Capital has no homeland: The formation of transnational producer cohorts in South America's commodity frontiers

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Abstract

Most of today's agricultural frontiers in the Global South involve large-scale agricultural companies operating across borders. While much has been written on large-scale land acquisitions and their social and ecological consequences, there is a relative lack of theoretically-informed empirical research on the decision-making of the actors driving these acquisitions. In this paper, I use the case of soy and cattle frontiers in the Gran Chaco and Chiquitano woodlands of Paraguay and Bolivia to explore the mechanisms behind such transnational land acquisitions. In particular, I draw attention to the formation of "cohorts" of agricultural producers from a common origin who acquire land in the same destinations. Based on interviews with farmers and key informants and drawing from literature on agricultural frontiers, international migration, and herding behavior, I discuss the role of structural and agent-level factors in the formation and evolution of these cohorts from the mid-1990s to the 2010s. In particular, I explore the importance of social dynamics, specifically network effects and herd effects, in shaping the development of these frontiers.

Keywords: commodity frontiers; transnational investments; land-use change; land grabbing; Gran Chaco; Chiquitania

"I tell you this: capital has no homeland."

Brazilian rancher in Paraguay (Interview, 30 July 2014)

1. Introduction

When I started interviewing large-scale commodity farmers in agricultural frontiers of Argentina, Bolivia, and Paraguay in 2013, I quickly became fascinated by the ways in which these farmers moved between regions, often across national boundaries, in the pursuit of new opportunities. There seemed to be a pattern in these transboundary movements, one that repeated itself between different groups of farmers in different countries. First, a couple of "visionary" pioneers from a core agricultural region would buy cheap land in a distant frontier considered unproductive or too remote by most. Then, if they seemed successful after a while, others from the same region would follow suit, driving agricultural expansion and pushing land prices up in the new frontier. What was interesting was not only the existence of these transboundary movements, but the fact that they seemed to occur in waves, with each move feeding off previous ones, resulting in "cohorts" of agricultural producers moving along similar trajectories. Such transnational cohorts have had a massive impact on the development of agricultural frontiers in the region, yet there still is little information on the processes driving them. In this paper, I set out to fill this gap by analyzing how transnational producer cohorts formed and evolved in the dry woodlands of Bolivia and Paraguay. With this, I hope to enrich the empirical evidence base and advance conceptual development for understanding the expansion of commodity frontiers in South America and the world.

59 The idea that foreign actors play a role in the expansion of agricultural frontiers is not new. In
60 the last decade, researchers and activists have documented an increasing number of large-scale
61 land acquisitions by foreign companies in the Global South, a phenomenon often called land
62 grabbing or land rush (Borras et al., 2011; Deininger and Byerlee, 2011; Li, 2014; Rulli et al.,
63 2013). Scholars have explored various dimensions of this phenomenon, such as the role of the
64 state (Grajales, 2013; Wolford et al., 2013) and of land tenure regularization (de L.T. Oliveira,
65 2013), or the efforts deployed by multiple actors to render land "investible" (Li, 2014). They
66 have highlighted its consequences in terms of food security (Daniel, 2011), dispossession of
67 smallholders (De Schutter, 2011; Schoneveld et al., 2011), or technological and other spillovers
68 (Deininger and Xia, 2016). However, while this literature has documented the structural causes
69 and social consequences of land acquisitions, there has been relatively little attention devoted to
70 the agency and decision-making of the actors driving them (but see Ofstehage, 2015).
71
72 A similar comment can be made about research on agricultural frontiers. There is an extensive
73 body of literature exploring the conditions that have led to the emergence and development of
74 agricultural frontiers, particularly in tropical forests. Studies have highlighted, for example, the
75 role of roads (Angelsen and Kaimowitz, 1999; Barber et al., 2014; Walker, 2004), population
76 growth (Carr, 2004; Carr et al., 2010), agricultural technology (Angelsen and Kaimowitz, 2001;
77 Kaimowitz and Smith, 2001), macroeconomic policies (Binswanger, 1991; Hecht, 1985;
78 Pacheco, 2006; Richards et al., 2012), government colonization programs (Rudel, 2007), social
79 movement organizations (Simmons et al., 2010), and agricultural cooperatives (Jepson, 2006a,
80 2006b; Jepson et al., 2010) in agricultural expansion and deforestation. This literature, however,
81 has focused on structural factors of frontier development, while agent-level constraints and

decision-making have received less attention. Although some research has explored smallholder land-use decisions (e.g., Walker et al., 2002; Caldas et al., 2007) and migration (Perz et al., 2010) in agricultural frontiers, the increasing predominance of large-scale farms calls for a greater attention to these actors' decision-making.

A better representation of the decision-making of large-scale producers involved in frontier expansion is important for at least two reasons. First, it has been argued that the diversity in these actors' responses to high economic rents at the frontier can create frictions that result in nonlinearities in frontier development (le Polain de Waroux et al., 2018). Taking this diversity into account can help better predict sudden bursts of frontier expansion, or "regime shifts" (Müller et al., 2014; Ramankutty and Coomes, 2016). Second, as I will show, the mutual influence of producers over each other's land-use decisions can both reinforce these non-linearities and establish a path dependence that shapes what frontiers develop into. This matters if we care not just about how fast land is being transformed, but also about what kinds of agricultural and social landscapes are created in these frontiers.

The objective of this paper is to trace the processes leading to large-scale land acquisitions by Brazilian, Argentine, and Uruguayan producers in the Chaco and Chiquitano woodlands of Bolivia and Paraguay, drawing attention to how producers' investment decisions lead to the formation of "cohorts" of producers following each other into new frontiers. The dry woodlands of the Gran Chaco and Chiquitania are one of the largest remaining continuous extents of native vegetation in South America, covering over 700,000 km^2 of Argentina, Bolivia, and Paraguay. Since the 2000s, these woodlands have experienced some of the world's highest rates of

conversion to agriculture, primarily for soybean farming and cattle ranching (Baumann et al., 2017; Fehlenberg et al., 2017; Grau et al., 2005; Killeen et al., 2008; Steininger et al., 2001). Although multiple actors have been involved in this expansion (Killeen et al., 2008), it would likely never have reached the proportions it has in Bolivia and Paraguay were it not for foreign investors from neighboring states – indeed, multiple voices have denounced the "foreignization" of land in these two countries (Galeano, 2012; Urioste, 2012).

In what follows, I start by proposing a conceptual framework to examine the formation of transnational producer cohorts in agricultural commodity frontiers. After explaining my methods, I turn to an analysis of the process of cohort formation in detail. Finally, I examine the role of social dynamics in influencing cohort formation.

2. Conceptual framework

For the purpose of this paper, I define *transnational producer cohorts* as groups of actors involved in agricultural production who come from a common geographical region of origin and invest in a common destination, either through expansion or through relocation. The term "producer" is understood here as encompassing a variety of actors involved in large-scale agricultural production, from individual farmers to family-owned companies to investment funds. I use the word "cohort" in reference to a common place of origin, but also to indicate some degree of social cohesion, whether through direct relationships, or a shared social environment. To explore the factors influencing the formation these cohorts, I propose a conceptual framework (Figure 2.) drawing from previous work on the dynamics of commodity

frontier expansion (le Polain de Waroux et al., 2018) and on literature describing the effect of network externalities and herding in human migration and in capital markets (Epstein, 2008; Hirshleifer and Teoh, 2003; Massey et al., 1993).

Land investments in commodity frontiers can be seen as driven largely by the existence of "abnormal" or "surplus" rents stemming from a disequilibrium between low land prices and high economic rents in commodity production. These can arise from sudden changes in local conditions such as accessibility, technology, or producer prices (Barbier, 2012; le Polain de Waroux et al., 2018). While in theory, producers can move to new frontiers from anywhere, those facing low or decreasing profits at home – and thus a higher *rent differential* between origin and destination – will have more incentive to overcome the costs or *frictions* associated with the move. Low or decreasing surplus rents may arise due for example to increasing land scarcity and prices, increasing taxes, depressed producer prices, or political instability. Frictions include the cost of relocating to a new country, the cost of adapting to a new environment, or the cost of managing farms from a distance. Producer cohorts may arise if certain pairs of places have a rent differential high enough that some producers will want to overcome these frictions and invest in the new frontier.

Not all producers, however, are equally positioned to take advantage of rent differentials: commodity frontier development depends not only on the existence of surplus rents, but also on the presence of actors with characteristics that enable them to influence and capture these rents (le Polain de Waroux et al., 2018). These enabling characteristics fall under four categories: information (e.g., knowing about weather conditions at the frontier), access to factors of

production (e.g., to land, technology, or specific trade networks), preferences (e.g., risk aversion), and agency (e.g., ability to build roads or lobby for political change). Following this, producer cohorts are more likely to form if producers from a certain area, as a group, share *common characteristics* that enable them to influence and capture these rents better than others.

A third possible explanation for the formation of transnational producer cohorts, and the one that this paper mostly focuses on, is that producers who expand or relocate internationally to new frontiers directly influence the decision of others to follow. Migration scholars have long recognized the contingent nature of migrations (Boyd, 1989, p. 642), and pointed to the fact that "[p]eople who are related to migrants are more likely to migrate themselves" (Palloni et al., 2001, p. 1264). Social capital theory has demonstrated the importance of migrant networks in determining migration decisions (Massey et al., 1993; Massey and Aysa-Lastra, 2011; Zhao, 2003). A large body of literature on the agglomeration of economic activities (e.g., Storper, 2013; Rigby and Brown, 2015; Krugman, 1991; Fujita and Thisse, 2013) and on herding in finance (e.g., Devenow and Welch, 1996; Hirshleifer and Teoh, 2003) also suggests that firms and investors tend to cluster spatially and to imitate each other's behavior. Agglomeration effects have been shown to be an important factor in the development of agricultural frontiers (Garrett et al., 2013, 2018; Richards, 2018). Following this literature, I differentiate between two types of effects that might play a role in the rise of transnational producer cohorts: network effect and herd effect.

The phrase *network effect*, in studies of migration, has been used to refer to the fact that knowing people in destinations directly influences the cost and risk of migration, and thus the likelihood

that a person will decide to migrate (Epstein, 2008). For example, the propensity to migrate can increase if the potential migrant knows people at the destination who can provide information on living and labor conditions. Friends and relatives can also "promote and channel migration to their own places of residence by facilitating adjustment to the new location, e.g. job search, material support, encouragement, provision of new social ties" (Haug, 2008, p. 589). Network effects, in that sense, may affect some of the enabling characteristics of actors discussed above. Pioneer producers might for example share *information* with peers about economic rents and conditions of production at the frontier, influencing their expectation of potential profits and their perception of risks. They may facilitate *access* to land for newcomers, by brokering land deals or helping to manage bureaucracy. Newcomers may form joint ventures with established producers to capture economies of scale, endowing them with greater *agency* to change investment conditions in frontiers, for example by expanding the road network. Finally, producers may have *preferences* that relate to the presence of other actors, e.g., for investing close to friends or family.

The *herd effect*, on the other hand, reflects the idea that people factor in the observed choices of others when making their own decisions, sometimes to the point of discounting their own information (Hirshleifer and Teoh, 2003; Raafat et al., 2009). Emigrants faced with imperfect information on migration destinations pay attention to the choices of previous migrants, assuming that these migrants enjoyed information that they do not (Epstein, 2008). Firms infer the profitability of investment options from the decisions of other firms (Barry et al., 2003; Mariotti et al., 2009) and make decisions based on that inference, sometimes leading to so-called informational cascades (Devenow and Welch, 1996; Hirshleifer and Teoh, 2003). Accordingly,

examples and stories of successful pioneers may encourage newcomers who have sufficient means, but incomplete information, to take the leap. While herd effects need not operate along social networks (anybody can imitate anybody), some studies of herding have shown that people tend to more readily imitate people they know (Lee et al., 2015). It seems reasonable to assume that the social and geographic proximity (Boschma, 2005) and relatedness (Hidalgo et al., 2018) of producers from a common region means that they are more likely to be exposed to, and to trust, information signals emanating from each other.

3. Data and methods

This paper is based primarily on interviews I conducted in 2013, 2014, and 2016 in Argentina, Bolivia, and Paraguay. I conducted interviews with 126 medium- to large-scale producers (most over 10,000 ha) and with key informants from agricultural cooperatives and lobbies (29), industry and services (17), research and extension services (22), social and environmental NGOs (29), and government organizations (13). I used a snowball sampling procedure in which producers whom I interviewed, initially approached through producers' associations or other contacts (e.g., land brokers, NGO employees, or local researchers), were then asked to provide the names of other producers they knew, prioritizing ones who had moved from different regions or countries. I used key informant interviews to verify that I was not missing important categories of actors. Semi-structured interviews with producers included questions about their own activities, including land acquisitions and production history, and questions about frontier expansion dynamics. Semi-structured interviews with key informants covered a wide range of topics, from frontier dynamics to supply chain structure, social and environmental issues, and

220 governance. To respect the anonymity of informants, I use real names only for public figures and
221 well-known producers who appear in the media or literature. Figure 3 represents producers I
222 interviewed who belong to the cohorts analyzed in this paper.
223
224 In order to extract systematic information from the interviews, I searched for phrases in the
225 interview transcripts associated with producer cohorts, social networks, and land acquisitions. I
226 coded the corresponding segments using a combination of a priori and axial codes and imported
227 them into a table for analysis. In addition to the interviews, I draw from a variety of secondary
228 sources to complete and cross-validate information. These include scholarly literature, grey
229 literature, newspaper articles, and data from various government and non-government sources.
230 While the core of the paper is based on the analysis of interviews, I cite independent sources
231 whenever possible in order to corroborate facts.
232
233 **4. Transnational producer cohorts in the Gran Chaco and Chiquitania**
234
235 Next, I analyze the main producer cohorts at the root of agricultural frontier expansion in the
236 Gran Chaco and Chiquitano woodlands since the 1990s. I highlight the main causes behind
237 movements to new frontiers for each cohort and analyze how they formed and evolved over time
238 (Figure 4).
239
240 4.1 “The country jumps the fence”: Brazilian producers abroad
241 The story of Brazilians in the Chaco and Chiquitania of Bolivia and Paraguay starts around the
242 late 1980s. At that time, the soy industry had been growing for two decades in Brazil, supported

by growing international demand and government programs that, among other things, had provided subsidized credit and improved soy varieties (Schenpf et al., 2001; Warnken, 1999). With the closure of agricultural frontiers in Southern Brazil, rising land prices and the fragmentation of land holdings fueled expansion towards the Brazilian Cerrado, and later, the Amazon (Garrett and Rausch, 2015; Jepson, 2006a; Richards, 2015). Although a first wave of poor farmers and agricultural workers from Paraná had moved to Eastern Paraguay in the 1970s, forming a community that became known as *brasiguaios* (Blanc, 2015; Richards, 2011; Souchaud, 2007), most expansion occurred within Brazil. Starting in the mid-1980s, however, a worsening of macroeconomic conditions in Brazil caused widespread emigration in all sectors of society (Margolis, 2005). For farmers, economic distress associated with hyperinflation was compounded by high import and export tariffs on agricultural products and the discontinuation of programs of subsidized agricultural credit (Chaddad and Jank, 2006; Schenpf et al., 2001). Additionally, with the return to democracy in 1985, "widespread demands for access to land returned with renewed force" (Wolford, 2005, p. 242), which, from the perspective of landowners, meant an increasing risk of property occupations by landless peasants. "There were many expropriation threats, several of us had problems," a Brazilian rancher in Paraguay explained to me, "so [investing abroad] was a way of diversifying risk." These combined constraints led an increasing number of producers to look for opportunities in neighboring countries, prompting the magazine *Veja* in 1995 to announce: "The country jumps the fence: In search for new land and opportunities, half a million Brazilians ignore borders and set out to generate wealth in neighboring countries" (Klintowitz, 1995, p. 60).

4.1.1. A “new Eldorado”: Brazilians in the Bolivian Lowlands

As Brazilian farmers struggled with inflation and increasing restrictions on agricultural exports at home, Bolivia embarked in 1985 on a structural adjustment program that led to a number of measures directly or indirectly favoring large-scale, export-oriented commodity agriculture. These included currency devaluation, road building, distribution of cheap land to large-scale farmers, removal of price controls, restructuring of taxes towards consumption rather than production, and a reduction of tariffs for the export of vegetable oils (Kaimowitz et al., 1999; Pacheco, 2006). Additionally, the World Bank, through its Eastern Lowlands project initiated in 1991, set out to support infrastructure development, agricultural technology improvement, the creation of a new land use plan, and new credit mechanisms for agricultural production (McKay and Colque, 2015; Redo et al., 2011), although the latter ended up being underused (Hecht, 2005; World Bank, 1998). To realize modernist dreams of export-led agricultural development however, Bolivia needed producers who had sufficient experience and capital to lead the way. It was only natural that they would look to the powerhouse next-door.

To draw Brazilian investments to Bolivia, the Bolivian government sought to create an example. In 1990, Jaime Paz Zamora, then President of Bolivia, met with Olacyr de Moraes, a businessman from São Paulo state then known as the “king of soy” in Brazil, to discuss the possibility of developing soybean agriculture in Bolivia (“Paz Zamora…,” 1990). Soon, de Moraes became the first Brazilian to experiment with soy and cotton in Santa Cruz province, in association with a Bolivian, Roberto Saavedra Bruno, a strongman of Zamora’s government (“Capital brasileiro…,” 1991, “Empresas migram…,” 1992).

De Moraes's experiments demonstrated the feasibility of Brazilian-style mechanized agriculture in Bolivia, and "helped bring producers of lesser size" to Bolivia (Greenlees, 1992, p. 1). The promise of successful farming in this new Bolivian "Eldorado" (Pivetta, 1995, p. 1) was relayed to the Brazilian public through newspaper articles, magazines, and TV shows. In these, Brazilian farmers praised the seemingly miraculous fertility of Bolivian soils and the other advantages of producing in Bolivia, such as the cheapness of land, the lack of restrictions on money circulation, financial stability, and the lack of export quotas ("Capital brasileiro…," 1991). Another important selling point for Brazilian farmers was the fact that "new" (i.e., recently deforested) soils did not necessitate fertilizers and calcium for several years, unlike those of the Cerrado and the Amazon. This led de Moraes to assert in an interview with the *Folha de São Paulo* that "[t]he cost of production is half of that in Brazil" ("Capital brasileiro…," 1991), while other producers were saying that "it is the easiest place in the world to make money" (Pivetta, 1995).

Several interviewees from Brazil recalled having been influenced by such media reports. For example, one producer whose brother moved to Bolivia from Bahia in 1995, remembered that his brother had seen a documentary about Bolivia on the TV channel *Globo Rural* in 1994-5: "this documentary said that the land was very fertile, you could do two harvests per year, which you can't do in Bahia, and the advantage was [not having to use] fertilizers, because he was spending a lot on fertilizers in Bahia… so he decided to come and check it out". Another prominent Brazilian producer, Rogerio Cadore, tells a similar story in an interview with the blog Consultorio Económico ("Rogerio Cadore…," 2014).

The Bolivian state used various other strategies to attract Brazilian producers. In 1989, with USAID funding, a foundation called BOLINVEST (Export Development and Investment Promotion in Bolivia) was created specifically to recruit foreign investors (Carana Corporation, n.d.; Pivetta, 1995). Among those that BOLINVEST brought to Bolivia was a group of 25 producers affiliated with a cooperative named Cocamar from Maringá, Paraná, who together acquired 8,300 hectares in Bolivia in 1995 under the name Agroinga (Pivetta, 1995). Later, Agroinga itself helped other Brazilian producers to get established in the lowlands. According to a journalist from the magazine *Veja,* in 1995, Bolivia had also been sending envoys to Uruguay, where Brazilians were already cultivating about a million hectares, "with the mission of captivating Brazilian producers with offers of cheap and fertile land" (Klintowitz, 1995, p. 64). Brazilians, once in Bolivia, had some advantages over locals. One of them was easier access to agricultural credit: because Bolivian banks valued the farmers' land assets in Brazil highly as collateral and trusted their know-how in soybean farming, they were considered safer borrowers than Bolivians. Brazilian farmers' production model of developing large estates in remote locations, bringing their own machinery and building private roads, also gave them a competitive edge in the early frontier.

As a result, the number of Brazilian producers in Bolivia rose sharply. The newspaper *Folha de São Paulo* announced in 1991 that almost 300 Brazilian businesses had started investing in Bolivia in the previous year, most of them in agriculture ("Capital brasileiro…," 1991). In the (Southern Hemisphere) summer of 1992-1993, ANAPO, the Bolivian soybean growers' association, reported that Brazilians were cultivating 2,500 hectares of soy and that this area was

in “constant increase” (ANAPO, 1993, p. 4). By 1997-8, Brazilians cultivated 175,000 hectares of soy in Santa Cruz province, or 35% of the total cultivated area (ANAPO, 1998a).

Interviewees explained that initial pioneers were often from Paraná and São Paulo states, though many of them came through Mato Grosso and Mato Grosso do Sul. Most were small- and medium-scale soy farmers who came to Bolivia as “adventurers,” with limited capital, and relying heavily on cheap credit. A few, though, were large, capitalized producers who used Bolivia as a place to diversify their investment portfolio. One prominent example is that of Sérgio Marchett, a producer from Rondonópolis in Mato Grosso and the CEO of Grupo Mônica, a major Brazilian agribusiness. In 1991, Marchett started acquiring land in Bolivia under the company “Cereales del Este,” and in 1992 he entered other parts of the soy supply chain with a local subsidiary of Grupo Mônica (Fides, 1998; Urioste, 2013). He was said to own 10,000 hectares in the Lowlands by 1996, and over 70,000 hectares by 2013 (“Lavoura de soja...,” 1996; GRAIN, 2016, and interviews). Though less numerous, due to their size, such large producers had an important impact on frontier development.

In 1997-8, at the peak of Brazilian influx, El Niño hit Bolivia, shifting precipitation patterns throughout Santa Cruz province, with some areas receiving more rainfall than usual, and others, less. The eastern part of the province, where almost all Brazilians were established, suffered severe drought, causing massive harvest losses (ANAPO, 1998a). Drought conditions continued into the summer of 1998-99 (ANAPO, 1998b, 1999a), and the climate remained unfavorable through the early 2000s (ANAPO, 2001, 2000a, 2000b, 1999b). Meanwhile, the global financial crisis caused soy prices to drop by 22% between 1997 and 1998 – producer prices would not

return to their 1997 levels for another 10 years (FAOSTAT). Most Brazilian producers, having borrowed large sums of money to finance their Bolivian adventure, suddenly found themselves unable to pay back. Creditors started seizing assets, and many Brazilians ended up fleeing Bolivia without honoring their debts. Interviewees agreed that the vast majority of Brazilian producers left the country at that time and had their land seized by creditors, be it banks or agribusiness companies. This led to an over-supply of land that would play an important role in the establishment of Argentine producers in the 2000s.

The Brazilian producers who did withstand the crisis were those who had financial backing from Brazil, either in the form of land they could sell, or from other businesses. One of them recalled: "we didn't have as much debt, and bit by bit we went increasing the area … Of course, we also brought a bit of money from Brazil, because otherwise we couldn't have endured [the crisis]. We had other fields in Brazil". Those who stayed earned the respect of the banks, having honored their debts and demonstrated their resilience, so that when banks tried to sell the land they had seized, they looked to these producers, leading to a strong land consolidation process. During that time, many Brazilians expanded northwards to the "Northern integrated zone" (Figure 5), an area with greater (sometimes overabundant) rainfall, while the drier areas of the lowlands were abandoned. This meant that while the number of Brazilians dropped steeply and suddenly, the total area managed by Brazilians decreased only slightly over this period.

Interviewees who were present after the crisis explained that although a few more Brazilian producers arrived in the early 2000s, these were isolated cases, and by the mid-2000s there were

no more arrivals from Brazil. In the early 2010s, according to an Argentine land broker, many of the early Brazilian investors were trying to sell their land, mostly to Argentines, and return home.

4.1.2. Brazilians in the Paraguayan Chaco

The Paraguayan Chaco, a sparsely populated region with little state presence, has long been a haven for speculative investments. Over the second half of the 20th century, it experienced several waves of land acquisitions by foreigners – Germans, Italians, Swiss, and others – that only rarely led to actual frontier development (Vázquez, 2013; le Polain de Waroux et al., 2018). Brazilians, however, were largely absent from the Chaco even as the *brasiguaios* expanded into the Atlantic frontier (Richards, 2011). When they finally did come, they were a very different crowd from both earlier speculators and the *brasiguaios*. Brazilian investors in the Chaco were, without exception, very large-scale, highly capitalized ranchers, with the capacity (and intention) to clear land on a massive scale.

The arrival of Brazilian ranchers in the Paraguayan Chaco coincides with the start of Juan Carlos Wasmosy's term as the president of Paraguay in 1993. Wasmosy was a respected cattle breeder both in Paraguay and in Mato Grosso do Sul (MS), Brazil, and his company Goya Agropecuária bred *nelore* cattle on properties in Bela Vista (MS) and in the department of Amambay in Paraguay ("Revistanelore: Goya," n.d.). While he may have handed over some land to Brazilian friends and associates (such as JBS meatpacker's former CEO Ricado Saúd (Landim, 2017; "Negocios…," 2017)), and greased the wheels of the Institute of Rural Wellbeing (IBR), the administration in charge of the distribution of public land to (small) farmers, interviewees agreed that the main effect of Wasmosy's presidency was to give Brazilian investors confidence in the

direction the country was taking. “I remember reading in the news that Wasmosy was going to build roads, that he was going to promote [agriculture]…” said one rancher. “He was friendly to Brazil,” said another, “he helped us overcome the fear of investing in Paraguay.” His arrival to power was an enabler that made a connection possible between Brazilian capital and the almost-free land of the Paraguayan Chaco.

Brazilian ranchers expanded into the Chaco from an area inland from the port of Bahia Negra, and from the area across the Paraguay River from the Brazilian town of Porto Murtinho – I refer to both as the Chaco-Pantanal frontier (Figure 6). Interviewees noted that the first Brazilian pioneer in the Bahia Negra hinterland was a rancher from Maringá (Paraná) who arrived in 1994 and whose holdings grew to over 80,000 hectares in just a few years. He was followed by a number of other producers, a couple of whom had owned land in Eastern Paraguay before. In the Porto Murtinho area, the pioneers were ranchers from Mato Grosso do Sul, one of whom, Nelson Cintra, later became mayor of Porto Murtinho (Romero, 2012). These were followed by a group of large investors from São Paulo state, and by the late 1990s this dozen or so Brazilian companies owned over 300,000 hectares of land in the area.

These pioneers, with a couple of exceptions, were members of a well-connected ranching elite from Mato Grosso do Sul, São Paulo, and Paraná states, around the towns of Campo Grande, Presidente Prudente, Araçatuba, and Maringá. Social cohesion and proximity to Brazil facilitated their establishment in Paraguay. “We invested together to improve or create roads and bring electricity,” recalled a rancher from São Paulo. Interviewees explained that these ranchers almost never relocated entirely to Paraguay: they kept ranches in Brazil and managed their Paraguayan

properties remotely, flying over the border in private planes directly to their farms. In the 1990s most also brought agricultural inputs and machinery directly from Brazil and smuggled animals back over the border to be sold on the Brazilian market. They soon discovered, however, the advantage of working with the Mennonite colonies in the central Chaco, and in the 2000s, Mennonites started providing them with know-how, infrastructure, and services, as well as with calves for fattening (Vázquez, 2013, p. 159).

The peak influx of Brazilian capital in the Chaco occurred in the early 2000s. By 2005, it was causing growing concerns over sovereignty, and Paraguay passed a law prohibiting further land acquisitions within 50km of its borders by investors from neighboring countries (Law 2532-05). This slowed down Brazilian investments in the Chaco-Pantanal frontier while encouraging incoming Brazilian investors to expand into other parts of the Paraguayan Chaco, notably in the Semiarid Chaco frontier, northwest of the Mennonite colonies (Figure 6). One of them, Tranquilo Favero, a producer from Paraná who moved in 1968 to Eastern Paraguay, started acquiring land in the Semiarid Chaco in 2005 ("Quién es…," 2008). By 2012, his land holdings in the Chaco alone, were estimated to be 250,000 hectares (Romero, 2012). Contrary to the Chaco-Pantanal frontier, Brazilians in the Semiarid Chaco were predominantly ranchers who, like Favero, had already owned land in Eastern Paraguay. Although there were no official numbers, in 2014, informants estimated that Brazilians owned about 2 million hectares in the entire Paraguayan Chaco.

448 4.2. Argentine producers expand northwards

449 The expansion of Argentine agricultural producers northwards, from the pampas to the Gran
450 Chaco of Argentina and then to Bolivia and Paraguay, was primarily the result of a soybean
451 boom in the 1990s and 2000s (Zak et al., 2008; Gasparri et al., 2013; Hoyos et al., 2013). In the
452 1990s, the boom was driven chiefly by the adoption of new technologies such as genetically
453 modified soy, no-till cropping (Qaim and Traxler, 2005) and silo bags (Goldfarb and van der
454 Haar, 2015), as well as by rising soy prices. In the early 2000s, currency devaluation after the
455 economic crisis lowered production costs (in pesos) relative to export prices (in dollars), which
456 increased profits from soy exports (Gasparri and Grau, 2009; Cáceres, 2015). This endowed
457 farmers from the core soy-producing areas of the humid pampas with capital that many, having
458 lost faith in banks, chose to reinvest in land at the forest frontier (Viglizzo et al., 2011). As in
459 Brazil, most of that territorial expansion occurred within the country: producers from the
460 provinces of Córdoba, Buenos Aires, and Santa Fe were responsible for most agricultural
461 expansion in the Argentine Chaco (Valenzuela, 2005; le Polain de Waroux et al., 2018). Starting
462 in the 2000s, however, concern over economic instability and, especially, increasing export taxes
463 compounded by rising land prices, increasing land scarcity, and new deforestation regulations,
464 led a growing number of Argentine producers to contemplate investing abroad (le Polain de
465 Waroux et al., 2016). Soy producers started crossing borders into Uruguay, Paraguay, and
466 Bolivia, and, in some cases, Brazil and other South American countries (Gasparri and le Polain
467 de Waroux, 2014). This phenomenon culminated after the 2008 “crisis del campo,” which placed
468 the government in opposition to the agricultural sector over an increase in export taxes for
469 agricultural products (Hora, 2010).

470

4.2.1. Argentines in the Bolivian lowlands

Contrary to Brazilians, Argentines were not keen to buy Bolivian land in the 1990s. In fact, only a handful did so, albeit with a large impact in terms of total area. The first Argentine to acquire land in the Bolivian lowlands was an investor of Irish ancestry from Buenos Aires province, Patricio Deane, a distant relative of prominent U.S. real estate investor Disque Deane (Bagli, 2010; "Bolivia," 2004). In 1994, wary of economic uncertainty in Argentina, and perhaps inspired by the experience of Brazilian farmers, Deane started buying property in Bolivia in association with his American relative, who provided the necessary financial capital. The company started modestly, but as Brazilians went bankrupt in the late 1990s, it expanded aggressively, using North American capital to acquire some of the best land Brazilian farmers left behind. By the early 2000s, the group was said to own over 25,000 hectares in the lowlands ("Bolivia cosecha inversiones," 2004). A couple of other Argentines from Córdoba, one of them the owner of a prominent seed production company, also invested in Bolivian land in the late 1990s ("Bolivia cosecha inversiones," 2004, "Una empresa…," 2004).

While it would be a few years until Argentines came in greater numbers, these pioneers set a precedent. One producer, referring to Deane, commented that "he was an example, in the sense that people learned that he had come here, and they were coming regularly to see him, [asking] where he had bought [land]." Visitors often ended up buying land themselves. An early investor, Gerardo Pizzi, explained in 2004 to the Argentine newspaper *La Nación* that after he had started producing in 1999, he "thought it a good idea to invite [his] long-time friend, Jaime McLean, of the company El Tejar" to Bolivia ("Bolivia cosecha inversiones," 2004: online). By 2004, El Tejar, one of the largest agricultural producers in Argentina, reportedly managed 5,500 hectares

in the lowlands ("Sojeros argentinos…," 2004). Other large-scale producers followed: CRESUD, a company with a strongly speculative model, and two other large family companies from Buenos Aires and Salta, acquired a total of about 45,000 hectares in the lowlands in 2007 and 2008 ("CRESUD," n.d. and interviews).

To Argentine producers of the early 2000s, Bolivia offered some of the same advantages Brazilians had encountered in the previous decade – cheap land, low taxes, a comparatively stable economy – with two major differences: the widespread availability of credit had disappeared, and Brazilians had left enormous amounts of agricultural land in the hands of banks and agribusiness companies, who were trying to sell it back, often at extremely low prices. Most of that land was in the drier parts of the lowlands, which Brazilians had come to fear but Argentines were comfortable with, many of them having worked in the Argentine Chaco prior to Bolivia. As they expanded, Argentine producers found they could also count on relatively good infrastructure. "Roads in the area are not a problem," explained a reporter in the newspaper *Clarín* in 2004. "That is because their powerful Brazilian *sojero* colleagues have already debarked in the area and formed consortia to realize these key investments" ("Sojeros argentinos…," 2004). This was important for the Argentine production model, which relied more on infrastructure and services than the Brazilian model.

This series of large-scale land acquisitions increased the visibility of the Bolivian lowlands for Argentines across the board and encouraged medium-scale farmers struggling with shrinking profit margins in the late 2000s to consider investing in Bolivia. Large-scale producers had also brought with them a number of service providers from Argentina (many of whom also ended up

buying land), making it possible for smaller farmers to rely on others for services like fumigation and harvesting. Interviewees explained that these new producers came from Salta, Buenos Aires, Santa Fe, and Córdoba provinces, mostly through other Argentines established in Bolivia. Contrary to their predecessors, their motivation was not to reinvest large windfall profits from the soy boom, but rather, to use Bolivia as a last resort to stay afloat. One farmer from Buenos Aires told me in 2014 that he had just started renting some land in Bolivia and was looking to buy one thousand hectares within the next year. "Since 2008," he said, "with the export taxes and all that, things got complicated. We had the idea of going to the North [of Argentina] to cultivate soy, but the numbers were thin, because costs were very high… So, I came in August with my brother, to see more or less what things were like."

Informants concurred that this was when most Argentine producers came to the Bolivian lowlands. ANAPO reported in 2009 that 70,400 hectares of soy were being cultivated by Argentines, or about 10% of the total area. In 2013, informants estimated that about 15% of the total cultivated area was under Argentine management. By the end of 2014, however, amidst rising land prices in Bolivia and increasing restrictions on dollar purchases in Argentina (Politi, 2012; Reuters, 2012), the influx was starting to slow.

4.2.2. Argentines in the Paraguayan Chaco

It was a mostly speculative model based on land appreciation that drove Argentines to the cheap lands of the Paraguayan Chaco in the late 2000s. The first investor, CRESUD, had originally been looking for land in Eastern Paraguay, but came upon an opportunity to develop land in the Chaco through contacts with Carlos Casado S.A., another Argentine company. Founded in 1883

by a Spanish Argentine businessman, Carlos Casado S.A. was historically one of the largest landowners in Paraguay, with a maximum extent of 5,625,000 hectares, or almost one fourth of the Chaco, at the end of the 19th century. By the late 20th century most of that land had been sold, among others to Mennonite colonies, but the company still possessed significant amounts (Kleinpenning, 2009, pp. 703–712). CRESUD and Carlos Casado S.A. formed a joint venture, CRESCA, that started operating in 2008 on 42,000 hectares in the Semiarid Chaco, with an option to buy another adjacent property of 100,000 ha. In 2013, CRESCA sold a part of these 100,000 hectares to BrasilAgro, a company created by CRESUD in 2006 to replicate its model in Brazil (Carlos Casado S.A., 2013). CRESCA's operations followed CRESUD's general "farmland development" strategy of transforming "any non-productive land that they acquire into farmland fit for beef cattle and then to transform it into agricultural land… thus generating further appreciation ("CRESUD," n.d.).

It would be a few years until other Argentine companies invested in the Chaco. In 2012, a company from Córdoba that had also looked for land in Eastern Paraguay but been unconvinced by the high land prices and the insecurity linked to guerilla activity, bought 20,000 hectares of land in the Chaco-Pantanal area. The company intended to cultivate crops in this cattle ranching area, inspired by a local Mennonite farmer who had been successful in his experiments with soy production, raising expectations and land prices. By the mid-2010s a few more Argentine companies were buying land in that area, almost all with a similarly speculative outlook based on land appreciation rather than production. One of them, LatAm Farms, an Argentine company registered in Canada that acquired 8,000 hectares in 2016, claimed to generate profits for investors "by turning unproductive land into high-quality grassland suitable for cattle raising in

one of the most competitive beef exporting countries in the world" (LatAm Farms, 2016). In spite of this, as of 2014, it was not clear that the Argentine "cohort" would ever take off in Paraguay the way it had in Bolivia. Uruguayans, meanwhile, had been expanding massively.

4.3. Spilling over: Uruguayans in the Paraguayan Chaco

In the mid-2000s, a conjunction of factors prompted Uruguayan producers to start looking for land abroad. In 2007, as part of a tax reform, Uruguay increased the tax burden for limited companies and farms above 1,500 hectares (de León, 2007; Oyhantçabal and Narbondo, 2011; Vassallo, 2013). Simultaneously, Argentines fleeing increasing taxes on soy exports at home started buying large quantities of land for soy cultivation (Piñeiro, 2012; Redo et al., 2012). By 2011, they owned 92,000 hectares of Uruguayan land (*Censo General Agropecuario 2011*, 2011). Partly as a result, land prices quadrupled between 2005 and 2011 (MGAP, 2016) endowing Uruguayans sellers with large amounts of cash to reinvest elsewhere. Many did so in the Paraguayan Chaco, where land in 2011 was still one tenth of the cost of, and more productive than, Uruguayan land (Artagaveytia, 2011, p. 110; Figure 7).

Although the bulk of Uruguayans came in the late 2000s, their history in the Paraguayan Chaco starts in 1994, when a businessman from Uruguay, Martín Bordaberry, convinced a group of a dozen Uruguayan investors to join him in acquiring a total of 60,000 hectares of land in the Chaco-Pantanal frontier (Figure 6). Bordaberry had already been trading cattle with Paraguay and Brazil for several years and, like his Brazilian counterparts, he must have been keen to seize the opportunities offered by the arrival in power of Wasmosy. The group's original intention was to develop a large cattle breeding operation catering to São Paulo's consumers. However, due to

lack of funding, absent infrastructure, and the closure of the Brazilian border to cattle trade following a foot-and-mouth disease outbreak, this project never came to fruition, and the land remained untouched until the end of the 1990s (Artagaveytia, 2011, pp. 115–120). In 1999, one of Bordaberry's associates, Rodrigo Artagaveytia, set out to find capital to revive the project, and after contacting prominent Uruguayan businessmen, he was able find financial support for the project, and moved to Paraguay to start operations (Artagaveytia, 2011, pp. 124–125).

Artagaveytia soon became a major promoter of the "Chaco dream," as one interviewee put it, along with Victor Galeano Perrone, a former Paraguayan senator who lived in political exile in Uruguay in the early 2000s and brought many Uruguayans to the Chaco, where he owned land himself (Lezcano F., 2018). To Uruguayans seeking new investment outlets, Artagaveytia offered an all-inclusive package of real estate brokerage-cum-property management that allowed them to reap high profits while staying home. Newcomers, at first, were all acquaintances of these first pioneers. Around 2008, however, conditions in Uruguay led to the arrival multiple new prospectors, and Artagaveytia's promotion strategy became more aggressive, with media interviews in Uruguay and the publication of two books showcasing testimonies from Chaco ranchers (Artagaveytia, 2011; Everdem S.A., 2012).

This strategy worked. The boom extended beyond the social circles of the first pioneers, and new land brokers appeared to cater to Uruguayan investors. By the early 2010s, Uruguayans were said to own 1.5-2 million hectares (Cotelo, 2013; El Observador, 2013; González, 2013). Most of these investors, like Argentines, followed a speculative model, betting on the appreciation of Chaco land. Some, but not all, were ranchers in Uruguay, and also like Argentines, some

functioned with their own capital while others provided platforms for foreign investment funds. Uruguayans supervised their estates remotely through local property managers, often Mennonites. According to one such manager, "for many investors, that's a determining factor: if you don't provide the services, they don't come, because they look for a trusted person, a reference."

5. The formation of transnational producer cohorts

Having exposed the historical development of cohorts of Brazilian, Argentine, and Uruguayan producers in Bolivia and Paraguay, I now return to the conceptual framework proposed at the onset and use these cases to illustrate the role of rent differentials, frictions, common characteristics, and networks and herd effects in the formation of transnational producer cohorts.

5.1. Rent differentials, frictions, and common characteristics

> *"In 2004, it was the soy boom, and really there was a surplus of money… you could buy a small plot of 20 hectares in Córdoba, or you could buy 2,000 hectares in Bolivia – those were the numbers."*
>
> Argentine producer in Bolivia (Interview, 16 September 2014)

These stories make it clear that the explanation for cohort formation lies at least partly in the exploitation of *rent differentials* between places of origin and destination, made possible by characteristics that some groups had in common. These rent differentials emerged because of sudden changes that generated 'abnormal' rents (Barbier, 2012) in destinations, such as technological innovations or infrastructure improvements, as well as because of changes in

source regions, overwhelmingly related to the soy boom. As soy production grew in Southern Brazil, the Argentine pampas, and later Uruguay, arable land became scarcer and more expensive, depressing rents and incentivizing investments further from core agricultural areas. While most expansion took place within countries, increasing land prices and scarcity in domestic frontiers and unfavorable macroeconomic and social conditions exacerbated perceived rent differentials enough to drive some companies abroad. These "push" factors were most salient in the 1990s for Brazil and in the 2000s for Argentina and Uruguay.

Differences in rents were dampened by various sources of *friction*, the most obvious of which being perhaps that of distance. The complexities of production abroad often made it necessary for producers who were not fully relocating to open new offices in destinations, rather than managing farms from a central office – "there is no autopilot," said an Argentine producer in Bolivia. "When you have an administration that is this far," said the manager of a large Argentine company in Paraguay, referring to the company's seat in Buenos Aires, "all processes are much slower." National borders were an additional source of friction, through restrictions on mobility, money circulation, or foreign ownership of land, but also through cultural and language barriers, which some Argentines cited as a reason not to invest in Brazil. Exactly how these frictions played out, however, is hard to know. While it is possible that differences in frictions facing investors played a role, for example, in the earlier establishment of Brazilians in the Paraguayan Chaco (due to proximity and unenforced borders), it seems unlikely they were a key determinant overall.

Producers coming from the same regions shared some *common characteristics* that enabled them to capture rents in agricultural frontiers. In the early 1990s, for example, Brazilian landowners had two important things in common: access to financial capital due to land appreciation, and know-how on large-scale mechanized soy farming in remote areas. These characteristics made them ideally suited to develop agriculture in the Bolivian lowlands. In addition, they were the object of targeted information campaigns that aimed to bring Brazilian producers to Bolivia, and benefitted from preferential credit conditions. By contrast, Argentines were not targeted by these campaigns and thus were presumably less well informed about opportunities in Bolivia. Moreover, because their soy production was still based largely in the pampas, with good access to infrastructure and a more amenable climate, they were probably less inclined to develop remote forest frontiers. Uruguayans, meanwhile, had not yet experienced a strong increase in land prices.

Similarly, Brazilians moving to the Paraguayan Chaco in the mid-1990s shared certain characteristics that Argentines and Uruguayans did not. In addition to a much higher ratio of pastureland prices (Figure 7), their geographic proximity to the Paraguayan Chaco put Brazilians at an advantage in terms of access to trade networks by allowing them to integrate their Paraguayan ranches into Brazilian supply chains and manage them from Brazil. The friendly disposition of Paraguayan president Wasmosy towards Brazilians may have encouraged them to invest. Brazilians also had the means and the know-how necessary to develop road infrastructure in remote areas, a preliminary condition for doing anything in the Paraguayan Chaco. Later cohorts of Argentines and Uruguayans mostly shared an access to capital derived from the soy boom, though the Argentines' familiarity with highly intensified and technicized agriculture also

made them well-suited to the Bolivian context once other actors had cleared the space and built infrastructure.

5.2 The role of network and herd effects

> *"You arrive in Paraguay, you talk to someone, that person talks to someone else, invites them for a visit, and people start coming. That's why there are zones with Brazilians, zones with Argentines, zones with Uruguayans…"*
>
> Brazilian producer in Paraguay (interview, 27 September 2013)

These stories, and this quote, show that social dynamics shaped the formation of transnational producer cohorts. Numerous respondents said that they or someone they knew had searched for land in an area because they had an acquaintance there. This could be a family member, a friend, or even a work colleague. It was very common for producers to visit acquaintances abroad, whether with the intention of investing there or just to get the lay of the land. Conversely, pioneer producers in new frontiers invited acquaintances to visit, often in the hope that they would join them in investing in the area. Thus, for example, one Argentine producer from Salta province explained that in 2007 he had started visiting friends from Córdoba who had bought land in the Bolivian lowlands. At first, he was "a little scared," because of the lack of infrastructure in Bolivia compared to Argentina – "everything still needed to be done," he said. After multiple visits, however, he decided to make the move. In 2011, he spread the word to his friends that he was interested, and through word of mouth, he soon found 3,000 hectares of land right next to people he knew.

Interviews reveal that in the absence of publicly available information on conditions of production in new frontiers, stories of investments abroad told by friends, family, or colleagues shaped expectations of rents and encouraged newcomers to imitate pioneers, consistent with the *herd effect* (Table 1.). One Uruguayan rancher in Paraguay told me that "there was a need for 'crazies' like me and others who … spearheaded [agricultural development] so that others would say 'Look, he has been there ten years, they haven't killed him, he's doing well and producing, … it seems like it's all true what people say.'" While the choices of acquaintances seemed the most influential, some well-known producers managed to set an example that transcended their immediate social environment. An Argentine producer and land broker in Bolivia was amused to see that everyone arriving from Argentina hoped to settle near a respected family from the agricultural elite of Salta, when there was a lot of good and often cheaper land elsewhere. Media stories of pioneer farmers had an even broader impact, signaling the existence of opportunities in these new frontiers to the broader public in Argentina, Uruguay, or Brazil. For every cohort discussed, the media gave a platform to pioneers, relaying stories of untapped potential, conquest, and opportunity. Many producers I talked to remembered reading and hearing these stories and said they had been influenced by them.

Network effects encouraged and facilitated land acquisition by newcomers mostly through information and access. Acquaintances established in the new frontier provided prospective producers with information on the location of the most productive land, on local conditions of production, and on land deals. A Brazilian producer in the Paraguayan Chaco explained to me that because he knew all the Brazilians in the area and had been visiting them regularly, he knew "where it rained more, where the soil was better, everything." Farmers who had been producing

in the frontier had hands-on knowledge about which areas were good and which to avoid. Even where this information was available publicly through local agricultural associations or government institutions, people might trust the experience of their peers more: “I prefer to ask someone I know or a friend who has a field in the area than listen to what an association says – I’m not saying it’s bad, but I don’t like to rely on that kind of criteria,” said the local manager of an Argentine agricultural company that acquired over 20,000 hectares in Bolivia in the late 2000s.

Knowing someone in a frontier region could help producers gain access to land or to other factors of production. Some got better deals on land because they knew those selling it. During the Bolivian crisis of the late 1990s, for example, Brazilians bought properties for cheaper from acquaintances who were trying to leave the country. Acquaintances could also facilitate legal access to land: some Argentines formed ventures with friends who had legal resident status in Bolivia in order to circumvent restrictions on foreign ownership of land. Additionally, joining other producers and investing as a group allowed some medium-sized producers to access economies of scale. Producers from Uruguay, for example, formed consortia that enabled them to mobilize sufficient funds to buy large properties in Paraguay, which they then had local administrators manage. Similarly, a consortium of Argentine producers who had been involved together as a CREA group in Córdoba (https://www.crea.org.ar/; also see Gras and Hernández, 2016) bought land together in Bolivia, which allowed them to access a property of close to 10,000 ha.

The role of network effects in shaping producer agency in a way that would favor the formation of producer cohorts was less clear in the interviews. Producers with the right political connections in destinations could get away with illegal deforestation with minimal or no fines. They could also influence policies in their favor, as happened with the blocking of a zero-deforestation law in the Paraguayan Chaco (le Polain de Waroux et al., 2018, 2017), or the weakening of the Forest Law in Argentina (Seghezzo et al., 2011). These effects, however, mostly played out after producers had established in a new frontier, rather than involving pre-existing relationships. As such, they fall outside the scope of the network effect as defined here, though they may have played a role in shaping expectations of rents for newcomers.

Finally, the influence of network effects on or through producer preferences, though a theoretical possibility, hardly came up in the interviews, the only cases being people who said that they preferred to buy land close to their friends (or in one case, *far away* from their family). Although producers regularly mentioned a desire to invest close to their acquaintances, most of the time this desire seemed motivated by information or economies of scale rather than by a preference for keeping friends or family nearby.

6. Conclusion

The rise of large-scale, internationally mobile agricultural producers as central actors in today's commodity frontiers challenges explanations centered on structural dimensions alone and calls for a better representation of the agency and decision-making of these actors. In this paper, I have documented the existence of "cohorts" of producers moving across national borders and

772 argued that these movements are better understood when taking into account the characteristics
773 and social networks of these producers. In particular, I showed that producers from a region
774 often shared characteristics that enabled them to capture rents in destination regions, most
775 commonly a greater availability of financial capital compared to local producers, but also
776 preferential access to land and credit, know-how, and information. Additionally, the formation of
777 transnational producer cohorts was encouraged by herd and network effects, particularly in terms
778 of information about land characteristics and opportunities, and access to land and other factors
779 of production.
780
781 The role of network and herd effects in the emergence of these producer cohorts can be thought
782 of as a catalyst. While larger forces – differences in land prices, in macroeconomic conditions,
783 and in land scarcity – are the ultimate drivers of these movements, in order for them to happen,
784 connections have to be made between distant places, and people have to make decisions
785 involving their own preferences, judgement, and information. In other words, even though
786 structural factors are what determine the flow, its composition – who moves, and when – is
787 shaped by the characteristics of actors and the relationships between them. In a previous paper, le
788 Polain de Waroux et al. (2018) emphasized the fact that the diversity of actors creates frictions
789 that influence the rate of frontier development. Here, I go further by highlighting how
790 relationships between these actors introduce contingency and path dependency in frontier
791 development through their influence on the social composition of the early frontier, which then
792 affects its later development.
793

There are, of course, many things that this framework does not explain. In describing transnational land investments largely as a result of rational actors attempting to capture surplus rents, the framework turns a blind eye to some of the complexities of land-use decision-making. Much more could be said about the role in land investment decisions of such things as identities and social status (Hoelle, 2012), dreams and conjured visions (Tsing, 2005, p. 62), or fictional expectations and their strategic manipulation (Beckert, 2013). Yet despite its limitations, I believe that this framework holds some explanatory power when it comes to understanding the development of early commodity frontiers. In particular, I think this discussion conveys three points. First, cross-border movements of agricultural producers often do not occur in isolation, but rather, form somewhat coherent waves, which I here call producer cohorts. Second, these movements are best explained by a mix of structural and agent-level factors. Third, the decisions of large-scale commodity producers are influenced by social dynamics – more so than is commonly acknowledged in the literature on agricultural frontiers and land grabbing.

As I was conducting my interviews, many producers were talking about Africa. Some had been to Mozambique, Angola, or South Africa, and others knew someone who had. The stories told about Paraguay or Bolivia some years before were being repeated with slight variations for these countries. People talked about the successes of some, the failures of others. They were watching closely.

Appendices

Appendix A: Land price data

Land price data for figure 7 was obtained from various sources. For Bolivia and Paraguay, land prices were compiled from interviews with producers and other informants. In addition, for Bolivia, I also compiled classifieds for agricultural properties in the newspaper *El Deber* from 2000 to 2010. For Argentina, I used data published in the magazine Márgenes Agropecuarios (https://www.margenes.com/) on historical land prices in the pampa region for cropland ("zona maicera") and pastureland ("zona cría"). For Brazil, I used data on cropland and pastureland prices from the Fundación Getulio Vargas for the states of Paraná, São Paulo and Mato Grosso do Sul (http://portalibre.fgv.br/). I averaged the values for the three states; due to missing values for the state of Mato Grosso do Sul after 2005, and of São Paulo after 2008, the prices may constitute an overestimate, since prices were generally about 50% lower for Mato Grosso do Sul than for the other two states. Data for Uruguay comes from the Ministerio de Ganadería, Agricultura y Pesca (MGAP). For pastureland prices, I took the average of land prices for departments that have a majority of pastures (Artigas, Cerro Largo, Lavalleja, Paisandú, Rivera, Rocha, Salto, Tacuarembó, Treinta y Tres) and for cropland prices, the average of land prices for departments where crops dominate (Colonia, Durazno, Flores, Florida, Río Negro, San José, Soriano). Given the large uncertainties on land price data, these numbers are only meant to provide an estimate of the magnitude of the price difference between source and destination, not to provide precise estimates of the prices themselves. Due to the extreme differences in prices between source and destination, these uncertainties do not affect the conclusions made.

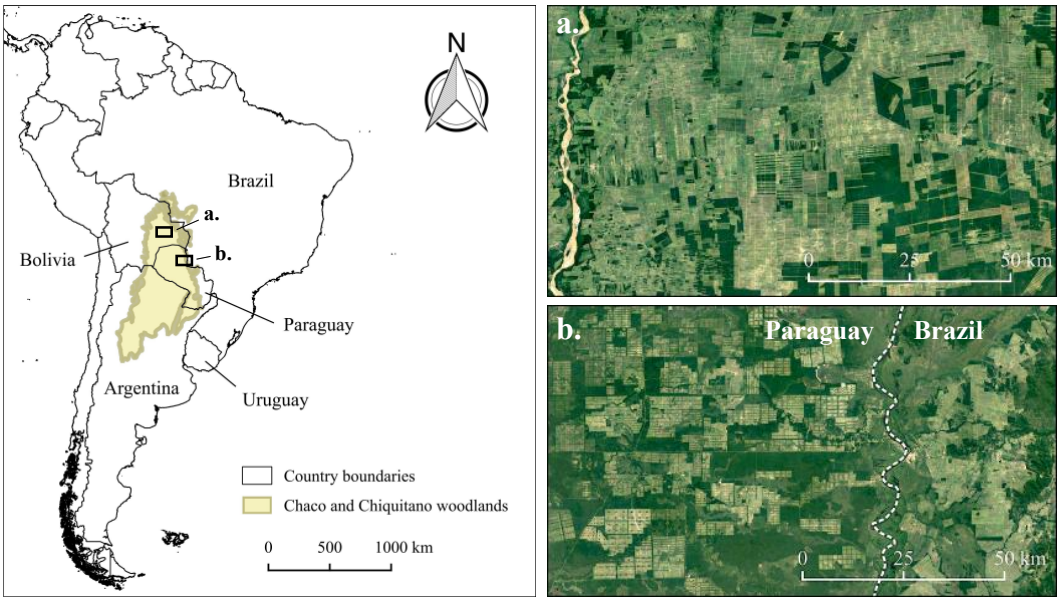


Figure 1 [2 columns]: The Chaco and Chiquitano woodlands. Brazilian, and later, Argentine producers were major agents in the expansion of agriculture in the Bolivian Lowlands (a.). In the Paraguayan Chaco (b.), the area west of the Paraguay river which forms the border with Brazil (dotted line) was developed primarily by large-scale Brazilian ranchers in the mid-1990s to mid-2000s; Uruguayans followed in the late 2000s. Both satellite images are from Google Earth.

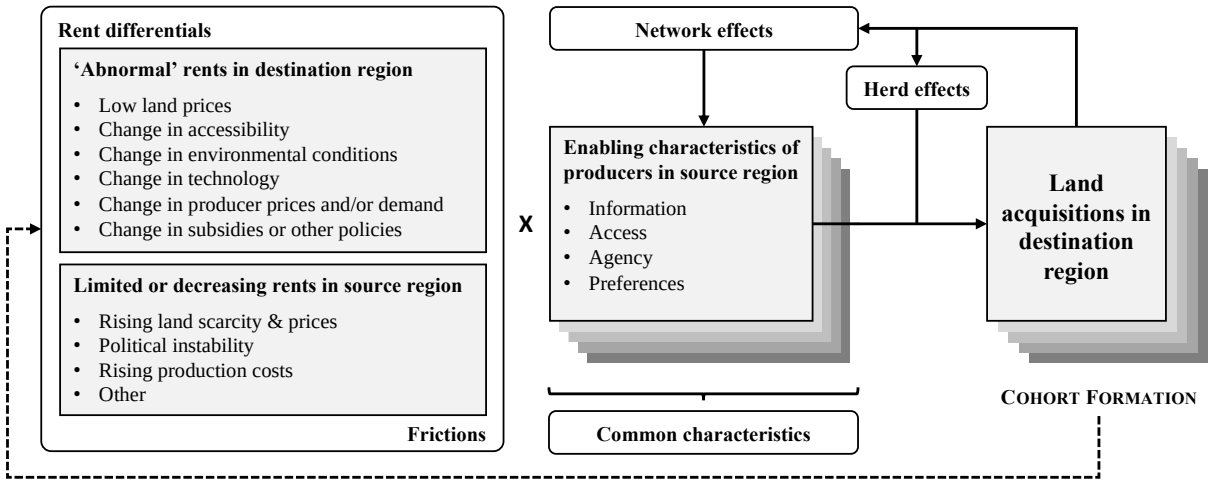


Figure 2 [2 columns]: Conceptual framework of transnational producer cohort formation in commodity frontiers (adapted from le Polain de Waroux et al (2018, p. 3)).

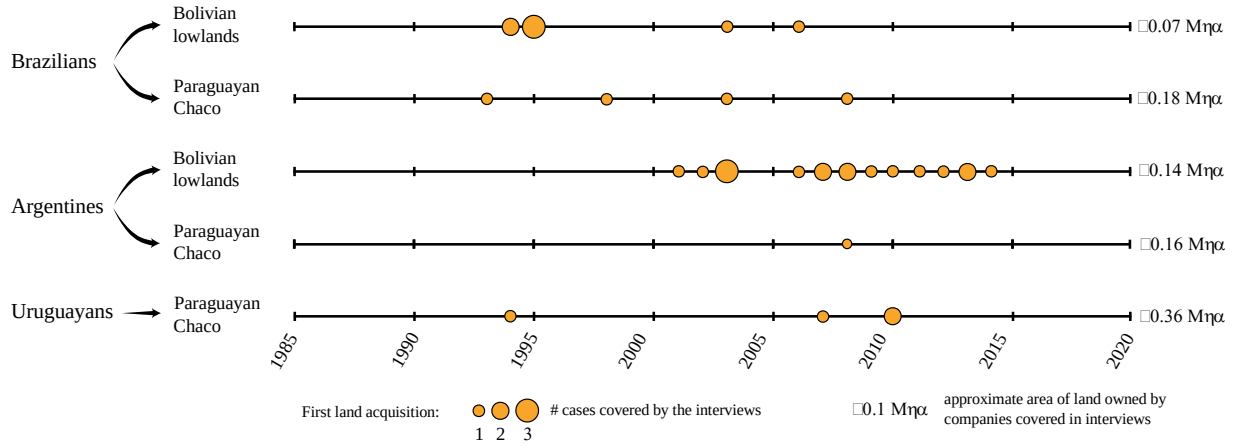


Figure 3 [2 columns]: Producers interviewed in each cohort considered in this paper, presented by date of first investment in land in the frontier.

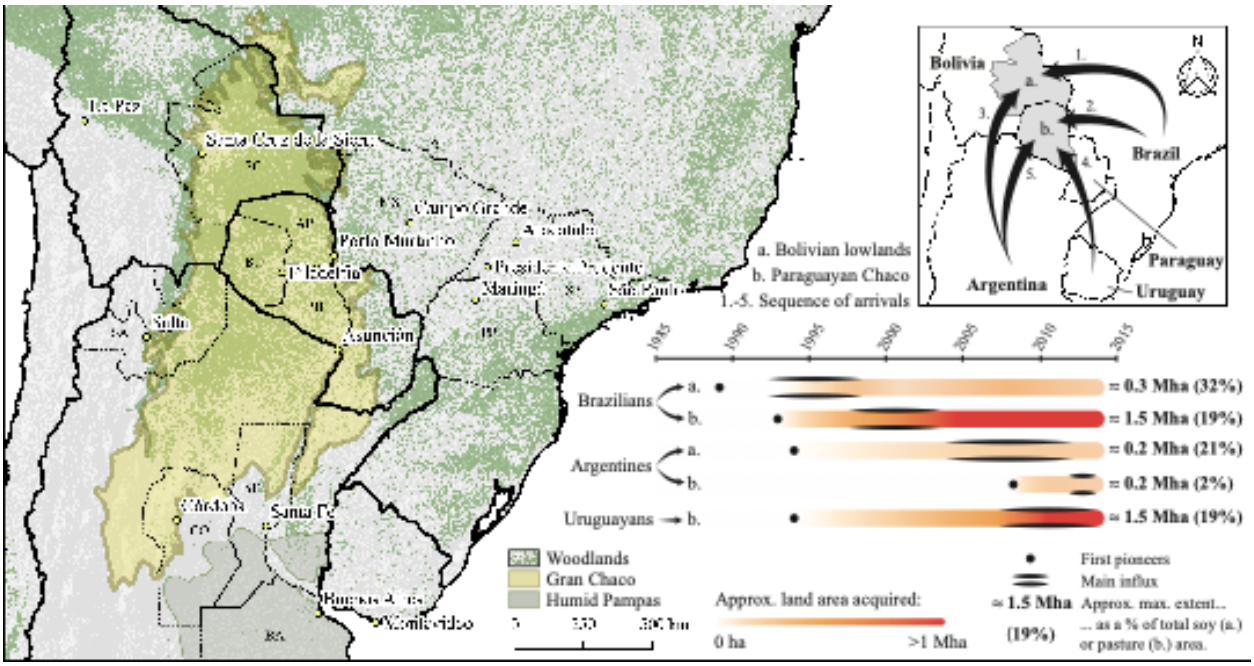


Figure 4 [2 columns]: Map of the study area with main place names and chronology of transnational producer cohorts. Statistics on total area under soy (2014) & pastures (2012) come from (ANAPO, 2014) and (Baumann et al., 2017), respectively. AP = Alto Paraguay, BA = Buenos Aires, BO = Boquerón, CO = Córdoba, MS = Mato Grosso do Sul, PH = Presidente Hayes, PR = Paraná, SA = Salta, SC = Santa Cruz, SF = Santa Fe, SP = São Paulo.

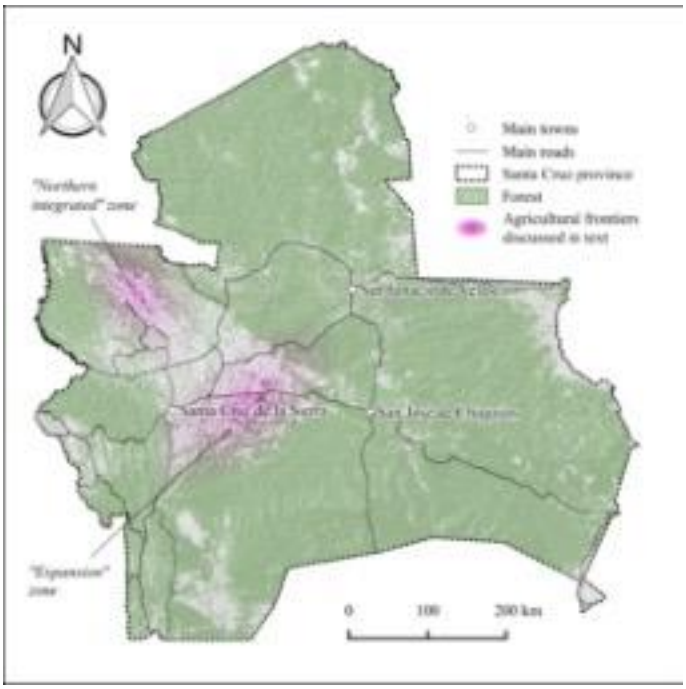


Figure 5 [1.5 columns]: The Bolivian lowlands. The phrases "Expansion zone" and "Northern integrated zone" are commonly used to refer to two distinct areas of expansion of industrial agriculture in Santa Cruz province (See for example Killeen et al., 2008; Pacheco, 2006; McKay and Colque, 2015).

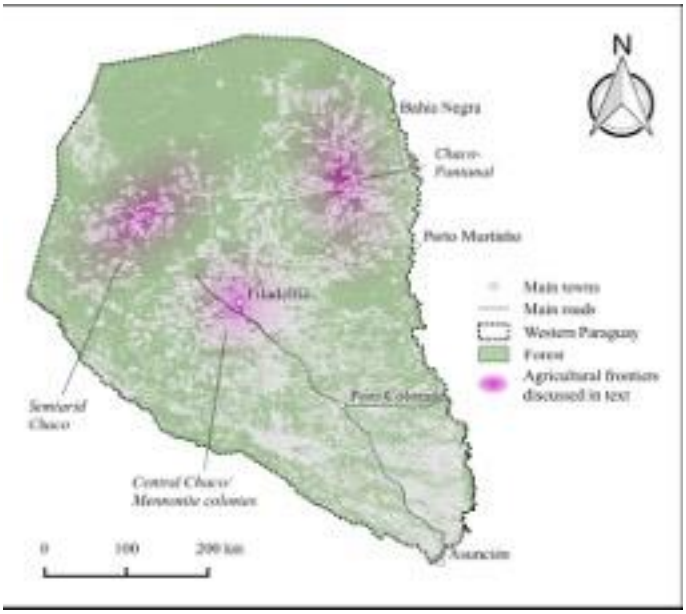
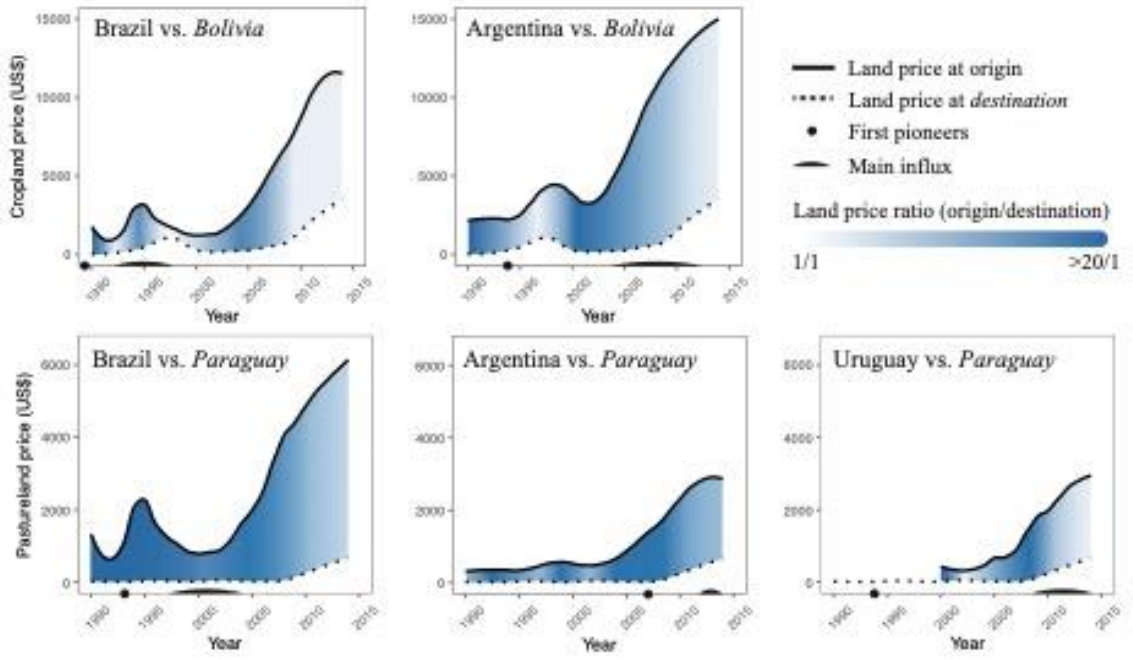


Figure 6 [1.5 columns]: the Paraguayan Chaco.



871

872 **Figure 7 [2 columns]:** Differences in land prices give an idea of the magnitude of rent
873 differentials between origins and destinations of cohorts. Even where there are large differences
874 in production costs and yields, land price ratios of 20 or more suggest the existence of important
875 rent differentials. Information on data sources is available in Appendix A.
876
877

Herd effects	
Expectations of rent are shaped by the experiences of acquaintances, of well-known producers, or by media stories of successful producers	
Network effects	
Information	Acquaintances provide information on location of best land, on local conditions of production, on land deals and opportunities
Access	Producers get access to better land deals because they know the sellers; Producers get preferential access to land because of their political connections in the destination; Producers associate with acquaintances to generate economies of scale and access land at the frontier
Agency	Producers with political connections in destination get away with illegal activities or modify rules to their advantage
Preferences	Producers prefer to invest in areas where acquaintances are established

878
879 **Table 1:** Summary of the influence of network and herd effects relevant to cohort formation.
880

881

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ANAPO, 1999a. Informe de campaña: Soya, verano 1998/1999.

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