

# PEASANT RESISTANCE IN TIMES OF ECONOMIC AFFLUENCE: LESSONS FROM PARAGUAY

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## Abstract

An influential literature suggests that low agricultural prices prompt peasant revolts in the rural countryside because they reduce returns to agricultural labor. We argue that in agrarian frontiers—economic regions with low potential for agroindustrial production and pervasive small-scale farming—positive price shocks drive peasant conflict in these areas. High prices encourage large commercial farmers and agribusiness to encroach on the lands of peasants. Resistance to land encroachment in peripheral areas is greater where organizational legacies and extensive subsistence agriculture allow peasants to pool symbolic and material resources to resist the expansion of capital-intensive commercial agriculture. We provide evidence of this contentious dynamic by using unique municipal-level data from Paraguay. Peasant resistance increases in areas less suitable to commercial agriculture when the prices of agricultural commodities grow over the 2000-2013 period, especially in areas with subsistence settlements and local peasant organizations.

**Key words:** conflict, rebellion, resource extraction, trade, political economy

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Extant views argue that peasants revolt when facing grievances due to low agricultural prices. Negative price shocks jeopardize rural wages and reduce the opportunity cost of rebellion (e.g., Dube and Vargas, 2013). In light of this scholarship, the surge in peasant conflict in recent decades—a period of extraordinarily high agricultural prices—presents a puzzle. Since the early 2000s, peasants in Argentina (Lapegna, 2016), Mozambique (Clements and Fernandes, 2013), Paraguay (Hetherington, 2011), or Indonesia (McCarthy and Cramb, 2009) have mobilized to resist capital-intensive farming. Although higher prices could also ignite conflict by promoting rapacity over resources (Collier and Hoeffler, 2004; Dal Bó and Dal Bó, 2011), grievances over land grabbing by capital-intensive agriculture marked peasant resistance in the new millennium (Borras Jr. et al., 2012). Historical studies of Latin America described a similar process of peasants resisting the advent of commercial agriculture during the 1880s commodities boom (LeGrand, 1986; Saffon, 2021). In both cases, higher agricultural prices and land encroachment drove peasant upheaval.

In this article, we propose a theoretical and empirical amendment to the literature by studying how economic geography shapes peasant conflict during a commodities boom. While low prices reduce the opportunity cost of engaging in conflict by decreasing the returns to agricultural labor, high prices endanger peasants' livelihoods because they provide incentives to encroach on their lands. High prices fuel landowners' incentives to appropriate peasant lands, which generate grievances that can lead to collective resistance. Thus, peasant conflict varies with exogenous fluctuations in commodity prices and the geographic characteristics that enable commercial agriculture, particularly land suitability for producing cash crops for trade.

Our framework distinguishes between central areas and agrarian frontiers. Central areas are those already incorporated into commercial agriculture, and are usually characterized by higher levels of land suitability to agroindustrial production, closeness to markets, and well-defined ownership rights. In these areas, peasants are tied to the land through tenancy contracts, like sharecropping or rental, with landowners. The agrarian frontier, by contrast, is characterized by lands that have not been incorporated into commercial agriculture due to lower suitability, remoteness, and unclear property rights. Peasants on the agrarian frontier tend to be cultivators with weak legal rights over land. As agricultural prices rise, frontier lands become commer-

cially attractive. Hence, high prices incentivize landowners to expand capital-intensive farming to the agrarian frontier and encroach on peasant lands, which are ready for cultivation.

When confronted with land encroachment, peasants can either exit—by selling their land and migrating to cities—or resist. Resistance requires symbolic and material resources to coordinate contentious collective action. These resources often rely on prior experiences of peasant insurrection and organization (Brockett, 1991; Zamosc, 1986). Moreover, practicing subsistence agriculture promotes norms of exchange and reciprocity that facilitate the coordination of contentious defensive behavior (Scott, 1976). We therefore expect peasant resistance to be greater in regions of the agrarian frontier where organizational legacies and subsistence agriculture are present.

We examine peasant resistance to land encroachment in Paraguay during the commodities boom of the early twenty-first century. Paraguay’s rural inhabitants constituted 40% of total population by 2013.<sup>1</sup> In this period, Paraguay became a top producer of capital-intensive crops, especially soybeans. Agroindustrial production, which was typical in the central belts surrounding the capital city of Asunción, expanded eastward into the country’s agrarian frontier, the Eastern Region, where peasant had settled in the 1960s and 1970s.

Empirically, we test our argument using a unique dataset of rural unrest in Paraguay at the municipal level based on newspaper archives spanning 2000-2013, a time of high yet fluctuating agricultural prices. Our dataset contains rich information about the key dimensions of conflict, including the actors involved, their demands, and contentious repertoires. We combine our measures of conflict with satellite and administrative data. We proxy economic geography by using data on land suitability to Paraguay’s most exported agricultural commodities, as determined by agroclimatic factors. Whereas central lands are more suitable to commercial agriculture and have been integrated into world markets at early stages, frontier lands are less suitable for agriculture and are mostly devoted to small-scale farming.

We evaluate our argument by examining, quantitatively, the interaction between exogenous shifts in the international price of Paraguay’s main commodities and land suitability at the municipal level. We show that higher prices heighten the intensity of peasant resistance, especially

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<sup>1</sup>World Bank, <https://data.worldbank.org/indicator/SP.RUR.TOTL> (accessed on January 21, 2022).

in the less suitable frontier municipalities. Furthermore, we show that this differential effect is heightened in municipalities where organizational legacies and subsistence agriculture are prevalent. We contextualize our econometric findings using in-depth interviews with stakeholders and qualitative data from our original database on rural unrest.<sup>2</sup>

Our work complements a literature in political economy linking booming prices to armed rural conflict through “rapacity effects” (Dal Bó and Dal Bó, 2011; Dube and Vargas, 2013). This literature focuses on capital-intensive commodities such as lootable hydrocarbons or minerals that are concentrated in deposits. Higher prices of oil or diamonds encourage insurgency by attracting peasants who seek to appropriate those resources. Conversely, that literature assumed that agriculture is labor-intensive, with higher crop prices increasing the returns to agricultural labor and the opportunity cost of conflict, thus making peasant rebellion less likely.

Our focus on the economic geography of capital-intensive agriculture illuminates a path through which high agricultural prices generate grievances that could foster peasant conflict: land encroachment. Higher prices of capital-intensive crops fuel the greed of landowners from central areas who seek to encroach on peasant lands—already cleared for cultivation—in the agrarian frontier. Nevertheless, the commercial expansion to the frontier also engenders new grievances because it threatens the economic sustenance of peasants by depriving them of their lands without increasing the demand for their labor. When organizational resources for contention are available, peasants are able to resist encroachment instead of abandoning their lands.

Our work also contributes to three other strands of research. First, we dispute an earlier literature suggesting that higher agricultural prices benefit peasants by boosting their income in the context of free trade (Bates, 1981). We show that, in contexts of capitalized agricultural sectors which reduce demands for rural labor and make peasants more reliant on land for survival, higher prices foster land encroachment and force peasants to choose between exit or resistance. That is, capital-intensive agriculture changes the locus of peasant conflict from rural wages to land access in line with the analysis of Borras Jr. et al. (2012). These authors argue that the expansion of “flex crops,” which have multiple uses (e.g., foodstuff, fuel, industrial material)

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<sup>2</sup>We conducted 35 semi-structured interviews in Asunción, Lambaré, Luque, and San Lorenzo conducted in between 2014-2020.

and can be traded in various markets, such as soybeans or sugar, promoted land grabbing and peasant expulsion.

Second, we conceive of peasant resistance to land encroachment during a commodities boom as a reactive form of contentious politics, to defend established claims (Tilly, 1978). The literature characterized collective action during booming prices as proactive because peasants seek to appropriate valuable resources violently through guerrilla insurrection, civil war, or revolution. Instead, we show that peasants rebel against landowners when their hold on land is imperiled and focus on less threatening contentious repertoires, including demonstrations, sit-ins at public places, and land occupations (Trejo, 2016).

Finally, our empirical strategy is tied to similar work in political economy. By exploiting as-if random variations in commodity prices and land suitability, this study joins a literature investigating how price shocks and agro-climatic conditions influence multiple relevant outcomes in developing countries with large rural populations, including not only peasant conflict (Guardado, 2018) but also land reforms (Albertus, 2019) and illicit markets (Dube et al., 2016).

## **Commodity Prices, Geography, and Conflict**

A literature on political economy underlined that commodity prices shape the opportunity cost of peasant rebellion (Dube and Vargas, 2013; Guardado, 2018; Hidalgo et al., 2010). Steep declines in agricultural prices lower the marginal value of rural labor and the opportunity cost of engaging in conflict. Thus, low prices exacerbate grievances and increase peasants' propensity to revolt. In contrast, price hikes improve peasant incomes and increase the opportunity cost of conflict. Classic agrarian studies (Scott, 1976) similarly associated falling prices with peasant rebellion against landowners exacting cash rents from peasants.

The waves of peasant conflict that ensued throughout the 2000s commodity windfall are puzzling in light of this literature. Why do peasants participate in contentious collective action in a commodities boom, when they are supposedly benefiting from price upswings? And why do they mobilize in some places but not others? We follow a growing literature (e.g., Beramendi, 2012; Rickard, 2020; Venables, 2008) on economic geography—understood as

cross-regional differences in the conditions that enable production—to answer these questions.

We differentiate between two types of economic geography. On the one hand, central areas involve traditional belts of large-scale commercial agriculture that were formed during the initial phases of state formation. Cities and infrastructure for trade such as roads, railroads, and ports were strategically located when these regions were included in world trade corridors facilitating integration into the export economy (Engerman and Sokoloff, 2012). Examples include the Argentine Pampas, the Brazilian South, or the U.S. Corn Belt. Central lands feature high levels of land suitability to agroindustrial production, clearer property rights, and proximity to agricultural markets. In those areas, peasants are wage laborers working in commercial estates and cultivating parcels of land through tenancy agreements with landowners—e.g., sharecropping or rental.<sup>3</sup>

On the other hand, agrarian frontiers are peripheral areas that have not yet been incorporated into commercial agriculture. These are vast hinterlands informally occupied by peasants who are independent cultivators—in subsistence or smallholding agriculture—and whose access to land is defined by squatter or communal rights (Saffon, 2021).<sup>4</sup> Agrarian frontiers might differ in the extent by which they can be promptly integrated into markets, but they share characteristics that make them less amenable to commercial agriculture in terms of relative land suitability, distance to cities and ports, and property rights (Alston et al., 1999).<sup>5</sup> Examples are the Brazilian Amazon, the Argentine Chaco, or the Paraguayan Eastern Region.

Although commercial agriculture had historically been labor-intensive, mechanization, high-yield seeds, and new farming technologies made it increasingly capital-intensive since the 1960s. In Latin America, capitalization created tensions between landowners and peasant

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<sup>3</sup>We use the term “landowners” as a synonym of landed elites, denoting large commercial farmers and agribusiness firms.

<sup>4</sup>Our definition of agrarian frontier resembles that of Saffon’s (2021), the “*colono* frontier ecosystem.” These are sparsely occupied lands outside the traditional areas of settlement and state presence in which peasants hold ill-defined land rights.

<sup>5</sup>Although many context-specific factors (e.g., colonial legacies, labor relations, social norms, military technology) could advance or retard frontier integration for certain commodities (see LeGrand, 1986), our key claim is that agrarian frontiers have in common geographic features that make them less suitable to commercial agriculture than central areas.

laborers, who suffered evictions along with the loss of jobs and crops. Hence, many peasants of central areas became *colonos* by abandoning large commercial estates to live as self-sufficient cultivators in the agrarian frontier. They resettled using slash-and-burn farming and state colonization schemes.<sup>6</sup>

The 2000s commodities boom exposed peasant settlers on agrarian frontiers to a new cycle of land encroachment because their lands were cleared and readily available for cultivation, but not incorporated into commercial agriculture. Borras Jr. et al. (2012) pointed to flex crops as providing stronger incentives for land encroachment during the last commodities boom. These crops involve capitalized agriculture and technology while having negative economic and environmental consequences for peasants. Peasant struggles against soybeans, maize, oil palm, or sugarcane in the agrarian frontiers of South America (Grajales, 2015; Lapegna, 2016), South-east Asia (McCarthy and Cramb, 2009), or Africa (Clements and Fernandes, 2013) epitomized their resistance in the new millennium.

Previous cycles of commercial expansion entailed similar spatial dynamics. The 1880-1914 export boom in Latin America incentivized landowners from central areas to enclose the lands of peasant pioneers and indigenous tribes in remote and ungoverned territories. However, unlike the 2000s boom, the expansion of labor-intensive cash crops—coffee, bananas, or tobacco—coupled with smaller urban sectors eased the appropriation of dispossessed rural masses as workers (LeGrand, 1986; Saffon, 2021). Landowners allowed peasant families to remain on enclosed lands in exchange for coerced labor.

Hence, we contend that higher prices of capital-intensive crops raise the value of peripheral lands and their attractiveness for commercial agriculture. Encroachment is more pervasive in the agrarian frontier during rising prices because these lands have not been incorporated into commercial agriculture; prior efforts by peasant *colonos* have already cleared the land; and property rights are weak. We therefore expect:

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<sup>6</sup>Frontier lands could be state-owned or private, bought for speculative purposes (Alston et al., 1999) or received as homesteads (LeGrand, 1986). Yet, frontier lands remain idle and unoccupied, allowing peasants to settle, clear them, and assert *de facto* rights over them (Saffon, 2021). High prices later encourage landowners to purchase state-owned lands or to reclaim unused private lands, neglecting peasants' *de facto* rights.

**Hypothesis 1.** *As commodity prices increase, episodes of peasant resistance to land encroachment should occur more frequently on areas less suitable to commercial agriculture.*

Because peasants face barriers for contentious collective action—they are numerous, poor, and dispersed (Bates, 1981)—exit options are often easier for them (see Sellars, 2017, 2019). Exit options raise the individual cost of participation, lower the confidence that mobilization will be successful, and thus dampen peasant conflict. For instance, peasants could strike individual deals with landowners and sell their lands, whereas family connections in cities facilitate migration from the countryside and make it easier to seek urban employment. Exit options have been more prevalent in the 2000s than in the 1880s, when dispossessed peasants were pushed into exploitative labor arrangements.

Collective resistance against land encroachment requires organizational resources. Scholars studying peasant rebellion highlighted the importance of prior organizing structures and subsistence agriculture's communal traditions for coordination and making individual exit options less likely.

First, past experiences of peasant rebellion can decrease the cost of coordination by supplying organizational skills, frames, and support structures for contentious politics. In much of 1950s and 1960s Latin America, when capitalized agriculture was being introduced, Communist intellectuals and progressive Catholic priests helped peasants to organize in peasant leagues (Brockett, 1991; Zamosc, 1986). These leagues rebelled against landowners who threatened peasant families with eviction and forced them to cultivate cash crops—instead of letting them produce food for their families—in exploitative working conditions. They demanded land reform, and some called for armed struggle. Although military governments effectively suppressed peasant leagues, readiness for mobilization in the wake of new grievances under democratic rule was one of the peasant leagues' principal legacies, which fed new peasant organizations in Argentina, Brazil, and Paraguay (Hetherington, 2011; Lapegna, 2016; Ondetti, 2008). We thus suggest the following hypothesis:

**Hypothesis 2.** *As commodity prices increase, episodes of peasant resistance to land encroachment should occur more frequently on areas less suitable to commercial agriculture, especially in locations where peasants were organized.*



A second mechanism refers to the social organization of subsistence agriculture—as densely-settled areas characterized by communal traditions of autonomy, solidarity, and reciprocity, which improve peasants’ ability to resist the threats of commercial agriculture (Scott, 1976). These “subsistence ethics” promote community-level exchanges and independence from agricultural markets, thus facilitating rebellion when peasants’ daily lives are in peril. Saffon (2021) showed that coordinating resistance to dispossession in Mexico and Colombia during the 1880s commodities boom was greater in closely-knit subsistence communities, such as *colono* settlements or indigenous *pueblos*, where members decided community affairs autonomously and pooled resources to resist evictions. Conversely, peasants commercializing cash crops at a small scale (e.g., smallholders or family farms) tend to be more fragmented and less internally able to coordinate their resistance, making them more vulnerable to exit. Hence, subsistence agriculture’s communal traditions of solidarity and reciprocity are crucial for coordinating resistance and decreasing the attractiveness of individual exit. Our third hypothesis is the following:

**Hypothesis 3.** *As commodity prices increase, episodes of peasant resistance to land encroachment should occur more frequently on areas less suitable to commercial agriculture, especially in locations where subsistence agriculture is practiced.*

Our in-depth interviews indicate that these two mechanisms are complementary and at play when peasants collectively defend their lands from encroachment. To summarize, when commodity prices rise, economic geography drives rural conflict. Higher prices encourage rapaciousness from landowners in central areas—they expand capital-intensive farming by encroaching on the lands of peasant cultivators on the agrarian frontier, where land is less suitable for agroindustrial production. The expansion of commercial agriculture from central to frontier areas generates peasant grievances over access to land. In turn, organizational resources determine whether peasants will exit or engage in collective resistance in response to these grievances. The prevalence of organizational legacies and subsistence agriculture will make peasant resistance more likely.

## Commercial Agriculture and the Peasantry in Paraguay

Historically, commercial agriculture in Paraguay was limited to the Central Zone—central and southern rural areas in the Central, Cordillera, Guairá, Misiones, Ñeembucú, and Paraguari departments. These zones are endowed with some of the country's most fertile lands and are near Asunción, host to the country's largest port. Commercial agriculture was dominated by large haciendas and ranches dedicated to cotton farming and cattle, with trading in world markets and clearer property rights. Peasants in the Central Zone practiced subsistence farming and worked for landowners as sharecroppers in exchange for small plots called *minifundios*.

The rest of Paraguay was not integrated into the country's export agriculture (Nickson, 1981). Outside the Central Zone, land is less suitable for commercial production because of rugged terrain, daunting vegetation, and poor access to Asunción. This includes the Eastern Region, a vast hinterland in Alto Paraná, Amambay, Caaguazú, Canindeyú, Concepción, and portions of Itapúa and San Pedro. In this region, land was mostly state-owned and sparsely occupied by indigenous populations, a few forestry companies extracting tannin, and Brazilian pioneers.

Rising population density and agricultural mechanization since the 1960s exacerbated frictions between commercial farms and *minifundios* over scarcer land in the Central Zone. These disputes led to the formation of the Christian Agrarian Leagues (LAC), a radical agrarian movement made up of communal organizations (Telesca, 2014). With the leadership of Jesuit and Franciscan priests, the LAC sought to combat land tenure injustices through biblical teachings, rural schools, and invasions of unproductive estates. Some of their members also embraced Marxist ideas and armed conflict. The military government of Alfredo Stroessner, who ruled on behalf of the Colorado Party (1954-1989), confronted these organizations with a mix of repression and compensation. The government created the Rural Welfare Institute (IBR) in 1963 to resettle peasants in the new peasant colonies of the Eastern Region. By promoting the "March to the East," Stroessner aimed to mitigate class conflict and deactivate peasant demands for land reform in the Central Zone (Nickson, 1981).

Peasants resettled in eastern departments by clearing forests and preparing soils for cultivation. According to Rojas and Areco's (2017) data, the IBR created 459 peasant colonies

between 1963-1989, each controlling, on average, 616 parcels of 18 hectares. Peasant settlers mostly cultivated subsistence crops, raised livestock for their households, and supplied food to local towns (Palau et al., 2007). High prices in the 1970s and low capital inputs prompted many peasants to commercialize cotton, reducing the farmland dedicated to subsistence farming. The area cultivated with cotton went from 81,000 hectares in 1973 to 312,000 hectares in 1979 (Rojas, 2016). Despite modest income increases, cotton brought many peasant families into indebtedness due to taxation and payments to cotton-ginning factories. Many other peasants, however, continued to produce food for their families (Palau et al., 1986).

The policy of peasant resettlement undermined peasants' property rights over colonized lands (Rojas and Areco, 2017). Land titles granted to peasants were provisional and thus not eligible as collateral. Numerous peasants also migrated spontaneously searching for free abundant lands, overcrowding the IBR's capacity to manage existing colonies and create new ones. Colonized areas lacked roads, technical assistance, and access to public services. Moreover, rampant corruption pushed the IBR to misallocate land grants to cronies of the Colorado Party and foreign investors. As a result, peasant settlers had to rely on squatting and communal forms of land occupation that were not formally recognized. By the time of Paraguay's 1989 democratization, as Hetherington (2011) notes, far-reaching colonization programs had ended and the Eastern Region was now home to masses of peasant cultivators whose tenure conditions remained precarious.

Since then, Paraguayan commercial agriculture has changed considerably. The adoption of mechanized equipment increased agricultural productivity and reduced demands for farm labor (Hanratty and Meditz, 1990). A new class of landowners made of large commercial farmers and agroindustrial groups produced commodities for trade while forging ties with multinational firms to acquire inputs and contract stockpiling, trading, and food-processing services (Rojas, 2016). Following the agricultural busts of the 1990s,<sup>7</sup> the 2000s offered unusual opportunities for Paraguay's agricultural sector. Soaring international prices of flex crops, combined with the introduction of genetically-modified seeds in 1999—which rely heavily on agrochemicals—

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<sup>7</sup>Appendix Figure A2 shows that the international prices of capital-intensive crops fell or remained low in 1991-1999.

and no-till farming, inaugurated an agricultural bonanza in the new millennium. Paraguay rose as one of the world's top soybean producers while also increasing the agroindustrial production of maize, sugarcane, and rice (Fogel and Riquelme, 2005).

These exogenous changes generated a land rush toward the Eastern Region among landowners from central areas and Brazilian entrepreneurs attracted by Paraguay's lower taxes and land prices. Because eastern lands had been cleared by peasant settlers and lacked legally-recognized titleholders, landowners had additional incentives to expand commercial capital-intensive agriculture eastward (Galeano, 2012). Soybean monoculture epitomizes this geographic and temporal trend. Soybeans in 1960-1961 were primarily found in the southern department of Paraguari, with only 1,300 planted hectares (Palau et al., 1986). In 2001-2002, soybeans had penetrated the borderlands of Alto Paran, Canindey, and Itapua, growing to 1.5 million planted hectares. By 2013, this number more than doubled.<sup>8</sup>

## **Peasant Resistance to Land Encroachment**

The 2000s commodities boom made peasants on the agrarian frontier vulnerable to encroachment. Landowners intruded on peasants' lands using sheer force or exposing peasant families to herbicides and pesticides meant for genetically-modified seeds. These incursions were backed by the country's two wealthiest associations of commercial farmers (UGP) and ranchers (ARP). Both dismissed peasants as economically backward (Galeano, 2012).

Against this backdrop, peasants had the option to sell or abandon their lands and move to the city, or stay and resist. The Paraguayan literature provides extensive evidence of peasant migration to urban areas (Fogel and Riquelme, 2005; Palau et al., 2007; Rojas and Areco, 2017). While collective resistance may have been the exception rather than the rule, we recorded 817 conflicts involving peasant resistance to land encroachment over 2000-2013.<sup>9</sup> Drawing on our press archives on rural conflict and data from FAO's Statistical Database (FAOSTAT), Figure 1 shows the annual variation in events of peasant resistance across Paraguay's three regions—

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<sup>8</sup>CAPECO, <https://capeco.org.py/area-de-siembra-produccion-y-rendimiento/> (accessed on February 25, 2021).

<sup>9</sup>We detail how the "peasant resistance" variable is constructed in the measurement subsection.

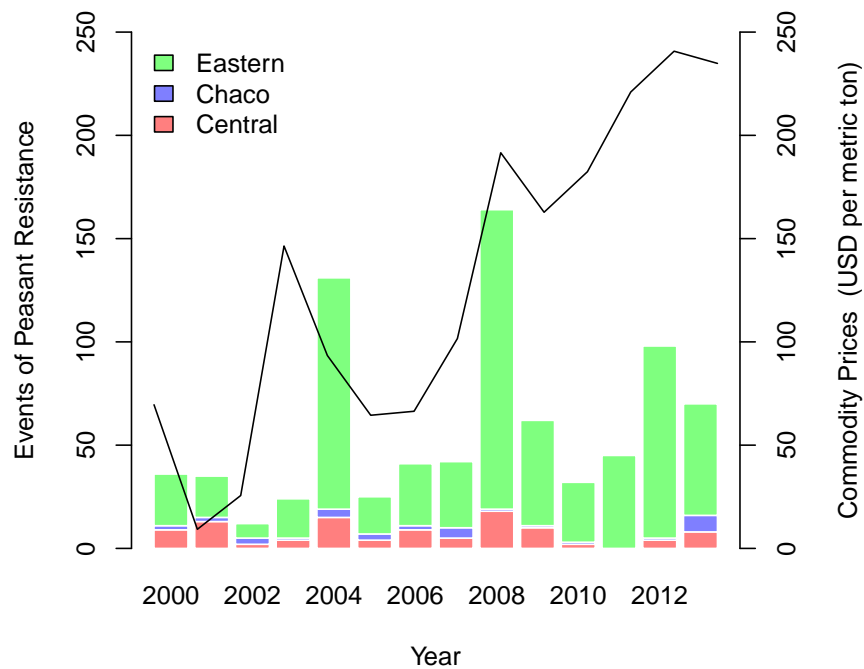


Figure 1: Commodity prices and peasant resistance, 2000-2013. The black line is the average annual producer prices of a metric ton of maize, rice, soybeans, and sugar in U.S. dollars.

Central, Eastern, and Chaco—and the average annual price in U.S. dollars of the country’s most exported cash crops (soybeans, maize, rice, and sugar) between 2000-2013. Although peasant resistance oscillated over the period, it peaked around the years of global price hikes—2004, 2008, and 2012.<sup>10</sup> In these years, the bulk of peasant upheaval, between 57.1% and 100% of conflicts, occurred in the Eastern Region.

These episodes of resistance were directly related to the expansion of capital-intensive farming. Peasants clashed both with the police that tried to evict them, and with commercial farmers, as the following episode from our archives illustrates:

A dead man and more than 50 people arrested is the result of one of the most violent evictions ever recorded in the San Pedro department. It was yesterday, in the Cuapé ranch, whose lands were occupied by nearly 500 peasants...the police came in the settlement where landless peasants initially tried to confront them with

<sup>10</sup>Conflicts decreased in 2009-2011 after the inauguration of President Fernando Lugo due to his ties with the peasantry, but resumed after his impeachment in 2012.

machetes and clubs.<sup>11</sup>

This protest was staged by the MCNOC, a national peasant movement, who blamed the ARP for the police repression.<sup>12</sup> Our records also include instances of landowners displacing peasants by applying large doses of herbicides and pesticides close to their homes. In these cases, peasants tried to sabotage commercial harvests and block landowners from spraying agrochemicals:

About 200 peasants from the MCNOC occupied the TZ property, in Toro Pirú, from the Guayabí district, of 2,700 hectares ... Peasants made it clear that... they won't stop fighting for something they consider legitimate: "The fumigation they are carrying out is terrible... the landowner is leasing this property to Brazilian farmers who cultivate soybeans and corn [and] our crops are getting ruined because of the fumigation."<sup>13</sup>

In interviews with peasant organizers, it becomes clear that the LAC's prior struggles provided peasants with mobilization frames and support structures for coordinating collective responses toward encroachment. As the national secretary of a peasant movement put it, "[our resistance] is the members of the LAC, a result of their struggle [and] some of the LAC's principles, and one of those principles is social class consciousness as a peasantry."<sup>14</sup> After the LAC were eliminated in 1976, some of their surviving rank-and-file members regrouped to found local peasant committees that became active in the early days of democratic rule, eventually converging into the formation of national peasant federations (Hetherington, 2011).<sup>15</sup> These federations provided logistical and financial assistance at the local level during land invasions and roadblocks. They also organized marches to Asunción to demand land titles. Of special salience in the national arena were the FNC, MCP, and MCNOC, which arose as coalitions of

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<sup>11</sup>"Los desalojos se cobraron otra vida campesina," *Última Hora*, November 5, 2004.

<sup>12</sup>"MCNOC culpa al fiscal de la muerte de Aureliano Espínola," *Última Hora*, November 5, 2004.

<sup>13</sup>"Campesinos entran a una finca ajena y destruyen el maizal," *Última Hora*, July 19, 2008.

<sup>14</sup>Author interview with P.O., Asunción, August 7, 2014.

<sup>15</sup>Author interview with M.G., Asunción, August 12, 2014.

local LAC offshoots.<sup>16</sup>

Our interviews also point to the importance of subsistence communities for collective action. A peasant national leader underscored their autonomy from commercial agriculture: “resisting in the countryside means, by definition, producing for feeding ourselves...it can’t be done if we are producing at a large scale.”<sup>17</sup> According to peasant activists, the implicit rule is to support fellow peasants in distress who are about to lose their land, regardless of any affiliation to a specific local committee.<sup>18</sup> This is relevant for land invasions: “peasant fellows from different settlements help each other...during a land invasion.”<sup>19</sup> Furthermore, solidarity and reciprocity allow peasants to pool material resources for launching and sustaining protests over time. In times of mobilization, peasants finance themselves in different ways: “by giving away their own produce or selling food in rural fairs and donating a share of that sale, but also by direct monetary contributions to fund marches to Asunción.”<sup>20</sup>

## Empirical Strategy

To test the effect of commodity prices on peasant resistance in agrarian frontiers, we compiled a dataset that includes Paraguay’s 223 municipalities<sup>21</sup> for the years 2000-2013—a period marked by a global rise in commodity prices. Our unit of analysis is the municipality-year and the number of observations is 3,122.

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<sup>16</sup>Author interview with L.A. (Asunción, August 6, 2014), P.O. (Asunción, August 7, 2014), and M.G. (Asunción, August 12, 2014).

<sup>17</sup>Author interview with P.O., Asunción, August 7, 2014.

<sup>18</sup>Author interview with M.G., Asunción, August 12, 2014.

<sup>19</sup>Author interview with E.F., Lambaré, March 30, 2015.

<sup>20</sup>Author interview with M.G., Asunción, August 12, 2014.

<sup>21</sup>Because the number of municipalities changed during our period of analysis, we map all our variables to the 223 municipalities that existed in 2002. We excluded Asunción because it is a fully urbanized district.

## Measurement

**Dependent Variable.** Our main dependent variable is the annual number of events of peasant resistance to land encroachment. These are occurrences in which peasants engage in contentious collective action against landowners—large commercial farmers and agribusiness firms—or the police to fight back, or protest against, attempts at seizing their land. We measure this variable by coding press archives from *Última Hora*, Paraguay’s top-selling newspaper<sup>22</sup> and the only nationwide newspaper whose archives were available and complete.<sup>23</sup> We recorded the municipality where the conflict occurred, the actors involved, the issue under dispute, the protest repertoires, and the organization of the involved actors, if any. We distinguished issues between access to land, agricultural income (e.g., wages, credit, transportation costs), the environment, and repression. Repertoires that peasants employ include roadblocks, sit-ins at public places, land invasions, public demonstrations, and the destruction of government or private property.

Our dependent variable includes conflicts over access to land, environmental conflicts that displace peasants from their lands (e.g., agrochemicals), and protests against evictions. We focus on land-related conflicts involving peasants or indigenous peoples, on the one hand, and landowners or the police, on the other hand. We exclude conflicts between peasants and indigenous peoples (e.g., over demarcation of land boundaries) and between landowners and the state (e.g., over export taxes).<sup>24</sup> We identify unique instances of peasant resistance, which required linking multiple stories reporting the same event and disaggregating events occurring in several places but reported simultaneously. Our final dataset includes 817 distinct events of peasant resistance. The number of conflicts at the municipality-year level ranges from 0 to 15, with a mean of 0.26 and a standard deviation of 1.04. Because of zero values, we normalize this vari-

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<sup>22</sup>National newspapers are highly advantageous sources for studying conflict (Earl et al., 2004). They enjoy high coverage rates, suffer less from nonresponse bias than surveys, and allow researchers to explore causal processes.

<sup>23</sup>*Última Hora*’s archives were retrieved from its repositories and the National Library of Paraguay, both located in Asunción.

<sup>24</sup>For comparison, we drop conflicts (i) between peasants and the police and (ii) involving environmental issues in Appendix Tables A2 and A3, respectively.



able using the Inverse Hyperbolic Sine (IHS) transformation instead of the natural logarithm (Bellemare and Wichman, 2020).<sup>25</sup>

The dependent variable only includes instances of peasant resistance reported by a national newspaper, thus raising measurement concerns (Earl et al., 2004). For instance, peasant federations may increase reporting by making certain conflicts salient at the national level. Our measure may be contaminated by other factors, too, including the commercial value of land or whether the newspaper has a correspondent in the locality. To account for these (observed and unobserved) factors that may influence reporting, our models include municipal fixed effects. To further check the robustness of our base results against the systematic under- or over-reporting of events, Appendix Table A4 re-runs our base models using (i) a binary dependent variable indicating whether an instance of peasant resistance occurred in a municipality-year and (ii) restricting our sample to municipalities that have reported at least one event of peasant resistance over the period (see Albertus et al., 2016; Hidalgo et al., 2010).<sup>26</sup>

**Explanatory Variables.** To examine how commodity prices and economic geographies shape peasant resistance, we collected price and satellite data on Paraguay’s main flex crops: maize, rice, soybeans, and sugar. They are Paraguay’s most internationally-traded agricultural commodities, accounting for 30% of the country’s total exports in 2014.<sup>27</sup>

Our first explanatory variable is the IHS of the average producer price of Paraguay’s main flex crops, in U.S. dollars per metric ton, as reported by FAOSTAT. Commodity prices in Paraguay are exogenous. Although Paraguay is a top producer of some of these commodities, it falls far behind Brazil, the U.S., or Argentina. Paraguay is a price-taker in international agricultural markets, having no capacity to alter aggregate supply. For example, the country is

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<sup>25</sup>The IHS approximates the natural logarithm while allowing to retain zero-valued observations and compute elasticities. Let  $y$  be the number of conflicts in a given year, our dependent variable is transformed using the following formula:  $\log(y + \sqrt{y^2 + 1})$ .

<sup>26</sup>As Earl et al. (2004) notes, the direction and magnitude of the bias depend on whether conflict is “newsworthy” in certain places and time periods, the type of news sources, and journalistic coding criteria. Because national newspapers are less prone to reporting biases than local newspapers (Earl et al., 2004, 70) and our base results are robust to alternative measures and specifications, we are confident that reporting biases are not driving our results.

<sup>27</sup>OECD, <https://oec.world/> (accessed on January 26, 2021).

the fourth global producer of soybeans, but only contributes 3% of the total output.<sup>28</sup>

Second, we leverage variation between central and frontier areas by examining satellite data on land suitability to commercial agriculture, as determined by agroclimatic factors such as climate, soil nutrients, and terrain ruggedness over the 1960-1991 period. The data were taken from FAO's Global Agro-Ecological Zones (GAEZ). We measure suitability as the IHS of the average potential yield for Paraguay's main flex crops, in metric tons per hectare. We compute the municipality-level average of land suitability and then divide it by the national average suitability.<sup>29</sup>

We identify frontier municipalities as those with less suitable soil for producing cash crops for trade. This measure is a better proxy for economic geography than actual production. First, land suitability closely conforms to our theoretical mechanism: we are interested in how landowners' incentives to encroach on peripheral lands—which are less fertile and have not yet been incorporated into commercial agriculture—trigger peasant resistance, not on whether landowners are able to expand production.<sup>30</sup> Second, the decision to plant cash crops may be endogenous to conflict. It may be correlated with unobserved or hard-to-measure factors, including ties between landowners and local political elites that may impact the likelihood of rural conflict. By contrast, land suitability is time-invariant and exogenous to local political dynamics, thus mitigating concerns about reverse causation and confounding.<sup>31</sup>

Figure 2 presents the geographic distribution of peasant resistance in 2003-2013 in panel (a), next to the level of land suitability across Paraguayan municipalities in panel (b). Both maps show that peasant resistance and land suitability are inversely correlated, in line with

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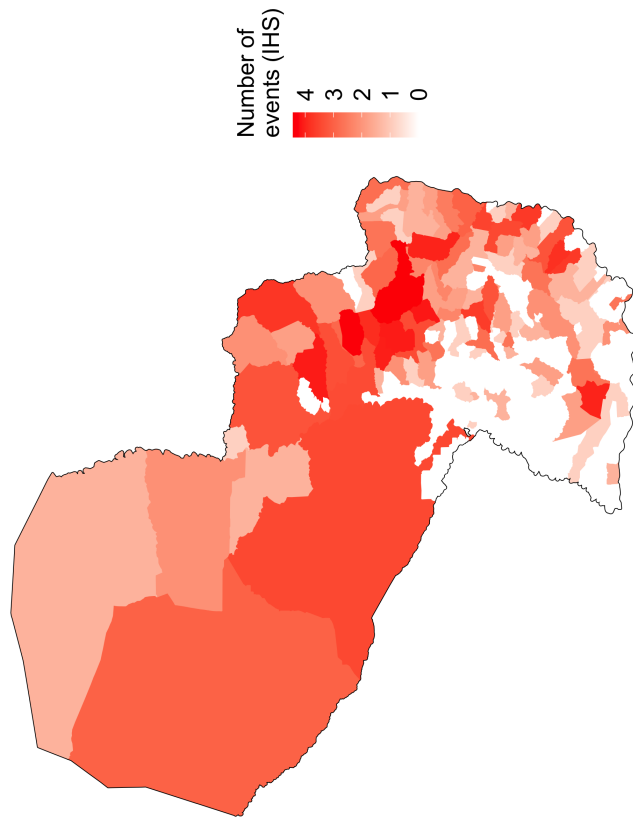
<sup>28</sup>FAOSTAT, <http://www.fao.org/faostat/en/#data/QC/> (accessed on January 26, 2021).

<sup>29</sup>We downloaded GAEZ satellite rasters on suitability for intermediate inputs, both irrigated and rain-fed, and spatially merged them with a layer of 2002 municipal boundaries to obtain measures of municipality-level suitability for each of the four flex crops. This gives us an average value of suitability within each municipality's polygon, weighted by the area of overlap with each suitability grid cell.

<sup>30</sup>The readiness for cultivation distinguishes agrarian frontiers from peripheries that have been forested, idle, and unsettled (Saffon, 2021). For comparison, we drop the western municipalities of the Chaco rainforest from the analysis in Appendix Table A5.

<sup>31</sup>Appendix Table A21 shows that the expansion of planted hectares from 1991 to 2008—when the two agricultural censuses were conducted—is negatively correlated with land suitability.

(a) Peasant Resistance to Land Encroachment



(b) Land Suitability to Commercial Agriculture

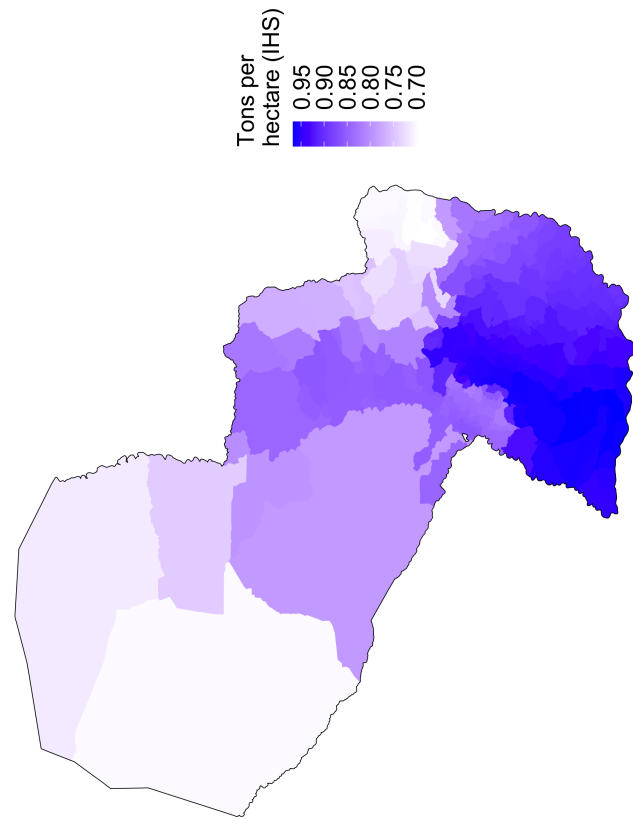


Figure 2: Peasant resistance (2003-2013) and land suitability by municipality

our theoretical expectations. The cluster of municipalities in the Eastern Region, which shows high or moderately high levels of peasant conflict, also exhibits the lowest levels of land suitability. Conversely, the southern and southeastern municipalities—the Central Zone nearby Asunción—show low or nonexistent levels of peasant resistance, as well as the highest potential for commercial production.

We examine peasants' organizational resources using two data sources. First, we rely on satellite data on the number of subsistence settlements in 1990-1992. These communities are dense, vaguely-demarcated areas of human settlement (dubbed *núcleos*) in which subsistence agriculture is practiced. Guyra Paraguay, an environmental NGO, provided the maps. Second, we use data on local peasant committees from the 1992-1993 guide prepared by Dávalos and Rodríguez (1994). Peasant committees are the lowest tier of national peasant federations, with affiliated members operating within the community or neighborhood. This guide, while outdated, captures well the legacies of peasant organizing dating from the 1960s LAC that resurfaced during the democratic transition (1989-1992). These new organizations mobilized peasants to demand land titling, access to public services, and rural credit.

We rely on organizational legacies as we do not know whether these peasant organizations survived, or if new ones were created into the 2000s. However, we know that peasant organizations were not formed in response to new grievances resulting from the 2000s commodities boom, as they predate price hikes. For both variables, we use dummies indicating whether the number of settlements and committees are greater than their respective median values.

**Control Variables.** We include three control variables that may be positively correlated with our outcome variable. First, we measure weak property rights as the share of a municipality's occupied farmland that is not legally titled. The data come from the 1991 agricultural census. Second, we measure distance to markets as a municipality's minimum distance, in kilometers, to any of the eight cities that are trading hubs, where agricultural commodities are exported. The data for trading hubs come from Paraguay's census bureau (DGEEC). Both untitled farmland and distance to markets are time invariant. In all our models, we also control for the IHS of the municipal population.

## Estimation

Our main model estimates changes in events of peasant resistance as a function of changes in commodity prices and land suitability:

$$y_{it} = \beta_1 P_t + \beta_2 S_i + \beta_3 (P_t \times S_i) + \mathbf{X}_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (1)$$

where  $i$  and  $t$  index each municipality and time period, respectively;  $y_{it}$  is the IHS of the number of events of peasant resistance in a given municipality  $i$  and year  $t$ ;  $P_t$  is the IHS of commodity prices at year  $t$ ;  $S_i$  is the IHS of the municipal-level measure of land suitability;  $\mathbf{X}_{it}$  is a matrix of controls, as defined above; and  $\delta_k$  and  $\gamma_t$  are municipal and year dummies, respectively. Because land suitability is time invariant,  $\beta_2$  is absorbed by the municipal fixed effects. To control for potential time-varying trends, we interact our time-invariant control variables with the time fixed effects. The estimand  $\beta_3$  captures the differential effect of commodity prices on peasant resistance at different levels of land suitability. Our main hypothesis is that a rise in commodity prices causes an increase in peasant resistance to land encroachment over less suitable lands ( $\beta_3 < 0$ ). We cluster standard errors by municipality to address heteroskedasticity and serial correlation.

The main identification assumption is  $E(\varepsilon_{it} | P_t, P_t \times S_i, \mathbf{X}_{it}, \delta_k, \gamma_t) = 0$ . In this setup, serially correlated errors may arise because of time-varying omitted variables or misspecified persistence in the dependent variable. To deal with these potential misspecifications, Appendix Table A6 presents a range of alternative models, including two-way random-effects regression models, linear auto-regressive models, as well as fixed-effects models using department instead of municipal fixed effects.<sup>32</sup> We also model peasant resistance using tobit models for censored data to account for the high number of observations without conflict.<sup>33</sup> Finally, we report results from a hybrid, fixed-effects negative binomial estimator in which our dependent variable is measured as event counts.<sup>34</sup>

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<sup>32</sup>On the relative performance of fixed- and random-effects estimators, see Plümper and Troeger (2019). On the importance of controlling for auto-regressive dynamics, see Imai and Kim (2021).

<sup>33</sup>Nearly 88% of all municipality-years had no conflict whatsoever.

<sup>34</sup>We choose least squares as the primary estimator as there are both excess zeros and over-dispersion in our

To evaluate the interaction effect between prices, land suitability, and organizational resources, we fit a “three-way” interaction linear model:

$$y_{it} = \beta_1 P_t + \beta_2 S_i + \beta_3 Z_i + \beta_4 (P_t \times S_i) + \beta_5 (P_t \times Z_i) + \beta_6 (Z_i \times S_i) + \beta_7 (P_t \times S_i \times Z_i) + \mathbf{X}_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (2)$$

where  $Z_i$  is the dichotomous moderator variable.<sup>35</sup> To interpret interaction terms, we present figures reporting marginal effects at different values of the moderating variables. Appendix Tables A10-A13 also report estimates from the binning model proposed by Hainmueller et al. (2019) by splitting the sample into two subsamples along the median value of the moderator.<sup>36</sup>

## Results

Table 1 presents our main results using linear fixed-effects models. The first two models estimate the interaction effect of commodity prices and land suitability on peasant resistance, with and without controls (columns 1-2, respectively). Columns 3-6 report results from three-way interactions between our key explanatory variables (i.e.,  $S_i$  and  $P_{it}$ ) and dummies for subsistence settlements in 1990-1992 (columns 3-4) and peasant committees in 1992-1993 (columns 5-6).

Table 1 provides supporting evidence for Hypothesis 1. Columns 1-2 show positive coefficients for commodity prices, indicating that when the international prices of agricultural

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data, making it problematic to fit count models with fixed effects (Allison and Waterman, 2002).

<sup>35</sup>We dichotomize these variables using their medians because triple interactions cannot be adequately interpreted if moderators are not set at different high or low values of interest (see Kam and Franzese Jr., 2007). For comparison, Appendix Table A7 dichotomizes settlements and committees using the first and third quantiles for coding low and high values. Appendix Table A8 keeps the number of settlements and committees as discrete variables, whereas Appendix Table A9 uses the dummies of subsistence hectares and committee members.

<sup>36</sup>The estimation of fixed-effects linear models on these samples reproduces the marginal-effect point estimates from the three-way interactions (Kam and Franzese Jr., 2007). Using the binning models allows us to examine the linearity assumption and the existence of common support (Hainmueller et al., 2019).

Table 1: Peasant Resistance, Commodity Prices, and Land Suitability, 2000-2013

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Commodity prices	1.382*** (0.365)	1.114*** (0.392)	0.653 (0.512)	-0.256 (0.363)	0.632 (0.434)	0.199 (0.385)
Land suitability $\times$ Commodity prices	-1.492*** (0.393)	-1.463*** (0.420)	-0.726 (0.552)	-0.071 (0.403)	-0.729 (0.457)	-0.524 (0.436)
Commodity prices $\times$ Settlements			1.599** (0.710)	2.526*** (0.683)		
Land suitability $\times$ Commodity prices $\times$ Settlements			-1.670** (0.773)	-2.671*** (0.743)		
Commodity prices $\times$ Organizations					2.152*** (0.828)	1.750** (0.789)
Land suitability $\times$ Commodity prices $\times$ Organizations					-2.256** (0.908)	-1.823** (0.863)
Controls	No	Yes	No	Yes	No	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3122	2884	3122	2884	3010	2884
Adj. R-squared	-0.015	-0.017	-0.006	-0.0003	0.005	-0.007

*Note:* Standard errors in parentheses are clustered by municipality. Constants estimated but not reported. The unit of analysis is the municipality-year.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

commodities increase, peasant resistance to land encroachment increases, too. This positive effect is decreasing in land suitability. In other words, prices have a differentially positive effect on resistance in the less suitable municipalities—i.e., agrarian frontiers. This finding is consistent and statistically significant for both models, with and without controls.<sup>37</sup> We illustrate the moderating effect of land suitability in Figure 3, which shows the linear marginal-effect estimate from the fixed-effects model without controls. The positive effect of prices on peasant resistance is concentrated in the municipalities with less fertile lands.<sup>38</sup> In the municipalities with the least suitable soil, a change in prices of one standard deviation increases the number of instances of peasant resistance by 17 percentage points.<sup>39</sup> The same movement in prices in the most agriculturally-apt municipalities decreases conflict by 10 percentage points. However, this last effect is not statistically significant at conventional levels.

Turning to Hypothesis 2 and 3, we investigate the differential effect of price increases on resistance, contingent on subsistence farming and LAC organizational legacies. Regression estimates are presented in Table 1. Figure 4 shows that, for municipalities with low levels—i.e., equal or less than the median—of subsistence settlements or peasant committees, the effect of prices on conflict is decreasing in land suitability and statistically insignificant across the range of land suitability. In contrast, higher prices have a larger and statistically significant effect on conflict in those municipalities with high levels—i.e., greater than the median—of settlements and committees. This effect decreases as land becomes more suitable until it becomes negative and statistically insignificant. Increasing commodity prices by one standard deviation in municipalities with the least suitable soils and high levels of subsistence settlements increases peasant resistance to land encroachment by 37 percentage points. As lands become more suitable, the effect of higher prices on resistance decreases until it loses statistical significance. The same is true for price movement in municipalities with low levels of subsistence settlements. A similar pattern characterizes municipalities with high levels of peasant committees—an increase

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<sup>37</sup>This is also true for the alternative models (Appendix Table A6).

<sup>38</sup>Though our argument is not about a specific crop but rather about price shocks and the economic geography of capital-intensive agriculture, we explore the effect of prices and suitability for each crop separately in Appendix Table A22 and Figure A28. Results show that soybean and maize drive the bulk of peasant resistance.

<sup>39</sup>Since our dependent variable is IHS-transformed, we calculate elasticities at the sample mean.



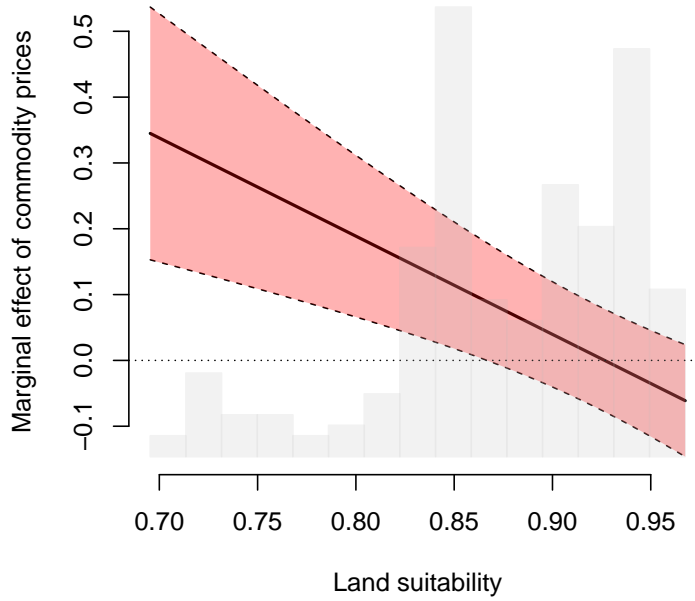


Figure 3: Marginal effect of commodity prices on peasant resistance by land suitability. Based on model 1. The histogram represents the distribution of municipalities at different levels of land suitability. Red bands represent 95% confidence intervals.

of one standard deviation in municipalities with the least suitable soil increases the number of episodes of peasant resistance by 30 percentage points. The same movement of prices in the most suitable regions reduces conflict by roughly 3 percentage points. However, this effect is not statistically significant.

In short, our results show support for our hypotheses about the effect that the expansion of commercial agriculture has had on peasant resistance to land encroachment in Paraguay. When commodity prices grow, so does resistance on the agrarian frontier where land suitability to commercial production is low (Hypothesis 1). That effect is heightened in areas where organizational legacies (Hypothesis 2) and subsistence farming (Hypothesis 3) is more prevalent.

## Placebo Tests

We conduct placebo tests to further examine our main results. First, we are concerned about the type of rural conflict. Resistance in the agrarian frontier should be over access to land and from peasants against landowners and state forces. Thus, we should not observe disputes over

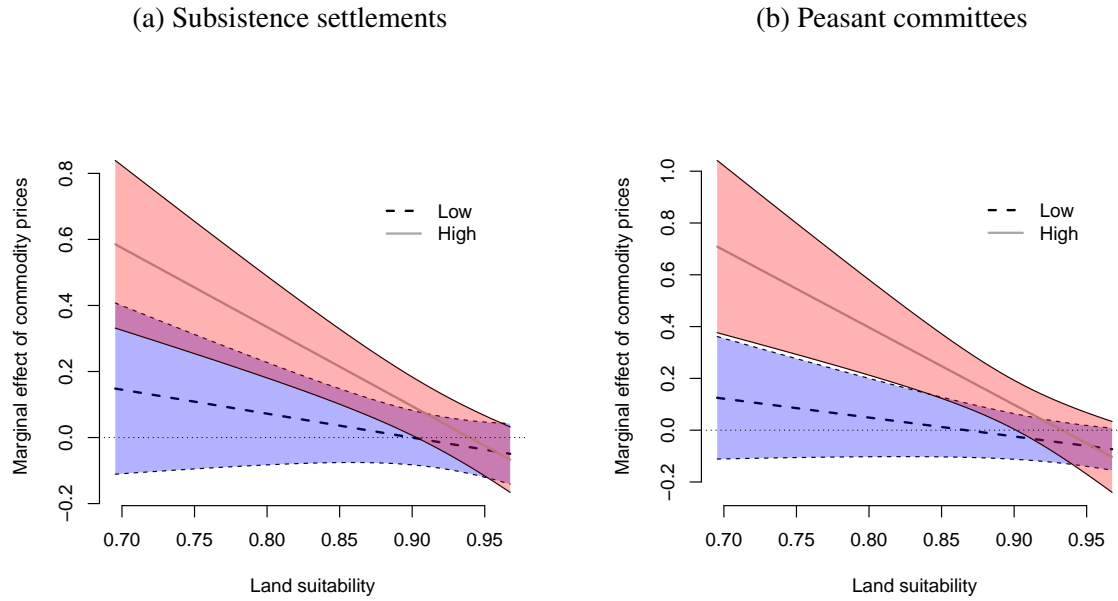


Figure 4: Marginal effect of commodity prices on peasant resistance by land suitability for municipalities with low and high levels of subsistence agriculture and organizational legacies. Based on models 3 and 5 (Table 1). Municipalities with low levels are those whose number of subsistence settlements and peasant committees are equal or less than its median value. Municipalities with high levels are those whose number of subsistence settlements and peasant committees are greater than its median value. Red and blue bands represent 95% confidence intervals.

income or involving other actors. We re-run our main models using conflicts where (i) income (e.g., wages, credit) is the peasant grievance, where (ii) peasants fight against indigenous peoples (e.g., land boundaries), and where (iii) landowners mobilize against state authorities (e.g., taxes) as dependent variables. We coded these instances of conflict from our archival database. Appendix Figures A17-A22 show that the marginal effects are small, not statistically significant, or running in the opposite direction.

Second, peasant resistance could be simply a response to the expansion of commercial agriculture, as occurred in 1880-1914, and not specifically to the expansion of profitable flex crops that require little labor. We use the average prices and land suitability of cotton, tobacco, and yerba mate—Paraguay’s primary export crops in the first half of the 1900s (Hanratty and Meditz, 1990)—as explanatory variables to check this possibility. These commodities are not capital-intensive and did not experience significant hikes in global prices. Hence, they should not provide strong incentives for land encroachment and conflict. As shown in Appendix Figures A23-A24, none of the estimated marginal effects are statistically significant.

Third, subsistence settlements could be picking up the presence of peasants instead of organizational resources. Thus, we test the conditional impact of cotton farming, Paraguayan peasants' commercial crop. Since commercial production atomizes peasants (Scott, 1976), cotton farming should hinder or have no effect on peasants' ability to resist encroachment. In our interviews, peasant leaders stressed the incompatibility of cotton commercialization with subsistence agriculture and the detrimental consequences that cotton has had for peasant collective action.<sup>40</sup> We measure peasant cotton farming with a dummy indicating whether the number of farms of 5 hectares or less that planted cotton is greater than the median.<sup>41</sup> The data come from the 1991 agricultural census. Appendix Figure A25 shows that the marginal effect of commodity prices by land suitability in municipalities with cotton farming is not statistically significant.

Fourth, state-led land distribution could be propelling conflict (Albertus, 2021; McClintock, 1984). Land policies that do not allocate strong property rights, combined with subsistence crises such as the 2000s land rush to the Eastern Region, can deepen grievances and spark rebellion. These policies could also empower peasants collectively because they establish the creation of communal associations such as cooperatives. We evaluate this using Rojas and Areco's (2017) data on all the IBR peasant colonies established between 1963-1989. We use a dummy indicating whether the number of colonies is greater than the median. Appendix Figure A26 shows that the marginal effects of commodity prices are positive and significant for municipalities with high and low levels of IBR colonization at low values of suitability, with IBR colonization driving higher rates of peasant resistance across a broader range of suitability values.

Finally, it could be that landowners' collective action capacity to penetrate the agrarian frontier and despoil peasants of their lands is catalyzing conflict (Albertus et al., 2016). Peasants might be resisting in places where landowners are well-organized and capable of threatening their communities. Anecdotal evidence from our press archives suggests that Paraguayan

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<sup>40</sup> Author interview with P.O., Asunción, August 7, 2014.

<sup>41</sup> Paraguayan peasants planting cotton did so in farms no bigger than 5 hectares, according to our interviews and IBR reports in San Pedro and Caaguazú (IBR, 1998).

landowner associations are sometimes behind encroachments. We explore this possibility using data on the local societies, chapters, and cooperatives belonging to the ARP and UGP, Paraguay's largest landowner associations. The data come from their lists of affiliates and district offices. Appendix Figure A27 shows that the marginal effects for low and high levels of landowner associations are positive and significant, with associations leading to increased resistance across a greater range of suitability values.

## Conclusions

The 2000s commodities super cycle was a time of unprecedented economic growth for developing countries, only comparable to the 1880s and the post-WWII era. Paraguay benefited exceptionally from these booming years. Between 2000-2013, the Paraguayan economy grew, on average, 4.5% annually.<sup>42</sup> The agricultural sector was the main driver of this growth: as a share of total exports, agricultural exports rose from 40% to 70% during this period.<sup>43</sup>

In this context, heightened peasant unrest is puzzling. Prior studies argued that commodity prices shape the opportunity cost of conflict. Peasant incomes shrivel when prices plummet, thus stimulating rebellion. Conversely, price upswings raise rural wages and allow peasants to reap the benefits of trade, thereby increasing the opportunity cost of conflict. This harkens back to classic agrarian studies such as Scott (1976), who argued that the expansion of commercial agriculture makes peasants vulnerable to subsistence crises because their wages fluctuate with crop prices. They argue that falling prices beget indebtedness, landlessness, and exploitative labor relations, thus driving rebellion. While also emphasizing the expansion of commercial agriculture as a source of peasant grievances, our work focuses on how periods of economic affluence—as determined by positive price shocks—can engender peasant resistance by inciting the greed of landowners in central areas and fueling encroachment on the agrarian frontier.

In Paraguay, peasants with ill-defined property rights inhabiting the Eastern Region's less

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<sup>42</sup>IMF, <https://www.imf.org/en/Data> (accessed on February 2, 2021).

<sup>43</sup>OEC, <https://oec.world/en/profile/country/pry> (accessed on January 26, 2021).

suitable and more remote lands were put in a defensive position in years of high commodity prices. Commercial farmers and agribusiness firms encroached on frontier lands and forced peasants to sell or abandon their homes and migrate to urban areas. When peasants could pull resources together, they resisted by clashing with the police, invading neighboring lands, blockading roads, or staging other forms of contentious collective action. Two sources of organizational resources facilitated coordination. In municipalities with subsistence agriculture and past experiences of LAC mobilization, peasants could draw on those resources to collectively resist land grabbing.

Our argument on positive price shocks, economic geographies, and organizational resources complements a extensive literature on peasant conflict, and it is not unique to Paraguay. The influence of Brazil's northeastern leagues, commanded by Christian and Maoist leaderships in the 1950s, stirred landless peasants in the Amazon basin to resist the expansion of soybean fields (Ondetti, 2008). Another example is Mozambique (Clements and Fernandes, 2013), where the peripheral tropical savannas were the target of agroindustrial soybean and sugarcane projects with ties to foreign banks. The subsistence customs of peasant communities and the local organizations of the UNAC—a peasant front built on the struggles of independence movements—facilitated peasant resistance.

Future studies should disentangle the effects of price fluctuations for different agricultural commodities—e.g., crops that are more or less intensive in capital, biotechnology, and agrochemicals. Agricultural capitalization challenges the literature's assumptions about commercial agriculture being labor-intensive and higher prices resulting in better wages and labor opportunities for the rural poor. Even though developing countries may benefit from better terms of trade and greater fiscal surpluses for subsidizing urban constituencies, peasant and indigenous populations living in the peripheries—whose economic survival hinges on having land for cultivation—might be hurt. Capital-intensive farming engenders land deprivation and causes environmental damages. In that regard, our paper suggests a more nuanced view of the winners and losers of the 2000s commodities boom.

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