Land Conflict, Property Rights, and the Rise of the Export Economy in Colombia, 1850-1925

Fabio Sánchez Torres
Antonella Fazio Vargas
María del Pilar López-Urbe

16

SEPTIEMBRE DE 2008

Serie Documentos Cede, 2008-16
ISSN 1657-7191

Septiembre de 2008

© 2008, Universidad de los Andes–Facultad de Economía–Cede
Carrera 1 No. 18 A – 12, Bloque C.
Bogotá, D. C., Colombia
Teléfonos: 3394949- 3394999, extensiones 2400, 2049, 2474
infocede@uniandes.edu.co
http://economia.uniandes.edu.co

Ediciones Uniandes
Carrera 1 No. 19 – 27, edificio Aulas 6, A. A. 4976
Bogotá, D. C., Colombia
Teléfonos: 3394949- 3394999, extensión 2133, Fax: extensión 2158
infeduni@uniandes.edu.co
http://ediciones.uniandes.edu.co/

Edición, diseño de cubierta, pre prensa y prensa digital:
Proceditor Ltda.
Calle 1C No. 27 A – 01
Bogotá, D. C., Colombia
Teléfonos: 2204275, 220 4276, Fax: extensión 102
proceditor@etb.net.co

Impreso en Colombia – Printed in Colombia

El contenido de la presente publicación se encuentra protegido por las normas internacionales y nacionales vigentes sobre propiedad intelectual, por tanto su utilización, reproducción, comunicación pública, transformación, distribución, alquiler, préstamo público e importación, total o parcial, en todo o en parte, en formato impreso, digital o en cualquier formato conocido o por conocer, se encuentran prohibidos, y sólo serán lícitos en la medida en que se cuente con la autorización previa y expresa por escrito del autor o titular. Las limitaciones y excepciones al Derecho de Autor, sólo serán aplicables en la medida en que se den dentro de los denominados Usos Honrados (Fair use), estén previa y expresamente establecidas; no causen un grave e injustificado perjuicio a los intereses legítimos del autor o titular, y no atenten contra la normal explotación de la obra.

LAND CONFLICT, PROPERTY RIGHTS, AND THE RISE OF THE EXPORT ECONOMY IN COLOMBIA, 1850–1925.*

Fabio Sánchez Torres
fasanche@uniandes.edu.co¹

Antonella Fazio Vargas
a-fazio@uniandes.edu.co²

María del Pilar López-Uribe
del-lope@uniandes.edu.co³

Abstract

This research attempts to explain the poor performance of the Colombian economy in the world markets during the late nineteenth century. Based on data on exportable production at the municipal level in 1892, coffee production in 1925 and of public land allocation and land conflicts during the nineteenth and twentieth century, we found that the greatest obstacle that faced Colombian export development was the weakness of settlers' property rights in the frontier lands. The quantitative results show that in the absence of land conflicts, the municipality's exportable production would have been at least twice as much as that observed.

Key Words: Property Rights, Export Economy, Land Conflict, Titling, Frontier Expansion, Public Land, Colombia.

JEL Classification: N5, N56, N76, P14.

¹ CEDE Director at Universidad de los Andes, Bogotá. Carrera 1 # 18 A -12. Bloque C. Of 302

² Researcher at CEDE, Universidad de los Andes, Bogotá.

³ Researcher at CEDE, Universidad de los Andes, Bogotá.

CONFLICTO DE TIERRAS, EL DERECHO DE PROPIEDAD Y EL ASCENSO DE LA ECONOMÍA DE EXPORTACIÓN EN COLOMBIA, 1850–1925.*

Fabio Sánchez Torres
fasanche@uniandes.edu.co⁴

Antonella Fazio Vargas
a-fazio@uniandes.edu.co⁵

María del Pilar López-Uribe
del-lope@uniandes.edu.co⁶

Resumen

Esta investigación intenta explicar el pobre desempeño de la economía colombiana en los mercados mundiales a finales del siglo XIX. Basándose en datos de producción exportable a nivel municipal en 1892, de producción de café en 1925, de adjudicación de tierras baldías y de conflictos de tierras durante el siglo XIX y el siglo XX, se encontró que el mayor obstáculo que enfrentó el desarrollo exportador colombiano fue la debilidad de los derechos de propiedad de los colonos en las tierras de frontera. Los resultados cuantitativos muestran que en ausencia de conflictos de tierras, la producción exportable a nivel municipal habría sido por lo menos dos veces más alta de la observada.

Palabras Claves: Derechos de propiedad, Economía Exportadora, Conflictos de Tierra, Titulación, Expansión de la Frontera, Baldíos, Colombia.

Clasificación JEL: N5, N56, N76, P14.

⁴ Director del CEDE - Universidad de los Andes, Bogotá. Carrera 1 # 18 A -12. Bloque C. Of 302

⁵ Investigadora del CEDE, Universidad de los Andes, Bogotá.

⁶ Investigadora del CEDE, Universidad de los Andes, Bogotá.

Introduction

The export performance of Colombia during the wave of globalization at the end of the nineteenth century was extremely poor. Per capita exports reached only US \$6.0 the second worst performance after Haiti and barely one tenth of those of Argentina or Brazil. This article states that the Colombian economy's weak integration into the world markets at the end of the nineteenth century was ultimately the result of the weakness of settlers' formal property rights in the frontier lands. In fact, although the national legislation on public land allocation adapted to the boom of world demand for primary products, facilitating land titling and protecting the peasant settlers from large landowners' encroachments, the *de facto* power of the latter and the high transaction costs of the land titling, led to very few peasant settlers acquiring formal property titles.

The lack of formal property rights on the frontier together with opportunities of higher revenue from exports of primary goods caused the emergence of land conflicts⁷ at the end of the nineteenth century and the beginning of the twentieth century. We will show that the economic result of property rights disputes between peasant settlers and landowners was a level of exportable production much lower than its potential.

This article is divided into eight sections. The first sketches the structure of the Colombian economy after 1820 following Independence; the second presents the evolution of public lands (“*baldíos*”) granting and their legislation and how this is related to agrarian conflicts; the third presents the relationship between export agriculture and public lands, the fourth develops the conceptual framework of the relationship between property rights and land

⁷ The conflicts are defined as the peasant settlers' petitions to national authorities to restore their lands invaded or encroached by landowners.

conflicts. The fifth, sixth and seventh sections contain the descriptive statistics, the econometric model estimations and their results. Section eight concludes.

The Colombian economy during the nineteenth century

The post Independence Colombian economy was deeply rooted in its colonial past (Ocampo, 1990) and inherited most of its features. The tax, the foreign and domestic trade and the labor force structures in the nineteenth century were quite similar to those of the Borbonic period. Nearly 80% of exports were comprised by precious metals whose revenues were used to import mainly consumption goods that once taxed provided most Government's income. Thus, public finances were weak and depended mainly on customs that made up more than 50% of public revenue (Ocampo, 1990). As of labor only a small percentage of workers were free particularly those located in the urban centers. The rest worked in the Haciendas under non-wage arrangements as sharecroppers, tenants, peons or domestic laborers (Ocampo, 1990; Tovar, 1980).

In the middle of the nineteenth century, the Colombian economy started to break its colonial structure. The liberal administrations (1850- 1880) implemented several reforms including abolition of slavery, disentanglement of Church lands⁸, legislation on public land settlements, elimination of colonial taxes on *aguardiente* and on tobacco as well as tithes and fifths (Diaz, 1977; Ocampo, 1990; Melo, 1989). In addition, Colombia became a federal Republic (the United States of Colombia) and free trade policy (*librecambio*) was adopted. The Conservative party gained the presidency in 1886 and remained in power until 1930. Under the Conservative rule the federal Republic was abolished and the country

⁸ Disentanglement was the process through which church lands were expropriated in order to be publicly auctioned.

turned back into centralism, the Catholic Church recovered their privileges while the trade policy became more protectionist. At the end of the nineteenth century Colombia underwent the One Thousand days War (1898-1902), a bloody civil conflict between liberals and conservatives.

During the second half of the nineteenth century, foreign trade expanded and diversified. Precious metals reduce their importance in exports displaced by new products such as tobacco, coffee, quinine, indigo and leather (Melo, 1988). Between 1850 and 1880 exports grew in average 4% per year prompting the expansion of other sectors namely river navigation and shipping, road construction and banking (Ocampo, 1990). Nevertheless, Colombia did not develop a stable export base insomuch as the exportable production – quinine, tobacco, etc. - was short lived and just reacted to the world economic cycles.

However, only coffee consolidated as a permanent export product and remained as the chief one until the end of the twentieth century. Thus, in 1860 coffee represented nearly 8% of the country's exports; in the early 1880s, 12%; at the end of the century, around 50%; and by the middle of the 1920s, 79%⁹. The increase of coffee production triggered off the expansion of the agrarian frontier, which moved from the eastern regions of the country to the central and western areas. Before 1885 coffee production in the latter regions was small but the late 1880s and 1890s rise of the international prices (more than 50% between 1885 and 1896) spurred on its expansion. Coffee prices halved between 1896 and 1900 (from US \$15.8 to US \$ 7.0 cents) ending the boom in midst of the so-called Thousand Days War (1898–1902), which also disrupted harvests and exports¹⁰. In 1902 once the civil war was over, coffee production steadily increased until the crisis of 1929.

⁹ GRECO, *El Crecimiento Colombiano en el Siglo XX*.

¹⁰ Ocampo, *Colombia y la Economía Mundial*, p. 114.

During that expansion the colonization of public lands in the Colombian west intensified – particularly lands suitable for coffee production (see Map 1 for the location of coffee production in 1851, 1892 and 1925).

The second half of the nineteenth century and the early twentieth century were characterized by a fast economic globalization, in which capital and labor flowed between countries and trade expanded (O'Rourke and Williamson, 1999)¹¹. The economic impact of globalization and, in particular, export performance in each country depended, among others, on its factor endowment, natural resources, level of integration with world trade, domestic and foreign investment and country size. Although exports in Latin America expanded at the same pace than world trade¹² there were important differences between countries. In this region, Argentina, Chile and Brazil performed the best whereas Colombia was among the worst (see table 1).

As seen in Table 1, Argentina, Chile and Paraguay experienced a fast export growth during 1850–1912 while Colombia's was below the Latin American average. As of per capita exports Chile, Uruguay and Argentina had the highest level while Colombia the lowest. Why Colombia had such low export development? The traditional view states that external factors –namely world price cycles and low demand for Colombian products¹³- were the main causes of the poor Colombia's export development during the second half of the nineteenth century. We will challenge that explanation and will maintain that internal factors, in particular, the weakness of land property rights may have been the hidden reason of Colombia's meager integration to the world markets.

¹¹ According to Madisson (1995), at 1990 prices, world exports rose from 7,300 million dollars in 1820 to 56,200 million in 1870, 236,300 million in 1913 and 334,400 in 1929.

¹² Bulmer-Thomas (1994) *The Economic History of Latin America since Independence*, p. 56.

¹³ These hypotheses were called “production-speculation” and “lottery of goods”, (Ocampo, 1984; Bulmer-Thomas, 1994).

Land supply, property rights and land conflicts

The population growth – from two millions to five millions between 1851 and 1913 – prompted the occupation of the vacant lands (*baldíos*) in agrarian frontier areas. After Independence in 1819 and more intensely after 1850, the national Government began granting public lands or *baldíos*, process that reached momentum during 1890-1930. Before the 1870s, property rights in these frontier lands were in general weakly defined as informal agreements established the boundaries of the settlers' terrains. No need to go beyond since at the frontier land was abundant and economic opportunities from land were limited. However, the expansion of world markets after 1870 offered new economic prospects to producers of primary goods in the periphery as land prices in the New World increased¹⁴. For instance in the Colombian, the notary data on land sales for the Department of Cundinamarca show that the price per *fanegada* (0.66 hectares) rose by more than 200% between the 1850s and the end of the century¹⁵. As land became scarce, informal property rights turned inadequate. Titling became a need for agrarian producers if they wanted to take full advantage of the opportunities offered by the world markets.

Peasant settlers faced a great deal of problems and obstacles to title their occupied terrains. On the one hand, titling was costly since it involved for instance hiring lawyers and surveyors, fencing, etc.; on the other hand, local landowners were powerful and used every tool in order to prevent land titling to peasants and rather obtaining it for them¹⁶. In many occasions landowners successfully claimed the terrains already occupied by peasants.

¹⁴ O'Rourke and Williamson, *Globalization and History*: An example of these new opportunities at the world level is the drastic increase in land prices in the different regions of the world. O'Rourke and Williamson (1999) show that between 1870 and 1910 the price of land increased by 250% in the United States.

¹⁵ Sánchez et al., *Precios de la Tierra en Cundinamarca*.

¹⁶ LeGrand, *Colonización y Protesta Campesina*.

However, the latter continued occupying the lands in dispute, as they would not give up the vast economic possibilities of export economy. Hence, conflicts and legal disputes over land between peasant settlers and landowners were just the result of the weakness and instability of formal property rights in the frontier in a context of expected higher land returns.

According to LeGrand (1988), the legislation on public land allocation during the nineteenth century had two phases. The first, from 1820 to 1873, had fiscal motivations, in particular to cover the expenses of the war of Independence¹⁷. The central government issued bonds that were exchanged for public lands. This policy meant that most of the public lands were allocated to rich businessmen and landowners. After 1873, land titling policy was redirected to bring it more in line with the economic changes set off by export economy. Thus, law 61 of 1874 and law 48 of 1882 established that those settlers who occupied terrains for five years or more and made productive use of them would be awarded property titles¹⁸. The legislation limited as well the concentration and unproductive use of the land¹⁹. However, the high costs of the titling process impeded most of the settlers in the frontier lands to establish formal property rights²⁰. In addition, to the low capacity of central government to enforce land laws at local level facilitated to

¹⁷ The expenses of independence included both internal and foreign debts and payments to war veterans, their creditors or legitimate children, who were compensated with lands of approximately 10 hectares (Parsons, 1997).

¹⁸ LeGrand (1988) mentions that the legislation protected the settlers, guaranteeing them the property rights of any *baldíos* they took over, thus preventing their expulsion from the lands that they occupied. Articles 2, 5 and 6 from law 48 of 1882 are examples of such legal protection. Article 2 indicated that the land cultivators would be considered “good faith” owners and therefore could not be deprived of the property unless a sentence ruled otherwise. Article 5 declared that should there be a case in which the cultivator lost the property through a ruling, he could not have the land he occupied taken from him until he was compensated with the value of the improvements he had made to the land. Lastly, article 6 stipulated that the agents of the public Ministry must support the cultivators of *baldíos* in any case of land dispute against them.

¹⁹ LeGrand, *Colonización y Protesta Campesina*; Parsons, *La Colonización Antioqueña*; Brew, *El Desarrollo Económico en Antioquia*. Law 48 of 1882 established that the maximum allocation would be 5,000 hectares. In 1912 it was reduced to 2,500. The law also determined that if the land remained unproductive for more than ten years, it would return to government’s hands (LeGrand, 1988).

²⁰ The transaction costs of titling included – among others – surveyors and lawyers’ fees, headed paper and, stamps charges and property registration (LeGrand, 1988).

landowners either the occupation of vacant public lands or the encroachment of those being exploited by settlers²¹. In an environment of growing economic opportunities for agricultural activities, the interaction between the settlers' informal rights and the increase in the land returns and export prices led to land conflicts²².

Policies to liberalize land during the second half of the nineteenth century were implemented by the liberal party administrations as it was believed that the concentration and immobility of that factor curbed economic progress. Granting or selling of public lands, disentanglement (expropriation) of church goods and dissolution of indigenous territories (*resguardos*) were the chief policies implemented to increase the land available for economic exploitation. Thus, between 1850 and 1930 land policies brought about that nearly 6% of the inhabited Colombian territory ended up in private hands.

Between 1850 and 1930 land granting experienced various cycles as shown in Graph 1. Before 1850 only around twenty square kilometers per year were titled, from 1850 to 1865 such figure reached ninety as the export economy began to flourish and during the 1870s with quinine and tobacco export boom land granting rose to nearly 4,000²³. The 1880s reduction of titling was followed by a recovery that started in 1886 as a new cycle of export growth began reaching a 3,000 square kilometer peak in 1891-1895²⁴. Land titled had its lowest levels during 1901-1905, following the Thousand Days War. As seen in Graph 1 once the war ended, land titling increased achieving its highest levels during 1920-1925. Graph 1 also presents the number of public land grants, which not always followed a pattern

²¹ LeGrand, *Colonización y Protesta Campesina*.

²² Alston et al., "Violence and the development of property rights", p. 152.

²³ Although exists data from 1827, the quantity of land granted between 1827 and 1850 was low, since the government did not encourage as much the colonization of frontier lands that through their sale were rather regarded as a source of fiscal revenue (LeGrand, 1988).

²⁴ According to LeGrand (1988), with the extinction of the tobacco and quinine boom, the granting process slowed down until the beginning of the coffee boom. LeGrand, *Colonización y Protesta Campesina*, p. 72.

similar to the quantity of square kilometers titled. Before 1900 the rise of the number of allotments (titling) coincided with the increase of land titled. In contrast, during 1900-1915 as land allotments intensified quantity of land titled grew at lesser pace implying that the size of the lots assigned was much smaller.

According to table 2 during 1853–1873, 61% (318) of the titling allotments comprised land granted to peasant settlers (*a titulo de cultivador*)²⁵ and 39% (206) public land sales to landowners. Nevertheless, one important difference between the two types of land allocation rested in the size of the terrains titled. As table 2 shows, from 1853 to 1873, 77% of the area titled was acquired through bonds and 23% was granted for free to peasant settlers.

During 1874 to 1892, when legislation was more favorable to squatters, 68% (413) of land allotments were granted to them and the remaining allotted through bonds to landowners. However, 69% (4,166.59 km²) of the quantity of terrains consisted of sales, while 31% (1,913.19 km²) grants to peasant settlers. Thus, the size of plots assigned through bonds was in average of 2,000 hectares while squatters' plots reached in average 600 hectares. Hence, despite national government policies intended to favor and to attract those who would occupy small parcels, most of the land titled ended up in landowners hands.

As LeGrand (1988) shows, the increase in the number of agrarian conflicts was the result of the usurpation by landowners of squatter occupied lands in the frontier. From 1827 to 1869, just one agrarian conflict was registered, 69 during 1870-1900, 137 between 1901 and 1917 and 241 from 1918 to 1931. Two factors influenced the rise of the land conflicts after 1870, first of all higher demand for land titles by peasant settlers and secondly the landowners'

²⁵ Article 1 of law 48 of 1892 stipulated that who cultivated public lands for at least five years would get for free the right over the exploited land plus another neighboring terrain of equal size.

encroachments of the same terrains prompted by larger expected land returns. According to the type of titling, 63% of the land conflicts occurred in municipalities where land was allotted through bonds, while 36% occurred where it was granted to peasant settlers²⁶. This pattern suggests that during the nineteenth century landowners intended to expand their lands where they already had properties. Thus, the agrarian conflicts arose as a consequence of a slow titling process of public lands occupied by peasant settlers in an environment of primary export opportunities.

Export agriculture and public lands at the end of the nineteenth century

During early 1890s, the country began to recover from the export crisis of the previous decade that led to the disappearance of quinine. Increase in coffee prices, in production of precious metals and in tobacco exports marked the late 1880s economic recovery and the start of a new era of export development²⁷. Table 3 shows the value of harvests for five exportable products (tobacco, coffee, cacao, sugar and plantain) in 1892²⁸. The data source is the 1892 census of exportable products carried out at municipal level. Coffee with 38.9% had the highest share in production followed by plantain with 25.3%, tobacco with 14.3%, and cacao with 14.1% and, lastly, sugar with 7.5%. Although plantain was exported in very low quantities the census' authorities included it among the exportable products. According to the census the 1892 total value of exportable production was 6,817.7 thousand pesos, of which 4,164.8 corresponds to products other than coffee²⁹.

²⁶ Authors' calculations based on data from Gaceta Oficial (1854, 1856, 1858–1861), Registro Oficial (1862–1864), Diario Oficial (1865–1931) and LeGrand (1988).

²⁷ Ocampo, *Colombia y la Economía Mundial*, p. 113.

²⁸ Exportable products are understood to be all products that could potentially be exported.

²⁹ These figures are consistent with Ocampo's (1984) estimates of exports excluding coffee and precious metals that reached 3,804.1 thousand pesos in 1891 and 3,409 in 1894. For instance, 1892 tobacco production totaled 4,526 tons which is coherent with the 3,500 tons of exports that Ocampo (1984) estimates for 1891. Although the census and Ocampo's (1984) calculations use different methodologies and sources, the basic

Table 4 presents for each department its percentage share of 1892 exportable production in pesos, of 1892 coffee production in pesos and of 1925 total number of coffee trees. Each departmental figure results after adding up production, in one case, across municipalities where public lands allotments occurred and, in other case, across neighboring municipalities of the former (located at a maximum distance of 25 kilometers).

Table 4 shows that 45% of 1892 exportable production took place in municipalities with public land allotments during 1827- 1892. Such percentage reaches 82% if exportable crops of neighboring municipalities (located within 25 kilometers) are included. Coffee production in 1892 and 1925 number of coffee trees has the same pattern. Consequently table 4 reveals that exportable production established itself mainly in the frontier lands or, in other words, in places either that experienced public land titling or near to them. The significance of the agrarian frontier for the export development is also evident if analysis is done by departments.

Thus, 100% of 1892 export production grew in departments as Córdoba, Huila, Norte de Santander, Quindío and Risaralda in municipalities with allotments of public lands or in their neighboring areas. In Cundinamarca, Tolima, Bolívar and Caldas approximately 92% of their export crops located on the frontier. Moreover, 100% of the coffee production in Quindío, Risaralda and Córdoba and 92% of Huila's was harvested in frontier lands. In 1925, when coffee was already consolidated as the chief export product, between 80% and 100% of the grain was picked in the frontier lands of Cesar, Magdalena, Huila, Risaralda and Valle del Cauca, Quindío and La Guajira.

principle that production cannot be lower than exports (in the absence of re-exports) is validated. See Ocampo, *Colombia y la Economía Mundial*, pp. 106–107.

Land conflicts and the export economy: a theoretical framework

As world demand for primary goods augmented so did exportable production in frontier. Growing international demand drove up expected returns and market prices of local lands. In a milieu of informal property rights, squatters got incentives to title their terrains and landowners were incited to encroaching them. Thus, titling demand from peasant settlers increased as well as conflict or disputes over land. Graph 2 shows that greater dynamics of land titling coincided with rise in international export prices, while periods of lesser land titling activity matched lower international prices.

However, despite the incentives for exportable production, it was limited by the lack of formal property rights of peasant settlers and by the conflict and disputes over squatters' terrains. Two factors impeded a wide spreading of formal property rights among squatters: the high cost of titling and the central government's low capacity to enforce land laws at a local level that facilitated landowners' to appropriate for themselves encroached lands. Hence, it is argued that the mentioned aspects contributed quite negatively to Colombia's performance in the world markets at the end of the nineteenth century and even to long-term export performance in the twentieth century.

Graph 3 formalizes the relationship between property rights and land conflict for a Colombian frontier municipality. Panel A shows the market of formal property titles for the peasant settlers whose demand depends negatively on the titling costs. The demand curve takes the value of one when it cuts axis x (percentage of formal titles). At this point the entire frontier land will be titled as titling costs are equal to zero. The supply curve reflects

the government's capacity to offer titles and depends positively on the titling costs. It is assumed that as titling costs rise the government will increase titling activity (more bureaucracy opening of new offices, etc.) and thus encourage settlers to get formal property rights. The equilibrium at panel A determines the percentage of settlers' lands with formal property titles.

Panel C contains the "market of land conflicts". The supply of conflicts, i.e. land encroachments by local landowners will grow as their power relative to the central government's increases. The demand for land conflicts by central government authorities will depend on its capacity to enforce national land laws at local level and protect peasant settlers from encroachments. In other words, it depends as well on landowner relative power³⁰. Thus, the quantity of land conflicts at the local level will be determined by the relative strength of the *de facto* institutions -power of the landowners- relative to the *de jure* institutions ability of the central government to enforce the law or institutional order at local level. The equilibrium of the "market of land conflicts" is established at point *c1*. For instance, if the supply curve of land conflicts cuts the demand curve at point K on the axis *x*, the power landowner would be low and zero the quantity of land conflicts.

The simultaneous equilibrium of the markets of titles and conflicts is shown in Panel B, where the relationship between the percentage of land titled and the number of conflicts is set up. As occurred before 1870, if the expected land returns are relatively low, the equilibrium would involve low levels of conflict and titling (point *b1* in the panel B). Now, if market opportunities improve – as happened after 1870 because of the boom in world markets – demand curve for land titling shifts to point *a2*, as depicted in Panel A. Such

³⁰ For the Colombian case, LeGrand (1988) maintains that the national power was very weak in relation to the local power, meaning the landowners had incentives to encroach on and manipulate the acquisition of lands. LeGrand, *Colonización y Protesta Campesina*, p. 80.

shift would indicate greater colonization of public lands and more titling activity at higher costs.

In panel C, the supply curve of land conflicts shift to the right to c_2 as a result of the higher expected profits from agricultural activities that encourage landowners to encroach peasant terrains. The movements of the demand curve for titles in Panel A and of the supply curve of conflicts in Panel C shifts, in Panel B, the locus “conflict – percentage of titling” to the new point of equilibrium b_2 . Thus, the new equilibrium b_2 reflects larger amounts of both land conflicts and land titling.

Descriptive statistics

Table 5 presents the descriptive statistics of the dependent and some independent variables of the model to be estimated. Column 1 shows the variable mean by municipalities; column 2, the standard deviation and columns 3 and 4, their minimum and maximum values. The first three dependent variables are the logarithms of the municipal per capita production (in pesos of 1892) of the exportable products (total exportable, exportable without plantain, only coffee). The last dependent variable, coffee in 1925, is the logarithm of the number of per capita municipal coffee trees.

For the purposes of the econometric estimation, it was assumed that the three types of land supply expansion (colonization of public lands, disentailment or expropriation of church lands and dissolution of indigenous lands - *resguardos*) not only influenced exportable production in the municipality where they took place, but also in the neighboring ones, though in a decreasing fashion. In order to observe such spatial effect, we calculated the variables: “distance to public lands, 1850–1892”, “distance to disentanglements” and

“distance to dissolution of *resguardos*”. These variables take the value of 1 in a municipality where their existence is reported and 0 if the municipality is located more than 100 km away from any municipality that had the above-mentioned institutions. If the municipality does not report any of the referred types of land expansion and is located within the range of the 100 km, a value between 0 and 1 is assigned, depending on its distance to the nearest municipality that reports it.

Thus, on average, the distance to municipalities with Church lands Disentailment was 0.58 (of a maximum of 1); with public lands allotments 0.61 and with dissolution of indigenous lands (*resguardos*) 0.29. The variable “distance to colonial institutions”, based on Tovar’s figures (1988) and calculated by Duque and Sánchez (2007) – following the methodology of Naritomi et al. (2007) – is the average of the distances from the nearest one that had *Encomiendas* in 1560 and more than 20 slaves in 1800 to a municipality that did not have those institutions. That variable will be used in the econometric estimations as an instrumental variable of the land conflict. According to Table 5, the distance to municipalities with *Encomienda* was 0.75 (of a maximum of 1); with *slavery* (more than 20 slaves in 1800) was 0.29, with public lands allotments 0.61 and with dissolution of indigenous lands (*resguardos*) 0.29. Table 5 also shows that 15% of the municipalities reported land conflicts during 1850–1917 and 21% during 1827–1931.

Empirical model

The econometric strategy seeks to relate the relative strength of the property rights expressed in the existence of land conflicts with the exportable production at municipal level. For this, the following model is estimated:

$$Y_{j,i} = \beta_0 + \beta_1 Geography_i + \beta_2 Land\ sup\ ply_i + \beta_3 Pr\ oduction_{1851i} + \beta_4 LandConflict_{ij_i} + \varepsilon_i$$

where Y_{ji} is the production of exportable products in the municipality i for the year j (where j is 1892 or 1925). For 1892, the exportable production included tobacco, coffee, sugar, cacao and plantain; $Geography_i$ is a matrix with the variables of altitude, soil fertility, precipitation, rivers in kilometers, temperature, humidity, the distances of each municipality to the main cities and the distance to Cauca river; $Landsupply_i$ is a matrix with the variables of dissolution of *Resguardos*, church land disentailments and public land titling. The variables take the value of 1 in a municipality that reports having them, and a value of between 0 and 1 that depends on the distance to the nearest municipality that had them. $Production_{1851i}$ is a matrix with dummy variables for the production of sugar, tobacco, cacao, plantain and coffee in municipality i in 1851; $LandConflict_i$ takes a value of 1 if any land conflicts occurred between 1827 and 1917 and 0 if not³¹.

Nevertheless, as conflict arises due to the interaction of higher expected land returns (new international markets for exportable goods) and the existence of informal property rights, the variable *Landconflict* may be endogenous to the exportable production activity. Thus, it is needed the use of instrumental variables in order to avoid the possible bias of the estimators. The instrument used was “distance to colonial institutions”. We use this variable under the assumption that the nineteenth century power of the central government was stronger in those places where these institutions existed and that this strength diminishes with the distance. In order to construct the variable “distance to colonial institutions”, we determined the localization of both the *Encomiendas* in 1560 and the places with more than 20 slaves in 1800³². *Closeness to colonial institutions* is an average

³¹ As observed, the time span for land conflict goes beyond 1892 the year of production census. That is the case because if the existence of a land conflict reflected the weakness of the formal property rights, this weakness should have emerged 20 or 30 years before the settlers began the legal process of land restitution. Such process may have started for instance in 1910 but the dispute between the peasant settler and the landowner as early as 1880 or before.

³² Tovar, *Grandes Empresas Agrícolas y Ganaderas*; Tovar et al., *Convocatoria al Poder del Número*.

of the distance from the closest municipalities with *Encomienda* and the existence of more than 20 slaves. It takes the value of 1 in municipalities that had the presence of both institutions and 0 at more than 100 km distance of a municipality with any of these institutions.

A value between 0 and 1 was assigned to each municipality where there was no *Encomienda* or there were less than 20 slaves, but it was located at less than 100 km distance of the nearest municipality with any of these variables. The value was determined by the average of the closest distance of the municipality without *Encomienda* to one with *Encomienda* and of the municipality with less than 20 slaves to one with more than 20 slaves. This means that these new variables should be able to explain the existence of land conflicts and at the same time should not determine the exportable production in 1892.

Thus, the equation for land conflicts takes the following form:

$$LandConflict_i = \alpha_0 + \alpha_1 Geography_i + \alpha_2 LandSupply_i + \alpha_3 Production_{1891} + \alpha_4 ClosenessColonialInstitutions_i + \nu_i$$

where *ClosenessColonialInstitutions_i* is the central government's influence in a determined municipality³³. In the municipalities where these institutions existed, the central government authority at the end of the nineteenth century was stronger and it could better enforce the land laws and property rights at the local level than in those where such authority was weak or did not exist at all. Historically the Spaniards settled in places where indigenous labor force was abundant and in these locations the formal land property

³³ Based on the visits of 1560 transcribed by Tovar (1988), it can be said that the Spaniards began to found "villages of Indians" in the places that had indigenous populations, as they needed to use them as a workforce. Similarly, the slave population was used to work in economic activities, such as gold extraction, domestic work in some urban centres or on the sugar or cotton plantations (Colmenares, 1999). In this way, the existence of tributary Indians and of slaves reveals the presence of the State and of the Spanish colonial institutions.

rights established were a concession of the Spanish Crown³⁴. Thus, the regions with colonial institutions would have less conflicts either over the land already titled or to be titled. In addition, in these regions the Crown enforced the law through its bureaucracy and institutions creating a tradition of compliance that must have persisted after Independence.

As the central government was more resilient, it discouraged the encroachment onto peasant settlers' lands by landowners, reducing the existence of conflicts. As there is no ground to expect that the existence of the *Encomienda* or of slaves during colonial times explain export performance in 1892 or in 1925, these variables are suitable instruments. In fact, the exogeneity test for the variable *ClosenessColonialInstitutions* indicates that its correlation with production of exportable products is not different from zero.

Empirical Results

Table 6 shows the results estimated with instrumental variables. We use a probit model to determine the probability of presence of exportable production and a tobit model to measure the level of exportable production. Columns 1 and 6 show the econometric results for per capita total exportable production (coffee, tobacco, plantain, sugar and cacao) measured in pesos; columns 2 and 7 exclude plantain from the export production; columns 3 and 8 include only coffee; and columns 4, 5, 9 and 10 include the per capita production of coffee in 1925 (measured in number of trees).

Table 6 also contains the first stage estimations, showing the relation between the conflicts (1827–1917) and the instrumental variable. For all probit estimations, “distance from

³⁴ Colmenares, 1999.

colonial institutions” is negative and significant at 99%, suggesting that municipalities with or close to colonial institutions in the past experienced a lower probability of land conflicts at the end of the nineteenth century. In those municipalities, the central government could more strongly enforce the land laws and deter landowners’ encroachments. The Wald test statistics allow the rejection of the null hypothesis of non-exogeneity, confirming the need to using instrumental variables.

The same table exhibits the results for exportable production (second stage). In both models, for the different production variables (total, without plantain, only coffee 1892 and only coffee 1925), *land conflicts* have a negative and significant impact on the presence and on the per capita exportable production. Thus, in those municipalities where there were land conflicts, the probability of these municipalities producing exports production in 1892 is reduced by 53%³⁵. Thus, land conflicts had a negative effect on the export development, confirming that the weakness of property rights contributed to the poor performance of the export economy and hence to the meager integration of Colombia in the international markets at the end of the nineteenth century.

As for the effects of other variables, the allocation of public land in a municipality also has a positive effect – significant at 99% – on the existence of export development, indicating that the allotment of public lands in a municipality increased in 40% the probability of producing exportable goods in 1892. Alternatively, the existence of disentailed Church assest increased that probability by 14%. Similar results are obtained if plantain is taken out of production or if production is reduced only to coffee in 1892 (see Table 6).

³⁵ This reduction is respectively 53% and 43% when plantain is excluded and only coffee in 1892 is included.

Using tobit estimation, we find that land conflict has a negative and significant coefficient for the four production variables (total, without plantain, only coffee 1892 and only coffee 1925). We confirm then that in the municipalities with agrarian conflicts, exportable production was lower than its potential. This result indicates that, in 1892 in absence of land conflicts per capita exportable production would have been at least twice as much as the observed actual production. Thus, the average per capita exportable output in 1892 was 1.49 pesos ($=\exp(0.4)$ of Table 5), whereas in the absence of land conflicts it would have been 3.73 pesos ($\exp(0.4-(0.15*(-6.12)))$). In the case of coffee production, it would have been 3.17 pesos rather than 1.19 pesos. By doing the same calculation for coffee trees in 1925, we observe that the average number of coffee trees – taken as a proxy of coffee production- was 7.02, while in the absence of conflicts, this would have been 21.2. If taken into account for a greater conflict period (1827–1931), this calculation rises to 35.5 coffee trees.

Regarding the land variables, the influences of disentailment activity and of public land titling (that take a value between 1 and 0 as explained above) in the municipality are related positively with all four exportable products (total, without plantain, only coffee 1892 and only coffee 1925). In contrast, the dissolution of *resguardos* in the eighteenth century has a negative effect although the coefficients are significant only for coffee in 1892 and in 1925.

In summary, the econometric results confirm the hypothesis that the poor integration of the Colombian economy into the world market at the end of the nineteenth century was the result of the weakness of property rights in agrarian frontier that prompted an important number of land conflicts. The peasant settlers' lack of land titles fed their fear of

encroachment, which may have inhibited them from sowing or increasing productivity to their highest potential. The limited transformation of informal property rights into formal ones, more in line with the economic opportunities of globalization, was one of the factors that heavily contributed to delay export development. The consequences of the land conflicts persisted even in the 1925 coffee production. Thus, property rights institutions (or the lack of them) have a substantial effect on economic performance, as other research has extensively confirmed³⁶.

Conclusions

This article shows the relationship between the expansion of the agrarian frontier, land conflicts and the production of exportable goods at the end of the nineteenth century. It starts out the hypothesis that land conflicts were the result of the combination of economic opportunities offered by globalization and the lack of formal property rights on the frontier. As landowners had incentives to encroach on those lands that had been occupied by peasant settlers the latter restrained themselves from sowing or investing, which may have determined that the production of exportable products were below its potential.

Our econometric evidence indicates that the land conflict had a negative effect on the potential production of exportable goods. In fact, it is estimated that, in the absence of land conflict, exportable production in 1892 could have been twice as much as the observed one and more than three times in the case of the number of coffee trees in 1925. To correct the likely endogeneity of the “land conflicts” variable, the average distance – standardized from 0 to 1 – between a municipality with no colonial institutions and the nearest one that had colonial institutions (*Encomienda* in 1560 or more than 20 slaves in 1800) was used as the

³⁶ Acemoglu and Johnson (2005) contrast the effect of the contracting institutions with the property rights institutions and they find that the latter are those that affect the most countries’ long-term economic performance, whether it be measured by income per capita or by the rate of investment.

instrument. The results also show that there was a positive relationship between the production of export goods and the public land allotments.

This article concludes that internal factors, more so than external factors, informal structure of property rights on the frontier areas and central government's incapacity to restrict the encroaching behavior of the landowners at the local level, curbed the Colombian export development during the nineteenth century.

Appendix 1

Variable	Definition	Source
Production of exportable products per capita (Log 1892)	Logarithm of the value of the production of exportable products that includes coffee, cacao, sugar, plantain and tobacco in 1892 prices.	Boletín Trimestral de la Estadística Nacional (1894)
Production of exportable products per capita without plantain (Log 1892)	Logarithm of the value of the production of exportable products that includes coffee, cacao, sugar and tobacco in 1892 prices.	Boletín Trimestral de la Estadística Nacional (1894)
Coffee production per capita (Log 1892)	Logarithm of the value of the coffee production in 1892 prices.	Boletín Trimestral de la Estadística Nacional (1894)
Coffee production per capita (Log 1925)	Logarithm of the quantity of coffee trees in existence in 1925.	Monsalve (1927)
Distance from colonial institutions	Calculated as the normalization of the average distance (between 0 and 1) of a municipality with respect to the nearest municipalities where there were <i>encomiendas</i> in 1560 and more than 20 slaves in 1800. Takes a value of 1 in the municipalities where there were both institutions and 0 if there was neither institution in the municipalities at a maximum of 100 km distance.	Tovar (1988) and Duque & Sánchez (2007)
Distance from disentanglements	Calculated taking into account the distance between the municipality in question and the nearest municipality with disentailed church properties. It takes a value of 1 when the municipality had disentailed properties and 0 if the nearest municipality with this institution was at more than 100 km distance. For those municipalities within the 100 km range, a value of between 0 and 1 was calculated, depending on the distance to the nearest municipality that reported this institution.	Archivo General de la Nación (AGN), Sección República, Fondo de Bienes Desamortizados (Rolls 1 to 30), Registro Oficial 1862–1864 and Diario Oficial 1865–1884

Distance from public lands	Calculated taking into account the distance between the municipality in question and the nearest municipality with public land awards. It takes a value of 1 when the municipality had public land awards, and 0 if the nearest municipality with this institution was at more than 100 km distance. For those municipalities within the 100 km range, a value of between 0 and 1 was calculated, depending on the distance to the nearest municipality that reported this institution.	Registro Oficial (1862–1864) and Diario Oficial (1865–1931)
Distance from dissolution of <i>resguardos</i> in 18th century	Calculated taking into account the distance between the municipality in question and the nearest municipality with dissolution of <i>resguardos</i> in the eighteenth century. It takes a value of 1 when the municipality had dissolution of protection in the eighteenth century, and 0 if the nearest municipality with this institution was at more than 100 km distance. For those municipalities within the 100 km range, a value of between 0 and 1 was calculated, depending on the distance to the nearest municipality that reported this institution.	Tovar (1980) and Tovar (1988)
Dummy conflict 1827–1917	It takes a value of 1 if the municipality had land conflict between 1827 and 1917 and 0 if not.	LeGrand (1988)
Dummy conflict 1827–1931	It takes a value of 1 if the municipality had land conflict between 1827 and 1931 and 0 if not.	LeGrand (1988)
Dummy production 1851	Matrix of variables of the production of sugar, tobacco, cacao, plantain and coffee that takes a value of 1 if the product was produced in the municipality in 1851 and 0 if not.	Geografía Física y Política de la Confederación Granadina, volumes I, II, III, IV, V, directed by general Agustín Codazzi (2002)
Geographical Variables		
Altitude	Metres above sea level.	Sánchez & Nuñez (2000)
Fertility	Index reflecting the aptitude of the land for agricultural activities (drainage, erosion, natural slopes, sodium contents, etc.).	Sánchez & Nuñez (2000)
Precipitation	Maximum rain levels per year.	Sánchez & Nuñez (2000)
Rivers	Index of extension of primary, secondary and tertiary rivers that run through the area of a municipality.	Sánchez & Nuñez (2000)
Temperature	Average degrees centigrade in the municipality.	Sánchez & Nuñez (2000)
Distance to River Cauca	Index of minimum distance of the municipality from the River Cauca.	Sánchez & Nuñez (2000)
Distance to Bogotá	Index of minimum distance of the municipality from Bogotá.	Sánchez & Nuñez (2000)
Distance to Barranquilla	Index of minimum distance of the municipality from Barranquilla.	Sánchez & Nuñez (2000)

Distance to Cali	Index of minimum distance of the municipality from Cali.	Sánchez & Nuñez (2000)
Distance to Buenaventura	Index of minimum distance of the municipality from Buenaventura.	Sánchez & Nuñez (2000)

Primary sources

- Archivo General de la Nación (AGN), Sección República, Fondo de Bienes Desamortizados (Rollo 1 to 30).
- *Geografía Física y Política de la Confederación Granadina*, volumes I, II, III, IV, V, under the direction of the General Agustín Codazzi (2002).
- *Gaceta Oficial* (1854, 1856, 1858–1861).
- *Registro Oficial* (1862–1864).
- *Diario Oficial* (1865–1931).
- *Boletín Trimestral de la Estadística Nacional* (1894).
- GRECO (2002), *El Crecimiento Colombiano en el Siglo XX, Aspectos Globales*, Banco de la República, Bogotá.
- Monsalve, Diego (1927) *Colombia Cafetera*.
- Tovar, Hermes (1988) *No Hay Caciques ni Señores*, Sendai Ediciones, Barcelona, Spain.
- Tovar, Hermes (1980) *Grandes Empresas Agrícolas y Ganaderas*, Universidad Nacional de Colombia, Bogotá.
- Tovar, Hermes; Tovar, Camilo; Tovar, Jorge (1994) *Convocatoria al Poder del Número. Censos y Estadísticas de la Nueva Granada, 1750–1830*. Archivo General de la Nación, Bogotá.

Bibliography

- Acemoglu, Aaron; Johnson, Simon (2005) “Unbundling Institutions”, *Journal of Political Economy*, vol 113, no 5, pp. 949–995.
- Alston, Lee; Libecap, Gary; Mueller, Bernardo (1997) “Violence and the Development of Property Rights to Land in the Brazilian Amazon” in *The Frontiers of the New Institutional Economics*, Drobak, John and Nye, John (Editors), Academic Press.
- Ayala, José (1999) *Instituciones y Economía. Una Introducción al Neoinstitucionalismo Económico*, Fondo de Cultura Económica, México.
- Barzel, Yoram (1997) *Economic Analyses of Property Rights*, Cambridge University Press.
- Bejarano, Jesús Antonio (1979) *El Régimen Agrario de la Economía Exportadora a la Economía Industrial*, La Carreta, Bogotá.
- Bejarano, Jesús Antonio (1988) “El despegue cafetero (1900–1928)” in *Historia Económica de Colombia*, Ocampo, José Antonio (compiler), Siglo XXI Editores, Bogotá.
- Brew, Roger (2000) *El Desarrollo Económico de Antioquia desde la Independencia Hasta 1920*, Editorial Universidad de Antioquia, Medellín.
- Bulmer-Thomas, Victor (1994) *The Economic History of Latin America since Independence*, Cambridge University Press, New York.
- Cardoso, Ciro; Pérez, Héctor (1987) *Historia Económica de América Latina*, Editorial Crítica, Barcelona.
- Colmenares, Germán (1999) *Historia Económica y Social de Colombia, 1537–1719*, Vol. 1, Tercer Mundo Editores, Bogotá.

- Duque, Valentina; Sánchez, Fabio (2007) *Instituciones Coloniales e Instituciones Republicanas en el Desarrollo Económico Colombiano: ¿Cuáles Pesan Más?*, Mimeo.
- Furubotn, Eirik; Richter, Rudolf (2005) *Institutions and Economic Theory. The Contribution of the New Institutional Economics*, The University of Michigan Press.
- Instituto Geográfico Agustín Codazzi, www.igac.gov.co.
- Kalmanovitz, Salomón (1984) “La Agricultura en Colombia durante el Siglo XIX” in *Manual de Historia de Colombia*, Volume 2, Colcultura, Bogotá.
- LeGrand, Catherine (1988) *Colonización y Protesta Campesina en Colombia: 1850–1930*, Universidad Nacional de Colombia, Bogotá.
- Maddison, Angus (1995) *Monitoring the World Economy, 1820–1992*, OECD, Paris.
- Naritomi, Joana; Soares, Rodrigo; Assuncao, Juliano (2007) *Rent Seeking and the Unveiling of ‘De Facto’ Institutions: Development and Colonial Heritage within Brazil*, Mimeo.
- North, Douglas (1990) *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, New York.
- Ocampo, José Antonio (1984) *Colombia y la Economía Mundial, 1830–1910*, Tercer Mundo Editores, Bogotá.
- O’Rourke, Kevin; Williamson, Jeffrey (1999) *Globalization and History*, The MIT Press, Massachusetts.
- Palacios, Marco (2002) *El Café en Colombia, 1850–1970*, Editorial Planeta, Bogotá.

- Palacios, Marco; Safford, Frank (2002) *Colombia: País Fragmentado, Sociedad Dividida*, Grupo Editorial Norma, Bogotá.
- Parsons, James (1997) *La Colonización Antioqueña en el Occidente Colombiano*, El Áncora Editores, Banco de la República, Bogotá.
- Sánchez, Fabio; Fazio, Antonella; López-Uribe, María del Pilar (2007) *Precios de la Tierra en Cundinamarca durante el Siglo XIX*, Mimeo.
- Sánchez, Fabio; Nuñez, Jairo (2000) “La Geografía y el Desarrollo Económico: una Aproximación Municipal”, *Desarrollo y Sociedad*, Vol. 46.
- Tovar, H (1995) *Que nos tengan en cuenta*, Colcultura-Tercer Mundo Editores
- Walton, Gary; Rockoff, Hugh (1998) *History of the American Economy*, Dryden Press, Fort Worth.
- Zambrano, Fabio; Bernard, Oliver (1993) *Ciudad y Territorio: El Proceso de Poblamiento en Colombia*, Academia de Historia de Bogotá, Bogotá.

Table 1. Annual export growth, 1850–1912, total and per capita exports in 1913
(in dollars)

	Export growth (%)	Per capita exports 1913 (a)	Total exports 1913 (b)
Argentina	6.1	67	510.3
Bolivia	2.5	20	36.5
Brazil	3.7	13	315.7
Chile	4.3	75	142.8
Colombia	3.5	6	33.2
Ecuador	3.5	12	15.8
Paraguay	3.9	10	5.5
Peru	2.9	9	43.6
Uruguay	3.4	59	71.8
Venezuela	2.7	9	28.3
Latin America	3.9	24	1588.2

a) Dollars per capita

(b) Exports in millions of dollars.

Source: Bulmer-Thomas (1994), Cardoso & Brignoli (1987).

Table 2. Land allocation by type of titling, 1853–1930.

	1853–1873	1874–1892	1893–1917	1918–1930	Total
Titles allotted to landowners through bonds	206	192	324	120	842
Titles allotted to peasant settlers through free grants	318	413	1479	266	2,476
Total number of titles allotted	524	605	1803	386	3,318
Square kilometers allotted to landowners	5,323.09	4,166.59	3,895.68	2,038.95	15,424.31
Square kilometers allotted to peasant settlers	1,627.13	1,913.19	4,409.72	3,497.17	11,447.21
Total number of square kilometers allotted	6,950.22	6,079.78	8,305.40	5,536.12	26,871.52

Source: Gaceta Oficial (1854, 1856, 1858–1861), Registro Oficial (1862–1864), Diario Oficial (1865–1931) and authors' calculations.

Table 3. Value of exportable production in 1892 (in thousands of pesos and percentages)

	Thousands of pesos	%
Tobacco	972.25	14.26
Coffee	2,652.94	38.91
Cacao	961.2	14.10
Sugar	508.31	7.46
Plantain	1,723.03	25.27
Total	6,817.73	100

Source: Boletín Trimestral de Estadística Nacional (1894), authors' calculations.

Table 4. Exportable production in municipalities with public lands allotments
(percentages).

Department	Percentage of the 1892f total production		Percentage of the 1982 coffee production		Percentage of the 1925l number of coffee trees	
	Municipalities with public lands allotments	Neighboring municipalities	Municipalities with public lands allotments	Neighboring municipalities	Municipalities with public lands allotments	Neighboring municipalities
Antioquia	13.66	48.29	20.89	65.93	19.91	60.34
Bolívar	20.53	70.27	10.75	63.21	-	100.00
Boyacá	12.86	74.23	3.57	50.72	26.65	63.23
Caldas	5.81	86.7	-	100.00	35.99	64.01
Casanare	-	-	-	-	-	6.42
Cauca	9.81	7.01	45.65	21.80	26.47	55.60
Cesar	-	-	-	-	83.63	16.37
Córdoba	100	-	100.00	-	-	-
Cundinamarca	49.83	42.51	57.36	34.81	22.70	46.02
Guajira	-	-	-	-	100.00	-
Huila	68.94	31.06	91.79	8.21	84.43	15.57
Magdalena	-	-	-	-	82.15	-
Nariño	-	55.08	-	18.78	12.35	45.89
Norte de Santander	63.39	36.29	66.06	33.60	39.82	58.74
Quindío	100	-	100.00	-	100.00	-
Risaralda	100	-	100.00	-	82.76	17.24
Santander	48.92	29.49	60.64	37.23	62.42	33.54
Sucre	3.49	-	-	-	-	100.00
Tolima	47.62	45.27	86.04	13.85	66.66	26.87
Valle del Cauca	77.15	5.58	85.42	2.45	81.95	18.05
Total	44.93	36.88	59.62	35.44	45.18	43.14

(a) Neighboring refers to a maximum distance of 25 kilometres.

Source: Boletín Trimestral de Estadística Nacional (1894), LeGrand (1988), Gaceta Oficial (1854, 1856, 1858–1861), Registro Oficial (1862–1864), Diario Oficial (1865–1893), authors' calculations.

Table 5. Descriptive statistics

Variable	Average (1)	Standard deviation (2)	Minimum (3)	Maximum (4)
Per capita production of exportable products in 1892 (in logs)	0.40	0.81	0.00	4.53
Per capita exportable products in 1892 without plantain (in logs)	0.35	0.78	0.00	5.98
Per capita coffee production in 1892 (in logs)	0.19	0.54	0.00	4.52
Per capita coffee production in 1925 (in logs)	1.95	2.21	0.00	6.86
Distance to town with colonial institutions	0.71	0.22	0.00	1.00
Distance to town with disentanglements of church lands	0.58	0.35	0.00	1.00
Distance to town with public lands allotments	0.61	0.27	0.00	1.00
Distance to town with dissolution of <i>resguardos</i> during the XVIII century	0.36	0.37	0.00	1.00
Presence of land conflicts, 1827–1917	0.15	0.36	0.00	1.00
Presence of land conflicts, 1827–1931	0.21	0.41	0.00	1.00

Source: See Appendix 1.

Table 6. Econometric results. Dependent variables: exportable production in 1892, exportable production without plantain in 1892, coffee production in 1892 and coffee production in 1925.

Methods	Instrumental Probit (marginal effects)					Instrumental Tobit				
	Production 1892 (1)	Production 1892 without plantain (2)	Coffee Production 1892 (3)	Coffee Production 1925 (4)	Coffee Production 1925 (5)	Production 1892 (6)	Production 1892 without plantain (7)	Coffee Production 1892 (8)	Coffee Production 1925 (9)	Coffee Production 1925 (10)
Panel A: Second stage										
Land conflict 1827–1917	-0.53*** (0.47)	-0.53*** (0.38)	-0.43*** (0.52)	-0.61*** (0.51)	-0.65*** (0.41)	-6.12** (3.04)	-7.81** (3.46)	-5.02** (2.51)	-7.36* (4.31)	-8.10 (5.27)
<i>Resguardos</i>	0.01 (0.22)	-0.02 (0.21)	-0.05 (0.22)	-0.25** (0.26)	-0.28*** (0.25)	-0.42 (0.53)	-0.58 (0.61)	-0.88** (0.44)	-2.36*** (0.76)	-2.97*** (1.04)
Disentailments	0.14* (0.20)	0.18** (0.21)	0.19** (0.23)	0.06 (0.20)	0.01 (0.19)	0.99** (0.48)	1.23** (0.55)	1.06*** (0.40)	0.57 (0.68)	0.33 (0.72)
Public lands	0.40*** (0.17)	0.40*** (0.18)	0.39*** (0.19)	0.30*** (0.19)	0.29*** (0.17)	2.27*** (0.85)	3.11*** (0.97)	2.37*** (0.72)	2.39** (1.22)	2.65* (1.50)
Panel B: First stage										
Colonial institutions	-0.19*** (0.07)	-0.19*** (0.07)	-0.19*** (0.07)	-0.19*** (0.07)	-0.17** (0.07)	-0.19*** (0.07)	-0.19*** (0.07)	-0.19*** (0.07)	-0.19*** (0.07)	-0.17** (0.07)
<i>Resguardos</i>	-0.03 (0.06)	-0.03 (0.06)	-0.03 (0.06)	-0.03 (0.06)	-0.10 (0.06)	-0.03 (0.06)	-0.03 (0.06)	-0.03 (0.06)	-0.03 (0.06)	-0.11 (0.06)
Disentailments	0.10* (0.05)	0.10* (0.05)	0.10* (0.05)	0.10* (0.05)	0.06 (0.06)	0.10* (0.05)	0.10* (0.05)	0.10* (0.05)	0.10* (0.05)	0.06 (0.06)
Public lands	0.23*** (0.04)	0.23*** (0.04)	0.23*** (0.04)	0.23*** (0.04)	0.25*** (0.05)	0.23*** (0.04)	0.23*** (0.04)	0.23*** (0.04)	0.23*** (0.04)	0.25*** (0.05)
p value sets										
p value for geographical variables set	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
p value for production variables set 1851	[0.65]	[0.73]	[0.90]	[0.67]	[0.72]	[0.33]	[0.60]	[0.85]	[0.04]	[0.03]
Number of observations	733	733	733	733	733	733	733	733	733	733
Wald Test	chi2 = 6.98 > 0.0082	chi2 = 9.13 > 0.0025	chi2 = 5.69 > 0.0171	chi2 = 6.93 > 0.0085	chi2 = 6.78 > 0.0092	chi2 = 4.23 > 0.0398	Chi2 = 5.26 > 0.0218	chi2 = 3.94 > 0.0472	chi2 = 3.07 > 0.0798	chi2 = 2.57 > 0.1090

Panel A: Reports the second stage of the estimation both of the probit and the tobit for the dummy of export production for 1892 and 1925 and log of the export production per capita as dependent variables, respectively.

Panel B: Reports the first stage for the two models with conflict (1827–1917) as a dependent variable. The explanatory variables are the average distance from *Encomienda* for the year 1560 and from municipalities with more than 20 slaves in 1800; the other regressors used in panel 1 are included.

Columns (5) and (10): These estimations were made taking the variable *conflict 1827–1931* as the instrument, to approach the whole period of public lands awards. Standard error in brackets.

Graph 1. Number of transactions and square kilometers of public lands titled 1850–1930 (in five-year periods).

Source: Gaceta Oficial (1854, 1856, 1858–1861), Registro Oficial (1862–1864), Diario Oficial (1865–1931), and authors' calculations

Graph 2. Number of public lands allotments and export price index, 1850–1910.

Source: Gaceta Oficial (1854, 1856, 1858–1861), Registro Oficial (1862–1864), Diario Oficial (1865–1893), Ocampo (1984) and authors' calculations.

Graph 3. Graphical analysis of land titling and land conflicts.

Map 1. Presence of coffee production in 1851, 1892 and 1925.

Source: Geografía Física y Política de la Confederación Granadina, volumes I, II, III, IV, V (2002), Boletín Trimestral de Estadística (1894), Monsalve (1927).