Exports and Inequality: Evidence from the Brazilian Frontier, 1870–1937

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In order to examine the relation between exports and inequality, this article first estimates per-capita income, exports, and other indicators of economic development in Mato Grosso, Brazil. Manuscript data are analyzed to measure and interpret three kinds of inequality: of income, of total wealth, and of landholding. The results suggest that exports and foreign ownership contributed far less to inequality than is imagined in dependency theory.

Did export-led growth, foreign investment, and economic development breed inequality in Mato Grosso, a frontier state in western Brazil? If so, then Mato Grosso faced a "harsh dilemma" in the trade-off between growth and equality, for exports did add substantially to per-capita incomes on the frontier.[1] If greater inequality was associated with rising exports and foreign investment, then Mato Grosso's experience buttresses the arguments of dependency theory. If, however, the relationship was weak, then the mainstream economists' argument for the benefits of trade is borne out: *ceteris paribus* with regards to economic justice, more wealth is better than less. In analyzing the relation between growth and equality, this article addresses two related questions: How unequal was wealth distribution on the frontier? And what caused variations in measures of inequality over time and space?

HISTORICAL CONTEXT

The economy of Mato Grosso was nothing if not dynamic in the decades following 1870. As large as Alaska, Mato Grosso had just 60,000 inhabitants in 1872, the year of Brazil's first census, but natural increase and immi-

[1] The term "harsh dilemma" is due to Gary Fields, *Poverty*, p. 85. Fields himself finds no systematic evidence of a relation between income growth and increasing inequality in his own multicountry study. The idea that such a harsh dilemma might exist is attributable to Kuznets's "inverted U" hypothesis, originally articulated in "Economic Growth."

gration raised this number to 430,000 by 1940.[2] As a test case, Mato Grosso presents both advantages and disadvantages. On the one hand, it serves reasonably well as representation of the Latin American experience as a whole: its export growth broadly mirrored that of the Latin America as a whole, as did its factor endowments—land was plentiful, labor less so, and capital least of all. On the other hand, Mato Grosso was a distinctively frontier region: its sparse population, limited transport network, and relative isolation from the national market set it apart from densely populated, better integrated, coastal Brazil.

The years under study can be grouped into three general periods. The first, 1870–1889, includes the abolition of slavery (1888) and the fall of the Brazilian Empire (1889). This period was marked by wartime destruction (Mato Grosso was invaded during the Paraguayan War) and then gradual recovery based on slow growth of exports, mainly cattle products (hides and jerked beef) and *erva mate* (Paraguayan tea). As such, it signifies a limited insertion of Mato Grosso into the nineteenth-century world market. For the most part, however, the frontier remained isolated. The persistence of slavery, moreover, distorted the nature of capitalism and class on the frontier.[3] The second period begins with the Republic in 1889 and runs to 1917. During this time, exports increased dramatically as Mato Grosso participated in the Rubber Boom and expanded its cattle-ranching industry. The third period, from 1918 to 1937, saw the Rubber Bust and end of the First World War combine to create a crisis in Mato Grosso's export markets and capital sources. During this same period, as if in compensation, the state's economy was increasingly tied to coastal markets via new railroad links and live cattle shipments.[4]

THEORETICAL CONTEXT: DEPENDENCY AND THE NEW ECONOMIC HISTORY

Few economists need to be convinced of the probable benefits of export promotion in developing countries. As Jagdish Bhagwati points out, only the radical fringe of development economists continue to excoriate export-led growth as authoritarian and immiserating.[5] Nevertheless, dependency theory, generally critical of reliance on exports and foreign investment as sources of economic development, remains dominant in mainstream textbooks on Latin American history.[6]

[2] Census data cited in Corrêa Filho, *História*, pp. 635, 637.

[3] Volpato, *Cativos*, pp.16–17.

[4] For the role of cattle shipments in the Mato Grosso's integration into the national market see Wilcox, "Cattle Ranching," pp. 235–38.

[5] Bhagwati, *Wealth and Poverty*, p. 20.

[6] One commonly assigned textbook in undergraduate Latin American history courses claims to "[provide] a comprehensive, authoritative, and in-depth introduction to Latin American history set

The success of export-led development in Latin America in the period 1870–1914 is usually ignored, obfuscated, or denied by dependency theorists and their world-systems colleagues. There are two main strands of dependency thinking. The first, orthodox dependency, is identified with Andre Gunder Frank's claim that export orientation was immiserating though "surplus drain" and the "development of underdevelopment"; a second strand, unorthodox dependency, is associated with Fernando Henrique Cardoso's critique of trade and foreign investment on the grounds that they concentrated wealth and led to "associated dependent development."[7]

The continued dominance of dependency theory in Latin American studies, in spite of major empirical doubts raised by economists, has led Stephen Haber to criticize it for a lack of testable hypotheses and empirical rigor.[8] This lack of falsifiable propositions, unfortunately, makes any empirically grounded critique of dependency doubly difficult. One is in the position of trying to imagine how dependency arguments might translate into quantifiable questions; and one faces the "heads I win, tails you lose" strategy employed by dependency theorists when contrasted with data that seemingly contradicts their underlying thesis.

Because of the difficulty in operationalizing dependency theory, and its currently moribund status outside of Latin American studies, the primary focus of this article is on simply describing the frontier economy in Mato Grosso and examining patterns and sources of inequality. But to the extent that archival data illuminates these relationships, the research presented here speaks to the substance of one of dependency theory's strongest claims.

EXPORT ORIENTATION AND ECONOMIC GROWTH

Exports and national incomes raced ahead in tandem in many Latin American countries in the decades prior to the First World War,[9] *pace* dependency theory claims to the contrary,[10] and Mato Grosso was no exception. To be

within the broad interpretive framework of dependency theory." The textbook is Benjamin Keen's *A History of Latin America*; the quotation is from the publisher's note on the back cover. See also Skidmore and Smith, *Modern Latin America*, pp. 48–49, for another example of a major textbook adopting a dependency framework.

[7] For a clear exposition see Packenham, *Dependency Movement*, pp. 7–53. See also Frank, *Capitalism and Underdevelopment*, and, still holding to the surplus-drain thesis in 1998, *ReOrient*, pp. 41–42; and Cardoso and Faletto, *Dependency*, p. xxiii.

[8] *How Latin America Fell Behind*, pp. 10–12.

[9] For estimates of growth in exports in the main Latin American economies, see Bulmer-Thomas, *Economic History*, p. 65, table 3.4. Bulmer-Thomas estimates that Mexico's exports declined by 0.7 percent per year between 1870 and 1890, then climbed 4.4 percent per year from 1890 to 1912; Argentina's exports, in the same periods, grew by 4.9 percent and 6.7 percent annually; finally, Brazil's grew at a yearly rate of 2.5 percent and 4.3 percent, respectively.

[10] *Dependentistas* do not generally calculate aggregate indicators of economic growth. Structuralist economists, although similar to *dependentistas* in outlook, use quantitative methods to deny the long-

sure, GDP growth is not the same as rising real per-capita incomes; population and prices have a role to play. Nevertheless, in spite of a quintupling of the population and rapid inflation during the years 1870–1930, real per-capita incomes in Mato Grosso rose alongside exports.

Table 1 provides basic data on income, prices, foreign and domestic trade, and government spending from 1870 to 1930. The precise relationship between aggregate economic growth and exports is difficult to estimate, owing to the paucity of time-series data for intervening variables. In addition, estimates of real per-capita income and real exports per capita at local prices are sensitive to the method of estimation and the choice of price index. Therefore, Table 1 presents two estimates of per-capita income; the first, based on Raymond Goldsmith's method, derives from family expenditure estimates; the second, based on Paul Bairoch's method, derives from the average rural daily wage.

Rapid growth in exports should translate, *ceteris paribus*, into growth in total income. How much did exports contribute to per-capita incomes? Allowing for the imprecision of the data, especially the provisional nature of the wage estimates, it nevertheless appears that export growth raised income levels. The estimates of income and exports presented in Table 1 show that, overall, exports and incomes rose and fell together. Perhaps one-quarter to one-third of per-capita income can be attributed to exports over the period analyzed. In the Bairoch specification, income peaks (at 425 *milréis* per capita) at the same time that exports peak (at 130 *milréis* per capita); similarly, the Goldsmith-style estimates indicate that per-capita income was high when exports were high. The estimates deviate, however, in identifying the peak years for per-capita income in Mato Grosso. Did income peak in 1905/07 (as the Goldsmith method indicates) or 1916/17 (Bairoch)? If the latter, then exports correlate closely with income; if the former, they do not. The reason for this discrepancy is that the Goldsmith method is extremely sensitive to his choice of price index; and prices and incomes need not rise or fall in unison.

Because no satisfactory price index exists for Mato Grosso, I averaged Goldsmith's GDP deflator for Brazil with my own estimate of food and housing costs in Cuiabá, the state's capital and its largest town. If this blended index is accurate, then the Mato Grosso index, based on limited data for limited years, overestimates inflation from the 1870s through 1905/07 and underestimates it thereafter. The cost of living appears to fall from 1905/07 to 1916/17 (Column *d*). This results in the decline in the Goldsmith-style per-capita income estimate, and yet it is extremely unlikely

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run viability of export-led growth for Latin America owing to deteriorating terms of trade with the industrialized countries. For a critical analysis of these theoretical positions, see Love, *Crafting,* chapters 8, 10, and 12.

TABLE 1
ESTIMATES OF PER-CAPITA EXPENDITURES, INCOMES, AND SHIPMENTS IN MATO GROSSO, 1871–1930

	Expenditures				Income			Shipments				
	[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]	[j]	[k]	[l]
	Food	Housing	Other (= 0.3·[a + b])	Total	Goldsmith Method	Bairoch Method	State Spending	Total	Exports	Rubber Exports	Cattle Shipments	Price Index
1871–1873	47	38	26	112	273	356						45
1895–1897	117	34	45	196	223	266	8	50	43			100
1905–1907	144	89	70	303	356	352	11	71	68	29	10	100
1916/17	141	67	62	270	330	425	22	130	98	62	49	113
1922/23	120	66	56	242	228	363	12	75	49	15	40	132
1929/30	177	200	113	490	293	312	16	72	44	5	38	200

Notes and sources: Household and per-capita expenditure (Columns *a* through *d*) are reported in current milréis and are based on prices in the public market in Cuiabá and prices cataloged in business and court records; weekly consumption is estimated at 2 liters of manioc flour, 1 liter of rice, 1 liter of beans, and 0.2 kilo of sugar; meat consumption is estimated at an additional 20 percent of food expenditure. These proportions are drawn, roughly, from Mattoso's painstaking research into the Bahian diet in *Bahia*, p. 576. The cost of housing is estimated from 147 housing valuations in probate records and court documents detailing rent payments; the figure used in the calculation is the yearly rent for the median home. Column *e* equals d times 1.1 for investment, plus exports ($h - (40 + 0.25h)$) for estimated trade surplus. Column *f*, following Bairoch's rule of thumb, equals $200w$; *w* is estimated as 0.33 times the average urban daily wage—the average of the daily wage of a *porteiro*, a teacher, and two unskilled urban wage earners. Columns *e* to *k* are deflated according to the price index reported in column *l*. Column *k* includes hides and charque as well as live cattle. The source for columns *g* to *i* is Frank, "Brazilian far West," p. 126. Columns *j* and *k* derive from Borges, "Do extrativismo," pp. 193–95. Export prices are from official government estimates. Finally, the price index is the average of two indices: Goldsmith's index for all of Brazil, in *Brasil*, pp. 91, 158; and Frank's index for Mato Grosso, "Brazilian Far West," pp. 244, 251. The base year for the combined index is 1906.

that prices fell in Mato Grosso during this period. Prices in the rubber-producing zone reached all-time highs between 1910 and 1920; the cost of living in Mato Grosso as a whole (Column *c*) must therefore be under-estimated, although the degree of underestimation is impossible to specify.[11] In this light, the Bairoch-style estimation accords better with the blended price index. Moreover, because in the Bairoch specification wages are not also a part of the price index itself, the resulting estimates of per-capita income are likely to be more independent and reliable.[12]

It is important to note that the two estimates move together during key time periods. For instance, both indicate a decline in per-capita income in Mato Grosso from the early 1870s to the late 1890s. This accords with other estimates of per-capita income in Brazil as a whole.[13] Additionally, the estimates peak in the 1910s and show a dip in the early 1920s; this accords with the expectation that the Rubber Bust adversely affected per-capita income in Mato Grosso.

The composition of shipments from Mato Grosso (Table 1, Columns *i*, *j*, and *k*) indicates that exports, especially rubber, contributed most to per-capita income through 1916/17. Thereafter, according to the Bairoch-style estimates, exports and income decline together, with interstate cattle ship-ments cushioning the fall. A similar shift occurs in the destination of ship-ments. During the peak years of the Rubber Boom, the United States and Great Britain were Mato Grosso's most important trading partners, absorb-ing 60 percent of its exports in 1910. By 1930, however, cattle shipments to São Paulo accounted for nearly 50 percent of Mato Grosso's trade; exports to the United States and Great Britain had fallen below 10 percent of the total.[14]

Technological advance also contributed to per-capita income growth during the period analyzed, in spite of the fact that no major technical inno-vations occurred in any of Mato Grosso's major industries. Instead, the rubber and cattle sectors benefited from transport savings following the

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[11] Santos reports that average food prices were approximately 10 times higher in the Madeira River region of Brazil than in Rio de Janeiro, the source for most price series, including Goldsmith's. See Santos, *História Econômica*, p. 169.

[12] When applied to Mattoso's Bahian wage figures, the Bairoch-method for calculating per-capita income ($200w$, where w is the average rural wage) yields results similar to those derived for Mato Grosso. For instance, in 1871–73, Bahian per-capita income, based on the same wage categories, divided by three to derive the average rural wage, is estimated at 170 *milréis*. In constant 1906 values this would come to approximately 375 *milréis*, compared to 352 for Mato Grosso. By 1890, Bahian per-capita income was 275 *milréis* (1906 values), compared to 266 in Mato Grosso. But Bahia contin-ued to stagnate economically well into the twentieth century, whereas Mato Grosso experienced major income gains in the 1900s and 1910s. By 1950, per-capita income was 56 percent higher in Mato Grosso than in Bahia (Maddison, *Brazil and Mexico*, p. 81).

[13] For example, Goldsmith estimates that Brazil's per-capita income (in constant 1910 values) declined from 255 to 233 *milréis* from 1870 to 1889.

[14] Frank, "Brazilian Far West," p. 126.

construction of the Madeira–Mamoré railroad in the rubber-tapping region (1913), and the Northwest Railroad connecting southern Mato Grosso with São Paulo, Brazil's wealthiest state (1912–1914). The importance of these railroads was not in integrating Mato Grosso's internal market—the two lines did not meet—but in lowering the transport costs of the frontier's products. By the late 1920s, cattle shipments on the Northwest Railroad, which served the dynamic São Paulo market, accounted for approximately 15 percent of Mato Grosso's total trade.[15]

The growth of long-distance trade was especially important for the expansion of government on the frontier. Mato Grosso's government regularly relied on international and interregional export duties for over 50 percent of its operating income. Far from starving the fisc, as is sometimes claimed, exports were the public sector's primary means of support.[16]

The preponderance of evidence thus shows that external trade contributed to rising private incomes and public expenditures. Beyond these measures, though, did exports contribute to basic human welfare? Perhaps indirectly: the rate of illiteracy (a proxy for human capital development) declined slightly over the period, falling from 81.9 percent in 1872 to 70.9 percent in 1920.[17] Greater wealth and increased spending on education may well explain this decline.

Given the evidence of a relationship between exports and aggregate income, the contention that the export-led model embraced by Latin America during the 1870s through the 1920s was logical and beneficial appears substantiated. Orthodox dependency theorists will have a hard time showing that real per-capita income growth—to a level well above the Brazilian average[18]—somehow disguised the pillage of Mato Grosso by imperialist powers.[19] Much of this added prosperity is attributable to exports of over 70 *milréis* per capita for two decades—as much as twice the national average.[20] Evidence from the export sector itself is even more telling: in 1910 rubber tappers, who made up only 15 percent of the labor force, were responsible

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[15] Ibid., p. 133.

[16] Ibid., pp. 458–59.

[17] *Anuário Estatístico*, p. 1303.

[18] At the low end, Bulmer-Thomas estimates per-capita income in Brazil, circa 1912, at approximately 130 *milréis* (*Economic History*, p. 439). At the high end, Goldsmith estimates Brazilian GDP per capita at 255 *milréis* in 1871, 233 in 1889, and 254 in 1913. Contrast this to the estimates of Mato Grosso per-capita income in Table 1, Column *a*, where income is above 300 *milréis* throughout the years of the export boom.

[19] Indeed, the only case of a foreign monopoly "bleeding" surplus from Mato Grosso is that of the mixed Brazilian–Argentine Mate Larangeiras Company, the only exporter of *erva mate* in the state. If a Brazilian–Argentine monopoly is evidence of "dependency," then the term has lost all meaning: the company exported exclusively to Argentina, itself part of the "periphery," and profits were drained away from the frontier to the powerful Murtinho brothers in Rio de Janeiro. For details on the economics of the *erva mate* industry in Mato Grosso, see Frank, "Brazilian Far West," pp. 171–78.

[20] Based on Bulmer-Thomas, *Economic History*, p. 69.

for about 30 percent of provincial output, and earned up to 1,000 *milréis*—or almost four times the national average—for their troubles.[21] If export orientation did not immiserate Mato Grosso on the whole, then, did it at least contribute to inequality?

EXPORT ORIENTATION AND ECONOMIC INEQUALITY

Wage Ratios

In their study of the inequality experience in the United States, Jeffrey Williamson and Peter Lindert find that trends in pay ratios between skilled and unskilled laborers coincide to a certain extent with measurable trends in overall distribution: pay ratios can function as proxies for overall inequality.[22] Williamson and Lindert construct time series of pay ratios for a wide range of public and private occupations; no such robustness is possible for Mato Grosso owing to lack of data. Nonetheless, sufficient data exist to calculate two measures of the pay ratio of highly skilled supervisory workers to relatively unskilled, low-status workers. The first measure is the ratio of earnings for the State Treasurer of Mato Grosso to his *porteiro* (a type of receptionist); the second compares the treasurer to a rural schoolteacher. In addition to these ratios, which cover a good part of the period 1851–1930, manuscript records provide spot estimates of the ratio between skilled stonemasons and their unskilled helpers. Clearly, the value of these occupational pay ratios is limited by the fact that they depend, primarily, on government workers; in addition, treasurer is just one job, albeit a position similar to other heads of government departments. In spite of these weaknesses, the advantage of these specific professional categories is that there exist relatively continuous data covering a long period of time.

A limited test of the validity of the pay-ratio data for Mato Grosso is possible, moreover, through comparison with the long-term wage data developed by Katia Mattoso for nineteenth-century Bahia. There, for instance, the pay ratio of the treasurer to that of a primary-school teacher was 5.8:1 circa 1861, and 6.5:1 in 1890.[23] By contrast, a similar pairing of wage earners in Mato Grosso at the same junctures reveals a ratio below 4:1. In both cases the ratios remain fairly stable over the latter part of the nineteenth century. Turning to wages in the private economy, Bahian stonemasons outearned their unskilled assistants by 1.6:1 circa 1850, and by 1.66:1 circa

[21] Indeed, if Oliver Coomes and Bradford Barham's estimate of per-worker earnings in the rubber industry is correct, annual wages for rubber tappers may have been as high as 1,000 *milréis* ("Amazon Rubber Boom," pp. 231–57, esp. 244).

[22] *American Inequality*, p. 82. To be sure, they also note that employment levels and other data are required to give a full account of this relationship.

[23] Mattoso, *Bahia*, p. 550.

1890. In Mato Grosso, stonemasons outearned their assistants by 2.5:1 circa 1892, falling to 2.15:1 circa 1903.[24] The skill premium was thus higher in labor-scarce Mato Grosso than in labor-rich Bahia; again, this is what the relative factor endowments of the frontier and the populated coasts would predict. In any event, the pay ratio is stable, or even declining, in spite of the trend toward export-led growth.

Figure 1 presents the trends in pay ratios in Mato Grosso, along with two possible determinants: inflation and exports. First, focusing simply on the pay-ratio series, it is apparent that for most of the period the ratio of high- to low-skill wages remained between 3:1 and 4:1, rising above 5:1 only in the late 1920s. It does not matter, for the most part, whether the ratio is treasurer—*porteiro* or treasurer—schoolteacher. Second, the spot estimates of the pay ratio of skilled to unskilled urban workers rest between 2 and 2.5:1. This ratio is slightly higher than the average 1.7:1 ratio reported in Williamson and Lindert for a roughly comparable data set and time period covering urban workers in building trades in the United States.[25] Perhaps, as mentioned above with respect to Bahian wage ratios, skilled workers earned relatively more in Mato Grosso because skilled labor was scarce on the frontier.

Casual inspection of Figure 1 points to inflation, not export levels, as a likely cause of shifts in pay ratios over the long run. Inflation has been identified as a potential factor in worsening income distribution, as skilled workers are better able to defend their purchasing power than are unskilled ones.[26] Based on the limited data, this prediction appears to hold true for Mato Grosso. Regressing the treasurer–*porteiro* pay ratios on changes in Goldsmith's GDP deflator for 1890 through 1930 yields an R^2 of 0.81. In contrast, regressing pay ratios on exports yields a negative coefficient that is not statistically significant and an R^2 of 0.08. While these results can by no means be termed conclusive, they do indicate that export-led growth was not implicated in inequality.

Wealth Distribution

The distribution of wealth differs greatly from that of earnings: the former is expected to be much more unequal than the latter, and is of interest in its own right. Probate records provide the best available data on this question.

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[24] *Bahia*, p. 548; for Mato Grosso, APMT, latas for 1892 and 1903.

[25] *American Inequality*, p. 307.

[26] The relationship between inflation and inequality is not, however, beyond dispute. The so-called wage-lag effect, which purportedly causes inequality to rise in periods of rapid inflation, has been challenged on empirical grounds by Williamson (*Did British Capitalism?*, pp. 84–85).
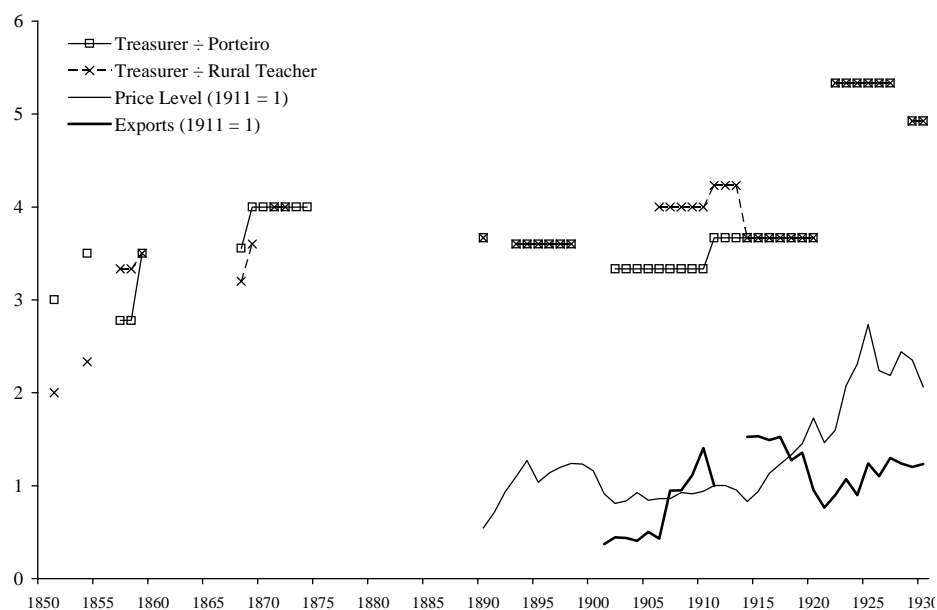
FIGURE 1
PAY RATIOS, PRICES, AND EXPORTS IN MATO GROSSO, 1851–1930

Sources: Wage data are from Arquivo Publico (1851–1890) and Asembleia Legislativa (1890–1930). Price levels are from Goldsmith, *Brasil*, pp. 91, 158. Exports are from Frank, "Brazilian Far West," p. 459.

Our data set covers the town of Cuiabá over the period 1870–1937.[27] Of these records, 574 contained quantifiable balances, yielding approximately eight records per annum.[28] All persons dying intestate or with minor children were subject to probate. Doubtless, many poor decedents, and even some wealthy ones, slipped through the cracks of this rule. Analysis of property tax lists shows that between 35 and 45 percent of the population of Cuiabá owned (rather than rented) their domicile, whereas 63 percent of probate inventories indicate homeownership.[29] This gap is substantial, but not so large as to indicate that the probate sample is wildly unrepresentative of the overall distribution of wealth in Cuiabá.

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[27] The source of probate records for Cuiabá is APMT, 1–3rd and 5th cartórios. Every indication points to their general distribution throughout all levels of society. For an exhaustive defense of probate records as a means to study social class relations, see Mattoso, *Bahia*, pp. 606–09.

[28] The number of probate records available per year is far too small to allow for robust year-to-year analysis; however, it is possible to combine the records into longer, historically coherent periods. The average number of probate records per year changes little when analyzed on a decade-by-decade basis. This is consistent with the fact that the population of Cuiabá grew little over the period under review.

[29] Property tax lists in APMT, lançamento de décimas prediaes.

Shifts occurred in the composition of probate records and in their relative concentration over time.[30] In the dying age of slavery, *cuiabano* fortunes seem to have been larger on average (25 *contos*[31] compared to 10 for the period after 1889). However, the data for the pre-1889 period present a major truncation problem, compounded by the fact that slavery may explain part of why relatively few lower-class inventories are present in this period. Since direct comparisons between the data sets are infeasible, the following analysis rests primarily upon records from the 1889–1937 period.

Table 2 presents data on the distribution of wealth in Cuiabá using all probate records for the period 1889–1937. Let us now seek to isolate factors that either dampened or exacerbated inequality in total wealthholding at death. The utilization of all probate records for the period, adjusted for inflation, avoids a pair of problems associated with the use of such records in the analysis of inequality. First, the long period avoids the potential for life-cycle distortions: the size of the sample ensures a random distribution of age at death and years lived in Cuiabá. Second, the length of the period avoids the distortions wrought by high-outlier probate records in single years. Aggregation and temporal dilation do have their costs, however. The data, in this form, do not support fine distinctions concerning changing levels of inequality over time.

The Gini coefficient provides a simple, summary measure of inequality. Throughout the export boom and thereafter, the Gini coefficient on probate wealth in Cuiabá remained substantially unchanged (0.76 in the period 1889–1917, and 0.78 in the period 1918–1937), suggesting little relation between export-led growth and the concentration of wealth. Both periods were typified by extreme inequality, even as they differed substantially in export intensity. Because Cuiabá did not participate directly in external trade to any great degree, these measures must be viewed as, at most, an indirect indication of the relation between export-led growth and inequality.

Returning to the question of sources of inequality, it appears from the disaggregated probate wealth shares that wealth in the form of housing stock was less unequally distributed than were financial assets. This is not surprising: poor people require shelter as do wealthy people, and one expects homeownership to be better distributed than stock portfolios. Beyond these general considerations, what more can be gleaned from specific probate records?

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[30] For the period from 1870 to November 1889, I found just 80 quantifiable records, or approximately 4 per annum. An extremely rough estimate of the mean wealth of *cuiabanos* in the late Empire in terms comparable to latter periods would simply divide 25 *contos* by two, estimating the truncated portion at an additional 4 per annum at very low values, then deflate by the percentage of the population that, as slaves, would not register probate records under any circumstance (10 percent). The result, 11.25, is roughly consistent with the 1889–1917 estimate of 11.19. Note: the population of Cuiabá remained nearly the same from 1872 to 1920.

[31] The *conto*, equivalent to 1,000 *milréis*, was worth $330 circa 1910. It was the largest unit of currency in Brazil until the 1940s.

TABLE 2
PROBATE WEALTH IN CUIABÁ, BY DECILE, 1889–1937
(Gini coefficient = 0.77)

Decile	Houses Value	%	Land Value	%	Cash Value	%	Livestock Value	%	Stocks and Bonds Value	%	Goods and Capital Value	%	Informal Notes Value	%	Misc. or Unknown Value	%	Total Value	%	Mean
Top	752.8	51.8	274.6	71.0	244.8	51.8	242.6	90.4	548.8	88.0	765.5	98.5	286.6	91.8	236.1	65.2	3,351.7	72.0	71.3
2nd	287.8	19.8	46.5	12.0	90.7	19.2	7.1	2.7	50.2	8.0	7.0	0.9	19.5	6.2	55.1	15.2	563.9	12.1	12.0
3rd	139.8	9.6	24.7	6.4	53.6	11.3	4.9	1.8	11.3	1.8	1.3	0.2	2.4	0.8	50.3	13.9	288.2	6.2	6.1
4th	105.0	7.2	16.6	4.3	30.1	6.4	7.4	2.8	0.3	0.0	2.0	0.3	5.1	1.6	8.9	2.5	175.4	3.8	3.7
5th	65.6	4.5	10.4	2.7	23.4	4.9	2.1	0.8	11.2	1.8	0.0	0.0	0.0	0.0	3.3	0.9	116.0	2.5	2.5
6th	45.9	3.2	8.2	2.1	10.1	2.1	2.4	0.9	1.6	0.3	0.9	0.1	0.0	0.0	−4.8	−1.3	64.3	1.4	1.4
7th	21.4	1.5	1.3	0.3	4.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.4	5.4	46.5	1.0	1.0
8th	21.0	1.4	2.5	0.7	4.2	0.9	1.0	0.4	0.0	0.0	0.0	0.0	0.3	0.1	0.7	0.2	29.7	0.6	0.6
9th	9.7	0.7	1.1	0.3	7.8	1.6	0.9	0.4	0.1	0.0	0.0	0.0	0.0	0.0	−3.8	−1.1	15.9	0.3	0.3
Bottom	4.7	0.3	0.7	0.2	3.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	−1.6	−0.5	−3.4	−0.9	4.0	0.1	0.1
Total	1,453.8	100	386.5	100	472.6	100	268.3	100	623.4	100	776.8	100	312.4	100	361.8	100	4,655.6	100	9.9
N	300		69		155		29		40		18		28		141		470		
Mean	4.8		5.6		3.0		9.3		15.6		43.2		11.2		2.6		9.9		

Note: Values in constant 1912 *contos*.
Source: APMT, inventarios, 1-5th cartorios.

Notwithstanding the insensitivity of overall inequality to export levels, it is true that the largest fortunes found in the probate records for Cuiabá derived from commercial activities with close ties to foreign trade. For instance, Martin Guilherme, a German-Jewish immigrant to Mato Grosso, died intestate in 1891. Owner of one of the largest commercial houses in Mato Grosso, his fortune totaled 573 *contos*, making his one of the largest of all records for the 1889–1917 period. However, this wealth was accumulated prior to the point at which the gradual rise in exports turned into a boom.[32] Another illustration of how wealth was concentrated in the hands of those involved in trade is provided by Ciz Verlangeiri Orlando, wife of an Italian importer-exporter. The total value of her estate, circa 1903, was 297 *contos*, of which 96 *contos* derived from a one-third share in the commercial firm Orlando & Irmãos, and another 96 *contos* from a 200,000-hectare ranch with 8,000 head of cattle in the export-oriented *município* (county) of Corumbá.[33] When Francisco Orlando passed away in 1920, his probate record summed to 573 *contos*, 375 of which were directly attributable to foreign trade. These three probate records alone account for 28 percent of the value of all observations for the period.

Commercial fortunes made up the bulk of the largest fortunes in Cuiabá; as such, they contributed to the high Gini coefficients during and after the export boom. However, decomposition of probate wealth indicates that the share of debentures, goods, and capital in total wealth was approximately 30 percent; their contribution to overall inequality was important but not overwhelming. The lack of a meaningful shift in the degree of inequality from the export-oriented period to the domestic-oriented period suggests that export levels themselves had relatively little to do with inequality in Cuiabá.

It remains to be seen, however, whether this holds true for other regions within Mato Grosso. In particular, the concentrating effect of land ownership might be expected to be greater in cattle-ranching zones, and in those areas most affected by foreign ownership, than in administrative and urban Cuiabá. The question is whether export orientation and foreign ownership were broadly determinative of the distribution of land on the ranching frontier.

Land Distribution

Levels of land concentration have often served as proxies for measures of inequality in developing countries.[34] Rosemary Thorp's recent survey of

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[32] Inventário of Martin Guilherme, Cartório do 1 Oficio, APMT, caixa 34, 1891.

[33] Inventário, Cartório do 1 Oficio, APMT, caixa 23, 1903. Orlando & Irmãos exported 108 tons of rubber that year. Clearly, fortunes in Cuiabá were linked to export-led economic growth in this period. The figure of 108 tons implies a workforce of over 200 tappers, if Dean's estimated per-tapper production of 500 kilograms per year (*Brazil*, p. 38) is accurate. The export price of high-grade rubber in 1912 was 5.7 *contos* per ton, yielding gross exports worth up to 600 *contos* for the firm. For the price of rubber, see *Anuário Estatístico*, 1939/40, p. 1378.

[34] Deininger and Squire, "New Data Set"; and Alesina and Rodrik, "Distributive Politics."

Latin American economies in the twentieth century asserts that "export economy expansion increased land concentration and reinforced social and political inequalities." This claim is made on the basis of "an understanding of the historical process as it is discussed in a wide literature," despite the fact that "quantification is impossible."[35] If Thorp's substantive assertion is disputable, her methodological one is simply wrong: quantification is possible, and it is revealing. I have identified data describing land- and cattle-ownership on the Brazilian frontier. Over 5,000 landowners named in tax registries for representative municipalities throughout Mato Grosso have been analyzed for degrees of concentration in land and cattle, and for intensity of foreign investment over time. In addition, land-tax records have been linked to lists of cattle ranchers, allowing for an analysis of concentration in the ranching industry.[36] For the purpose of testing hypotheses about export orientation, foreign investment, and inequality, each *município* is identified in terms of the type, volume, and direction of its exports.

Figure 2 portrays the seven *municípios* in the sample with their approximate boundaries circa 1920. Cuiabá, the state capital, was isolated from transport networks—and thus from foreign ownership—throughout the period. Corumbá and Cáceres, on the western border with Bolivia and with access to transport on the Paraguay River, were ranching *municípios* with substantial exports and foreign ownership of 50 percent or more of all claimed land. Três Lagoas, Campo Grande, and Aquidauana were serviced by the Northwest Railroad connecting southern Mato Grosso and São Paulo; all were producers of cattle for interstate shipment, but only Três Lagoas was marked by substantial foreign ownership of land. Bela Vista, located on the Paraguayan border, was characterized by cattle ranching, isolation from transport networks, and slight foreign ownership.

Two general points can be made concerning land-tenure patterns in Mato Grosso: first, landholdings were of very unequal size, with Gini coefficients ranging from 0.63 to 0.82 (Table 3); and second, only a tiny minority of the populace (between 0.8 and 2.6 percent, depending on the municipality) held any land at all.[37] Thus, measured inequality was great, and would have been far greater still if all *potential* landowners were included in the analysis. Difficulty in defining the number of potential landowners in a consistent manner precludes such an adjustment, however.

The results for Corumbà and Cáceres conform to dependency theory, in that both were major exporters of ranch products and both are characterized by high Gini coefficients. The results for Cuiabà, however, are more

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[35] Thorp, *Progress*, pp. 25–26.

[36] Land tax records found in Coletorias, Imposto Territorial, APMT and in the *Gazeta Official* (Cuiaba) for 1911; cattle tax records are found in APMT, Coletorias, Imposto de Profissões.

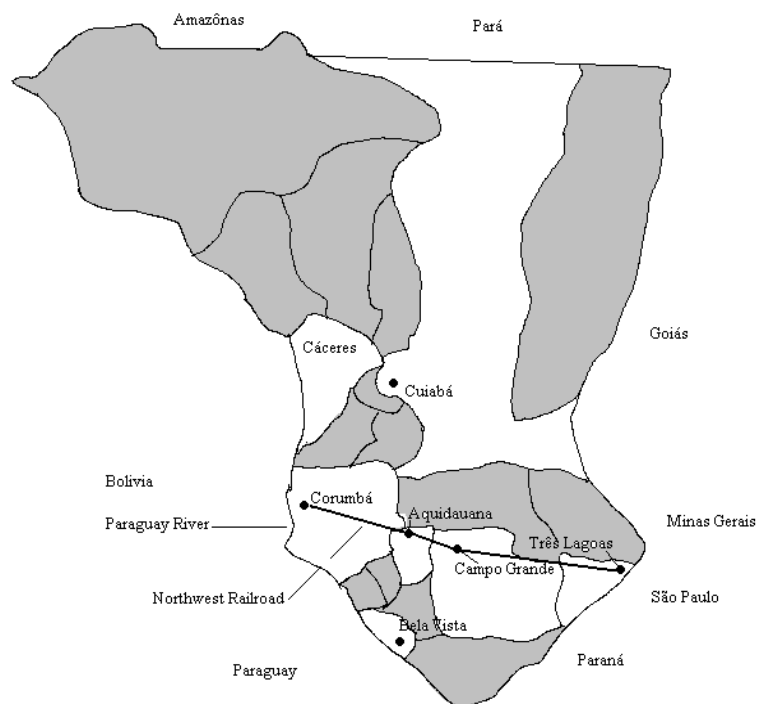[37] Percentage figures in Frank, "Brazilian Far West," p. 74.

FIGURE 2
MATO GROSSO, CIRCA 1920

Note: Mato Grosso is today three states: Mato Grosso, Mato Grosso do Sul, and Rondônia. Shaded areas are municípios not included in the sample.
Source: Frank, "Brazilian Far West," p. 43.

challenging: its coefficient is nearly as high, and yet it supported only a small ranch sector; indeed, one is hard pressed to find any economic or environmental grounds for such concentration. The origins and persistence of this inequality must, therefore, derive from historical and institutional factors unrelated to export orientation and foreign investment. Evidence of the historical roots of land concentration in Cuiabá is provided by tax rolls. From its founding in 1719 up to the mid-nineteenth century, Cuiabá's settler élite was awarded *sesmarias* (land grants, usually encompassing 13,068 hectares) for "services rendered" and to encourage colonization.[38] Most *sesmarias* originated in the colonial era, at a time when the Portuguese

[38] For a Marxist discussion of Brazil's land laws and the practice of granting *sesmarias*, see Martins, *Os camponeses*, pp. 41–42. For a critique of Martins, see Frank, "Brazilian Far West," pp. 56–69. Bell's discussion of *sesmarias* in Rio Grande do Sul indicates the importance of these land grants in fostering *latifundia* in another frontier region (*Campanha Gaúcha*, chap. 2).

TABLE 3
CONCENTRATION OF LAND AND CATTLE OWNERSHIP IN SEVEN MUNICIPALITIES
(Gini coefficients)

		Local Cattle		Foreign Export		Domestic Export	
	Cuiabá	Bela Vista	Aqui-dauana	Corumbá	Cáceres	Três Lagoas	Campo Grande
Land							
1911	0.73			0.79	0.77		
c. 1920	0.68	0.63	0.67	0.78	0.78	0.81	0.76
c. 1930	0.70			0.79	0.82		
Counterfactual, c.1920[a]				0.69	0.71	0.70	
Cattle							
c. 1920				0.53	0.74	0.70	0.59

Notes and sources: The counterfactual land distribution figures reported for Corumbá, Cáceres, and Três Lagoas derive from disaggregated land tax data for the year 1920. In the first case, three foreign owners in Corumbá consolidated holdings of 763,000; 549,156; and 117,060 hectares. Tax records indicate that the first two of these claims contained 32 smaller claims prior to purchase by foreign investors. In Cáceres, one foreign owner consolidated 9 claims (5 · 136,800; 57,129; 54,000; 50,214; and 34,848) into one vast 884,23- hectare estate. In Três Lagoas, the American-owned Brazil Land and Cattle Packing company held 759,087 hectares, which, prior to consolidation had been distributed in over twenty ranches ranging from 196,000 hectares down to 3,810. The British-owned Lancashire Trust cattle ranch consolidated ranches of 169,381; 71,973; 30,849; 22,057; and 7,200 into one vast holding. The land and cattle Gini coefficients, as well as the Corumbá and Cáceres counterfactuals, are derived from property and professional tax lists, APMT, Imposto Territorial and Imposto de Indústrias e Profissões. The Três Lagoas counterfactual is also based on data and remarks in the correspondence of T. G. Chittenden to Ralph Paget, APMT, Lata C, 1920. The reported Gini coefficients account for multiple holdings: the total size of each individual's land or herd is used in calculating the coefficient of concentration.

crown was desperate to attract settlers to underpopulated and vulnerable Brazil. Patterns of land tenure from the colonial era persisted into the twentieth century: as late as 1911, 14 of the 20 largest land claims in Cuiabá were *sesmarias*.

Only *municípios* with no history of *sesmarias* and little or no foreign ownership enjoyed much more equal land distribution, with Gini coefficients between 0.63 and 0.67. Neither Aquidauana nor Bela Vista attracted major foreign purchases of land; and neither was a major exporter, although cattle ranching made up the main economic activity in both. Moreover, according to tax records, neither *município* had land claims identifiable as *sesmarias*. Aquidauana is located in southern Mato Grosso on the Northwest Railroad, so it had some access to markets; Bela Vista is located on the Paraguayan border, with access only to small regional markets. Small-scale ranching, with little or no foreign ownership and no history of *sesmarias*, resulted in the most egalitarian distribution among landholders on the frontier.

The *municípios* of Corumbá and Cáceres participated increasingly in long-distance international trade; by 1910 they accounted together for ap-

proximately 30 percent of Mato Grosso's exports.[39] Between 1892 and 1911, during the peak of the export boom, the tonnage of ships leaving Corumbá for foreign ports rose from 4,000 to 35,000 tons.[40] Both *municípios* were dominated by large foreign land claims; both had a history of granting *sesmarias*. Observable *sesmarias* (that is, claims of exactly 13,068 hectares), however, accounted for none of the land claims in the top decile in either case.

Dependency theory posits a link between exports, foreign ownership, and inequality; and indeed, the Gini coefficient for export-oriented *municípios* was consistently high. Even after Mato Grosso's exports had plummeted in real value, the Gini coefficients for these *municípios* remained high by any standard. Extensive foreign-owned ranches accounted for 50 percent or more of all land claims in both *municípios* from the 1910s through the 1930s.[41] It appears that foreign ownership was associated with land concentration in these *municípios*; it is equally possible, however, that industrial structure in the hide and jerked-beef industries favored large enterprises owing to increasing returns.[42] Therefore, comparison with other ranching *municípios* is required to isolate further the factors in land concentration.

Domestic-market-oriented *municípios* shipped live cattle, primarily to São Paulo. The Gini coefficients for Campo Grande and Três Lagoas, the leaders in this trade, were as high as for Corumbá and Cáceres. Foreign-owned ranches accounted for 44 percent of all claims in Três Lagoas, but just 8 percent in Campo Grande: thus, a high Gini coefficient and intense outward orientation, but not foreign ownership, appear common to these *municípios*.

Large-scale ranching, either for foreign or domestic markets, was predictably associated with land concentration but not necessarily with foreign ownership, as indicated by the case of Campo Grande. It is noteworthy that the Gini coefficients for cattle ownership display no clear trend: in some instances, such as Cáceres and Bela Vista, the Gini for cattle ownership was similar to that for land; in others, such as Corumbá and Campo Grande, there was a wide difference. The precise influence of market orientation or foreign investment on land or cattle ownership is thus difficult to measure.

The contribution of foreign land ownership to concentration in the ranching sector can be estimated in light of information concerning pre-

[39] Frank, "Brazilian Far West," p. 133. Cattle hides and jerked beef (*charque*) were the main products exported.

[40] Registros, Porto de Corumbá, Núcleo de Documentação e Informação Histórica Regional, Universidade Federal de Mato Grosso, Cuiabá.

[41] Frank, "Brazilian Far West," p. 100.

[42] Bell claims that foreign capital led to concentration in the Rio Grande do Sul *município* of Itaqui (*Campanha Gaúcha*, p. 191); he does not, however, provide data or explore other reasons for large landholdings.

investment land tenure patterns and domestic investment trends. More specifically, the difference between the observed levels of concentration and a counterfactual estimate without foreign participation indicates, in rough terms, the actual influence of foreign investment on concentration. The construction of a counterfactual model is facilitated by the tax registries, which disaggregate foreign land claims into original lots; as such, this data serves as a reasonably exact representation of the size of domestically owned claims prior to their consolidation by foreign buyers. In the case of Cáceres, this counterfactual exercise yields a drop in the Gini coefficient from 0.78 to 0.71. Admittedly, this is not a great decline, but it does much more closely approximate the Ginis derived for Cuiabá. The counterfactual cases for Três Lagoas and Corumbá result in similar declines in the Gini coefficient.

It appears, therefore, that foreign ownership was one determinant of concentration in land tenure on the frontier, with the capacity to increase Gini coefficients by something like a tenth. But it also appears that foreign ownership was not the decisive factor: Campo Grande's high Gini coefficient was not driven by foreign claims. In every case, large-scale cattle ranching, access to markets, and historical-institutional factors were decisive. The Gini values for Bela Vista and Aquidauana were lowest, owing to smaller-scale ranching, an absence of large foreign claims, and an absence of inegalitarian institutional factors such as *sesmarias*. Even without the foreign presence, that is, Corumbá, Cáceres, and Três Lagoas would have had more concentrated land tenure (Ginis of 0.69–0.71) than Bela Vista or Aquidauana.

Evidence of the historical and institutional basis of inegalitarian land-tenure patterns in Mato Grosso is also found in data concerning the registration of private land deeds (*títulos de dominio*). Following the declaration of the Republic in 1889, Brazil's legislature devolved authority over public lands to the various states. This meant, among other things, that the government of Mato Grosso had to take an inventory of privately held land in order to determine the extent of its patrimony.[43] In 1901, for instance, 1,148,331 hectares were registered with the Department of Land, Mines, and Colonization.[44] The Gini coefficient for the size distribution of these claims, located throughout the state, was a substantial 0.73, suggesting that concentration in landownership largely preceded the export boom, the arrival of foreign owners, and the construction of the railroads.[45]

[43] For a discussion of the legal history of land in Mato Grosso, see Frank, "Brazilian Far West," chapter 1.

[44] APMT, Relatorio 152, Repartição de Terras, Minas e Colonização, 1901.

[45] In fact, the state recognized the concentrated nature of landholding and attempted to ameliorate it through the granting of smaller claims in the public domain. Public land sales, based on limited data, appear to have significantly undershot Mato Grosso's historical trend in land concentration: in 1900,

CONCLUSIONS AND COMPARISONS

With respect to the debate over export-led growth, this article has suggested that reliance on exports cannot be blamed for Latin America's laggardly performance. On Brazil's western frontier, where there was little hope for local industrial development, export growth raised per-capita incomes well above the Brazilian average. When export growth faltered, so too did income growth. If these findings on Mato Grosso have broader applicability, it will do no good for pessimistic *dependentistas* to argue that export-led growth subjected Latin America to a "surplus drain," leaving it poorer than it otherwise would have been.

With regard to the effect of export-led growth on economic inequality, the research presented here has found little evidence for a link. Export levels are shown to have had an insignificant effect on pay ratios (based on very limited data) or on the distribution of total wealth (as measured by probate records). Only with respect to land tenure can export orientation and foreign ownership be shown to have contributed to inegalitarian distribution. However, variation in land concentration owing to differences in region, market access, and institutions appear to have affected inequality patterns more than export orientation or foreign ownership per se.

In broader perspective, the degree to which land was concentrated in Mato Grosso was not much different from levels of concentration found on the Argentine frontier during the same period. Jeremy Adelman has derived a Gini coefficient of between 0.66 and 0.72 for the size distribution of landholding on the frontier of Buenos Aires province in 1914, in the absence of significant foreign ownership.[46] Other regions of Brazil also experienced great inequality in landownership. Analysis of landholding in São Paulo at the end of the colonial era yields Gini coefficients ranging from 0.67 to 0.92. *Municípios* focused on coffee (0.69) and subsistence farming (0.67) had the lowest levels of concentration, whereas ranching was mixed, with a range from 0.69 in Sorocaba to 0.92 in Itapetininga.[47] Moving ahead to the 1970s, the Gini coefficient for land concentration in Brazil has been found to range between 0.72 in the South to 0.85 in the Northeast and Center West.[48] Inequality in the distribution of land in Brazil has proved remarkably stable and persistent.

The contrast between Brazilian patterns and the relatively egalitarian distribution of land in the United States is remarkable: Lee Soltow's estimate for Wisconsin, circa 1870, yields a Gini coefficient of 0.41; and his

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the Gini for public land sales was 0.61; in 1926 it was 0.62. APMT, Repartição de Terras, Lata c, 1901; Relatorio 161, Repartição de Terras, 1927.

[46] Adelman, *Frontier Development*, p. 90.
[47] Data cited in Schwartz, "Colonial Past," p.188.
[48] Data cited in Mahar, *Frontier Development Policy*, p. 86, fn.16.

data for the size distribution of land grants in Illinois from 1814 to 1899 yields a Gini of between 0.52 and 0.59.[49] If land was better distributed on the frontier in the United States, wealth was not. For instance, Soltow reports a Gini coefficient of 0.70 for males reporting real estate in Milwaukee County circa 1850—a figure not far removed from that found for the distribution of wealth in Cuiabá.[50] Patterns of landownership appear to have exacerbated inequality in Brazil and Argentina, even as they dampened it in the United States. Large-scale agriculture and ranching, combined with institutions favoring the property rights of large landowners, were the most salient factors in land concentration in Latin America.[51] Exports and foreign ownership, so pronounced in dependency theory, were of secondary importance, and their elimination would not have resulted in an egalitarian distribution of land.

The question remains whether this growth was worth the cost of skewed land distribution. In the case of Mato Grosso, the fact that the export boom ended did not mean that export-led growth was a failure; the alternative would have meant decades of significantly lower per-capita incomes and reduced government revenues, with very small gains in equality. Given the absence of empirical evidence to substantiate a strong link between exports and inequality, it is clear that Mato Grosso did not face a dilemma between growth and distribution; the problem was the institutional framework within which land concentration flourished.

The conclusions offered here serve to elucidate the distributional effects of export-led growth in the case of the Brazilian frontier. More broadly, the significance of this article to Latin American economic history is that it offers falsifiable hypotheses and empirical evidence concerning a little-known region as it underwent a controversial form of development. Inasmuch as the evidence presented refutes pessimistic assumptions of dependency theory, it serves a limited function in an old debate. It may yet prove possible to show that aggregate income gains obtained through exports and foreign investments were outweighed by increased inequality and structural distortions. Proof, like disproof, will only come with a commitment to the scientific method. For now, the evidence points in the other direction: the claim that dependency theory remains the "best" approach to understanding the Latin American economy remains, itself, an unsubstantiated assertion.

[49] Wisconsin data in Soltow, *Patterns*, p. 122; Illinois data in Soltow, *Distribution*, p. 91. Texas, another frontier state, had a Gini of 0.74 for wealthholders circa 1860 (Jones, *Wealth*, p. 286).

[50] The concentration of *total* wealth was even more pronounced, with a Gini of 0.74–0.77 for all persons in Wisconsin, and 0.89 for all persons in Milwaukee, circa 1860 (Soltow, *Wealthholding*, p. 67).

[51] For a comparison of property rights in inegalitarian Argentina and egalitarian Canada, see Adelman, *Frontier Development*, pp. 3–15.

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