From Cocaine to Avocados: Criminal Market Expansion and Violence

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Abstract

Most of what we know about organized criminal violence comes from research about illegal narcotics markets. Yet, these groups also fight to capture markets for legal commodities, as evidenced by Sicilian lemons and South African abalone. Under what conditions do criminal groups violently expand into markets for licit goods? We argue that rapid increases in the accessible share of a good's export value create opportunities for immediate profit and future market manipulation. This provokes violence against producers and competitors as groups expand their territorial holdings and economic portfolio. We test our argument cross-nationally (1993-2018) with data from the Atlas of Economic Complexity, V-Dem, and UN-ODC. Positive shocks to a country's share of global export value for agricultural goods correspond with high homicide counts – but only where criminal groups are present. We then provide additional evidence of our mechanism and address concerns about reverse causality using data on Mexican avocados.

1 Introduction

Conventional wisdom suggests that criminal organizations—groups involved in a variety of criminal activities, whether it be drug cartels, gangs, or mafias (Lessing, 2020, 3)—emerge to capture rents from illicit goods sold illegally on informal markets (Misse, 2007, 140). In fact, most of what we know about criminal organizations is connected to the illicit drug market (Snyder and Duran-Martinez, 2009; Durán-Martínez, 2017; Trejo and Ley, 2020; Lessing, 2017; Osorio, 2015). However, examples across time and space tell a different story: in the 1800s in Sicily, the mafia took over the market for lemons, and in the 1900s in New York, it sought to control the artichoke market. In the 1990s, street gangs in Cape Town, started encroaching on the abalone market, and in Mexico in the 2010s drug cartels took control of the lime and avocado markets (Dimico, Isopi and Olsson, 2017; Tiscornia, 2020; Linthicum, 2019; Critchley, 2008). If trading in illicit goods is highly profitable, why bother with artichokes, lemons, and shellfish?

Research on criminal market expansion suggests that criminal groups will attempt to control any market that seems profitable (Wainwright, 2016). Yet, expansion to other markets has costs. Diversification, in illegal or legal markets, is neither automatic nor obvious: not all markets are complementary, as economies of scale are not always present, and not all groups are equally risk-tolerant (Farfán-Méndez, 2019). Given these challenges, when do criminal groups diversify their economic portfolios by participating in markets for legal commodities? We argue that when the export value share of agricultural goods rapidly increases, criminal organizations will seek to profit from these expansive and newly lucrative markets. Positive price shocks to agricultural goods that these organizations' home states export in high quantities present unique opportunities for profit, local territorial gain, and long-term control that merit the risk of expansion. Organizations capitalize on these opportunities by engaging in coercive violence against agricultural producers and rivals to secure territorial and economic control. We focus on the consequences of criminal groups' early attempts to control these markets.

To test our argument we combine data on agricultural production and value from the World Bank, criminal threats to the state from the Varieties of Democracy (V-Dem)

project, and homicide statistics from the United Nations Office on Drug and Crime from 1993 to 2018. We find that unexpected increases in a state's share of agricultural goods' export value - an indicator of both immediate opportunities for profit and the plausibility of market control - is associated with increases in homicide rates.

This paper contributes to current research on criminal markets by focusing on international economic factors. In centering on markets for legal commodities, we extend existing scholarly research on economic shocks as triggers of changes in illegal markets. We specify the conditions under which criminal organizations attempt a takeover of legal markets: when market share–the proportion of a market that an entity controls (Farris et al., 2010, 33)– is large and product value increases. In doing so we contribute in refining arguments focusing on price shocks as explanations for criminal behavior. We also contribute to research on criminal governance by showing that groups seek territorial control not only as a means to control drug markets, but also the markets for other goods that generate profit and increase future capacity and influence. The paper is structured as follows: we first engage the literature on criminal market capture and the role of exogenous shocks. We subsequently present our argument, which focuses on the extent to which changing market share create the conditions for violent criminal market capture. We then present our analytical strategy and a discussion of our findings. In the conclusion, we highlight the main contributions of this project, and avenues for further research.

2 Criminal Market Expansion and Conditions for Violence

2.1 When is there Criminal Market Capture?

Under what conditions do criminal organizations decide to expand control to other markets? We use market expansion and diversification interchangeably to refer to criminal organizations' efforts to incorporate additional goods or services to their portfolio. These

organizations–whether gangs, mafias, or cartels–typically trade in illicit commodities because of the immense profits derived from their control.

Criminal markets emerge when brokers gain control by evading regulations and using violence in some part of the chain of production and distribution of a given good (Giraldo Ramírez, Rendón and Duncan, 2014). We refer to criminal market capture as the ability to forcefully and illegally control portions of the market for a commodity, eventually manipulating production and prices. Capture does not require controlling the entirety of a market, it might be restricted to portions of the different links in the chain of production and distribution. For example, in the 1920's the Morello-Terranova family of mafiosi in New York took over the artichoke market. Originally, they leveraged their control over the rail line and imposed a tax on artichokes arriving from California by train. But as the market for artichokes grew, they began intimidating producers into limiting their crops, and they bought production at lower prices, which they then sold for 30 to 40 percent more (Dash, 2011; Critchley, 2008). The Sicilian mafia used a similar strategy to control the production of lemons, given the unusually high market value in international markets at their time of entry (Dimico, Isopi and Olsson, 2017, 1098). In South Africa criminal groups manipulate local prices based on their storage capacity and demand from international buyers (De Greef, 2014). Current research on market expansion can be classified in at least three broad categories focusing on: comparative advantage, characteristics of markets, and sudden changes in markets.

One group of explanations for market expansion focuses on the similarities between criminal organizations and firms. According to these explanations, over time, as business grows, criminal organizations attempt expansion into other markets. Criminal organizations will invest in other areas where they think their expertise can give them an advantage. For example, organizations will expand control over the market for the production of various illicit drugs, or they will expand contraband activities to include people smuggling (Wainwright, 2016, 195). However market expansion has costs, so it may not always be desirable. In fact, because economies of scale are not always present, not all markets are complementary. This can be seen even in similar markets for unregulated goods: for

instance when comparing the market for heroin versus synthetic drugs; the production logistics differ drastically, the costs and needs are also different. In fact, entry costs for synthetic drugs are lower when compared to naturally produced heroin (Morrison, 1997).

If diversification to other markets is costly, additional incentives are required. A second strand of research focuses on the characteristics of markets and their ease of capture. Some agricultural markets have features that make them easy to control, such as their territorial specificity. If commodities are concentrated in a relatively small amount of territory, they are easier to capture and control (Tiscornia, 2020). In addition, some, but not all, are composed of smaller size firms, which also facilitates control and reduces competition (Bazzi and Blattman, 2014). However, a market's ease of capture does not imply it is sufficiently attractive to merit expansion. In order to be desirable, it needs to add profit to a criminal group's current portfolio. Markets for agricultural products also offer advantages in this respect: they typically require lower levels of technology, labor and tailored production knowledge. They may also have existing shipping routes, infrastructure, and local markets, reducing up-front costs and labor (Farfan Mendez, 2021). All of these features reduce the cost of expansion, and increase profitability making them ripe for criminal investment. Nevertheless, we do not observe criminal expansion into all these profitable markets, nor does expansion entail the same levels of violence when it does occur. According to our argument, price shocks in markets with opportunities for expanding control provide windows of extreme profitability adding to the existing appeal of legal agricultural goods.

An important strand of research on the 'natural resource curse' demonstrates the relevance of capturing revenues from these resources as a tool that non-state actors use to bolster their capacity for violence (Ross, 2004; Herrera and Martinez-Alvarez, 2022). Recent research suggests that the direction of the relationship between natural resources and violence may not be straightforward: some commodities are positively associated with violence, whereas others are not (Blair, Christensen and Rudkin, 2021). Furthermore, a strong assumption in this strand of research is that under the resource curse there are few incentives to build governance structures: the focus is on extracting rents

after winning a war, or for the purpose of war-making (Ross, 2004; Laitin, Watkins IV et al., 2007). We posit that criminal organizations may seek to control markets for agricultural commodities while also attempting to build governance structures because their ultimate objective is not war-making, but profit maximization. Even though they have a comparative advantage in violence they may want to preserve, their main goal is making money.

A related set of explanations for diversification is tied to the role of external shocks. A variety of shocks can increase the attractiveness of a market, thus creating conditions for diversification. Researchers have shown that commodity price shocks can lead laborers to switch between markets in order to increase their income and violent organizations to alter their financial strategies. For example, negative price shocks in agricultural products may make it more attractive for farmers to switch to the production of illegal drugs (Dube, García-Ponce and Thom, 2016; Dube and Vargas, 2013). A similar phenomenon can explain incentives to capture markets for legally traded commodities. Policy changes can lead to price shocks in agricultural markets. For example, changes in the USDA Mexican avocado import program led to a sharp increase in the export value of Mexican avocados, which created an incentive for criminal organizations to capture the avocado market (Erickson and Owen, 2020). Other research suggests that climate shocks can make high value commodities scarcer, which also generates incentives for criminal capture (Tiscornia, 2020; Estancona, 2021).

This body of research provides evidence of a relationship between the presence of economic shocks and incentives for market capture. However, this research assumes that changes in international prices will create conditions for capture, by focusing on cases where commodities represent an important proportion of the global economy– Mexican maize and avocados and Colombian coffee. It is possible that if a country's exports of a given commodity do not represent an important portion of the global market, the incentives to capture such market may not be present. Building on extant literature, this paper takes on this challenge and it proposes that market share is a key factor influencing the attractiveness of certain goods for criminal diversification: the risk is high, but so is

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the reward.

Current research provides evidence of the conditions for market expansion in general, with an emphasis on markets for illicit commodities. We know comparatively less about why criminal organizations might attempt to take over markets for licit commodities. In addition, researchers have tended to focus either on one specific market, or one specific case. We propose a general argument that encompasses multiple commodities in multiple locations over time.

2.2 When is there Violent Criminal Expansion?

A problematic consequence of criminal market expansion is that it frequently provokes violence. When, exactly, does criminal market control become violent? Most of what we know about violent market takeover comes from research on illicit economies. Scholars have linked variation in international cocaine and heroin prices to increased violence in Colombia and Afghanistan (Mejia and Restrepo, 2013; Gehring, Langlotz and Kienberger, 2020). Yet, even illicit markets are not always violent (Snyder and Duran-Martinez, 2009; Meehan, 2011). Explanations for variation in violence in illicit markets have placed emphasis on the role of states (Barnes, 2021). For example, when states sponsor protection rackets–informal mechanisms for the selective application of the law (Snyder and Duran-Martinez, 2009; Trejo and Ley, 2020)– or when they are able to build structures to jointly extract rents (Meehan, 2011), levels of violence will be lower. However, levels of violence depend on more than states' involvement. When criminal organizations compete for control over an illicit market, violence ensues (Yashar, 2018; Magaloni et al., 2020). Recent research has shown that sudden increases in demand for illicit drugs create incentives for controlling production and trafficking routes, which in turn creates conditions for violent confrontations to control a larger portion of the market (Sobrino, 2019), yet, not all traffickers seek violent control of routes (Blume, 2022). Overall, we know very little about how these dynamics play out in the illicit capture of legal markets.

There are reasons to expect competition over licit markets to be more peaceful, all else equal. Criminal groups have incentives to avoid detection of their illicit goods, which

might lead them to reduce, or at least conceal, violence (Cruz and Durán-Martínez, 2016). However, empirical evidence suggests that licit markets may also be sites for violent competition. For example, in the state of Michoacan, Mexico, the *Caballeros Templarios* gang forcefully took over the lime market (García-Ponce and Lajous, 2014). Similarly, the *Jalisco Nueva Generacion* drug cartel took control of the avocado production through extortion, kidnapping of farmers, and forced labor. This same cartel has also engaged in violent conflict with several other organizations who are competing for control over the avocado market and transportation routes (Dehghan, 2019). Violence results when controlling territory becomes valuable because it enables control of production, creating opportunities for criminal groups to confront other groups (Dube, García-Ponce and Thom, 2016).

Along similar lines, scholarly work about civil wars posits a strong relationship between commodity prices and conflict. However, there is conflicting evidence in terms of the direction of such relationship, with some research finding a negative association (Bazzi and Blattman, 2014; Brückner and Ciccone, 2010), while others demonstrate a positive association (Besley and Persson, 2008), or a mix of effects depending on how labor intensive a commodity is (Dube and Vargas, 2013), or whether violence comes primarily from the state or non-state groups (Estancona, 2021). We build on this research by specifying that when market share is sufficiently large to incentivize capture, levels of violence will increase because controlling territory becomes valuable (Dube, García-Ponce and Thom, 2016). Criminal organizations may have similar incentives to other violent organizations regarding territorial control, but they attempt control only when it is economically expedient or profitable. Holding territory allows longer term control over a valuable commodity, which in turn allows access to the profits from international markets.

3 Agricultural Price Shocks, Market Share, and Violent Criminal Diversification

We develop and test a general argument for criminal group expansion into legal commodity markets. Building on previous research, we argue that criminal groups attempt diversification when there are unusually large increases in the export value of agricultural goods that are produced where these groups operate. Our argument zeroes in on countries' market share of agricultural commodities as a missing factor that creates incentives for criminal market capture when the value of these goods changes. We emphasize that international price increases for agricultural commodities create a significant opportunity to profit when criminal groups operate in states that account for a large portion of the commodity's international market share. Under these conditions, criminal groups will attempt to seize the opportunity for profit and eventual market control.

A state's export share within a given global market matters. If criminal organizations are primarily focused on maximizing profit, capturing a market that only represents a small share of the international economy would not allow them to manipulate prices as effectively, although they might still be able to affect producers' profit. Several empirical examples support our argument. South African abalone, a commodity targeted by criminal organizations, represents a large proportion of Hong Kong's imports (one of the largest global consumers) (Tiscornia, 2020). At the end of the 19th century, almost 34% of the total Italian production of lemons–a market under mafia control–was exported to the US, and about 78% of the total US imports came from Italy (Dimico, Isopi and Olsson, 2017). Mexico is the world's largest producer of avocados and the second largest producer of limes, two markets that criminal organizations have actively targeted (García-Ponce and Lajous, 2014). Market share, in combination with upward shifts in price, creates a lucrative window for immediate profit as well as incentives for market capture. Criminal organizations are aware of the profitability of these markets internationally because they typically operate as brokers between sellers and international buyers as well as contract enforcers (Dimico, Isopi and Olsson, 2017; Tiscornia, 2020). In synthesis, we argue that

criminal groups are most likely to enter legal agricultural markets when the state in which they are present holds a sufficiently large share of global agricultural production. We would not expect criminal organizations to start exploiting a market in places that are not well suited to do so with minimal costs of entry. We focus on agricultural products in part to hold costs of entry 'constant' within a distinct type of goods.

Economic opportunity can generate shifts in violence. Because agricultural goods require land for growth and production, criminal groups must gain territorial access to profit in the long term. When states control a large share of the market for a licit commodity and the commodity's value rapidly increases, these markets become quite lucrative. In addition, control of markets for licit goods also affords other opportunities to access territory or labor and to ultimately build governance at the local level. Expansion into legal markets creates new economic and political connections for criminal groups with producers and, at times, with corrupt state officials, allowing them to solidify territorial control and gain an edge over competitors. But because these markets are lucrative, controlling them generates tensions. Seizing legal markets may be met with competition from other groups, resistance from producers, or increased policing from the state. The extent to which there is confrontation produces variation in violence.

Avoiding confrontation has advantages, such as not drawing attention from the state, or more easily winning over local populations. In fact, criminal organizations can be benevolent towards populations (Magaloni et al., 2020). Yet, seizing control may require violence, as demonstrated by criminal gangs capturing trucks transporting abalone in Cape Town, and invading palm plantations in Indonesia and Colombia (Tiscornia, 2020; Aspinall, Kenny and Shrestha, 2019; Palacios, 2012). Violence also ensues from clashes with rival organizations, confrontations with private security providers, or from forcefully removing peasants from plantations (Palacios, 2012; Aspinall, Kenny and Shrestha, 2019, p. 10). Although violence may not be criminal groups' default tactic (Magaloni et al., 2020), when expanding into new markets and new territory, groups may resort to it to signal strength to rivals, to establish the bounds of social contracts with producers, or to reduce the authority of official/unofficial security providers. In addition, criminal orga-

nizations typically operate under uncertainty, which predisposes them to react violently. Because criminal control is fragile and short lived, organizations tend to be predatory and will use violence to establish control, or to maintain it when there are signs that they might be losing it (Arias, 2017; Trejo and Ley, 2020). Criminal groups may also be particularly likely to use violence when seizing these expanding, lucrative markets as other strategies such as bribes or extortion may delay their entry. Violence can escalate as a result of confrontations with other groups, with the state, or with producers, spilling over to communities more generally, usually leading to high homicide levels (Yashar, 2018; Trejo, Albarracin and Tiscornia, 2018).

Our argument, then, can be summarized in one hypothesis:

H1: A positive shock to the export value share of a state's agricultural goods is associated with an increase in homicides perpetrated by criminal organizations in that state.

Importantly, diversification to new markets does not imply substitution. Changes in the export prices of agricultural goods create an opportunity for market capture as a complement of, not a substitute for, drug markets. In fact, diversification may involve parallel processes of development in licit and illicit markets (Farfan Mendez, 2021). In addition to the profit that can be made in drug markets, criminal organizations may also respond to opportunities resulting from shifts in legal markets. A lingering question is why go through the trouble of capturing territory when criminal organizations might choose to employ extortion instead. First, it is unclear that extortion involves fewer costs and effort than capturing land (Brown et al., 2021). Conversely, capturing territory provides multiple benefits. In the same way that territorial control provides access to profits from the illegal drug trade (Magaloni et al., 2020), capturing legal markets is not only lucrative, but it also provides access to territory, to production, and to labor. Nevertheless, extortion and market capture may not be mutually exclusive, rather, groups may begin by extorting rents and capture markets when it is more profitable to do so (García-Ponce and Lajous, 2014). Criminal organizations could simply extort money from producers by imposing a tax. Yet, there are limits to how much can be extorted from

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a business before it is no longer a viable strategy (Dash, 2011). In addition, if groups are in competition, this requires a more involved strategy in order to retain control. Increased involvement to control territory generates violence. The strategic importance of agricultural goods to increase criminal organizations' profits is one explanation for the phenomenon of criminal market capture. However, there may be other reasons for attempts at diversification. For example, one alternative explanation for diversification into legal markets is tied to the existence of surplus cash from illicit market activity. Since investing in the stock market might prove challenging, criminal organizations will seek to launder their proceeds through legal businesses. One example is the acquisition of gas stations by drug cartels in Mexico (Gagne, 2015). A second alternative explanation for the triggers behind criminal market expansion relates to a need to reduce the amount of disruption. Illicit markets may be targeted by governments, expansion into legal ones may have the objective of avoiding detection (Erickson and Owen, 2020).

In either of these cases, whether the market captured has value in itself may be less consequential, and physical capture should happen in the absence of violence. However, as we demonstrate, shifts in anticipated export value in the legal markets represent a powerful incentive for capture. Although the need to launder money may be a reason to diversify into the legal economy, there are strong incentives to engage in the legal economy beyond smoke screens. Patterns of investment for money laundering also would be unlikely to follow the same patterns as investment for economic gain from the sale of goods.

Regarding disruptions, if this were strictly true, we should not observe criminal organizations engaging in illicit enterprises. The risk of disruption in illicit markets is high, but so is the reward. Criminal groups make cost–benefit calculations when deciding which markets to target, if an opportunity is booming it may be hard to resist. Legal commodities that are highly attractive constitute a hard case for our argument, the fact that criminal organizations are willing to risk detection when there is a lot of attention placed in those commodities indicates that they will seek to capture less relevant markets as well.

4 Cross-National Data and Method

4.1 Dependent Variable

To test the validity of our claims, we analyze the relationship between large shifts in a country's share of a commodity's export value and changes in homicides at the country-year level. We use a global sample of countries between 1993 and 2018 based on data availability. Our hypothesis is that large, unexpected increases in a state's share of a good's export value - how much profit criminal organizations could expect in the future from capturing a substantial portion of the good's international market - are associated with increases in criminal violence. To test our hypothesis at the cross-national level, we bring together several sources of data about the value of commodities, criminal groups' threat to the state, and the number of homicides per year. Our argument is that criminal organizations seize opportunities for expansion into booming legal markets, particularly for agricultural goods which require minimal initial investment in technology or expertise.

Our dependent variable is criminal violence, which we operationalize as count of homicides per year by country. For our dependent variable, we make use of the United Nations office on Drugs and Crime (UNODC)'s yearly homicide data (UNODC, 2019). A notable difficulty with these data is that they capture all homicides, rather than only homicides attributable to criminal organizations. While the UNODC does collect data about homicides attributed to criminal organizations, there are both concerning levels of bias and extensive missingness in these data. The available country/years with counts of criminal homicides are but a small fraction of the broader homicide data, and are likely missing or under-counting observations from countries in which criminality may be rampant. Using counts of homicides also allows us to capture the multiple ways in which organized criminal violence manifests: homicides due to the presence of criminal organizations can come from confrontations between groups, but also from confrontations with the state and also with producers, or as an unintended consequence in the death of bystanders. Previous work (Trejo, Albarracin and Tiscornia, 2018; Yashar, 2018) has used general homicide data as an indicator of heightened criminal activity. We follow these scholars' lead in our

use of this measure.

4.2 Main Independent Variables

To estimate the effect of rapid, large changes in commodity markets on organized criminal violence we first must address some empirical challenges. The municipalities where these commodities are present may be very different from those where they are not present. If these differences are correlated with our dependent variable they can induce bias in our analyses. We take a series of steps to ameliorate these endogeneity issues: following Herrera and Martinez-Alvarez (2022), our key assumption is that global demand shifts in price, which drives changes in exporting countries' global share of markets, is exogenous to domestic violence levels. This allows us to analyze how unexpected changes in agricultural commodities' global markets affect violence within and across countries. In addition, we employ two-way fixed effects to account for idiosyncratic variation across countries and over time.[1]

When the value of key agricultural products and raw materials increases, it provides criminal groups with the incentive to seize territory that yields these crops, often with violent consequences as groups threaten producers, rivals, or state forces. As a result, our primary independent variable must reflect changes in criminal groups' perceived opportunity to profit from these agricultural products. To this aim, we make use of the Atlas of Economic Complexity International Trade Data (The Growth Lab, 2019), which tracks information at the yearly level about countries' export value for individual goods, as well as countries' export diversity and trade sophistication. These data organize and refine information about export and import value and volume based on the United Nations' Statistical Division (COMTRADE) Standard International Trade Classification scheme of products. Specifically, we use the export value of a distinct set of goods. As our argument is about agricultural goods and raw materials[2], we include SITC categories 00, 02, and 04, which encompass a subset of goods such as non-processed food products, raw

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[1]In our single-case analysis of Mexico, we also take an instrumental variable approach to address reverse causality.

[2]"Raw materials" indicates commodities like animal hides, wood and cork, but does not include more lucrative raw materials such as gemstones or petroleum.

paper materials, and animal or vegetable based oils. We then make several adjustments to capture moments of lucrative economic opportunity that criminal organizations may seize. For each country/year/product, we first calculate the following:

$$\frac{\text{Country Export Value}_t}{\text{Global Export Value}_t} - \frac{\text{Country Export Value}_{t-1}}{\text{Global Export Value}_{t-1}}$$

This operation gives us a measure of the change in each country's share of the export value of each good in the above categories (henceforth Δ_{ev}). Larger, positive values of Δ_{ev} indicate that the country is capturing a substantial portion of the growth in export value of a particular agricultural good. However, our argument is that large, unexpected changes in Δ_{ev} provide windows of opportunity for criminal groups to enter the newly booming market with goals to gain immediate profit and eventual control. To assess these windows of opportunity, we code positive shocks to our measure Δ_{ev}. We use a 3-year moving standard deviation to capture expected changes in export value share, then code any increase in Δ_{ev} greater than two standard deviations as a positive shock. We then create a dummy variable capturing if the country experiences a positive shock in their share of the export value of any agricultural goods in a given year. In these instances, we expect that criminal organizations operating in or near territory that produce these booming goods will use coercive violence to quickly seize control of production and exports as a means of increasing both their income and local clout.

Our proposed mechanism centers around the presence of criminal organizations in countries profiting from increased agricultural export wealth. This indicates that increases in global export share of agricultural goods in countries without observed criminal activity should not be associated with an uptick in homicides. To distinguish countries under criminal threat from those in which there is no real criminal presence, we rely on data from the V-Dem project (Varieties of Democracy Project, 2021). We make use of the variable coding "anti-system" movements that are "heavily engaged in criminal activity, e.g. narcotics, bootlegging, illegal exploitation of natural resources, extortion, kidnapping" (196). The variable is averaged over coders' decisions of 0: no criminal threat or 1: the threat to the state is criminal in nature. Values close to 0 indicate that it is unlikely

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that criminal organizations threaten the state, while values close to 1 indicate consensus that criminal organizations are present and active. Because our argument is that criminal groups engage in violence when expanding their territorial and economic presence in the legal market, we expect to see increases in homicides in countries with a criminal threat following growth in a commodity's export value. In contrast, countries without active criminal organizations should not experience a significant uptick in violence. Given this expectation, we interact the criminal presence variable with the change in export value share.[3]

4.3 Key Confounders

Several other country-level factors may influence changes in the number of homicides states experience in each year. We account for these possible confounders by including a set of additional explanatory variables in our models. We include a measure of GDP per capita to account for connections between country wealth and violence. Further, we control for a state's population given that more populous states may experience higher homicide rates. We then include the percent of the labor force employed in agriculture as an indicator of the importance of agricultural commodity production for a state's welfare. All of the above variables are taken from the World Bank's Development Indicators (World Bank, 2019).

We also expect that the importance of a given commodity to the state's economic well-being impacts whether criminal organizations are able to compete both economically and territorially for its control. Export diversification promotes economic growth (Mudenda, Choga and Chigamba, 2014; Hamed, Hadi and Hossein, 2014; Hesse, 2009). Diversified export portfolios lead to stronger states, which are better able to provide access to more employment and economic opportunities to disincentivize involvement in crime. Stronger, more capable states might also be more effective at crime detection and deterrence. Conversely, when countries are dependent on few commodities, reflected by low export

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[3]In our appendix, we employ an alternate measure of criminal group presence: whether or not the state is a narcotics producer according to UNODC. Results are robust to this proxy for criminal organizations' activity.

complexity, states may guard market entry for key products more closely, making it more difficult for criminal groups to take advantage of demand shocks for goods that states view as central to their economies. Therefore, we should expect higher competition, and violence, in countries with minimal export diversity. As an indicator of a country's export diversity, which may influence the plausibility of a criminal group capture of important export markets, we include the Economic Complexity Index from the Atlas of Economic Complexity (The Growth Lab, 2019). Whether a state is embroiled in violent conflict influences the overall level of violence, so we further include a dummy variable that takes on a value of 1 if a country/year experiences civil war and 0 if it does not (Petersson and Oberg, 2020). Finally, a state's ability and willingness to enforce laws over their territory influences both criminal organizations' ambitions and the homicide rate. We include two measures from V-Dem to capture the extent to which laws are enforced and public officials are held accountable: an index of the rule of law and an indicator of how likely public officials are to engage in corruption.

When combined, these variables yield a data frame of 40,590 observations covering a global sample of countries over the years 1993-2018. Our dependent variable of the count of homicides takes on a wide range of positive values, making standard OLS an appropriate modeling strategy. For ease of interpretation, we scale GDP per capita, population, and homicides by dividing by two standard deviations (Gelman, 2008). The dependent variable is led by one year relative to all predictors, as we expect criminal groups to respond to export value share shocks in the year prior. Our model is as follows:

$$\text{Homicides} = \beta_1 \text{ country characteristics} + \beta_2 \text{ criminal presence} +$$
$$\beta_3 \text{ positive shock to } \Delta_{ev} +$$
$$\beta_4 \text{ criminal presence} * \text{ positive shock to } \Delta_{ev}$$

In the following section, we discuss the results of our models.

5 Cross-National Results

To reiterate, we hypothesize that large, unexpected increases in a state's share of a good's export value are associated with increases in criminal violence. Our results provide strong evidence in favor of our argument. As the models in Table 1 show, when criminal organizations threaten the state, unexpected increases in said state's share of agricultural goods' export values is associated with a significant increase in homicides. Model 1 provides basic evidence of this relationship, while Model 2 includes the confounding variables discussed in the section above. Positive shocks to a country's export value share of agricultural goods correspond to much higher counts of homicides in countries - provided that criminal groups are active.

Figures 1 and 2 represent the results from the complete model in Table 1 visually. The figure shows a sharp increase in homicides resulting from positive shocks to product export value share in countries where criminal groups threaten the state. It is important to note two things for interpretation. First, the median homicide count is just over 300. Countries experiencing shocks to their export value experiencing between 1000 and 3000 more criminal homicides is thus a substantively significant distinction. Further, the states falling above the 'median threat' level (in Figure 2) are prime examples of organized crime hubs—states such as El Salvador, Honduras or Colombia. Thus, in environments where criminal organizations are a salient threat, jumps in these states' export value share of agricultural products are associated with substantial increases in homicides.

Our results provide initial support for our theoretical argument in a cross-national setting. In the next section, we complement our cross-national findings with an in-depth analysis of the Mexican case.

Table 1: Homicides, Criminal Threat and Shocks to Export Value Share

|	*Dependent variable:*	
	Homicides	
	(1)	(2)
Shock in Export Value Share	−0.002	−0.004***
	(0.001)	(0.001)
Criminal Threat	0.136***	0.153***
	(0.012)	(0.012)
Shock in Export Value Share x Criminal Threat	0.029***	0.018*
	(0.009)	(0.009)
Population		−0.230***
		(0.011)
GDPPC		−0.094***
		(0.010)
% Employed in Agriculture		0.229***
		(0.011)
Conflict Dummy		−0.028***
		(0.003)
ECI		0.003
		(0.003)
Rule of Law		0.387***
		(0.019)
Corruption		0.406***
		(0.017)
Constant	0.069***	−0.607***
	(0.010)	(0.024)
Observations	41,206	40,590
Fixed Effects?	Yes	Yes
Note:	*p<0.1; **p<0.05; ***p<0.01	
Note:	All Indep. Vars. $_{t-1}$	
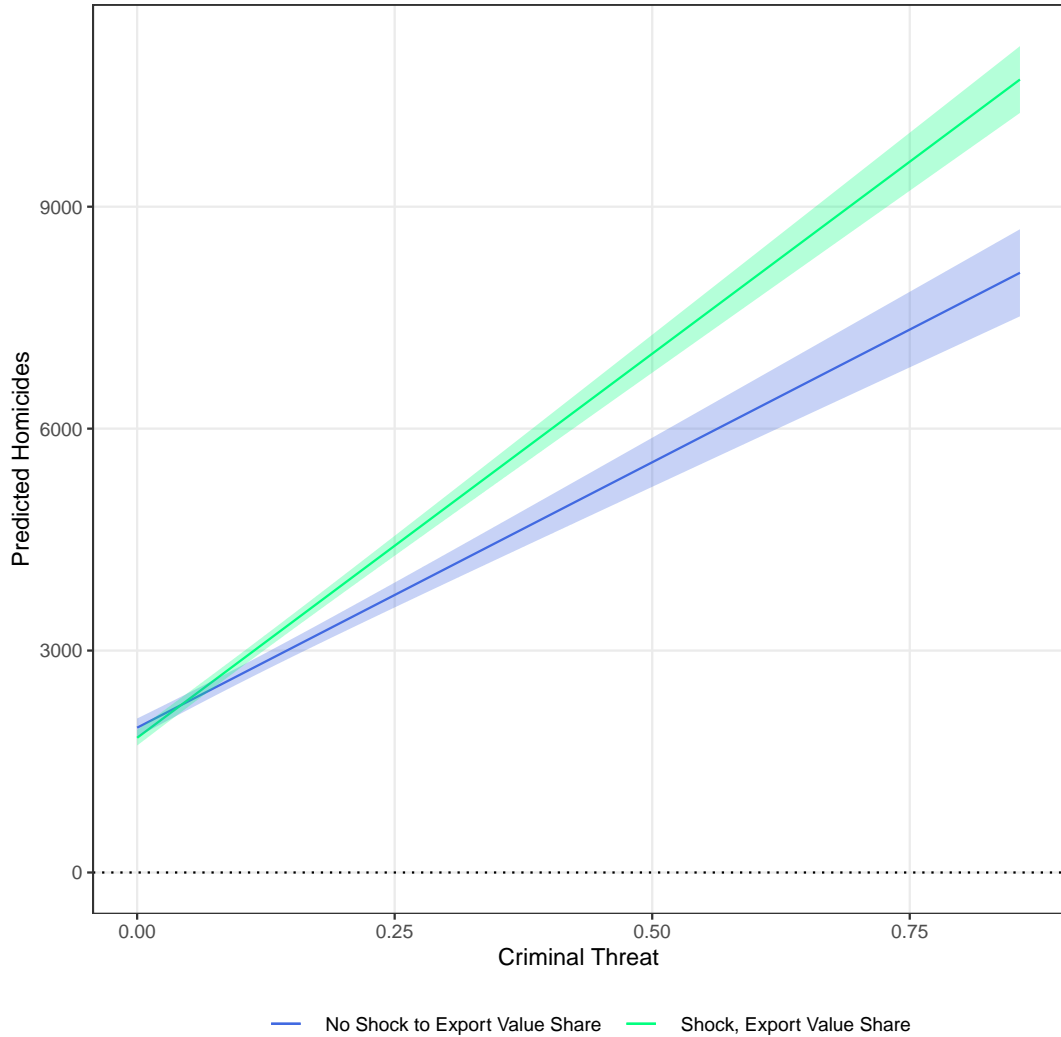
Figure 1: Predicted Homicides and Criminal Threat (Produced from Model 2 in Table 1

6 Agricultural Production and Cartel Violence in Mexico

To illustrate our mechanism of interest, we conduct sub-national analysis in the case of Mexico, combining qualitative evidence from secondary sources with data on criminal groups' territorial presence. The Mexican case offers important advantages: there is wide variation in terms of agricultural production, as well as variation in the presence of criminal organizations and levels of violence across sub-national units. In our design, Mexico can be characterized as a typical case. Typical cases are representative of a population defined based on the scope of a theoretical argument (Seawright and Gerring,
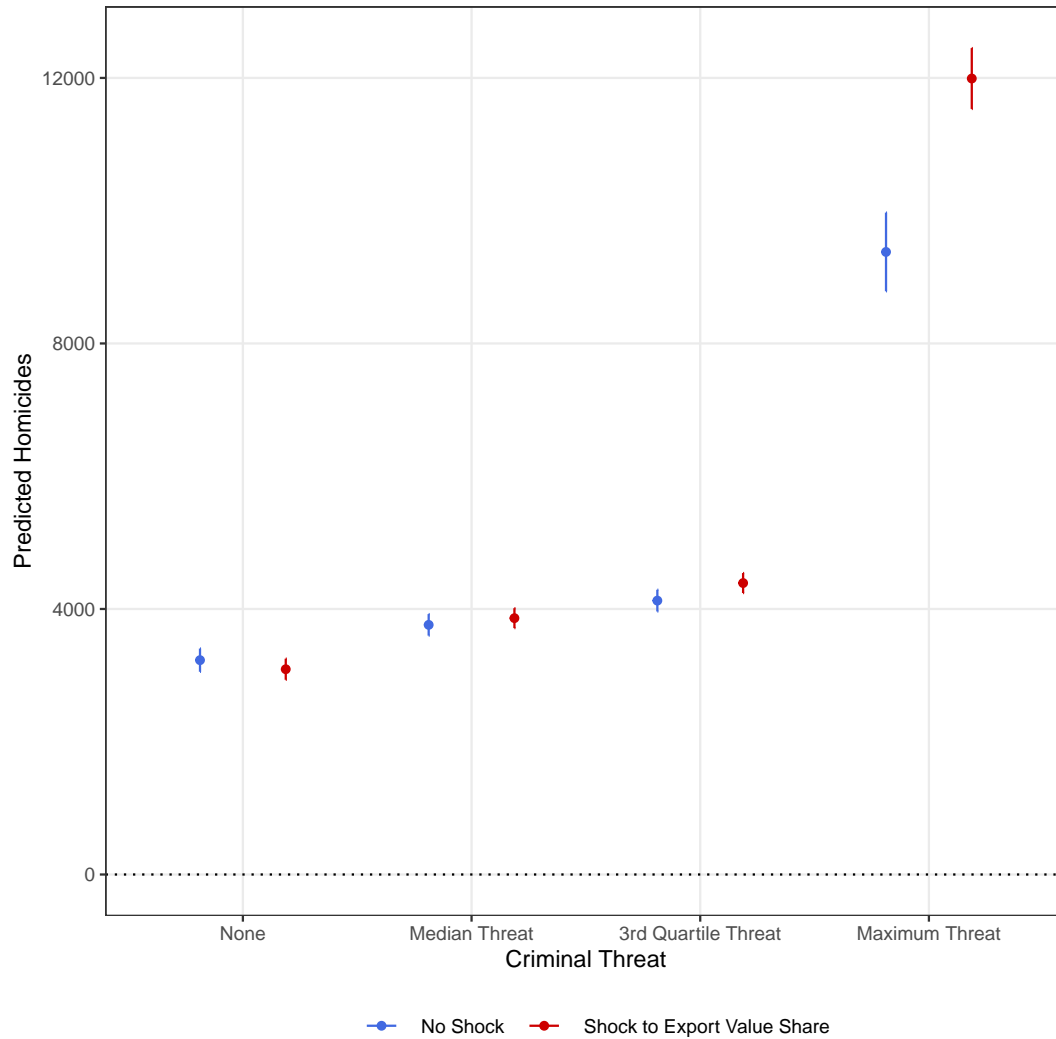
Figure 2: Predicted Homicides, Criminal Threat Categories (Produced from Model 2 Table 1)

2008). Our argument is scoped to apply to producers of agricultural products where there is presence of criminal groups.

As a way to illustrate where Mexico lies in relation to other cases in our sample, Figure 3 plots the average agricultural export value against average homicides. The cases that are labeled correspond to those countries above the threshold of 10 per 100,000. This threshold separates countries with epidemic levels of violence, per the World Health Organization's definition, likely to face the presence of organized crime (Trejo, Albarracin and Tiscornia, 2018). As the Figure suggests, Mexico is not the only possible case for analysis. However, it is the case where there is data available for our central analytical indicators: agricultural production, violence, and criminal group presence at the local

level. In addition, research on the dynamics of organized crime in Mexico is extensive, which allows us to triangulate our information and analyses with multiple other sources. Mexico is one of the main world-producers of several commodities, has widespread presence of criminal organizations, and homicide levels are quite high. If our theory is correct, booms in market share of certain agricultural products should lead us to observe criminal attempts to capture these lucrative markets. In turn, if we observe these dynamics in the Mexican case, we should expect to see them in comparable cases.
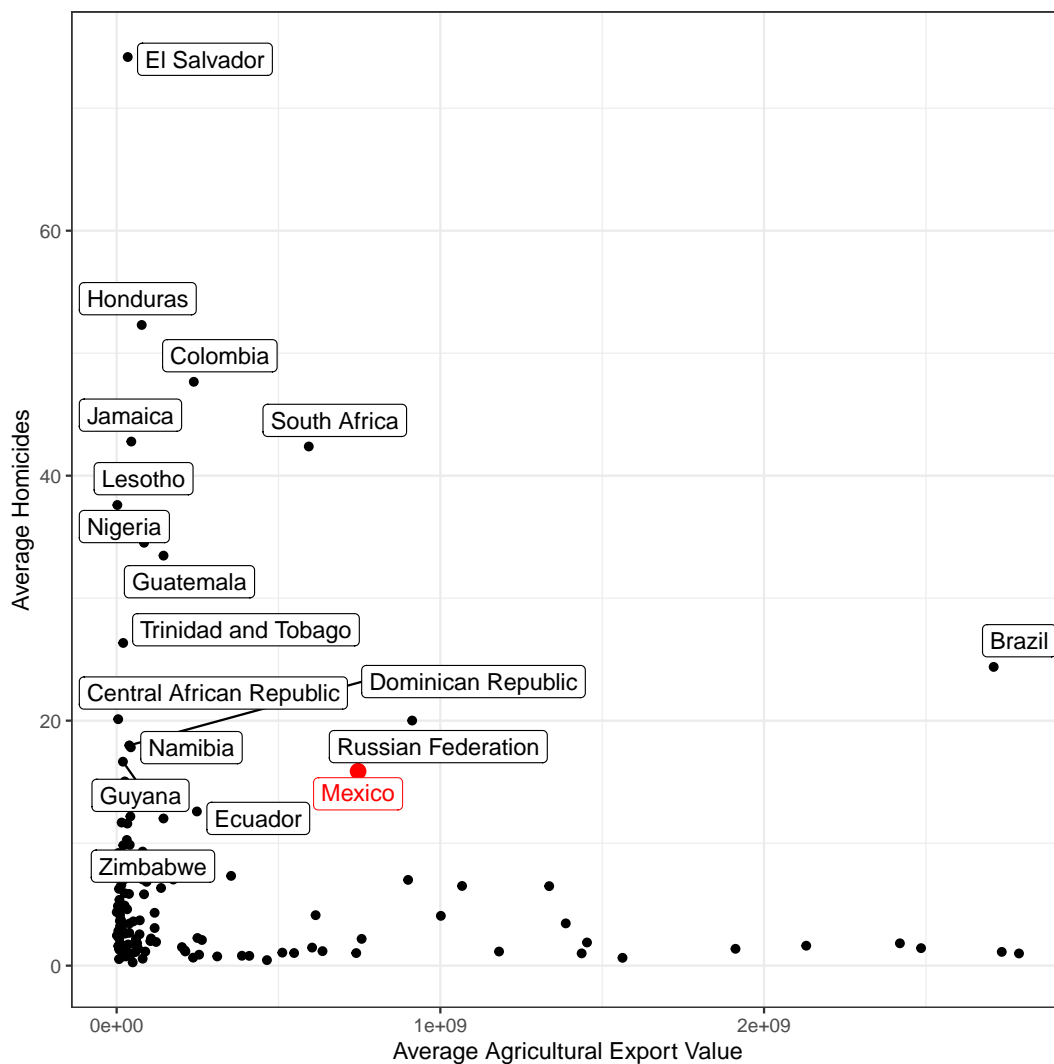

Figure 3: Case Selection

6.1 Agricultural Market Capture and Violence in Mexican Municipalities

Research on organized crime and violence in Mexico is extensive (Trejo and Ley, 2020; Durán-Martínez, 2017; Lessing, 2017; Osorio, 2015; Magaloni et al., 2020; Ley, 2018). Scholars have posited a wide variety of mechanisms to explain the growth and expansion of criminal organizations in Mexico, primarily tied to changes in the international drug markets (Shirk and Wallman, 2015; Durán-Martínez, 2017), as well as factors connected to the transition to democracy and the loss of networks of protection from the authoritarian period (Trejo and Ley, 2020). The breakdown of protection networks also increased inter-cartel competition and violent confrontations with the state (Trejo and Ley, 2020; Lessing, 2017; Osorio, 2015).

After 2006, the war on drugs further increased cartel fragmentation and inter-cartel competition. As a result, cartels also diversified their strategies: whereas before 2006 the focus was mostly on trafficking drugs to the USA, they increasingly engaged in other crimes like extortion, human trafficking, and kidnapping (Magaloni et al., 2020). Cartels also began controlling local populations, using a variety of strategies, some more benevolent than others, all with the objective of controlling territory for drug production and access to trafficking routes (Magaloni et al., 2020; Ley, 2018; Trejo and Ley, 2020).

As profitable as drug trafficking is, evidence suggests that this is not all that criminal organizations in Mexico do. Early accounts of the connections between licit and illicit markets in Mexico date back to the late 1940's and the parallel development of the opium and tomato industries (Farfan Mendez, 2021). Over time, they have attempted to control production of a variety of agricultural goods and Mexico's most profitable raw materials, like avocados, limes, and iron-ore. According to our argument, Mexican cartels should be attracted to these markets if there are sudden changes in export value of agricultural goods for which Mexico represents an important portion of the global market. The extent to which they use violence in pursuit of territorial and market access will depend on how much resistance they face.

Mexican criminal organizations have been involved in the violent takeover of several

markets for licit commodities. In the state of Michoacán, the *Caballeros Templarios* moved from illegally taxing lime farmers to taking over their lands and regulating production, with the goal of affecting prices. [4] When they attempted to regain control over production, several lime farmers were killed. [5] Following a sharp increase in the production of limes, which triggered a decline in prices, the *Templarios* sought to bring prices back up by violently regulating production, much like the Sicilian Mafia or the Morello-Terranova family in New York.[6] Similar dynamics are present in the iron-ore and avocado industries, much of which is also located in Michoacán. Revenue generated by iron-ore has also attracted criminal groups, which reportedly managed to control about 50 per cent of all mining activities in the state of Michoacán, at different points along the production and distribution chain (Herrera and Martinez-Alvarez, 2022).[7] Criminal control involves not only imposing a 'tax' on producers, but in many cases direct exploitation and coercive violence by groups.[8] As Herrera and Martinez-Alvarez (2022) show, criminal organizations' efforts to control commodities have the dual purpose of generating revenue and establishing criminal governance—de facto mechanisms to control populations (Arias, 2017)—to consolidate their territorial influence.

The avocado market also became attractive to criminal organizations. Mexico alone accounts for roughly 40 per cent of the world's supply of avocados.[9] According to the United States Department of Agriculture, in 2019-2020, Michoacán, the largest avocado producer in the country, exported 2.4 billion dollars in avocados to the United States[10]. Much like with limes and iron ore, in mid-2000s the *Templarios* began violently extorting rents from producers as well as packing plants and exporters (Ornelas, 2018). The attempts at controlling the avocado market in Mexico are tied to fluctuations in the international market, as demonstrated by the temporary ban imposed by the USA as a mechanism to curtail violence [11]. Figure 4 represents the spatial distribution of avocado

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[4]See: Washington Post
[5]See: El Universal
[6]See Excelsior
[7]See El País
[8]See BBC
[9]See here: USDA 2020 Citrus
[10]See here: USDA 2020 Avocado
[11]See this article in The New York Times.

cultivation and criminal presence. As the figure shows, criminal organizations are present in many areas where avocados are also grown.
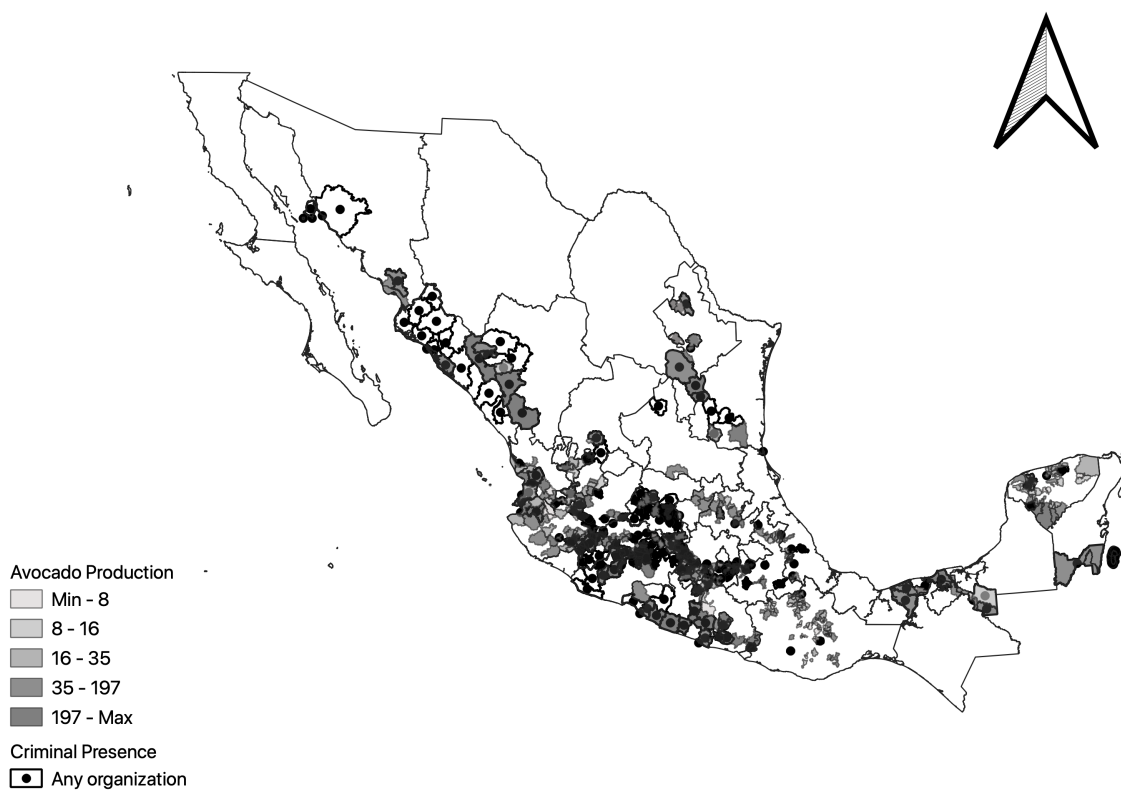

Figure 4: Avocado Production and Criminal Presence

Beyond this powerful descriptive evidence, there is little systematic exploration of the relationship between changes in agricultural markets and criminal control in Mexico.[12] Next, we probe our argument by focusing on the avocado market, combining homicide data at the municipality level with data on exports of avocados from Mexican municipalities and criminal presence.

Our Mexico-specific hypothesis is as follows:

H1$_{local}$**:** Positive changes in a municipality's share of avocado export value are associated with an increase in that municipality's criminal homicides.

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[12]For an exception see Herrera and Martinez-Alvarez (2022)

Our independent variables of interest are the change in a municipality's share of avocado's export value (taken from SIAP), and the presence of criminal organizations (from Coscia and Ríos (2012). In the previous section, we considered positive shocks to be an indicator of country-level competitiveness in the export market for a commodity. However, our argument is that criminal organizations observe *local* changes in opportunity resulting from changes in a country's position within the global market for exports. As such, we use increases in municipality-level export share as an indicator of territorial and economic attractiveness for criminal groups. When an avocado producing municipality begins to account for a substantial portion of Mexico's avocado exports, this municipality may be seen as a particularly lucrative prize for groups seeking territorial control.

For the presence of criminal groups we use data from Coscia and Rios (2012). The authors use web content to identify areas of operation of Mexican drug trafficking organizations between 1990 and 2010. However, our additional independent variables - including avocado export information - are recorded only from 2004 onward. To avoid post-treatment bias, we code each municipality's percent of years in which at least one criminal group is present in the period 1990-2003. This provides an indicator of the municipality's baseline attractiveness to criminal groups and how likely a municipality is to experience criminal presence.

For our dependent variable, we use information on homicides at the municipal level obtained from the National Institute of Statistics and Geography (INEGI).[13]. We also control for population size, which can impact the level of violence.[14] To account for state capacity at the local level, we control for municipal income, as well as for the number of prosecutors at the municipal level, following Trejo and Ley (2021). [15] [16] Because research has shown that organized criminal violence is linked to elections at the local level (Trejo and Ley, 2021; Ley, 2018), we include dummy variables for local election years. [17] All combined, our data captures a 6-year (2004-2010) span and totals 3,806 observations

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[13]Available here

[14]Data on population are from INEGI, available here.

[15]Data on municipal income comes from Maldonado and Grau (2013) and from INEGI, available here.

[16]Data on the number of prosecutors are from Maldonado and Grau (2013).

[17]Data on local elections are combined from Maldonado and Grau (2013) and from Magar (2018).

at the municipality-year level. As our dependent variable is once again the number of homicides, we conduct OLS regressions with year fixed effects.[18] The dependent variable is again led one year relative to all independent variables with the exception of the election year variable. Our model is as follows:

$$\text{Homicides} = \beta_1 \text{ municipal characteristics} + \beta_2 \text{ criminal presence} +$$
$$\beta_3 \Delta \text{ avocado export value share} +$$
$$\beta_4 \text{ criminal presence} * \Delta \text{ avocado export value share}$$

Table 2 provides evidence in support of our Mexico-specific hypothesis. As anticipated, increases in a municipality's share of the export value of avocados is associated with an increase in homicides, but only in areas where criminal groups are present. Elsewhere, these sharp increases in production value have a dampening (albeit not statistically significant) effect on the count of homicides. Figure 5, produced using model 2 in Table 2 illustrates the predicted homicides in municipalities with minimal change in their share of avocado export value vs. those experiencing maximal change in their share of avocado production for export. In municipalities that are frequently threatened by criminal organizations - making it likely that these organizations observe proximate opportunities to increase their profit and influence - large increases in the municipality's share of avocado export value are associated with a large number of homicides. This effect, however, is not observed in municipalities where criminal groups are present but there is no change in the municipality's share of the value of avocado exports. For reference, the median homicide count is 0. Municipalities that are highly threatened by criminal organizations and experiencing a growth in their avocado exports, meanwhile, may see over 200 homicides - a sobering, but substantively significant effect.

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[18]Models with both year and municipality fixed effects do not converge due to the small number of observations and large number of municipalities. However, as we are interested in differences in criminal behavior across municipalities based on municipality characteristics, the year fixed effect is appropriate.

Table 2: Change in Avocado Export Value Share, Criminal Presence, and Homicides

|	*Dependent variable:*		
	Homicide Count		
	(1)	(2)	(3)
Δ Export Value Share	−0.013	−0.009	−0.010
	(0.017)	(0.015)	(0.015)
Criminal Presence	0.562***	0.327***	0.328***
	(0.008)	(0.011)	(0.011)
Δ Export Value Share x Criminal Presence	0.017***	0.013***	0.014***
	(0.005)	(0.005)	(0.005)
Municipal Election Year		−0.003	0.0001
		(0.011)	(0.011)
Municipal GDP		0.390***	0.371***
		(0.045)	(0.046)
Population		−0.294***	−0.282***
		(0.033)	(0.034)
Federal Prosecutors		0.340***	0.340***
		(0.014)	(0.014)
Constant	−0.007	0.008	0.001
	(0.013)	(0.006)	(0.012)
Observations	7,517	3,806	3,806
Year Fixed Effects?	Yes	No	Yes
Note:			*p<0.1; **p<0.05; ***p<0.01
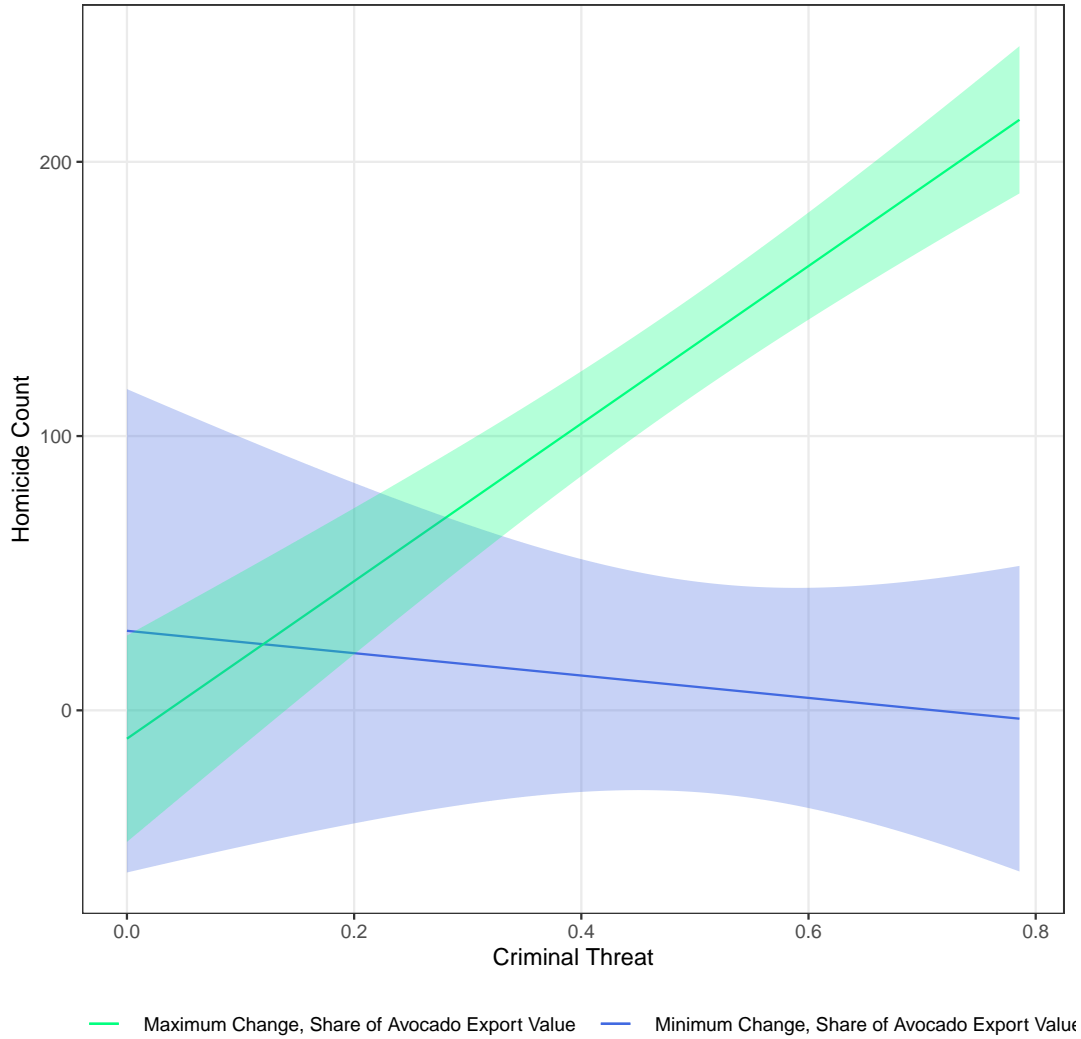
Figure 5: Predicted Homicides by Change in Avocado Export Share (from model 2 in Table 2)

6.2 Endogeneity and Avocado Toast

A notable concern with our empirical strategy thus far is the endogeneity between criminal group presence, a municipality's production of avocados, and their corresponding international price. In our theory section, we discussed how changes in international demand for a product can prompt changes in export volume as the country seeks to seize the market. We hypothesized that this change in both market share and price makes certain goods doubly attractive for criminal organizations, leading to violence as they compete with the state and others for access and control. However, it may be the case that criminal groups first seize the market for certain goods and then manipulate their

supply and price. In the case of Mexico, this would mean that criminal organizations first manipulated the production and supply of avocados to influence their export value and profitability in global markets.

In order to address concerns with endogeneity, we instrument our measure of export value share. To do so, we need a measure of international demand for avocados that might spark changes in Mexico's production and export of this good. However, this measure must also be exogenous to criminal group manipulation. The second condition eliminates the possibility of international avocado price, which changes based on both demand for avocados (plausibly exogenous) and supply (manipulable by criminal groups). Instead, we instrument with the number of searches for avocado toast on Google Trends.

The increased demand for avocados in international markets is driven by consumer behavior, and the popularity of avocado toast is one of these behaviors. Avocado toast gradually became a staple at trendy cafes through the mid-200s and 2010s (Orenstein, 2016). The global phenomenon still sees innovation on TikTok even now, with influencers and celebrities proposing new recipes or twists on the original. Google Trends captures "interest in a particular topic from around the globe" (*Trends Help*, 2022). Searches for "Avocado Toast" reflect the world's obsession with a new means of consuming avocados, which corresponds to overall trends in consumption. In the U.S. alone (one of the largest importers of Mexico's avocado bounty), per-capita consumption of avocados more than doubled in the 2010-2020 period (Manning, 2021). The Trends data captures the relative popularity of a search term over time, providing information about global demand for avocados that is plausibly exogenous to other factors driving changes in criminal homicides. Although the overall popularity of avocados and avocado toast increases over this time period, there are fluctuations in the popularity of the search. Table 3 and its corresponding figure 6 provide a robustness check in support of our proposed causal explanation: that changes in global demand for avocados made avocado exports a particularly lucrative business and provided an opportunity for criminal capture in growing areas. Our results are consistent with our previous analyses. In avocado-growing municipalities that face a criminal threat, an uptick in the popularity of "Avocado Toast" in the year prior

leads to a large increase in homicides. This is roughly 250 more than when there is no such change in the global trendiness of avocado toast.

Table 3: Avocado Toast Searches and Homicides

	Dependent variable:	
	Homicides	
	(Avocados)	(No Avocados)
Δ "Avocado Toast" Searches	0.0004	−0.016
	(0.009)	(0.040)
Criminal Presence	0.563***	0.548***
	(0.011)	(0.026)
Δ "Avocado Toast" Searches x Criminal Presence	0.300***	−0.073
	(0.020)	(0.049)
Constant	0.038***	−0.015
	(0.005)	(0.024)
Observations	9,373	847
Year Fixed Effect?	Yes	Yes
Note:	*p<0.1; **p<0.05; ***p<0.01	

7   Conclusion

Research has predominantly focused on understanding diverse features of organized criminal groups and violence in connection with markets for illicit goods. Our paper contributes to our understanding of criminal group behavior by shedding light on a comparatively less studied phenomenon: the conditions under which they might target markets for legal commodities. In this paper we develop and test a theory of criminal control of markets for licit goods. We focus on the markets for agricultural goods and we show that when there are positive value shocks that make targeting these markets valuable, criminal groups will attempt to do so. We provide two different sources of evidence, a cross-country analysis and a case study of Mexico. In both cases, the results provide evidence in support of our argument. By analyzing cross-national, cross-temporal data, we seek to provide a general
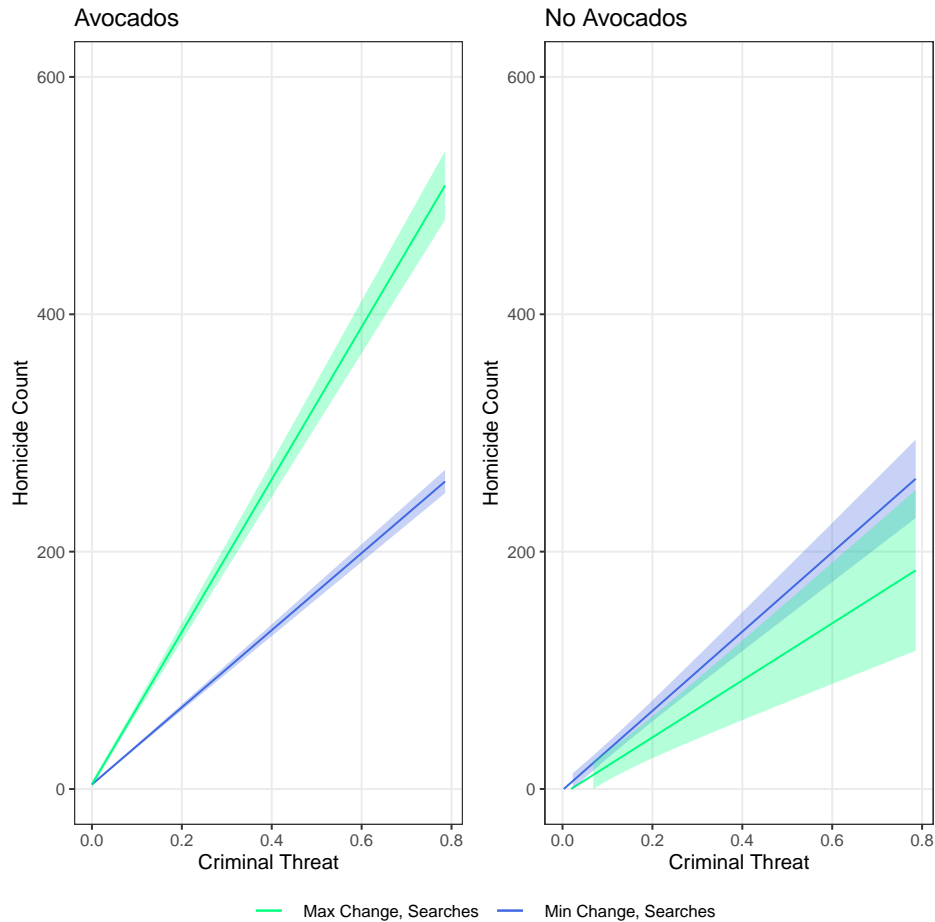
Figure 6: Predicted Homicides and Avocado Toast Search Popularity, Produced using Models in Table 3

argument. By analyzing the case of Mexico we are able to provide direct evidence of the presence of criminal groups and their attempts to control markets beyond illicit ones. Finally, instrumenting for avocado price allows us to mitigate concerns about reverse causality.

In our analysis we show that violence is not only circumscribed to the underworld of illicit goods. By understanding why and how market capture of licit goods happens we shed light on when violence may arise in these contexts. Scholars have shown that criminal violence can be as deadly as civil war violence. However, these analyses are focused on illicit markets. By providing evidence of the conditions for violent takeovers of licit markets we extend our current understanding of organized criminal behavior and its consequences to a comparatively less understood area of research. In addition to contributing to the literature on organized crime behavior and violence, we contribute

to the literature focusing on economic and price shocks to propose a specific mechanism linking these shocks to criminal group behavior: changes in market share. We argue that this is a better measure of groups' motivation to seize markets for eventual control and manipulation.

Our research also contributes relevant insights for future research. Dominant accounts of organized crime describe it primarily as an urban phenomenon and as a drug related phenomenon: we show here that this understanding of criminal behavior might be biased. Criminal organizations deal in a wide variety of products beyond drugs, the capture of natural resources implies that these dynamics extend to rural areas. This behavior has implications for what we know about criminal governance; whether the same mechanisms apply in rural and urban settings is an open question for future research.

We also generate a systematic explanation of criminal group behavior in a cross-national setting, currently an underdeveloped area of research. Our knowledge comes primarily from case studies, which are very rich sources of theory development but limit our ability to generalize. We take advantage of an area where there is access to cross–national cross–temporal data to develop and test our argument.

Finally, our project opens further questions about the nature of diversification. There is little information about criminal organizations' revenue streams. Researchers focus on drug markets because they are very lucrative, but not all criminal organizations are powerful drug cartels. Because criminal markets are, in the words of Trejo and Ley (2020) "global chains of local operations, this means that revenue flows at the top may not be the same as at the bottom of the chain. Diversification may be associated with accessing other sources of cash that can be more easily distributed among group members. Furthermore, diversification is not necessarily about price drops in drug markets. Instead, it may be about long-term investment opportuities (Farfan Mendez, 2021). More research, particularly research using fine grained data on group features, is necessary to better understand what types of groups are able to diversify.

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Appendix

Table 4: Descriptive Statistics, Dep. Var. and Continuous Indep. Vars.

	Min.	Median	Mean	Max.
Population (Standardized)	0.00	0.03	0.18	4.79
GDPPC (Standardized)	0.01	0.17	0.41	2.82
Percent Employed in Agriculture	0.00	0.31	0.48	1.95
ECI	-3.83	0.13	0.21	2.87
Criminal Presence (Av. Coder)	0.00	0.00	0.07	0.86
Rule of Law	0.03	0.67	0.64	1.00
Corruption	0.00	0.39	0.41	0.96
Homicide Count (Standardized)	0.00	0.02	0.17	3.83

Table 5: Discrete Independent Variables

	No	Yes
Conflict	34584	6006
Shock to Export Value Share	15598	24992

Table 6: Export Value Share and Homicides, no Fixed Effects

	Dependent variable:
	Homicides
Shock in Export Value Share	−0.008*
	(0.004)
Criminal Threat	0.428***
	(0.023)
Shock in Export Value Share x Criminal Threat	0.191***
	(0.027)
Population	0.503***
	(0.003)
GDPPC	−0.058***
	(0.005)
% Employed in Agriculture	−0.195***
	(0.006)
Conflict Dummy	0.133***
	(0.006)
ECI	−0.016***
	(0.003)
Rule of Law	0.961***
	(0.017)
Corruption	1.029***
	(0.017)
Constant	−0.890***
	(0.018)
Observations	40,590
Note:	*p<0.1; **p<0.05; ***p<0.01

Alternate Measure of Global Criminal Threat: Narcotics

In addition to the measure of criminal presence used in the main text (criminal threat to the state coded by the V-Dem project) we also proxy for the location and activity of criminal organizations with a dummy for whether the country is a narcotics producer. We make this choice for two reasons. First, it matches well with our theoretical expectations and motivating examples in which extant drug cartels expanded into the legal market for food products. Second, although drug production is not always an indication of organized crime, accounting only for criminal activity in the limited number of drug producing states should bias against our results. We interact this dummy indicator with the share of export value change. When positive shocks to agricultural export value share occur in drug-producing countries, we expect an increase in homicides as a result of criminal expansion. However, similar shocks in non-narcotic states where such groups are less likely to be present should not see a similar escalation of homicides. The results of these additional models - which confirm the results in the main text - can be found in table 7 below.

Table 7: Drug Producing Countries and Homicides, Shock to Export Value Share

	Dependent variable:	
	Homicides	
	(1)	(2)
Shock, Export Value Share	−0.004***	−0.0004
	(0.001)	(0.001)
Drug Producing Country	0.138***	0.043***
	(0.014)	(0.014)
Shock, Export Value Share x Drugs	0.025***	0.023***
	(0.005)	(0.005)
Population	−0.221***	
	(0.011)	
GDPPC	−0.086***	
	(0.010)	
% Employed in Agriculture	0.229***	
	(0.011)	
Conflict Dummy	−0.028***	
	(0.003)	
ECI	0.004*	
	(0.003)	
Rule of Law	0.414***	
	(0.019)	
Corruption	0.418***	
	(0.017)	
Constant	−0.719***	0.062***
	(0.026)	(0.011)
Observations	40,876	41,492
Fixed Effects?	Yes	Yes
Note:	*p<0.1; **p<0.05; ***p<0.01	