Property Rights to Land and Agricultural Organization: An Argentina–United States Comparison

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Abstract

The contributions of Harold Demsetz offer key insights on how property rights and transaction costs shape economic organization. These guide our comparison of agricultural organization in the early 20th century in two comparable regions, the Argentine Pampas and the US Midwest. In the United States, land was distributed in small parcels and actively traded. In the Pampas, land was distributed in large plots, and trade was limited because land was a social and political asset, as well as a commercial one. We analyze why the absence of trade led to persistently larger farms, specialization in ranching, and peculiar tenancy contracts in Argentina relative to the United States. Our empirical analysis, based on county-level data for both regions, shows that geoclimatic factors cannot explain the observed differences in agricultural organization. We discuss implications for long-term economic development in Argentina.

1. Introduction

In a classic study, Demsetz (1967) outlines a theory of property rights as economic institutions, illustrating key points with examples about agricultural organization. He argues that when land is traded smoothly, markets respond to information about expected profits, which results in modifications in scale, output mix, and other aspects of economic organization. Initial property rights al-

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locations and production structures do not matter. In addition, he argues that if the property rights regime limits the market responses of producers to profit opportunities, this could lead them to make other changes in institutional arrangements. In this paper, we build on Demsetz's ideas to examine the persistent differences of farm structures in the Argentine Pampas and a comparable region in the US Midwest in the early 20th century.

These two regions had similar geoclimatic characteristics and produced commodities for the same international grain and livestock markets. Yet their agricultural organization was historically very different: in the Pampas, farms were larger, specialized more in cattle than cereals, and relied more on short-term cash tenancy. Prior research argues that Argentina's concentrated landownership is one of the causes of the country's poor economic performance despite its favorable prospects at the beginning of the 20th century (for example, Scobie 1964; Solberg 1987; Adelman 1994; Amaral 1998). This paper considers the origins, persistence, and impact of land concentration in Argentina relative to the United States, drawing connections with distinctive features of its agricultural organization.

We argue that large landowners in the Argentine Pampas, whose property rights granted social and political status, behaved differently than small landowners in similar parts of the US Midwest, whose property rights primarily provided commercial benefits. Because landownership in Argentina conveyed additional benefits beyond production and the capital gains of sale, breaking up and selling their land implied a loss in status, which ultimately made market-generated changes less frequent and less extensive (see Demsetz 1964, pp. 13–15). Consistent with the emphasis of Demsetz (1967, p. 347) on the role of "laws, customs, and mores of a society" in the functioning of property rights regimes, the bundling of property rights to economic and noneconomic attributes of land in Argentina is key to understanding the different agricultural organization of the Pampas with respect to otherwise comparable areas of the United States.

A property rights regime that limits how producers can respond to new profit opportunities creates incentives to change or resort to different institutional arrangements. We discuss this thesis of property rights adjustment, advanced by Demsetz (1967, p. 350), and describe how it applies to the cases we study. We suggest that adjustment takes place in the United States and, with important constraints, also in Argentina. In the United States, rights modifications from colonial times onward were made to make land more easily distributed to small claimants, smoothly transacted, and a basis for collateral (Gates 1979; Kanazawa 1996; Libecap and Lueck 2011; Priest 2021). These patterns are not observed in Argentina, where the landed elite opposed land policies like the US Homestead Acts, and political institutions did not support land markets. In the Argentine context, adjustments in agricultural organization in response to new opportunities had to operate through channels other than land markets.

In both regions, new profit opportunities were generated as real international wheat prices rose by about 50 percent between 1895 and 1914, with cattle prices generally static (Jacks 2019). Pampas landowners, who traditionally raised and

sold cattle globally, responded quickly. By 1913, Argentina was the largest corn supplier to the United Kingdom and the fourth largest source of wheat, while the United States was the second largest source of corn and the largest for wheat. Argentina also was the principal supplier of chilled and frozen beef to the United Kingdom, with the United States ranked fifth (Ross 1917, p. 128).

While livestock production had economies of scale and required limited labor, intensive grain production required more labor and smaller land plots. Pampas owners might have partitioned their large holdings (estancias) and sold their lands as small farms, but they did not do so. They divided parts of their lands for short-term tenancy contracts, holding onto ownership and social status. Production units remained sharply different from the US Midwest, where small, owner-operated farms that relied on family labor dominated. Such farms were commonly sold, and land sales were a primary source of wealth generation. Easily traded land was a source of collateral, supporting the development of land and capital markets, in contrast to Argentina.

Our empirical analysis uses data from the Argentine Pampas and the US Lower Midwest in the early 20th century. The US region we call the "Lower Midwest," which is not an official designation, comprises Arkansas, Kansas, Missouri, Oklahoma, and Texas (plus, in an extended sample for robustness checks, Louisiana, Nebraska, Iowa, and Illinois); in terms of official designations, it constitutes a southern section of the Midwest Census Region and the West South Central Census Division. We chose this region of the United States because of its similarities to the Argentine Pampas, which were noted by contemporaneous observers (Eastabrook 1926). The regions have similar temperate climates and fertile flatlands and lie primarily between 30 and 40 degrees of latitude.

Farm size, output mix, and tenancy patterns reveal sharp contrasts between Argentina and the United States. For instance, the average county-level mean farm size in the Pampas was 1,076 acres, while in the US Lower Midwest it was 724 acres. Subnational variation allows us to examine how geoclimatic factors influence agricultural organization, and we find that such factors cannot account for the differences in farm sizes, ranching specialization, and tenancy contracts in the two regions. Considering each country separately, we show that geographic and climatic features explain a much smaller fraction of variation in farm sizes for Argentina than for the United States. While the empirical design does not directly attribute unexplained differences to particular causes, property rights institutions and costs of market exchange offer very plausible explanations. Following Demsetz, our approach differs from others who emphasize geography as a primary factor in explaining different economic, social, and political outcomes.

Our analysis also shows that the Pampas had greater specialization in cattle ranching and higher prevalence of cash contracts among tenants, which indicates that these patterns are also not a result of geoclimatic features. Rather, we argue that they were shaped by the incentives to maintain large landholdings. Production of cereals was labor-intensive relative to cattle ranching. Large landholdings would have required substantial external labor to grow corn and wheat, which led

to potentially large incentive and contracting problems. The persistence of large landholdings in Argentina therefore favored an output mix with more specialization in cattle production relative to the Lower Midwest. Moreover, when Argentine agriculture shifted to cereals in response to profit opportunities, it did so not by breaking up large estancias but instead through a peculiar system of short-term cash-tenancy contracts that allowed landowners to retain ownership and political status—which created another sharp difference with the United States, where share-tenancy contracts were more common.

If there were immediate costs for the Argentine economy, they were not large enough to preclude a rapid expansion of its participation in world markets in the late 19th century and early 20th century. Like Australia, Canada, and the United States, by the early 20th century Argentina had a large and growing production of agricultural staples, high levels of income per capita, and glowing growth prospects. The longer-term impacts, however, may have been more significant, inhibiting capital markets and rural human capital investment and contributing to farm labor strikes and political instability.

Our paper contributes to a large literature on comparative development, presenting a contrast with contributions that emphasize the role that resource endowments play in shaping agricultural organization (for instance, Sokoloff and Engerman 2000). While the emphasis on the key role of property rights and market exchange does not deny the important role of resource endowments, it emphasizes that these differences do not account for the sharp contrast between Argentina and the United States. Our emphasis on the role of colonial land policies and their legacies in shaping land allocations, transaction costs, and the flexibility of property rights regimes is in line with the colonial origins thesis of La Porta, Lopez-de-Silanes, and Shleifer (2008), La Porta et al. (1997, 1998), and Acemoglu, Johnson, and Robinson (2001), which highlights the differences in legal traditions former colonies inherited from their colonizers. Finally, our view of the role of landed elites in Argentina highlights, in line with Acemoglu, Johnson, and Robinson (2005), that the evolution of property rights regimes can be constrained by the interests of groups with political power.

The paper proceeds as follows. Section 2 develops a conceptual framework for understanding how property rights institutions and the costs of exchange in land markets influence agricultural organization. Section 3 surveys the historical record on the differing colonial property rights policies of England and Spain and subsequent national land policies. Section 4 describes the data and approach used in our empirical analysis, the results of which are presented in Section 5. Section 6 discusses some possible implications of our analysis of agricultural organization for development. Section 7 concludes.

2. Institutional Structures of Agricultural Production

This section outlines a conceptual framework to understand differences in scale, output mix, and tenancy structure. These are presented as adaptations to

incentives for land exchange arising from the different property rights regimes in the Midwest and the Pampas.

2.1. Scale of Production Units and Output Mix

The size of production units is a principal dimension of economic organization in any productive activity, including agriculture. A key notion discussed by Coase (1960) and Demsetz (1967) is that when the transaction costs are sufficiently low, the initial allocation of property rights does not matter for the organization of production. This follows from the so-called Coase theorem. In agriculture the optimal-scale problem is closely tied to the land's productive attributes like soil quality, climate, terrain, and elevation and to the labor intensity of production that varies by output type. The response of agricultural organization to changes in these factors to achieve greater profitability occurs through market exchange. Furthermore, "the output mix that results when the exchange of property rights is allowed is efficient and the mix is independent of who is assigned ownership" (Demsetz 1967, p. 349).

Demsetz (1967, pp. 357–58) discusses the adjustment of farm sizes and the role of transaction costs through a thought experiment. He asks readers to consider a situation in which "land was distributed in randomly sized parcels to randomly selected owners" who then have to "negotiate among themselves to internalize any remaining externalities." Landowners can make contractual agreements to internalize externalities associated with suboptimal land sizes or engage in land sales to change the size of the parcels. He suggests that "[w]e have here a standard economic problem of optimal scale." Transaction costs will be compared with costs that "depend on the scale of ownership, and parcels of land will tend to be owned in sizes which minimize the sum of these costs."

Throughout the paper, we consider the implications of costs immediately related to market transactions and other relevant costs and barriers to trade. For convenience, we encompass all of them in a broad notion of transaction costs or costs of exchange. As noted by Allen (2000, p. 898), a broad definition of transaction costs as "the costs [of] establishing and maintaining property rights" is common in the property rights literature; Demsetz usually adopts a narrow definition (for example, "the cost of exchanging ownership titles" [Demsetz 1968, p. 35]), but at the same time, some of his key contributions are in line with broader notions (for a detailed discussion, see Allen 2000, pp. 903–4).

Low transaction costs require that property rights parameters be conventional, be measurable, and have verifiable value indicators used by both sellers and buyers (Barzel 2004; Allen 2011, pp. 31–39). If these conditions do not hold, the costs of exchange are higher, and market-generated changes are more limited (Demsetz 1964, pp. 13–15). While we describe in Section 3 how property rights to land as commercial assets were easily traded in the United States, that was not the case in Argentina. The ownership of land conveyed benefits of social status and political power in addition to its economic returns from production and capital gains

of sale. Status benefits could not be traded separately. And since status was not generally traded in markets, it lacked the equivalent external valuation and validation required to facilitate commercial transactions.

The bundling of economic and noneconomic attributes of land increased transaction costs and lowered the incentives to trade because status benefits could dissipate with transfers. The status of elite landowning families was tied to the ownership of their large estates and inherited across generations. Custom assigned benefits to them as historical owners, not just to the estate. Historical descriptions of the tie between social hierarchy and landownership in semifeudal England (Beckett 1989; see also Allen 2011, pp. 44–80) and Spanish-American colonies (Elliott 2006, p. 340) indicate a convex function of property size. As a result, parceling parts of estates for sale would erode total status values.

The allocation and nature of property rights to land are key to understanding the Pampas' high levels of specialization in cattle ranching relative to cereal cultivation in the Midwest. The two activities had very different organizational features: ranching was extensive in nature, while cereal production was much more labor-intensive and occurred on a smaller scale. Insofar as the property rights regime favored the persistence of large landholdings, this was likely to influence choices about output mix.

Small landowners in the US Midwest relied on internal family labor where agency costs were limited (Allen and Lueck 1998, p. 355). They could adjust output in response to price signals with less concern about monitoring and differential incentives of farm labor. By contrast, large landowners in the Pampas used external labor, which increased the degree of asymmetric information about inputs and performance. Misaligned incentives between owners and hired labor could result in shirking, different production and marketing practices, and holdup during critical periods (Klein, Crawford, and Alchian 1978; Feder 1985; Williamson 1985; Demsetz 1988, p. 151; Becker and Murphy 1992). To limit these problems, large landowners had an incentive to specialize more in ranching, as just a few laborers could handle a large estate with several thousand cattle (Ortiz 1978). This incentive was magnified for landowners who did not reside on their estates year round, since monitoring while absent was even harder.

2.2. Tenancy Contracts

Tenancy transfers some of the economic attributes of land (in particular, its use for production) from the owner to the tenant for a specified amount of time. It does not exchange ownership as in a land market transaction. There are two main types of tenancy contracts with a core trade-off for landowners: cash-rent contracts, which provide strong incentives for farmer effort but also incentivize land overuse and soil depletion, and crop-share contracts, which share risk and capital but encourage output underreporting (Alston, Datta, and Nugent 1984; Allen and Lueck 1993; Roumasset and Uy 1987; Roumasset 1995).

In the United States, by the late 19th century share tenancy was common, and

it often provided an option for farmers to acquire land through purchase at the end of the contract, which favored a widespread agricultural ladder pattern of upward mobility (Spillman 1919; Atack 1989; Winters 1982, pp. 137–43; Alston and Ferrie 2005; Alston and Kauffman 1997). By offering farmers the prospect of ownership, share tenancy increased the demand for land rentals and gave landowners a way to discourage soil depletion.

In the Pampas, however, landowners typically did not use share contracts. Their advantage was that they could encourage tenants' investment in production knowledge and physical capital. This benefit generally required renewable contracts over a long term. These attributes potentially raised monitoring and measurement costs in output shares. Importantly, renewable, long-term share contracts also could imply a tenant's stake in the land. Pampas' landowners, who were often absentee, sought to maintain their ownership status and lower the costs associated with monitoring output.

As a result, they chose short, often nonrenewable, cash-tenancy contracts with explicit production instructions, ceding land use rights in only a limited and temporary way. Insofar as tenants provided their labor and little else, the leases designed by large landowners (estancieros) were labor contracts, in contrast with the land contracts held by midwestern tenants.

Argentine tenants were not encouraged to invest in physical capital, nor were they reimbursed for any investments made during the contract term. Landowners specified what crops were to be grown during the time of the contract, including the requirement to sow alfalfa at the end of the contract period. Doing so reduced soil depletion by tenants during the last year and improved pasture when the land was moved back to ranching. The commitment to leave good-quality alfalfa was verifiable. On completion of the contract, the relationship between the land and the tenant ended. The use of short-term cash contracts allowed estancia owners to shift small plots of land into grain production in response to rising relative grain prices and then to move them back into ranching with fewer laborers, lower monitoring costs, and more clearly measurable livestock output. Through this process, large estates were divided as *estancias mixtas* into small, short-term tenant plots for grains and larger pastures for livestock raising

2.3. Adjustment in Property Rights Regimes

Demsetz (1967, p. 350) argues that changes in property rights may emerge "in response to the desires of the interacting persons for adjustment to new benefit-cost possibilities." If political and/or legal support were required to promote trade and institutional change toward more valuable arrangements, asset owners, who would internalize those gains, could mobilize for them. This process has been referred to as the political Coase theorem (Acemoglu 2003; Acemoglu and Johnson 2005).

As we reference below, in the United States the ability to acquire property rights to land, the uniformity in their definition, and their recognition as col-

lateral were advanced by legislatures and Congress from colonial times through the turn of the 20th century. These actions promoted land markets, which was in the interest of the many small land claimants who sought to occupy and then buy and sell land as a commercial asset. By contrast, this pattern is not observed in Argentina. Large landowners sought to maintain, not trade or diminish, their holdings and the bundled economic and noneconomic benefits they provided. They resisted political efforts to allow for more entry and exchange of land via markets.

The analysis in Demsetz (1967, p. 350) hints at the possibility of limitations to institutional adjustments created by local particularities of property rights regimes and opposition from relevant parties. We observe this opposition in the Pampas as noted in the historical literature. Our analysis goes further, however, by examining the incentive of large landowners to respond to profit opportunities via alternatives that did not compromise the size of their holdings or their status. Subdividing their lands into short-term tenancies, the *estancia mixta,* instead of selling them provided such an alternative.

3. Colonial Legacies in Property Rights Regimes

3.1. England and the United States

In this section, we provide an analytic narrative of the differences in property rights to land in the United States and Argentina. In feudal England, property in land entailed both wealth and privilege. It was part of the social, economic, and political hierarchy that flowed from the sovereign to the nobility. The different classes of landed gentry were signaled by the size of their estates. Those who worked the land as serfs or diverse types of tenants were at the bottom of the hierarchy, with no property claims. The feudal system concentrated political power and social status in a small group, the landed elite, who had incentives to hold onto their estates and the status benefits they provided (Beckett 1989, pp. 545–49).

As English feudalism declined from the 16th century on, land become more transferable as a commodity or asset rather than primarily a source of political position (Campbell 1942, pp. 67, 156). Land markets gradually became more active after the advent of the agricultural and industrial revolutions, which weakened the position of traditional landed gentry relative to new industrial and merchant classes and provided new sources of wealth from the reorganization and sale of land. Estates gradually were broken up and sold in smaller parcels (Johnson 1909, p. 11). Participation in land markets increased among farmers who had started as tenants, members of the rising merchant and industrial classes, and other segments of society (Linklater 2013, pp. 5, 12, 30–38, 58; Johnson 1909, pp. 20, 117).

Landownership remained relatively concentrated through the 19th century (Lindert 1987). But maintenance of heredity status based on land became in-

creasingly costly, while selling property to compensate for lost status benefits became more and more common. Historical legal constraints were relaxed to promote market transactions (Bean 1991; Holdsworth [1927] 2013). Over time, landowners became more and more willing to shift land to commercial uses.

Property rights to land in colonial North America were in line with this pattern. Most immigrants aspired to own land (Ely 2008, p. 13). English colonial charter holders intensely competed to attract settlers to create small farms in temperate regions, establish profitable new communities, and raise land values as an asset. To do so, British colonial policies quickly made land a marketable commodity and a liquid asset that could be transferred and used to obtain credit (Priest 2021, pp. 21–38). Even large land grants from the Crown were broken up and sold. The availability of fertile land to small holders, who could secure and cultivate freeholds, generated a comparatively egalitarian society (Lindert and Williamson 2013).

After independence, as the United States expanded westward via dispossession of land from Native American populations, federal land policies continued to emphasize low-cost, small-scale landownership and exchange. This emphasis was present in the adoption of the Public Lands Survey System under the Land Ordinance of 1785, which placed frontier lands into uniform grids for definition, use, and sale (Libecap and Lueck 2011); in military warrants, redeemable for small parcels (Ford 1910, pp. 359–411); in the recognition of squatters via the Preemption Act (Kanazawa 1996); and after 1862 in the Homestead Acts, which opened land for widespread claiming and ownership (Gates 1979, pp. 799–805).

Examination of manuscript census and probate records reveals that capital gains from land sales were a primary source of wealth generation, particularly in midwestern states (Kearl, Pope, and Wimmer 1980; Steckel 1989; Galenson and Pope 1989; Ferrie 1993; Gregson 1996; Stewart 2009). The study of land transfers between 1839 and 1889 in southern Wisconsin by Hartnett (1991) reveals a turnover of 12 percent of land each year. Collateral and cash raised from past transactions or loans from neighbors and relatives were used in these purchases. Hartnett (1991, p. 47) argues that this record was representative. The close ties linking landownership, collateral, and property markets encouraged nascent capital market development.

As available frontier land declined and midwestern land prices rose in the late 19th century, share tenancy became an option for new farmers to acquire land through purchase at the end of a contract. The ultimate aim of tenancy was ownership as part of the agricultural ladder (Spillman 1919; Winters 1982, pp. 137–43; Alston and Ferrie 2005). Share-tenancy contracts aligned the incentives of owners and tenants through sharing inputs, risk, and joint claims on output (Cheung 1969a, 1969b).

There were influential constituencies for low-cost, rapid transfers of federal lands in small plots, among them members of Congress and presidents, as illustrated by Thomas Jefferson's well-known support for widespread ownership of

small landholdings (Katz 1976, p. 480). At the end of the 19th century and the closing of the frontier, the Public Lands Commission looked back over the small-farm, homestead principle and concluded in a celebratory fashion, "The maxim that He who tills the soil should own the soil is accepted as a fundamental principle of political economy. . . . Small holdings distributed severally among the tillers of the soil is believed to be a fundamental condition for the prosperity and happiness of an agricultural population"' (US Public Lands Commission 1880, p. xxii).

3.2. Spain and Argentina

In contrast to the changes that took place in England, over the colonial period Spanish feudal structures remained in place (Van Bath 1966). Spain's pastoral, grazing economy did not experience major transformations, and the Crown, church, and landed nobility remained at the top of a rigid hierarchical system (Hennessy 1978, pp. 28–30, 161). All land was the property of the Crown, and concessions to hereditary nobility or to nonhereditary officeholders were made at the sovereign's discretion. Even by the 18th century, there was no appreciable small-landowner class in Spain like the one growing in England.

A salient case in the organization of primary production in medieval Spain illustrates how forces pushing toward adjustment in property rights led to adjustments under constraints. The Mesta, a union of sheep raisers, was set up in the late 13th century to maintain rights-of-way for migration and grazing. The Spanish Crown granted the Mesta these privileges in exchange for tribute payments and loyalty, which reinforced a hierarchical system. But as suggested by Nugent and Sanchez (1989) and Drelichman (2009), with the absence of extensive land markets and the logistical challenges of migratory shepherding, this seemingly rigid regime was a second-best institution that fostered the development of Spain's comparative advantage in wool while enabling flexibility in output mix. In response to changes in terms of trade, the Crown adjusted the incentives for agricultural and shepherding activities through selective enforcement of existing privileges. The Mesta system was thus in line with Demsetz's thesis of property rights adjustments under constraints, just like the adjustments we discuss below for Argentina centuries later.

In the Spanish colonies, the distribution of land rights bundled them with political and social power, which mimicked positions held by the Spanish landed gentry (Elliott 2006). Land policies, tightly controlled by the Crown, limited independent colony proprietorships and competing colonial charters like the ones in English-settled North America. In the Pampas, a relatively small number of landowners held estancias that comprised in some cases tens of thousands of acres and were only very rarely were broken up for subsequent resale to small holders (Scobie 1964, p. 45; Adelman 1994, pp. 63–68; Engerman and Sokoloff 1994, p. 19; Amaral 1998, pp. 24–25; Hora 2001, p. 2; Elliott 2006, pp. 40–55; Linklater 2013, p. 77).

After independence, settlement moved inland across the temperate Argentine Pampas, displacing native populations as occurred in the United States. Smaller-scale land distributions and agricultural production might have been feasible, but contemporary observers and subsequent historians instead emphasize the immense size of estancias (Duval 1915, p. 286; Ross 1917, pp. 2–7, 51, 153; Estabrook 1926, p. 60; Zimmerman 1945, pp. 5–6, 14). Owners specialized in livestock raising for export of meat, hides, and other products to Spain. With two key production periods—roundup, marketing, and/or slaughter in the fall and breeding and pasture herding in the spring—monitoring costs were low for the limited labor required. In contrast to the United States, as Hennessy (1978, p. 18) puts it, "the latifundio, not the homestead, became the typical rural institution."

Landownership provided social and political power by facilitating access to critical networks (Losada 2012, 2016). Members of this aristocratic sphere participated in exclusive social clubs, sports, and cultural activities that facilitated links with political elites. They gained access to political parties, as documented by Figueroa and Leiras (2014, 2018). These studies show that from 1880 to 1912, landowners who were more involved as members of exclusive clubs had higher chances of getting political positions and that once elected they favored legislation in accordance with their economic interests.

In an effort that imitated US frontier land policies and to promote more small-scale landownership, Argentine presidents Domingo Faustino Sarmiento (1868–74) and Nicolás Avellaneda (1874–80) attempted to replicate US homestead laws and to implement systematic, rectangular plot surveys on remaining government lands in the Pampas (Solberg 1971, p. 36). These efforts were opposed by large landowners, who sought additional access to remaining government frontier land and to avoid restrictions on their economic and political positions (Adelman 1994, pp. 81, 68–77, 89).

To illustrate, the 1876 Law No. 847, or Ley Avellaneda, provided a survey system of 40,000-hectare, or approximately 100,000-acre, sections, with individual plots of 100 hectares, or about 250 acres. A total of 1 percent of each section was to be town owned, and 19 percent would be communal property (Scobie 1964, pp. 118, 121–26; Yuln 2012). The law also forbade the purchase of large land blocks by a single person. Land sales of small plots, however, were limited, and shortly afterward land policy reverted to favoring the interests of large landholders. Law No. 947, passed in 1878, allowed for larger distributions of 25 plots of 10,000 acres each, almost 25,000 acres and 100 times the size of plots allowed under the 1876 law (Adelman 1994, pp. 81, 68–77, 89; Yuln 2012). Each individual 10,000-hectare plot was larger than a whole US township, which was subdivided into 36 sections of 640 acres each or quarter sections of 160 acres. By comparison, the smallest units in Argentina's 1878 law were 62.5 times the size of those quarter sections. Large landholdings continued to be favored following the military campaigns directed by Julio Argentino Roca as minister of war and then president, which seized large amounts of land from indigenous peoples.

Although estancias historically were devoted to livestock raising, as the inter-

national price of wheat rose (Jacks 2019), there were incentives to shift some land to cereals production. In this regard, Argentine landowners were successful, and the country became a leading grain exporter by 1913 (Ross 1917, p. 128). Some new production came from small holdings via colonialization schemes in the province of Santa Fe (Scarzanella 1984, p. 3). The major source of new grain output came from institutional innovation by estancieros in a shift to labor markets and use of tenant farmers, rather than the division and sale of their properties. To achieve optimal scale in grain production, the resort to labor markets was more attractive than the use of land markets. Large landowners generally did not want to sell their lands and instead parceled them into small tenant plots for grains, while maintaining larger holdings for livestock. As noted above, *estancia mixta* allowed for both cattle and cereals production under different organization structures but the same ownership structure (Slutzky 1968; Palacio 2002; Scobie 1964, pp. 52, 72–88; Adelman 1994, pp. 77, 133–35, 202–49; Scarzanella 1984, pp. 3, 5).

Large landowners rented fractions of their properties to cereal farmers as cash-tenancy leases, *arrendamiento*s. The leases typically were short-term, 2- to 5-year contracts on plots of 100–200 hectares that generally were not renewed (Scobie 1964, pp. 52, 72–88; Solberg 1971, pp. 20, 40; Scarzanella 1984, p. 3; Adelman 1994, pp. 77, 133–35, 202–49). Tenants then moved to other plots or estancias. As noted above, the contract required cultivation of alfalfa during its last year to improve subsequent pasture by fixing atmospheric nitrogen and to reduce overcultivation in wheat by tenants (Slutzky 1968; Scarzanella 1984, pp. 3, 5, 13; Palacio 2002). Immigrants to the Pampas from Italy and Spain, where ownership of small plots was unusual, became tenants or temporary laborers who returned to Italy or Spain after harvest. Unlike those who migrated to the Midwest, they did not expect to own land (Ross 1917, pp. 8–9, 126; Solberg 1971, p. 40; 1987, p. 141).

The tenancy contracts that enabled the implementation of this joint production system were described in 1892 in the annals of the *Sociedad Rural Argentina* and became a major feature of Argentina's agricultural organization over the next decades. The system enabled landowners to respond to profit opportunities from cereal production, retain ownership and political status, and at the same time obtain from tenant farmers improved soil for their ranching activities. The widespread expansion of the *estancia mixta* system during the cereals boom is in line with Demsetz's adjustment thesis in which the high costs of using land markets led to alternatives, in this case a shift by owners to labor markets via cash tenancy in agricultural production.

4. Comparative Analysis: Data and Empirical Approach

In this section, we describe our approach for a quantitative comparative analysis of the Argentine Pampas and the US Lower Midwest. We begin with discussion of the selection of regions for a meaningful comparative analysis. Then we turn to variable definitions and sources. Finally, we describe our empirical approach.

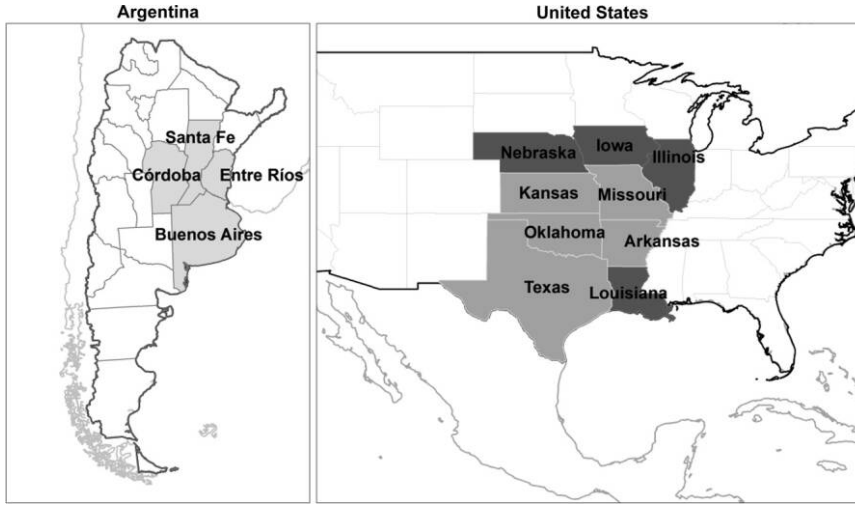

Figure 1. Areas in the sample

4.1. Sample Regions and Data

We consider four Argentine provinces: Buenos Aires, Córdoba, Santa Fe, and Entre Ríos. These constituted the core agricultural region and most of the country's agricultural output in 1914. We exclude from our analysis the small departments in the province of Buenos Aires located around the city of Buenos Aires, as they were already highly urbanized.

Because of their geoclimatic similarities with the Pampas, we consider the states of Texas, Oklahoma, Arkansas, Kansas, and Missouri. The regions, shown in Figure 1, lie primarily between 30 and 40 degrees of latitude. Accounts of contemporaneous discussions suggest that "[t]he Pampa of Argentina is a region similar to portions of the Great Plains country west of the Mississippi, especially portions of Texas, Oklahoma, and Kansas" (Estabrook 1926, p. 11).

The US region that we call the "Lower Midwest" includes Kansas and Missouri (which are included in the Midwest as defined by the US census). For robustness, we also consider an extended US sample that includes Louisiana, Nebraska, Iowa, and Illinois, with the latter three states also part of the Midwest as defined by the US census. Figure 2 displays the regions with some of their key climatic and geographic characteristics. Table 1 shows comparison statistics for the Argentine sample, the baseline and extended US samples, and the entire United States east of the 98th meridian, the line typically considered the division between the humid and semiarid regions of the country.

We use the numbers of farms operated by owners, renters, rental agreement types, and cattle and the number and size of farms in the digitized 1914 Argentine national census reported by Droller (2018) and Droller and Fiszbein (2021) and

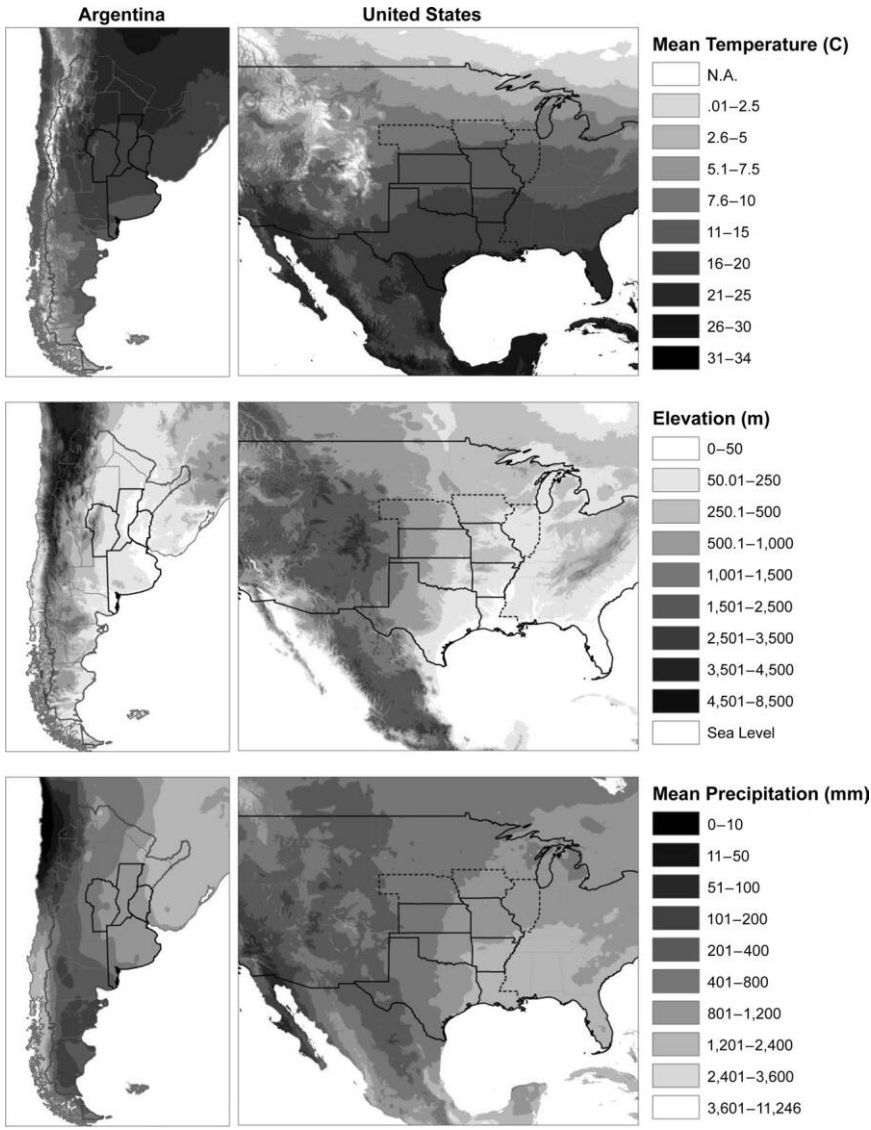

Figure 2. Geoclimatic comparisons

data from the 1910 US States Census of Agriculture digitized by Haines (2010). The data are at the county level for the United States and at the equivalent level (*departamentos* or, for the province of Buenos Aires, *partidos*) for Argentina.

In both censuses, data on farms and ranches report units run by a single operator, not ownership, and hence include farms rented by tenants as separate units. This factor biases downward the size of overall owner holdings in the Pampas

Table 1
Summary Statistics

	United States			
	East	Lower Midwest, Extended	Lower Midwest, Baseline	Argentine Pampas
Elevation (meters)	237.30	357.50	373.40	128.40
	(161.9)	(289.6)	(292.5)	(192.0)
Temperature (degrees Celsius)	12.74	14.06	15.51	16.49
	(4.19)	(3.71)	(2.85)	(1.55)
Precipitation (log)	6.98	6.77	6.75	6.81
	(.23)	(.34)	(.35)	(.18)
Pasture potential yields (log)	7.15	6.53	6.34	7.19
	(.39)	(1.03)	(1.15)	(.49)
Wheat potential yields (log)	8.66	8.28	8.08	8.31
	(.22)	(1.20)	(1.46)	(.26)
Corn potential yields (log)	8.96	9.14	9.20	9.18
	(.68)	(.12)	(.06)	(.02)
Mean farm size (log)	4.66	5.29	5.41	6.64
	(.42)	(1.00)	(1.16)	(.82)
Cattle per capita (log)	.26	.55	.63	1.58
	(.74)	(.99)	(1.03)	(.95)
Cattle per farm acre (log)	.13	.22	.28	.89
	(.14)	(.39)	(.48)	(1.09)
Proportion of tenants with cash rent	.38	.31	.27	.71
	(.24)	(.22)	(.20)	(.27)

Note. The US East sample includes all counties east of the 98th meridian. The extended sample also includes all counties in Louisiana, Nebraska, Iowa, and Illinois. The baseline sample includes all counties in Kansas, Arkansas, Oklahoma, Missouri, and Texas. Potential yields are in tons per hectare. Standard deviations are in parentheses.

relative to the Midwest, as estancias were subdivided into individual tenant plots. Furthermore, the censuses differ slightly in how they report cropland, with the US census reporting improved acres and the Argentine census reporting numbers and acres in *explotaciones agrarias,* or agriculture. We label both as cropland, although there may be some differences in what is reported under each measure.

We also collect data from both countries on the number of rented farms. In Argentina, rented farms are further divided into cash-rent and share-rent establishments in cropland, but only the number of renters is provided for ranches—we assume that this is because a share rent is not a common form of contract for ranch operations. We construct a cumulative number of tenancy rentals for the Pampas by adding numbers of rented farms and ranches. In addition, we construct the proportion of establishments with cash-rent and share-rent systems.

In the US census, four rent categories cover ranches and farms cumulatively. The additional two categories are cash-share rent and unknown rent. To present a consistent comparison, we categorize cash-share rentals as share rentals and unknown rentals as cash rentals. Our key variable of interest is the number of cash-rent farms divided by the total number of tenant farms.

We calculate the average farm size for each county or department as the total area in farms divided by the total number of farms. Both censuses also provide the number of cattle, which we use to construct a measure of ranching intensity, cattle per capita, and an alternative measure, cattle divided by total farm area.

To construct geoclimatic descriptions of the historic counties and departments, we extract the area-weighted mean of yearly temperature, precipitation, and elevation using geographical information system software. The US 1910 county shapefiles are from the National Historic Geographic Information System produced by the Minnesota Population Center. We construct Argentine department shapefiles by modifying a shapefile of the current boundaries using Argentina department maps corresponding to the 1914 boundaries as provided in Cacopardo (1967). We extract average normalized attainable yields for pasture, wheat, and corn from Global Agro-ecological Zones (IIASA/FAO 2012).

These estimates employ climatic data, including precipitation, temperature, wind speed, and sunshine hours, as well as crop-specific factors, thermal suitability, water requirements, and growth and development parameters. Combining these data, the model determines the maximum attainable yield (measured in tons per hectare per year) for each crop in each grid cell of .083 $\times$ .083 degrees. We use the measure of agroclimatic yields based solely on climate, not on soil conditions, to eliminate potential endogeneity in soil productivity investments. We do not have historic measures of soil quality for both regions, and current soil quality is related to land-use decisions made subsequent to our period of study. We consider attainable yields under rain-fed conditions using yields for intermediate levels of inputs and technology.

From the US census, the number of farms and area in farms are comprehensive counts that include all ownership types, farming activities, and ranching. These measures correspond most closely to the Argentine Pampas data on *explotaciones agropecuarias,* which include both farms and ranches, and the area measure corresponding to all these establishments. Because of differing definitions and translation issues, we label as "farms" the US farm and ranch total and total Argentine *explotaciones agropecuarias*. Maps of farm size, cattle per capita, and proportion cash rent are shown in Figure 3 (with cattle per farm acre shown in Online Appendix Figure OA1).

4.2. Empirical Approach

Argentine farms are a worldwide outlier in size historically and today (Eastwood, Lipton, and Newell 2010; Federico 2005). In the period we study, the average of county-level mean farm size in the Pampas was 1,076 acres, while in the US Lower Midwest it was 724 acres. Figure 4 provides a histogram comparing the distribution of county or department mean farm sizes in the Pampas and the US Lower Midwest (the extended sample is shown in Figure OC1).

The larger size of Argentine farms, relative to US farms, and other input and output choices could plausibly be explained by underlying differences in poten-

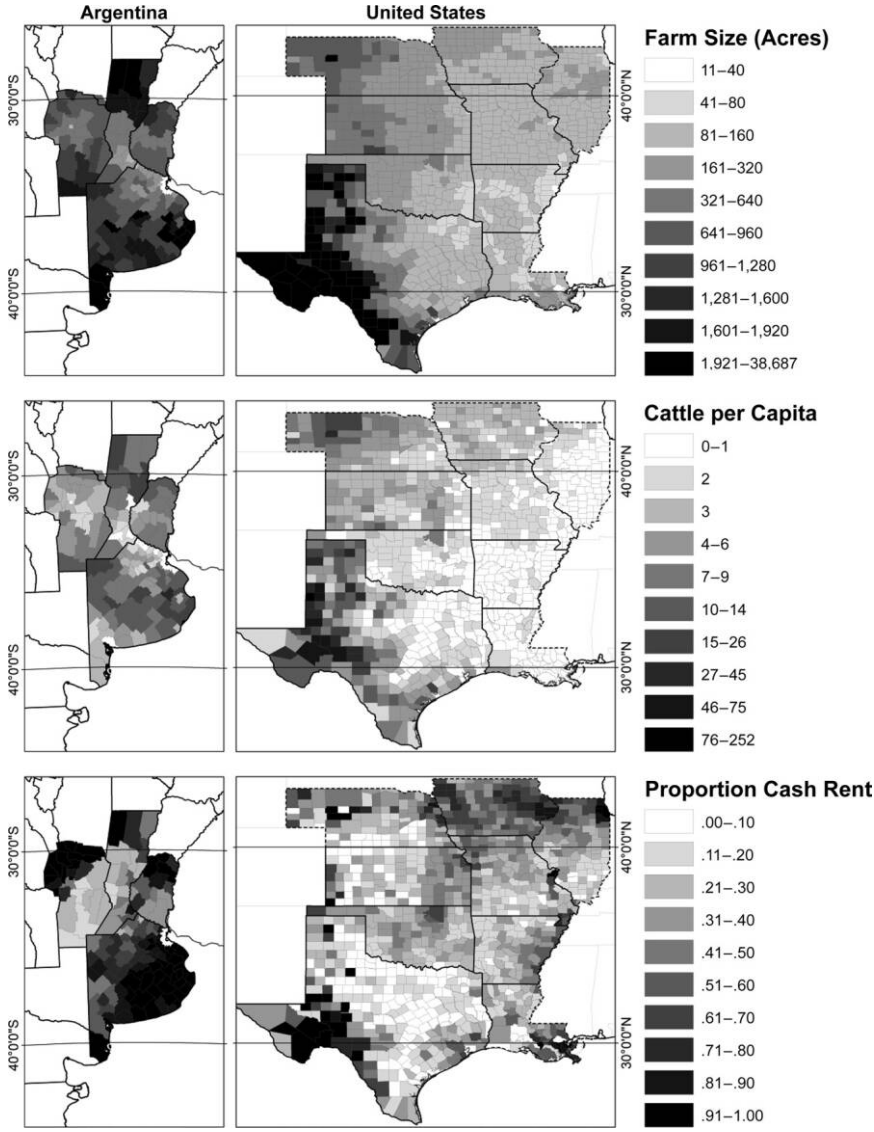

Figure 3. Comparison of farm organization

tial agricultural productivity. This would be in line with the contribution of Engerman and Sokoloff (2002), which highlights soil and climate-influenced agricultural specialization patterns and associated levels of land concentration across the Americas. Our choice of the Argentine and US samples to be similar in geoclimatic characteristics, however, is a broad attempt to consider comparable areas.

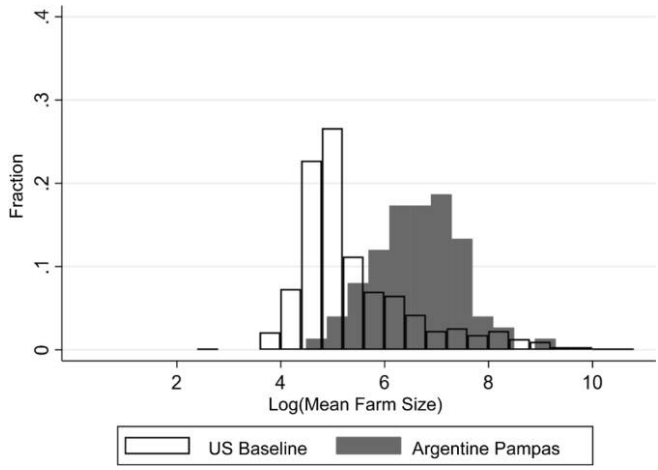

Figure 4. Comparison of farm sizes

We rely on subnational data on agricultural organization for the Argentine Pampas and the US Lower Midwest baseline sample. Exploiting cross-sectional variation, we can examine how geoclimatic factors influence agricultural organization and whether they can explain observed overall differences in agricultural organization between Argentina and the United States. Moreover, we can examine responsiveness to these factors in both countries.

Our main estimating equation takes the following form:

$$y_c = a + \beta \text{Argentina}_c + \gamma' \boldsymbol{X}_c + \varepsilon_c, \tag{1}$$

where y_c is an agricultural organization attribute (for example, farm size) in county c, Argentina_c is a dummy that equals one for counties in Argentina and zero for counties in the United States, $\boldsymbol{X}_c$ is a vector of geoclimatic variables, and ε_c is an error term.

The key outcome of interest is farm size. Estimating regression (1) without including the vector of geoclimatic variables (area-weighted mean of yearly temperature, precipitation, and elevation) simply captures the overall difference between counties in our Argentine and US samples. Including this vector allows us to assess whether differences in agricultural organization between the two regions can be explained by geoclimatic factors. Our analysis in Section 5 thus establishes differences in the organization of farm production that are not related to geoclimatic factors. While the empirical design does not directly attribute unexplained differences to specific causes, differing property rights institutions offer a plausible explanation.

One additional exercise provides further suggestive support for the idea that different property rights regimes underlie the differences in agricultural organi-

zation. We assess the levels of responsiveness to the geoclimatic factors in each country by splitting the sample and running regression (1) on each subsample. Our assumption is that, absent institutional constraints, farm characteristics in each country will respond similarly in sign and magnitude to factors including precipitation, temperature, elevation, and yield. Finally, we examine differences in agricultural organization, including not only farm sizes but also the output mix favoring ranching specialization and cash contracts as the preferred type of tenancy.

5. Comparative Analysis: Results

5.1. Farm Size

To understand the difference in farm size between the two countries, we pool the observations and regress farm size (in logs) on a country dummy, with results shown in Table 2. The coefficient in column 1 is the overall mean difference in the size of farms in Argentina relative to those in the United States. In column 2, we control for geoclimatic variables, and the dummy for Argentina is larger. Without accounting for the way in which these factors influence farm size across counties, Argentine farms are over two times larger than those in the United States. However, after accounting for geoclimatic factors, the difference becomes even larger, and the estimates imply that under the same conditions Argentine farms are six times larger than US farms.

We also consider regression specifications including weights by county size for robustness in Table 2. In Online Appendix Table OB1, we do the same using weights by the number of farm acres and by the inverse of the number of observations for the corresponding county. The latter is an ad hoc specification of weights to check that the results are not driven by the fact that our sample has more US counties (616) than Argentine counties (150). Online Appendix Table OC1 applies the specifications in Table 2 to the extended sample. In all cases we find that the coefficient on the Argentina dummy is positive, significant, and larger in magnitude with geoclimatic controls. Online Appendix Tables OA1 and OD1 show that the results do not change when including controls for soil quality and when accounting for spatial dependence using Conley standard errors with various distance cutoffs (in both tables, these additional exercises include the regressions for farm size and outcomes considered in Sections 5.2 and 5.3).

To visualize the overall size of farms in Argentina relative to those in the United States, we run the regression of (log) farm sizes on the set of geoclimatic factors with no country dummy. Then we plot in Figure 5 the predicted and actual farm sizes and a 45-degree line where predicted size equals actual size. The Pampas farms generally lie above the 45-degree line, which indicates that Argentine farms are systematically larger than the model predicts.

The difference in farm sizes in the two countries that is unexplained by geoclimatic factors is suggestive of the difficulties in breaking up large land allocations,

Table 2
Farm Size

	No Weights		Weighted by County Size	
	(1)	(2)	(3)	(4)
Argentina	1.22**	2.06**	1.19**	2.35**
	(.08)	(.10)	(.13)	(.10)
Elevation (1,000 meters)		−.51+		−.19
		(.28)		(.29)
Temperature (degrees Celsius)		−.02		.02
		(.01)		(.02)
Precipitation (log)		1.01**		1.46**
		(.36)		(.40)
Pasture potential yields (log)		−1.20**		−1.30**
		(.13)		(.15)
Wheat potential yields (log)		−.12**		−.10**
		(.04)		(.03)
Corn potential yields (log)		−3.65**		−4.11**
		(.60)		(.68)
Constant	5.42**	41.18**	5.79**	42.15**
	(.05)	(4.40)	(.09)	(5.35)
R^2	.16	.76	.16	.76

Note. Results are coefficient estimates for regressions of county average farm size (logged) on factors affecting agricultural production. The Argentine sample includes departments in Córdoba, Buenos Aires, Santa Fé, and Entre Rios. The US sample includes counties in Texas, Oklahoma, Kansas, Arkansas, and Missouri. Farm size is defined as total acres in farming and ranching in a county or department divided by the number of establishments. Importance weights are proportional to the acres in a county. Robust standard errors are in parentheses. $N = 766$.

+ $p < .1$.

** $p < .01$.

potentially because of bundled property rights in Argentina compared with the United States. We now test how responsive farm size was to geoclimatic conditions that would ordinarily provide an incentive for altering farm size to address the economies of production. We run the same regression as equation (1) but with the sample split by country. Figure 6 displays the scatterplots.

Geoclimatic controls explain much less variation in farm size in Argentina than in the United States, as demonstrated by the Argentine R^2-value of .23 relative to a US value of .79. In Argentina farms were generally fixed in size and were not readily adjusted to climatic conditions via sales. Regression results are shown in Online Appendix Table OA2.

One concern with this type of analysis is that Argentina and the United States might have different distributions of underlying climate conditions that could be driving the strength of fit. To ensure a common support for the regression analysis, we limit the US sample to counties with elevation, temperature, and precipitation levels that fall within the range of those variables for Argentine counties. The results (in Figure OA1) are nearly identical to those in Figure 6, and using

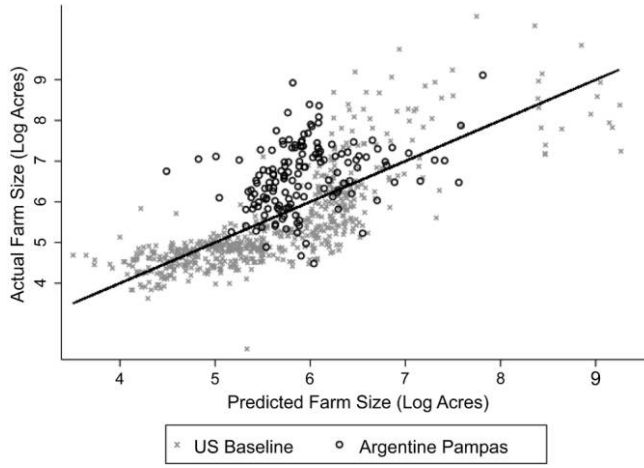

Figure 5. Actual and geoclimatic-predicted farm sizes

this subsample of the US Lower Midwest, which eliminates 30 percent of the counties in the baseline sample, does not alter the results.

5.2. Differences in Output Mix and Tenancy

In his discussion of how the initial allocation of property rights and the costs of exchange affect the organization of production, Demsetz (1967) explicitly mentions the output mix as a key outcome that may be affected. A salient feature of the Pampas was its specialization in ranching activities. This was also a feature of the Lower Midwest, but not to the same extent. The difference may have originated in geoclimatic differences, in line with the theories in Engerman and Sokoloff (2002). Moreover, Droller and Fiszbein (2021) show that variation in ranching specialization across localities in the Argentine Pampas is partly explained by geoclimatic conditions. But it could also be the case that large Argentine landowners in 1914 specialized in ranching to maintain their extensive properties with lower monitoring costs as they shifted in and out of grain production.

To examine this question, we estimate regression (1) with two measures of ranching specialization: the number of cattle per person and the ratio of the number of cattle to the number of farm acres as the outcome. The results in Table 3 suggest that, as predicted, Argentina's specialization in ranching is not accounted for by geoclimatic conditions.

With regard to tenancy, Table 4 shows the results of a regression of the proportion of tenant farms with cash contracts. After controlling for geoclimatic characteristics, the Pampas have a higher proportion of cash tenants among all tenants than the baseline Lower Midwest sample. Online Appendix Tables OB2–OB3 and OC2–OC3 provide robustness checks for ranching specialization and cash tenancy, respectively, for the extended sample and alternative weights.

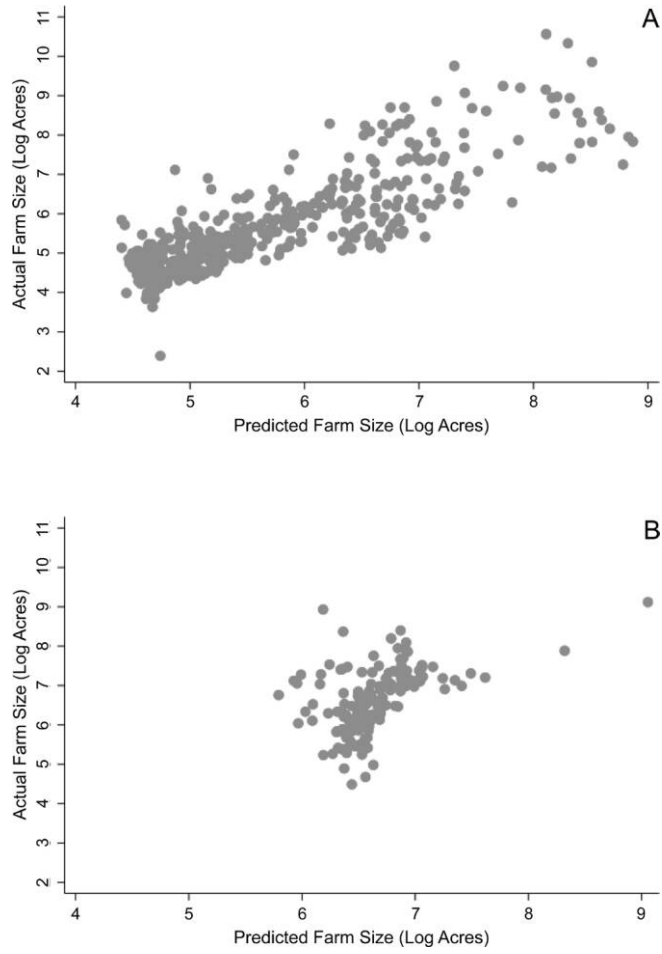

Figure 6. Split regressions and differential responsiveness. *A,* United States; *B,* Argentina.

6. Discussion: Implications for Development

Our empirical analysis focuses on the origins and impact of the distinctive features of Argentina's agricultural organization, not on their long-term consequences. However, our examination of how property rights and the costs of land market exchange influence farm sizes, ranching specialization, and tenancy contracts contains insights into their likely longer-term effects that are consistent with historical studies.

As discussed above, despite the persistence of large estates, the Argentine Pampas substantially expanded the production of cereals in response to profit opportunities through the *estancia mixta* system. By design, this system was im-

Table 3
Ranching

	Cattle per Capita				Cattle per Farm Acre			
	No Weights		Weighted by County Size		No Weights		Weighted by County Size	
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Argentina	.99**	1.63**	.97**	1.99**	.60**	.72**	.34**	.65**
	(.09)	(.15)	(.10)	(.19)	(.09)	(.12)	(.10)	(.16)
Elevation (1,000 meters)		.18		.76		.14		.71*
		(.40)		(.57)		(.34)		(.34)
Temperature (degrees Celsius)		.00		.02		.05*		.08**
		(.02)		(.03)		(.02)		(.03)
Precipitation (log)		.88+		2.28**		.33		.49
		(.49)		(.79)		(.64)		(.82)
Pasture potential yields (log)		−.77**		−1.03**		−.16		−.17
		(.18)		(.31)		(.24)		(.28)
Wheat potential yields (log)		−.16**		−.07		−.15**		−.14**
		(.04)		(.09)		(.03)		(.03)
Corn potential yields (log)		−3.69**		−4.56**		−2.18**		−3.13**
		(.70)		(1.01)		(.51)		(.65)
Constant	.55**	34.70**	.78**	33.58**	.29**	19.59**	.45**	26.43**
	(.04)	(4.93)	(.06)	(6.45)	(.02)	(2.70)	(.06)	(3.83)
R^2	.12	.51	.15	.48	.12	.32	.04	.33

Note. Results are coefficient estimates for regressions of logged values affecting production. The Argentine sample includes departments in Córdoba, Buenos Aires, Santa Fé, and Entre Rios. The US sample includes counties in Texas, Oklahoma, Kansas, Arkansas, and Missouri. Importance weights are proportional to the acres in a county. Robust standard errors are in parentheses. $N = 766$.

$^{+}$ $p < .1$.
* $p < .05$.
** $p < .01$.

Table 4
Cash Tenancy

	No Weights		Weighted by County Size	
	(1)	(2)	(3)	(4)
Argentina	.45**	.56**	.36**	.51**
	(.02)	(.03)	(.04)	(.05)
Elevation (1,000 meters)		−.05		.03
		(.08)		(.11)
Temperature (degrees Celsius)		−.02**		−.01
		(.00)		(.01)
Precipitation (log)		.46**		.45*
		(.14)		(.21)
Pasture potential yields (log)		−.17**		−.18**
		(.05)		(.07)
Wheat potential yields (log)		−.02		−.01
		(.01)		(.01)
Corn potential yields (log)		−.97**		−1.18**
		(.18)		(.25)
Constant	.26**	7.62**	.29**	9.48**
	(.01)	(1.33)	(.01)	(1.78)
R^2	.41	.46	.30	.38

Note. Results are coefficient estimates for regressions of the proportion of tenant farms in cash tenancy on factors affecting production. The Argentine sample includes departments in Córdoba, Buenos Aires, Santa Fé, and Entre Rios. The US sample includes counties in Texas, Oklahoma, Kansas, Arkansas, and Missouri. Importance weights are proportional to the acres in a county. Robust standard errors are in parentheses. $N = 766$.

* $p < .05$.

** $p < .01$.

plemented through short-term cash-tenancy contracts. The short time horizon and lack of renewal of tenancy contracts helped ensure the continued status of large landowners. However, these features likely had broad negative effects on longer-term economic development.

6.1. Investment in Physical Capital

The choice of cash contracts may have led to soil mining by tenants, as suggested by historical narratives. While landowners tried to limit this through stipulations in the cash-tenancy contracts, observers claim that soil exhaustion was occurring on tenant plots to some degree (Ross 1917, p. 229; Scobie 1964, pp. 72–88; Scarzanella 1984, p. 21). Adelman (1994, p. 77) references a 1900 report by the Ministry of Agriculture on the potential problem of overcultivation by tenants (Duval 1915, pp. 287–88; Ross 1917, p. 234). We do not have data to assess this impact.

Under tenancy contracts, existing equipment and buildings belonging to the owner were to be returned in original condition at the end of the tenancy (Scar-

zanella 1984, pp. 6–7). Owners did not reimburse tenants' investments in housing, and with short-term occupancy and limited family migration, there was less demand for housing stock (Solberg 1971, p. 22, n. 15; 1987, p. 138; Scarzanella 1984, pp. 12–14). With no incentives for tenants to make improvements, housing and roads in the Pampas were of low quality, as described in the historical literature and by contemporary observers. According to Solberg (1971, p. 16), in 1925 there were only 1,273 km of all-weather roads in rural Argentina.

6.2. Development of Credit Markets

In the United States, land and credit markets developed in tandem. Hartnett (1991) describes how owners of small farms pooled assets to invest in land purchases by relatives. Capital gains from land market participation could then be used in other economic investments. In Argentina, formal rural land and capital markets were much less active (Cortés Conde 1979; Adelman 1990; Banzato 2013).

It is plausible that limited development in land and credit markets in Argentina was reinforcing. From colonial times through the 19th century, most frontier land was acquired by large landowners. Even where they might secure open lands, tenants could not do so if they required credit. Access to credit required collateral, but without credit they did not have property as collateral. Because tenants moved frequently, their credit histories would have been sparse. They generally could not get mortgages, nor could they rely on a network of neighbors or family members as in the Midwest. Instead, tenant farmers relied on informal credit from local merchants to cover any short-term costs of production and consumption until harvest, when the loan was to be repaid (Adelman 1990, pp. 81–82). Furthermore, creditor protection was much weaker in the Spanish legal tradition than in the British one (La Porta et al. 1997, 1998). Finally, landowning elites may have had reasons to oppose credit market expansion via the entry of banks, fearing that easier access to land would provide tenants with an outside option. This pattern is similar to that noted by Rajan and Ramcharan (2011) for the US South in the early 20th century.

6.3. Immigration Patterns and Investment in Rural Human Capital

As noted above, difficulties in access to land, which were the flip side of the persistence of large estates, may have discouraged permanent immigration. In contrast to the United States, migrants could not expect to own land; they could be tenants or short-term laborers during harvest, and they often returned to home countries after harvest (Ross 1917, pp. 8–9, 126; Solberg 1971, p. 40; 1987, pp. 141, 149). Nearly 50 percent of Italian immigrants, who were from the most common country of origin, returned to their home country between 1857 and 1924 (Wilcox 1929, p. 543). Lack of permanent migration was also associated with a higher ratio of male-to-female migrants, lower rates of family formation, and lower population densities (Ross 1917, pp. 8–9, 13, 216–28; Estabrook 1926,

p. 60; Wilcox 1929, pp. 395–96, 539–40; Solberg 1971, p. 48; Adelman 1994, pp. 8, 63–88, 104–31, 147–67).

These patterns were also bound to affect investment in education. Temporary migration and low rates of family formation limited opportunities to collectively organize local school districts as occurred in the Midwest and reduced overall demand for the education of children (Scarzanella 1984, pp. 16–18). With temporary short-term tenants and farm laborers, landowners had little incentive to invest in education for their employees. Scarzanella (1984, p. 13) reports that the tenants in her samples were illiterate. Solberg (1971, p. 22) claims that the 1931 local censuses on education revealed that the bulk of rural children in the Pampas had not attended any school and could not read or write. Taylor (1948, p. 316) claims that even as late as the 1940s, 10–20 percent of rural children between the ages of 6 and 13 in the Pampas had had no education. The lack of education contributed to a rural labor force with limited human capital (Scobie 1964, p. 63; Scarzanella 1984, p. 7; Campante and Glaeser 2018, pp. 2, 12–14).

The connections between access to land and immigration, population density, and education were not lost on contemporaries. The land policies of Avellaneda and Sarmiento were meant to foster immigration and denser settlement, and they sought to complement these policies with public investments in education, in the end with limited success.

By contrast, in the US Midwest in the late 19th and early 20th centuries, owners of small farms invested in schooling for their children with an emphasis on practical subjects aimed at understanding and using new technologies, cropping patterns, and shifts in market opportunities. The Northwest Ordinance of 1785 set aside section 16 of each survey township for public schools (Libecap and Lueck 2011). School governance was decentralized as a local effort (Goldin 1998, pp. 347, 351; 2001, p. 279; Goldin and Katz 2010; Go and Lindert 2010, pp. 3–16). Farm families captured many of the returns, including higher wages due to the quality of the labor force that migrated to Chicago and other urban areas (Campante and Glaeser 2018).

6.4. Agricultural Labor Unrest and Political Instability

Another likely implication of tenancy contracts in Argentina was the higher prevalence of agricultural labor strikes, induced in part by the misalignment of incentives between owners and tenants. Solberg (1971, pp. 24–30, 36) and Scarzanella (1984, pp. 2, 12) describe strikes by tenants in the Argentine grain belt during critical sowing and harvest periods in 1912, 1913, 1917, 1919, and 1930. About 70,000 farm workers, two-thirds of whom held 2- or 3-year tenant contracts on plots of 150–200 hectares (371–494 acres) were involved, halting farm work and in some cases destroying crops across the grain regions of Santa Fe, Entre Rios, Córdoba, and Buenos Aires Provinces (Solberg 1971, pp. 24–26). Their efforts were coordinated by the formation of a tenant cooperative, the Federación Agraria Argentina. During the strikes, workers withheld labor and demanded

lower rents, longer contract tenures with a minimum of 4 years, and, later, overall landownership reform (Solberg 1971, pp. 40–52; Scarzanella 1984, pp. 11–12). There was nothing comparable in the US Midwest among owners of small farms and their family labor nor among US farm tenants, whose incentives were more aligned with owners'.

In his study of labor strikes and militancy in the Pampas, Solberg (1971, p. 37, nn. 51, 65) argues that political instability resulted, and this setting contributed to the well-known political volatility of Argentina across the 20th century. With limited access to land following from property rights allocation and the general absence of collateral to secure it via land markets, agricultural laborers remained landless. Landownership and wealth were concentrated. The sense that the economy was not open to new entry encouraged resort to the political arena for redistribution. This ignited opposition from wealthy, landowning elites. These political conflicts were ongoing and characterized Argentina, even after the economy became more urban and industrial.

7. Concluding Remarks

Guided by insights of Harold Demsetz, we have examined how different property rights to land in the United States and Argentina—influenced by the legacies of colonial practices—affected the costs and expected returns of land market exchange. In the US Midwest, land was distributed in small parcels as a commercial asset. Following investment in rights demarcation and measurement under US land laws, property was easily exchanged. When compared with Argentina, the US setting approximates Demsetz's thought experiment: when trading costs are low, market exchanges enable adjustments in scale, organization, and output mix.

In the Argentine Pampas, land was distributed in estancias, and property rights granted commercial value and social and political status. These bundled attributes were difficult to measure and verify, which limited trade. Estancia owners sought to retain their properties across generations to preserve their positions, which further limited exchange. Overall, the costs in trade were higher, and market-generated changes were less frequent and less extensive (see Demsetz 1964, pp. 13–15).

Our conceptual framework based on Demsetz's work and the empirical patterns that we document present an alternative narrative to studies that emphasize geography as a primary driver of differences in economic, social, and political outcomes. Our empirical analysis is based on subnational data from the Argentine Pampas and the US Lower Midwest, two regions with very similar geoclimatic features. We find that Argentina's distinctive agricultural organization—large farm sizes, specialization in ranching, and prevalence of cash tenancy—cannot be explained by differences in geography and climate. Moreover, we show that farm size across locations in the Pampas was less responsive to local variation in geoclimatic factors.

One of the key takeaways from our analysis is that property rights regimes and the costs of exchange not only influence the organization of production but also condition the subsequent evolution of property rights. Demsetz (1967, p. 350) suggests that a property rights regime that limits how producers can respond to profit opportunities creates incentives to change or resort to different institutional arrangements. While there were fluid property rights adjustments in the United States from colonial times onward to promote entry, exchange, and the commercial value of land, this was not the case in Argentina, where landowners had incentives to oppose policies favoring widespread landownership. In this context, in response to new product market opportunities in grain cultivation, Pampas' landowners turned to labor markets, which were not affected by the same constraints. Instead of selling parts of their large landholdings, they rented plots to tenants through short-term, constrained cash contracts. The *estancia mixta* system enabled a shift in the production mix, while estancieros retained ownership, status, and control over investment decisions.

If there were direct costs created by Argentina's peculiar agricultural organization, they were not serious enough to preclude a massive expansion of its agricultural exports in the late 19th century and early 20th century. However, longer-term impacts may have been more relevant. The large literature that examines the causes of Argentina's poor economic performance emphasizes concentration in landownership as a potential cause. Our analysis offers an explanation as to why land concentration emerged and persisted in the property rights regime and how this affected agricultural organization. This organization, in turn, may have hindered the development of capital and land markets, limited investments in rural human and physical capital, encouraged agricultural labor unrest, and contributed to political instability.

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