (Richani, 2010; Blume, 2021), private security operations (Reno, 1997; Ndlovu-Gatsheni, 2007), or community protection – which often comes in the form of vigilante and mob violence (Anderson, 2002; Wilke, 2023; Bateson, 2021; Cohen, Jung and Weintraub, 2023). As such, my second hypothesis is as follows:

**Hypothesis 2 (H2):** *An increase in crime in areas of virtually no state capacity will lead to an increase of vigilante violence as a form of protection, retribution, and justice.*

# 3 The Vanilla Industry in Madagascar

I test these hypotheses using the case of the vanilla industry of Madagascar. Madagascar has little to no state capacity, characterized by its reliance on clientelism, its incomplete private property rights protections, its failure of making credible commitments to private investors, and its difficulties in raising revenue from the population (Cárdenas, 2010). The United Nations places Madagascar within the Least Developed Country category; the World Population Review measures Madagascar as the third worst country in terms of poverty rate, with over 80% of the population living on less that $1.50 a week; and the World Bank claims that elite capture has institutionalized corruption, limited access to finance, and eroded investor trust (Nogueira-Budny and van der Werf, 2010). To be sure, the population exhibits little trust in the government – the most recent Afrobarometer survey in 2018 shows that households on average believe the government is "very bad" at issues such as handling the economy, creating jobs, reducing the income gap, ensuring price stability, and reducing crime (Afrobarometer, 2018).[1]

## 3.1 Vanilla Production

Malagasy vanilla accounts for over 85% of the global supply, constituting the largest share of exports from Madagascar at 22%, approximately $619 million (Hending et al., 2020).[2] Vanilla grows in warm and humid climates at temperatures between 21°C and 32°C, making tropical regions the ideal place for cultivation. The northeast region of SAVA (an abbreviation of its four composite districts Sambava, Antalaha, Vohemar, and Andapa), seen in Figure 1, became the primary producer of vanilla because of its humid climate, forested terrain, and high levels of annual rainfall. An estimated 70,000 of Madagascar's 80,000 vanilla farmers operate from SAVA (U.S. Department of Labor, 2023).

[1]Ranked on a Likert scale where 1=very badly, 2=fairly badly, 3=fairly well, and 4=very well, average household survey responses rank trust in the government handling 1.76, trust in the government creating jobs at 1.63, trust in government in reducing the income gap at 1.47, trust in government at ensuring price stability at 1.42, and trust in government at reducing crime at 1.79.

[2]See Figure A1 for a map of the global distribution of vanilla production.

From planting to final conditioning for export, the process of vanilla bean cultivation takes almost five years total; additionally, due to lack of infrastructure, the supply chain is long and complex, further adding to the time when vanilla is grown, harvested, exported, and sold on consumer markets. Table A1, adapted from SAVA Trading Co (n.d.), captures the timeline for vanilla production.


Figure 1: Regions of Madagascar, with SAVA (vanilla-producing region) highlighted.

Because the vanilla plant is an orchid, it is extremely labor intensive to grow and cultivate and has little economy of scale. Smallholder farmers in Madagascar are the primary producers of vanilla, which they grow using traditional farming methods without mechanization. This means that, from the very beginning stages of cultivation, farmers need to manually clear plots and plant tutor trees and vanilla vines. Approximately three years after farmers plant the orchids, there is a three-month window from September to December in which the plant produces blossoms. Flowers wilt and die within a day of blooming, so farmers survey their fields daily. The pollination process itself demands meticulous attention given the fragility of the plant, and thus farmers hand pollinate each flower within 12 hours of opening.[3] From pollination, vanilla beans take about five to six weeks to grow but another six months at least to mature. Farmers then engage in an intensive "vanilla campaign," surveying their fields daily and harvesting mature beans as soon as they become ripe.

## 3.2 Vanilla Supply Chain

Following the vanilla campaign, vanilla follows a complex and often opaque supply chain as production is transferred from farmers to an extensive line of middlemen with the responsibility of drying, sorting, and conditioning beans before the final product reaches exporters.[4] International traders or large foreign flavor companies such as Symrise and Firmenich in Europe and Virginia Dare in America then purchase the beans, who then often render the vanilla into high-quality luxury products to supply to large multinational companies includ-

[3]Farmers use a beveled sliver of wood or grass stem to lift the membrane separating the male organ (anther) and female organ (stigma) of the flower, then transfer the pollinia from the anther to the stigma using the thumb.

[4]The middlemen between vanilla farmers and exporters included rabatteurs, commissionaires, collectors, and preparators. Rabatteurs and commissionaires function in similar ways, with the payment structure being the main different. Both rabbateurs and commissionaires buy green vanilla from farmers and sell it to collectors. During the vanilla campaign, they travel daily to centralized green bean markets, where they register and weigh yields with local officials and negotiate sales with collectors. However, rabatteurs pay the farmers after the vanilla has been sold, whilst commissionaires pay the farmers the moment of vanilla sales. Collectors are typically employed by an exporter or preperator and are paid on a contractual basis. Preparators buy the green vanilla from the collectors and often cure, dry, and prepare the vanilla for export. Exporting companies that are in contact with the middlemen put collectors and preparators in contact with international traders and flavor houses for sale.

ing Nestlè, Unilever, and Mars (Steavenson, 2019).

In particular, Nestlè has struck several agreements related to the production of vanilla, with the company establishing corporate rights to a large share of SAVA's vanilla output through deals with farmers (Sustainable Vanilla Initiative, 2020). Given this investment and the lack of viable economic alternatives, local livelihoods are tethered to the whims of the global vanilla market (Steavenson, 2019; Osterhoudt, 2020). Most notably, in 2015, Nestlè announced it would only use natural vanilla in its products, and other large food and beverage companies followed suit. This policy announcement led to the price of vanilla skyrocketing – Figure 2 tracks the global price of vanilla, which went from an average of $50 per kilogram before 2015 to $100 per kilogram at the beginning of 2015, and reached a record high of almost $600 per kilogram in 2018.

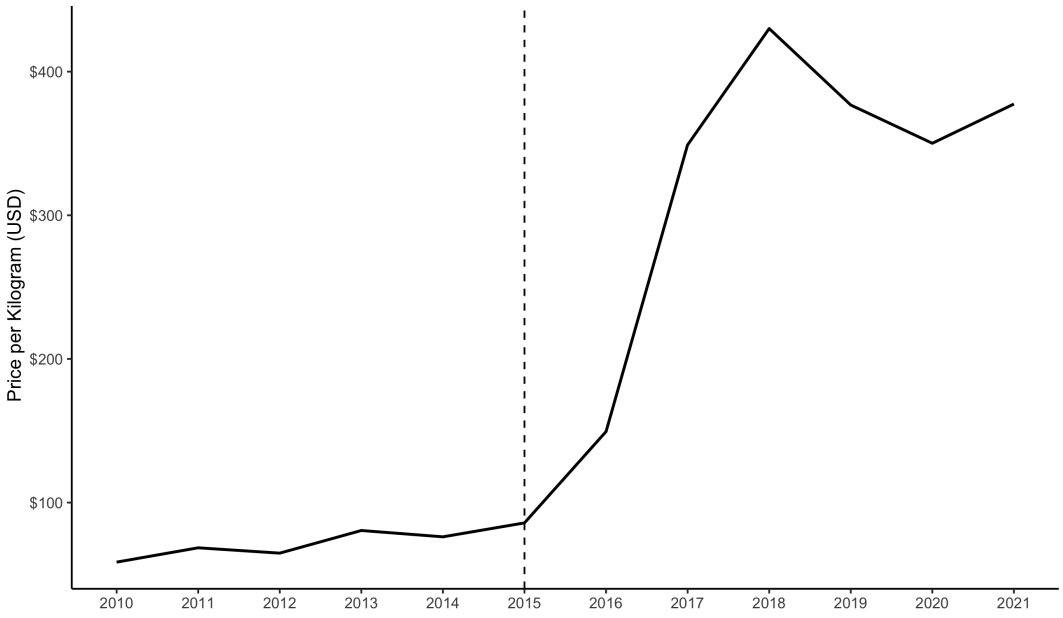


Figure 2: Global price of Malagasy vanilla from 2010 to 2021.

The incoherence of the vanilla supply chain, when combined with the unforeseen spike in prices, further stimulated the economic volatility of vanilla, where farmers, middlemen, and exporters all have a say in pricing. Although there were high levels of state control of the vanilla industry from the 1970s to 1980s, structural adjustment policies of

the World Bank from 1995 to 1997 liberalized the vanilla market and opened the door for competition (Boone, Kaila and Sahn, 2022). After the market was liberalized but before the height of prices in 2018, exporters typically established prices. However, as demand rose, the middlemen in the system attempted to undercut farmers while selling to exporters for much more, leading to high levels of speculation and stock-piling (Steavenson, 2019).

## 3.3 Crime in the Vanilla Industry

In the aftermath of Nestlè's adoption of natural vanilla in 2015, many land-owning producers have seen their lives improved dramatically. The influx of capital led to high levels of conspicuous consumption: "A chameleon plastered with money might cross one's path at the edges of town. A passerby might notice a man joyously smashing a box of ripened mangoes purchased by the side of the road and then nonchalantly paying the vendor 10 times the price of the box" (Zhu, 2018, 253). People bought mobile phones, solar panels, television, and dirt bikes; others rebuilt their homes with new wood, corrugated iron, or sometimes even cement (Steavenson, 2019). At the same time, these economic gains have not been equally distributed (Boone, Kaila and Sahn, 2022). For example, even following the boom in prices, over three in four vanilla farmers in Madagascar report not having adequate access to food within the previous three years (Herrera, 2021), and estimates from the U.S. Department of Labor suggest that over a quarter of the vanilla sector's workforce is staffed by children aged between 12 and 17 (U.S. Department of Labor, 2023).

Given the unequal distribution of wealth, crime in the vanilla industry in Madagascar anecdotally appears to be on the rise, the most prevalent crime being theft. Green rather than prepared vanilla is the most vulnerable good due to the smallholder farming techniques that dominates the industry (O'Reilly, 2018). Thieves steal green vanilla directly from the vine during the vanilla campaign, and these thefts can often turn violent, as would-be thieves arm themselves with machetes or firearms. Due to opportunities to gain wealth through speculation, thieves have stolen so much green vanilla that some estimates suggest

that upwards of 15% of the annual crop is stolen each year (Steavenson, 2019). At the time of the price shock, Madagascar did not have an extensive network of criminal gangs active in the vanilla-producing region. Occurrences of organized crime are rare, and the criminal trade in vanilla is far from monopolized, with theft typically perpetrated by local criminals rather than organized networks.

Reports from the region have documented how farmers have needed to bolster security to minimize the potential risk posed by criminal activity to the vanilla trade in SAVA because the state has been unable to sufficiently protect farmers from predation (Reuters, 2019; The East African, 2021; Daily Maverick, 2021). With little public trust in the police and justice system, communities engage in mob justice when a suspected thief is caught (O'Reilly, 2018). Osterhoudt (2020) describes how communities carry out this mob violence:

> A mob incident typically occurs when a thief is caught stealing vanilla beans at night. The thief may be spotted in a variety of ways: by farmers sleeping in their fields, by private guards hired to protect the vanilla vines of wealthier families, or by members of the communal patrols organized by neighborhood councils, which circulate through the village streets and fields at night [...] They will then attempt to apprehend the thief, restraining and bringing him to town. Others in the village who hear the commotion will leave their homes and join the group. Usually, most people who join these mobs are younger male members of the community [...] Once the group is formed, they encircle the accused thief and wave sticks, stones, and machetes at him. The mob will beat and stone the suspect, usually until death. (pp. 6–7)

# 4 Data

Without longitudinal evidence, it is unclear whether these recent reports represent a true change from prior trends, especially as rural crime rates are typically under-reported in the

Global South (Abraham and Ceccato, 2022). For instance, it could be that increased wealth among producers has allowed them to improve security efforts to effectively counter persisting criminal activity, or that crime overall in Madagascar is on the rise and sensationalist media target vanilla over other resource industries. Invaluable work by Boone, Kaila and Sahn (2022) has provided survey evidence that these reports are not merely anecdotal. Local producers report a greater fear of agricultural crime now, in the aftermath of the shock, than they did prior to 2015. Through interviews with vanilla producers, innovative work by qualitative researchers support this suggestive outcome by revealing how there is a pervasive perception of growing insecurity within the industry (Osterhoudt, 2020; Andriamparany, Hänke and Schlecht, 2021).

I conduct an empirical test on if crime in Madagascar has indeed increased relatively more in regions that produce vanilla after the price shock. However, data on Madagascar is problematic to come by – low state capacity means that accurate data on economic and social outcomes is fairly inadequate. For example, since independence in 1960, Madagascar's National Institute of Statistics has carried out only three general housing and population censuses for years 1975, 1993, and 2018. This article overcomes data concerns through utilizing two unique sources of quantitative data to test my first hypothesis – first, I was granted special access to novel data from Madagascar's local gendarmerie in partnership with representatives from the Malagasy National Ministry of Police on local levels of various types of crime; and second, I utilize Afrobarometer survey data to construct a set of covariates that represents the economic and social determinants of crime.

## 4.1 Dependent Variable: Crime in Madagascar

In this article I introduce novel data from Madagascar's gendarmerie on various types and aspects of crime, which I call MADACRIME. This unique data offers avenues for innovative research because it is currently the only panel dataset on reported crime in Madagascar,

accounting for all 22 regions in Madagascar[5] for the years 2010 to 2020. Thus, the resulting panel dataset yields 242 region-year units.

MADACRIME is sourced from all regional police and genderme stations in Madagascar and is disaggregated by types of crime; though, taken together, each type of crime measured accounts for *all* instances of crime in Madagascar. Specifically, MADACRIME accounts for acts of banditry, zebu (indicine cattle) crime, and vanilla crime – acts of banditry accounts for cases of extortion, robbery, and murder including those related to arms theft for resale on the black market, armed robbery, and vehicle hold ups; zebu crime accounts for crime carried out by dahalo, the Malagasay term for bandits engaged in cattle rustling; and vanilla crime accounts for cases of both petty and violent theft of green and prepared vanilla. Importantly, for each region-year, MADACRIME accounts for the number of cases of each type of crime, along with the number of perpetrators and the number of subsequent arrests. For the number of arrests, MADACRIME takes into account the number of perpetrators arrested that are released versus the number of perpetrators arrested that are convicted. Additionally, for each type of crime, MADACRIME indicates the number of community members and criminals that are killed or injured as a result of the crime.

For the purposes of this study, I operationalize crime by creating an aggregate measure by combining the number cases of acts of banditry, zebu crime, and vanilla crime and standardizing the count so that the outcome is the rate of crime per 10,000. Figure 3 displays the average number of cases for acts of banditry, zebu crime, and vanilla crime from 2010 to 2020. Figure 4 displays the overall pattern of crime, measured by number of cases per 10,000, in all regions of Madagascar from 2010 to 2020, highlighting SAVA before and after the 2015 price shock to vanilla.

[5]Seen in Figure 1, highlighting SAVA as the unit of interest: Atsinana, Amoron'i Mania, Analamanga, Analanjirofo, Androy, Anosy, Alaotra Mangoro, Atsimo Andrefana, Atsimo Atsinanana, Betsiboka, Boeny, Bongolava, Diana, Haute Matsiatra, Ihorombe, Itasy, Melaky, Menabe, SAVA, Sofia, Vakinankaratra, and Vatovavy Fitovinany.

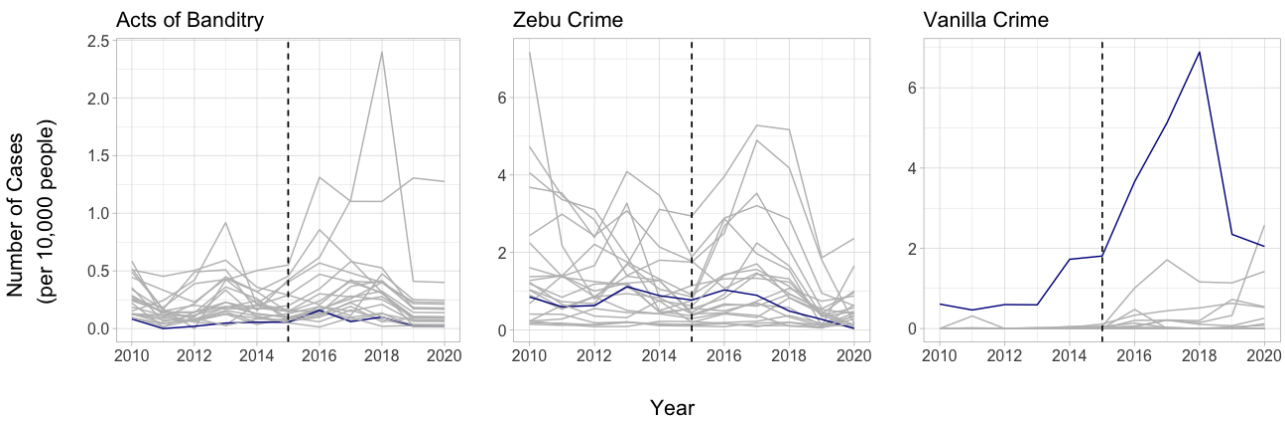


Figure 3: *Average number of cases of crime per 10,000 people from 2010 to 2020.*

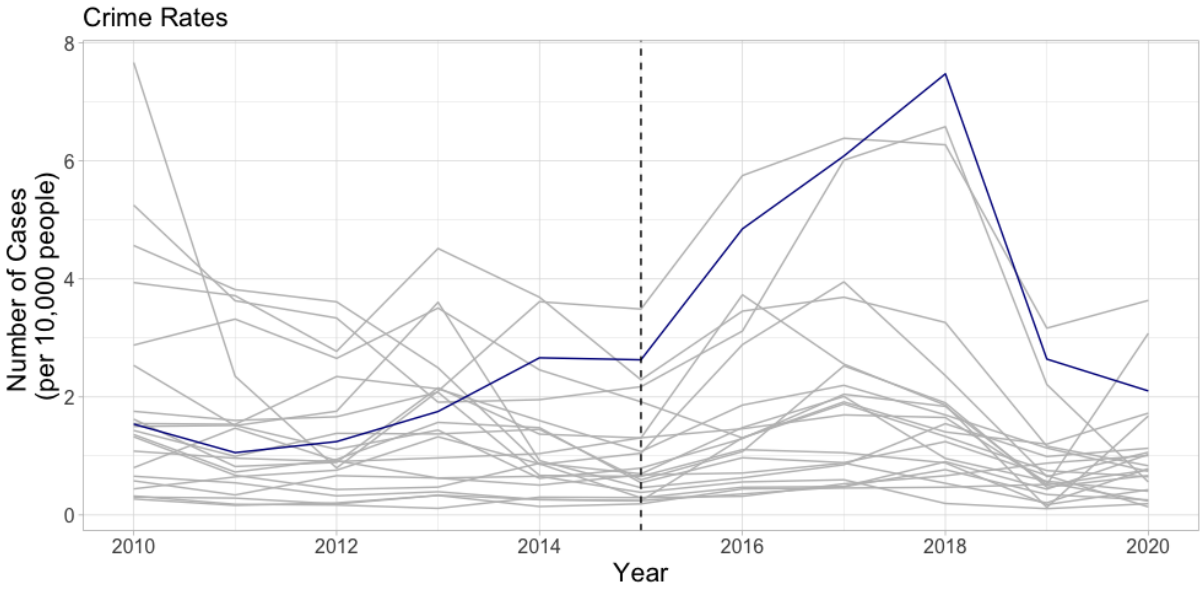


Figure 4: *Distribution of rates of crime for each region from 2010 to 2020.*

One critique of this measure is that vanilla crime can only increase in regions with vanilla production – since 90% of vanilla is produced in SAVA, vanilla theft can essentially only increase in SAVA. This means that, by construction, one could claim that I will get an effect mechanically because vanilla crime cannot increase in other regions with no vanilla to steal, and therefore there is a ceiling effect in control units that does not exist in the treated unit. However, this aggregate measure of crime is superior to either using a single form of crime or leaving some crimes out of the aggregate measure. Taken together, these

measures account for *all* types of crime in Madagascar. Because certain types of crime will be more regionally prevalent, omitting any type of crime should wash out any potential effect for SAVA. For example, acts of banditry will be more likely in urban areas, such as the capital Antananarivo in the Analamanga region at the center of Madagascar; zebu crime will be more likely where specific tribes are more closely linked to raising zebu, specifically in the southern regions of where the Mahafaly tribe lives and the western regions where the Sakalava tribe lives. By combining each type of crime, I capture all cases of crime reported by the police and gendarme, ultimately allowing me to more credibly measure criminal trends across all regions in Madagascar.

I remain aware of the additional potential shortcomings of this data. First, because the data is government-reported, it likely suffers from undercounting. Indeed, "comprehensive crime statistics do not exist for Madagascar... [m]oreover, there appears to be a high degree of under-reporting, either because victims do not contact the security forces or because the security forces are themselves directly or indirectly involved in the criminal acts committed" (Jütersonke and Kartas, 2011, 180). Though I assume the data in this analysis offers a low count of crime, this implies that with more accurate data the results will still hold true especially given that under-reporting is likely systematic across regions. Second, because this data is compiled across all regions in Madagascar, it likely suffers from measurement error. Due to the lack of communication across police and gendarme stations, as well as the lack of vertical integration with the national offices, stations could label observed crimes inconsistently – an act of banditry for one station could be coded as a case of zebu theft at another station. I attempt to overcome this potential for measurement error by using the composite measure of crime, such that all observed crime will be captured by the aggregate measure even if component elements are coded inconsistently across regions.

## 4.2 Covariates

In addition to the gendarme crime data, I use data from Afrobarometer's survey rounds in Madagascar on public attitudes towards democracy, governance, and society. Most relevant to the MADACRIME panel dataset for years 2010 to 2020, Afrobarometer provides household surveys for years 2008, 2013, 2015, and 2018. Despite there being multiple rounds of surveys in the sample time I examine, they are irregular and unequally spaced. Thus, adopting a strategy such as imputing observations for following years based on the closest previous survey year introduces statistical bias because the missingness is not randomly distributed around the treatment year. I thus treat observations from Afrobarometer's 2015 survey as time-invariant across all years in the sample, a common strategy when using Afrobarometer data for a set of controls.[6]

Table 1: Afrobarometer 2015 summary statistics.

| Variable | N | Min | Max | Mean | SD |
|---|---|---|---|---|---|
| Access to an electricity grid | 1,200 | 0 | 1 | 0.33 | 0.47 |
| Access to piped water | 1,200 | 0 | 1 | 0.47 | 0.49 |
| Mobile phone | 1,200 | 0 | 1 | 0.48 | 0.50 |
| Internet | 1,170 | 0 | 4 | 0.15 | 0.64 |
| Motor vehicle | 1,200 | 0 | 1 | 0.09 | 0.28 |
| Received cash income in the past year | 1,200 | 0 | 4 | 2.25 | 1.10 |
| Education level | 1,200 | 0 | 9 | 2.99 | 1.52 |
| Employment level | 1,200 | 0 | 3 | 1.34 | 1.22 |

*Note:* See Afrobarometer (2015) for the codebook for how these variables are measured.

I focus on survey questions that can illuminate the economic and social determinants of crime from Afrobarometer's Round 6 survey, which surveys 1,2000 households (Afrobarometer, 2015). Table 1 presents summary statistics for selected variables in the following

[6]See Table A2 in the appendix for a comparison of relevant covariates from Afrobarometer's 2008, 2013, 2015, and 2018 surveys.

category: access to infrastructure, presence of state security, experienced incidences of crime, opinions on rights of citizens, opinions on rights of the courts of and the police, opinions on the government's handling of the economy, household asset ownership, and household socio-economic characteristics. For each variable, I drop non-responses or responses labeled as "unsure" (amounting to 30 dropped observations) and average responses across each region.

# 5 Empirical Strategy: The Effect of Price Shocks on Crime

In summary, the case I evaluate is the price shock to the Malagasy vanilla industry driven by Nestlè's policy to use all-natural vanilla in 2015. This policy primarily impacted Madagascar's northeast region of SAVA, which produces the majority of Bourbon vanilla not only in Madagascar but in the world. To test H1 positing that a positive shock to Western consumer markets will lead to an increase in crime in regions most impacted by the shock, I adopt an empirical strategy that estimates the effect of the increased price of vanilla on crime by comparing the SAVA region with a control group of regions not (or less) affected by the price shock. To reduce the scope for omitted variable bias, I weight units in the control group to construct a synthetic counterfactual that replicates the initial conditions of criminality of the SAVA region before exposure the price shock.

## 5.1 Synthetic Control Method

I follow the seminal works of Abadie and Gardeazabal (2003) and Abadie, Diamond and Hainmueller (2010) to test H1 by constructing a synthetic control model. The goal of the synthetic control method is to measure the effect of an intervention on a particular post-intervention outcome. However, the fundamental problem of causal inference is that it is impossible to observe the counterfactual, when the intervention does not occur (Rubin, 1974). The synthetic control method allows researchers to create a combination of weighted

comparison units to serve as an approximation for how the outcome of interest would have manifested in the treated unit if the intervention never took place.

Assume that I have a sample of $(J+1)$ units, which are regions in Madagascar. These units are indexed by $j$, and $j = 1$ is my case of interest, or the treated unit; in other words, the region of SAVA. Units $j = 2$ to $j = (J+1)$ is the set of potential control regions in Madagascar. These units constitute a reservoir pool of comparison cases, called the donor pool. The sample spans time periods, $t = 1, ..., T$. $T = T_0 + T_1$, where $T_0$ is the preintervention period prior to the 2015 policy and $T_1$ is the postintervention period following the 2015 policy. Thus, unit $j = 1$ was not exposed to the intervention from $1, ..., T_0$ but becomes treated for time $T_0, ..., T$.

The synthetic control is the weighted average of units in the donor pool. $W = (w_2, ..., w_{j+1})'$ is a $(J+1)$ vector of non-negative weights that sums to one. The scalar $w_j (j = 2, ..., J)$ is the weight assigned to region $j$ in synthetic SAVA. To determine the values for $W$, or the weight assignments for each control region, I use $X_1$ as a $(K \times 1)$ vector of pre-price shock values of $K$ predictors of crime for SAVA, and $X_0$ is a $(K \times J)$ matrix that contains the values of the same predictor variables for the $J$ possible control regions. $X_0$ and $X_1$ are meant to be predictors of postintervention outcomes – in this case, crime rates – though the predictors are not affected by the intervention.

I select the vector of weights $W^*$ to minimize the difference between the preintervention characteristics of the treated unit versus the synthetic control, given by $X_1 - X_0 W$. To do so, I take $m = 1, ..., K$, where $X_{1m}$ is the value of the $m$-th variable for the treated unit and $X_{0m}$ is a $1 \times J$ vector containing the values of the $m$-th variable for the units in the donor pool. Following Abadie, Diamond and Hainmueller (2015), I choose $W^*$ as the value of $W$ that minimizes:

$$\sum_{m=1}^{K} v_m (X_{1m} - X_{0m} W)^2 \tag{1}$$

where $v_m$ is a non-negative weight reflecting the relative importance of the different crime

predictors to reduce $X_1 - X_0 W$. Intuitively, variables assigned a large $v_m$ value are those with the most predictive power on the outcome of crime for the SAVA region.

Taken together, I let $Y_{jt}$ be the outcome of unit $j$ at time $t$. $Y_1$ is a $(T_1 \times 1)$ vector whose elements are the values of the real crime rates in SAVA in the postintervention time period, whereas $Y_0$ is a $(T_1 \times J)$ matrix where column $j$ contains the postintervention values of the outcome for for the control regions in the donor pool. The synthetic control estimator of the effect of the treatment is the comparison of postintervention outcomes between SAVA, which is exposed to the 2015 policy, and the synthetic control, which is not exposed to the intervention, $Y_1 - Y_0 W^*$. In other words, following Abadie, Diamond and Hainmueller (2015), for a postintervention period $t$, the synthetic control estimator of the effect of the treatment is given by the difference between the outcome for the treated unit and the outcome for the synthetic control at that period:

$$Y_{1t} \sum_{j=1}^{J+1} W_j^* Y_{jt} \tag{2}$$

## 5.2 Results

The region of interest that becomes treated with the 2015 price shock to the vanilla industry is SAVA. The remaining 21 regions in Madagascar constitute the donor pool: Atsinana, Amoron'i Mania, Analamanga, Analanjirofo, Androy, Anosy, Alaotra Mangoro, Atsimo Andrefana, Atsimo Atsinanana, Betsiboka, Boeny, Bongolava, Diana, Haute Matsiatra, Ihorombe, Itasy, Melaky, Menabe, Sofia, Vakinankaratra, and Vatovavy Fitovinany.[7] I use outcome variable, $Y_{jt}$, to measure crime in Madagascar – the rate of cases of all observed crime (including acts of banditry, zebu crime, and vanilla crime) per 10,000 people. The $v_m$ weights I select represent the most important predictors of crime, including access to an electricity grid, access to piped water, receiving cash income in the past year, education

[7]Results can be driven by the region with the capital city, which could bias the estimates. Figure A4 in the appendix includes synthetic control results for my main model, but excluding Analamanga (the region with the capital city Antananarivo) from the donor pool.

level, employment level, access to a mobile phone, and access to the internet.[8]

The left plot in Figure 5 displays the weights of each region in the donor pool that makes up synthetic SAVA. One can see that synthetic SAVA is the weighted average of Haute Matsiatra, Beony, Ihorombe, as all other donor regions receive a zero weight. The right plot in Figure 5 compares predictors of crime in the preintervention period of SAVA to the preintervention period of synthetic SAVA.

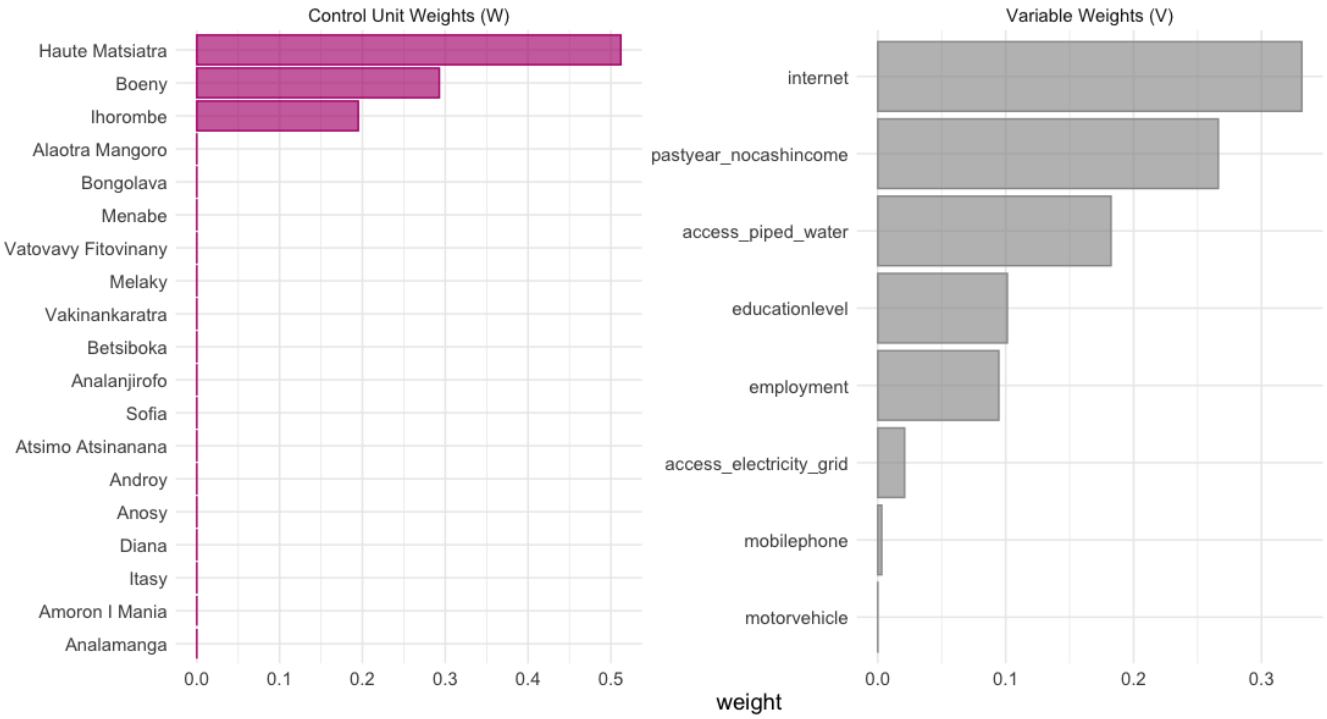


Figure 5: *Weights used to generate the synthetic control. The left plot shows the weights of each unit in the donor pool; the right plot shows the weight of each predictor of crime.*

The estimate of the effect of Nestlè's 2015 policy on crime rates in SAVA is given by the difference between the actual SAVA and its synthetic version, visualized in Figure 6. Plot 1 displays both the average outcomes of the treatment unit and synthetic control units

[8]A potential shortcoming to my study is the presence of only time-invariant covariates. In Figure A2 in the appendix, I include a robustness check using the Afrobarometer waves and imputing missing years given the closest previous year. Results hold true to my original model. Another common type of covariate that synthetic control studies use are a set of preintervention outcomes (Abadie and Gardeazabal, 2003; Abadie, Diamond and Hainmueller, 2010), though some scholars (Kaul et al., 2015) remain skeptical that this strategy is empirically sound – including outcome lags as separate predictors may render all other covariates irrelevant. In Figure A3 in the appendix, I run the same synthetic control model using outcome lags as the covariates. Results hold true to my original model.

before and after the implementation of policy to show parallel trends, and Plot 2 displays the differences between the units over time. These plots show that increased vanilla prices due to Nestlè's announcement to use all-natural vanilla in 2015 increased crime in the SAVA region. Trends between the SAVA region and synthetic SAVA remained mostly parallel until 2015, though beginning in 2014 there was already a slight difference in the average number of cases. However, after 2015, the difference between the treated and synthetic units increased drastically.

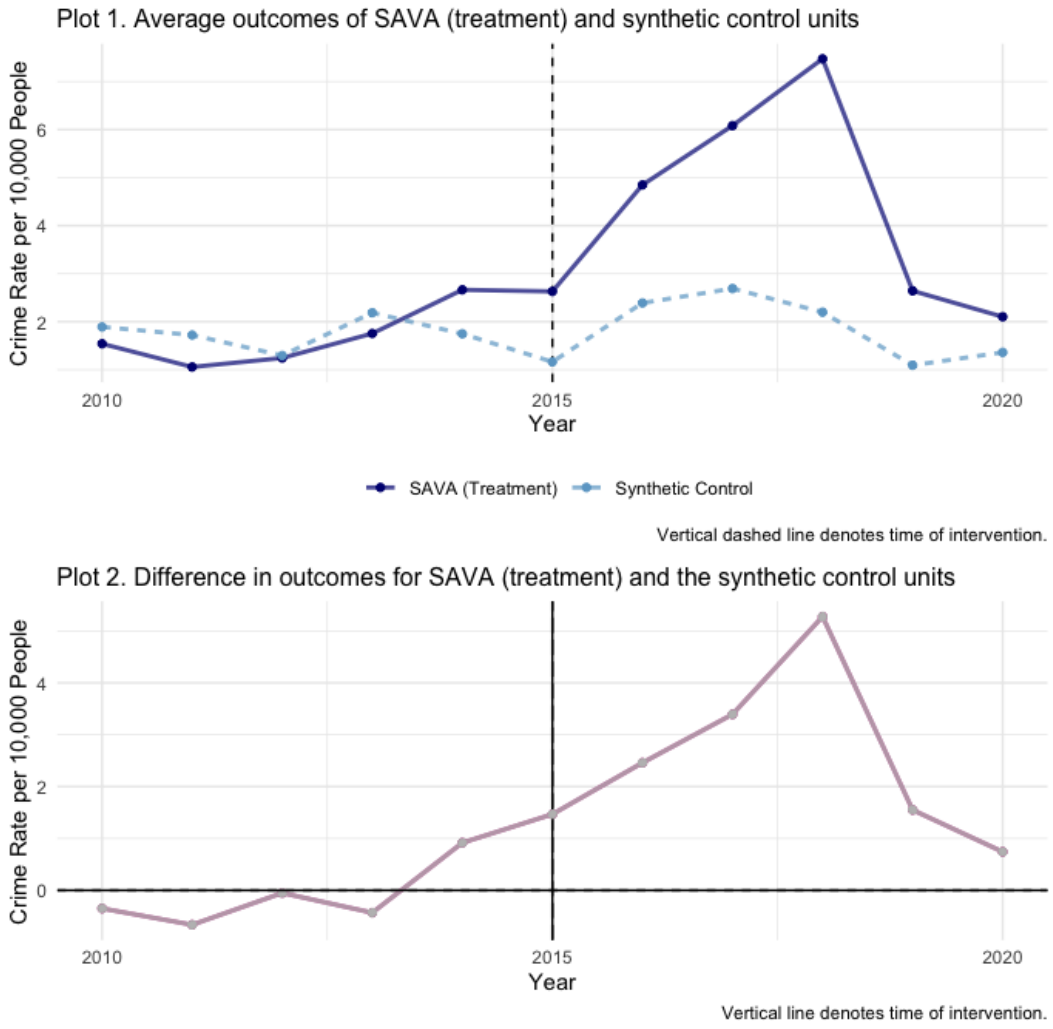


Figure 6: *Results of the synthetic control. Plot 1 compares the trends of outcomes for the the synthetic and observed units. Plot 2 shows the causal quantity, or difference between the observed and counterfactual.*

Thus, the results support H1 and suggest a pronounced positive effect of the price shock to vanilla on criminal rates in SAVA. In particular, I find that from 2015 to 2018, crime rates rose an average of two cases per 10,000 people in SAVA compared to the synthetic control. This translates approximately to an additional 200 cases of crime a year in SAVA, with a peak of approximately 600 additional cases of crime in 2018.

The subsequent sharp decrease in crime after 2018 makes sense given that the price of vanilla began to decrease again at that point. High prices coupled with price volatility drove multinational corporations to look elsewhere for vanilla in places such as Indonesia, Uganda, and Papua New Guinea, preferring stability and a fair price rather than uncertainty (Steavenson, 2019). By 2020, prices fell so low that the government again stepped in and imposed a minimum price for exported vanilla in an attempt to stabilize the market.

## 5.3 Alternative Specifications

Price shocks do not only occur due to commodity market shifts; environmental and climate factors likewise impact the supply and demand of agricultural goods. Thus, I utilize an alternative specification for treatment by using Cyclone Enawo in 2017 as the intervention of interest (Boone, Kaila and Sahn, 2022). In March 2017, the Enawo cyclone made landfall over the SAVA region and became the worst cyclone to hit Madagascar since 2004. The cyclone dramatically diminished the vanilla supply by ravaging crops, which caused another increase in prices.

Given the expectation that Cyclone Enawo stimulated crime in SAVA due to the ensuing increase in vanilla prices, coupled with damaging infrastructure along the coast and eliminating other opportunities employment, I run an alternative specification of the synthetic control using 2017 as the treatment year. I plot the average outcomes of the treatment unit and synthetic control units before and after the 2017 Enawo cyclone in Figure 7. The plot suggests that differences in observed outcomes for SAVA and for synthetic SAVA started occurring before the 2017 cyclone, and the pretreatment parallel trend condition

does not hold in this case. This lends credence to the original finding that adjustments to western consumer markets marked by Nestlè's policy change, not the Enawo cyclone, led to a disproportionate increase of crime in the SAVA region compared to all other regions in Madagascar.

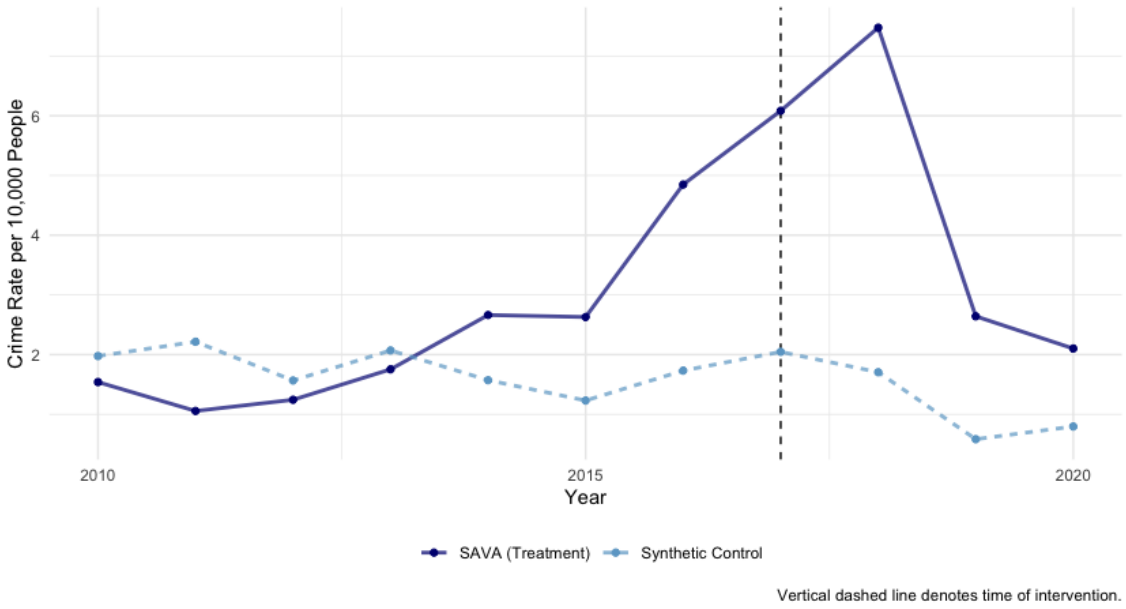


Figure 7: *Results of the synthetic control using the alternative treatment of Cyclone Enawo in 2017.*

## 5.4 Placebo Study

To check the credibility of my results, I conduct a placebo study by reassigning the treatment to a comparison unit, where I then obtain synthetic control estimates for regions that did not experience the intervention. Using this strategy, I am able to compare the estimated effect of the intervention on SAVA to the distribution of placebo effects obtained from other regions in the donor pool. I can be confident that the effect of the treatment on SAVA is significant if the estimated effect for it is unusually large relative to the distribution of placebo effects.

Figure 8 shows the ratio of the postintervention mean square predictive error (MSPE) and preintervention MPSE of SAVA as well as the other regions in the donor pool. MPSE measures the magnitude of the gap, or the lack of fit, between the outcome variable for any

particular country and its synthetic counterpart (Abadie and Gardeazabal, 2003; Abadie, Diamond and Hainmueller, 2010, 2015). The logic holds that, if the synthetic control fits the path of the outcome variable well, there will be a low MSPE pretreatment; if the synthetic control then diverges and fits the path of the outcome variable poorly in the post-period, there will be a high MSPE posttreatment. If both are true, then there is a meaningful effect due to the intervention. Alternatively, if the intervention had no or little effect, the unit of interest and its synthetic control should map onto one another fairly well in the pretreatment and posttreatment periods, yielding a lower MSPE.

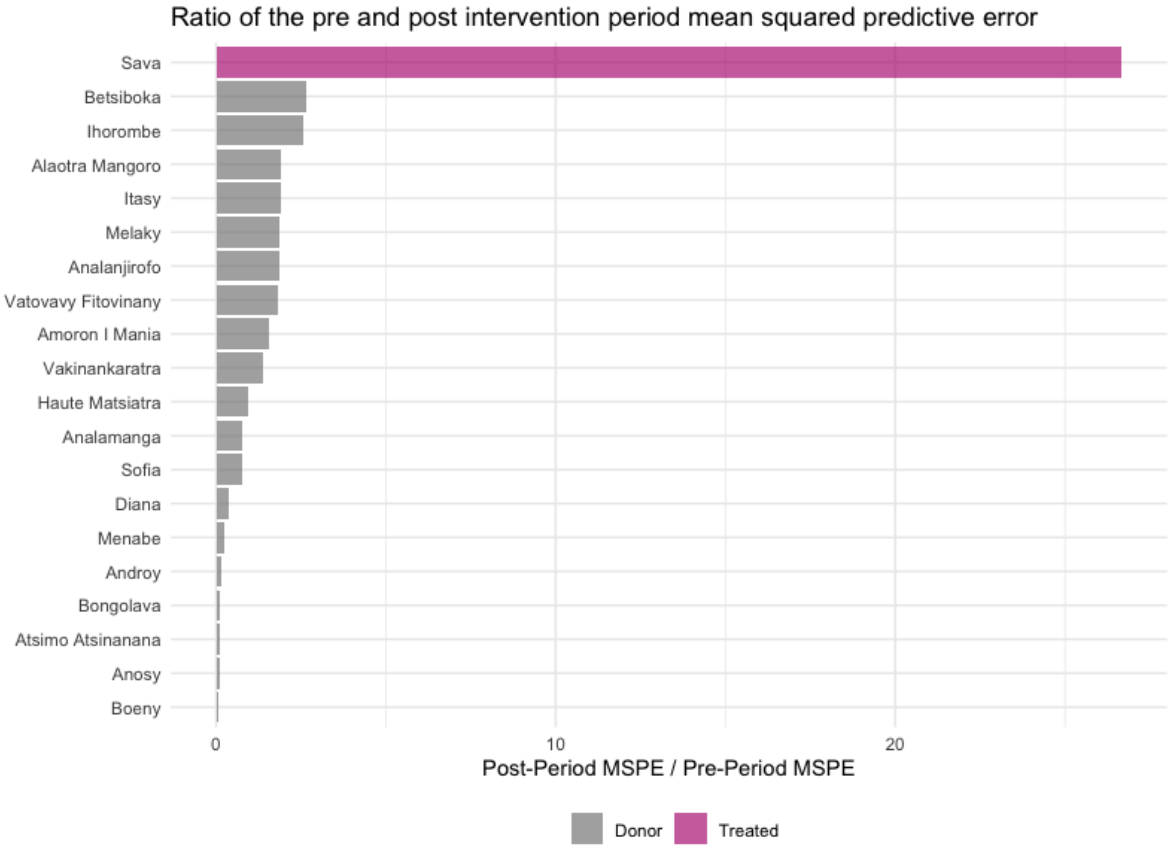


Figure 8: *Ratio of postintervention MSPE to preintervention MSPE for SAVA and control regions.*

As such, if the placebo units fit the data similarly as the primary unit of interest, then I cannot reject the hull hypothesis that there is no effect brought about by the intervention. However, in Figure 8, SAVA stands out as the country with the highest MSPE ratio, with the

posttreatment gap being over 25 times larger than the pretreatment gap. I can thus reject the null hypothesis and claim that the policy uniquely impacted the SAVA region compared to all other regions in Madagascar.

# 6 The Effect of Crime on Vigilantism in SAVA

Results from the synthetic control show that the 2015 policy leading to a sharp price increase for vanilla has a strong, positive effect on crime measured in terms of cases per 10,000 people. This finding supports H1 positing that, in areas of virtually no state capacity, a positive shock to Western consumer markets dominated by labor-intensive commodities will lead to an increase in crime in regions most impacted by the shock. However, results from the synthetic control model do not provide insight for H2, where I hypothesize that an increase in crime in areas of virtually no state capacity leads to vigilante violence as a form of protection, retribution, and justice.

In order for H2 to be true, I must be able to demonstrate that vigilantism is on the rise to protect farmers, to avenge victims of crime, and to ensure justice due to the lack of state in areas where vanilla is grown. There is no data on instances of vigilante justice, and it cannot be examined using quantitative methods. Instead, I use evidence from fieldwork carried out in September 2023 to lend credence to the claim that vigilante violence is indeed on the rise in response to vanilla crime as a form of protection, retribution, and justice.[9] I use participant interviews conducted in a fokontony (the smallest administrative unit in Madagascar) in the district of Andapa to address three main questions – first, did vigilante justice increase at the height of vanilla prices?; second, if vigilante justice did increase, why was it on the rise?; and third, if vigilantism increased due to low state capacity, how does vigilantism function as a substitute for the state?

[9]The following names of interviewees are anonymized.

## 6.1 Did Vigilantism Increase?

First, did vigilante justice increase at the height of vanilla prices? At the height of vanilla prices in 2018, interview participants confirm the results from the synthetic control that crime simultaneously increased, which means they have seen a decrease in crime as prices plummeted:

> `Toky:` There was [theft] but minor. None would risk prison time for a thing that is worth 200,000. When it was 1,000,000 more thieves did risk for prison.[10]
>
> `Manitiana:` It is really like that, when vanilla was expensive the farmers were insecure. Now it is cheap, none even guards the vanilla at the farm. Because, people do not want to steal since it's not expensive.[11]

Theft led to insecurity in the fokontony, as villagers heard about farmers or thieves being killed daily by vigilantes or criminals, respectively, on the radio.[12]

Farmers discussed two other nonviolent strategies for combating crime, though they conceded that these alternatives to vigilantism were ultimately ineffective. The first alternative to vigilantism is a phenomenon called tsiangalarana, which is a traditional or mystic belief that a criminal can die spontaneously if a person who knows who perpetrated a crime does not tell the rest of the village who the criminal is.[13] Using this method, villagers do not have to organize for retribution; instead, the perpetrator will still face punishment just by virtue of being known. Participants claimed that, although villagers wanted to adopt tsiangalarana as a strategy to prevent crime, it was ineffective and made farmers lose even more money for nothing.[14] Those who claimed that tsiangalarana was productive over-promised its efficacy.[15]

[10]Toky, vanilla farmer, focus group, Andapa, September 2023.
[11]Manitiana, vanilla farmer, focus group, Andapa, September 2023.
[12]Patrick, vanilla farmer, focus group, Andapa, September 2023.
[13]Manitiana, vanilla farmer, focus group, Andapa, September 2023.
[14]Patrick, vanilla farmer, focus group, Andapa, September 2023; Rado, vanilla farmer, focus group, Andapa, September 2023.
[15]Rado, vanilla farmer, focus group, Andapa, September 2023.

The second alternative to vigilantism is "booby trapping" the fields, either by setting up traps, painting the vanilla vine, or using a "vanilla tattoo" to imprint the farmer's initials on the bean.[16] However, farmers concede that these strategies do not effectively deter criminals. Because vanilla production is carried out primarily by smallholder farms, the average land a farmer holds is about one hectare. Using traps is dangerous because "it does know the owner or thief."[17] Farmers are at risk of getting injured from the traps as well. Once thieves take the vanilla, "the only way to track your vanilla if it is stolen is just a tattoo."[18] At that point, the beans can quickly advance along the supply chain, getting to the hand of the rabatteurs, commissionaires, collectors, and preparators.

## 6.2 Why Did Vigilantism Increase?

Second, given that vigilante justice did increase, why was it on the rise? Through interview evidence, it appears as if vigilantism was on the rise for two main reasons. On one hand, the *threat* of vigilantism increased because thieves are often villagers or family members.[19] A common instance of crime would be a brother or cousin that steals from the family's field and sells the beans at a high price to collectors. In these cases, groups within the fokotony coalesce to tell the criminal: "Don't do it again next time. This is your first warning. If you still commit crime, we will bring you to the justice."[20] The criminal can do penance by public service works, such as cleaning roads or fixing homes.[21]

On the other hand, the primary reason for the use of violence through vigilantism is one the rise is because of distrust for the hierarchy of the justice system:

> `Toky:` People do not have the hierarchy of justice. This is not only at the court, it starts from the commune. This kind of situation occurs at the commune, for

[16] See Figure A5 in the appendix for an example of the instruments used for tattooing.
[17] Felana, vanilla farmer, focus group, Andapa, September 2023.
[18] Patrick, vanilla farmer, focus group, Andapa, September 2023.
[19] Felana, vanilla farmer, focus group, Andapa, September 2023.
[20] Toky, vanilla farmer, focus group, Andapa, September 2023.
[21] Felana, vanilla farmer, focus group, Andapa, September 2023.

example threatening the owner of vanilla. You send the case to the gendarme, a similar situation happens, you bring it to the court, there again the worst justice system.[22]

`Andoniaina:` Vigilantism is caused by the lack of trust in justice. Despite all the evidence, the thieves are released when they come to the hierarchy of justice at the court. The people no longer trust the government. They would rather kill that person.[23]

Evidence overwhelmingly points to the lack of state capacity as the reason why members the community turn to vigilantism. Oftentimes this is lack of trust in the state stems from corruption. Villagers maintain that the Bureau National of Anti-Corruption, with their zero tolerance policy, is more a theory than a practice.[24] Indeed, although the gendarme must bring criminals to the courts of justice, thieves often negotiate bribes and have their cases dismissed.[25] In these cases, the thief is often released, later bragging about being free before stealing another farmer's vanilla.[26] Villagers agree that vigilantes must step in to fill in the role of the state.

## 6.3 How Does Vigilantism Substitute for the State?

Third, since vigilantism increased due to low state capacity, how does vigilantism function as a substitute for the state? Interview evidence suggests that vigilantism promotes fairness and administers justice when the state fails to do so. The minimum sentence for stealing vanilla is two years of prison, with a maximum of five years.[27] However, many people think this sentence is unfairly short:

[22]Toky, vanilla farmer, focus group, Andapa, September 2023.
[23]Andoniaina, vanilla farmer, focus group, Andapa, September 2023.
[24]Toky, vanilla farmer, focus group, Andapa, September 2023.
[25]Toky, vanilla farmer, focus group, Andapa, September 2023.
[26]Andoniaina, vanilla farmer, focus group, Andapa, September 2023.
[27]Felana, vanilla farmer, focus group, Andapa, September 2023.

> `Toky:` We hear about cattle theft in the South of Madagascar. There are regulation requires the thief to pay the cattle or there is severe punishment for death. So, the vanilla farming region should have similar regulations. The community sees that anyone who steals should be really locked up. But most of the time the case is different. That is why vigilantism happens.[28]

Villagers frequently alluded to anger not only with these short sentences, but how criminals are released from conviction and return to the village and brag about escaping punishment.[29] Even when villagers acknowledged killing criminals is not especially fair or proportional to the crime, they still conceded that it is one of the only effective forms of punishment:

> `Rado:` It's not fair but it's just a punishment from me personally.[30]

> `Manitiana:` For me, killing a person will never be fair. But the reason that there is vigilantism is because of the government system. They said do not beat. They farmers comply. But when you bring the issue to them, their system is not satisfying. As the thief who have a lot of money is ready to bribe the government to corrupt its system. The farmers do not want to kill a person, but the government pushes them to steal. The reason why the justice insists that the crime should be brought to them is so that they get money from the corruption. Killing a person is not fair, god hates it.[31]

Taken together, this evidence lends support to H2. First, I find that vigilantism is indeed on the rise in SAVA. Although alternative and nonviolent forms of punishment are possible, such as tsiangalarana, villagers claim that such passive ways to administer justice are ineffective. Second, I find that vigilantism is on the rise for two reasons. On one

[28]Toky, vanilla farmer, focus group, Andapa, September 2023.
[29]Toky, vanilla farmer, focus group, Andapa, September 2023.
[30]Rado, vanilla farmer, focus group, Andapa, September 2023.
[31]Manitiana, vanilla farmer, focus group, Andapa, September 2023.

hand, villagers use the threat of vigilantism when family members commit crime. On the other hand, villagers support the use of violent vigilantism because of the lack of trust in government. The hierarchy of justice is incoherent and ineffective, and members of the courts, gendarme, and police force are often corrupt and fail at their duties of ensuring justice. Third, vigilantism fills the vacuum of the state by promoting fairness when government structures fail to do so. Because minimum sentences for vanilla theft are so short and because criminals often are released shortly after being arrested, communities engage in extralegal justice.

# 7 Conclusion

In this article, I have explored the impact of changes to Western consumer markets on cycles of violence in areas where there is virtually no state capacity. In what is called the opportunity cost argument, prominent studies hold that an influx of capital to labor-intensive commodity markets leads to a decrease in crime when the state can step in to manage the newfound wealth. However, these studies fall short in explaining the link between price spikes and crime when the state is not present. I thus test two hypotheses – first, in areas of virtually no state capacity, a positive shock to labor-intensive commodities will lead to an increase in crime in regions most impacted by the shock; and second, an increase in crime in areas of virtually no state capacity will lead to an increase of vigilante violence.

I test this logic using the case of the Malagasy vanilla industry using a mixed-method approach. To test my first hypothesis, I use a synthetic control design by leveraging Nestlè's 2015 announcement that it would no longer use synthetic vanilla in its products as a plausibly exogenous shock to the market; to test my second hypothesis, I use novel data on interviews with vanilla farmers in the Andapa district of Madagascar. I find that the price shock had strong positive effect on rates of crime in vanilla-producing regions. As crime increases, communities are increasingly organizing for the purpose of extralegal justice by forming mobs to punish criminals who seek to plunder the vanilla industry.

These findings suggest a fascinating, yet sobering, trend in Madagascar that remains relatively unexplored. Although innovative qualitative studies have explored the nexus of market shocks and crime in the vanilla industry (Osterhoudt, 2020; Zhu, 2018), this study is one of only a few quantitative studies (Boone, Kaila and Sahn, 2022) that examines this phenomenon. Given the novelty of this case, there are limits to my analysis that may be addressed in future studies. First, I may more explicitly define the operationalization of crime with the data I utilize. Second, I may more concretely test the mechanisms that drive my findings, especially those of the synthetic control model. Third, I may take advantage of data innovations in Madagascar if covariates that could serve as time-variant predictors of crime are made available in the future.

Nonetheless, the MADACRIME data I introduce presents many avenues for further research in Madagascar. Research can explore if other conditions drive various types of crime, measured by acts of banditry, zebu crime, and vanilla theft. Subsequently, it could measure if different vigilante strategies arise in response to these various types of crime. Lastly, when the state does make arrests, MADACRIME accounts for the number of perpetrators who are convicted versus released. Future studies can focus on the impact of the low ratio of convictions on various economic and social outcomes in Madagascar.

Ultimately, this study is significant in understanding the impact of Western consumer markets on violence and the cycle of crime and civil resistance. It exposes the range of unintended consequences of consumer trends on areas of virtually no state capacity that produce and export lucrative labor-intensive commodities. In turn, this raises questions on the complicity of multinational corporations in driving crime in areas of little state capacity, the role of consumer trends in pushing multinational corporations towards potentially harmful policies, and the responsibility of the state to protect those most vulnerable to crime and violence.

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# A Vanilla Production by Country

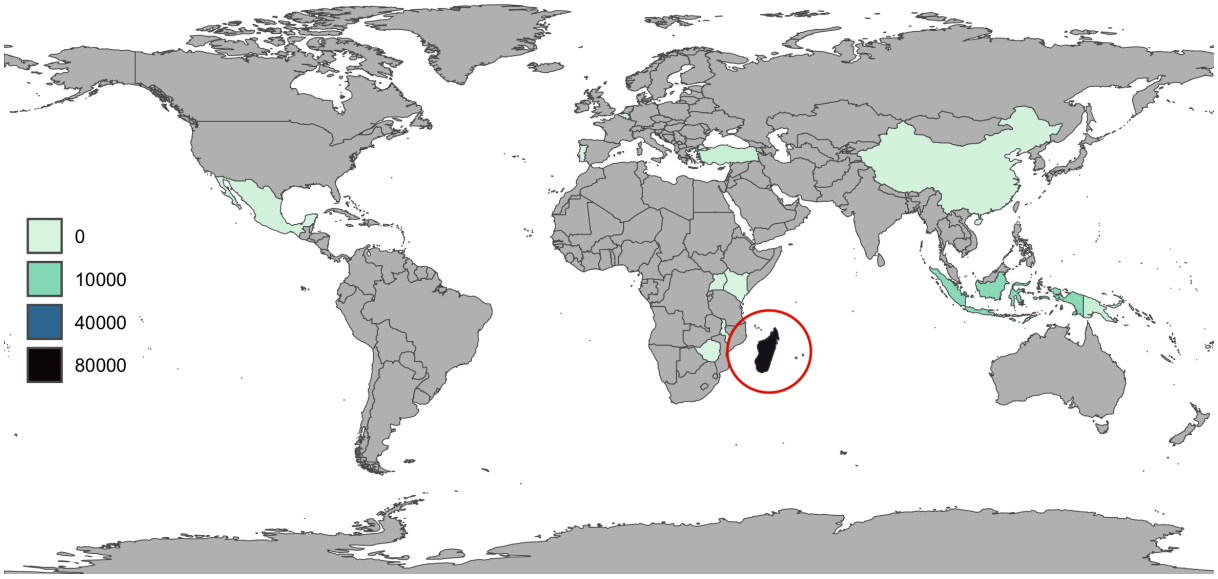


Figure A1: *Tonnes of Natural Vanilla Produced by Country*

# B Vanilla Production Timeline

Table A1: Timeline for vanilla production.

| Activity | Timeline | Description |
|---|---|---|
| Planting | The first flowering occurs 3 years after planting. | The main species of vanilla grown on Madagascar is *Vanilla planifolia*, which is a vine that needs support from trees (often called tutors), stakes, or trellises to grow. |
| Blossoming | Mid-September to Mid-December | Vanilla orchids produce racemes attached to the vine and grow upward toward the sunlight. Typically one flower blooms at a time with each raceme. |
| Pollinating | Mid-September to Mid-December | During blossoming, workers have 12 hours to pollinate. |
| Harvesting | June to July | The beans are ready to harvest when the tips become yellow. Pods are picked daily as soon as they are ready. |
| Blanching | Curing should begin within 1 week of harvest. | Blanching is a 2-3 minute process, where beans are placed over a wood fire at 65ºC. |
| Sweating | One to two days | Allows for oxidation and enzymatic hydrolysis, then the "sweated" vanilla beans are usually placed on wool blanket. |
| Drying | August to September | Using methods of either sun drying, shade drying, or rack drying, beans are removed for conditioning, sorting, and are straightened by hand. The beans are bundled by 50 beans, wrapped in wax paper, then placed in wax paper-lined, wood conditioning boxes. |
| Selecting | October to January | Culled by color, length, moisture content—the beans are sorted by quality category. |
| Conditioning | February to March | The beans are packed by categories. For extraction, moisture and vanillin content are most important. Lastly, the beans are given a final grading and packed for shipment. |

# C Afrobarometer Covariates for 2008, 2013, 2015, and 2018 Survey Waves

Table A2: Average responses for crime predictors in Afrobarometer surveys: 2008, 2013, 2015, and 2018.

| Variable | 2008 | 2013 | 2015 | 2018 |
|---|---|---|---|---|
| Access to an electricity grid | 0.26 | 0.26 | 0.33 | 0.23 |
| Access to piped water | 0.42 | 1 | 0.42 | 0.30 |
| Mobile phone | 0.61 | 0.60 | 0.48 | 0.20 |
| Internet | 0.11 | 0.11 | 0.15 | 0.27 |
| Motor vehicle | 0.04 | 1 | 0.09 | 0.12 |
| Received cash income in the past year | 2.42 | 2.41 | 2.25 | 2.52 |
| Education level | 2.59 | 2.58 | 2.99 | 3.13 |
| Employment level | 1.23 | 1.23 | 1.34 | 1.05 |

# D Robustness Checks: Alternative Specifications

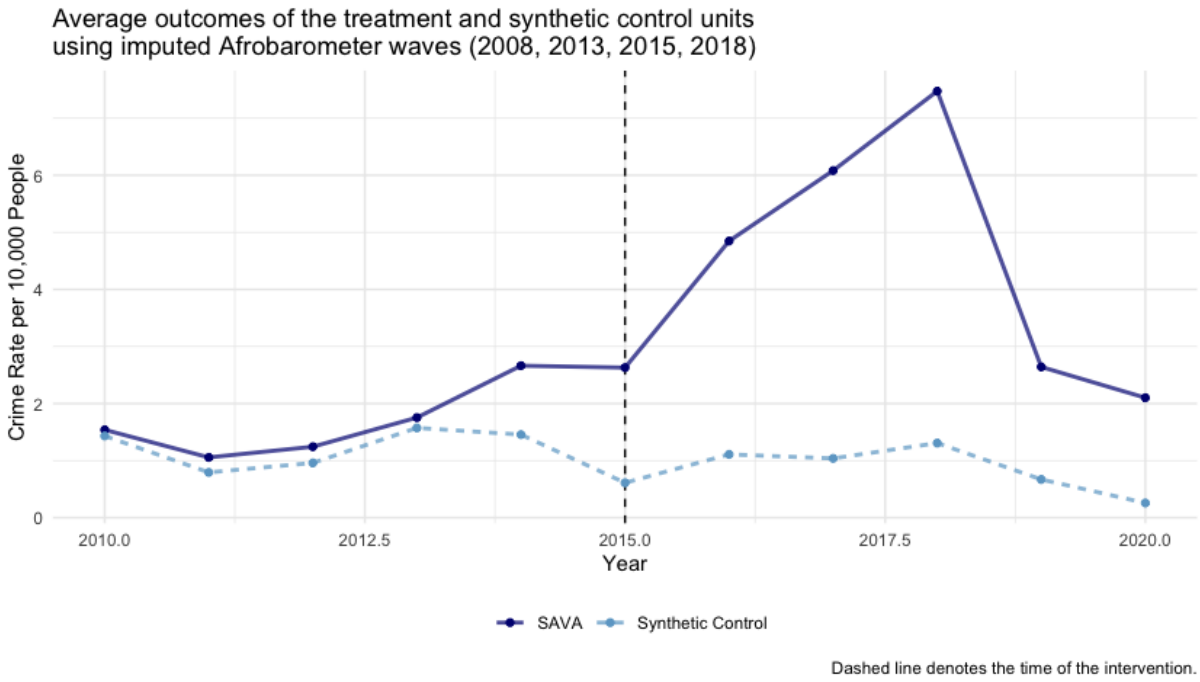


Figure A2: *Synthetic control results using Afrobarometer waves as covariates.*

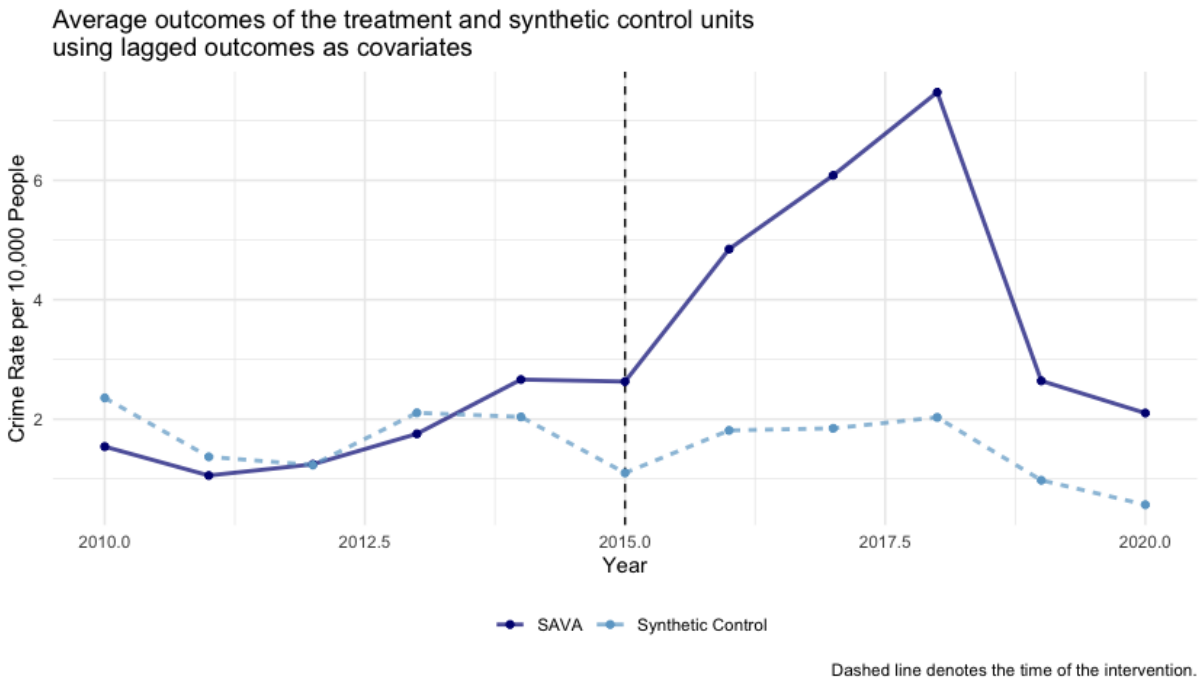


Figure A3: Synthetic control results using lagged outcomes as the covariates

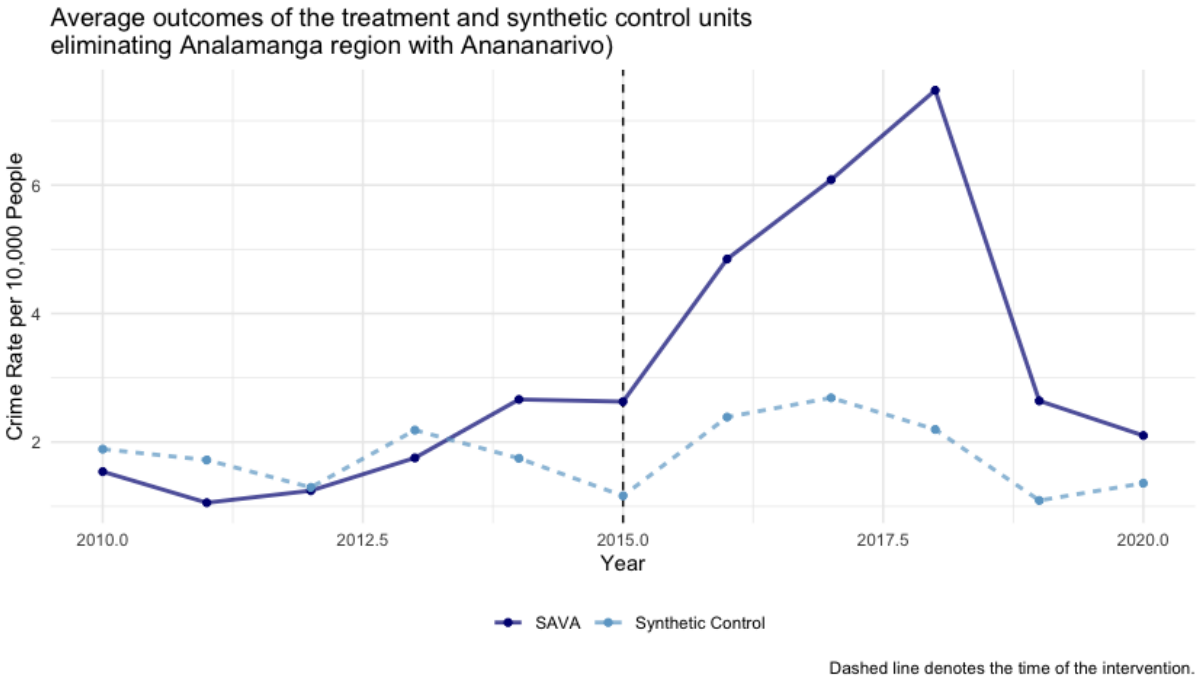


Figure A4: Synthetic control results removing Analamanga (Antananarivo)

# E Vanilla Tattoo

Figure A5: Instrument used to tattoo vanilla tattoo in order to protect crops from thieves.

# Chapter 4

# Getting to the Hereafter: Variation in the Survival and Transformation of Pro-Government Militias

## 1 Introduction

In February 2022, Russia invaded Ukraine, commencing a brutal war after what was the largest attack on a European country since World War II. The Wagner Group, a private military company acting on behalf of the Russian state, became known to be a particularly violent actor in the conflict (Rácz, 2020). Although the Wagner Group was not formally registered – *de jure*, it did not exist – the Kremlin employed it for the strategy of force multiplication and plausible deniability of atrocities. The Wagner Group became responsible for much of the egregious violence in the span of the conflict, such as being especially key in Russia's capture of Bakhmut after a six-month battle, a siege so devastating that media reports have referred to as a "meat grinder" (e.g., Beaumont, 2022) or "vortex" (e.g., Gibbons-Neff and Yermak, 2022).

Interestingly, the Wagner Group had origins beyond Russian soil (CSIS, 2020). In 2012, the Syrian government contracted two employees of a Hong Kong-based conventional Russian private military company, the Moran Security Group, to establish a fighting force to assist it in combating the Islamic State. What emerged was the Slavonic Corps, which started operations in Syria but had a short-lived tenure and disbanded in 2013, not long after

its inception. However, by the end of 2014, former Slavonic Corps members reorganized in Russia under former commander Dmitry Utkin. The Wagner Group thus emerged, fighting on behalf of the Russia state.

This example illustrates the risks that state-backed militias pose not only while they are officially active, but after they supposedly cease to exist. The attitudes and behaviors that underpin the distinct identity of armed groups are often incompatible with post-conflict societies and peace initiatives. And yet, there is a great degree of variation in the evolution of militias after they are meant to disband (Carey, Mitchell and Paula, 2022). In Peru's fight against the Maoist insurgent group Sendero Luminoso, the state ultimately armed and institutionalized the *rondas campensinas* peasant self-defense groups; with the decline of Sendero Luminoso, the state successfully demobilized and integrated members of the *rondas campensinas* into the state apparatus. In Guatemala's civil war from 1960 to 1996, civil defense patrols endured varying degrees of state sanction during periods of armed conflict, but by and large were endorsed by the government; with their disintegration, groups continue to operate as patrols across communities and serve as both instigators of abuses and protectors of order. Following the decades-long civil war in Colombia against the FARC, the demobilization and disintegration of the *autodefensas* was largely unsuccessful; the same networks continue to operate as counter-state entities and commit human rights violations.

A cohesive account of the divergent trajectories of these distinct violent non-state actors after they are meant to terminate remains relatively sparse. I therefore examine the survival and transformation of pro-government militias (PGMs)[1] by posing the following research question: what explains the survival of PGMs after they are meant to officially terminate; and, of those that survive, what explains the variation in the type of group they become? In other words, I seek to account for the overall survival and trajectories of PGMs.

[1]I adopt the operational definition of PGMs from Carey, Mitchell and Lowe (2013, 250), who define a PGM as a group that is: 1) pro-government or sponsored by the government (national or subnational), 2) not part of the regular security forces; 3) armed; and 4) has some level of organization. In accordance with Carey, Mitchell and Paula (2022), PGMs encompass other labels such as "militias," "paramilitary groups," "irregular forces," "death squads," or "vigilantes."

While scholars are increasingly grasping the impact such actors have in areas of instability such as their effect on recruitment, internal order, and governance over civilians, "the death... or political 'afterlife' of militias is unexplored territory" (Carey and Mitchell, 2017, 135). While the literature on the post-conflict transformation of rebel groups is expansive, only recently did the agenda of militias and conflict termination open up to new research. Scholars have recently examined the effect of wartime PGMs on the post-conflict world in terms of crime (Peña and Dorussen, 2021), postwar repression (Carey and González, 2021), and conflict recidivism (Fergusson et al., 2021). But an even narrower set of literature focuses specifically on the post-termination identities of PGMs. Although earlier work in this emerging agenda is valuable and innovative, the scholarship expectedly suffers from certain shortcomings due to the fact that this field of research is still relatively nascent. Scholars have justifiably bracketed their studies, typically falling into at least one of several camps – for example, focusing on single countries (Rickard and Bakke, 2021; Balta, Yüksel and Acar, 2022), focusing on PGMs that have either successfully persisted after conflict or completely disintegrated (Aliyev, 2019), or focusing on state rather than PGM behavior (Aliyev, 2019; Bolte, Joo and Mukherjee, 2021).

Based on the existing literature from violent non-state actors including paramilitaries, rebel groups, and vigilantes, I consider a range of variables and conditions that can be consequential in understanding the afterlife of PGMs. I draw on six frameworks to understand how PGMs may survive and subsequently re-mobilize and return to perpetuating violence: organizational structure, power sharing, government relation, group identity, conflict characteristics, and state capacity. In an inductive approach, I generate theoretical conjectures to explain the ways in which these frameworks may impact the likelihood of the survival of PGMs and how they influence the trajectory of what those PGMs that survive become.

To test my theoretical conjectures, I design the PGM Transformation (PGMT) Project to advance a multi-method program that accounts for the post-termination identi-

ties of PGMs. The PGMT Project provides an unique contribution to the study of non-state actors in conflict, and to the political violence literature more generally, by advancing original quantitative and qualitative data in a program that has had little empirical scholarship until now. First, the PGMT Project provides a quantitative dataset accounting for the post-termination identities of PGMs, which is compatible with other conflict datasets to offer scholars the scope for evaluating the evolution of PGMs from pre- to post-termination. For five years after a PGM terminates, I identify if it dissolved; and, if not, what identity it adopts after formal termination by classifying five broad categories – criminal groups, local defense groups, political groups, state forces, and counter-state groups. Second, I accompany the quantitative portion of PGMT Project with the PGMT Repository, a qualitative handbook that includes case notes for all PGMs in the dataset to facilitate opportunities for in-depth comparative case analyses. The resulting PGMT Project accounts for 325 PGMs that terminated between 1982 and 2017.[2]

Using original data from the PGMT Project combined with other variables sourced from existing datasets, I conduct a two-part analysis to address my research question. To address the first question of what explains the survival of PGMs after they are meant to officially terminate, I use a logistic regression. I find that structure within PGMs in terms of centralized command and outside PGMs in terms of increased state control over territory determines their likelihood of dissolution. However, PGM identity and ties to the state determines their survival. PGM identity not only in terms of the mobilization strategies a group relies on for membership recruitment, but also in terms of the social networks forged with communities through governing institutions explains its survival. Similarly, PGM ties to the state in terms of its strategic status and power-sharing measures explain its survival.

To address the second question of what explains the variation in the type of group a PGM becomes of those that do not dissolve, I use a multinomial logistic regression. Of those

[2]Note that the project captures PGMs that terminated between 1982 to 2017, not necessarily PGMs in conflicts that terminated. Respective conflicts can be ongoing. Further coding processes is in the design section introducing the Pro-Government Militia Transformation Project.

PGMs that survive, various explanatory factors illuminate the conditions under which we see groups turn to local defense, politics, states forces, or counter-state operations. PGMs may draw on existing hierarchical structures within the group to become a local defense entity, which operates in peripheral regions as the state consolidates control at the center. PGMs that maintain many governing institutions and that operate within long conflicts are likely to become political groups, for they already have the structures in place to maintain control over civilians. PGMs that maintain many governing institutions are less likely to become part of the state forces for the state would have to contend with existing structures to integrate them into the security apparatus, and thus semi-official PGMs are instead more likely to become part of state forces. Lastly, opportunities to become a counter-state group decreases as there is less contestable territory in the state.

The contribution of this project is therefore theoretical and empirical. First, in theorizing the afterlife of PGMs, I implicitly adopt a view of conflict that accounts for cyclical violence, where interactions among among state and non-state actors continue to reproduce the very conditions that lead to conflict. I trace group dynamics, behavior, and characteristics from times of conflict and crisis to when violent groups are assumed to terminate. However, violent groups do not always fully dissolve, and incompatibilities among state and non-state actors are reproduced across time and space. Second, to explore the conditions that lead to cyclical violence, I advance a empirical innovation with the PGMT Project. This project is the first to account for the afterlife of PGMs in terms of group identity. Using a multi-methods approach, I collect quantitative and qualitative data on post-termination PGM characteristics, such as whether PGMs transform into criminal groups, local defense groups, political groups, become part of the state forces, or counter-state groups. Together, the theoretical and empirical contributions of this project advance the study of PGMs by helping scholars understand the conditions under which militias reproduce violence.

# 2 Theorizing the Afterlife of Pro-Government Militias

Prewar characteristics undoubtedly influence a group's postwar transformation. For example, a group that originates as an adversary of the state, transforms into a PGM during conflict, then becomes a rebel group after conflict may not be surprising, such as what happened with Shura-e Nazar in Afghanistan from 1989 to 2001. Shura-e Nazar allied with the other mujahideen groups as a rebel force against the Soviet-backed regime of President Mohammad Najibullah until 1992, then became a PGM under the leadership of Burhanuddin Rabbani when he took power as the interim president from 1992 to 1996, then became a rebel group again as part of the mujahideen Northern Alliance against the Taliban after the fall of Kabul in 1996.

However, early scholarship provides insight for why we must consider wartime transformations. In cases such as Colombia, rebel and militia groups with the same resource endowments and similar financial bases ultimately behave differently, fundamentally due to the idiosyncratic imperatives each group needed to address in order to sustain their survival and growth during wartime (Gutiérrez-Sanín, 2008). To be sure, this tells us that the "social processes of civil war – the transformation of social actors, structures, norms, and practices – that sometimes leave enduring legacies for the postwar period" (Wood, 2008, 539) may mute prewar characteristics. Ideas, incentives, social networks, and exposure to violence may alter the identities of groups throughout conflict, and we therefore must pay attention to the transformational power of conflict and crises.

Because of the sparsity of literature on the afterlife of PGMs, I draw heavily on insight from studies on the transformation of rebel groups to help understand the variables and conditions that may be consequential for the post-termination life of militias. Specifically, existing literature identifies the following conditions that help explain post-termination transformations of violent groups: organizational structure, power sharing, government relation, group identity, conflict characteristics, and state capacity. Ultimately, the lack of existing clear expectations of PGM trajectories allows me to draw on these frameworks to

inductively generate broad theoretical conjectures about the afterlife of PGMs.

## 2.1 Organizational Structure

The first explanatory framework focuses on *organizational structure*. I adopt Parkinson and Zaks's (2018, 272) broad definition of organization, understood as a "collections of roles, linked by relations, which produce behaviors, to work toward goals within a given context." The dynamics that shape individual incentives to pick up arms, inform the decision to adopt violent or non-violent strategies, and influence armed group resilience during and after conflict occur to a large degree at the organizational level because organizational dynamics shape and constrain individual conduct.

While state and non-state armed groups alike produce violence during conflict, leaders confront a distinct set of challenges – including recruitment, control, governance, violence, and resilience – which in turn shape how members engage in collective violence (Weinstein, 2007, 40). Groups adopt procedures and structures that manifest at the organizational level to address these challenges. These structures could involve the services militants offer to create wartime social order (Arjona, 2014; Mampilly, 2011; Mampilly and Stewart, 2021). Mampilly and Stewart (2021) demonstrate the iterative process for how armed organizations must decide what institutions they will construct and how, which involves concerns such the degree of innovation for constructing governing institutions and how embedded these institutions should be in communities. Such decisions influence a group's capacity to provide stability, solve disputes, and offer public good and services (Mampilly, 2011). The ultimate goal of such organizational capacity is to forge a social contract not only among immediate group members, but with the civilians the groups govern, to establish order and control (Arjona, 2014).

Another way groups establish social order among ranks involves the hierarchical structure they develop within organizations (Gutiérrez-Sanín, 2008; Gutiérrez-Sanín and Giustozzi, 2010; Staniland, 2014). Groups develop unique organizational hierarchies to en-

sure their survival and growth, depending on strategic imperatives (Gutiérrez-Sanín, 2008). Such organizational structure is thus a product of co-evolution, where groups must organize in response to very different pressures from adversaries, civilians, and even the environment in which they operate (Gutiérrez-Sanín and Giustozzi, 2010). Variation in hierarchically-organized groups emerge from different combinations of horizontal ties between organizers and vertical ties between organizers and local communities in response to the organizational imperatives to maintain order and control (Staniland, 2014).

But studies have often disregarded these structures when trying to understand how militants transform after conflict. In what Zaks (2017, 4) calls the structural novelty assumption when understanding how rebels create political parties after conflict, "the post-war period is characterized by a scramble as former-rebels quickly acquire the personnel and resources to build a party from scratch." This means that studies often assume that armed groups haphazardly forge organizational routines and relationships that somewhat reflect those seen in a democratic society, which is problematic for two primary reasons. First, the structural novelty assumption erroneously takes all armed groups as homogeneous and fundamentally focused solely on combat. Second, the assumption disregards the tremendous effort of armed groups to overhaul existing wartime organizations and repurposing them for peacetime.

As such, studies on rebels and PGMs alike are increasingly accounting for the large degree of organizational resilience that goes unaccounted for. PGMs draw on informal (Rickard and Bakke, 2021) and formal (Balta, Yüksel and Acar, 2022) wartime institutions by mapping onto the organizational foundations necessary to maintain social order in the post-conflict environment. The structures that allow groups to carry out policing, recruitment, monitoring, punishing indiscipline, and providing the community with public and private goods during conflict are the shell of the very institutions that continue providing order after conflict. These groups that are more highly organized in conflict should be expected to have durable postwar channels for monitoring and mobilization; on the other

hand, groups that are less organized will be unable to accurately judge the extent to which groups still hold power over members (Daly, 2016).

The expectation is thus that highly-organized PGMs are more likely to persist after formal termination, whereas less-organized PGMs are more likely to dissolve. However, of those groups that persist, highly-organized groups are more likely to become local defense or counter-state groups because they can draw on existing structures of organization to re-mobilize.

## 2.2 Power Sharing

The second explanatory framework focuses on *power sharing*. In interviews with village guards that the Turkish government used to prevent attacks from Kurdistan Workers' Party combatants throughout the 1990s, Balta, Yüksel and Acar (2022, 8) find that PGM members "would prefer any peace to no peace, provided that they are not excluded from the peace negotiations and have continued security assurances and welfare benefits from the government." In other words, power sharing can transform relations from zero-sum to positive-sum in nature (Ottmann and Vülelrs, 2019). This tells us how the conditions of peace processes may inform the variation in the practices and attitudes of PGMs to a great extent.

The nature of postwar peace processes can betray the type of relationship that persists between the state and PGMs after conflict. States may find that dismantling militias in the post-conflict environment is appealing as a way for them to consolidate authority and avoid the risk of continued fracturing of their monopoly over violence (Mehler and Hartzell, 2019). However, the inclusion of PGMs in peace processes may in fact be a way to augment state power. In state-society literature, it turns out that "cutting deals with local strongmen" (Migdal, 1988, xv) may allow states to consolidate support in local communities. One way to appeal to these local strongmen is by partnering with local PGMs, thereby delegating some power to them as a roundabout way to regaining control over them. Power sharing ultimately alters the balance of power among state and non-state actors, reorders local power

relations, and mutes rivalries.

On the other hand, the exclusion of PGMs from peace agreements may speak to a state's attitude towards them, specifically their lack of legitimacy. By excluding certain actors from such agreements, power-sharing becomes restricted to "legitimate" actors, thereby shrinking the governing coalition (Mehler and Hartzell, 2019). In this scenario, excluded groups may be more likely to become spoilers in the peace process. The decision to resume violence happens for several reasons – the absence of PGMs from post-conflict agreements reduces their commitment to peace, it lowers the expected and real benefits from disarming, and it overshadows their former advantage of pursuing personal interests while being protected by the government (Steinert, Steinert and Carey, 2019). Simply put, such PGMs feel that "peace emerging from negotiations threatens their power, worldview, and interests, and use violence to undermine attempts to achieve it" (Stedman, 1997, 5). Thus, in practical terms, PGMs may remilitarize because the opportunity cost of re-arming is low (Joshi and Mason, 2011).

While interactions between power sharing and other explanatory variables likely exist – for example, perhaps highly organized groups are more likely to be included in power-sharing agreements – I theorize the independent effect that power sharing has on PGM trajectory. Specifically, the expectation is that PGMs that have more power-sharing measures with the state are more likely to persist after formal termination and pro-government militias with fewer power-sharing measures are more likely to dissolve. Of the PGMs that persist after formal termination, those that have more power-sharing measures with the state are more likely to become part of the state forces or political groups; those that have fewer power-sharing measures are more likely to become counter-state groups.

## 2.3 Government Relation

The third explanatory framework focuses on *government relation*. A fundamental difference between PGMs and many other violent actors in conflict is PGMs' distinct strategic role

with the state. During conflict, the strategic relationship between states and PGMs can most explicitly be seen if a state directly delegates violence to PGMs. States are often sensitive to the consequences of human rights abuses, risking loss of face in international politics and potentially losing out on alliances, financing, and public support. This means that states may exploit PGMs as a form of effective deniability as a means to avoid scrutiny for their own actions (Ahram, 2011; Mitchell, Carey and Butler, 2014; Carey, Colaresi and Mitchell, 2015). State agents thus delegate violence to non-state armed groups for several primary reasons – to exploit the comparative advantage some PGM actors have in using violence, to avoid direct confrontation and diplomatic fallout, to increase the credibility of their commitments, and to ensure that state preferences continue to be acted on even if state power wanes.

One observable implication of this strategic relationship is the degree of affiliation with the state – PGMs may be semi-official where the state oftentimes organizes or contracts out militias, or they may be informal where the militias may operate with relative autonomy without direct state guidance (Carey, Mitchell and Lowe, 2013). Semi-official militias are typically sponsored by the government in some way, or at the very least formed by it at their inception. These strategic links allows states to reduce the costs of violence, for the PGMs serving as a military arm can obfuscate the information flows that betray who is responsible for violence (Carey, Colaresi and Mitchell, 2015). In a post-conflict environment, the state may forego the need to use PGMs to escape accountability for violence, and in fact PGMs could risk the legitimacy of the state in the eyes of foreign actors. Moreover, integrating with the military demands a certain degree of organizational resilience within the state forces, and the state must be able to absorb PGM combatants with little disruption if it is meant to be a successful merger (Bolte, Joo and Mukherjee, 2021). Therefore, the state may be incentivized to ensure the lasting termination of PGMs.

Informal militias are not necessarily sanctioned by the government and operate with relative autonomy, separate from the state. Given the principal-agent framework, state are

less able to control these PGMs that have their own internal power dynamics, organisational aims, and strategic goals – although they are assumed to act behalf of the state they may not always behave in accordance with its wishes (Nelson and Petrova, 2023). Indeed, Nelson and Petrova (2023) demonstrate how informal PGMs are more likely to be spoilers of the peace process rather than risking their role becoming obsolete. Given informal PGMs' goal to continue surviving after their assumed termination and their incentive to dismantle the postwar peace process, one could assume they turn to more criminal or counter-state activities after conflict.

One could again theorize the interaction between government relation and other factors – to be sure, a PGM that is semi-official may be more likely to have power-sharing measures – though this may not always be the case because states may want to cut ties with militias once they are no longer strategically necessary. Thus a PGM's status would have an independent effect on post-termination processes. One would thus expect a PGM with a lesser degree of connections to the state is more likely to persist after formal termination and a PGM with a greater degree of connections is more likely to dissolve. Of the PGMs that persist after formal termination, those with a lesser degree of connections to the state are more likely to be criminal or counter-state groups.

## 2.4 Group Identity

The fourth explanatory framework focuses on *group identity*. An explanation focusing on group identity would ascribe a degree of agency to PGMs, which could be overlooked by asserting that structural factors such as organization and peace processes or state factors such as government relations are what determine a PGM's post-conflict identity. A theory of agent-structure relations would hold that the "existence of human agents are in some way necessarily related to a social structural context – that they are inseparable from human sociality" (Wendt, 1987, 355). This means that an agent's internal beliefs, preferences, and ideology constitutes structure, which in turn informs how this agent relates to the world

around it.

To be sure, Gutiérrez-Sanín and Wood (2014) tell us that that sidelining an ideational approach neglects the very conditions explaining much of the variation across armed groups. On one hand, identity can be instrumental – rallying around a common belief system serves group behavior by "socializing combatants with heterogeneous motivations into a coherent group, dampening principal-agent problems, prioritizing competing goals, and coordinating external actors including civilians" (Gutiérrez-Sanín and Wood, 2014, 213). But beyond this instrumental value of identity, it has intrinsic value. Identity guides behavior by its normative prescriptions on members, thereby influencing strategic decisions. In turn, identities prescribe different institutions and strategies such that certain belief systems provide a blueprint for organization itself. This is why, for example, Marxist insurgencies often embody similar organizational characteristics such as a party organization, indoctrination procedures, and sessions for self-criticism, or why Islamist terrorist organizations adopt strategies that adhere to an ideological interpretation of martyrdom not seen in other terrorist organizations (Schubiger and Zelina, 2017).

If agency is predominant, then a PGM's identity in terms of its belief system, ideology, religion, ethnicity, and so on will in part dictate how it adapts to conflict, and in turn how it transforms after conflict. Recruitment from local identity-based groups can spur mobilization for violence (Daly, 2016), though the very act of mobilization can further transform these networks (Wood, 2003, 2008). Tight networks can decrease the costs of initial collective action, but the act of engagement itself can reinforce the moral commitments and emotional engagements to sustain behavior (Wood, 2003, 18, 231). The continuation of affective mobilization during and after conflict can thus be a function of a shared understanding of moral commitments, resentment of subordination, and pleasure of agency for the thick networks from which they are a part.

One would thus expect that PGMs with strong identity-based mobilization strategies are more likely to persist after formal termination and PGMs with weak identity-based

mobilization strategies are more likely to dissolve. Of the PGMs that persist after formal termination, those with strong identity-based mobilization strategies are more likely become a local defense group in the subsequent post-conflict years.

## 2.5 Conflict Characteristics

The fifth explanatory framework focuses on *conflict characteristics*. Specifically, conflict duration and intensity can influence the prevalence of PGMs during and after conflict (Aliyev, 2019). A protracted civil war may make PGMs burdensome for the state and thus the government may prematurely disband them. Similarly, conflicts characterized by high levels of battle deaths implies that the state has lost control over the escalation of violence and thus is more likely to terminate PGMs in an attempt to curb violence and once again gain control. However, this official termination may not mean that a PGM will necessarily dissolve.

In protracted and intense conflicts, the principal-agent framework between PGMs and states can break down, and a group can reorganize to compete against the state that attempted to dissolve it. To be sure, side-switching, defections, and group fragmentation can serve as both a cause and consequence of protracted and intense conflicts (Seymour, 2014; Kenny, 2010; Kalyvas, 2008; Staniland, 2012). We thus may be more likely to see PGMs persist after states attempt to terminate them in protracted and intense conflicts, though they may reorganize to counter the state or to engage in other extra-legal behavior.

## 2.6 State Capacity

The sixth explanatory framework focuses on *state capacity*. A Weberian state is that which is able to maintain a monopoly of violence over a given territory (Weber, Gerth and Mills, 1946) – in other words, it must not only be able to ensure security, but it must have the capacity to protect private property rights, impose and collect taxes, and to make and enforce binding rules (Migdal, 1988, 19).

While violence creates states (Bates, 2001; Tilly, 1992; Rasler and Thompson, 1985),

strong states are that which can control violence through the institutional development that drives state formation itself. Institutions and bureaucracy emerge through war, and these innovations in the practices of the state – particularly in terms of enumeration, bureaucratic organization, and the outward expansion of administrative capacity from the center to the periphery – serve to rein in violence (Bates, 2001). The ability of states to continue controlling violence depends on the structure and maintenance of relationships among powerful individuals, as mediated by such institutions and organizations (North, Wallis and Weingast, 2009). Modern societies create open access to economic and political organizations, fostering political and economic competition to ultimately control the use and effects of violence. As these institutions control the deleterious effects of violence, they similarly become a determinant of growth as a state becomes more incentivized to maintain and increase revenue.

The expectation thus holds that higher levels of state capacity will allow states to quell dissent, leading to PGMs effectively disbanding. The PGMs that persist are likely to be a result of weak state capacity, and will likely to counter the state in the post-conflict environment.

# 3 The Pro-Government Militia Transformation Project

Through inductive theory-building, I seek to understand the effect of organization, identity, and the structural characteristics of the environment in which militias operate on the transformation of PGMs, which I further illuminate through empirical testing. Thus, to test my theoretical conjectures, I design the Pro-Government Militia Transformation (PGMT) Project. The PGMT Project is a multi-methods project that accounts for 325 PGMs that terminated between 1982 and 2017. The quantitative component includes group-level data on the post-termination identities of PGMs by first recording the specific identity a group adopts after it is meant to officially terminate, then classifying these identities into five

broad categories. I accompany the quantitative dataset of the PGMT Project with the PGMT Repository, a qualitative handbook that includes case details and records the logic behind coding decisions in the data collection process of the project.[3] As such, the PGMT Project's multi-method contribution facilitates large-$N$ cross-national analyses as well as small-$n$ comparative case analysis.

## 3.1 Selection Criteria

The PGMT Project builds upon Carey, Mitchell and Paula's (2022) Pro-Government Militia Database (PGMD) 2.0 (hereafter the "PGMD"). The PGMD identifies over 500 PGMs in a cross-national dataset accounting for PGMs that existed from 1981 to 2014. Because the PGMT Project explores the post-termination nature of PGMs, I eliminate groups that have not yet undergone official termination. I include groups that have officially terminated given PGMD coding, though this does not necessarily mean that the associated conflicts have ceased; that is, though the PGMs have terminated, the conflicts or events they are associated with may be ongoing. The PGMT Project thus covers termination years 1982 to 2017.[4]

The PGMD identifies 308 PGMs that terminated between 1981 and 2014. However, some PGMs have endured fragmentation events after they terminate, and each subsequent group may adopt a distinct identity. Of the 308 terminated militias in the PGMD, I identify 12 PGMs that splintered in the years after their recorded terminations, resulting in an

[3]For each case, the handbook discusses the context for all coding decisions by including: 1) each variable coded; 2) the source/location where the information was retrieved such as website links, article links, and book titles; 3) a brief explanation why it was coded that way; and 4) a discussion if there is any discrepancy in values from different sources, any uncertainty with the value included, or any assumptions made.

[4]Although the selection criteria for the PGMT Project starts with the PGMD and eliminates groups that have not terminated as of 2014, the PGMT Project identifies three militias that terminated after what was recorded in the PGMD. These militias are all in Libya – the Al-Qa'qa' Brigade (PGM ID 597) the Al-Sawa'iq Brigade for Protection (PGM ID 598), and the Special Deterrent Force (PGM ID 600). The PGMD claims the Al-Qa'qa' Brigade terminated in 2014, though I find that it terminated in 2015 according to the Sukhairat Agreement. The PGMD claims the Al-Sawa'iq Brigade for Protection terminated in 2014, though I argue that the group terminated in 2015 according to the Sukhairat Agreement, and they protected the National Transitional Council who were replaced in the peace agreement. The PGMD claims the Special Deterrent Force terminated in 2014, yet there are sources that claim that the PGM was still active in at least 2017, though further proof does not exist after 2017.

additional 17 groups that emerged from these fragmentation events.[5] As such, the PGMT Project includes 325 PGMs with termination years 1982 to 2017.

## 3.2 Dependent Variable

The most significant contribution of the PGMT Project is its careful identification of the afterlife of PGMs, accounting for how a group's functions may be repurposed in a way that allows it to persist yet behave in an operationally different manner from its conflict identity. While the unit of observation is the group, PGMs may adopt multiple identities over time, especially after they are able to regroup after initial incoherence with the end of conflict. For example, both the Johnson and Kromah factions of the United Liberation Movement for Democracy in Liberia first transformed from PGMs to rebel groups before fully disbanding about a year later, and the Sudanese state did not integrate the United faction of the Sudan People's Liberation Movement/Army until two years after the civil war had ended.

In accounting for the dynamic nature of postwar PGMs, especially after the first year of termination, I record the identities of PGMs yearly for the five years after a group technically terminates. There are empirical and practical reasons for this decision rather than accounting for more or fewer post-termination years. Empirically, Bolte, Joo and Mukherjee (2021) tell us that most of the variation of militias' fate after civil war happens in the first five years, when militias are more likely to engage in military integration, disintegrate, or continue in some form, and after this time period the PGMs that have not regrouped will most likely not reemerge. Practically, though one may consider accounting for ten years

[5]In order for groups to count as splinter factions, they must continue to exist as a coherent group with some level of organization. This means that splinter groups are often named with a distinct leader; I do not include factions that splintered but immediately dissolve. Groups that splinter include Seleka in the Central Africa Republic (PGM ID 582), Baltageya in Egypt (PGM ID 620), Fedayeen Saddam in Iraq (PGM ID 230), Badr Brigade in Iraq (PGM ID 235), the Muttahida Qaumi Movement in Pakistan (PGM ID 183), the Equatoria Defence Force (EDF/Khartoum) in Sudan (PGM ID 167), the South Sudan Defence Forces (SSDF) in Sudan (PGM ID 259), the Sudan People's Liberation Movement/Army – Nasir Faction (SPLM/A-Nasir) in Sudan (PGM ID 262), the Sudan People's Liberation Movement/Army – United (SPLM/A-United) in Sudan (PGM ID 265), the South Sudan Unity Movement/Army (SSUM/A) in Sudan (PGM ID 266), the Sudan People's Liberation Movement/Army - United Lam Akol (SPLM/A-United Lam Akol) in Sudan (PGM ID 646), and the Arrow Militia in Uganda (PGM ID 201).

after conflict, such as what Carey and González (2021) do in their analysis by including short-term (five year) and long-term (ten year) effects, collecting data for more than five postwar years is extremely difficult due to data sparsity. Given difficulties related to data availability when collecting information on violent actors in civil war, group-year data for the five post-termination years still offers a significant contribution to the study of PGMs.

Therefore, for the five years after a PGM terminates, I identify if it dissolved; and, if not, what identity it adopts in its post-termination life. In addition to dissolution, I identify five broad categories for the post-termination identities of PGMs: criminal groups, local defense groups, political groups, state forces, and counter-state groups.

The first category is *criminal groups*, including cartels, street gangs, and groups engaged in petty crime. Cartels are those that seek to monopolize a market for criminal gain, such as the Kuretong Balaleng Gang in the Philippines. Street gangs are those that seek to control a certain territory or turf, such as the West Side Boys in Sierre Leone. Groups that engage in petty crime such as Jatiyatabadi Chhatra Dal in Bangladesh are involved in criminal activity such as extortion, armed robberies, or wildlife theft though do not necessarily seek to monopolize a market or control territory.

The second category is *local defense groups*, including vigilante groups, self-defense groups, or private security groups. Vigilante groups enforce or punish perceived offenses without legal authority, such as the Anambra State Vigilante Group (also known as the Anitsha Vigilante Group or the Bakassi Boys) in Nigeria or the Sandinista Popular in Nicaragua. Self defense groups such as the Kamajors in Sierra Leone or the Grey Wolves in Turkey are similar to vigilante groups but are associated with a specific community, such as a region or ethnic group. Local groups hire private security forces, such as Mohammed Qasim Fahim (semi-official) in Afghanistan, to protect a certain population or area.

The third category is *political groups*, including national political parties or groups that hold local power positions. I record those that become represented political parties on the national level, such as the Kurdistan Democratic Party and the Badr Organization

in Iraq. PGMs that maintain local power are those that maintain positions of power and representation at the local level but may not be represented at the national level, such as the Ghana Private Road Transport Union in Ghana or the Popular Committees in Egypt.

The fourth category is *state forces*, including groups absorbed by the state military or police, or those that are used as private contractors. Groups absorbed by the state military such as the semi-official Civilian Defence Patrols in Guatemala or the Paramilitary Self Defence Groups (also known as the semi-official Death Squads) in Colombia are under the command of the state military and takes orders from it. However, the PGM can maintain its own unit and even its own leader, but as long as it is under the command of the state military and takes orders from it. Groups absorbed by the police include the Green Berets in Bosnia or the Sungu Sungu in Tanzania, which are used as for law enforcement and security. Private contractors neither are part of the military nor the police, such as the Slavonic Corps in Syria, yet they are employed by the state as a for-hire armed force

The fifth category is *counter-state groups*, including rebel groups, terrorist groups, or cults. Rebel groups such as the Revolutionary United Front in Sierra Leone or Jaysh al-Mujahideen and Jama'at al-Tawhid wal-Jihad (al-Qaeda) in Iraq use violence to oppose the established government to incite political change or to establish, maintain, or to gain independence. Terrorist groups such as the September 11 Command in Chile or the Tripoli Military Council in Libya are organized clandestine entities that use unconventional means to terrorize citizens as a political statement aimed at the state. Cults such as Ilagas Sagrado and Corazon (also known as Tadtad) in the Philippines are controlled by charismatic leaders exercising divine authority over members to combat the state.

Figure 1 presents the distribution of PGMs that dissolve between 1982 and 2017. The figure visualizes the number of PGMs that dissolve in time $t = 0$ and never return to the sample in the subsequent five years. This tells us that 194 PGMs, 60% of the sample, dissolved and 131 PGMs, 40% of the sample, survived at least for one year. The figure further visualizes the survival times of the 131 PGMs that survive for some time after their

supposed terminate. Of the 131 PGMs, 109 survived for all five post-termination years and 22 dissolved at some point in the five post-termination years, $t = 1$ to $t = 5$.

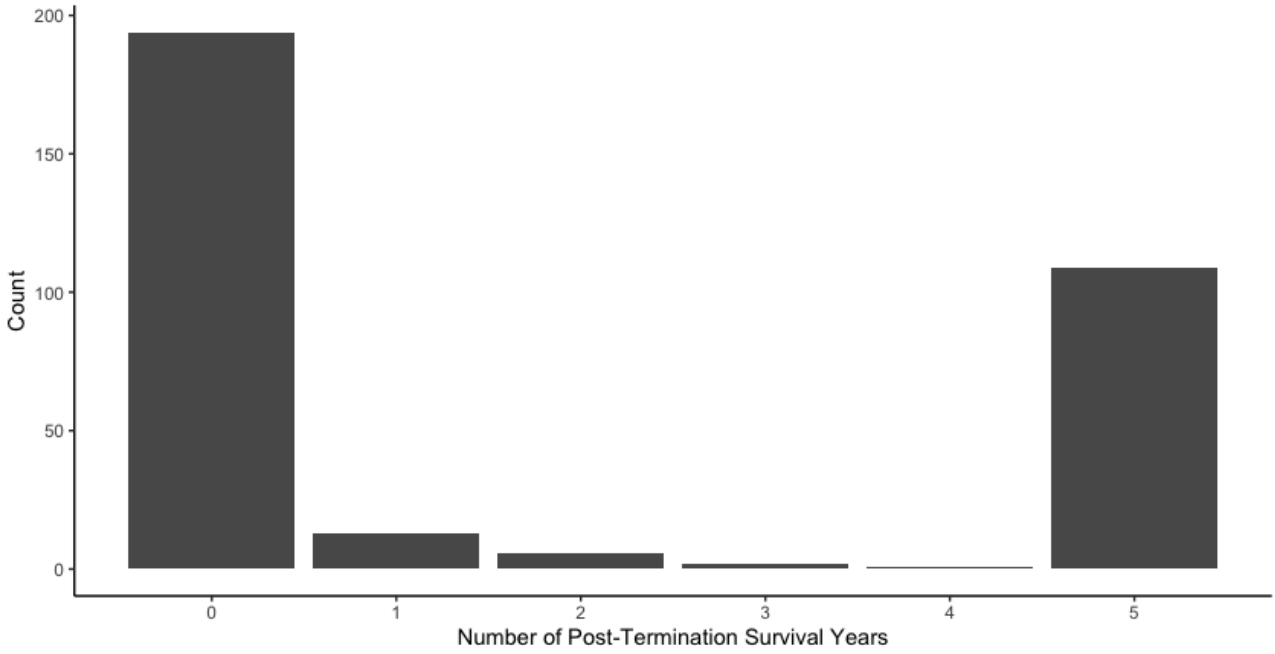


Figure 1: The number of PGMs that dissolved in time t=0 and never returned to the sample versus the number of PGMs that survived at some point in time t=1 to t=5. Of those that survived, the plot presents the number of years they survived from time t=1 to t=5.

Of the PGMs that survive, I visualize variation in identity at the PGM-year level of analysis in Figure 2. Because I account for the post-termination identity of the 325 PGMs for five years, the PGMT Project ultimately captures 1,625 total post-termination PGM-years. Of these 1,625 PGM-years, there are 591 observations where the PGM is not dissolved. Plot A in Figure 2 presents these 591 PGM-year observations by capturing the distinct identities PGMs adopt, which are classified in five categories. Plot B collapses these identities by capturing just the broad post-conflict PGM categories I identify in the PGMT Project. Of the 1,625 post-termination PGM-years, 1,064 dissolved while the remaining 591 become 17 criminal groups, 79 political groups, 84 local defense groups, 178 counter-state groups, and 233 state force groups.

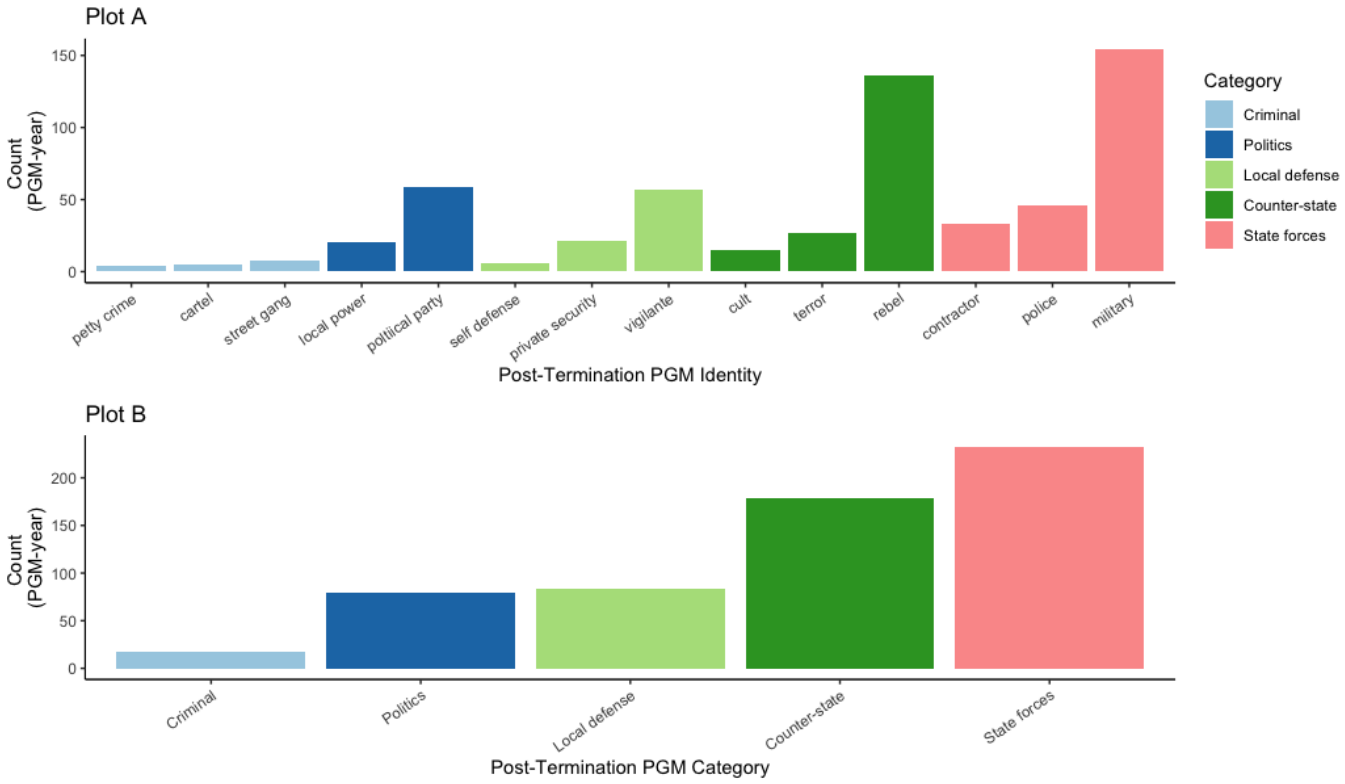


Figure 2: Plot A presents the distribution of post-termination PGM-year identities for those that were not dissolved. I identify 14 identities the PGMs could adopt, which I then classify in five broad categories. Plot B presents the distribution of the five broad categories only for each PGM-year that was not dissolved.

## 3.3 Independent Variables

I derive data for my independent variables from a variety of sources, including hand collection for the PGMT Project and using existing datasets such as the PGMD and other sources.[6] Although the values for these independent variables may change during the course of the PGM's existence before it terminates, the variables I use are time-invariant.[7] The

[6]Additional datasets primarily include the Government and Armed Actors Relations Dataset (Otto, Scharpf and Gohdes, 2020), the Uppsala Conflict Data Program (UCDP) Conflict Termination Dataset (Kreutz, 2010), the UCDP Peace Agreement Database (Pettersson and Öberg, 2020), the Peace Agreement database and dataset (Bell and Badanjak, 2019; Bell et al., 2019), and Varieties of Democracy (Coppedge et al., 2024; Pemstein et al., 2024).

[7]Though the independent variables are time-invariant, I account for them at various times in the lifespan of the PGM. For example, I account for the organizational structure variables as close to the termination of the PGM as possible, as I believe it is the structure of the group close to the time of its formal termination as most consequential in how it can use these structures in its afterlife. Conversely, I account for the power

decision to include time-invariant independent variables have practical reasons similar to those expressed by Zaks (2023) in her article on rebel-to-party transformations. The novelty of the PGMT Project is the conceptualization of the dependent variable, for PGMs are inherently difficult to gather data on given that they are typically not one of the primary warring groups in conflict. Thus, collecting time-variant data on the dependent variable is novel, and collecting time-variant data on the independent variables is an time-intensive yet innovative undertaking for future research. Table 1 provides summary statistics of the independent variables.[8]

I operationalize organizational structure using two measures, *command structure* and *governing institutions*, which I hand collect for the PGMT Project. *Command structure* captures the configuration of power and authority within a group or organization, which lies on a spectrum including centralization, decentralization, and factionalization (Popovic, 2017). Centralized organizations are vertically oriented, typically with a clear central leadership and hierarchy and with a strong central command. Decentralized organizations are horizontally oriented where commanders and members have stronger local ties. Factionalized organizations have some constituent factions of the overall organization operate autonomously from the leadership and can veto the central organization's command, carve out parallel organizations within the wider parent organization, and carry out monitoring and recruitment independently. I measure command structure on a ordinal scale where factionalization in 1, decentralization is 2, and centralization is 3.

*Governing institutions* captures the structures that PGMs may form during conflict for governance. I draw on Zaks's (2023) conceptualization of proto-party structures to define governing institutions as those subdivisions that contribute to a stable and functioning organization. I use organization-level data on whether a given PGM had structures dedicated to governance and administration, educational provision, health services, facilitating commu-

sharing variable at the time of termination itself. Though this variable can change after a PGM terminates, I claim that initial power-sharing measures effects its trajectory over the next five years. I provide more details below as I discuss the specific coding procedures for each measurement.

[8]Figure A1 in the appendix provides a correlation matrix for the primary independent variables.

nity outreach groups, and political messaging. Administrative structures refers to security provision, regulating taxation and market transactions, land and resource allocation, and dispute resolution. Educational structures refers to education for noncombative roles, including primary and secondary education, skills training, or vocational schools. Health structures refers to hospitals and food allocation. Community outreach refers to the provision of welfare or aid to civilians, such as in response to a natural disaster or an enemy attack, and it may take a variety of forms such as food, money, or agricultural aid. Political messaging refers to systems dedicated to managing the creation and distribution of the group's core ideology. Given these variables, I create a composite index that is additive and unweighted, for there are no theoretical reasons to justify the relative importance of one domain over the other (Zaks, 2023). The final measure is a dummy taking on a 1 if the PGM formed one or more governing institutions and a 0 if there were no governing institutions.

I operationalize power sharing using a measure called *inclusion* that I hand collect for the PGMT Project. I first identify the post-conflict peace agreement from the Peace Agreement (PA-X) database and dataset (Bell and Badanjak, 2019; Bell et al., 2019), if present. Using the agreement, I measure the presence of power sharing along four component parts – political power sharing, military power sharing, economic power sharing, and territorial power sharing (Mehler and Hartzell, 2019, 8-9). Political power sharing involves offering political concessions to armed group leaders, such as cabinet or legislative seats, or the opportunity to form political parties. Military power sharing involves offering senior military positions to armed group leaders as well as guaranteeing armed group representation in the state's security forces. Economic power sharing involves reserving certain jobs to armed group members, allowing them to participate in the licit economy. Territorial power sharing involves allowing territorial concessions to armed groups, allowing them to operate at least semi-autonomously in certain areas. I create an additive 0 to 4 ordinal measure accounting for the extent of power sharing between the state and the PGM, with 0 indicating no power sharing and 4 indicating power sharing on all dimensions. The final measure is a dummy

variable taking on a 1 if there were one or more power-sharing measures between the state and PGM and a 0 if there were no power-sharing measures.

I operationalize government relation using a measure called *semi-official* derived from the PGMD. This variable takes on a 0 for informal militias and a 1 for semi-official militias. According to Carey, Mitchell and Lowe (2013), semi-official militias are typically sponsored by the government in some way, or at the very least formed by it at their inception. Informal militias are not necessarily sanctioned by the government and operate with relative autonomy, separate from the state.

I operationalize group identity using three measures derived from the PGMD to capture the main characteristic that distinguishes the majority of PGM members. The first measure, *ethnic membership*, identifies groups where members are recruited along ethnic lines, though does not imply that they are recruited from only one ethnic group. The second measure, *ideological membership*, identifies groups where members share a common ideological identity or a common ideological goal. The third measure, *religious membership*, identifies groups where members are recruited along religious lines. Each variable is a dummy, and because the measure captures the main characteristic of PGM membership based on recruitment along ethnic, ideological, or religious lines, a PGM cannot have multiple identities.

I operationalize conflict characteristics using two measures, *duration* and *intensity*, which I source from the Uppsala Conflict Data Program/International Peace Research Institute (UCDP/PRIO) Armed Conflict Dataset (Gleditsch et al., 2002; Davies, Pettersson and Öberg, 2023). *Duration* is a continuous variable to capture the number of years from the conflict or associated event start to the termination year of the PGM. There are three notable coding conventions for the *duration* variable. First, some PGMs are associated with a long-standing conflict that spans years of dormancy. For example, I list that the conflict duration for the Democratic Karen Buddhist Army in Myanmar (Burma) as 1949 because it emerges as a function of the ongoing Keren conflict. The Democratic Karen Buddhist Army terminated in 2010, meaning the conflict it is associated with had a 61-year duration at the

time of its termination. Second, some conflicts do not experience much active violence at all. This is the case, for example, for the Gladio PGMs, which have a conflict start date of 1947, signifying the beginning of the Cold War. Third, some PGMs are not necessarily associated with a conflict at all and emerge during skirmishes, border disputes, contested elections, and so on. For example, many PGMs in Indonesia emerged and terminated in 1999 with the announcement of President Bacharuddin Jusuf Habibie that an independent ballot would take place. I attempt to account for the relevant event that explains the emergence of the PGM with the duration variable. *Intensity* is a dummy variable that codes whether the conflict or associated event since onset until the termination of the PGM has exceeded 1,000 battle-related deaths.

I operationalize state capacity by a set of measures from the Varieties of Democracy (V-DEM) Dataset (Coppedge et al., 2024; Pemstein et al., 2024) including *revenue source*, *GDP per capita (GDPpc)*, and *controlled territory*. *Revenue source* is an ordinal measure from 0 to 4 to capture the sources of revenue the central government primarily relies on to finance its activities – 0 measures when the state is not capable of raising revenue to finance itself and 4 measures when the state primarily relies on taxes on economic transactions and/or taxes on income, corporate profits, and capital. *GDP per capita* measures the median value of the latent per capita GDP to distinguish between rich and poor societies. *Controlled territory* measures the percentage of the territory the state has effective control. This captures the extent to which a state has the preeminent authority – or hegemonic control – over its territory.

## 3.4 Controls

I include two additional variables as controls – *geopolitical region* and *cold war*. I borrow *geopolitical region* from V-Dem. The measure is a tenfold geopolitical classification of world regions, based on both geographical proximity and demarcation by area based on a regional

understanding of democratization.[9] *Cold war* is a dummy variable that takes a 0 if the PGM terminated before the end of the Cold War and a 1 if the PGM terminated at or after the end of the Cold War.

Table 1: Summary statistics for independent variables.

| Variable | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| **Organizational structure** | | | | | |
| Command structure | 325 | 2.560 | 0.658 | 1 | 3 |
| Governing institutions | 325 | 0.249 | 0.433 | 0 | 1 |
| **Power sharing** | | | | | |
| Inclusion | 325 | 0.062 | 0.241 | 0 | 1 |
| **Government relation** | | | | | |
| Semi-official | 311 | 0.302 | 0.460 | 0 | 1 |
| **Group identity** | | | | | |
| Ethnic membership | 325 | 0.302 | 0.460 | 0 | 1 |
| Ideology membership | 325 | 0.197 | 0.398 | 0 | 1 |
| Religious membership | 325 | 0.102 | 0.303 | 0 | 1 |
| **Conflict characteristics** | | | | | |
| Duration | 325 | 17.218 | 13.763 | 0 | 61 |
| Intensity | 325 | 0.523 | 0.500 | 0 | 1 |
| **State capacity** | | | | | |
| Revenue source | 316 | 2.793 | 1.152 | 0 | 4 |
| GDPpc | 316 | 5.718 | 6.501 | 0.309 | 46 |
| Controlled territory | 316 | 81.476 | 14.296 | 42.8 | 100 |
| **Controls** | | | | | |
| Geopolitical region | 316 | 4.516 | 2.133 | 1 | 9 |
| Cold War | 325 | 0.923 | 0.267 | 0 | 1 |

## 3.5 The PGMT Repository

The primary data collection challenge of this project rests on how it is an example of what Hoover Green and Cohen (2021, 2) call "desk research" in political violence, or "the process of collating and coding existing information for analysis, without direct contact between researchers and research participants – in this case, victims, perpetrators, and witnesses

[9]The ten geopolitical regions include: (1) Eastern Europe and post-Soviet Union, (2) Latin America, (3) North Africa and the Middle East, (4) Sub–Saharan Africa, (5) Western Europe and North America, (6) Eastern Asia, (7) South–Eastern Asia, (8) Southern Asia, (9) the Pacific, and (10) the Caribbean.

of political violence."[10] While desk research in political violence helps researchers circumvent ethical concerns about direct interactions with vulnerable people, there are still ethical considerations that impact the epistemological and ontological validity of the data such as production transparency, false precision, and bias in publicly available data.

I address these challenges in three primary ways. First, I make the PGMT Project codebook readily available in the Coding Ontology in the appendix. The codebook not only outlines the project workflow, but most notably it describes how project researchers address issues of uncertainty and assumptions in the data collection process. Second, the PGMT Repository highlights the coding decisions researchers made for each case. The PGMT Repository therefore offers not only a qualitative archive for all the cases in the PGMT Project, but it provides transparency for the coding decisions in the dataset by highlighting areas of uncertainty or assumptions made in the data collection process. Third, researchers triangulate information from existing datasets, primary sources, and reputable secondary sources to collect data. Although this does not overcome all issues related to collecting data based on publicly available sources, it is the most reasonable strategy at mitigating the effects of bias that come from a single source.

Despite these strategies in overcoming challenges related to desk research, I recognize the shortcomings of the data gathered in the PGMT Project, especially related to availability bias and to rough quantitative measurements. However, carrying out desk research in general is one of the most accessible methods in collecting political violence data, avoiding the ethical quandaries of directly engaging with those exposed to or engaged in violence. Furthermore, Hoover Green and Cohen (2021) highlight the mitigation measures I adopt as a best practice for researchers to move towards more ethical and transparent desk research-based data.

[10]See Conducting Desk Research in the appendix for further discussion of the processes and challenges of desk research related to this project.

# 4 Results

Using this novel data, I conduct a two-part analysis to assess my research question. To address the first question of what explains the survival of a PGM after its official termination, I use a logistic regression. To address the second question of what explains the variation in the type of group a PGM becomes of those PGMs that do not dissolve, I use a multinomial logistic regression.

## 4.1 Post-Termination Survival Versus Dissolution

What explains the survival of PGMs after they are officially meant to terminate? To address this question, I use a logistic regression. The dependent variable, *survival*, takes on a 0 if the PGM permanently dissolved after its intended termination and a 1 if the PGM survived for at least one of the five years after its intended termination. Figure 1 displays the distribution of the dependent variable, where 194 PGMs take on a 0 and 131 PGMs take on a 1.

Table 2 presents model results in terms of average marginal effects (AME).[11] Model 1 provides the main model to estimate the causes of PGM survival by including the primary explanatory variables, and Model 2 estimates the causes of PGM survival by including the primary explanatory variables as well as control variables. A negative coefficient indicates a unit decrease in the probability of a PGM surviving after its formal termination, whereas a positive coefficient indicates a unit increase in the probability of a PGM surviving after its formal termination.

First, organizational structure presents variable significant results depending on the measure. As a PGM has a higher level of organization in terms of *command structure* we see a negative association with survival, though as a PGM has a higher level of organization by maintaining *governing institutions* we see a positive association with survival. Figure 3 presents the predicted probabilities of these findings.

[11] Table A1 in the appendix includes results in terms of log-odds.

Table 2: Dissolution versus survival logistic regression
average marginal effects (AME)

| | *Dependent variable:* | |
|---|---|---|
| | survival | |
| | (Model 1) | (Model 2) |
| command structure | $-0.155^{***}$ (0.043) | $-0.136^{***}$ (0.042) |
| governing institutions | $0.148^{**}$ (0.060) | $0.144^{**}$ (0.061) |
| inclusion | $0.575^{***}$ (0.189) | $0.526^{**}$ (0.173) |
| semi-official | $0.115^{**}$ (0.056) | 0.079 (0.054) |
| ethnic mem. | $0.194^{**}$ (0.075) | $0.210^{***}$ (0.074) |
| religious mem. | $0.344^{***}$ (0.093) | $0.323^{***}$ (0.092) |
| ideological mem. | $-0.080$ (0.156) | $-0.056$ (0.138) |
| duration | 0.002 (0.002) | $0.004^{*}$ (0.002) |
| intensity | $-0.098$ (0.063) | $-0.080$ (0.064) |
| GDPpc | 0.006 (0.007) | $-0.025^{*}$ (0.012) |
| revenue source | 0.026 (0.002) | 0.101 (0.029) |
| controlled territory | $-0.006^{**}$ (0.002) | $-0.004$ (0.002) |
| fac(Latin America) | | $-0.361^{***}$ (0.109) |
| fac(N. Africa & Mid. East) | | $-0.064$ (0.105) |
| fac(Sub–Saharan Africa) | | $-0.455^{***}$ (0.094) |
| fac(W. Europe & N. America) | | $-0.802^{***}$ (0.080) |
| fac(Southeast Asia) | | $-0.613^{***}$ (0.093) |
| fac(Southern Asia) | | $-0.347$ (0.119) |
| fac(The Pacific) | | $-0.321$ (0.247) |
| cold war | | 0.031 (0.109) |

*Note:* $^{*}$p<0.1; $^{**}$p<0.05; $^{***}$p<0.01
Standard errors in parentheses.

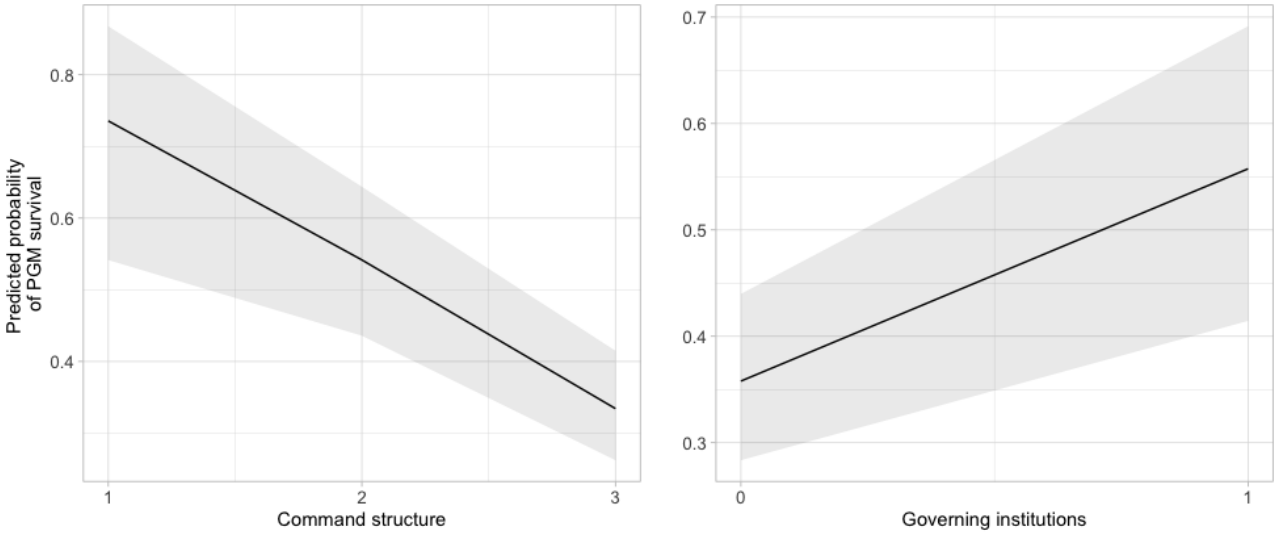


Figure 3: Predicted probability results of organizational structure from logistic regression model with 95% confidence interval.

I posit that we see this divergence in results because the two ways of operationalizing organizational structure have different implications for group incentives. *Command structure* measures the hierarchical configuration of power within a group, where a centralized command system approximates the highest level of organization. However, a centralized command system with a high command-and-control centralization can lead to instability in times of transition when the leader abandons the group and it ceases to exist without clear orders from top command. This is what happened, for example, with the Ismaili militia in Afghanistan and the Front for the Advancement and Progress of Haiti (FRAPH) (Carey, Mitchell and Paula, 2022). Sayed Mansour Naderi led the Ismaili militia until the Taliban took over Afghanistan in 1996, after which he fled the country, thereby leading to the ultimate dissolution of the PGM. Similarly, Emmanuel "Toto" Constant formed the FRAPH in 1993 to combat supporters of former president Jean-Bertrand Aristide, who was ousted in a military coup, and supported the regime of General Raoul Cédras who came to power. The CIA supported Constant and even provided him with a salary to maintain the PGM, though the United States eventually returned Aristide to power. Once payments to Constant ceased, he abondoned his support for Cédras and enabled the dissolution of the FRAPH.

*Governing institutions*, on the other hand, measures the structures in place to govern both members and civilians alike. These institutions become sticky over time, making them difficult to dissolve with the PGM's formal termination, such as what occurred in Northern Ireland through the Troubles (Rickard and Bakke, 2021). Loyalist paramilitaries emerged to protect Protestant communities against Republican paramilitaries, especially in working class areas where state forces were ineffective or slow to protect the community. Loyalist groups took on community policing roles, especially by administering informal justice, infamously in the form of kneecappings. The Troubles ended with the Good Friday Agreement, yet these working-class communities felt abandoned by the Unionist elite. They have turned to the Loyalist paramilitaries for policing and justice even until present day, drawing on the institutions that guaranteed them order during wartime and continue to have the same function in peacetime.

Second, power sharing has a positive and significant effect on the survival of PGMs – as the predicted probabilities in Figure 4 demonstrate, a PGM is more likely to survive after its intended termination if there are more power-sharing measures between the state and militia. The leading example of this is Fedayeen Saddam in Iraq, where the group maintained political, military, and economic power sharing measures with the state. Instead of dissolving, Fedayeen Saddam fractured into disparate groups – Jaysh al-Mujahideen, Jama'at al-Tawhid wal-Jihad, the Islamic State of Iraq, and the Kurdistan Democratic Party – and continued operations into the post-termination years.

However, the standard error for this finding is quite large, which implies a great degree of uncertainty in this result. I posit that we can derive this degree of uncertainty from the lack of variation in the *inclusion* measurement, thereby failing to offer much explanatory power. While 305 PGMs have no power-sharing measures with states, only 20 PGMs have one or more power-sharing measures. Nonetheless, this offers a fruitful avenue for future studies to explore the puzzling presence of power-sharing measures between PGMs and states – if power sharing between PGMs and states is so uncommon, what explains the cases where we

see it occur?

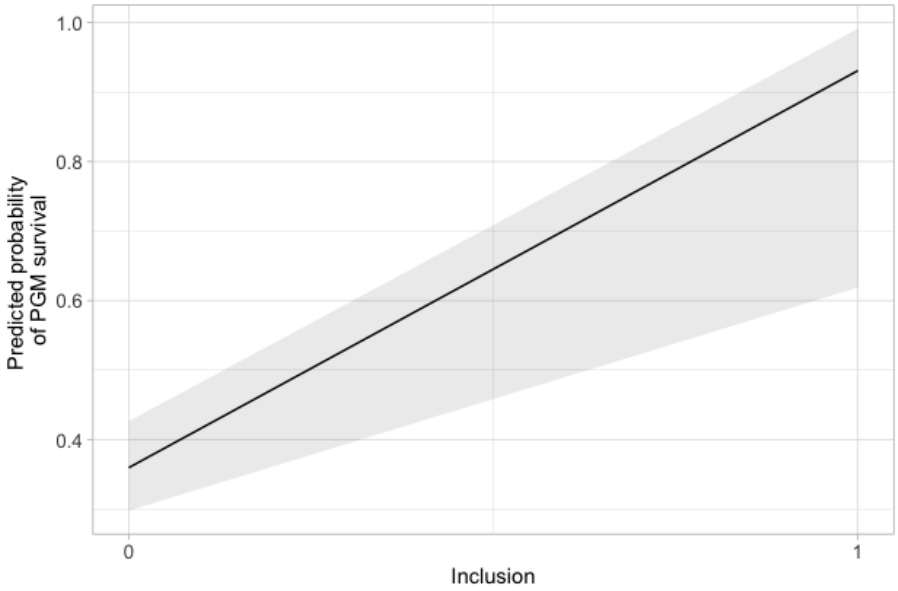


Figure 4: Predicted probability results of power sharing from logistic regression model with 95% confidence interval.

Third, government relation has a positive and statistically significant effect on the survival of PGMs, and *semi-official* PGMs are more likely to survive after their intended termination compared to informal PGMs. While one may speculate that the driving force of this result is the possible correlation between semi-official status and organizational structure, a correlation test yields significant yet weak results – the correlation coefficient between semi-official status and command structure is 0.05 and between semi-official status and governing institutions is 0.21. Semi-official status thus uniquely impacts the likelihood of PGM survival, as seen with the predicted probabilities in Figure 5 – informal PGMs have about a 35% probability of surviving while semi-official PGMs have about a 50% probability of surviving. This is true, for example, of the Arrow Militia in Uganda (Carey, Mitchell and Paula, 2022). The Ugandan state maintained the semi-official status of the PGM when they first created it to support the army in containing Lord's Resistance Army rebels. After its formal termination, the state integrated Arrow Militia members into both the army and part of the police force's Anti-Stock Theft Unit to further aid the state in anti-crime ventures.

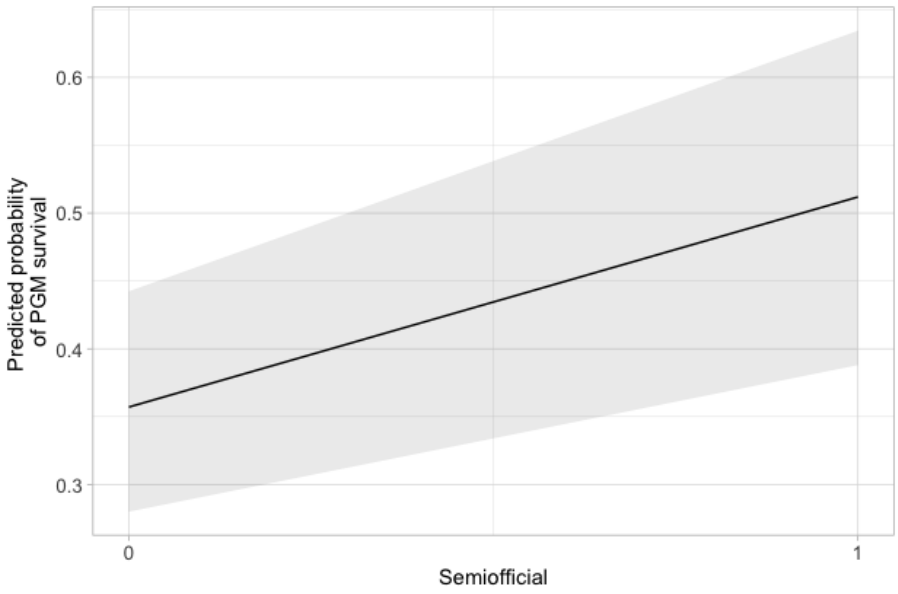


Figure 5: Predicted probability results of government relation from logistic regression model with 95% confidence interval.

Fourth, group identity has a positive and statistically significant effect on the survival of PGMs, but only in terms of *ethnic membership* and *religious membership*. Figure 6 presents the predicted probabilities of these findings. While a group that is not based on ethnic or religious membership has a just under a 40% probability of surviving, groups that are based on ethnic or religious membership have a 65% and 80% probability of surviving, respectively. Ultimately, these results tell us that that PGMs with strong identity-based mobilization strategies when it comes to ethnicity or religion are more likely to persist after formal termination

Alternatively, PGMs based on *ideological membership* have a negative coefficient but is not statistically significant. For example, we see this outcome with several anti-communist PGMs in the Philippines that emerged in the late-1980s, including KADRE and the National Alliance for Democracy (Carey, Mitchell and Paula, 2022). Pastor Jun Alcover, a former Maoist leader himself, formed KADRE to fight communist guerillas in the Cebu region of the Philippines. Alcover later was responsible for facilitating the National Alliance for Democracy, an umbrella organization of 120 anti-communist vigilante groups. Though

these groups ultimately functioned as part of President Corazon Aquino's "total war" policy against communists, they eventually fully dissolved with a change of government, when Benigno Aquino III became president in 2010.

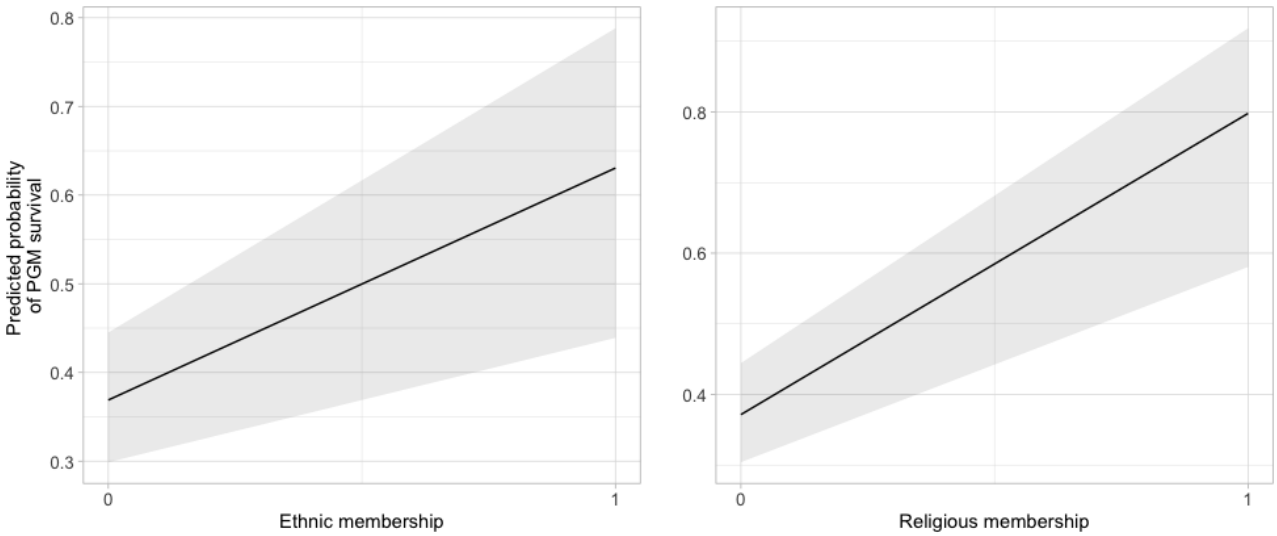


Figure 6: Predicted probability results of group identity
from logistic regression model with 95% confidence interval.

I posit two reasons why ideology yields a different outcome than ethnicity or religion. The first potential reason why ideology may yield disparate results is because, like that of *inclusion*, there is little variation in ideological membership, and thus we see large standard errors for this measure – only 5% PGMs in the sample are based on ideological membership. However, there is similarly little variation for ethnic membership (20%) and religious membership (10%), and thus I do not believe it is only the slight amount of variation driving this difference.

Thus, the second potential reason why ideology may yield disparate results than ethnicity or religion lies in the broader scholarly debate of the mobilizing role of ideology more generally. Indeed, scholars have long debated the demonstrative effect of ideology – while some claim that ideology has undeniable effects on political violence (Leader Maynard, 2019; Gutiérrez-Sanín and Wood, 2014; Basedau, Deitch and Zellman, 2022; Schubiger and Zelina, 2017), others claim that the role of ideology is overstated. Indeed, ideology can

be shallow and purely instrumental, ubiquitous and therefore not able to offer explanatory power. The cleavages that emerge can bear little resemblance to the drivers of violence in the first place (Kalyvas, 2003). While I do not claim that ideology has no practical effect on PGMs, this finding suggests it is dynamic and the role of ideology can change throughout the life of a PGM. For example, as Basedau, Deitch and Zellman (2022) find, immaterial assets can be a mobilizing factor of armed violence, though the role of ideology can change at the end of a group's lifespan and other structural or material factors can temper the effects of ideology.

Fifth, conflict characteristics in terms of *duration* and *intensity* do not have a significant effect on the dissolution of PGMs. Although this goes against expectations that PGMs that operate in a long and intense conflict environment are more likely to persist after formal termination, it is not altogether surprising. As stated, there are several observations that I take into account when adopting coding conventions for the relevant event that explains the emergence of the PGM – some PGMs are associated with a long-standing conflict that spans years of dormancy, some conflicts do not experience much active violence at all, and some PGMs are not necessarily associated with a conflict at all and emerge during other types of violent or non-violent events. Thus, because I capture a range of disparate types of events using these measures, it is difficult to make a generic claim for the effect of duration and intensity on PGM dissolution.

Sixth, state capacity has a significant only in terms of *controlled territory* – as the predicted probabilities in Figure 7 demonstrate, a PGM is less likely to survive as a state exercises uncontested control over more of its territory. While PGMs emerge for various reasons, two of the primary reasons are to protect a state's national borders and integrity and to aid the state in fighting insurgents seeking to control the state. To be sure, in the PGMT Project, the purpose of approximately 40% of the PGMs is to protect territory and the purpose of approximately 50% of the PGMs is to fight insurgents.[12] Other common

[12]Note that the coding of the PGMD 2.0 does not make the "purpose" of PGMs mutually exclusive categories.

reasons why PGMs emerge include providing self-defense and security (35%), protecting the leader (22%), gathering intelligence (10%). Because the majority of PGMs emerge to secure territory and protect it from rebel groups, it is not surprising that PGMs are more likely to dissolve as the state has uncontested control over more territory.

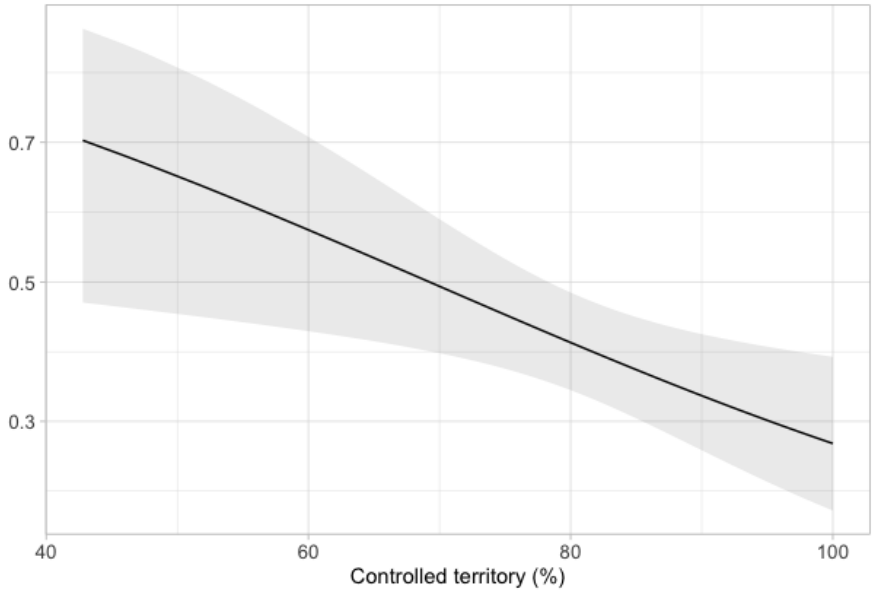


Figure 7: Predicted probability results of state capacity
from logistic regression model with 95% confidence interval.

However, the two other measures for state capacity – *revenue source* and *GDPpc* – present positive, though insignificant, findings. I posit that we see this divergence in results because of the implications for different measures of state capacity. On one hand, states can have strong fiscal capacity – even strong states have PGMs, and PGMs are not necessarily an indication of a weakening level of state capacity. For example, the majority of Western European states participated in Operation Gladio, leading to the emergence of groups from U.S.-directed clandestine network aiding the CIA in intelligence gathering during the Cold War. In fact, PGMs may emerge as a tool for strong states to further project their power in crises, such as with the Wagner Group in Russia, and thus in the wake of a PGM's formal termination a state can continue using it for its needs instead of compelling the militia's dissolution. This highlights the difference, for example, between what Aliyev (2016) calls

"state-parallel" militias versus "state-manipulated" militias – state-parallel militias operate parallel to the state but are beyond its control, whereas state-manipulated militias are those directly employed by the state when it is strong enough to maintain control over the militias.

Together, these logistic regression results tell us that, while structure determines the likelihood of PGMs permanently dissolving after its formal termination, PGM identity and ties to the state determines their survival. I advance three main takeaways from the AME results to highlight this conclusion. First, structure within and outside a PGM determines its likelihood of dissolution. A group's increasing hierarchical power configuration will make it less likely to survive after conflict because of its vulnerability when top leadership abandons the group after its formal termination. Increases in the amount of territory over which a state exercises hegemonic control makes the PGM more likely to dissolve, as states may no longer need the PGM as a force multiplier to maintain control over territory. Second, group identity helps explain the conditions under which a PGM survives after formal termination. This is true not only of the mobilization strategies a group relies on for membership recruitment, but also in terms of governing institutions. Indeed, as the Northern Ireland example tells us (Rickard and Bakke, 2021), PGMs build governing institutions in local communities to fill in for the state when it is absent. Iteration reinforces these ties over time, and communities and PGMs are able to build strong social networks that persist after conflict. Third, ties to the state likewise helps explain the conditions under which a PGM survives after formal termination. On one hand, this can mean the strategic ties that PGMs have with the state in terms of maintaining a semi-official status. On the other hand, this can mean political, economic, or military ties through power-sharing measures between the PGM and state.

## 4.2 Variation in Post-Termination Identity

Of those PGMs that survive, what explains the variation in the type of group they become? To address this question, I use a multinomial logistic regression.[13] The dependent variable,

[13]Alternative models considered include a vector autoregression (VAR) model, which would otherwise allow me to model the relationship between multiple time series variables. However, one assumption of VAR

*PGM identity*, is a nominal variable that can take on one of the five categories of post-conflict PGM identity – criminal groups, local defense groups, political group, state forces, and counter-state groups. To create *PGM identity*, I identify the groups that survived until the fifth year after its formal termination. Figure 1 displays the number of groups that dissolved in first through fourth years after a PGM's formal termination year. Of the 131 that survive after the formal termination, only 22 dissolve before the fifth post-termination year, which I eliminate from the sample.[14] Another six PGMs change identity between years one to five, though I only account for their identity in the final year.[15] Thus, the multinomial logistic regression examines the post-termination identity of 109 PGMs, which includes 15 local defense groups, 15 political groups, 48 groups absorbed in state forces, and 31 counter-state groups. Criminal groups exit the sample.

Table 3 presents multinomial logistic regression results in terms of group-average marginal effects (G-AME)[16] for Model 3, my main model estimating variation in post-termination PGM identity by including the primary explanatory variables. Table 4 provides G-AME results for Model 4, a multinomial logistic regression estimating variation in post-termination PGM identity by including the primary explanatory variables.[17] A negative coefficient indicates a unit decrease in the probability of a PGM becoming that particular type of group in its post-termination life, whereas a positive coefficient indicates a unit increase in the probability of a PGM becoming that particular type of group in its post-termination life.

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models is that the outcome variable is ordinal, which my data violates. Nonetheless, there is little change in PGM identities from years one to five, and therefore using a multinomial logistic regression does not lose much analytical purchase compared to an alternative time-series model.

[14]Table A2 in the appendix lists these PGMs, and the year they dissolve.

[15]Table A3 in the appendix lists these PGMs, and the identities they take on from $t = 1$ to $t = 5$.

[16]G-AME results are used to understand how the effect of an independent variable varies across different groups or levels of a categorical variable. The goal of G-AME results is to examine the average change in the dependent variable associated with a one-unit change in the independent variable across all groups of the categorical variable. This interpretation allows us to assess how the effect of the independent variable differs across these groups without necessarily comparing them to a specific reference category. Thus, in interpreting G-AME results, there is no reference category for the dependent variable. Instead, each group serves as its own reference point, allowing for comparisons within and between groups. Table A4 in the appendix presents multinomial logistic regression results in terms of log-odds.

[17]Table A5 in the appendix presents multinomial logistic regression results in terms of log-odds.

Table 3: Variation in PGM identity multinomial logistic regression group-average marginal effects (G-AME)

| | *Dependent variable:* | | | |
|---|---|---|---|---|
| | PGM identity (Model 3) | | | |
| | Local defense | Political | State forces | Counter-state |
| command structure | 0.144* (0.086) | −0.007 (0.056) | −0.068 (0.081) | −0.069 (0.078) |
| governing institutions | 0.022 (0.087) | 0.058** (0.089) | −0.185* (0.109) | 0.105 (0.118) |
| inclusion | 0.022 (0.087) | −0.023 (0.114) | −0.154 (0.139) | 0.212 (0.155) |
| semi-official | −0.031 (0.018) | −0.008 (0.078) | 0.182* (0.105) | −0.144 (0.101) |
| ethnic mem. | 0.090 (0.115) | −0.129 (0.074) | −0.034 (0.133) | 0.072 (0.137) |
| religious mem. | −0.014 (0.129) | −0.179*** (0.040) | 0.008 (0.156) | 0.194 (0.170) |
| ideology mem. | 0.161 (0.252) | −0.150*** (0.034) | −0.396*** (0.049) | 0.385*** (0.254) |
| duration | −0.003 (0.003) | 0.009** (0.004) | −0.003 (0.004) | −0.003 (0.004) |
| intensity | −0.084 (0.122) | 0.046 (0.095) | 0.066 (0.138) | −0.097 (0.134) |
| GDPpc | −0.012 (0.011) | 0.013 (0.011) | −0.006 (0.016) | −0.006 (0.016) |
| revenue source | 0.009 (0.048) | −0.049 (0.051) | −0.041 (0.066) | 0.082 (0.063) |
| controlled territory | 0.005* (0.004) | −0.004 (0.003) | 0.003 (0.005) | −0.005** (0.004) |

*Note:* *p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Table 4: Variation in PGM identity multinomial logistic regression group-average marginal effects (G-AME)

| | *Dependent variable:* | | | |
|---|---|---|---|---|
| | PGM identity (Model 4) | | | |
| | Local defense | Political | State forces | Counter-state |
| command structure | 0.117 (0.081) | −0.031 (0.051) | 0.003 (0.073) | −0.089 (0.074) |
| governing institutions | 0.079 (0.092) | 0.058 (0.082) | −0.109 (0.110) | −0.028 (0.121) |
| inclusion | 0.083 (0.128) | −0.147*** (0.058) | -0.098 (0.138) | 0.163 (0.138) |
| semi-official | −0.029 (0.084) | −0.013 (0.069) | -0.098 (0.138) | −0.151** (0.092) |
| ethnic mem. | 0.104 (0.113) | −0.157*** (0.064) | −0.027 (0.128) | 0.080 (0.121) |
| religious mem. | 0.241 (0.178) | −0.190*** (0.036) | −0.066 (0.156) | 0.015 (0.140) |
| ideology mem. | −0.130*** (0.028) | 0.248*** (0.042) | −0.395*** (0.041) | 0.277*** (0.051) |
| duration | −0.005* (0.003) | 0.003 (0.005) | 0.005 (0.004) | −0.003 (0.005) |
| intensity | −0.117 (0.124) | 0.074 (0.094) | 0.154 (0.121) | -0.111 (0.143) |
| GDPpc | 0.011 (0.016) | 0.085** (0.041) | −0.069** (0.030) | −0.026 (0.029) |
| revenue source | 0.008 (0.037) | −0.169 (0.125) | 0.075 (0.089) | 0.086 (0.092) |
| controlled territory | 0.003 (0.003) | 0.005 (0.005) | −0.003 (0.004) | −0.005 (0.005) |
| fac(Latin America) | 0.607*** (0.138) | −0.001 (0.001) | −0.535 (0.148) | −0.072*** (0.053) |
| fac(N. Afr. & Mid. East) | −0.015 (0.016) | 0.054*** (0.020) | −0.412 (0.214) | 0.372** (0.215) |
| fac(Sub–Saharan Africa) | 0.215** (0.098) | 0.324 (0.131)*** | −0.655 (0.082) | 0.094*** (0.087) |
| fac(Southeast Asia) | 0.217* (0.136) | 0.435*** (0.154) | −0.412 (0.214) | 0.145*** (0.168) |
| fac(Southern Asia) | 0.102 (0.088) | 0.462 (0.172) | −0.634 (0.090) | 0.264*** (0.170) |
| fac(The Pacific) | 0.973*** (0.010) | −0.001 (0.001) | −0.799 (0.112) | −0.072*** (0.052) |
| cold war | −0.114 (0.201) | 0.150*** (0.029) | −0.366 (0.203) | 0.329** (0.041) |
| *Note:* | | | | *p<0.1; **p<0.05; ***p<0.01 |
| | | | | Standard errors in parentheses. |

First, for PGMs that transform into local defense groups, *command structure* and state capacity in terms of *controlled territory* by the state have the most impact. As predicted probability results in Figure 8 demonstrate, increased centralization in terms of command structure and an increase in state-controlled territory increases the probability of a PGM become a local defense group.

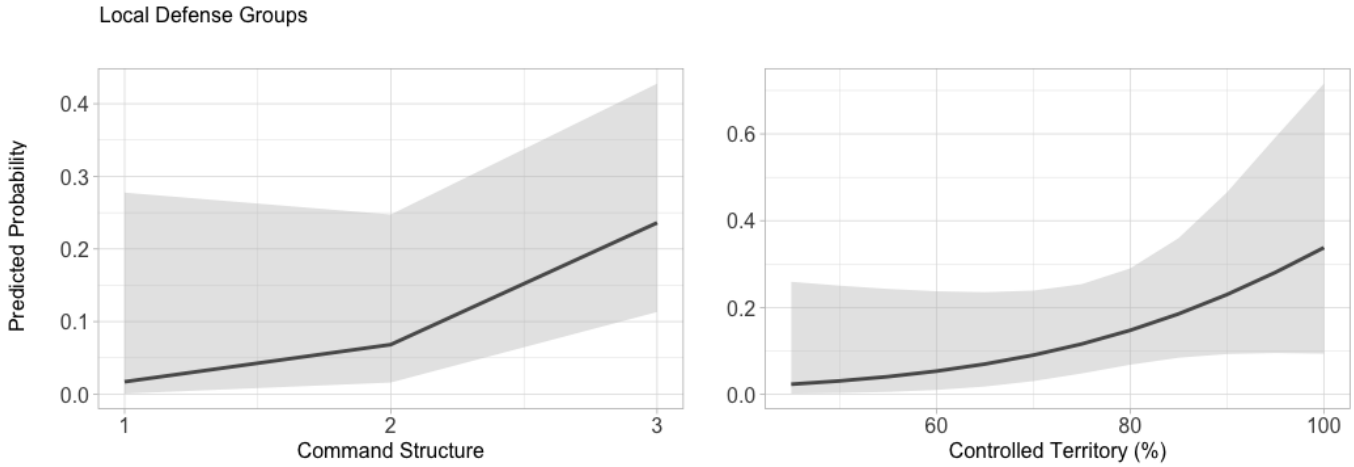


Figure 8: Predicted probability results for local defense groups
from multinomial logistic regression model with 95% confidence interval.

In terms of organizational structure, the predicted probabilities tell us that a factionalized PGM has a near-zero probability of becoming a local defense group while a centralized PGM has a 15% probability of becoming a local defense group. This finding is not surprising, as PGMs that are centralized and vertically-oriented can maintain those structures post-termination to continue using violence in the communities in which they operated prior to termination. This is true, for example, of the Anambra State Vigilante Group (also known as associated groups, the Anitsha Vigilante Group and the Bakassi Boys) in Nigeria (Carey, Mitchell and Paula, 2022). The Anambra State Vigilante Group maintained a highly organized and centralized structure after the formalizing its role as a paramilitary with the Anambra State Vigilante Services Law in 2000. It then maintained a formal security board with a chairperson and a police superintendent. Upon termination in 2002, the Anambra State Vigilante Group again became known as the Bakassi Boys and continued brutal vig-

ilante operations in Abia State and Anambra State (Human Rights Watch, 2002). The Bakassi Boys used exceptional forms of violence to combat crime as a local defense group, though the public largely supported Bakassi Boy operations and were tolerant of members using violence as a legitimate means to counter criminal behavior.

In terms of state capacity, a PGM in a state that has uncontested control over less than half of its territory has a near-zero probability of becoming a local defense group while a PGM in a state that has uncontested control over all of its territory has a 40% probability of becoming a local defense group. I posit that this may be the case when the state maintains uncontested control over its territory, yet may have less of a reach in peripheral regions. PGMs may be repurposed to not necessarily contest the state, but to offer security to regions at the margins of state control far from the central authority.

Second, for PGMs that transform into political groups, *governing institutions*, *religious membership*, *ideological membership*, and *duration* have the most impact. While an increase in governing institutions and conflict duration have a positive and significant impact on the probability of a PGM become a political group, religious membership and ideological membership decreases the probability of a PGM becoming a political group. This can be seen in Figure 9, which presents the predicted probability of these findings.

PGMs with no governing institutions have a near-zero probability of becoming a political group while PGMs with many governing institutions have almost a 20% probability of becoming a political group. It is indeed not surprising that the state would fold the PGM into the political apparatus if the group has multiple structures to govern civilians. This is what happened, for example, with Jamiat-i-Islami in Pakistan (Carey, Mitchell and Paula, 2022). Jamiat-i-Islami was Pakistan's oldest religious party and already had many existing governing structures when it became an official PGM – it maintained administrative functions to exercise religious rule over civilians, it funded madrassas to educate people of the Islamic State, and it ran two daily newspapers to spread news and terror in the public. Although Jamiat-i-Islami left the government in 1992 after disagreements over the future

of Afghanistan, it maintained status as a lesser political party. Over the next five years, it attempted to piggyback on right wing extremists and tried to re-brand itself for political leverage.

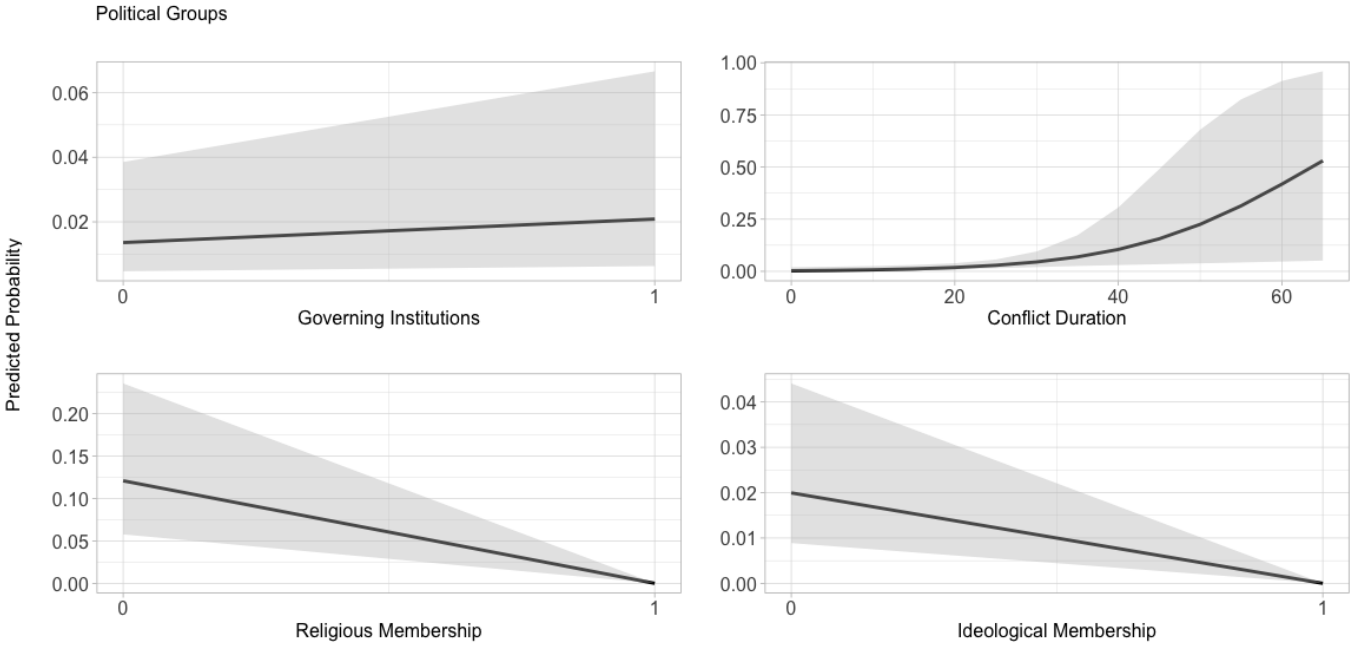


Figure 9: Predicted probability results for political groups
from multinomial logistic regression model with 95% confidence interval.

A positive association between an extended conflict duration and a PGM transforming into a political group likewise makes sense, as a protracted conflict could imply that a state must make more concessions to fighting groups. Indeed, a PGM operating during a short conflict has a near-zero probability of becoming a political group while a PGM operating during a short conflict has a 75% probability of becoming a political group. This is true, for example, of many of the People's Liberation Organization of Tamil Eelam in Sri Lanka (Carey, Mitchell and Paula, 2022). The Sri Lankan Civil War commenced in 1983 with Black July, and so by the time the People's Liberation Organization of Tamil Eelam (PLOTE) terminated in 2002 the war was going on for 19 years. Like the Liberation Tigers of Tamil Eelam (LTTE), the PLOTE adopted a Marxist-Leninist ideology, and indeed the LTTE and PLOTE fought alongside each other in the beginning of the conflict. However,

the LTTE later coordinated attacks against PLOTE members, leading to a vast elimination of PLOTE fighters. Thus, after 1987, the PLOTE allied with the Sri Lankan state and fought alongside state forces against the LTTE. The PLOTE officially terminated in 2002 in a ceasefire agreement, yet the state supported its continued operations as a mainstream political party.

However, because Jamiat-i-Islami is a religious group and PLOTE is an ideological group, these results are moderately surprising given that group identity is negatively associated with becoming a political group. A PGM not based on religious or ideological membership has a 15% probability of becoming a political group while a PGM that is based on religious or ideological membership has a near-zero probability of becoming a political group. I believe these results for group identity are driven by the little variation we see in groups that are religious or ideological, and therefore we should not take these results as entirely valid. Of the 109 groups in the sample for the multinomial logistic regression, only 12 groups are based on religious membership and two groups are based on ideological membership. On the other hand, 20 groups are based on ethnic membership, which offers more variation and therefore we should take the null results for ethnic membership as more valid.

Third, for PGMs that become part of the state forces, *governing institutions*, *semi-official* status, and *ideological membership* have the most impact. However, as stated above, I regard the results for group identity with skepticism due to little variation that ideological membership presents. While an increase in governing institutions decreases the probability of a PGM becoming part of the state forces, semi-official status increases the probability of a PGM becoming part of the state forces. This can be seen in Figure 10, which presents the predicted probability of these findings.

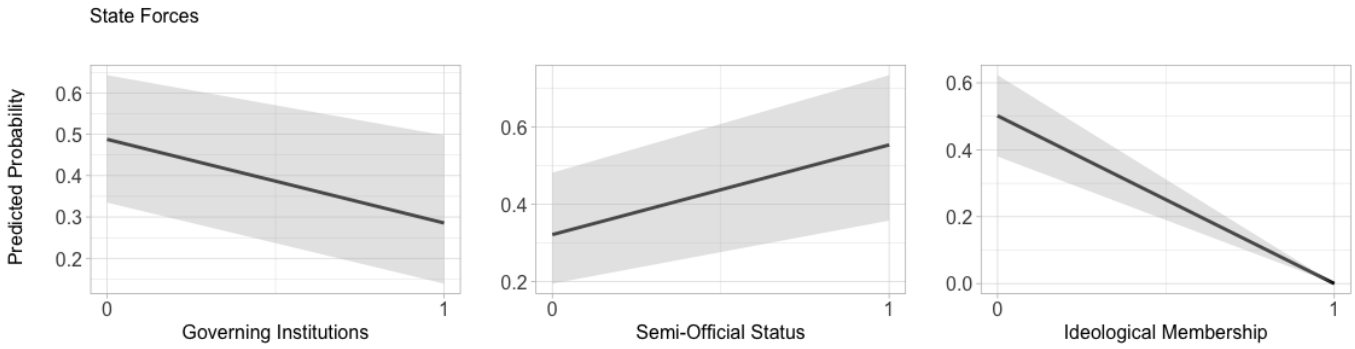


Figure 10: Predicted probability results for state forces
from multinomial logistic regression model with 95% confidence interval.

It indeed makes sense that PGMs with few structures to govern civilians are more likely to be absorbed into state forces, given that the state does not have to contend with existing structures to fold PGM members into its military or police forces. Similarly, in terms of government relation, it is not surprising that states that officially recognize a PGM as at least a semi-official group are more likely to fold members into state forces after the PGM is meant to terminate. To be sure, an informal PGM has a 45% probability of becoming part of the state forces while a semi-official PGM has almost a 70% probability of becoming part of the state forces. We see this play out with the Komitehs in Iran (Carey, Mitchell and Paula, 2022). The Komitehs form after the Islamic Revolution in 1979 as local groups to police communities, ensuring people conform to Islamic Law. For decades the Komitehs maintain a semi-official status, as clerics and the state alike run the local patrols. However, by 1995, President Akbar Hashemi Rafsanjani initiated the formal termination of the Komitehs but assimilated it into the police force to better maintain control over former members. From then on, members of the Komitehs became a unit called the Disciplinary Force, officially part of the civilian or municipal police.

Fourth, for PGMs that transform into counter-state groups, *ideological membership* and state capacity in terms of *controlled territory* by the state have the most impact. This can be seen in Figure 11, which presents the predicted probability of these findings, though as stated above I regard the results for group identity with skepticism due to little variation that

ideological membership presents. However, while increases in property rights increases the probability of a PGM becoming a counter-state group, increases in state-controlled territory decreases in the probability of a PGM becoming a counter-state group.

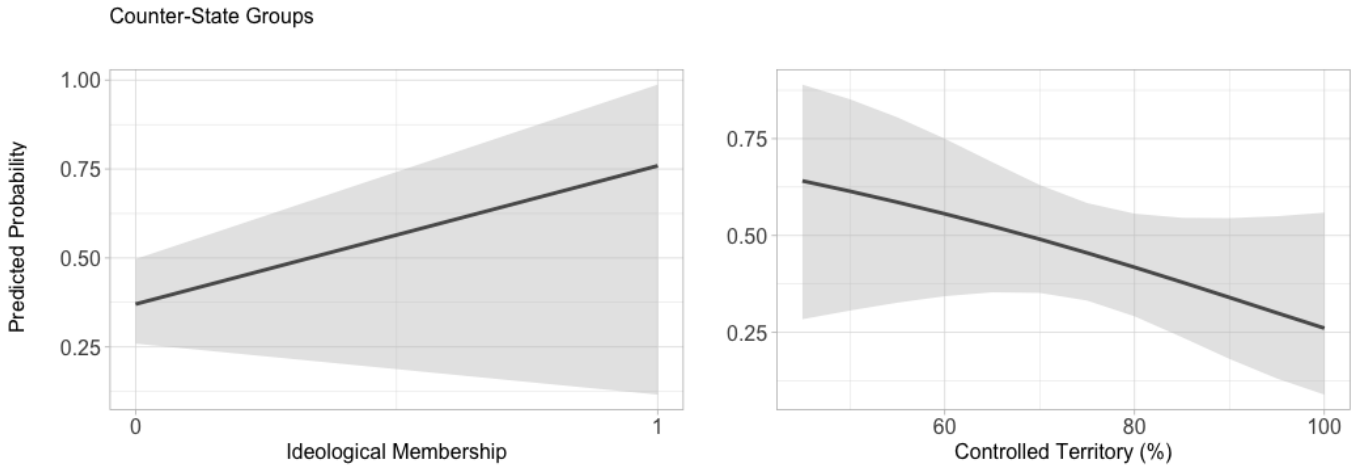


Figure 11: Predicted probability results for counter-state forces from multinomial logistic regression model with 95% confidence interval.

It is indeed not surprising that PGMs are unlikely to become counter-state groups when there is no contestable territory in the states in which they operate. There are some cases where states maintain total control over almost all of its territory yet we see PGMs become counter-state groups, such as when the Bangladeshi state maintained uncontested control over 99.4% of its territory yet Jatiyatabadi Chhatra Dal and Islami Chhatra Shibir both became terrorist groups, or when the Filipino state maintained uncontested control over 91.42% of its territory yet Illagas and Sagrado Corazon both became cult organizations. However, we are more likely to see counter-state groups sustain themselves when they are able to maintain control over territory, which implies an inverse relationship with state capacity.

Table 5 summarizes the general trends of these multinomial logistic regression results, from which I ultimately advance four main takeaways. First, PGM with centralized command structures and that operate in states that maintain hegemonic over most of its territory are like to become local defense groups. PGMs may draw on existing hierarchical structures within the group to become a local defense entity, which operates in peripheral

regions as the state consolidates control at the center. Second, PGMs that maintain many governing institutions and that operate within long conflicts are likely to become political groups, which is not surprising as they already have the structures in place to maintain control over civilians. Third, PGMs that maintain many governing institutions are less likely to become part of the state forces, for the state would have to contend with existing structures to integrate them into the security apparatus. As such, semi-official PGMs are instead more likely to become part of state forces. Fourth, as a state gains more hegemonic control over its territory, we are less likely to see a PGM become a counter-state group. Opportunities to become a counter-state group decreases as there is less contestable territory in the state.

Table 5: Summary results for multinomial logistic regression outcomes.

| | *Dependent variable:* | | | |
|---|---|---|---|---|
| | PGM identity | | | |
| | Local defense | Political | State forces | Counter-state |
| command structure | + | . | . | . |
| governing institutions | . | + | − | . |
| inclusion | . | . | . | . |
| semi-official | . | . | + | . |
| ethnic mem. | . | . | . | . |
| religious mem. | . | − | . | . |
| ideology mem. | . | − | − | + |
| duration | . | + | . | . |
| intensity | . | . | . | . |
| GDPpc | . | . | . | . |
| revenue source | . | . | . | . |
| controlled territory | + | . | . | − |
| *Note:* | + indicates a significant positive G-AME coefficient; − indicates a significant negative G-AME coefficient; . indicates an insignificant G-AME coeffcient. | | | |

# 5 Conclusion

In sum, I seek to understand the puzzling survival and transformation of PGMs after they are meant to terminate. I theorize the role of six analytical frameworks in understanding the conditions under which PGMs dissolve after termination, or otherwise survive and transform into another type of violent or nonviolent actor – organizational structure, power sharing,

government relation, group identity, conflict characteristics, and state capacity. To test my theoretical conjectures, I design the PGMT Project, a multi-method innovation in understanding the post-termination identities of PGMs. The PGMT Project accounts for 325 PGMs that terminated between 1982 and 2017 by providing a group-level dataset on the post-termination identities of PGMs, which I accompany with a qualitative handbook with detailed case notes for all PGMs included in the project. Using this novel dataset, I conduct a two-part analysis – I use a logistic regression to understand the conditions under which PGMs dissolve, and I use a multinomial logistic regression to understand variation in PGM identity of those groups that survive.

Ultimately, the primary conditions driving PGM dissolution are structure within PGMs in terms of centralized command and outside PGMs in terms of increased state control over territory. However, PGM networks and ties to the state determines their survival. PGMs are more likely to survive when they are characterized by dense social networks, such as those determined by recruitment strategies based on identity or the social networks forged with communities through governing institutions. Similarly, PGMs are more likely to survive when they have close ties to the state in terms of its strategic status and power-sharing measures.

Of those PGMs that survive, various explanatory factors illuminate the conditions under which we see groups turn to local defense, politics, states forces, or counter-state operations. First, PGMs that become local defense groups are more likely to draw on existing hierarchical structures within the group and operate in peripheral regions as the state consolidates control at the center. Second, PGMs that become political groups are more likely to maintain many governing institutions and operate within long conflicts. Third, PGMs that become part of the state forces are less likely to maintain many governing institutions yet are more likely to have a semi-official relationship with the state. Fourth, PGMs that become counter-state groups when where the state maintains uncontested control over most of its territory.

These findings illuminate empirical realities of the world today. Turning to the motivating example of the Slavonic Corps in Syria, for instance, we can trace how conditions such as organizational structure and state capacity led to its re-emergence as the Wagner Group in Russia where it started acting as a discrete outfit serving Russia's foreign policy as a tool of plausible deniability for the Kremlin's violence. Indeed, this study can serve to shed light on other contemporary cases such as the anti-crime groups in Mexico fighting the expanding scope of cartels, vigilante groups in Nigeria filling in for the Nigerian Police Force in areas where it is absent, or grassroots paramilitary movements in the United States attempting to disrupt democratic institutions.

This analysis therefore leaves scholars with several avenues for future research. First, an accompanying study can conduct a rich qualitative analysis of illustrative cases to further illuminate these findings. This analysis is significant in its cross-national scope, and in-depth case examinations can serve to further shed light on the mechanisms driving the results from this study. Second, while this study introduces the PGMT Project to understand the *causes* of PGM survival and transformation, future studies can draw on the PGMT Project to alternatively evaluate the *consequences* of PGM survival and transformation. Potentially interesting outcomes to explore include the effect of the survival and trajectory of PGMs on democratic consolidation or democratic backsliding, public opinion of the legitimacy of leaders, or community safety and public security. Lastly, an emerging form of militia group includes internet vigilantes, such as the hacktivist collective group called Anonymous responsible for Operation Payback or the volunteer group called the Youth Security Service in Russia regulating extremist material online. Future studies can assess whether the same explanatory factors that explain the emergence and afterlife of PGMs that manifest as physical entities can account for PGMs that manifest in the online world.

Consequently, this study reveals important aspects of conflict and crises, and political violence more generally. Violence is often cyclical, and this study indeed tells us when armed groups are likely to persist after they are meant to terminate. These groups then serve

to perpetuate violence by repurposing themselves into different types of organizations and continue armed struggles in their afterlife by turning to criminality, local defense, politics, state forces, or counter-state operations. Ultimately, in highlighting the cyclical aspect of conflict and crises, this study hopefully begins to shed light on how to end persistent cycles of violence.

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# A Conducting Desk Research

## Challenges in Data Collection

The primary data collection challenge of this project rests on how it is an example of what Hoover Green and Cohen (2021, 2) call "desk research" in political violence, or "the process of collating and coding existing information for analysis, without direct contact between researchers and research participants – in this case, victims, perpetrators, and witnesses of political violence." While desk research in political violence helps researchers circumvent ethical concerns about direct interactions with vulnerable people, there are still ethical considerations that impact the epistemological and ontological validity of the data such as production transparency, false precision, and bias in publicly available data.

First, production transparency concerns issues related to the processes, decisions, and uncertainties involved in data collection. The Data Access and Research Transparency (DA-RT) project has shaped the dialogue and norms around research integrity in political violence concerning transparency,[18] though its primary focus is on analytic transparency rather than production transparency. Second, false precision concerns issues related to quantifying hard-to-measure phenomena, and subsequently having these rough numerical measures appear more rigorous than similarly rough qualitative descriptions. This shortcoming follows a fallacy in political science that "more data are always better" (Hoover Green and Cohen, 2021, 7), and thus scholars tend to conflate the breadth of the data offered in large cross-national projects with precision and rigor. Third, bias in publicly available data concerns issues related to collecting data from secondary sources, which means the data becomes a function of visibility from assessments in available sources. This introduces bias both in the inclusion criteria because it is based on visibility and in measurement because different sources have varied quantification standards and objectives in data collection.

I address these challenges in three primary ways. First, I make the PGMT Project codebook readily available in the following Coding Ontology. The codebook not only outlines the project workflow, but most notably it describes how project researchers address issues of uncertainty and assumptions in the data collection process. Second, the PGMT Repository highlights the coding decisions researchers made for each case. The PGMT Repository therefore offers not only a qualitative repository for all the cases in the PGMT Project, but it provides transparency for the coding decisions in the dataset by highlighting areas of uncertainty or assumptions made in the data collection process. Third, researchers triangulate information from existing datasets, primary sources, and reputable secondary sources to collect data. Although this does not overcome all issues related to collecting data based on publicly available sources, it is the most reasonable strategy at mitigating the effects of bias that come from a single source.

Despite these strategies in overcoming challenges related to desk research, I recognize the shortcomings of the data gathered in the PGMT Project, especially related to availability

[18] See an overview and discussion of the DA-RT guidelines at Lupia and Elman (2014). See International History and Politics Section (2016) for a discussion on the debate surrounding the DA-RT, as well as the associated Friendly Fire responses from Moravcsik (2016) and Isaac (2016).

bias and to rough quantitative measurements. However, carrying out desk research in general is one of the most accessible methods in collecting political violence data, avoiding the ethical quandaries of directly engaging with those exposed to or engaged in violence. Furthermore, Hoover Green and Cohen (2021) highlight the mitigation measures I adopt as a best practice for researchers to move towards more ethical and transparent desk research-based data.

# B PGMT Project Coding Ontology

The Pro-Government Milita Transformation (PGMT) Project is a unique multi-methods program accounting for the afterlife of militias in conflict or crises. The following coding ontology outlines the processes coders followed for data collection, highlighting both the quantitative dataset as well as the qualitative case archive.

Support from a team of undergraduate students was the fundamental factor in carrying out this project. They helped refine the coding ontology and collect data on the majority of PGMs in this project. I thank Marley Ray, Abby Stover, Ilinca Slabu, and Katie Ruesink for the research support. Lily Wheaton, Luke Jouflas, and Sarah Tran also contributed coding assistance to this research project.

# Organization, Exclusion, and the Post-Conflict Identity of Pro-Government Militias

Megan Erickson

Coding Ontology V.1.2
April 2022

## Expanding the PGMD 2.0

This dataset builds upon Carey, Mitchell, and Paula's (2022) PGMD 2.0, which ranges from 1981 to 2014 and identifies over 500 PGMs. However, because this project explores the *postwar* nature of PGMs, I am able to eliminate groups that have not yet terminated; that is, groups from conflicts that are ongoing. As such, I focus on approximately 250 PGMs as my universe of cases. By starting off with the PGMD 2.0, I have already identified the universe of cases as well as baseline variables accounting for various PGM characteristics. We will expand on the PGMD 2.0 by triangulating information across primary sources (from PGMs, governments, and NGOs), secondary sources, and country experts. The primary innovation of this dataset will thus be the additional variables we collect, including PGM organizational structure, the nature of the postwar settlement, and, of course, the shifting identities of PGMs for at least five years after the end of conflict. The unit of analysis is the group, and therefore it will be compatible not only with the PGMD 2.0 but also other notable conflict datasets, such as those from UCDP, GAARD, FORGE, etc.

## Workflow & Documentation

### *Spreadsheet*

Coders will have a spreadsheet template with the relevant variables already input.

### *Coding notes*

As coders fill out the spreadsheet, they will take detailed coding notes. These notes will ultimately be compiled for each group to make an entire archive of cases and coding decisions. Coders are provided with a template with which to fill in their coding notes. The coding notes will include:

1) each variable to be coded
2) the source/location where the information was retrieved (such as website links, article links, book names with corresponding page numbers, etc)
3) a brief explanation why it was coded that way
4) a discussion if there is any discrepancy in values from different sources, any uncertainty with the value included,or any assumptions made

This will be filled out for *each* variable for *each* group, where a new coding notes file will be saved for each group. Copy and paste the master coding notes – as it's in progress, you can save it in your individual folder. Once you are finished, transfer it to the coding notes repository folder as: 'Country_pgmID_CodingNotes'. For example, if I am coding the Civil Defense Patrols (semi-official) in Guatemala, I will save the coding notes as: 'Guatemala_299_CodingNotes.'

**Note:* You don't have to fill in the coding notes for every time you code '0' for the PGM identity category variables. Just code why you coded '1' for the relevant variable. I didn't create a row for each year for these variables too, just include a description for what year (e.g., year *t+1, t+2,* etc.) you code a 1 for and why.

### *Peace agreement repository*

We must code the peace process variables based on the actual text of the peace agreement. It will thus minimize work in the future if we save the original text for each peace agreement. Download the PDF for each peace agreement you use and save it in the designated folder in Google Drive with the following naming scheme: 'Country_year_pgmID'. For example, if I'm saving the peace accord for the Civil Defense Patrols (semi-official) in Guatemala, I will save it as: Guatemala_1996_299. The same peace agreement can apply to multiple groups. Save multiple copies of the peace agreement but change the corresponding PGM ID number at the end of the file name.

*Time variance*

The unit of observation is the group. However, I account for time variance in several ways. Refer to the table of specific categories of variables below, starting on page 3.

- *Identification variables* – These are a given and will be the same throughout the conflict.
- *Command structure & institutions/structure variables* – These should be observed *before* the end of conflict, but as close to the end of conflict as possible. This means that, if a conflict ends in year *t,* we will try collecting data in *t–1*. Specifically, if a conflict ends in 1996, we should gather the variable as close to 1996 as possible, ideally in the 1995–1996 time frame.
- *Power sharing & inclusion variables* – These are naturally observed either after the conflict or once the PGM terminates. This means that, if a conflict ends in year *t,* we will try collecting data in *t+n,* where *n* symbolizes the amount of time it takes for the belligerents to reach a peace deal if there is one.
- *Post-conflict identity & post-conflict categories variables* – These variables are time variant, signified by how they are listed five times (e.g., *postwar_name1, postwar_name2, postwar_name3, postwar_name4, postwar_name5)*. We want to know how the PGM transforms in the five years after a conflict, though sometimes this can take several forms over the span on the five years. Thus, for each year, we will try to code the identity the PGM adopts. The five years will start the year *after* the end of conflict or the PGM terminates. This means that, if the conflict ends in year *t,* then we will collect data for *t+1, t+2, t+3, t+4,* and *t+5*. Specifically, if a conflict ends in 1996, then we will collect data for 1997, 1998, 1999, 2000, and 2001. However, collecting data for each year may be impossible. At the very least, we will collect data for year *t+5*.

*Uncertainty & assumptions*

In dealing with uncertainty, coders will highlight the observation in the spreadsheet where they are uncertain of the value. This uncertainty should be articulated in the coding notes and highlighted as well. A second coder will attempt coding the variable. The two coders will then get together to discuss the appropriate value. The decision will be documented in the coding notes.

Another form of uncertainty comes from if something simply is not present. For example, if we are looking for evidence of the PGM having institutions for education or health, we may not find such evidence because the PGM simply did not have these institutions. Below has a procedure you should follow when looking through existing datasets to find this information. If the information is not present in existing datasets, you can Google around for the information. If, after 30 minutes, you do not find evidence of what you are looking for, we can take that as evidence of it not existing in general. Document this in your coding notes.

## Relevant Links

- PGMD 2.0 – This is the foundation of the dataset we are creating. When I refer to the PGMD 2.0, coders can also refer to the corresponding PGM Guidebook or the Online PGM Database. Although the PGMD 2.0 accounts for more variables, the associated guidebook and online database provide explanations for coding decisions, as well as links to the sources that they used to collect such data.
- Peace agreement links – The following are helpful links for coding the peace agreement variables.
  - Peace Agreement Database – Online repository for many peace agreements as well as codings for certain variables. You can search for the country you are coding for, find the relevant peace agreement, and click on 'View Coding' to see how they catalogue it.
  - UCDP Peace Agreement Dataset catalogue – Online repository for many peace agreements.
- Google Drive
  - RA folders – Students have their own folder. Each folder contains their test spreadsheet, their actual spreadsheet, their coding notes, and their timesheet.
  - Project documentation – Prospectus, codebook, and master templates.
  - Peace agreement repository – This is the folder where you will save all original texts for the peace agreements you coded, naming them as: 'Country_year_pgmID'
  - Coding notes repository – Save finished coding notes here as: 'Country_pgmID_CodingNotes.'

  Existing datasets and codebooks – This includes the datasets I mention below, including the GAARD, UCDP Conflict Termination Dataset, UCDP Peace Agreement Dataset, Peace Agreement Dataset (PAX), and the PGMD 2.0. You should be able to download and view the datasets in excel. Refer to the corresponding codebook to understand the variables.
  - Helpful articles – Additional readings that may be helpful.

| Category | Variable | Type | Measure | Locations |
|---|---|---|---|---|
| Identification | Country (*country*) | text | Country | PGMD 2.0 |
| | Country code (*gwno*) | numeric | ID | PGMD 2.0 |
| | Group name (*pgm_name*) | text | Name | PGMD 2.0 |
| | PGM ID (*id*) | numeric | ID | PGMD 2.0 |
| | Termination year (*year*) | numeric | YYYY | PGMD 2.0 |
| Command structure | Command structure (command_structure) | ordinal | 1–3 | PGMD 2.0 |
| Institutions/ structures | Administrative (*admin*) | binary | 0/1 | PGM 2.0 sources; handcode |
| | Education (*education*) | binary | 0/1 | PGM 2.0 sources; handcode |
| | Healthcare (*health*) | binary | 0/1 | PGM 2.0 sources; handcode |
| | Community outreach (*comm_outreach*) | binary | 0/1 | PGM 2.0 sources; handcode |
| | Political messaging (*messaging*) | binary | 0/1 | PGM 2.0 sources; handcode |
| Power sharing | Political power sharing (*political_sharing*) | binary | 0/1 | UCDP Peace Agreement Dataset; Peace Agreement Database |
| | Military power sharing (*military_sharing*) | binary | 0/1 | UCDP Peace Agreement Dataset; Peace Agreement Database |
| | Economic power sharing (*economic_sharing*) | binary | 0/1 | UCDP Peace Agreement Dataset; Peace Agreement Database |
| | Territorial power sharing (*territorial_sharing*) | binary | 0/1 | UCDP Peace Agreement Dataset; Peace Agreement Database |
| Inclusion | Inclusion (*inclusion*) | ordinal | 0–4 | Derived from power-sharing variable |
| Post-conflict identity | Number of splits (*splits1-splits5*) | numeric | 1+ | PGMD 2.0; GAARD; handcode |
| | Postwar name (*postwar_name1-postwar_name5)* | text | Name | PGMD 2.0; GAARD; handcode |
| | Postwar identity (*identity1-identity5*) | text | text | PGMD 2.0; GAARD; handcode |
| Post-conflict categories | Cartel (*cartel1-cartel5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Street gang (*street_gang1-street_gang5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Trafficking organization (*trafficking1-trafficking5*) | | | |
| | Petty crime (*petty_crime1- petty_crime5*) | | | PGMD 2.0; handcode |
| | Vigilante group (*vigilante1-vigilante5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Self-defense forces (*self_defense1-self defense5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Private security forces (*private_security1-private_security5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Political party (*pol_party1-pol_party5*) | binary | 0/1 | PGMD 2.0; GAARD; handcode |
| | Local political power (*local_power1-local_power5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Military (*military1-military5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Police (*police1-police5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Terrorist organization (*terror1-terror5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Rebel group (*rebel1-rebel5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Cult (*cult1-cult5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Disintegration (*nonexist1-nonexist5*) | binary | 0/1 | PGMD 2.0; handcode |
| | Other/unlisted (*other1-other5*) | binary | 0/1 | PGMD 2.0; GAARD; handcode |

**country**
The country where the PGM exists. PGMs may originate in one country but function in another country, they may get most of their fighters from other countries, etc. The PGMD 2.0 should be the ultimate determinant in the country the PGM is associated with.

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**gwno**
The country code for the country in which the PGM is (primarily) active and linked to the government of that country is identified with the country code based on Gleditsch and Ward (1999) – hence, Gleditsch (*g)* and Ward (*w)* numbers (*no)*. You can find this in the PGMD 2.0, which has a *gwno* column. You can also find a list of countries and their *gwno* codes in the PDF in the Dataset & Codebook folder.

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**pgm_name**
The name of the PGM. Use the PGMD 2.0 for the main group name. This could be a descriptive name assigned by the PGMD 2.0 coder.

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**id**
This variable provides a unique identifier for each PGM. Find this in the PGMD 2.0.

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**year**
The year the group terminated, in YYYY form.

The termination date may be unclear at first. It is often (but not always) the end of the conflict, though different datasets themselves code different years for conflict termination. However, sometimes the PGM terminates before the end of the conflict. This is the case in Colombia, for example, when the government reached a peace deal with the AUC before it reached a peace deal with the FARC.

Use the year in the PGMD 2.0 for the termination date *(date_terminated)*.

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**command_structure**
Command structure refers to the distribution of power within a group, whether centralized, decentralized, or factionalized.

**Note:* You should find this observation as close to the termination of the PGM as possible, right before the conflict terminated or right before the PGM and the government reached a peace agreement. For example, if the conflict ended in 2003, you should hopefully find this variable around 2002 or so.

> 1 – *Centralized command* – vertically integrated, where the central command exercises near complete control over subordinate units, such as coordinating attacks, governance systems, or membership
> e.g., RUF in Sierra Leone: "The RUF was created and headed by Foday Sankoh, of Temne and Mende background."
>
> 2 – *Decentralized command* – horizontally integrated, where secondary units can operate autonomously or semi autonomously from the central command
> e.g., Kamajors in Sierra Leone: "The militia groups owed allegiance to various local leaders but not to a national body. Many Kamajor leaders openly boasted that they had rescued the state and were therefore beyond its control. Some even disregarded state authority with impunity."
>
> 3 – *Factionalized command* – either completely devolved from any kind of central command and component

groups operate autonomously using the name of the PGM, or a conglomerate group encompasses many PGMs under a single heading though the component groups maintain their own name and command structure e.g., AUC in Colombia: "It included PGMs such as Muerte a Secuestradores (Human Rights Watch), informal paramilitary groups and members of high-rank drug cartels. A news source reports that 150 groups attended the AUC founding conference."

Start by looking at the *organization* variable in the PGMD 2.0. This is a text field so you will have to interpret how what it says fits within our coding scheme. In many cases, it may not be obvious, in which case look to the PGM guidebook or online database, which has a more extensive field talking about PGM organization. They have other fields that may be relevant for organization, such as details of formation, size, and reasons for membership – you can sometimes infer organizational structure from these details. They link sources where they found information for specific PGMs, so if it's not evident from the existing PGMD 2.0 coding scheme then refer to the sources it links.

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## admin

The PGM has structures dedicated to governance and administration. This includes security provision, regulating taxation and market transactions, land and resource allocation, and dispute resolution. Note that informal administrative tendencies count as administrative functions as well – sometimes groups don't have formal structures, one reason being because sometimes PGMs are illicit groups. If there is clear evidence of them having administrative functions but without a formal structure or agency, this still counts as administration.

**Note:* You should find this observation as close to the termination of the PGM as possible, right before the conflict terminated or right before the PGM and the government reached a peace agreement. For example, if the conflict ended in 2003, you should hopefully find this variable around 2002 or so.

0 – *Administrative institutions are not present*

1 – *Administrative institutions are present*

This variable is not present in existing datasets. Search for your PGM in the PGMD 2.0 or PGM guidebook or online database and refer to the sources they list. If you can't find evidence of this institution after reading these accounts that are already linked, you can do a Google search to find sources and evidence yourself. If, after 30 minutes of searching, you can't find evidence of this institution, we will take that as evidence that the PGM did not have these structures and therefore code this as a 0. Make sure to document your decision in the coding notes, either by linking the source that you find evidence at with a brief explanation of why you coded it as a 1, or by explaining that you searched for 30 minutes for evidence that was not present.

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## education

The PGM has structures dedicated to education provision. This includes education for the population for noncombative roles, including primary and secondary education, skills training, or vocational schools. This does not include military training.

**Note:* You should find this observation as close to the termination of the PGM as possible, right before the conflict terminated or right before the PGM and the government reached a peace agreement. For example, if the conflict ended in 2003, you should hopefully find this variable around 2002 or so.

0 – *Educational institutions are not present*

1 – *Educational institutions are present*

See the description for *admin* for coding procedure. Make sure to document your decision in the coding notes, either by linking the source that you find evidence at with a brief explanation of why you coded it as a 1, or by explaining that you searched for 30 minutes for evidence that was not present.

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## health

The PGM has structures dedicated to health services or food allocation.

**Note:* You should find this observation as close to the termination of the PGM as possible, right before the conflict terminated or right before the PGM and the government reached a peace agreement. For example, if the conflict ended in 2003, you should hopefully find this variable around 2002 or so.

0 – *Healthcare institutions are not present*

1 – *Healthcare institutions are present*

See the description for *admin* for coding procedure. Make sure to document your decision in the coding notes, either by linking the source that you find evidence at with a brief explanation of why you coded it as a 1, or by explaining that you searched for 30 minutes for evidence that was not present.

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## comm_outreach

The PGM has structures dedicated to facilitating community outreach. This variable captures when PGMs provide welfare or aid to civilians. This may be done in response to a natural disaster, or an enemy attack, and it may take a variety of forms such as food, money, or agricultural aid (seeds, oxen, plows, etc.).

**Note:* You should find this observation as close to the termination of the PGM as possible, right before the conflict terminated or right before the PGM and the government reached a peace agreement. For example, if the conflict ended in 2003, you should hopefully find this variable around 2002 or so.

0 – *Community outreach institutions are not present*

1 – *Community outreach institutions are present*

See the description for *admin* for coding procedure. Make sure to document your decision in the coding notes, either by linking the source that you find evidence at with a brief explanation of why you coded it as a 1, or by explaining that you searched for 30 minutes for evidence that was not present.

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## messaging

The PGM has structures dedicated to political messaging. These structures are dedicated to managing the creation and distribution of the group's core ideology.

**Note:* You should find this observation as close to the termination of the PGM as possible, right before the conflict terminated or right before the PGM and the government reached a peace agreement. For example, if the conflict ended in 2003, you should hopefully find this variable around 2002 or so.

0 – *Political messaging institutions are not present*

1 – *Political messaging institutions are present*

See the description for *admin* for coding procedure. Make sure to document your decision in the coding notes, either by linking the source that you find evidence at with a brief explanation of why you coded it as a 1, or by explaining that you searched for 30 minutes for evidence that was not present.

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## political_sharing

The postwar agreement has provisions for political power sharing with the PGM. Political power sharing is defined around Lijphart's criteria, focusing on establishing an executive grand coalition, proportional representation in legislatures, mutual veto, and segmental autonomy (such as in different jurisdictions). This also accounts for institutions within the state which also provide for power sharing with international actors.

0 – *Political power sharing is not present*
1 – *Political power sharing is present*

You can start by looking at the UCDP Conflict Termination Dataset, which codes six possible outcomes in conflict termination (*peace agreement, ceasefire, government victory, rebel victory, low activity, actor ceases to exist*) – although this is more relevant for rebels, it gives an initial sense of what to look for in terms of the type of agreement reached after conflict.

Next, look at the UCDP Peace Agreement Dataset catalogue or the Peace Agreement Database by the University of Edinburgh to find the original text of the peace agreement. It is from the original texts that you should find this variable. The .csv files for these datasets are in Google Drive, which you can use for your coding, though looking at the websites will probably be easier.

The Peace Agreement Database specifically will be immensely helpful. Search for the country you are coding and find the relevant agreement. Note that there may be a lot of agreements for that country – you must find the agreement that includes provisions for the PGM, if it exists. For example, if you search for Colombia, there will be 129 agreements, though we know that the government and AUC agreed to put down arms in 2003 so the agreement that is relevant is the 2004, which is evident by the name (e.g., *Acuerdo entre Gobierno Nacional y las Autodefensas unidas de Colombia para la zona de Ubicación en Tierralta*). You can also identify the relevant peace agreement by looking at the agreement text itself and noting the relevant parties/stakeholders it usually lists at the beginning of the agreement – often (but not always) the PGM will be listed. Sometimes there is just a general peace agreement for the conflict, which is implied that all warring parties (including PGMs) are involved.

To the right of the agreement in the Peace Agreement Database, you will see a button that says: "View Coding." Click on it, which will bring you to where the database codes agreement characteristics, including political, territorial, economic, and military power sharing. You can start by looking at this this to code this variable – if the variable in the database takes on 1, 2, or 3, code it as a 1; if it takes on a 0, code it as a 0. *However*, note that this is not always going to be relevant for PGMs – if the agreement has more than two parties involved, or if it is primarily talking about the government–rebel relationship, this variable could be misleading and in fact does not apply to the PGM. I urge you to skim the peace agreement to double check if the coding is relevant for the PGM.

Remember to save the PDF of the peace agreement in the repository in Google Drive. Remember to include the snippet of text that informs your coding decision in the coding notes, or otherwise write why it appears that power sharing did not occur. Link the agreement coding page from the Peace Agreement Database if you use that to inform your coding decision.

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## military_sharing

The postwar agreement has provisions for military power sharing with the PGM. Military power sharing refers to provisions which share power in the institutions of police, army, or security ministries. This involves completely merging forces, sharing resources like weapons and funding, combining command structures, or containing provisions of proportional representation in the security services. This also involves establishing information channels between two separate armed entities. Provisions that involve UN verification mechanisms do not count as military power sharing – instead, these provisions are established and regulated by third party entities and do not necessarily mean that the two groups will merge their armed forces.

0 – *Military power sharing is not present*

1 – *Military power sharing is present*

See the description under *political_sharing* for coding procedure. Remember to save the PDF of the peace agreement in the repository in Google Drive. Remember to include the snippet of text that informs your coding decision in the coding notes, or otherwise write why it appears that power sharing did not occur.

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## economic_sharing

The postwar agreement has provisions for economic power sharing with the PGM. Economic power sharing is defined on the basis of joint participation in economic or fiscal institutions. These are wealth-sharing arrangements aimed at inter-group accommodation.

0 – *Economic power sharing is not present*

1 – *Economic power sharing is present*

See the description under *political_sharing* for coding procedure. Remember to save the PDF of the peace agreement in the repository in Google Drive. Remember to include the snippet of text that informs your coding decision in the coding notes, or otherwise write why it appears that power sharing did not occur.

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## territorial_sharing

The postwar agreement has provisions for territorial power sharing with the PGM. Territorial power sharing is defined around divisions of power on a territorial basis, usually to ensure group accommodation. This includes devolving power to smaller subunits such as in a federal system, or devolving power to local or municipal powers.

0 – *Territorial power sharing is not present*

1 – *Territorial power sharing is present*

See the description under *political_sharing* for coding procedure. Remember to save the PDF of the peace agreement in the repository in Google Drive. Remember to include the snippet of text that informs your coding decision in the coding notes, or otherwise write why it appears that power sharing did not occur.

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## inclusion

Additive variable, derived from the *power sharing* variables (which includes *political_sharing, military_sharing, economic_sharing,* and *territorial_sharing*). Add the four variables together. The resulting variable is a 5-point scale, which will take the value of 0 to 4.

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## splits(1–5)

The number of groups the PGM splintered into, if it split in the given observation year. A split is when two or more separate entities emerge from one group – this can either be at least two highly organized groups, or a clear split into at least one highly organized entity and the other large entity dissolves eventually. If a group splits into so many pieces so that it effectively ceases to exist, we count that as not splitting and instead simply disintegrating.

Start with the PGMD 2.0 to identify which PGMs have successor groups (*successor, successor_id*). This should be a good start to finding out which PGMs continued to exist, in one form or another, after conflict. If your group is present in the GAARD, you can use the *termination_type* variable to code this as well. A 9 in the GAARD's *termination_type* denotes that the group split. Note that this also accounts for other termination types that can be relevant – for example, a 5 for dissolution or an 8 for turn to politics. You may also refer to the sources in the PGM Guidebook as well as the GAARD coding notes to find this variable before using Google search. If, after 30 minutes of search, you cannot find out if the group split or not, we will take that to mean that it did not split in the given observation year.

If the group did not split, e.g., there is only one group, code 1. If the group disintegrated, code 1. A group could fracture even more though after conflict, ultimately amounting to two or more groups. Count the number of groups and code that number here.

**Important:* If there is a split and two or more groups emerged, we must be able to code the group separately for their post-conflict identity. However, the group remained a single unit before the split. Thus, if there is a split, **copy and paste the entire row in the dataset** and keep all the same data for the PGM before the end of conflict, i.e., up until this variable. For example, if *splits3* is a 3, you should have three rows for the PGM, and *splits3* for all three rows should be a
3. Code the name for each group for *postwar_name(1-5)* for each row and code the identity for each group in *identity(1-5)* for each row.

We are collecting data for the post-conflict identity of PGMs in the five years after a conflict ends, therefore you should have an observation for each year (i.e., *splits1, splits2, splits3, splits4, splits5*). However, this may be difficult. It is likely that gathering data on each year is impossible. At the very least, we should have an observation for year 5.

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## postwar_name(1–5)
The name of the PGM in the postwar years, if it changes.

This is a text field, where you should enter the name of new group the PGM becomes in the postwar world. If the group disintegrated and no longer exists, put a period ('.') in this field. If the group has a formal name (e.g., the Asakaba Gang), then use that name. If the group appears to go by a common name in all sources but without being a proper noun (e.g., civil defense forces), then use that name. If you find no evidence of a name at all, code as 'none'.

As above, start with the PGMD 2.0 to identify which PGMs have successor groups (*successor, successor_id*). This should be a good start to finding out which PGMs continued to exist, in one form or another, after conflict. You may also refer to the sources in the PGM Guidebook as well as the GAARD coding notes to find this variable before using Google search. If, after 30 minutes of search, you cannot find out if the group split or not, we will take that to mean that it did not split in the given observation year.

**Important:* If there is a split and two or more groups emerged, we must be able to code the group separately for their post-conflict identity. However, the group remained a single unit before the split. Thus, if there is a split, **copy and paste the entire row in the dataset** and keep all the same data for the PGM before the end of conflict, i.e., up until this variable. For example, if *splits3* is a 3, you should have three rows for the PGM, and *splits3* for all three rows should be a 3. Code the name for each group for each row and code the identity for each group in *identity(1-5)* for each row.

We are collecting data for the post-conflict identity of PGMs in the five years after a conflict ends, therefore you should have an observation for each year (i.e., *postwar_name1, postwar_name2, postwar_name3, postwar_name4, postwar_name5*). However, this may be difficult. It is likely that gathering data on each year is impossible. At the very least, we should have an observation for year 5.

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## identity(1–5)
The type of group the PGM becomes after conflict.

This is a text field. As above, start with the PGMD 2.0 to identify which PGMs have successor groups (*successor, successor_id*). This should be a good start to finding out which PGMs continued to exist, in one form or another, after conflict. The termination variables will also help – you can find out how the group terminated and details of the termination, specifically with the variable *termination.* You may also refer to the sources in the PGM Guidebook as well as the GAARD coding notes to find this variable before using Google search. If, after 30 minutes of search, you cannot find out if the group split or not, we will take that to mean that it did not split in the given observation year.

Type anything here that makes sense, make it relatively short though. You can even use the cues from the following list of binary variables if relevant. However, if you don't find anything in that list that is relevant, that is ok – include whatever you find here.

**Important:* If there is a split and two or more groups emerged, we must be able to code the group separately for their post-conflict identity. However, the group remained a single unit before the split. Thus, if there is a split, **copy and paste the entire row in the dataset** and keep all the same data for the PGM before the end of conflict, i.e., up until this variable. For example, if *splits3* is a 3, you should have three rows for the PGM, and *splits3* for all three rows should be a 3. Code the name for each group for *postwar_name(1-5)* for each row and code the identity for each group in *identity(1-5)* for each row.

We are collecting data for the post-conflict identity of PGMs in the five years after a conflict ends, therefore you should have an observation for each year (i.e., *identity1, identity2, identity3, identity4, identity5*). However, this may be difficult. It is likely that gathering data on each year is impossible. At the very least, we should have an observation for year 5.

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## cartel(1–5)
The PGM becomes a cartel in the given postwar year. This implicitly means a drug cartel, which is a criminal organization with the intention of supplying drug trafficking operations. Note the difference between *cartel* and *trafficking,* below. Also note that drugs cartels can engage in different markets other than drugs, such as agriculture, car

parts, oil, etc., though their main activity should be within the drug market. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a cartel in this given year*

1 – *The PGM became a cartel in this given year*

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### street_gang(1–5)

The PGM becomes a street gang in the given postwar year. Street gangs are gangs formed by youths in urban areas, and are known primarily for street fighting and gang warfare. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a street gang in this given year*

1 – *The PGM became a street gang in this given year*

---

### trafficking(1–5)

The PGM becomes a trafficking organization in the given postwar year. Trafficking organizations engage in the recruitment, transportation, transfer, harboring or receipt of people or things through force, fraud or deception, with the aim of exploiting them for profit. Products can include illegal wildlife, humans, labor, sex, etc. If the group trafficks drugs, code a 0 here and a 1 for *cartel*. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a trafficking organization in this given year*

1 – *The PGM became a trafficking organization in this given year*

---

### petty_crime(1–5)

The PGM uses petty crime in the given postwar year. Petty crime refers to a group that engages in crime that is less serious than drug trafficking or other kinds of trafficking, or they appear less organized than a formal street gang. This includes armed robberies, wildlife theft, rape, etc. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM does not use petty crime in this given year*

1 – *The PGM uses petty crime in this given year*

---

### vigilante(1–5)

The PGM becomes a vigilante group in the given postwar year. Vigilante groups enforce or punish perceived offenses without legal authority. In other words, they are not police but decide on their own to stop crime and punish criminals, as they perceive it. This is different than a self-defense group because it is unattached to a particular community to
protect. These groups are unpaid by the areas they operate – coerced payment does not count. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a vigilante group in this given year*

1 – *The PGM became a vigilante group in this given year*

---

### self-defense(1–5)

The PGM becomes a self-defense organization in the given postwar year. Self-defense groups are like vigilante groups

but are associated with a specific community, such as a region or ethnic group. But like vigilante groups, they enforce or punish perceived offenses without legal authority in protection of a specific community. These groups are unpaid by the communities they protect – coerced payment does not count. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a self-defense organization in this given year*

1 – *The PGM became a self-defense organization in this given year*

---

## private_contractor(1–5)

The PGM provides private security in the given postwar year. Private security forces are hired to protect certain groups or areas. Unlike vigilante groups or self-defense groups, those who want protecting voluntarily pay them for their services. Payment should not be coerced. Your coding here should reflect the identity that you find and code in *identity(1- 5)*.

0 – *The PGM does not private security in this given year*

1 – *The PGM provides private security in this given year*

---

## political_party(1–5)

The PGM becomes a political party in the given postwar year. Being a political party means that it is represented on the national scale, such as participating in election, being accommodated in national unity governments such as sharing the executive office, or through other forms of formal representation. Use the GAARD variable *politics* to code this, but use
the coding notes to determine if it means the group participated in national or local politics. If it is represented on the local level but not nationally, code this as a 0 and *local_power* as a 1. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a political party in this given year*

1 – *The PGM became a political party in this given year*

---

## local_power(1–5)

The PGM maintains local power in the given postwar year. A group has local power if it holds positions at levels of governance lower than the national level. This includes being instated as the mayor or governor of certain areas, being able to govern entire municipalities, or maintaining control of certain districts. Use the GAARD variable *politics* to code this, but use the coding notes to determine if it means the group participated in national or local politics. If it is represented on the national scale, code this as a 0 and *political_party* as a 1. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not maintain local power in this given year*

1 – *The PGM maintained local power in this given year*

---

## military(1–5)

The PGM becomes part of the military in the given postwar year. A group is part of the military when a fraction or all of its members are absorbed into the state military. A PGM can maintain its own unit and even its own leader, but as long as it is under the command of the state military and takes orders from it, then it counts as being absorbed in the state military force. If it only receives training or weapons from the state but does not operate within the military, code this as 0 and *training* as 1. Use the PGMD 2.0 variable *termtype_integrate* to code this, but use the coding notes to see if the PGMD 2.0 means it integrated into the military or police (they use this variable for both). Your coding here should

reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become part of the military in this given year*

1 – *The PGM became part of the military in this given year*

---

**police(1–5)**
The PGM becomes part of the police in the given postwar year. A group is part of the police when a fraction or all of its members are absorbed into the state police force. If it only receives training or weapons from the state but does not operate within the police, code this as 0 and *training* as 1. Use the PGMD 2.0 variable *termtype_integrate* to code this, but use the coding notes to see if the PGMD 2.0 means it integrated into the military or police (they use this variable for both). Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become part of the police in this given year*

1 – *The PGM became part of the police in this given year*

---

**terror(1–5)**
The PGM becomes a terrorist group in the given postwar year. The group is an organized clandestine entity that uses unconventional means – including violence and the threat of violence – to terrorize citizens as a political statement aimed at the state. Although citizens are the victims, the state is the target. This does not include lone wolf perpetrators that use terrorist tactics. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a terrorist group in this given year*

1 – *The PGM became a terrorist group in this given year*

---

**rebel(1–5)**
The PGM becomes a rebel organization in the given postwar year. A rebel group uses armed conflict in opposition to the established government for reasons to seek political change or to establish, maintain, or to gain independence. Use the PGMD 2.0 variable *post_rebel* to code this. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a rebel organization in this given year*

1 – *The PGM became a rebel organization in this given year*

---

**cult(1–5)**
The PGM becomes a cult in the given postwar year. A cult is led by a charismatic leader and can exhibit other qualities (e.g., like that of a rebel group) but membership should primarily be based off beliefs from the leader. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM did not become a rebel organization in this given year*

1 – *The PGM became a rebel organization in this given year*

---

**nonexist(1–5)**
The PGM is nonexistent in the given postwar year. The group ceased to exist after the conflict. There is no evidence ofit existing as a coherent unit. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM exists in this given year*

1 – *The PGM is nonexistent a cartel in this given year*

---

**other(1–5)**
The PGM becomes something else not listed by the other binary variables above given postwar year. Your coding here should reflect the identity that you find and code in *identity(1-5)*.

0 – *The PGM is something listed above in this given year*

1 – *The PGM is something not listed above in this given year*

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Last updated: 4/5/2022

# C Correlation Matrix for Primary Explanatory Variables

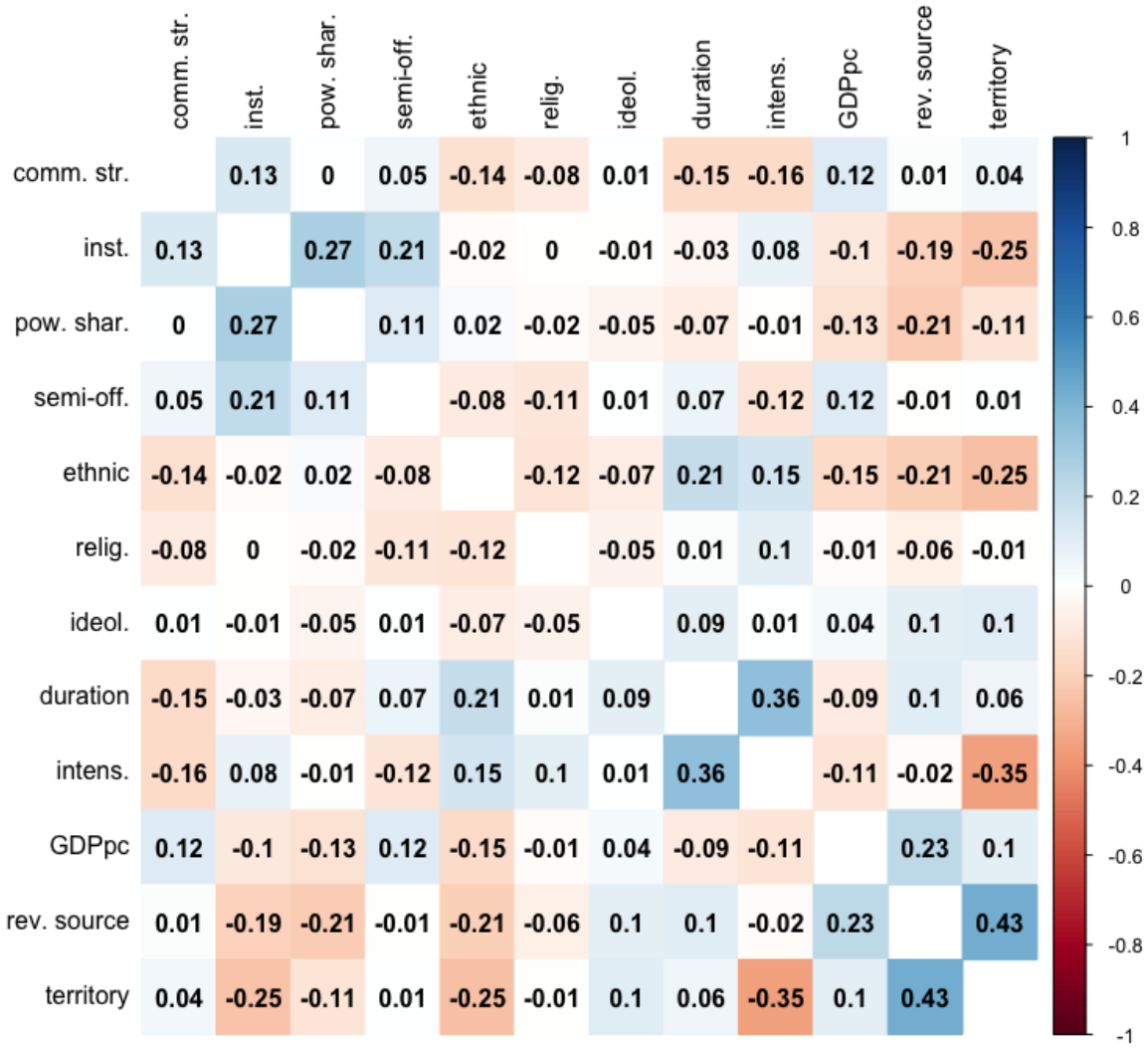


Figure A1: Correlation matrix for the primary explanatory variables.

# D Logistic Regression Log-Odds Results

Table A1: Dissolution versus Survival Logistic Regression Log-Odds Results

| | *Dependent variable:* | |
|---|---|---|
| | survived | |
| | (1) | (2) |
| command_structure | −0.856*** | −0.842*** |
| | (0.253) | (0.278) |
| institutions_dummy | 0.815** | 0.887** |
| | (0.347) | (0.391) |
| powersharing | 3.180*** | 3.250*** |
| | (1.090) | (1.120) |
| government_relation | 0.636** | 0.488 |
| | (0.315) | (0.340) |
| primary_mem_ethnic | 1.070** | 1.300*** |
| | (0.432) | (0.482) |
| primary_mem_religious | 1.900*** | 2.000*** |
| | (0.556) | (0.613) |
| primary_mem_ideology | −0.443 | −0.348 |
| | (0.862) | (0.856) |
| conflict_duration | 0.013 | 0.025* |
| | (0.012) | (0.014) |
| intensity | −0.541 | −0.492 |
| | (0.355) | (0.400) |
| GDPpc | 0.033 | −0.156** |
| | (0.037) | (0.077) |
| revenue_source | 0.142 | 0.625*** |
| | (0.150) | (0.194) |
| state_controlled_territory | −0.033** | −0.023* |
| | (0.013) | (0.013) |
| factor(geopolitical_region)2 | | −2.210*** |
| | | (0.795) |
| factor(geopolitical_region)3 | | −0.473 |
| | | (0.751) |
| factor(geopolitical_region)4 | | −2.770*** |
| | | (0.830) |
| factor(geopolitical_region)5 | | −13.700 |
| | | (883.000) |
| factor(geopolitical_region)7 | | −3.940*** |
| | | (0.879) |
| factor(geopolitical_region)8 | | −2.130** |
| | | (0.890) |
| factor(geopolitical_region)9 | | −1.990 |
| | | (1.470) |
| coldwar | | 0.194 |
| | | (0.674) |
| Constant | 3.190** | 3.890** |
| | (1.240) | (1.690) |
| Observations | 311 | 311 |
| Log Likelihood | −151.000 | −137.000 |
| Akaike Inf. Crit. | 329.000 | 317.000 |
| *Note:* | *p<0.1; **p<0.05; ***p<0.01 | |

# E PGMs that Dissolved, Years 1–5

Table A2: PGMs that dissolve between $t = 1$ and $t = 5$.

| Country | PGM Name | PGM ID | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|---|---|
| Haiti | Chimeres/Popular Organisations | 370 | criminal | criminal | criminal | criminal | dissolved |
| Iraq | Fedayeen Saddam | 230 | localdefense | dissolved | dissolved | dissolved | dissolved |
| Liberia | United Liberation Movement for Democracy - Johnson (ULIMO-J) | 15 | counterstate | dissolved | dissolved | dissolved | dissolved |
| Liberia | United Liberation Movement for Democracy - Kromah (ULIMO-K) | 16 | counterstate | dissolved | dissolved | dissolved | dissolved |
| Libya | The Libyan Shield Force (National Shield) | 606 | counterstate | counterstate | dissolved | dissolved | dissolved |
| Mali | Mouvement patriotique malien Ghanda Koy aka Ganda Koy | 492 | counterstate | dissolved | dissolved | dissolved | dissolved |
| Nigeria | Abia State Vigilante Group/Bakassi Boys | 410 | counterstate | dissolved | dissolved | dissolved | dissolved |
| Pakistan | Middle East People's Aman Committee (PAC) | 631 | criminal | criminal | criminal | dissolved | dissolved |
| Philippines | Kuratong Baleleng | 573 | criminal | criminal | criminal | dissolved | dissolved |
| Sierra Leone | West Side Boys | 86 | criminal | dissolved | dissolved | dissolved | dissolved |
| Sudan | Sudan People's Liberation Movement/Army - Nasir Faction (SPLM/A-Nasir) | 262.1 | localdefense | localdefense | localdefense | dissolved | dissolved |
| Sudan | Sudan People's Liberation Movement/Army - Nasir Faction (SPLM/A-Nasir) | 262.2 | localdefense | dissolved | dissolved | stateforces | stateforces |
| Sudan | Sudan People's Liberation Movement/Army -) United (SPLM/A-United | 265 | localdefense | localdefense | dissolved | dissolved | dissolved |
| Sudan | Sudan People's Liberation Movement/Army - United Lam Akol (SPLM/A-United Lam Akol) | 646 | localdefense | dissolved | dissolved | dissolved | dissolved |
| Sudan | Anyanya II | 161 | localdefense | dissolved | dissolved | dissolved | dissolved |
| Turkey | Hizbullah | 248 | counterstate | dissolved | dissolved | dissolved | dissolved |
| Zimbabwe | Youth Service Brigade/Green Bombers | 101 | dissolved | stateforces | stateforces | dissolved | dissolved |

# F PGMs that Changed Identity, Years 1–5

Table A3: PGMs that change identity between $t = 1$ and $t = 5$.

| Country | PGM Name | PGM ID | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|---|---|
| Ghana | Battalion 64 | 19 | localdefense | localdefense | stateforces | stateforces | stateforces |
| Haiti | Tonton Macoutes Semi-official PGM/ Volunteers for National Security | 362 | criminal | criminal | criminal | criminal | localdefense |
| Russia | Kadyrovtsy | 118 | stateforces | localdefense | localdefense | localdefense | localdefense |
| Sudan | South Sudan Defence Forces (SSDF) | 259 | counterstate | counterstate | counterstate | counterstate | stateforces |
| Sudan | South Sudan Defence Forces (SSDF) | 259 | localdefense | politics | politics | politics | politics |
| Sudan | Sudan People's Liberation Movement/Army - United (SPLM/A-United) | 265 | dissolved | dissolved | stateforces | stateforces | stateforces |

# G Multinomial Logistic Regression Log-Odds Results

Table A4: Multinomial logistic regression log-odds results for Model 3

| | *Dependent variable:* | | |
|---|---|---|---|
| | localdefense | politics | stateforces |
| | (1) | (2) | (3) |
| command_structure | 1.451 | 0.150 | 0.021 |
| | (0.905) | (0.603) | (0.430) |
| institutions_dummy | −0.136 | 0.069 | −0.896 |
| | (0.930) | (0.913) | (0.646) |
| powersharing | −0.903 | −0.841 | −1.104 |
| | (1.200) | (1.250) | (0.806) |
| government_relation | 0.235 | 0.496 | 1.030* |
| | (0.907) | (0.862) | (0.616) |
| primary_mem_ethnic | 0.431 | −1.631 | −0.410 |
| | (1.008) | (1.165) | (0.776) |
| primary_mem_religious | −0.653 | −17.240*** | −0.622 |
| | (1.406) | (0.00000) | (0.829) |
| primary_mem_ideology | 0.086 | −18.568*** | −17.097*** |
| | (1.624) | (0.00000) | (0.00000) |
| conflict_duration | −0.017 | 0.093** | 0.007 |
| | (0.035) | (0.040) | (0.023) |
| intensity | 0.190 | 0.749 | 0.526 |
| | (1.116) | (1.100) | (0.748) |
| GDPpc | −0.102 | 0.118 | 0.006 |
| | (0.125) | (0.127) | (0.093) |
| revenue_source | −0.196 | −0.709 | −0.414 |
| | (0.525) | (0.546) | (0.365) |
| state_controlled_territory | 0.065* | 0.023 | 0.019 |
| | (0.038) | (0.032) | (0.025) |
| Constant | −8.582** | −3.553 | −0.445 |
| | (4.264) | (3.465) | (2.313) |
| Akaike Inf. Crit. | 284.079 | 284.079 | 284.079 |

*Note:* *p<0.1; **p<0.05; ***p<0.01.
Counter-state groups are the reference category.

Table A5: Multinomial logistic regression log-odds results for Model 4

| | *Dependent variable:* | | |
|---|---|---|---|
| | localdefense | politics | stateforces |
| | (1) | (2) | (3) |
| command_structure | 1.938 (1.295) | −0.052 (0.727) | 0.408 (0.510) |
| institutions_dummy | 1.069 (1.412) | 0.778 (1.230) | −0.330 (0.829) |
| powersharing | 0.449 (1.686) | −4.548 (5.245) | −0.865 (0.934) |
| government_relation | 0.333 (1.396) | 0.421 (1.058) | 1.403* (0.746) |
| primary_mem_ethnic | 0.847 (1.337) | −2.651 (1.638) | −0.424 (0.965) |
| primary_mem_religious | 2.439 (2.188) | −25.844*** (0.00000) | −0.151 (1.076) |
| primary_mem_ideology | −30.653*** (0.005) | 2.002*** (0.000) | −49.492*** (0.00000) |
| conflict_duration | −0.067 (0.057) | 0.057 (0.077) | 0.031 (0.033) |
| intensity | −0.929 (1.633) | 1.400 (1.733) | 1.041 (0.955) |
| GDPpc | 0.202 (0.256) | 1.105* (0.637) | −0.202 (0.195) |
| revenue_source | −0.147 (0.643) | −2.335 (1.805) | 0.028 (0.561) |
| state_controlled_territory | 0.067 (0.055) | 0.086 (0.078) | 0.006 (0.033) |
| factor(geopolitical_region)2 | 21.779*** (1.612) | 1.234*** (0.000) | 13.170*** (1.613) |
| factor(geopolitical_region)3 | −21.169*** (0.00000) | 24.390*** (4.070) | −3.148** (1.327) |
| factor(geopolitical_region)4 | 3.603 (3.284) | 31.456*** (1.940) | −3.302* (1.793) |
| factor(geopolitical_region)7 | 3.436 (3.303) | 32.152*** (1.686) | −4.687** (2.345) |
| factor(geopolitical_region)8 | 1.694 (3.223) | 31.916*** (1.894) | −5.562** (2.186) |
| factor(geopolitical_region)9 | 18.585*** (0.00000) | 0.381*** (0.000) | −11.899*** (0.000) |
| coldwar | −23.137*** (2.439) | −12.301*** (2.907) | −23.212*** (2.563) |
| Constant | 9.175 (5.646) | −25.278*** (2.906) | 24.309*** (3.045) |
| Akaike Inf. Crit. | 267.243 | 267.243 | 267.243 |

*Note:* *p<0.1; **p<0.05; ***p<0.01

# Chapter 5

# Conclusion

## 1 How Do Violent Non-State Actors Adapt?

Violent non-state actors often step in when the state is absent. While we would most commonly expect this to happen in cases of collapse – when markets fail, when conflict breaks out, when state forces turn on the communities they are meant to protect – we also see these actors emerge in contexts where we would otherwise hold out hope that violence would subside. Large-scale shifts such as market expansion or the end of conflict can create the opportunities and incentives for violent actors to emerge and take advantage of situations like newfound wealth or a power vacuum left by the state.

In this dissertation, I have explored the transformational power of large-scale economic, social, and political shocks. Each paper advances a unique finding on how violent actors respond to these shifts to the environments in which they operate. They collectively serve to answer the question: how do violent non-state actors adapt?

In Chapter 2, "Blood Avocados? Trade Liberalization and Cartel Violence in Mexico," co-authored with Lucas Owen, we find that the expanding avocado market in Mexico has led to a relative decrease in cartel-related violence in avocado-producing regions, in part due to the deterring effect of vigilante violence on criminal activity. This tells us that actors have adapted to the influx of capital in the avocado industry by diverting newfound wealth to self-defense forces. We find that there are relatively fewer cartel-related homicides in areas that grow avocados compared to those that do not. On one hand, this finding supports

the opportunity cost hypothesis, where criminal actors shift away from illicit activities and instead engage in the licit economy because there are higher returns in terms of wages net of appropriation loss. On the other hand, violence is on the rise in absolute terms. In what we call the vigilante mechanism, we posit that individuals adapt to criminal violence by supporting self-defense groups to act as an effective deterrent against cartel incursions.

In Chapter 3, "Not So Sweet: External Price Shocks, State Capacity, and Violence from Madagascar's Vanilla Industry," I find that shifts in consumer preferences in one part of the world lead to an increase in crime and vigilantism in areas of virtually no state capacity such as Madagascar, the world's largest supplier of vanilla. This tells us that unorganized criminal actors have taken advantage of areas where the state is practically absent and adapted to the the increased demand and prices of vanilla by engaging in more crime such as petty and violent theft of green and prepared vanilla. Correspondingly, local actors have adapted to the increase of criminal activity by supporting vigilante action to protect farmers, to avenge victims of crime, and to ensure justice in areas that lack state presence where vanilla is grown.

A potential factor that drives the difference in outcomes between the Mexico and Madagascar cases – where we see comparatively less crime in avocado-producing areas and comparatively more crime in vanilla-producing regions – is a matter of variation in levels of organization. That is, more highly-organized vigilante groups, as opposed to less-organized groups, will more likely have a deterrent effect on criminal actors. Mexico has a longer history of organized violence manifesting from criminal, state, and self-defense actors alike; likewise, the gains from increased avocado trade have been sustained as markets have been expanded piecemeal over decades. This has allowed groups to become more highly organized over time. Madagascar, conversely, has a weaker history of organized violence. Furthermore, the gains from vanilla were short-lived – Nestlè's policy fundamentally altered the demand for vanilla in 2015, yet a devastating cyclone in 2018 decimated the supply. While stockpiles and the constrained supply initially kept prices high, once the stores of vanilla were depleted,

the global price of vanilla decreased. Without the material incentives to sustain a highly-organized effort for violence and extralegal behavior, crime and vigilantism subsided.

In Chapter 4, "Getting to the Hereafter: Variation in the Survival and Transformation of Pro-Government Militias," I find that non-state actors such as pro-government militias (PGMs) may not terminate as expected, and certain conditions explain when they are more likely to remobilize and again pick up arms to reproduce violence. This tells us about the pathways PGMs take to adapt to new strategic imperatives and shift toward operating in a new environment when they are instead meant to terminate. Groups learn, and indeed PGMs can take advantage of their wartime organizational structure or the overall structure of the environment in which they operate to become a local defense group, political group, part of the state forces, or counter-state group.

# 2 Dissertation Contributions

Collectively, the articles in this dissertation speak to at least four theoretical and empirical contributions – understanding variation in levels of group organization, understanding the role of varying levels of state capacity, understanding the contexts in which vigilante groups emerge, and understanding the ways in which scholars can make use of novel sources of data in political and criminal violence research.

## 2.1 Variation in Levels of Group Organization

When there is an influx of capital in areas of low state capacity, media reports have us wringing our hands about the increase of violence in places where criminal organizations infiltrate the licit economy to win a share of the newfound wealth. For example, accounts of avocados went from framing it as a "glamorous green interloper" of the health industry to a "blood-soaked fruit" (White, 2023) that is now associated with "killings, modern slavery, child labour and environmental degradation" (Dehghan, 2019) as "Mexico's multibillion-

dollar avocado industry, headquartered in Michoacàn state, has become a prime target for cartels" (Linthicum, 2019). Consequently, these reports have consumers asking: are U.S. avocado buyers financing the cartel conflict in Mexico (Flannery, 2023)?

However, common accounts exploring the relationship between positive economic shocks and violence tell us that, as labor-intensive licit markets gain more wealth, the opportunity cost of crime increases (Dal Bó and Dal Bó, 2011; Dube and Vargas, 2013; Mejia and Restrepo, 2015; Blattman and Annan, 2016). This means that organized criminal violence will decrease relatively in areas that produce the licit good compared to areas that do no produce the good. While violence is unmistakably on the rise across Mexico in absolute terms as cartels diversify their activities beyond the drug trade, we see the opportunity cost argument play out empirically. However, this hypothesis accounts for only two strategies in which actors can gain a market advantage – seizure or production; we claim that actors can engage in a third strategy to gain a market advantage – defense. In what we call the vigilante mechanism, we claim that violence can decrease with positive shocks to labor-intensive licit commodities because market participants make both material and immaterial investments in defensive measures to protect the industry, thereby effectively deterring criminal actors from violently seizing assets.

This finding is not what played out empirically in Madagascar. The Malagasy vanilla industry experienced a positive economic shock in 2015 when Nestlè announced it would use only all-natural vanilla in its products, leading to a 12-fold increase in prices. Given the opportunity cost argument and findings from Mexico, one would expect that there is similarly fewer cases of crime in vanilla-producing regions relative to non-vanilla-producing regions. Yet I find that there is in fact a relative increase in crime and vigilantism in the SAVA region, which accounts for almost 90% of the vanilla producers in Madagascar.

What explains this variation? Why did a positive shock to the avocado market lead to comparatively less violence in avocado-producing regions in Mexico while a positive shock to the vanilla market lead to comparatively more violence in vanilla-producing regions in

Madagascar? I claim that the answer, in part, lies in variation in the level of organization across groups in Mexico and Madagascar. Collective mobilization of armed groups – even vigilante groups with the purpose of reducing crime – can plausibly lead to an increase of violence, and literature on the effect of vigilantism on crime and violence provides variable findings. Vigilantes can be responsible for an overall escalation of extra-lethal violence (Fujii, 2013), for example with the *sungusungu* in Tanzania (Plyler, 2007; Abrahams, 1987) and the *Mapogo* (Harris, 2001) and *Amadlozi* (Buur, 2006) vigilante groups in South Africa.

This tell us that collective action for vigilantism is costly, and so we must understand the conditions that allow for collective group behavior to deter violence. I claim that self-defense groups can effectively deter violence when there are both material and immaterial factors motivating collective action. These material and immaterial factors create the incentives for groups to become more highly organized, leading to the sustained mobilization that allows vigilante groups to fill the void left by organized crime and the state in the long run.

Material incentives, such as monetary investments and increased market returns, are crucial to counter external threats. Effective crime prevention involves deterrence through detection and punishment. For vigilante groups to provide protection where the state cannot, they must mimic the state to deter outside violence. By using wages and monetary support, vigilante groups can enhance their coercive capacity to prevent crime in areas without state presence. Criminal actors maintain control through investments. Likewise, victims must "invest in building their own coercive power" (Moncada, 2021, 36). Thus, monetary incentives and investments enable vigilante groups to become highly organized and deter criminal violence.

Immaterial incentives, such as membership from tight-knit communities, are equally crucial to counter predatory violence from militia members. Vigilantes can prey on the communities they are meant to protect. Membership from existing tight-knit organizations and communities helps solve the principal-agent problem, where vigilantes (the agent) must pro-

tect producers (the principal) from violence. Militia members may defect and prey on these communities. To deter violence, vigilante groups must draw members from organizations with established norms of reciprocity and trust. For example, Skarbek (2011) shows how norms govern prison gangs in tight-knit, homogeneous communities, reducing defection and information costs and improving internal governance.

In Mexico, the vigilante groups that emerged to combat organized crime are highly organized and relatively sophisticated in their use of violence (Moncada, 2021). The self-defense forces that protect avocado farmers have origins in Local Plant Health Boards (Juntas Locales de Sanidad Vegetal, or JLSVs), which Mexican federal and state authorities created to help producers and packing plants meet U.S. Department of Agriculture regulations to facilitate avocado export. Avocado producers in Tancítaro, Michoacán's largest avocado-producing town, saw the success of the *autodefensa* movement combating the Knights Templar in the Tierra Caliente region, and members of the local JLSV met with *autodefensa* forces to see if they would help those in Tancítaro develop their own self-defense group. This catalyzed the collective vigilante movement in Tancítaro, where intra-sectoral actors via the JLSVs pool assets to sustain members of the avocado industry as a self-defense force through financing wages, weapons, trucks, and other equipment. This level of organization can in fact be a mediating condition that not only effects the capacity – but also the credibility – to carry out threats, and thus the ability to deter violence.

In Madagascar, conversely, the vigilante groups that emerge to combat criminals appear to be more unorganized and spontaneous than what we see in Mexico (Osterhoudt, 2020). With increases in the threat of vanilla theft – which challenges the livelihood of people with few outside options – communities engage in *fitsaram-bahoaka*, also known as people's justice. While these events appear chaotic and extremely violent, they are in fact conducted with care and deliberation once mobs capture the thief: "mob killing events are often marked by speeches, ancestral associations, and guiding relationships of social hierarchy" (Osterhoudt, 2020, 251). Despite this careful intent, mobs often emerge spontaneously,

when a farmer or night watchmen alarms others of a thief. It is then that a mob forms, apprehends the thief, and punishes them publicly.

## 2.2 Role of State Capacity

Level of organization may be partly a function of state capacity. Interview evidence[1] from fieldwork in September 2023 lends credence to the claim that state capacity matters. In these cases, vigilantism serves a deeper sense of retribution and justice in communities in the absence of the state. This evidence provides us with insight for how and why individuals believe in the utility of vigilantism in these cases:

> `Andoniaina:` The people no longer trust the government. They would rather kill that person.[2]
>
> `Toky:` When the thief is released, he can brag about being free again and steal somebody's vanilla next time. This is why vigilantism happens.[3]
>
> `Patrick:`Everyone knows he commits crimes many times. He may have an influence on youth and increase crime so the community decides to kill him.[4]

This tells us how and why criminal and extralegal actors emerge in these areas of low state capacity. A depth of literature explains how criminal actors behave like firms – they have rules for business and conduct, they provide to people who then pay for their goods and services, they have enforcement mechanisms to ensure people are behaving the way they are expected to even without direct oversight from other members – to fill in where the state is absent (Gambetta, 1996). This is why, for example, we see drug cartels seek to minimize competition in a single market, or the mafia enforce illicit agreements between criminals and the organization through the use of violence, or street gangs defend a particular territory or turf.

[1]The following names of interviewees are anonymized.
[2]Andoniaina, vanilla farmer, focus group, Andapa, September 2023.
[3]Toky, vanilla farmer, focus group, Andapa, September 2023.
[4]Patrick, vanilla farmer, focus group, Andapa, September 2023.

There must be state structures and capabilities for these groups to move in and secure resources. Simply put, without a nominal level of state capacity, there is nothing for criminal or extralegal groups to capture. Without incentives for organization – especially the material factors that allow groups to become more highly organized through investments in augmenting coercive capacity – groups are unlikely to form in the long run to fill in the power vacuum the state leaves behind. Additionally, the opportunity cost mechanism – the primary mechanism underlying studies that find that positive economic shocks to labor-intensive licit industries reduces violence – assumes at least a nominal level of state capacity at the local level. The state must be present to reallocate production, effectively impose and collect taxes, and enforce contracts to protect property. When the state lacks the power to impose such rules and regulations, the logic of the opportunity cost argument unravels.

The simple fact that the state institutions in Mexico offer publicly-available data on crime tells us that there is at least a nominal level of state capacity.[5] I assert that we should not overstate claims based on findings from studies that analyze areas of low state capacity, for all low-capacity states are not created equal. Indeed, while there is clearly significant variation in cases of high versus low state capacity – Norway is markedly different from South Sudan, for example – there is also meaningful variation at the lower end of the spectrum across areas of low state capacity – Mexico is markedly different from Madagascar, for example. Low state capacity is vastly different from virtually no state capacity, and we are prompted to misleading conclusions if we assume they are the same. Scholars should exercise caution when overstating claims of studying areas of low state capacity. Instead, we should improve our identification strategies to fully assess the varying levels of state capacity across cross-national or sub-regional units.

[5]I do not want to overstate the level of state capacity in Mexico. While there are aspects of Mexico that allows scholars to say the state has a relatively high level of capacity, at its core the Mexican state lacks the coercive capacity to offer security to its population. Based on that metric – the ability of the state to maintain security structures to protect the population – Mexico has quite low levels of state capacity.

## 2.3 Pathways To Vigilantism

Large-scale shocks alter the nature and scope of the actors operating in a certain environment. Imagine a game of billiards – the break shot hits the head ball of the rack, and the colored balls burst out and disperse across the table. This is one potential outcome of an economic, social, or political shock that alters the playing field for non-state actors and creates incentives for them to emerge, terminate, or change behavior.

In this dissertation, I explore the pathways to vigilantism. Extant literature provides valuable context for understanding when and why vigilante groups emerge, positing that vigilantism manifests due to economic explanations (Phillips, 2017; Moncada, 2021), institutional explanations (Freire and Skarbek, 2023; Moncada, 2021), or historical explanations (Wolff, 2020; Osorio, Schubiger and Weintraub, 2021). The explanation for the emergence of vigilante groups that I provide in this dissertation accounts for how large-scale shocks provide different incentives for communities to organize for the purpose of self defense.

The first broad pathway to vigilantism explores economic shocks. I find that criminal actors in areas of low to no state capacity emerge or alter their behavior when there are large-scale economic shocks in the areas they operate. When positive economic shocks to licit industries bring more wealth to certain areas, illicit actors infiltrate the market in an attempt to capture part of the expanding prize to be won. In turn, people respond to crime in diverse ways. They ultimately may resist, assist, or simply tolerate criminal actors that prey in their communities. In this dissertation, I explore cases of active resistance, where individuals organize efforts to combat crime.

I account for two different ways that vigilantes emerge in the wake of these economic shocks. Following these economic shocks, highly-organized groups emerged in Mexico while more spontaneous and ad hoc groups emerged in Madagascar. In Mexico, both material and immaterial factors allowed for the mobilization of *autodefensas* via the JLSVs. In terms of immaterial factors, mobilization via the JLSV allowed the vigilante movement within the avocado sector to be coordinated through an encompassing political economy,

which Moncada (2021, 30) defines as "featur[ing] a single organization that encompasses all sectoral actors and thus fosters sustained horizontal ties among them while serving as the main coordinator for sectoral activities." In terms of material factors, intra-sectoral actors pooled assets to, first, fund vigilante forces from Tierra Caliente to train those in Tancítaro and, second, to sustain members of the avocado industry as a self-defense force through financing wages, weapons, trucks, and other equipment.

In Madagascar, communities engage in mob justice in a relatively ad hoc manner: "[A farmer] will then attempt to apprehend the thief, restraining and bringing him to town. Others in the village who hear the commotion will leave their homes and join the group [...] the mob will beat and stone the suspect, usually until death" (Osterhoudt, 2020, 6-7). Although mob mobilization appears to be exclusively through tight-knit village communities, the groups lack any material incentives for organization. Instead, they are unorganized, spontaneous, and ad hoc. Without the material incentives to invest in becoming more highly organized, they lack the coercive capacity to effectively deter violence in the vanilla industry, making the vigilante mechanism insignificant in this case.

The second broad pathway to vigilantism explores socio-political shocks. I examine cases where the end of conflict or crisis can create incentives for local defense groups to emerge. During conflict or crisis, states may operate in tandem with PGMs as a force multiplier or to function as a form of plausible deniability for the state. When these conflicts or crises subside, one would expect that state and non-state actors alike will work towards stability, thereby upending the "order" that is created under during armed conflict and replaced with a peacetime order. However, conflicts commonly recur, or at the very least instability prevails.

One reason why we see instability continue to manifest is that, once PGMs terminate, they can either formally dissolve or they can re-purpose themselves into different types of organizations and continue armed struggles in their afterlife. One of these outcomes is vigilantism. I specifically find that PGMs pursue pathways to vigilantism through organiza-

tional structure and state capacity. PGMs are more likely to turn to local defense when they have a highly-organized command structure. This means that PGMs that are centralized and vertically-oriented can maintain those structures post-termination and continue using violence in the communities in which they operated prior to termination.

PGMs are also more likely to turn to vigilantism when the state exhibits high levels of capacity by exercising uncontested control over its territory. This finding at first seems surprising, given the first two empirical chapters of my dissertation that finds that low state capacity provides the conditions for vigilante groups to manifest. However, I claim that although a state may maintain uncontested control over its territory, it may have less of a reach in peripheral regions. PGMs may then seek to provide security to regions at the margins of state control, far from the central authority. This conjecture can be examined in future studies with sub-national analyses that seek to understand how state control is projected to peripheral areas and how PGMs can fill in for the state in areas where it cannot reach.

## 2.4 Data Innovations in Political and Criminal Violence Research

Despite these contributions, the articles I present carry certain limitations precisely because I examine violence in contexts of low state capacity. Most notably, one could claim that the identification strategies I draw on lead to shortcomings in my analyses. The world is a complicated place, and it is difficult to precisely identify the various treatments, interventions, and measurements that would otherwise be more precise in laboratory experiments.

Given the complex – and, frankly, somber – nature of the studies in this dissertation, I accept these limitations. I welcome the shortcomings to my studies on the merit of circumventing the ethical deficiencies of potentially exploiting vulnerable communities and putting them at risk of more hardship or violence. To be sure, I am aware that "contexts of state fragility or violent conflict constitute permissive environments in which researchers can find themselves (usually unintentionally) skirting the edges of what would be considered

responsible research practice elsewhere" (Cronin-Furman and Lake, 2018, 611). Moreover, because research in the realm of political violence may suffer from "few (if any) formal mechanisms of ethical oversight, short time horizons, clustering in over-researched areas, and the unlikely prospect of disseminating research results" (Eck and Cohen, 2020, 856), I endeavor to remain humble in my research since it speaks to other people's livelihoods and well-being. I hope this dissertation can be part of the wider dialogue on ethics in political violence research advanced by prominent scholars such as Cronin-Furman and Lake (2018), Eck and Cohen (2020), Hoover Green and Cohen (2021), Krause and Szekely (2020), and Shesterinina (2019).

To address the ethical quandaries of conducting research in the realm of political violence and organized crime, this dissertation utilizes a diverse set of empirical evidence derived from government sources, from fieldwork, and through hand collection. First, I source publicly-available data derived from Mexico's Executive Secretariat of the National Public Security System (SESNSP) and the Mexican Attorney General to operationalize cartel violence using three separate proxy measures – intentional homicides, cartel-related homicides, and missing persons. Notably, the data primarily measures *homicidios dolosos*, or "intentional homicides," from the SESNSP, which I demonstrate is highly correlated with cartel-related homicides. I thus create a second proxy measure for cartel-related homicides through manual imputation based on the estimated relationship between intentional homicides and cartel-related homicides from earlier data from the Attorney General's office. Lastly, missing persons captures another form of violence cartels commonly use.

Because this article leverages SESNSP, a government source, the data risks bias due to under-reporting. We could assume the data in this analysis offers a low count of homicides, which implies that with more accurate data the results will still hold true especially given that under-reporting is likely systematic across municipalities.

A second government source I leverage is from special access to novel data I was granted by Madagascar's local gendarmerie in partnership with representatives from the

Malagasy National Ministry of Police on local levels of various types of crime. Like crime data from the Mexican government, this data suffers from similar types of biases. However, it is the only known systematic source of crime data in Madagascar, making it invaluable despite potential biases. I compile ten sets of data in what I call MADACRIME, a panel dataset that accounts for crime in each of Madagascar's 22 regions from 2010 to 2020. In cataloguing instances of crime, the officials classified cases into either acts of banditry, zebu crime, or vanilla crime. I aggregate these measures to create a single measure to capture overall crime in Madagascar.

Second, I conducted fieldwork in Madagascar in September 2023 to collect interview data. Vanilla farmers were my primary interview participants, where I sought to understand the conditions that drive communities towards vigilante justice. The primary set of interviews was through a focus group, where I met seven participants in a small fokontony in SAVA to discuss their perceptions of criminal and counter-criminal activity in their area.

After being welcomed into the fokontony and speaking with these vanilla farmers, I had several key realizations about conducting fieldwork in fragile environments. Off-the-shelf Institutional Review Board (IRB) regulations are often enough to ensure scholars are not committing totally unscrupulous research, though going beyond IRB stipulations is often necessary to ensure truly ethical conduct. While the IRB establishes a floor to guide ethical conduct, it is a relatively low one given the extent of variation in social science research, and thus it is the responsibility of the researcher to behave ethically, beyond what the IRB demands. This involves understanding local customs, relationships among individuals, and power structures. For example, approval for the interviews must go through the head of the fokontony even before contacting individuals living in that community. Upon arrival, it was clear that paper documentation made villagers wary, and many were unable to sign due to low literacy rates, and so I obtained consent through oral rather than written means. As I obtained oral consent, the interview participants affirmed that they would like results from my study shared with them. It became clear that the farmers have previously been

research participants, though the researchers have not shared results derived from insights the villagers provided, and the farmers expressed disappointment.

Third, I hand-collect conflict data by triangulating information across primary sources, secondary sources, and country experts in the PGM Transformation (PGMT) Project. The PGMT Project is a multi-methods program that accounts for the survival and transformation of 325 PGMs from 1982 to 2017 in a quantitative and qualitative dataset. While this project allows me to circumvent some ethical concerns about direct interactions with vulnerable people, there are still considerations that impact the validity of the data such as production transparency, false precision, and bias in publicly available data (Hoover Green and Cohen, 2021).

I address these epistemological and ontological concerns in three primary ways. First, I make the PGMT Project codebook available in this dissertation, which notably describes how project researchers address issues of uncertainty and assumptions in the data collection process. Second, I collect case narratives for all 325 cases in the PGMT Repository, which highlights the coding decisions researchers made for each case. The PGMT Repository thereby provides transparency for the coding decisions in the dataset by highlighting areas of uncertainty or assumptions made in the data collection process. Third, my research triangulate information from existing datasets, primary sources, and reputable secondary sources to collect data to lessen the likelihood of bias from a single source.

The PGMT Project offers a unique innovation in data collection. It not only provides researchers with a new dataset on the post-termination characteristics of PGMs, but it highlights a systematic process that researchers can use for collecting data on violent actors in fragile environments, especially by being open and transparent to the biases and assumptions made in the data collection process.

Together, when triangulating findings derived from these unique sources of data, this dissertation provides significant lessons in carrying out empirical analyses in the fields of political and criminal violence in areas of low state capacity. By being transparent about

biases in measurements and data collection processes, this dissertation is part of the wider dialogue on the ethics of political violence research.

# 3 Avenues for Future Research

Given these three broad contributions, each article in this dissertation leaves scholars with several directions for future research as we seek to better understand how violent non-state actors adapt to the world around them. In terms of research on avocados and Mexico, future studies can use innovative ways to test the vigilante mechanism against the opportunity cost mechanism. The article presents a meaningful way to explore the ways in which we see the vigilante mechanism play out in Mexico, though future studies can seek to mediate between the two mechanisms to understand to what extent each one is functioning to reduce violence comparatively in wealthier areas.

In terms of research on vanilla and Madagascar, future studies can extend the analysis I present in this dissertation to cross-national or even sub-regional analyses. One could compare variation in state capacity across other vanilla-producing regions, such as Okinawa in Japan, Bali and South Java in Indonesia, or certain islands in French Polynesia. Alternatively, one could compare variation in state capacity within Madagascar itself, approximating state capacity as being higher or lower with geographical proximity closer to ports or to the capital districts of each region. Comparisons can be drawn between SAVA and other vanilla-producing regions, even if they have less of the market share of vanilla compared to SAVA. The region of Diana in the northwest of Madagascar, for example, is expanding its vanilla production as climate change generates more rainfall in the area. By comparing violence across regions of varying levels of state capacity, one could gauge the true effect of state capacity.

In terms of the afterlife of PGMs, future studies can make use of the qualitative dataset offered by the PGMT Repository to better understand the causal pathways for the

outcomes I examine in this dissertation. Cross-national analyses may lead to misleading conclusions given the idiosyncrasies of violent groups. To address this concern, scholars can utilize this data innovation for future studies on the afterlife of PGMs by drawing on the qualitative narratives of the PGMT Repository as a basis for more in-depth case studies to evaluate particular causal processes. Furthermore, as I examine the *causes* of PGM survival and transformation, this data can serve to as a public good for others to examine the *consequences* of PGM survival and transformation. In using PGM survival and transformation as the independent variable, future studies can examine important outcome such as implications for democracy, governance, the rule of law, and citizen trust in government institutions.

Ultimately, this dissertation lends itself to advancing a related research agenda by posing the following question: what explains the variation in community responses to criminal actors? As this dissertation demonstrates, criminal groups prey on communities where the state lacks the ability to effectively protect victims from violence. However, communities that have similar underlying characteristics may mobilize for collective action in disparate ways despite being exposed to the same forms of criminal violence. Victims can respond to predation using a repertoire of means for resisting, assisting, or even simply tolerating criminal actors.

My experience during fieldwork in Madagascar in September 2023 ultimately shaped the nature of this puzzle. While interviewing vanilla farmers about the strategies used to counter criminal incursions, it became clear that different villages within the same district that the very same criminals steal from have adopted at least three disparate strategies for community resistance. First, some villages have commonly formed vigilante groups to exercise mob violence, often leading to the public killing of criminals. Second, some villages report crime to the police or gendarmerie to let the state punish the thieves. Third, some villages let thieves prey on farmers despite condemning such acts.

Insights from this dissertation – as well as scholarship on collective action, civil resistance, organized crime, and vigilantism – inform this future research agenda. Earlier conflict

literature holds that social networks and community connectivity are crucial to understanding civilians' propensity to activate violent and nonviolent resistance movements (Parkinson, 2013; Petersen, 2001; Chenoweth and Stephan, 2011; Pearlman, 2011). A more recent scholarship has sought to capture the macro-level variation of specifically vigilantism as a form of civil resistance (Bateson, 2021; Moncada, 2021; Cohen, Jung and Weintraub, 2023). This agenda seeks to create an account of community responses to criminal actors. It builds upon insights from my dissertation and departs from the extant literature by conceptualizing the variation in repertoires of resistance beyond vigilantism, including nonviolent modalities of resistance.

In pursuing this future research agenda, we are left with a series of broad questions that could have us further contemplate the relationship between criminal and counter-criminal movements. How does the role of the state vary across communities, and how does that shape community response to criminal actors? What is the history of criminal-community interaction, and should criminal activity be better understood as a one-shot or iterative game? Are counter-criminal efforts a form of collective resistance or are counter-criminal efforts idiosyncratic across individuals? What are the various modalities of resistance individuals can adopt against criminals? Can we limit resistance strategies to exit, voice, and loyalty, or are there other approaches community members can adopt? These questions would build upon this dissertation and continue exploring the economic, social, and political causes and consequences of political violence and organized crime.

# 4 Overcoming Violence

This dissertation explores the conditions under which we see cycles of violence persist in areas of low state capacity. Primarily, these studies tell us about the limits of weak state capacity and globalization for licit and illicit actors alike. It tells us that what people consume in richer parts of the world impacts cycles of violence in other, more vulnerable,

parts of the world. These shortcomings of globalization could be a function of government policy or multinational corporations fueling market failure. We can thus ask ourselves a set of questions that has us examining the role of individuals, corporations, and the international community in addressing violence. To what extent should agreements, like trade agreements or peace agreements, account for the behaviors of violent illicit actors? Do multinational corporations have a responsibility in protecting those populations from which they gain their wealth? What is the responsibility to support weak states in gaining the capacity to offer public goods, and do mediators or international organizations involved in post-conflict processes have a similar responsibility? What role do international or domestic actors have in developing a functioning justice system that people could trust to protect them from crime and violence?

While my primary findings are outwardly bleak, there are in fact some optimistic implications we can draw. Various economic, social, or political shocks disproportionately impact areas of weak state capacity. Because the deleterious consequences of crime and violence occur primarily in areas where the state is absent, we can seek to understand the conditions under which the state can provide trustworthy structures to protect these vulnerable people. As this dissertation shows, local actors have agency – they are not simply swept up in external shocks, but they respond in nuanced ways – and thus the incentives must be altered to support productive rather than destructive ways to adapt to the world around them.

As such, I pose five main implications for policy. First, targeted economic development programs can reduce vulnerabilities to criminal and vigilante violence. By focusing on initiatives that promote sustainable income growth and economic opportunities in affected communities, governments can mitigate the risk factors associated with criminal activity. Second, investing in social services and support systems – such as education, healthcare, and social welfare programs – can help strengthen community resilience and reduce reliance on criminal networks for income generation. By addressing underlying socioeconomic dis-

parities and providing alternative pathways for individuals at risk of engaging in criminal behavior, governments can contribute to long-term crime prevention efforts. Third, policymakers can pursue community-based approaches to crime prevention, such as community policing, neighborhood watch programs, and community development initiatives. By empowering local communities to address the root causes of crime and violence, governments can foster collaboration, trust, and social cohesion, thereby reducing the influence of organized criminal groups and vigilante networks. Fourth, effective law enforcement strategies should rethink universal hard-line policies and instead be tailored to the specific dynamics of organized crime and vigilante violence in different contexts in order to disrupt networks while minimizing human rights abuses. Fifth, policymakers can use the insights from this dissertation to inform the design and implementation of effective law enforcement strategies tailored to the specific dynamics of organized crime and vigilante violence in different contexts.

Ultimately, this dissertation is motivated by my conviction to illuminate how, in an increasingly interconnected world, political behavior does not occur in a vacuum – actions people take in one part of the world often have downstream consequences in other parts of the world that are more vulnerable to political violence and organized crime. If we have the power to generate bad outcomes, we have the power to generate good ones.

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