# Economic subversion in civil wars: Evidence from the Colombian armed conflict

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**Abstract**

Rebel groups, often too weak to defeat the state in direct combat, adopt strategies to erode its capacity and resolve. One important class of such tactics – what we call *economic subversion* – are attacks that disrupt economic activity and impose large costs on the state, elites, and civilians. We conceptualize economic subversion as an umbrella class of rebel tactics that disrupt "business as usual", regardless of whether economic harm is the primary motive. This approach helps connect related concepts in the literature, including looting, sabotage, and other tactics. We further theorize that the economic value of a locale should incentivize rebel subversion, while state fortification efforts should deter it, and test our concept using historical data from the Colombian armed conflict. On the incentive side, we show that rebels are more likely to engage in economic subversion in municipalities important to internal trade, especially during formal negotiations with the state. On the deterrent side, we find mixed, inconclusive evidence via a difference-in-difference design that a large-scale policing effort failed to deter rebel subversion. These findings highlight the substantial leeway rebels have to inflict painful economic costs on the state.

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## Introduction

Irregular war – in which rebel forces use small and agile units to indirectly engage state forces – has been the dominant technology of civil war since at least 1945 (Kalyvas and Balcells, 2010). In these wars of attrition, rebels work to gradually erode the state's capacity and willingness to fight (Pape, 2003; Arreguin-Toft, 2005; Fortna, 2015; Stanton, 2013). The rebel's hope is to create what Taber (1965) called a "climate of collapse": a situation that makes rebel victory possible or that allows rebels to extract political concessions from the state.

One important – yet understudied – way that rebels try to do this is by carrying out attacks whose consequence is the disruption of 'normal' economic activity. A survey of armed conflicts provides numerous examples of such tactics, including the disruption of trade flows in the Red Sea by Houthi forces (Thamer and Akkas, 2024), Al Qaeda in Iraq's targeting of Baghdad's electric grid during the Iraq war (Glanz, 2005), and rebel efforts to undermine oil production in the Second Sudanese civil war (Paine, 2016). This class of tactics – which we label rebel *economic subversion* – is strategically valuable in that it makes "business as usual" in the country impossible, create tensions between elites and the regime, and make the continuation of the war costly for the state and society.

Despite its widespread use, we know surprisingly little about the dynamics of rebel economic subversion in civil wars. Not all rebel groups carry out attacks that disrupt economic activity and, among those that do, there is significant variation in target selection and timing. What factors account for these dynamics? We have a rich literature on how rebels wage wars of attrition, but it mostly focuses on how rebels threaten the state's *security*: for instance, by attacking civilians and military targets, (Kalyvas, 2006; Balcells and Stanton, 2021; Stanton, 2019), or by undermining elections (Condra et al., 2018). These attacks share a common goal with economic subversion – creating a climate of collapse – and can also have economic spillovers that hurt the state. Yet there are also settings where we can expect security and economic subversion to diverge: armed groups may choose targets with high

*political* value and little economic value when undermining state security – as in the Shining Path's infamous burning of ballot boxes in a remote town in highland Peru (La Serna, 2012) – whereas economic subversion may instead choose locations with high *functional* value for the state's economy (Ackerman et al., 2006). We argue that economic subversion deserves more attention and analysis on its own terms.

We address this gap in the literature by conceptualizing economic subversion as a broad, umbrella class of rebel strategies whose *consequence* is the disruption of "business as usual" for the state. Economic subversion thus includes not only acts whose *primary* goal is to impose economic harm on the state and society, but also acts in which economic costs are a major *secondary* consequence. This broader, consequence-based conceptualization clarifies how different tactics – such as sabotage, extortion, or wartime looting – can share a strategic logic that centers on undermining the economy. Rather than drawing a hard line between subversion and looting, we argue that a consequence-based definition captures rebel tactics that are driven by a mixed set of goals, such as rebel capture of oil pipelines that can both generate revenue and sap state resources (Glanz, 2005; Paine, 2016). It also addresses a key empirical challenge: since looting may also produce economic harm for the state, event data alone cannot distinguish between looting and subversion. A focus on consequences, we argue, better captures how these acts shape wartime dynamics and the burden faced by civilians and the state during conflict.

Our goal is to explain variation in *where* and *when* rebels use these tactics. More specifically, we explore the extent to which incentives and disincentives to carry out economic subversion shape rebel behavior. We follow Ackerman et al. (2006) in conceptualizing the decision to attack a target as a trade-off between how important the location is to the national economy and how *fortified* the target is by state security forces. Our expectations are straightforward: in the weak state contexts where rebellions often take root, rebels will choose (all else equal) to target locations that are valuable to the national economy. By contrast, state fortification should (all else equal) deter rebels from economic subversion by

increasing the difficulty of carrying out the attack or raising the probability that the attackers are caught.

We test these conjectures by drawing on micro-level, historical data from the Colombian armed conflict, one of the longest and most widely studied civil wars in the world. We look at the war from 1993 to 2010, a period in which the country's varied rebel groups were expanding militarily and putting maximum pressure on the state to collapse or make concessions, often through acts of economic subversion (Leech, 2011). This period also encompasses a failed peace process between the government and the Revolutionary Armed Forces of Colombia (FARC), which we use for analytic leverage in the empirics as a way to isolate our claims from competing accounts.

We measure rebel economic subversion using, to our knowledge, rarely used event data on two kinds of subversive acts. The first is land piracy: a common and highly disruptive form of economic subversion in which rebel actors either destroy or steal inter-municipal transportation of goods and other trade (Sierra, 2013). The second is the incidence of road blocks, in which rebel groups use a variety of approaches – creating obstacles, destroying roads, or using the threat of violence – to block inter-municipal traffic (Arenas, 2024). Both tactics wreak havoc on a country's internal trade and, in the process, generate enormous economic costs for the state and society.

For our main explanatory variable (the incentive side of the logic of subversion), we measure how valuable a location is to the national economy by focusing on a specific type of economic activity: inter-municipal commerce, or what we refer to as *internal trade*, and draw on data from Duranton (2015). These data measure the commercial potential of each Colombian municipality based on its connectivity to the national road network. We also use a survey of inter-municipal commerce that tracks the actual flow of goods between municipalities to test our mechanism. To measure state fortification (the deterrent side of the logic of subversion) we exploit the timing of a large national security policy – the Uribe administration's *Seguridad Democratica* policy – which supplied and reinforced police

in affected municipalities (Cortés et al., 2012). We use a staggered difference-in-difference design (Sun and Abraham, 2020) to examine how economic subversion trends respond to a sudden and substantial rise in police fortification at the municipal level.

Our results are the following. First, we find that municipalities better connected to the national road network tend to experience both forms of rebel economic subversion with more frequency. Second, this correlation is robust and persists when we instrument for the current period road connectivity measure with a measure derived from the Colombian road system in 1938 and a measure derived from the colonial period. Third, we provide evidence of rebels being *primarily* motivated by the desire to disrupt economic flows by showing that valuable locales were attacked more aggressively during the 1999 peace negotiations, a period during which rebels had incentives to increase pressure on the state. Fourth, we use a survey of inter-municipal commerce to show that trade volume is correlated with the prevalence of these tactics, supporting the notion that internal trade could mediate the relationship between road connectivity and economic subversion. Finally, we do not find consistent, conclusive evidence that state fortification efforts deterred economic subversion.

Our results make several contributions to the civil war literature. First, we provide early and rare evidence of rebels selecting targets for economic subversion in a way that is systematic (Lordan-Perret et al., 2019). Our finding matches prior work suggesting that rebels constantly learn and adapt to their environments (Trebbi et al., 2017; Condra et al., 2018), albeit in a way that is specific to the contours of a country's domestic economy. We also show that economic subversion can be active in the realm of common economic activities like *internal trade* whereas existing literature on the economics of insurgency overwhelmingly focuses on natural resources and illicit drug flows (Whitaker, Walsh and Conrad, 2019; Denly et al., 2022). Our work suggests there is value in further exploration of economic subversion and, more broadly, how rebels interact with the 'ordinary', legal economy (Estancona and Tiscornia, 2025).

Second, we find mixed and inconclusive evidence on the deterrent effects of the large-scale

*Seguridad Democratica* program. While the average treatment effect on the treated is negative for land piracy – meaning that extra police deployments are associated with *fewer* land piracy events – clear evidence of pre-trends limits our ability to conclude these changes are causal. For road blocks, by contrast, pre-trend patterns are more promising and the average treatment effect on the treated is positive, indicating an *increase* in rebel activity in response to police deployments: a finding in line with additional policing *exacerbating* attacks, rather than deterring them. However, we only observe this effect in one post-deployment period. Taken together, the findings underscore the challenge of deterring rebel economic subversion and point to potentially heterogeneous rebel responses to state fortification efforts. We speculate that these patterns could reflect a key insight from Taber (1965) and others who have written on guerrilla warfare: that the state is vulnerable to economic subversion because it simply has too much to defend. There is reason to believe that as countries develop, this dynamic can worsen: as Ackerman et al. (2006) argue, "globalization and the often dizzying pace of technological advancement have resulted in a society that is increasingly connected, interdependent and therefore more vulnerable to intentional disruption" (p. 1). On the other hand, development may generate more capable and deterrent states, generating trade-offs that we argue merit further study. A key question then becomes whether, at any stage of development, the state can hold out long enough to meaningfully weaken or defeat the insurgency.

## How rebels fight wars of attrition

Facing an enemy that is often substantially better resourced and armed, rebel movements frequently engage in 'wars of attrition', sometimes typified in the literature as irregular war or guerrilla warfare (Kalyvas and Balcells, 2010). In these conflicts, rebels avoid direct clashes with state forces and instead use small and indirect attacks (Kalyvas, 2006; Kydd and Walter, 2006). Over time, so rebels hope, the impact of these small attacks accumulate and produce deleterious effects for the state: draining the morale of state troops (Sonin and

Wright, 2023; Fortna, 2015), angering the international community and the local population over the state's prosecution of the war (Spaniel, 2019), and otherwise isolating the regime from its base of support. In the long run, a rebel organization that can endure and continue to carry out these attacks may defeat the regime or force it to negotiate (Asal, Gustafson and Krause, 2019; Arreguin-Toft, 2005).

We propose that an important yet understudied way that armed groups fight wars of attrition is by carrying out acts of economic subversion. We delineate the boundaries of economic subversion more carefully in the following section. Here, we highlight a wide array of rebel tactics that share a common *consequence*: the costly disruption of the normal functioning of the economy. One notable example is the recent wave of attacks by Houthi rebel forces on Red Sea shipping lanes (Thamer and Akkas, 2024), which raised container shipping costs by an estimated 350% (Lynch and Halper, 2024). Attacks on energy infrastructure – not to steal or capture energy resources, but to undermine extractive industries and interfere with the normal functioning of the economy – have been documented in thousands of instances across conflicts in Iraq, Pakistan, and Colombia (Giroux, Burgherr and Melkunaite, 2013). Even small organizations can generate substantial damages through coordinated actions, as with the Chukaku-ha revolutionary movement's sabotage of Japan's national railway system in the 1980s (Ackerman et al., 2006). Importantly, in all of these cases the total costs comprise both the damage caused in the attack itself and the resources the state must expend to guard against future attack.[1]

We argue that these actions are best understood not as isolated events, but as part of a broader umbrella category of rebel strategies (what we call *economic subversion*) aimed at disrupting "business as usual". This framing captures a wide range of behaviors whose central consequence is to erode the economic functioning of the society, regardless of whether

[1]As Taber (1965) describes in relation to IRA attacks in Ireland: "...the mere chance of a raid or an ambush, anywhere, at any time, slowed transport, restricted production, and forced the military to stay constantly on the alert...at tremendous cost to the government, to the war-weary British taxpayer, to the straitened British owner of Irish properties, to investors, the banks, and all who had a stake in an orderly, productive Ireland" (p. 78).

economic disruption was the rebel group's only or primary intent.

Economic subversion shares characteristics with terrorism and other attacks meant to subvert the *security* of a country and it's population, on which there is a well-established literature. By attacking state personnel and civilians, rebels undermine the security of strategically important sites (Weinstein, 2006; Hammond, 2018; Condra et al., 2018), spread fear among security forces and civilians, and cast doubt on the government's ability to protect its population (Piazza, 2008; Shapiro, 2012). These actions can also help rebels deepen territorial control in contested areas (Kalyvas, 2006; Balcells, 2010).

That said, economic subversion cannot be fully subsumed under a broader umbrella of terrorism. For one, economic subversion tends to target infrastructure and property, whereas terrorism tends to target civilians. The *symbolic* value of a target is also clearly much more important to acts of terror than economic subversion, which tends to emphasize the *functional* value of the target (Ackerman et al., 2006). Moreover, while acts of terror almost invariably have some wider audience in mind beyond the victims of the attack (Bueno de Mesquita and Dickson, 2007), acts of economic subversion can go entirely unnoticed by the public. For instance, Colombia's oil pipelines experienced rebel sabotage roughly 1,000 times in a fifteen year period (Maher, 2015), yet it is unlikely the average citizen would be aware of the scale of these attacks.

Our broader conceptualization of economic subversion also helps clarify its relationship to looting. Economic subversion is clearly related to a large literature on the political economy of rebellion. This research has shown that the availability of 'lootable' wealth – e.g., natural resources, precious minerals, illicit economies – can influence the formation and survival of rebel movements (Walsh et al., 2018; Ross, 2004; Dube and Vargas, 2013; Collier and Hoeffler, 2004; Snyder, 2006). In this work, rebel behavior can be understood as being motivated by the desire to capture and exploit lootable resources. The overlap between wartime looting and economic subversion lies in how certain rebel actions can simultaneously finance the group and disrupt the normal functioning of the economy – actions like bank robberies or

land piracy serve both purposes (Keefe, 2019). This overlap raises the question of whether we can subsume attacks against economic targets under the concept of wartime looting.

We argue that reducing economic subversion to looting misses a broader range of cases that the logic of looting alone cannot explain. Some rebel attacks on economic targets yield little to no direct return for the group, especially relative to the costs of carrying out the attack. Rather, some attacks appear better understood as attempts to impose costs on the state than to extract revenue. Al Qaeda in Iraq's intense focus on sabotaging – and specifically not *stealing* – Baghdad's fuel supply during Iraq's post-US invasion civil war is one prominent example (Glanz, 2005). Al Qaeda's *disruption* of oil production stands in contrast to later efforts by ISIS to directly control and exploit oil production in Syria (Abdul-Ahad, 2023), a form of wartime looting. Of course, groups can be motivated by both subversion and looting in carrying out an attack, a point we explore further in the following section. Our contention, however, is that economic subversion is better conceptualized as an umbrella category, which can include – but is not limited to – looting and other acts of violence that hold consequences for the economy.

Another limitation in the literature on the political economy of rebellion that this study addresses is the overwhelming focus on lootable wealth in the form of extractable natural resources, such as oil, or drug production (Dube and Vargas, 2013). While this research convincingly shows the varied interactions between armed actors and large-scale natural resource extraction, it often overlooks the ways armed groups can engage with the 'mundane', legal economy in unexpected ways, as shown by Estancona and Tiscornia (2025) in the case of Mexico. Our study's empirical focus on internal trade broadens and reinforces this insight.

## The targeting of economic subversion

We propose that economic subversion is a distinct form of rebel behavior that merits further study. But what exactly is it? We conceptualize economic subversion as a general class of rebel behavior that imposes *substantial* economic costs on the state and society.. These are

violent actions undertaken by rebel groups that render normal economic production in the country costlier, riskier, or otherwise intractable.

Our definition of economic subversion focuses on the consequences rather than the motives behind these actions for a few reasons. First, any one rebel action may have multiple, underlying motives which makes classifying rebel behavior based on motive difficult.[2] This is because in carrying out one attack, rebels may be able to achieve multiple, simultaneous objectives. Robbing banks (Keefe, 2019) or intercepting commercial transport via land piracy (our focus here) (Sierra, 2013), are actions that both subvert the national economy by generating large costs for the state *and* serve as a source of rebel funding, among other potential consequences. Second, and relatedly, accurately identifying rebel motives is notoriously difficult, as Ackerman et al. (2006) notes: "...assessing what drives a particular group to select a target over any of the myriad of alternatives is no easy task, so much so that some commentators almost despair..." (p. 3). We shift our focus from what may be difficult or impossible to observe – motives – to what is observable and measurable. For our purposes then, what matters for economic subversion is that large economic costs are a major *consequence* of rebel action, regardless of whether those consequences were a primary or secondary motive.

This consequence-based definition supports our broader argument that economic subversion can serve as a useful conceptual umbrella for a range of rebel tactics. Rather than drawing strict lines between categories like looting and sabotage, this framing allows us to identify a larger set of rebel strategies that disrupt everyday economic exchange in society and to evaluate how those disruptions shape wartime trajectories and relations between the state and the broader society.

One illustrative example from our context is a recent incident, in which members of

[2]This is arguably true as well of terrorism, which historically has been treated as a behavior with "obvious" motives. However, while acts of terror may spread fear among an intended out-group, they may also signal something about the group's capacity or ideological commitments to an in-group in an 'out-bidding' logic, as described in Bloom (2004). While the distinction between these motives is interesting and analytically valuable, a group can be motivated by both in carrying out an act of terror.

an armed rebel group, impersonating Colombian security forces, disrupted traffic on the *Neiva-Castilla-El Espinal* highway by blocking the road and stealing a small truck operated by an agricultural supply company (Arenas, 2024). From a distance, we can glean (at least) two possible motives for the attack: the disruption of traffic and commerce on this major thoroughfare, and the theft of the truck. Was this action primarily motivated by economic subversion, or is it simply wartime looting? Given that the group in question had been holding on-again, off-again talks with the government over a potential peace process (Torrado, 2024), it seems unlikely that they would *not* consider the disruptive consequences of their actions, particularly relative to the benefit of stealing a truck. In short, while pinpointing a single, primary motive in any such instance is challenging, it is reasonable to conclude that economic disruption was a likely factor in the group's decision-making.

Given this definition, our goal is to explain when and where rebels will carry out acts of economic subversion. To this end we develop a theoretical framework of the incentives and disincentives rebels face in using these tactics. Specifically, we draw on Ackerman et al. (2006), who identify target characteristics (including physical characteristics, geographic location, and the target's function) and how protected a target is against attack (what we call *state fortification*) as key variables in the targeting of a country's critical infrastructure.

Turning to how target characteristics shape rebel decision-making about *where* to carry out acts of economic subversion, we argue that a key factor is how important a location is to the national economy. Such locations might be sites of valuable natural resources (e.g., oil fields (Paine, 2016)), where key industries are located (e.g., timber fields (Johnston, 2004)), points of entry and exit (such as ports), commercial hubs, shipping lanes, and other places that either directly or indirectly shape economic exchange (Dell, 2015). Using violence to disrupt economic activity in these locations can impose substantial costs on the state and civilians, which in turn increases the costs of defeating the rebellion. During Iraq's civil war (2006–2008), for instance, the destruction of oil pipelines by insurgent groups was generated hundreds of millions of dollars in lost revenue for the impoverished state (Glanz, 2005).

Rebels face an interesting trade-off when engaging in economic subversion: by sabotaging economic activity, they risk directly or indirectly harming the livelihoods of the local population, on whom they may rely for support or survival (Kalyvas, 2006). For example, La Serna (2012) demonstrates that the Shining Path's decision to sabotage marketplaces in highland Peru created resentment among locals that likely stalled the group's growth among this population (p. 195). However, civilian responses to harm can be complex. For instance, Lyall, Blair and Imai (2013) find that while state-inflicted harm in Afghanistan drove civilians toward the Taliban, the reverse is not true, suggesting that rebels may have greater leeway in causing harm than state forces in some settings.

We expect that this trade-off[3] will lead to variation in *which* groups employ economic subversion; for some groups, the potential loss of popular support may outweigh the benefits of harming the state. A key factor influencing this decision could be the group's reliance on civilian support for resources and funding (Weinstein, 2007). Additionally, this trade-off may drive differences in the selection of *targets* of economic subversion. For example, groups may choose to sabotage economic activities from which their base of support has been historically excluded or in which they have little stake. In rural insurgencies, like the one we study here, the disruption of economic exchange in or near the urban center could have little obvious bearing on the lives of impoverished farmers in the periphery.[4] While we do not formulate or test specific hypotheses regarding this heterogeneity between groups and/or rebel ideologies, we acknowledge it as a scope condition for our study and highlight it as a promising direction for future research.

Empirically, we focus on economic subversion of subnational *commerce* – the movement of goods between cities – also known as *internal trade*. In most countries, much is at stake in the security of internal trade: trade flows between the average pair of municipalities in our data amount to hundreds of millions of dollars a year. In Colombia, and likely in most

[3]Analogous trade-offs are apparent in the decision to carry out terrorist attacks against civilian populations (Bueno de Mesquita and Dickson, 2007).

[4]The favorable performance of the 2016 peace referendum in rural, peripheral regions and substantial antipathy in central, core regions likely speaks to this dynamic (Tellez, 2019).

of the world, the majority of internal trade moves by road (Duranton, 2015), which also places a premium on the transportation networks on which these goods flow.[5] Locales vary substantially in how important they are to these trade flows: some locations receive little in the way of trade, while others, on their own, account for millions of dollars in yearly receipts. We argue that this variation in how important a location is to internal trade will influence the targeting of rebel economic subversion.

More specifically, we build on a large literature that describes how the quality of a location's transportation infrastructure affects the amount of trade it attracts. There is a well-established body of evidence that shows transportation infrastructure (roads, rail, etc.) can have a large impact on regional commerce and development (Redding and Venables, 2004; Duranton, Morrow and Turner, 2014; Chandra and Thompson, 2000; Coşar and Demir, 2016). Places with more, and better trade-suitable infrastructure will receive more trade, on average, than otherwise comparable locations. Disrupting "business as usual" in these locales should undermine internal trade and thereby impose economic costs on the state. This tendency should also have implications for rebel economic subversion: all else equal, rebels should target economic subversion in locations that have better transportation infrastructure, since this infrastructure shapes the quality of internal trade. Our first expectation is thus that we should see a positive relationship between the quality of a locale's transportation infrastructure and the incidence of rebel economic subversion.[6]

> *$H_1$: All else equal, rebels will engage in increased economic subversion in locations with more robust transportation infrastructure.*

Our first hypothesis concerns spatial variation in the targeting of economic subversion. As an additional proof of concept, we also test expectations concerning the *timing* of these kinds of attacks. In particular, we leverage the fact that our data covers a period of negotiations

[5]More broadly, Ackerman et al. (2006) identify transportation networks and internal trade as key parts of a country's critical infrastructure that are also frequently vulnerable to attack.

[6]To clarify the counterfactual: we anticipate that areas with weaker transportation infrastructure will experience fewer instances of economic subversion. However, this does not necessarily mean there will be less violence overall, as rebels may target these locations for other strategic reasons.

between rebel forces and the government—a period that, we argue, creates incentives for rebels to intensify subversive attacks in locations where they can maximize economic harm at the margin.

Turning next to *when* a rebel group might use economic subversion, we theorize that timing considerations will be important for carrying out economic subversion attacks. Rebel groups often use violence during and in anticipation of negotiations as a way to improve their bargaining position, signal resolve, or through a logic of spoiling and outbidding. Sustained attacks during negotiations pressure states to make additional concessions or risk public fallout from a failed process. Well-executed attacks also signal the group's resolve – either to the government or to domestic audiences – to continue fighting should negotiations fail (Kydd and Walter, 2006; Fortna, 2015). The Taliban's barrage of attacks during its negotiations with the Afghan government are one notable example of this logic (Al Jazeera, 2020). Additionally, the use of violence around negotiations can be motivated by outbidding or spoiling logics, where groups (or factions within groups) deploy attacks to derail negotiations or enhance their standing among supporters (Stedman, 1997; Fortna, 2015).

We thus expect that rebel groups face increasing incentives to weaken the state during negotiation periods. We contend that these incentives help us partially discount competing accounts that are unaffected by negotiations, such as the idea that the relationship between economic subversion and subnational trade follows a looting logic. We thus test the following secondary hypothesis:

> *$H_1b$: The relationship between a locale's importance to the national economy and the incidence of economic subversion should be stronger during negotiation periods than during non-negotiation periods.*

These hypotheses bear on the incentives rebels face to use economic subversion, but we also consider disincentives that deter rebels from carrying out these attacks. Following Ackerman et al. (2006), we focus on the extent to which potential targets are fortified against rebel attacks through the buildup of defensive infrastructure, presence of security personnel,

and the use of surveillance. In theory, attacks against well-fortified areas are less likely to succeed and more costly for the group to carry out, as perpetrators face worse odds of being caught or killed in the process. Indeed, prior research shows that rebels are less likely to attack well-fortified targets (Blair, 2023; Santifort, Sandler and Brandt, 2013). One expectation is thus that rebels will use economic subversion less in areas that are more heavily fortified.

On the other hand, the extent to which rebels are deterred by fortification might be more limited, at least in settings like the ones we consider here. In short, the state cannot be everywhere and to the same degree at once, and so must make hard trade-offs about which locales it fortifies against rebel attack, leaving some locales *relatively* undefended (Polo, 2020; Hendrix, 2010). These problems are likely worse in the context of developing countries, where the state is often absent in much of its nominal territory or resource constrained (Rodríguez-Franco, 2016). Rebels may be especially undeterred by fortification with respect to economic activities that exhibit high interdependence or are network-reliant, such as those involving information distribution systems, the movement of oil through extensive pipelines, or, as in our case, internal trade networks. As Jackson (2001) argues, "...interconnectedness and interdependencies .... have also made modern society increasingly more vulnerable to terrorism. For every advance that improves the quality of life there is a corresponding new vulnerability"(p. 184).[7] In such cases, fortification is challenging because numerous points in the network remain vulnerable to attacks that can disrupt the entire system. Strengthening one location might merely shift attacks to other, more vulnerable areas.

We aim to adjudicate among these competing possibilities by testing the expectation that rebels will be more likely to select targets for economic subversion that are vulnerable. Our second hypothesis, therefore, concerns whether rebels strategically avoid fortified locations in carrying out economic subversion:

[7]One example of this dynamic, discussed in Ackerman et al. (2006), is a series of coordinated arson attacks carried out by a leftist revolutionary movement against Japan's rail system in the 1980s. Given the interconnected nature of the rail, officials acknowledged it was "impossible to guard the entire system" (Moosa, 1985).

*$H_2$: All else equal, rebels will engage in increased economic subversion in locations that are less heavily fortified.*

Economic subversion should thus be a function of the value of the prize (i.e., how disruptive the attack would be to internal trade) and the deterrent effects of state fortification. As Ackerman et al. (2006) argue, the balance of these trade-offs across a country's territory will be a key factor in where and when economic subversion happens. Our contribution in this study is to provide empirical evidence for both sides of the equation: 1) whether rebels strategically target places that are important to internal trade; and 2) whether rebels strategically avoid carrying out attacks in places where they anticipate state forces.

## Economic subversion in Colombia

Empirically, we focus on Colombia, a country that has experienced one of the longest armed conflicts in the world (Steele, 2011). Colombia's multi-party conflict – between left-wing guerrilla organizations like the FARC and ELN, right-wing paramilitary forces, and the state – has been tremendously costly in human terms, generating one of the largest internally displaced populations in the world (Balcells and Steele, 2016). In economic terms – the focus of this paper – the war has also been very costly in terms of public spending, losses in physical and human capital, and otherwise unrealized economic potential.

The economic costs of Colombia's armed conflict are partly an indirect consequence of the war since armed groups, in the process of fighting, destroy physical capital and otherwise disrupt predictable economic activity. Yet these costs are also the result of acts of deliberate sabotage and economic subversion. Guerrilla groups, in particular, have relied on these tactics extensively throughout the war. For example, armed actors destroyed oil pipelines and kidnapped oil engineers and executives in order to disrupt this important Colombian industry (Dube and Vargas, 2013). Rebel forces also used 'armed strikes', in which all commerce and foot traffic stops in a town under the threat of violence, to impose economic costs on the state (Ortiz, 2001). Most relevant to our study, Colombia's rebels have frequently

targeted the country's internal trade, including through land piracy, setting up road blocks, or attacking and destroying transport trucks on the country's roadways (Ortiz, 2023). As Rodríguez-Franco (2016) notes, the extent of economic subversion in Colombia even motivated conservatives and some in the business sector to support a wealth-based war tax to fund the effort against the guerrillas.

Quantifying these cost is difficult, but one report – from 2003, more than a decade before a major peace process demobilized the FARC – puts the costs of fighting at 2% of annual GDP and notes that "the revenue lost in guerrilla sabotage of the country's oil pipelines...would be enough to double the country's annual budget for social assistance" (Arnson, 2004). That same report suggests that national per capita GDP, in the absence of the war, would be around 50% higher than it is today. Evidence from a ceasefire with the FARC in 2014 further shows that reductions in fighting had second-order positive consequences for human capital development (Prem, Vargas and Namen, 2023). In short, the economic consequences of war, caused by economic subversion in particular, are of great importance to Colombia.

As discussed in more detail below, we measure economic subversion by using event data on two kinds of rebel attacks: land piracy and the use of road blocks. Broadly, land piracy involves either the theft or destruction of property on land (as opposed to sea piracy). In Colombia, this is typically piracy of commercial vehicles and other transport carrying merchandise. Road blocks are events in which rebel groups use a variety of approaches – creating obstacles, destroying roads, or using the threat of violence – to block inter-municipal traffic (Arenas, 2024). In theory, a road block disrupts economic activity but does not generate funding for rebel actors. Figure 1 visualizes the distribution of total economic subversion events, by type, in the eight most afflicted municipalities. The figure showcases the magnitude of these events: over our study period, for instance, the most afflicted municipality experienced hundreds of land piracy events. We can also see that road blocks are, on the whole, much rarer than land piracy. This is interesting given that road blocks are arguably *less* risky attacks to carry out, perhaps reflecting that land piracy can also be a source of

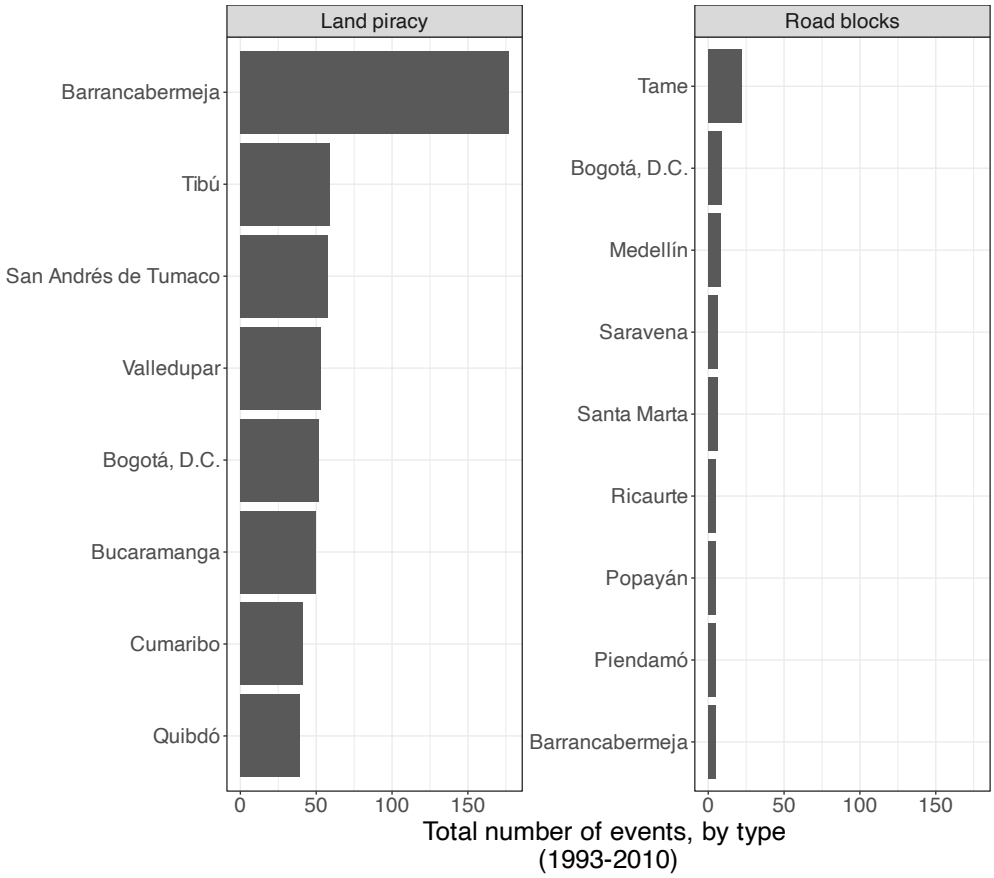


Figure 1: Number of economic subversion events in the eight municipalities that registered the most events, by type. Data from CEDE (Acevedo and Bornacelly Olivella, 2014).

revenue for armed groups.

## Research design

We present our empirical evidence in three parts. First, we look at which places rebels target with economic subversion, and test whether municipalities that have characteristics that are amenable to internal trade are targeted more frequently with economic subversion (*target selection*). Second, we examine the mechanism specified in our theory: that these municipalities are targeted *because* they play an important role in internal trade (*mechanism*). Third, we test whether increases in state presence can successfully deter rebel economic subversion (*deterrence*).

*Target selection*

The first analysis tests the incentive side of our theory of rebel economic subversion: that rebels will deliberately select targets that are valuable to the national economy. To this end, we compile data at the municipality-year level from 1993 to 2010 for roughly all 1,100 Colombian municipalities.

To measure our outcome variable, economic subversion, we rely on event data of incidence of *land piracy* and *road blocks* collected by the Center for Economic Development Studies (CEDE) at the University of the Andes in Bogota, Colombia (Acevedo and Bornacelly Olivella, 2014). Land piracy is defined by the Colombian National Police as:

> "Criminal activity aimed at the theft of cargo or passenger transport vehicles, through the use of different maneuvers defined as punishable by current criminal law and that are carried out, either while the vehicles are moving or when they are parked somewhere (at origin or destination)". Quoted in Sierra (2013).

We argue that land piracy is a form of economic subversion because it targets the functioning of normal, everyday economic exchange and, in the process, imposes large costs on the national economy.[8] For instance, Sierra (2013) reports that 60% of the losses assumed by cargo insurers in Colombia are due to land piracy. With respect to road blocks, where rebels destroy large vehicles or place obstacles on thoroughfares to block traffic, we argue that these are relatively low tech instances of economic subversion due to the economic costs that the blockages generate.[9] For each of these outcome measures, we combine all available[10] reports of these events but exclude those attributable to paramilitary groups, as these were

[8] We note that our data does not allow us to distinguish whether and how rebels subsequently use what was stolen in a land piracy event.

[9] We do note that, of course, we cannot determine from the event data whether the road block was created specifically to undermine economic activity. However, we would argue that it is reasonable to assume a significant proportion of these road blocks are for that purpose.

[10] Excluding "unknown" attacks from our land piracy measure does not significantly alter our results. However, for roadblocks, the data records very few events of any kind. Removing attacks by unknown actors greatly reduces our statistical power, and the key findings do not hold under this adjustment. We expect that roadblocks are primarily actions carried out by violent political organizations rather than those with otherwise criminal goals. Nonetheless, we recognize this as a limitation of our study.

effectively aligned against the country's rebel movements and thus fall outside the scope of our theory.[11]

Our treatment variable is how valuable a given locality is to internal trade. We follow a large body of research on the importance of transportation infrastructure to internal trade (Chandra and Thompson, 2000; Coşar and Demir, 2016; Duranton, Morrow and Turner, 2014) and measure the quality or 'connectedness' of each Colombian municipality to the national road network. We draw on data from Duranton (2015), who measures, for each municipality in the year 1995, the number of distinct principal roads, the total length of those roads in kilometers, and the number of exits into the municipality from those roads. These are combined into an index of overall road quality that varies continuously across municipalities. We generate a single index of road quality through principal component analysis, and find that the first principal component (which we use as our index) explains the majority of the combined variation of these three variables (Appendix Figure A.1). Larger values in this index indicate higher quality of road infrastructure or connectedness in that municipality.

Of course, the quality of road infrastructure is not randomly assigned across municipalities and there is reason for concern that whatever relationships emerge are confounded by other factors. There are two broad concerns here: one is that other factors – such as the overall level of municipal development – affect both the quality of road infrastructure and the incidence of violence. The other concern is of reverse causality: that violence affects where roads are built and not the other way around. We attempt to overcome these challenges in several ways, though we note here that these challenges are fundamental to observational work.

The first way we address confounding is through selection on observables. We control for municipal and temporal characteristics that bear on development, geography, and the

[11]We note here that much of our data is *event data*, reports gathered by government agencies, NGOs, and other bodies on the use of violence. The limitations and biases associated with this kind of data are well known (Davenport and Ball, 2002). We also opt against disaggregating events by actor type given well-known difficulties in attributing perpetrators to conflict events in Colombia. See, for instance, Echandía and Salas (2008, p.152).

overall level of violence in municipalities. These controls include municipal altitude, distance from the national capital, a binary variable for the presence of coca production, municipal population, GDP per capita, the level of poverty, as well as a variable for the number of people displaced by the conflict from each municipality, which we use to measure the overall intensity of violence in the municipality (Balcells and Steele, 2016). All of this data comes from the CEDE panel.

Our primary analysis thus uses the following model:

$$Y_{it} = \alpha + \beta_1 RoadIndex_i + \beta_i \chi_{it} + \epsilon_{it}$$

Where $Y_{it}$ is a measure of economic subversion in municipality $i$ at time $t$, $RoadIndex_i$ is the value of the road index in municipality $i$ in 1995, $\beta_1$ is our coefficient of interest, and $\chi_{it}$ is a vector of control variables. Since our road index is time invariant, we cluster standard errors at the municipal level. We estimate the regression using the ordinary least squares as well as a negative binomial specification given that the dependent variable is a count. We also include a dummy variable to indicate which years negotiations were taking place.

Our second approach to address confounding is to employ the instrumental variable methodology in Duranton (2015). We instrument for our index of municipal road quality derived from measures in 1995 with identically constructed indices derived from snapshots of the Colombian road system at two prior points in time. The first is the road system established during the colonial period by the Spanish in the 17th century. The second is the road system in Colombia in 1938, decades before the armed conflict begins in the 1960s. The key here is that these earlier road systems were developed for reasons unrelated to patterns of contemporary conflict, conditional on our control specification. As Duranton (2015) notes, the colonial road system was developed at a time when the Colombian population numbered 1-2 million, while it is now roughly 50 million. Similarly, in 1938, the road system was largely regional, mostly connecting neighboring cities. Yet, through path dependence, these early

road systems shaped where future roads were built.[12]

The use of an instrument allows us to address concerns of reverse causality because we use variation in the treatment variable that occurred *prior to* the start of the armed conflict. An instrument may also help us address more general concerns of endogeneity, but this rests on the assumption that, conditional on observable characteristics, these older snapshots of road quality impact economic subversion only through their effect on the 1995 road system. This is a difficult bar to clear and cannot be verified with data; we are careful to note it here as a limitation.

*Mechanism*

Implicit in our analysis of the effect of road quality on economic subversion is that municipalities with better road quality are more important to the country's internal trade. To evaluate the evidence in favor or against this mechanism we draw on the 2011 Commodity Flow Survey, also from Duranton (2015). This survey captures trade flows between municipalities, specifically the weight of commercial trucks on major Colombian roads. These surveys are used to measure the volume of trade moving between municipalities. We take this dyadic data and aggregate it to the level of the recipient municipality, and test whether: 1) municipalities with better road infrastructure experience more trade; 2) municipalities that receive higher volumes of internal trade are more likely to be targeted with economic subversion.[13]

[12]The work of Daly (2012) and others have identified linkages between early, pre-armed conflict land disputes in Colombia and patterns of violence after the armed conflict begins. To this end, we include a dummy for the presence of land disputes between 1918-1931 (prior to our 1938 road system measure) at the municipal level.

[13]An important limitation of this data is that they are only available for one year (2011), and that this year is after our measures of economic subversion are captured. For our inferences to be valid, we must assume that this year of trade data is representative of general trends in Colombia's internal trade.

*Fortification*

Finally, we test to what extent the state can deter rebel economic subversion through fortification. We take advantage of the roll-out of Colombian president Álvaro Uribe's (2002-2010) *Seguridad Democrática* program during our period of study. The *Seguridad Democrática* program was the Uribe administration's landmark policy program, which explicitly sought to increase the state's control over its territory, especially in relation to the armed conflict (Cortés et al., 2012). The program's principle policy lever was a substantial increase in the presence of National Police forces: establishing police presence in municipalities that did not have permanent police stations and reinforcing municipalities that had only weak police presence. These police deployments constitute a sudden and significant increase in the state's capacity to defend municipalities against various armed group attacks, including economic subversion. The program had a significant presence in our study areas: 11.5% of observations in our sample were from municipalities that had no police prior to the program and at least one economic subversion event. Further, 20% of observations that received reinforcements were from municipalities that had at least one economic subversion event.

Data on this program comes from Cortés et al. (2012). The data captures the exact timing and location of police deployments during our study period. As Cortés et al. (2012) describe, the program roll-out was staggered, with police reinforcements being supplied over nine waves beginning in 2002 and ending in 2007. Our treatment variable is thus the onset of increased policing in municipality $i$ in year $t$, and our outcome is the incidence of land piracy and road blocks.

We test the effects of the police deployment intervention in a difference-in-difference framework. In the difference-in-differences framework, identification comes primarily from the parallel trends assumption: that, absent the intervention, unobserved differences between treatment and control would remain constant over time (Sun and Abraham, 2020). The staggered nature of our intervention complicates the traditional approach to analysis, so we employ the methodology described in Sun and Abraham (2020). The equation is described

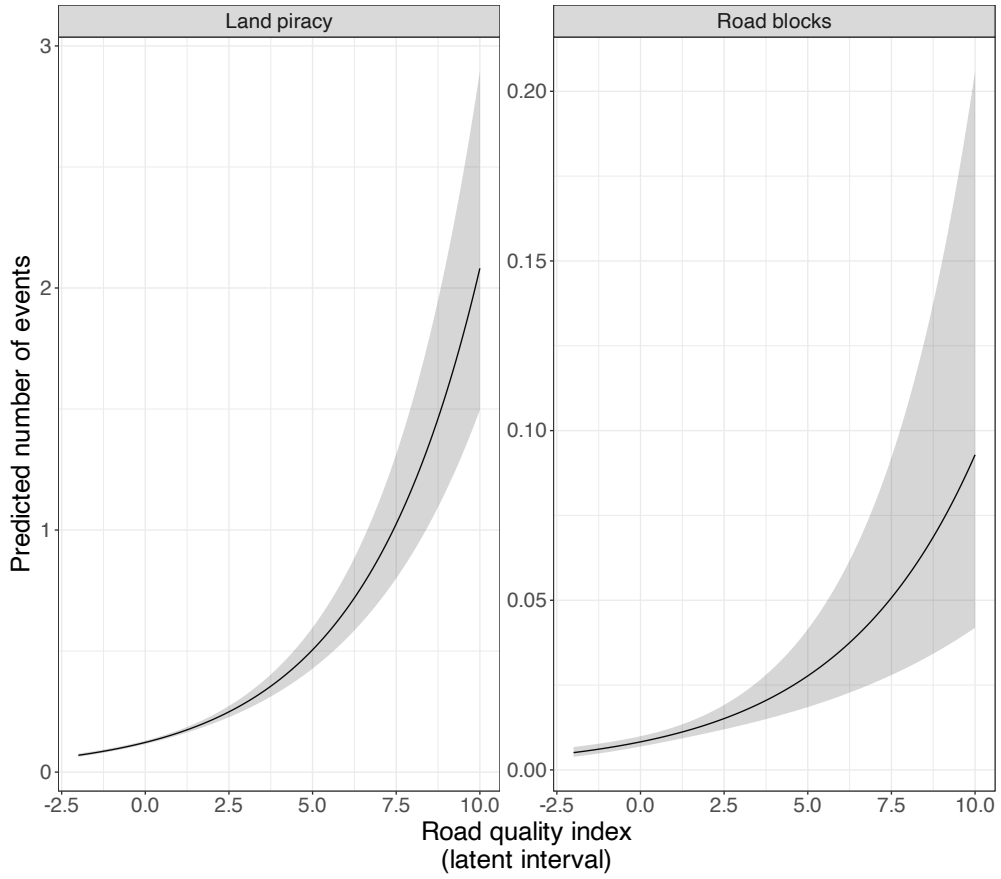


Figure 2: Predicted number of economic subversion events as a function of increasing road quality, other factors held constant. Regression results available in Appendix Table A.1.

in detail in the Appendix.

## Results

*Where do rebels use economic subversion?*

Overall, we observe a strong correlation between our road quality index and the incidence of economic subversion: rebels target places with characteristics that are valuable to the national economy.[14] Figure 2 visualizes the magnitude of these trends from our count models.[15] The trends are substantial: holding other factors constant, municipalities with the highest

[14]It is worth emphasizing that these are correlations: it is possible, for instance, that the quality of roads are endogenous to rebel subversive tactics.

[15]These result are also robust to excluding observations prior to 1995 (Appendix Table A.2).

road quality index experience about twice the predicted number of events of land piracy compared to those with the lowest road quality index.[16] Similarly, municipalities with the highest road quality index experience an almost tenfold increase in the predicted number of events of road blocks compared to those with the lowest road quality index. In other words, municipalities with poor road quality rarely experience these subversion events. This latter point is worth highlighting in light of the concern that these outcomes may not capture economic subversion but rather that they are 'generic' forms of civil war violence. Much of the literature notes a strong positive association between weak state capacity, low levels of development, and particularly poor road infrastructure and general violence (Cortés and Montolio, 2014), in *direct opposition* to what we see here.

[16]We also evaluate these models without measurements for municipal GDP and municipal poverty to account for the risk of post-treatment bias. The results remain unchanged without these controls (Appendix Table A.3).

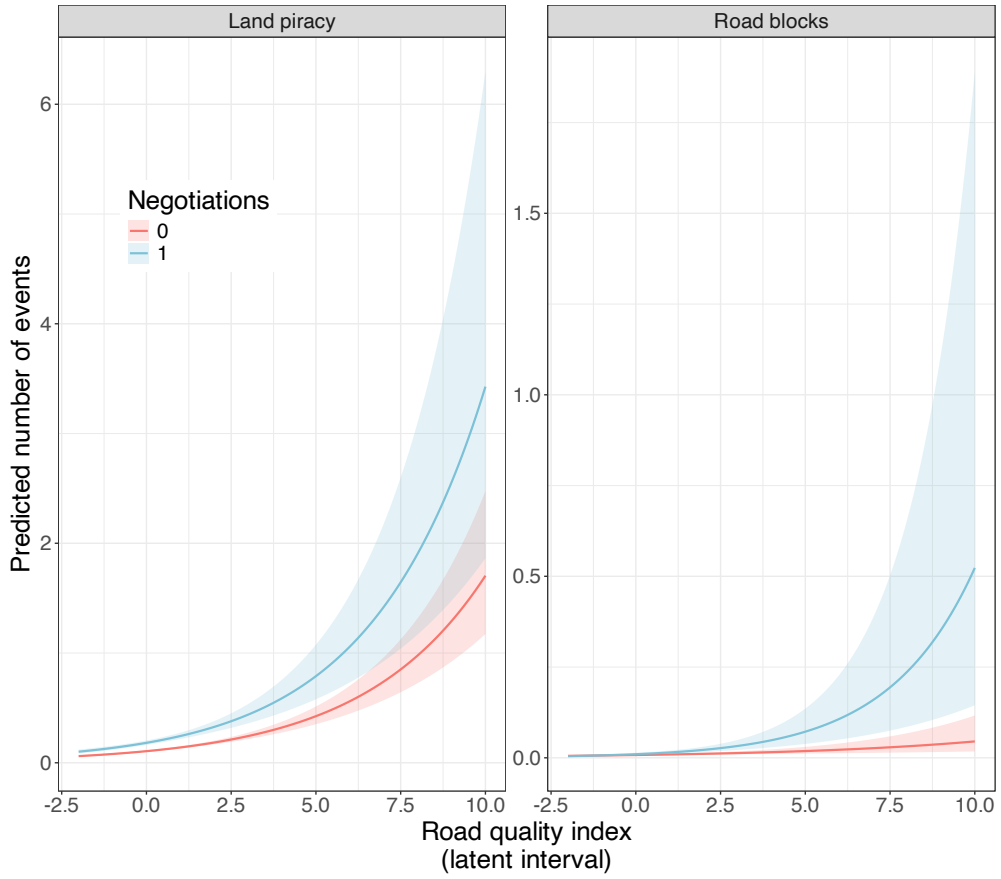


Figure 3: Conditional Effect Plots. Regression results available in Appendix Table A.5.

We further find, in accordance with $H_1b$, that these relationships are conditionally stronger during the 1999 peace negotiations (Figure 3). $H_1b$ posits that the peace talk period will increase incentives for economic subversion as a means of coercing the state into making more favorable concessions, while not necessarily heightening incentives for other competing motives, such as looting. Our findings support this notion. We find that increased road quality is associated with more economic subversion attacks during negotiation periods than non-negotiation periods. The result is particularly substantial for road blocks (the right panel) where we observe an almost five-fold increase in the predicted number of events during negotiation periods than non-negotiation periods at the highest level of road quality. However, the conditional effect is less substantial between negotiation and non-negotiation periods for land piracy (the left panel) at the higher values of road qual-

ity. These findings suggest that activities to disrupt inter-municipal traffic through road blocks are particularly salient during peace talks, conforming to a narrative of armed groups *deliberately* using economic subversion to undermine the state.[17]

What are these targeted municipalities like? Figure 4 highlights the municipalities that are targeted for economic subversion across levels of development, as measured by municipal GDP per capita. The figure plots the highly right-skewed distribution of municipal per capita GDP in Colombia and identifies the top ten municipalities by predicted number of land piracy events from our model. As we can see, the targeted municipalities are largely concentrated in the middle of the distribution – not the wealthiest municipalities, but also not the poorest. This may reflect the trade-off we highlight in our theory: the wealthiest places, while representing the biggest prize, are also likely the most heavily fortified.[18]

[17]We also explore the extent to which 'hearts and minds' considerations could shape where rebels use economic subversion. In other words: do rebel groups use economic subversion less or more depending on the extent to which the local population support their movement? Measuring public support for armed groups in civil war settings is difficult. As a proxy, we interact our key road quality index with a measure of municipal vote share for the Patriotic Union (roughly, the FARC's political wing in the 1980s) in the 1986 elections from Acemoglu, Robinson and Santos (2013). The results, in Appendix Figure A.3, reveal substantial uncertainty in whether patterns meaningfully differ across locales where rebel groups enjoy more or less support.

[18]As a test of robustness against the possibility that an "outlier" municipality has an out-sized influence on our coefficient estimates, we re-fit our model dropping one municipality from the analysis at a time. There is some variation in coefficient estimates across model runs but the results are consistent with the main estimates (Figure A.4).

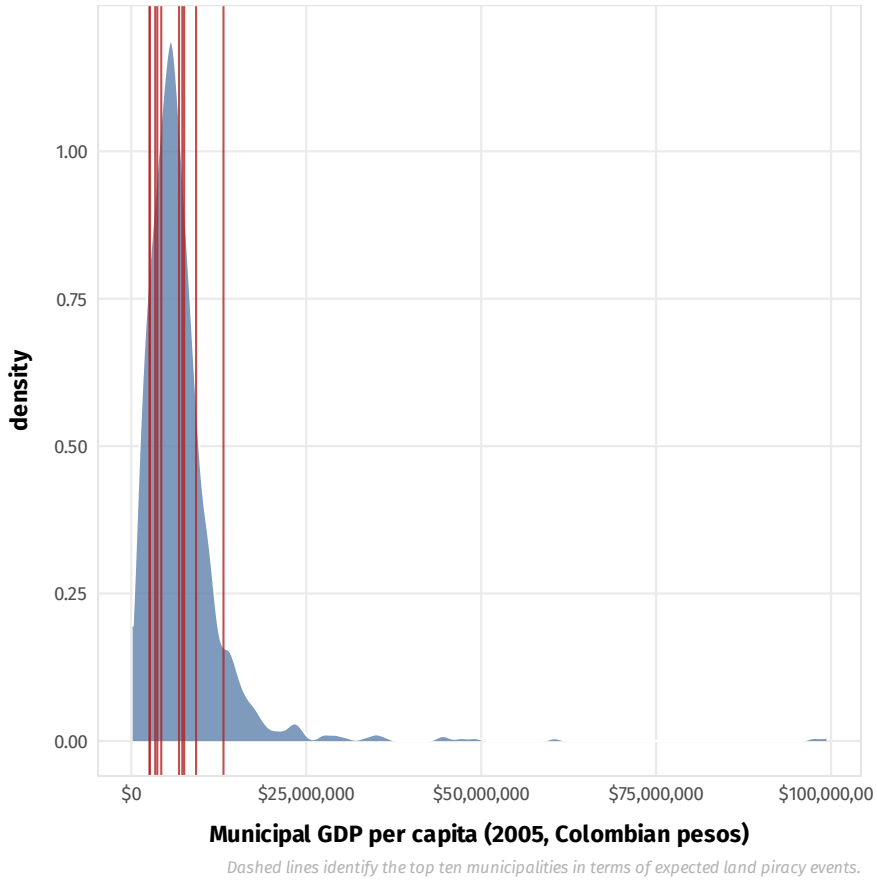


Figure 4: Distribution of municipalities according to municipal per capita GDP in Colombian pesos (2005). Highlighted lines are the ten municipalities our model indicates are most likely to be targeted.

The presented results are largely robust to instrumenting for our road quality index with an index derived from older snapshots of the Colombian road system. Table 1 presents the two-stage least squares results that use the 1938 map as an instrument for the current period road system. As reported in the table, the first-stage F-statistic is quite high (larger than the conventional threshold of 10), which is typically interpreted as evidence of a strong instrument. The table further shows that the road quality index is positive and significant across all outcomes: municipalities with a higher road quality index tend to experience more economic subversion. Appendix Table A.6 reports the same results but uses the colonial road system as an instrument for the current day road system, and shows that our results are robust to this approach. However, the colonial system is a weaker instrument for the current road system than the 1938 road system.[19]

[19]We also explore the extent to which municipal state capacity interacts with our road quality index to produce economic subversion. The results in Appendix Figure A.2 show that the relationship between road quality and subversion is positive and significant among both low and high capacity municipalities, and that the relationship is stronger in municipalities with low state capacity.

Table 1: Two stage least squares, using 1938 roads as instrument. Standard errors clustered at municipal level.

| | Land piracy | Road blocks |
|---|---|---|
| Intercept | 0.25 | 0.01 |
| | (0.13) | (0.01) |
| Road quality index | 0.09*** | 0.01* |
| | (0.02) | (0.00) |
| Conflict 1918-1931 | 0.15 | 0.00 |
| | (0.09) | (0.00) |
| Altitude (1000s of meters) | −0.01 | −0.00 |
| | (0.01) | (0.00) |
| Distance to Bogota (1000s of kilometers) | 0.03 | 0.00 |
| | (0.07) | (0.01) |
| Presence of coca | 0.21*** | 0.02** |
| | (0.05) | (0.01) |
| Population | 0.04 | 0.01 |
| | (0.02) | (0.00) |
| GDP per capita (tens of millions of pesos) | −0.02 | −0.00* |
| | (0.01) | (0.00) |
| Poverty (percent living in poverty) | −0.26 | −0.01 |
| | (0.26) | (0.02) |
| Displacement (thousands of people) | 0.10** | 0.01 |
| | (0.03) | (0.01) |
| First stage F-statistic | 178.11 | 178.11 |
| Num. obs. | 18219 | 18219 |
| N Clusters | 1018 | 1018 |

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

*The mechanism: trade volume*

We next turn to our mechanism analysis using the 2011 Commodity Flow Survey. We begin by showing that there is, in fact, a positive relationship between the amount of internal trade a municipality receives and levels of economic subversion it experiences. We regress, using a negative binomial count model, our averaged land piracy outcome against the average level of internal trade (logged) received by each municipality and include controls. Figure 5 visualizes the magnitude of this relationship and shows that the predicted number of land piracy events rises sharply as the amount of trade increases and then tapers off at higher levels of trade.[20] For instance, a municipality in the third quartile of trade is expected to experience almost twice as many land piracy events as a municipality in the first quartile. Confidence bounds also grow as trade increases because there are fewer municipalities with very high levels of internal trade. Results are robust and similar to instead looking at road blocks (Table A.7).

[20]As a test of robustness against the possibility that any "outlier" municipality may have an out-sized influence on our coefficient estimates, we show our main results are robust by dropping one municipality at a time and fitting a model to the remainder (Figure A.5). The result also holds after excluding municipalities with trade volumes above 55k tons (Table A.8).

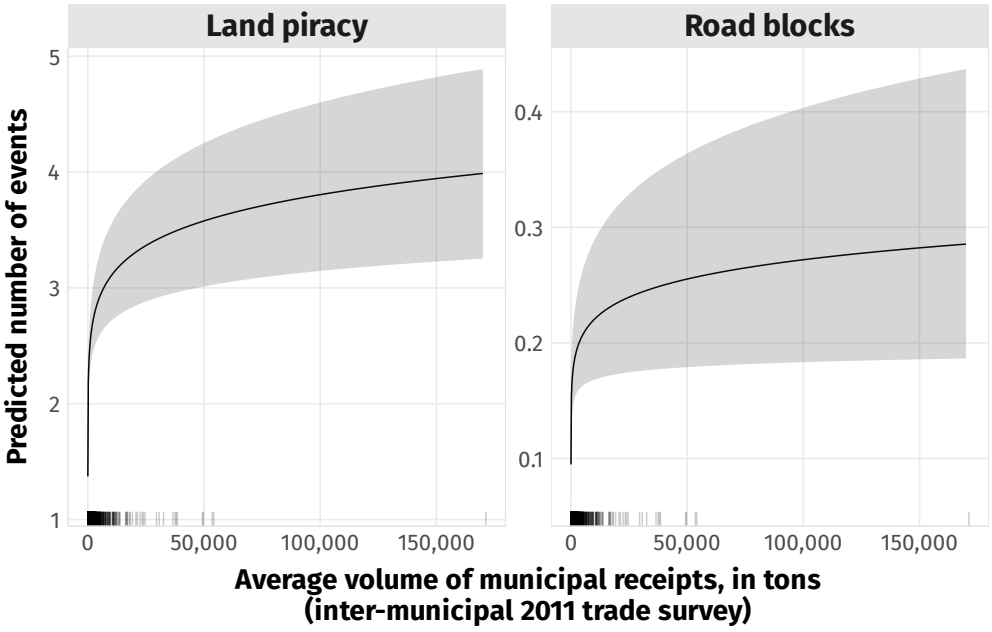


Figure 5: Expected number of average municipal land piracy events across levels of received municipal trade volume. Regression results available in Appendix Table A.7.

As a robustness test, we also consider whether the *position* of a municipality as a transportation hub in the network of trade flows within the country is associated with more land piracy and road block events. To this end, we construct a directed network out of the dyadic trade flows from the commerce survey data. For each municipality we calculate a *betweenness centrality* score – which captures how often a city is on the shortest path between any two cities engaged in trade, and is thus a measure of how critical that city is for trade flows. In substantive terms, the implication is that cities that often find themselves on the path of trade flows are more likely to be hit by land piracy and road block attacks. As reported in the Appendix, this is precisely what we find (Table A.9). This pattern adds further empirical support to the notion that commercial trade flows shape rebel economic subversion.[21]

[21]We formally test for mediation using the methodology described in Imai et al. (2011). We find some evidence of mediation for land piracy (Appendix Table A.11) but not road blocks (Appendix Table A.12) at conventional levels of statistical significance. We note that the methodology in Imai et al. (2011) rests on strong assumptions and must be interpreted with caution.

*Can state fortification deter economic subversion?*

Next, we test whether rebels employ economic subversion more frequently against fortified or less fortified targets. Implicitly, we are also testing to what extent the state can deter economic subversion. We take advantage of the roll-out of police deployments as a result of President Uribe's *Seguridad Democrática* program. To test the effect of the police deployments on economic subversion we employ a difference-in-difference framework, estimating the causal effect of an intervention (the police deployments) on an outcome (economic subversion events), by comparing changes in treated municipalities (i.e., those that receive deployments at some point) against changes in control municipalities (i.e., those that never, or have not yet, received deployments). Implicitly, we are treating changes in control municipalities as the counterfactual for the changes observed in treatment municipalities. Given that the police deployments were rolled out in a staggered manner, we further use the staggered difference-in-difference event study design described in Sun and Abraham (2020).[22] Our models also include controls for two time-varying factors: the level of displacement in the municipality in that year and the population in that year.

The results are depicted in Figure 6. Overall, we find mixed and inconclusive evidence on the deterrent effects of the large-scale *Seguridad Democratica* program.. While the estimated average treatment effect on the treated (ATT) is negative for land piracy – indicating that police deployments deter land piracy – the event study also shows that there are clear pre-trend differences in treated and control municipalities. These differences limit our ability to infer that the observed decreases in land piracy are causal. Our findings should thus be interpreted as correlational: post-program rollout, the receipt of police deployments is associated with fewer cases of land piracy.

By contrast, with road blocks we see suggestive evidence of temporary *increases* in road blocks following new police deployments. Pre-trend patterns here are also more promising: prior to program implementation we see null differences between treatment and control

[22]The detailed description of their approach and equation is discussed in Appendix Section 1, page 19.

municipalities for a large period of time, which is suggestive evidence of parallel trends. In the immediate aftermath of the deployments, we see an increase in road blocks for one period that then largely dissipates. One possibility is that the arrival of new police forces could create incentives for rebels to increase attacks as a costly signal the rebel group's strength to the state or potential supporters (Abrahms, 2013). However, this is not a conjecture we can test in this study.[23]

[23]Our difference-in-difference analysis compares all municipalities that ever receive police deployments as part of the program (treated) against all those that do not. In a more constrained analysis, we only look at municipalities that had no police presence prior to program implementation. However, only about 50 municipalities fit this criteria, leaving us severely under-powered (Figure A.6). An alternative is to look at only municipalities that already had some level of police presence. Here, the result looks nearly identical to our main analysis (Figure A.7).

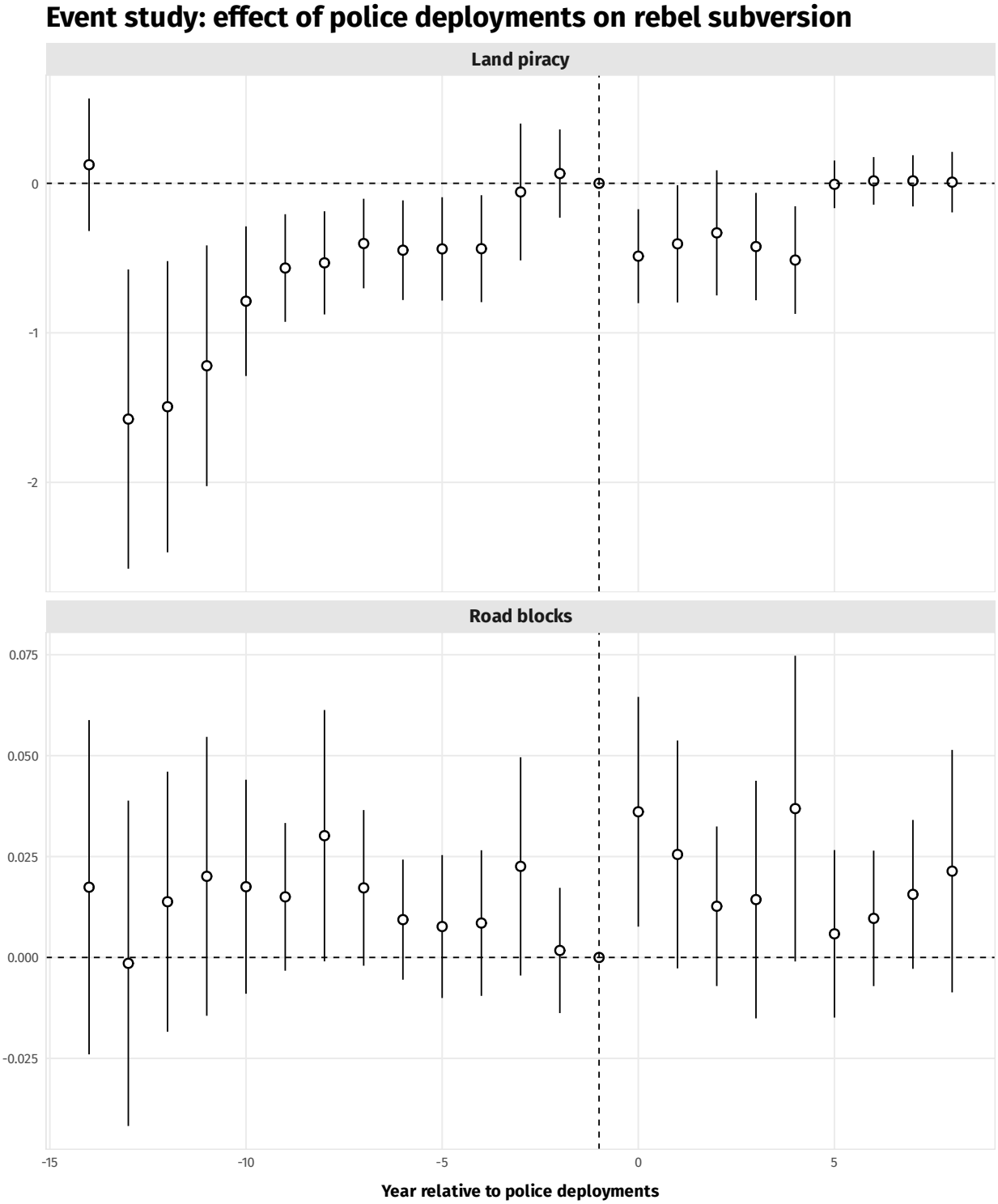


Figure 6: Event study design following methodology in Sun and Abraham (2020). Point estimates depicted with 95% confidence intervals. The reference year is one year prior to the onset of treatment. Regression results available in Appendix Table A.13.

## Conclusion

Economic subversion is a powerful, frequently used tool wielded by armed actors to impose economic costs upon both the state and society at large. Yet we know relatively little about the dynamics of economic subversion in civil wars. In this paper, we present correlational evidence that rebels use economic subversion strategically to target municipalities that are important to internal trade, and that this association is stronger during formal negotiations, when rebels have incentives to increase pressure on the government. We also test the deterrent effects of an extensive security program aimed at bolstering police presence in afflicted municipalities, finding mixed and inconclusive evidence of the program's efficacy. Our broad interpretation of these patterns is that, in countries where the state exerts weak control over its territory, there is opportunity for rebels to subvert the national economy with impunity (Lordan-Perret et al., 2019; Hendrix and Young, 2014).

Our work is just one entry-point to a broader research agenda on rebel economic subversion. We see a number of avenues for future research. First, there is the question of what impact these attacks have on the countries that experience them. There is some work on the economic effects of civil wars writ large (Collier, 2008; Costalli, Moretti and Pischedda, 2017), yet having estimates of economic subversion effects in particular would help us characterize how disruptive these actions are to the state (Taber, 1965). Second, there is ample room to further explore the state's ability to deter these attacks, and particularly how it chooses – given a limited budget – to fortify economically valuable assets or infrastructure (Getmanski, Grossman and Wright, 2019). Along these lines, work that more explicitly considers spillovers and rebels adapting to state deterrence by shifting their focus to newly unprotected areas has promise (Blattman et al., 2021).

A second line of research could consider whether these attacks have the intended effect: do groups that rely on these tactics meaningfully increase the probability of rebel victory (Toft, 2010), or are they able to bring the state to the negotiating table faster, and extract more

concessions? This latter question is particularly interesting given that economic subversion can alienate segments of the public who may have more "say" in the state's ability to negotiate, making the expected effect of these negotiations unclear (Tellez, 2019; Matanock and Garcia-Sanchez, 2017). Finally, following a wealth of literature that treats rebel groups as units, there is value in studying what kinds of groups rely on economic subversion, how often, and especially relative to other types of rebel behavior (Braithwaite and Cunningham, 2020).

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