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# ECONOMIC DEVELOPMENT AND REGIONAL INEQUALITY: ORIGINS OF THE BRAZILIAN CASE \*

NATHANIEL H. LEFF

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With the increasing interest in equity and income distribution in the process of economic development, considerable attention has focused on the size distribution of incomes. In some cases, however, much of the variance in income distribution within countries may be accounted for by wide disparities in interregional levels of per capita income. The presence of regional inequalities in the process of economic development has of course often been noted, and various theories have been proposed to explain this phenomenon.<sup>1</sup> For lack of historical analysis, however, the empirical relevance of these theories is not clear.<sup>2</sup> Thus it is not always known whether such inequalities are generated by endogenous features of the development process (e.g., "backwash effects"), or are essentially the result of an accidental difference in initial levels of income before the onset of modern industrialization, or whether regional inequality stems from a combination of both conditions. In this paper we will consider the origins of regional inequality in one of the cases of disparate development that is frequently cited, the Northeast and Southeast (Rio de Janeiro and São Paulo) regions of Brazil. Alternately, this paper is addressed to a more general question in eco-

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1. See, e.g., Gunnar Myrdal, *Rich Lands and Poor* (New York, Harper and Row, 1957), ch. 3.

2. For an example of an historical study of regional inequalities, however, see R. S. Eckaus, "The North-South Differential in Italian Economic Development," *Journal of Economic History*, XX (June 1961).

economic development — the failure of the Brazilian Northeast to develop during a long period when the country's other major region, the Southeast, was achieving notable economic progress.<sup>3</sup>

Because of the limited data available on nineteenth-century Brazil, the hypotheses advanced in this paper can only be considered tentative. Still, because of the importance of the phenomenon discussed, it may be worthwhile to analyze the causal factors that appear to be relevant in this case of regional inequality. As we will see, much of the explanation seems related to the operation of comparative advantage, and optimum currency-area considerations in the conditions of nineteenth-century Brazil. More generally, this historical experience also underlines questions that have been raised concerning the desirability under present conditions of monetary union for some of today's less developed countries.

## I

The Northeast-Southeast economic differential in Brazil is not a recent phenomenon, but appears to date from the nineteenth century. At the end of the eighteenth century, the Northeast does not seem to have been a relatively backward region within the country. Indeed a leading Brazilian economic historian, Roberto Simonsen, speaks of the *Southeast* as having been in deep economic crisis.<sup>4</sup> By the 1850's, however, levels of per capita output were higher in the Southeast than in the Northeast. A greater joint marginal-value product of labor and capital in the Southeast is shown by the ability of that region's planters to bid away part of the slave labor force (and the capital invested in it) from the Northeast despite the existence of very high interregional transportation costs.<sup>5</sup> Higher per capita incomes in the Southeast are also suggested by the fact that, when large-scale European immigration to Brazil began, the immigrants were attracted mainly to the Southeast.

The opening of a significant regional income differential implies that per capita income in the two regions grew at markedly

3. For data on the extent to which, by the middle of the twentieth century, Brazil's economic development had been concentrated in the Southeast, see Stefan Robock, *Brazil's Developing Northeast* (Washington, D.C.: Brookings, 1963).

4. See Roberto C. Simonsen, *História Econômica do Brasil* (4th ed., São Paulo, 1962), pp. 375, 380. The Northeast may even have been relatively well off. In 1796, the value of exports from the Northeast was more than double those of the Southeast (*ibid.*, p. 294), while, as noted below, the difference in population was much smaller.

5. See the data presented in Section V.

different rates. A relatively low rate of growth in the Northeast during the nineteenth century has sometimes been attributed to poor conditions of human capital formation in the region. This, in turn, has been explained in terms of the purported prevalence of slavery in the region, and the political and social conditions that militated against investment in the education of slaves. That explanation is not convincing, however, for slavery was also widespread in the higher-productivity, export sector of the Southeast. Indeed, by the time slavery was abolished in Brazil, in 1888, approximately 75 percent of the country's slave population was concentrated not in the Northeast, but in the Southeast.<sup>6</sup>

Rather, the disparity in regional rates of income growth seems to have been at least partly related to important differences in the growth of exports of the commodities in which these regions specialized, particularly coffee in the Southeast, and sugar and cotton in the Northeast.<sup>7</sup> Quite apart from possible contrasts in linkage effects as between the different export commodities, the difference in rates of export growth was sufficient to account for significant differences in the pace of regional development.

## II

Table I sets out the data on the sharp fall of the share of sugar and cotton in total Brazilian export receipts during the nineteenth century.<sup>8</sup> As the data indicate, at the beginning of the period, sugar and cotton, which were produced mainly in the Northeast, had accounted for nearly half of Brazil's export receipts. By 1912-1914, however, their contribution had fallen to some 3 percent.<sup>9</sup> By con-

6. This figure is from J. Pandía Calógeras, *A Política Monetária do Brasil* (trans. by Thomaz Newlands Neto from the 1910 edition of *La Politique Monétaire du Brésil*; São Paulo, 1960), p. 179. A regional population breakdown for 1888 is not available, but the data of Table III suggest that slaves probably also constituted a much higher proportion of the population of the Southeast than of the Northeast.

7. Cf. a similar suggestion by Simonsen, *História Econômica do Brasil*, *loc. cit.* and pp. 405, 434-36. In the early nineteenth century, Brazil's Southeast also exported some sugar; and following significant relative price changes in the second third of the twentieth century, the Southeast again became a major producer of sugar and cotton. However, during most of the nineteenth century, Brazil's sugar and cotton were produced predominantly in the Northeast, while the Southeast specialized in coffee.

8. The principal data source used in this paper is the Instituto Brasileira de Geografia e Estatística's *Anuário Estatístico* (Rio de Janeiro, 1941). It presents the data (available from 1821) on the value of exports, and on the exchange rate.

9. Exports of some other commodities produced in the Northeast, notably cocoa, expanded during the nineteenth century. However, as late as 1912-1914, cocoa amounted to only 3 percent of Brazil's total export receipts. More gen-

TABLE I  
SHARE OF COTTON, SUGAR, AND COFFEE IN  
TOTAL BRAZILIAN EXPORT RECEIPTS  
(Percent)

Product	1821-1823	1871-1873	1912-1914
Cotton	25.8	16.6	2.9
Sugar	23.1	12.3	0.3
Coffee	18.7	50.2	60.4

trast, coffee increased its share in total exports, and grew to dominate Brazil's foreign trade.

This change in the composition of exports reflected the marked differences in the rate of growth of exports in these commodities during the nineteenth century. Table II presents data on the annual

TABLE II  
ANNUAL PERCENTAGE TREND RATE OF GROWTH IN  
THE INCOME TERMS OF TRADE OF BRAZILIAN  
COTTON, SUGAR, AND COFFEE, 1822-1913

Product	1822-1913	1822-1873	1874-1913
Cotton	1.4	4.1	*
Sugar	*	2.3	-7.0
Coffee	5.0	6.2	3.6

\**t*-value of trend term not significant at 0.05 level. The  $p_m$  index used in computing the income terms of trade series is the export price index (1880 prices) of Great Britain, Brazil's principal foreign supplier. This index is available in Albert H. Imlah, *Economic Elements in the Pax Britannica* (Cambridge, Mass., 1958), pp. 94-98. Note: After 1870, international transportation costs fell, so that Brazilian import prices could improve by a margin greater than indicated by the movement of British export prices. The fall in international transport costs, however, affected import costs of both the Northeast and the Southeast by approximately the same extent. Consequently, the main point of the table—a large disparity in the rates at which income from these exports grew—is not changed.

exponential trend rates of growth of the income terms of trade ( $V_x/p_m$ ) for Brazilian cotton, sugar, and coffee exports between 1822 and 1913. To permit some degree of disaggregation over this long time span, trend equations were also estimated for these series in two subperiods, divided at the world depression year of 1873. As the data of Table II indicate, coffee exports grew at an annual trend rate appreciably higher than cotton and sugar in the earlier period. After 1874, the disparity in export growth was even more

erally, a rough computation (based on the assumption that all of Brazil's sugar, cotton, tobacco, and cocoa exports, and half of its leather exports came from the Northeast) indicates that the share of the Northeast in total Brazilian export receipts fell from approximately 60 percent in 1821-1823 to 36 percent in 1871-1873 and 11 percent in 1912-1914. The main factor in the decline was, as indicated in the text, the sharp fall in sugar and cotton exports.

marked. Coffee continued to expand, while cotton showed no trend. Overseas sales of sugar, however, experienced an absolute decline, at a precipitous rate.<sup>1</sup>

Export growth was of special importance for nineteenth-century Brazil, for, as discussed elsewhere, the country's major export commodities were produced under conditions that made for a high foreign trade multiplier.<sup>2</sup> Consequently, trends in export receipts were amplified in their impact on regional income. The disparate pace of export growth was in fact associated with significant differences in industrial development and in urbanization in the two regions.

With the growth of regional income and a domestic market based on coffee exports, Brazil's industrialization that began after 1850 was also concentrated in the provinces of Rio de Janeiro and São Paulo.<sup>3</sup> In reflection of greater growth in secondary and tertiary activities, urbanization proceeded at a more rapid pace in the Southeast. In the census of 1872, the combined population of the cities of Rio de Janeiro and São Paulo was already 50 percent greater than that of Bahia and Recife, the two major Northeastern cities.<sup>4</sup> Taken

1. These data on overseas sales of sugar and cotton do not give a complete picture of the growth of exports of these commodities in the Northeast, for an increasing part of the region's output was sold in the Brazilian Southeast. There are no reports, however, of a continuing flow of capital from the Southeast to the Northeast. Hence, a counterpart to those interregional sales from the Northeast must have been exports from the Southeast to the Northeast. Consequently, the data of Table II on the major export commodities of these regions do give an approximate idea of the relative rates of export growth in the Southeast and Northeast. In addition, the decline in the Northeast's overseas exports reduced its access to the foreign capital that financed the Southeast's export trade and that also provided some of the capital for the latter region's industrialization. On the export-import activities as a source of capital for industrialization in the Southeast, see Warren Dean, *The Industrialization of São Paulo, 1880-1945* (Austin: University of Texas Press, 1969), Chs. 1 and 4.

2. See Nathaniel H. Leff, "Tropical Trade and Development in the Nineteenth Century: The Brazilian Experience" (mimeo, 1972), and "Long-Term Brazilian Economic Development," *The Journal of Economic History*, XXVIII (Sept. 1969), 479-85. The higher-value productivity of the export sector in Brazil (and this sector's importance for the economy's growth) is indicated by the concentration of the country's slave labor force in the export activities as compared with the economy's major other activity, domestic agriculture.

3. Despite the Northeast's proximity to raw material supplies, for example, the cotton textile industry shifted to the Southeast. The share of the Northeast in Brazil's cotton textile industry fell from 6 of the country's 9 cotton mills in 1866, to 14 out of 30 in 1875, to 15 out of 48 in 1885. These data are from Stanley J. Stein, *The Brazilian Cotton Manufacture* (Cambridge: Harvard University Press, 1956), p. 21.

4. Computed from data in Richard Graham, *Britain and the Onset of Modernization in Brazil, 1850-1914* (Cambridge University Press, 1968), p. 32. Data on the regional distribution of Brazil's population are presented in Table III. The greater extent of urbanization in Rio de Janeiro of course

in relation to the two regions' populations at that time, these figures indicate a rate of urbanization 65 percent greater in the Southeast. In addition, between 1872 and 1900, the population of Rio de Janeiro increased at an annual rate of 3.7 percent, while São Paulo grew at an annual rate of 8.3 percent. By contrast, the population of Bahia grew at 2.2 percent while that of Recife was virtually stagnant, leading to an even greater difference in the extent of urbanization by region.

The rapid development in the Southeast occurred while per capita income for the country as a whole was probably growing at only a low rate before 1900.<sup>5</sup> At the beginning of the nineteenth century, the Southeast region had more than one third of Brazil's total population, while the Northeast had approximately a half. Since per capita income for the country as a whole is a weighted average for the country's various regions, the rapid growth of the Southeast, with its more than negligible weight, implies that per capita income levels in the Northeast stagnated. Indeed, Celso Furtado (himself from the Northeast) considered it plausible to suggest that per capita incomes in the region actually fell, so that the Northeast underwent an absolute as well as a relative decline during the nineteenth century.<sup>6</sup> In any case, as a result of its poor experience during the nineteenth century, the Northeast began the twentieth century at relatively low levels of income and wages.<sup>7</sup>

### III

The foregoing discussion raises some obvious questions. Why did Brazilian exports of sugar and cotton do so badly as compared with coffee during the nineteenth century? In addition, may not the Northeast's relatively poor export performance be only a surface symptom reflecting profound differences in social or psychocultural aptitudes for economic development between the Northeast and the Southeast?

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partly reflected the fact that the central government was located there. Still, from 1799 to 1864, the population of the city of Rio de Janeiro grew some 560 percent, from approximately 80,000 to approximately 450,000 inhabitants. (See Stein, *The Brazilian Cotton Manufacture*, p. 8.) Only part of that large increase was determined by the localization of the capital in Rio.

5. See the estimates presented in Nathaniel H. Leff, "Estimating Income Trends from Currency Data: Nineteenth-Century Brazil" (mimeo, 1972).

6. See his *Formação Econômica do Brasil* (5th ed., Rio, 1965) p. 175.

7. In 1889, the British consul in Pernambuco reported that labor there was cheaper than anywhere in the old world except Asia. This is cited in J. H. Galloway, "The Last Years of Slavery on the Sugar Plantations of Northeast Brazil," *Hispanic American Historical Review* LI (Nov. 1971), n. 54.

The relatively slow export growth of sugar and cotton appears especially surprising, for these were two products for which demand in the major advanced countries expanded enormously during the nineteenth century.<sup>8</sup> Cotton and sugar had long been produced in Brazil, and in sugar at least, the nineteenth century saw a notable increase in the area under cultivation in the Northeast.<sup>9</sup> In both products, however, Brazil had only a small and declining share in major world markets. Brazil supplied only 13 percent of Great Britain's raw cotton imports in the 1820's, 7 percent in the 1830's, and only 3 percent in the 1840's. Following the world cotton famine of the 1860's, Brazil's market share rose to 10 percent of British imports in the 1860's; it was 9 percent in the 1870's. By the 1880's, however, the figure was down to 6 percent.<sup>1</sup> As regards sugar, during the nineteenth century Brazil had less than 10 percent of world sugar exports, a market share that fell below 2 percent by the 1880's.<sup>2</sup>

Numerous explanations have been suggested for the relatively poor export growth of Brazilian sugar and cotton in the nineteenth century. As discussed below, however, these explanations are not completely convincing. Let us therefore examine in greater detail the conditions affecting Brazilian exports of these commodities, to provide a more satisfactory explanation of this unhappy experience in nineteenth-century trade and development, which also influenced the emergence of regional inequalities in the Brazilian development process.

#### IV

One explanation of the relatively poor performance of Brazilian cotton and sugar exports has been in terms of (nonmarket) limita-

8. The growth in world demand for cotton, stemming both from rising income and from falling prices in cotton textiles, is well known. World consumption of sugar also seems to have increased notably. Between 1832-1842 and 1858-1862, for example, *per capita* consumption of sugar in Great Britain increased by 115 percent, and by 280 percent from the same base period to 1878-1888. Those figures are computed from data in Albert H. Imlah, *Economic Elements in the Pax Britannica* (Cambridge: Harvard University Press, 1958), p. 143.

9. See J. H. Galloway, "The Sugar Industry of Pernambuco During the Nineteenth Century," *Annals of the Association of American Geographers*, LVIII (June 1968), 292-95.

1. These data are from James A. Mann, *The Cotton Trade of Great Britain* (London, 1860; reprinted, Clifton, N. J.: Kelley, 1968), p. 43; and from U.S. government data cited in Alfred Conrad *et al.*, "Slavery as an Obstacle to Economic Growth in the United States: A Panel Discussion," *The Journal of Economic History*, XXVII (Dec. 1967), 529.

2. These data are from Peter Eisenberg's study, "The Sugar Industry of Pernambuco, 1850-1889" Ph.D. thesis, Columbia University, 1969.



tions on the demand side. In particular, Roberto Simonsen has suggested that Brazilian exports to some major world markets were hampered because of the colonial preferences imposed by the British, French, and Dutch in favor of imports from their own empires.<sup>3</sup> For example, an 1810 treaty between Brazil and the United Kingdom excluded Brazilian sugar, tobacco, and coffee from the British market during the first half of the century.

Colonial policies undoubtedly influenced the geographical distribution of Brazilian exports during the nineteenth century. However, in relation to the problem at hand, Simonsen's interpretation leaves a number of questions unanswered. Why, for example, did Brazilian cotton, which was not excluded from the market even before the advent of free trade, do so poorly in the British market? Similarly, why did Brazilian exports of coffee to the American market (which was not restricted during most of the century) grow so much more rapidly than Brazil's exports of sugar to the United States? More generally, it is not clear how colonial restrictions in favor of other tropical export regions explain the marked differences in the rates of Brazilian export growth by *commodity* during the nineteenth century.

Other explanations have attributed the poor experience of Brazilian sugar and cotton exports to conditions on the supply side. For example, a contemporary British observer stressed the importance of labor shortages that affected Brazilian cotton production after the cessation, in 1850, of overseas importation of slaves.<sup>4</sup> Still, the share of Brazilian cotton exports in the British market had also declined during the earlier period of large-scale importation of slaves from Africa. Similarly, other writers have suggested that the high internal transportation costs of the prerailroad era limited cotton exports.<sup>5</sup> After the fall in transport costs occasioned by the construction of the railways, however, there was no long-term increase in the share of Brazil's cotton exports in the British market.

Another, more general explanation has focused on socio-cultural conditions, and the noneconomic or nonadaptive behavior allegedly associated with a slave-owning society such as the Brazilian Northeast. This interpretation neglects the fact that coffee in the Southeast was also produced by slaves in a planter-dominated society. Furthermore, it is relevant to note the results of supply response

3. See Simonsen, *História Econômica do Brasil*, *op. cit.*, pp. 404-06, 434-36.

4. Mann, *The Cotton Trade of Great Britain*, *op. cit.*, p. 86.

5. Stein, *The Brazilian Cotton Manufacture*, *op. cit.*, pp. 221-22.

equations that were estimated for sugar and cotton, and for Brazil's other exports in the nineteenth century.<sup>6</sup> These results generally do not indicate a longer adjustment process for the commodities produced in the Northeast than for Brazil's other exports.

A different version of this argument has suggested that, although the Northeast planters may have demonstrated entrepreneurship and an absence of supply rigidities with given production functions, social and cultural constraints retarded the acceptance of new technology. Brazilian cotton producers were in fact technologically backward as compared with producers in other countries.<sup>7</sup> Similarly, in sugar, the Northeast lagged two and three decades behind Louisiana and Cuba in the introduction of technical innovations in the milling process and in the conversion from water to steam power.<sup>8</sup> Such behavior cannot always be attributed to the existence of different relative factor prices in Brazil, for some of the innovations seem to have been capital- as well as labor-saving.

This argument suggests that, if it paid other producers, who, it is assumed, faced cost conditions similar to those of Brazil, to introduce technological innovations, the failure of the Northeast planters to do so reflects noneconomic behavior due to cultural constraints. That interpretation assumes that the returns to producers were determined mainly by international prices, and neglects — in a point to which I will return below — the fact that the prices received by Brazilian producers were also affected by the exchange rate that was used to convert sterling prices to domestic currency. Furthermore, the emphasis on the alleged cultural backwardness of the Northeast planters is not consistent with the results of an episode in the 1870's and 1880's, when the Brazilian government attempted to arrest the decline of the Northeast by promoting the introduction of modern sugar technology by foreign companies.<sup>9</sup> The government experienced considerable difficulty in getting foreign investors (who were presumably not constrained by the Northeast's

6. Leff, "Tropical Trade and Development," *op. cit.*

7. See Stein, *The Brazilian Cotton Manufacture*, p. 223. Simonsen has also stressed the importance of Brazil's technical lag behind the United States. He attributed "the American victory" in the international cotton market mainly to Eli Whitney's invention of the cotton gin. See *História Econômica*, p. 370, n. 25.

8. See Eisenberg, "The Sugar Industry of Pernambuco," *op. cit.*, Ch. 3.

9. An account of this episode, which is strikingly contemporary in the self-conscious effort at economic and social salvation through technological modernization, is presented in Graham, *Britain and the Onset of Modernization in Brazil*, pp. 149-58; Eisenberg, "The Sugar Industry of Pernambuco," Ch. 3; and Galloway, "The Sugar Industry of Pernambuco in the Nineteenth Century," pp. 300-02.

cultural traditions) to take up the concessions it offered. In addition, many of the enterprises that were finally launched using more modern technology made losses rather than profits!<sup>1</sup> Some of these mills were subsequently sold, at depreciated capital values, to Brazilian owners, and the new mills continued to operate. However, the introduction of the new technology failed to stem the dramatic decline of Brazilian overseas sugar exports, whose value fell at an annual trend rate of 9.2 percent between 1881 and 1913.<sup>2</sup>

## V

For the reasons discussed, the earlier explanations proposed are not satisfactory. However, another approach suggests itself readily: that Brazilian comparative advantage and the rates of return available in the country's different export activities during the nineteenth century favored coffee as against sugar and cotton. This interpretation would indeed appear too straightforward to be worth discussing were it not for the misperceptions concerning the origins of regional inequalities in Brazil that have been introduced by the earlier explanations.

Brazil did not end slavery until 1888. Consequently, the data on the allocation of the country's slave labor force can be used to provide an indication of the relative marginal value product of labor, and of the relative rates of return to the capital (invested in slaves) that were employed in the different export activities.

During most of the century, the returns available in cotton were apparently below those available in other export activities. This is indicated by the fact that cotton was generally not produced in a plantation system, using slaves, but was planted on a small scale by individuals too poor to have access to the capital needed for sugar and other plantation crops.<sup>3</sup> At the same time, in a shift in which a movement of relative prices appears to have played a

1. Poor management on the part of some of the foreign firms also played a part in the failure of this episode. However, the main factors responsible seem to have been the economic conditions affecting Brazilian sugar exports, which are discussed in the next sections.

2. As W. A. Lewis has pointed out in his 1969 Wicksell Lectures (*Aspects of Tropical Trade, 1883-1965*, Uppsala, 1969, p. 10), world sugar prices fell between 1883 and 1913. However, the fall in the value of Brazilian sugar exports was much greater than was the case for other sugar exporters. The greatest decline Lewis cites is that of Mauritius, where the value of sugar exports fell at an annual rate of approximately 2 percent. As indicated in the text, the decline in Brazil was much greater.

3. Stein, *The Brazilian Cotton Manufacture*, p. 47, and "Evolution of Brazilian Cotton Plantations," *Conjuntura Econômica* (1970), No. 5, p. 24.

part, rates of return and the marginal value product of labor seem to have moved in favor of coffee and against sugar.<sup>4</sup> Evidence for this change is provided by the fact that during the century, the Southeastern coffee planters were able to bid away part of the slave labor force from the Northeast.<sup>5</sup> Table III presents data on that

TABLE III  
REGIONAL DISTRIBUTION OF BRAZIL'S  
POPULATION, 1823 AND 1872  
(Percent)

Region	Slave population		Free population		Total population	
	1823	1872	1823	1872	1823	1872
North	3	2	3	4	3	3
Northeast	54	32	51	49	52	47
Southeast	39	59	37	37	38	40
South	1	6	7	7	5	7
Central West	3	1	2	2	2	2

Source: Computed from data cited in Stanley J. Stein, *Vassouras* (Cambridge, Mass., 1957), p. 296.

Note: Following the current convention of the Brazilian Institute of Geography and Statistics, the various regions were defined in the following way. The North consists of Amazonas, Pará, and the Territories; the Northeast, of Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, and Fernando Noronha; the Southeast, of Minas Gerais, Espírito Santo, Rio de Janeiro, and São Paulo; the South, of Paraná, Santa Catarina, and Rio Grande do Sul; and the Central West, of Mato Grosso and Goiás.

shift. As noted earlier, by the time slavery was abolished, approximately 75 percent of the slave population was located in the coffee region of Rio de Janeiro, São Paulo, and Minas Gerais.

The reallocation of factors into the activities with higher returns was incomplete, however. As late as 1872, some 47 percent of the country's population was still in the Northeast.<sup>6</sup> There is no

4. The price of coffee relative to sugar rose at an annual trend rate of 1.2 percent between 1828 and 1873. This may have been due to world market supply conditions that made for disproportionately large increases in both cane and beet sugar production. Data presented in "Tropical Trade and Development" suggest that prices of other Brazilian export commodities relative to sugar rose at even higher rates. However, the reallocation of the slave labor force seems to have been mainly from sugar to coffee.

5. As a contemporary observer described this movement: "The slaves have been drained into the Southern provinces for years. It is common to find three or four hundred of them on the Rio coffee plantations; rarely, there will be as many as a score on the sugar estates of Pernambuco or Para." (Herbert H. Smith, *Brazil, the Amazons and the Coast*, London, 1879, p. 470).

6. The proportion fell rapidly thereafter, by 5 percentage points between 1872 and 1890. In that period, population in the Southeast region grew at an annual rate of 2.3 percent as compared with 1.4 in the Northeast. Most of the difference in regional rates of population growth reflects the impact of foreign immigration, which went to the Southeast. However, the fact that the Northeast's rate of population growth was below Brazil's natural rate of population increase of 1.6 percent suggests that regional outmigration may also have

need to posit economic irrationality to account for this continuing disparity in factor returns, however, for there were important costs and constraints on resource reallocation.

The high internal transportation costs between the regions of Brazil, of course, reduced the flow of labor for any given wage differential.<sup>7</sup> Relatively high capital costs, which were the case in nineteenth-century Brazil,<sup>8</sup> also lowered the amount of investment in migration. In addition, the reallocation of slaves to the Southeast was restricted by the export taxes imposed by several of the Northeast provinces in an effort to stop the movement. Further insight into why the movement of labor was so limited is provided by the fact that, despite these barriers, as indicated in Table III, the interregional migration was much greater for slaves than for the free population. First, free labor was not used widely in the major export activities of the Southeast until the 1880's, so that the demand for free labor was largely limited to the domestic sector. In addition, transportation costs were lower for slaves than for free migrants.<sup>9</sup> Moreover, on the supply side, the slave labor market provided a mechanism for financing the capital costs of interregional labor reallocation of slaves. No comparable capital market facilities were available to finance migration by the free population. Finally, most of the special types of land (and climate) of the Northeast were technically not suited for coffee production, and had higher returns in other activities. Consequently, in cases of landowners whose income was derived from a combination of land, capital, and entrepreneurship inputs, reallocation of factors to coffee was also impeded. In reflection of these conditions affecting the costs of factor reallocation, although part of Brazil's slave labor force was transferred to the Southeast, the overall factor movement was limited.

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occurred. Internal migration may have accelerated as a result of the fall in transportation costs occasioned by the growth of the railway network in these years. (Data on population and immigration are from Ministério de Planejamento, *Demografia* (Rio, 1966), pp. 39, 73-78; and Oliver Onody, *A Inflação Brasileira, 1822-1958* (Rio, 1960), p. 308.)

7. Transportation from northeastern Brazil to the Southeast was usually by sea. From Recife to Rio, for example, by sea was a trip of some 1200 miles. Another important element in the cost of the journey, however, was incurred by the time-consuming and primitive transportation facilities between the hinterland and the ports.

8. Stanley J. Stein, *Vassouras* (Cambridge: Harvard University Press, 1957), pp. 19-20.

9. Special low-quality accommodations were available for slaves shipped from the northeastern ports to Rio de Janeiro; the charge for their transportation was approximately half the level of that for free passengers. I am indebted to Herbert Klein for this information.

## VI

Implicit in the previous discussion on the causes of the limited reallocation of resources from sugar and cotton to coffee were the conditions associated with Brazil's endowment of land. This is a factor that is sometimes neglected, but because of its importance as an input in an agricultural economy like nineteenth-century Brazil, a number of points should be noted.

Land was not a uniform or homogeneous factor, in the sense of having identical technical properties and hence equal returns in all activities. In particular, as noted, the special types of land in the Northeast had higher returns in activities other than coffee. Consequently, land was not a mobile factor, and thus reallocation of other resources involved geographical mobility. Because of Brazil's endowment of land and because of the country's backward transportation network, however, the costs of reallocation were high. First, with the country's abundance of land, cultivation was extensive, and population densities were low. Consequently, the distances from the interior of Brazil to the borders of the different regions were large. Transfer costs were also high because of the great distance between the regions of Brazil. Because of the large interregional as well as intraregional distances, the geographical movements required for factor reallocation were quite large. Partly because of the high internal transportation costs, the Southeast coffee planters found it cheaper to import labor from Italy than from the Northeast. The availability of low-cost transportation facilities such as railroads would have helped this situation by reducing costs and permitting labor to escape from the Northeast and its low returns. The railroads were built relatively late in nineteenth-century Brazil, however, after large-scale foreign immigration had already begun.<sup>1</sup>

## VII

So far we have noted that the Northeast-Southeast differential in Brazilian economic development appears to stem from a significant disparity during the nineteenth century in the rates of

1. See Nathaniel H. Leff, "Economic Retardation in Nineteenth-Century Brazil," *The Economic History Review*, XXV (Aug. 1972). Data on Brazil's backward transportation network during the nineteenth century are presented in that paper. Internal factor reallocation was also limited because, as noted there, the Brazilian government subsidized the costs of foreign immigration. Perhaps because of the pressures of landowners in the Northeast, similar measures were not implemented to lower the private costs of internal migration.

growth of the exports in which the two regions specialized. The difference in export growth, in turn, reflected a shift in the country's comparative advantage, so that despite the great expansion of world demand for sugar and cotton, Brazilian exports of those products did not increase notably. In addition, in this situation of imperfect domestic factor reallocation, exports of sugar and cotton were also increasingly limited by the impact of coffee exports on the country's floating exchange rate.

The domestic currency (*milreis*) price received by exporters of each commodity was determined by two factors: the individual commodity's sterling price, and the global exchange rate. In reflection of Brazil's stronger comparative advantage in coffee, the implicit sterling-milreis exchange rate (the sterling value of the domestic factors required to produce a unit of foreign exchange) was higher for coffee than for sugar or cotton. Expressed in other terms, Brazilian coffee could be exported at world market prices with a lower milreis-sterling exchange rate than could sugar or cotton. Consequently, as coffee exports grew to dominate Brazil's foreign trade, the exchange rate increasingly reflected the weight of coffee and its pressures for exchange appreciation.<sup>2</sup>

The ensuing effects in the exchange rate had important effects on the milreis price of Brazil's sugar and cotton exports. To ascertain the relative importance of changes in the exchange rate and of the individual commodity's annual sterling price in determining movements of the annual milreis price for those products, the following procedure was adopted. The logarithm of the annual milreis price of each commodity is equal to the sum of its sterling price and of the logarithm of the country's milreis-sterling exchange rate. Consequently, the variance of the logarithm of the annual observations of each commodity milreis price can be analyzed in terms of the variances (and the covariance) of the logarithm of these two terms. The results of this decomposition are presented in Table IV.

Percentages do not sum to 100 because of rounding. As the table indicates, in the earlier period variations in the exchange rate and in the sterling price of sugar were of equal importance in ac-

2. The growth in domestic incomes consequent upon coffee exports also generated increased demand pressures on the exchange market. There is evidence, however, that the marginal propensity to import of the coffee sector was not high (see Leff, "Long-Term Brazilian Development," p. 481, n. 25). Moreover, expanding coffee exports also led to foreign investment in Brazil, which increased the supply of foreign exchange and also led to pressures for an exchange rate higher than would have obtained in the absence of coffee exports.

TABLE IV

RELATIVE CONTRIBUTION OF THE VARIANCE IN THE EXCHANGE RATE OF EACH COMMODITY'S STERLING PRICE, AND OF THE COVARIANCE TERM TO THE TOTAL VARIANCE OF THE MILREIS PRICE OF BRAZIL'S EXPORTS OF SUGAR AND COTTON.

Product and Period	Var ln ER	Var ln $\epsilon p_t$	Cov (ER, $\epsilon p_t$ )
	(Percent)		
Sugar, 1822-1873	89	91	-40
1874-1913	76	35	-5
Cotton, 1822-1873	27	80	-3
1874-1913	67	22	6

Note: These percentages were computed from the formula  $\text{Var ln milreis } p_t = \text{Var (ln ER)} + \text{Var (ln } \epsilon p_t) + 2 \text{ Cov (ln ER, ln } \epsilon p_t)$ .

counting for changes in the milreis price of sugar. (The large contribution of the covariance term reflects the importance of the sterling price of sugar in determining the annual value of Brazilian sugar exports, and given the large share of sugar in total Brazilian exports at that time, the country's total foreign exchange supply.) In the later period, however, variations in the exchange rate became the most important determinant of variations in the milreis price of sugar. Similarly, in cotton, too, movements in the exchange rate became much more important quantitatively than changes in the sterling price in accounting for the variance of the milreis price.

Thus the following process seems to have occurred. For the reasons discussed, factor reallocation from the Northeast to the Southeast (and from sugar and cotton to coffee) was limited. Both regions, however, had to face the same foreign exchange rate.<sup>3</sup> As coffee exports grew, they led to a higher exchange rate than would otherwise have prevailed. This affected adversely sugar and cotton, which required a lower sterling-milreis rate in order to export, for it entailed falling real (domestic currency) prices. With an upward sloping supply curve, their exports were lower than they would otherwise have been. The lower domestic currency prices for these products also reduced the returns in Brazil from investing in new technology, which was profitable in other countries. At the same time, the increasing exchange overvaluation for sugar and cotton was a dynamic process, which, with the growing weight of coffee in the exchange market, priced ever greater quantities of Brazilian sugar and cotton out of world markets, and led to the large reduc-

3. There were sometimes slight disparities between the exchange rates in Rio de Janeiro and in Recife, but arbitrage of the foreign and the domestic banks kept them very small.



tion of overseas sales of these products that we have noted.<sup>4</sup> Finally, because Brazil's comparative advantage was so much stronger in coffee than in sugar, and because of the exchange rate mechanism and lower milreis prices by which this fact was brought home to producers, returns to the factors remaining in these activities were reduced, thus contributing further to the economic decline of the Northeast.

### VIII

We should note the absence in nineteenth-century Brazil of mechanisms to assure a convergence of regional incomes. Indeed, because of the process we have just discussed, the growth of coffee exports from the Southeast led directly to an accelerating decline in overseas sales of the Northeast's sugar and cotton. The Northeast-Southeast movement of labor was also, as we have seen, limited. Moreover, there was apparently no tendency toward decreasing returns to scale in the Southeast's economic activities. External economies and infrastructure facilities such as railways, which were generated by growth in earlier periods, probably even facilitated subsequent development in the Southeast, both in manufacturing and in agriculture. For example, when internal relative prices shifted to favor cotton and sugar in the twentieth century, the Southeast outdid the Northeast with its supply response in increasing the production of these commodities. Finally, the central government did not cushion the Northeast from the regional economic shift. By the 1830's, the government was politically dependent on the coffee interests, and in the aggregate, government allocation policies may even have discriminated against the Northeast.<sup>5</sup> In the 1870's and 1880's, the central government did extend some help to the region after periods of catastrophic drought, but, like the program for the introduction of modern sugar technology, this was not very effective in inducing regional convergence. It was only in the middle of the twentieth century that more effectual large-scale government programs were implemented.<sup>6</sup>

Under these conditions, the Northeast might well have been

4. Global devaluation, which occurred frequently in response to Brazil's long-term inflation during the nineteenth century, did not help sugar and cotton appreciably since they required an exchange rate which was permanently lower than the rate which was dominated by coffee.

5. On the last points, see Stein, *Vassouras*, p. 64, and Eisenberg, "The Sugar Industry of Pernambuco," Ch. 3.

6. See Albert O. Hirschman, *Journeys toward Progress* (New York, 1963), Ch. 1.

better off as a separate political unit, with its own currency system. Its trade and development would then have been determined by the region's own comparative advantage. At the least, to the extent that after the fall in world sugar prices alternative activities with higher returns could not be developed, the exchange rate would have depreciated more rapidly, to permit a less drastic reduction in domestic currency prices for sugar, and, as happened in other exporting areas, a smaller fall in the receipts from sugar exports.<sup>7</sup> Thus the experience of the Northeast also has more general implications concerning optimal country size when the currency system coincides with the political unit, and there are constraints or high costs to interregional factor mobility.

The Northeast's development may also have been retarded by another condition related to currency union considerations — the region's obligation to maintain a fixed parity in its transactions with the Southeast. Taken together with the Northeast's exchange overvaluation vis-à-vis the rest of the world, its fixed parity within Brazil implies that the region's exchange rate in relation to the Southeast may also have been overvalued.<sup>8</sup> The Northeast's stock of nationally marketable financial assets that could be transferred to finance an interregional payments disequilibrium was limited essentially to money, and, in fact, there seems to have been a chronic scarcity of money in the Northeast.<sup>9</sup> This illiquidity must have affected interest rates, capital formation, and activity levels in the region. Furthermore, with (internal) exchange rate changes precluded as a mechanism for adjusting an interregional payments imbalance, restoration of equilibrium involved a deflationary bias for the Northeast: an adverse shift in the terms of trade, and — with wages rigid downwards at the subsistence level — lower levels of

7. See the data cited above in note 2, page 252. As noted earlier, part of the rapid decline of overseas sugar exports was due to the fact that the Northeast sold a growing portion of its sugar output to the Brazilian Southeast. The total volume of exports, however, was probably much lower than it would have been had the Northeast had undistorted access to the entire world market. Moreover, as noted in note 1 p. 247, interregional exports did not bring with them the capital imports which helped finance the Southeast's industrialization. Finally, the welfare gains from interregional exports were reduced, because the value, in international prices, of the milreis receipts generated was lowered by the high Brazilian protective tariff. This raised the prices of many commodities imported from the Southeast or from overseas above world market levels.

8. On the discussion that follows, see R. A. Mundell's "A Theory of Optimum Currency Areas," *American Economic Review*, LI (Sept. 1961), and Tibor Scitovsky, *Money and the Balance of Payments* (Chicago: Rand McNally, 1968), Ch. 8.

9. Galloway, "The Last Years," n. 49.

real output and of employment.<sup>1</sup> The deflationary pressures were, moreover, not temporary or transient. This was the case because adjustment was aimed at a moving disequilibrium, the regional exchange overvaluation that was caused by a progressive — rather than a once-and-for-all — increase of the weight of coffee in the country's foreign exchange market. Finally, to the extent that the economies of the two regions were — or could have been — complementary, regional overvaluation also tended to reduce the magnitude of the Northeast's exports to the rapidly growing Southeast, as compared to what they would have been under a different exchange regime. This lowered the interregional linkage effects that were presumably the Northeast's chief economic benefit from remaining within the same political unit as the Southeast.

The relevant trade-off in this situation was not between higher "aggregate" growth and increased regional disparities. Aggregation is especially misleading here because the Northeast shared very little in the growth that took place within Brazil as a whole. Rather, until the end of the century, when coffee reached the limit of its dominance in the country's foreign exchange market, the trade-off was between higher growth for the *Southeast* and stagnation, if not decline, in the Northeast.

## IX

This paper has presented evidence indicating that regional differentials in Brazilian economic development are not the result of twentieth-century industrialization, but date from the nineteenth century.<sup>2</sup> The regional disparity had its source in the very process by which economic development began in Brazil — export growth — as exports of coffee, in which the Southeast specialized, grew at a much higher rate than overseas sales of sugar and cotton, which were produced mainly in the Northeast. The decline of Brazil's sugar and cotton exports, in turn, seems to have followed from a shift in the country's comparative advantage. This was suggested by the data on the reallocation of the country's slave labor force during the nineteenth century. What should a country do when such a shift

1. This is consistent with reports from the region. See, e.g., the 1875 statement of the British consul in Pernambuco: "The immense number of people without a trade or ostensible means of living is truly astonishing." (Cited in Galloway, "The Last Years," n. 46.)

2. The North-South disparity in Italy seems also to be a case where regional inequality antedates — and therefore cannot be attributed wholly to — modern industrialization. See Eckaus, "The North-South Differential in Italian Economic Development," pp. 300, 315–17.

in comparative advantage occurs? Clearly, resources should be re-allocated to the activity with higher returns. To a limited extent, this occurred in Brazil, particularly for slave labor. Capital and entrepreneurship, however, were often linked as joint inputs to land, which was not mobile. Moreover, because factor reallocation involved geographical mobility, and because of the high costs that this entailed under nineteenth-century Brazilian conditions, large-scale factor reallocation was impeded.<sup>3</sup>

The plight of the Northeast in the nineteenth century can thus be viewed as a case in which the comparative advantage shifts, but in which the textbook assumptions of instantaneous and costless internal factor reallocation are not fulfilled. At the same time, the country did have a unified foreign exchange market. Consequently, the expansion of coffee exports, with its attendant pressures for a higher exchange rate than would otherwise have prevailed, led to a reduction of exports and a squeezing of returns to the factors remaining in sugar and cotton. As noted, some of the frequently cited "backwash" effects — for example, large-scale migration of capital and entrepreneurship from the poor to the rich region — do not seem to have occurred. However, other conditions that have not received sufficient attention in the analysis of disparate regional development did operate, with pernicious interregional effects. Consequently, the accidental circumstance of the spatial distribution of activities that ranked very differently in Brazil's comparative advantage led to a process whereby expansion of the exports of one region was associated with a decline in exports and development in the other.<sup>4</sup>

In addition to analyzing the origins of an important case of inequality in economic development, this paper also provides per-

3. The analysis of the origin of this case of "dualism" in terms of differential returns in different activities and the existence of high costs or constraints to factor reallocation may of course also be relevant in other contexts. Such constraints, which permit continuing disequilibrium, may be institutional as well as economic. The relations sometimes established between the colonizing and the indigenous population in colonies are a prime example of such institutional barriers.

4. This discussion has emphasized economic conditions rather than alleged regional psycho-cultural differences in explaining the origin of Brazil's regional differential. For a similar view minimizing the importance of original differences in "values" in the regional development of Colombia, see Albert O. Hirschman, *The Strategy of Economic Development* (New Haven: Yale University Press, 1958), pp. 185-86, and Alvaro Lopez Toro, "Migración y Cambio Social en Antioquia durante el Siglo XIX," *Demografía y Economía*, V (1968). It should also be noted that the analysis of this paper does not support climatic interpretations of Brazil's regional disparity, which have emphasized the fact that, like Argentina and Uruguay, the Southeast is closer to the temperate zone than is the Northeast.

spective on some potential pitfalls involved in current proposals for monetary union among present less developed countries. (Alternatively, similar considerations apply in evaluating the possible benefits arising from the dissolution of existing political and currency unions in the less developed countries.) The nineteenth-century Brazilian experience provides a dramatic example of the unfortunate consequences when a condition stressed by optimum currency-area theory — labor mobility — is not satisfied. Under present conditions in some less developed countries, constraints on effective factor reallocation may be imposed not by the costs of migration, but by ethnic or national hostilities.<sup>5</sup> Unless labor mobility is assured, however, or economically equivalent measures are implemented to avoid currency union effects such as afflicted the Northeast during the nineteenth century, currency unions may lead not to the expected overall acceleration in development, but rather to the creation of regional backwaters and to deadweight loss.

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5. Examples of cases in which such hostilities led to violence and subsequent barriers to labor mobility are provided in the massacre of Ibos in Northern Nigeria, and in the 1969 war between two members of the Central American Common Market, El Salvador and Honduras.