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Brazil's Export Promotion Policy (1980–1984): Impacts on the Amazon's Industrial Wood Sector

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For over 300 years, conventional economic wisdom has emphasized the importance of foreign trade in fostering economic development. In the 1660s, the British mercantilist Thomas Mun declared that "[t]he ordinary means to *encrease* our wealth and treasure is by *Forraign Trade*."[1] We have become accustomed to hearing accolades to trade, such as Robertson's famous allusion to nineteenth-century trade as "the engine of economic growth," and Marshall's supposition that the "causes which determine the economic progress of nations belong to the study of international trade."[2] Recent neoclassical research tends to support these eloquent assertions.[3] With respect to Brazil for instance, Carvalho and Haddad (1981) conclude that "Brazil's switch [from an import substitution–industrialization strategy] to an export promotion policy has been successful in increasing both manufacturing output and employment."[4]

This paper examines the impacts of Brazil's export promotion policy on the structure and conduct of the Amazon's industrial wood sector (IWS) between 1980 and 1984.[5] I interviewed 35 Brazilian industrial wood exporters and 27 lumber producers operating in the Amazon state of Rondonia who were active between 1980 and 1984 in the mahogany (*Sweitenia macrophylla*) trade.[6] The results of this field research indicate that subsidized export financing furnished by Brazil's Central Bank implicitly favored capital accumulation by the merchant class of trading companies and led to the concentration of IWS production on a single export commodity, mahogany lumber, often at the expense of domestic demand. From 1980 to 1984, a veritable boom in mahogany lumber

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production ensued, fueled by export incentives. Mahogany became one of the Amazon's premier export staples, constituting over 30 percent of all Brazilian lumber exports in 1983.[7] By 1985, foreign markets became saturated with subsidized Brazilian mahogany lumber, prices plummeted, and the mahogany trade collapsed, leaving producers crippled by operating losses, unsold inventories, and standing debts to trading company *padroes* (financiers). Akin to the exploitative *aviamento* pattern of business that emerged during the Amazon rubber boom (1870–1910), mahogany merchants (i.e., trading companies) subjected lumber producers to a predatory system of advance purchase financing that, while keeping producers perpetually indebted, also served to appropriate producer surplus and impoverish producer fixed capital.[8] Rather than being a catalyst of economic growth in the Amazon region, Brazil's export promotion policy between 1980 and 1984 impoverished the very producers on whom exports depended.

The first section of this paper describes Brazil's export promotion policy during the 1980–1984 period, illustrates how the policy favored capital formation in the professional merchant class, and notes some of the abuses that followed from its implementation by participating commercial lending institutions and trading companies. The second section discusses how the merchants gained a dominant foothold in the mahogany timbershed, regulated logging activities, and engaged the lumber yeoman in a series of exploitative relationships. The final sections present the empirical evidence of merchant oligopoly and unequal exchange in the Amazon lumber industry during the mahogany boom of 1980–1984 and consider the theoretical ramifications of this evidence. A cost-of-production framework is used in the financial analysis of the mahogany trade.

Brazil's Subsidized Export Financing Program 1980–1984

After nearly 15 years of reasonably successful industrialization in Brazil, the constraints on growth in the late 1960s were not widely perceived as originating from inadequate production capacity, but rather from deficient marketing, particularly foreign market penetration.[9] When the Brazilian military government first established a subsidy program for exporters in 1967, shifting away from a prior emphasis on import substitution, it clearly had domestic economic objectives in mind. Subsidies to competent exporters would "ensure the amplification of employment levels as well as promote fuller use of idle industrial capacity."[10] Such subsidies were embodied in two forms: (1) corporate exemptions to certain ad valorem taxes and import duties and (2) subsidized loans to the certified exporters. This paper is concerned with the latter.

In the case of subsidized loans to exporters, two lines of export credit were established in the early 1980s, one for producer-exporters and the other for trading companies.[11] The first line of credit, commonly called CACEX Resolution 674, authorized commercial lending institutions to execute short-term (six-month renewable) loans, on a refinance basis with the Central Bank, to eligible producer-exporters in amounts not to exceed 40 percent of the FOB dollar value of each producer's prior-year exports (most producer-exporters received only 25 percent of this credit limit). Participating producers were expected to maintain their previous year's level of export sales during the financed year and were assessed financing charges at a rate of 40 percent per year (commercial short-term lending rates exceeded 150 percent). In effect, participating producers could obtain short-term capital for about 25 percent of its true cost.[12]

The terms of the loans that applied to producer-exporters would seem to be quite generous until they are compared to those that were already in effect for trading companies under the companion credit line known as Resolution 643. The essential difference between the two credit lines was that certified trading companies were eligible to receive larger loans, equivalent to 50 percent of their "liquid assets," which could include but not be limited to the FOB value of their prior-year exports. Although calculated differently, total interest and loan service charges assessed on Resolution 643 loans were not significantly higher than those assessed on producer Resolution 674 loans during this period.[13]

There were two important implications of Brazil's subsidized export financing program for the Amazon's IWS that favored trading companies over producers. First, most industrial wood companies that produce and export only wood products rarely earn as much from exports as most trading companies, for which wood-product sales usually represent a small fraction of their total merchandise trade. Thus, the very base (gross export sales) which determined the amount of financing a trading company could obtain was typically much larger than the base that normally applied to producers.

At my request, the Central Bank graciously searched its records for financing information on my interview sample of 8 trading companies and 24 mahogany lumber producer-exporters that together were responsible for 88 percent of all Brazilian mahogany lumber exports in 1983. The search revealed that the average trading company obtained US$1.1 million in subsidized loans, or 68 percent more financing than the average producer-exporter received (US$681,000) in 1982 and 1983.[14]

A second important ramification of the export program for the IWS pertained to its provision of equal repayment periods for producer-exporters and trading companies alike. Because the capital operating time (i.e., period of time in which operating capital is tied up in production) for producers proved to be considerably longer than that for trading companies, the latter enjoyed longer periods of time in which their subsidized loan monies were idle, and therefore available for investment elsewhere (e.g., in short-term, high-yield, "overnight" accounts).

A specialized "subterranean" money market quickly emerged within the commercial banking community, tailored to trading companies flush with Central Bank subsidized loan capital. One such bank, Bamerindus of Belem, offered depositors a special 6-month supplemental financing plan, in which the bank retained 60 percent of the amount of the Central Bank loan in a money market account bearing an annual interest rate of 178 percent, while only 40 percent of the loan amount would be disbursed to the exporter for the purposes of export promotion.[15] Since the plan allowed Bamerindus to hold most of the exporter's Central Bank financing for the entire 6-month term of the loan, and given that the rate of return on this short-term account exceeded what most exporters could expect to earn in profits from overseas sales, this "overnighting" scheme, in effect, worked to subvert the main objective of the export promotion program. Rational "profit-maximizing" export companies were given an outright incentive *not* to export. Most major banks in Brazil offered some kind of money market program during this period, and exporters enthusiastically participated in the wide array of schemes that were presented to them by bankers acting duplicitously in their role as local managers of the Central Bank's export financing program.[16] Given that an estimated 73 percent of all mahogany exporters participating in the Central Bank's subsidized export financing program had diverted loan funds into such money market accounts, it would be reasonable to conclude that at any given time during the life of this program (1980–1984) a substantial portion of the Central Bank's cash reserves was simply drawing interest in private "overnight" accounts.[17] This self-defeating situation was aptly summarized by Brazilian textile manufacturer-exporter Ulrich Kuhn, who poignantly admitted in a *Wall Street Journal* interview that "you get more money by investing in money markets [in Brazil] than you do by investing in production facilities."[18]

Other abuses of the export program occurred as well. The case of one North American-affiliated producer-exporter illustrates the intrigue that persistently beleaguered the Central Bank's export promotion program. In 1981, company "X" exported US$2.5 million of lumber from Brazil and was granted a six-month Resolution 674 loan of CR$95 million (equivalent to US$750,000), or 30 percent of its prior-year's sales. Due to the U.S. recession in 1982, company X failed to meet its sales commitment during the financing period and was foolishly granted a six-month extension on the repayment of its loan. Company X obtained three unintended benefits from the program. First, it opened a lucrative money market account yielding over 100 percent per annum in interest, thereby guaranteeing a profit of at least 60 percent (difference between interest income and loan service charges) just on the subsidized loan money deposited. As sales dropped further in 1982, X's American parent corporation decided to shut down its Brazilian milling operation and lay off its 200 employees, but it retained the loan money in its money market account just the same. A second benefit accrued to the company as a result of the rapid devaluation of the Brazilian currency during the loan period. Due to such monetary adjustments, the value of the principal (CR$95 million) had dropped from its original exchange value of US$750,000 to about US$400,000 after the 12-month extended term of the loan had expired. The North American parent corporation cleared a benefit of US$367,365 from monetary correction alone.[19] The third benefit came in the form of opportunity cost savings to the North American parent company. Since the North American corporation usually borrowed operating capital from a U.S. lending institution at full cost, the corporation obtained additional savings in interest charges it would otherwise have paid to its usual North American creditor. In essence, Brazilian subsidized financing replaced the North American corporation's own resources. Moreover, since company X closed during the loan period, the Brazilian financing promoted neither production nor exports, but simply furnished the parent corporation an additional (windfall) profit. This windfall prompted company X's manager to quip, "We made more money in 1982 in Brasilia [i.e., Central Bank] than we did at the sawmill," which it had long since closed. By June 1984, X had repaid only US$140,000 of the Central Bank loan principal. Finally, in 1985, company X pulled out of Brazil altogether, leaving about US$250,000 of its outstanding principal unpaid.[20]

The severity of these abuses in Brazil's export subsidy program were only magnified by the enormity of the program's budget. In 1982, the value of subsidized export loans and related services was nearly US$9 billion, equivalent to 44.2 percent of the total FOB value of all Brazilian exports in that year.[21] Given the difference between the prevailing commercial interest rate (157 percent per annum) and subsidized program interest rate (40 percent), Brazil's export promotion program added about US$10.5 billion in subsidization costs to Brazil's total domestic and foreign debts in 1982 alone.[22] This substantial transfer of public capital from the Brazilian Central Bank to the private accounts of exporters not only enriched the merchant class but gave trading companies, who benefited preferentially from the program, the resources necessary to make a fundamental restructuring of production relations in the Amazon's industrial wood sector.

Merchant Domination of the Mahogany Timbershed

When the first trading companies arrived in Rondonia in the late 1970s, they found a flourishing but vertically differentiated and seemingly disorganized four-tiered log procurement and lumber production network, involving farmers (as timber owners), independent loggers (*terceiros*), truckers, and numerous small-scale lumber mills, each fulfilling a separate function in the lumber production process. Before the export subsidy program in question, loggers would typically purchase stumpage rights from settlers, either for cash or in exchange for services (e.g., road building, crop transport), extract the timber (usually by manual methods), and lay the logs at convenient roadside landings to be inspected by shopping lumbermen. On a good Sunday, the convivial meetings of loggers and lumbermen would eventually result in a small transaction of logs. The lumbermen, thus fortified for another week, would arrange the log-haul back to the mill with an independent trucker. Early Monday morning the logs would arrive, and the mills would go back to work, churning out about 50 cubic meters of rough lumber during the course of the week. At week's end, the lumbermen would return to the countryside to buy more logs, perhaps from different suppliers.

For the trading companies, this highly informal and pluralistic system of log procurement posed several obstacles to the efficient high-volume export business. The economies of scale obtained from large (more than 5,000 cubic meters) maritime shipments to North American and Gulf ports favored high-volume transactions. The procurement of large quantities of lumber from numerous small suppliers posed expensive logistical problems and unwelcome administrative costs. Since the government's export promotion program rewarded exporters, through subsidies, in fixed proportion to the volume of their foreign sales, the existing structure of lumber production in Rondonia, characterized by a plethora of independent, low-volume suppliers, did not encourage profitability in the high-volume international trade of mahogany. Consolidation of the region's seemingly chaotic logging operations and vertical integration of extraction and production phases were perceived as structural changes necessary for competitive export production.

The trading companies also realized that mahogany roundwood production could be accelerated through mechanization (use of skidders, front-end loaders, etc.). The use of large fleets of such expensive equipment, however, is only economical on large logging areas.[23] Since the typical forest landowner (farmer) in Rondonia owns a relatively small lot by logging standards (100 hectares), and since most of the mahogany on these lots had already been cropped by 1980, the trading companies applied their superior capital resources to the expensive task of consolidating mechanized logging operations on large tracts of untitled federal forestland beyond the settlement fringe, keeping competitors at bay through an elaborate system of armed checkpoints.

By mid-August of 1984, most of the mahogany-rich government forestland (an estimated 15,000 square kilometers) in Rolim de Moura and neighboring Costa Marques counties (*municipios*), was controlled by two large trading companies (SAB and Banco Real) and one large producer-exporter (Estil) through the use of selected local logging companies. One such collaborating company (Dinamo Group) alone asserted control over 300,000 hectares of prime mahogany forestland in Rondonia on behalf of its merchant sponsor (SAB Trading) and, by admission of the company's director, drove off would-be interlopers at gunpoint.[24] All of the spartan necessities of life normally found in rugged logging camps (such as food stations and lean-to barracks), as well as the more sophisticated accoutrements (e.g., a mechanics shop full of imported Case and Caterpillar parts and various fuel stations), were furnished by the logging company, with funds subsidized by Brazil's Central Bank, to support its 200 forest workers and 13 skidders. Even without legal title or government concession to the federal forests (*terra devoluta*) they exploited, these large dominant companies were violently protective of their self-asserted territories. Cases of intimidation by trading company henchmen were cited by independent lumbermen, at least one of whom was driven off of his legally owned forest property by a large logging company (Agreste) working as a subcontractor for the Resolution 643-financed SAB Trading Company. While about 61 percent of the producers operating in my study area owned heavy log extraction equipment (skidders, bulldozers, tractors), nearly one-half of these were prevented by trading company vigilantes from deploying their expensive capital investments to the public forestlands.[25] By denying lesser competitors access to the mahogany timbershed, the trading companies acquired oligopolistic control of both the supply and prices of mahogany logs harvested in Rondonia on which the lumbermen depended. That conditions had worsened for most lumber producers in Rolim de Moura during this period was not lost on the lumbermen. One bitterly complained that "the large companies dominate the production of sawnwood in Rolim de Moura, they regulate the prices of lumber, they control the logging roads; the [Brazilian] government and the multinationals are their associates."[26] Another lumberman asserted that "there exists a race for mahogany by the big companies that is squeezing out the small companies who are not able to compete."[27]

Indigenous peoples fared even worse. Once the trading companies had depleted the mahogany resource from the public territories they openly, but illegally, controlled, they moved into restricted areas in Rondonia (i.e., indigénous and biological reserves). Stories of violent confrontations between mahogany loggers and Indians have been daily fare in the Porto Velho tabloids.[28] Three different trading company logging contractors raided mahogany timber from the Gaupore River Biological Reserve, where logging is expressly prohibited by Brazilian federal law. One lumber company, in blatant violation of the Brazilian Forestry Code, went so far as to build a cattle ranch ("Vale do Nilo") in the Reserve which I visited in August of 1984. The loggers had bulldozed and set fire to Indian hunting trails and ransacked Indian campsites. One ever-armed individual on the company's payroll was nicknamed the "Matador do Indio" ("Indian Killer") by the company's director. This company engaged in a systematic campaign of illegal expansion into the Reserve. The families of several ranch employees were resettled in the Reserve, providing the company with a first line of defense against Indian attacks and a deceptive justification for its own illegal activities in the Reserve. The ranch's isolation in the Rondonian wilderness rendered these activities impervious to the government's haphazard enforcement efforts. The Indians, who have undoubtedly lived in this Reserve for centuries, although never contacted by the Brazilian government's Indian Agency (FUNAI), have been continually victimized by marauding teams of corporate loggers, the beneficiaries of government export subsidies.[29]

Without legal title to the vast tracts of forestland that the trading companies, through their proxies, controlled or invaded, there was little incentive for the merchants to conserve the mahogany resource as a living stock in the forest. Ever vigilant for opportunities to increase exports in one year and thereby to obtain larger subsidized export loans in the next, trading companies pressured lumbermen to liquidate the log inventories they had built up during the dry season to keep their mills operating when logging operations ceased during the rainy season (November to May). As a result of this pressure most (58 percent) of the mills surveyed in Rolim de Moura were forced to close and dismiss their employees during the long rains of 1983 and 1984.[30]

Once the government-subsidized trading companies gained exclusive control of logging operations in the mahogany timbershed, lumber production soon followed. The internal relations of lumber production, previously characterized by interdependency between various members of the frontier rainforest community (i.e., farmers, loggers, truckers, and lumbermen), radically changed as producers became increasingly dependent on the merchant class alone for log supplies and short-term production loans. Through their financial relations with producers, the trading companies exploited this dependency, exacting an unequal exchange from producers for their mahogany lumber. A form of aviamento emerged, resulting in the appropriation of producer surplus and the decapitalization of producer fixed capital. These production relations are further considered below.

Merchant-Producer Relations in the Mahogany Trade

In view of the export subsidies, the mahogany trade was initially attractive to both trading companies and independent lumbermen. Trading companies enjoyed access to low-cost subsidized short-term capital, an important profit source by itself. Moreover, trading companies could enhance their profits through the lucrative circulation of their subsidized funds in commercial short-term money markets.

Amazon lumber producers, on the other hand, chronically pressed for operating cash, saw the export program as a rare opportunity to build up investment, although for the majority of producers access to the government export subsidies required some affiliation with a certified trading company. Once the trading companies gained oligopolistic control over mahogany forestlands, producers were obliged to accept the terms of exchange for mahogany logs dictated by the traders. Moreover, with superior capital resources at their disposal, the trading companies could overbid the small producer competing for internal transport services to domestic wholesale lumber markets, thereby eliminating producer options for marketing woods other than export-bound mahogany. Once committed to the mahogany trade, producers became increasingly dependent on the trading companies not only for their prime materials, extracted from the illegally controlled trading company territories and adjoining Indian and biological reserves, but also for short-term operating cash that the trading companies supplied.

Three types of financial relationships emerged between exporters (trading companies and large producer-exporters) and the small independent producers: producer incorporation, advance purchase financing, and production contracting ("jobbing"). These relations of production determined producer participation in the mahogany trade and the degree of merchant appropriation of producer surplus.

Producer Incorporation

The incorporation of independent lumber mills as trading company subsidiaries was the most risky merchant option, since it required capital outlays in an inherently risky business. On the other hand, this option afforded trading companies the advantage of being eligible, for a time, to obtain export loans under both Resolutions 674 and 643 credit lines, in effect "double-dipping" the Central Bank. Incorporation provided producers with a greater degree of financial security than other arrangements with merchants, but it also reduced producer autonomy over important strategic planning decisions. Two of the four largest trading companies operating in Rolim de Moura in 1984 had acquired controlling interest in one or more lumber mills. In one instance, the trading company simply purchased an independent lumber company. In the other case, the trading company financed capital improvements to an existing company under a joint-venture agreement. In both cases, the previous owners were retained to manage the operations on a contractual basis.

The incorporation approach was the least depredatory to producers in the short term. Obliging lumbermen received some compensation for their fixed investment at the onset of the agreement and a commission on production. After the mahogany boom began to collapse in late 1984, however, the trading company-owned mills were the first to close, their previous owners left to drift.

Advance Purchase

All of the trading companies that came to Rolim de Moura engaged in the practice of purchasing mahogany lumber from independent mills in advance of production, in effect providing short-term (typically 30–60 days) operating credit to the mills. The "advance-purchase" was the most widespread relationship that evolved between trading companies and producers and proved to be the most disadvantageous to the latter. In the most common form of this practice, a trading company would offer a lumberman a cash advance for a specific quantity of export-grade mahogany lumber. Such advances, although varying in term, always closed at the price of lumber on the day the advance was made. Generally, this arrangement obliged the producer to work under exclusive service terms to a single merchant. In addition, in order to ensure a captive market for their logs, a lucrative business for the merchants in itself, the three large trading companies that had financed their own logging operations on public lands usually required the obliging producers to purchase mahogany logs only from specific trading company-sponsored log suppliers.

In my 1984 survey of 23 lumbermen in Rolim de Moura, none who had been operating in 1980 accepted trading company advance purchase financing, nor had any become obligated by an exclusive service arrangement to a single marketing agent in that year. By 1984, the picture had changed dramatically when 17 (74 percent) of the 23 sampled lumber mills accepted advance purchase financing, 13 (57 percent) from government-subsidized trading companies, and 4 (17 percent) from large producer-exporters (see table 1). These agreements resulted in more than 75 percent of Rolim de Moura's mahogany lumber production in 1984 (80,000 m^3). Moreover, 9 (39 percent) of the 23 mills surveyed became locked into exclusive service agreements with their exporter financiers, effectively restraining free trade in the local mahogany lumber market. In effect, the principal beneficiaries of the export credit program, the trading companies, gained oligopolistic control of industrial wood production in this important Amazonian mahogany lumber town.

The advance purchase system exposed the independent lumber producer to numerous abuses. As recipients of a usurious loan (with producer fixed equity as collateral), producers became indebted to trading companies on terms that usually prejudiced production. Once indebted to a merchant through an initial advance purchase deal, subsequent deals often followed.

One method by which trading companies appropriated producer fixed capital was through the trading companies' contracted mahogany loggers, with whom the advance-financed producers were usually obliged to deal. These log suppliers, either surreptitiously or with the implied consent of their trading company sponsors, periodically exploited producer vulnerability by delaying delivery to the mill of the logs needed to fulfill the advance purchase agreement until after the term of the agreement

TABLE 1
ADVANCE MAHOGANY LUMBER PURCHASES BY SOURCE AND SERVICE EXCLUSIVITY

	1980	1981	1982	1983	1984	1985[a]
Export-oriented mills[b]	4	10	12	17	22	1
Mills receiving advance purchase financing	0	1	3	11	17	0
(Percentage)[c]	(0)	(10)	(25)	(65)	(74)	(0)
Source of advance purchase financing						
Res. 643						
Trading companies	0	0	2	9	13	0
(Percentage)[c]	(0)	(0)	(17)	(53)	(57)	(0)
Res. 674						
Producer-exporters	0	1	1	2	4	0
(Percentage)[c]	(0)	(10)	(8)	(12)	(17)	(0)
Exclusive service agreements	0	1	2	5	9	1
(Percentage)[c]	(0)	(10)	(17)	(29)	(39)	(4)

SOURCE: John O. Browder, "Logging the Rainforest: A Political Economy of Timber Extraction and Unequal Exchange in the Brazilian Amazon" (Ph.D. diss., University of Pennsylvania, 1986), p. 267 (revised to include 1985 data).

[a]1985 percentages refer to base sample size of 27 mills (surveyed in July 1985) in contrast to 23 mills (surveyed in August 1984).

[b]Mills exporting or selling to exporters more than 75 percent of total annual production.

[c]Percentage (1980–1983) refers to percentage of export-oriented mills. Percentage (1984) refers to 1984 sample size of 23 mills (72 percent of the population). Percentage (1985) refers to 1985 sample size of 27 mills (75 percent of the population).

expired. In the interim, the prevailing price of mahogany logs, which the merchants easily regulated through their control of supply, had invariably increased. Troubled by the threat of property condemnation to compensate the trading companies for unfulfilled prepaid purchase orders, lumbermen were forced to accept the precious cargo of logs for prices that often exceeded the amount of cash advanced by the trading companies for the exportable mahogany lumber they had yet to produce.

The mahogany log business was itself a lucrative venture for the trading companies. Between 1980 and 1984, the rate of increase in mahogany log prices in Rolim de Moura had exceeded by a factor of 2.3 to 1 the rate of growth in the value of Brazilian treasury bonds (ORTN), on which U.S. dollar exchange rate and domestic price inflation adjustments were based (see fig. 1). Any enterprise that could stay ahead of the ORTN index was virtually assured a profit.

A second penalty to lumbermen occurred in the form of opportunity cost after the logs, once obtained, had been rendered to lumber. Although the millgate price of export-grade mahogany lumber had also increased during the 30–60 day life span of the purchase agreement, the lumbermen were always locked into the old price, current on the day of the cash advance. Since the producer was obligated to sell the mahogany lumber product to his trading company financier at the old price, there was little chance the producer could capture the benefits of rising lumber prices by offering his product freely to the highest bidder. In effect, the advance purchase system tied the lumbermen in a net of perpetual indebtedness to merchant middlemen. Inexorably, the process of profit

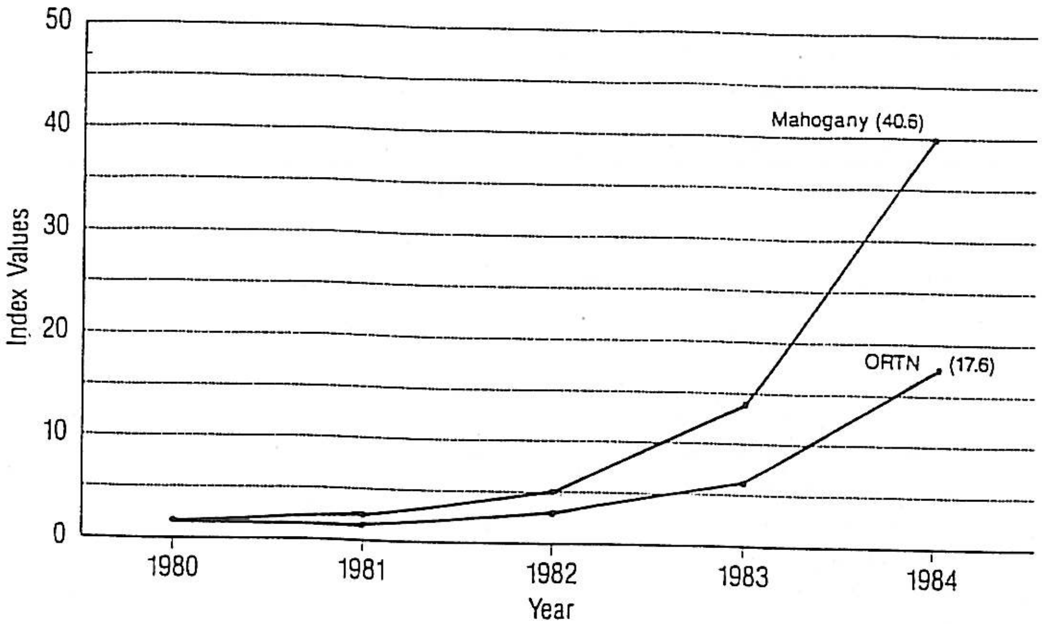

Fig. 1. Rate of Change in Nominal Prices of Mahogany Logs in Rolim de Moura, Rondonia, versus Rate of Change in Value of Brazilian Treasury Bonds (ORTN): 1980–1984.

SOURCE: John O. Browder, "Logging the Rainforest: A Political Economy of Timber Extraction and Unequal Exchange in the Brazilian Amazon" (Ph.D. diss., University of Pennsylvania, 1986), p. 192.

NOTE: 1980 base mahogany price: CR\$2,666/m^3; 1980 base value of Brazilian Treasury Bond (ORTN): CR\$527.14 (March 1980).

and fixed-investment deterioration afflicted up to 57 percent of the mills accepting such financing that I surveyed in Rolim de Moura in 1984.

Production Contracting ("Jobbing")

Another form of production contracting emerged in 1984 involving one large trading company-sponsored mill (Dinamo) and two lesser competitors that worked as contract suppliers. This large mill would periodically provide surplus mahogany logs to these smaller independent producers in exchange for exportable lumber on a 3-to-1 basis (i.e., 3 m^3 of logs for 1 m^3 of lumber). The contract producer would keep the sawnwood difference, if any, as payment for the sawing services rendered. This in-kind exchange arrangement, while enabling the contract producer to avoid exorbitant mahogany log acquisition costs, placed three constraints on producer profits. First, the value of this "3-for-1" deal for the contract producer depended on the size and quality of the logs received. As younger mahogany trees were increasingly cropped and log recovery rates declined, the large producer usually promoted this practice in order to avoid sawing small, nonremunerative logs. In fact, as mahogany log recovery rates decreased from 64 percent in 1980 to 32 percent in 1984, due to the increased cropping of younger trees, 3 cubic meters of logs were barely sufficient to produce the 1 cubic meter of export-grade lumber that had to be remitted to the patron mill under the agreement.[31] The one producer providing detailed information about its experience with this arrangement indicated dissatisfaction with the quality of logs he received and asserted that this arrangement was a break-even proposition at best.[32] Second, by depending on the log surpluses of a larger competitor, the smaller contract producer was never guaranteed the continual supply of logs needed to maintain operation during the production season (generally May to November in Rondonia). Finally, since the logs rendered had to be returned in lumber form within a specified short period of time, the contract producer was unable to stock logs for the rainy season when logging operations ceased and was forced to suspend operation for several months in 1984.

With marketing channels virtually closed for all but mahogany lumber, and with the production of mahogany lumber controlled by the trading companies, the industrial wood sector of Rolim de Moura and as many as 15 similar lumber towns in Rondonia became regimented to the export of a single commodity. While remaining aloof from any substantial proprietary responsibility for the means of production, and given the ample supply of small lumber producers, trading companies easily exploited the lumbermen, whose labor and capital gave Rondonia 61 percent of its total industrial output in 1980.[33] As several localities in the state languished for want of inexpensive construction lumbers, mahogany lumber production for export soared.[34] The Amazon's mahogany boom commenced.

The Mahogany Boom: 1980–1984

Although mahogany timber has been extracted from the Brazilian Amazon region in sizable quantities since the early 1960s, the Resolutions 674/643 export subsidy program beginning in 1980 gave unprecedented momentum to the rush for mahogany. Numerous towns in Amazonia, like Rolim de Moura, became urban child prodigies of the mahogany boom.

In 1980, only 6 mills operated in the town of Rolim de Moura, Rondonia. Together they produced an estimated 12,860 cubic meters of rough sawnwood products, mainly for local consumption.[35] Only 17.5 percent of this production, generated by only two mills, was destined for foreign markets.[36] By 1984, the town was bursting with lumber mills (34 in all). Lumber output rose to nearly 100,000 cubic meters, over 80 percent of which was mahogany.[37] Rolim de Moura was transformed by the mahogany trade. Complete houses, from floorboards to rafters, fences to common furniture, even fuel wood, were crafted from mahogany sawnwood, the substantial refuse generated by this burgeoning export lumber industry in a makeshift town on the edge of the Amazon frontier.

By early 1985, Rolim de Moura's mahogany boomlet had burst. Foreign markets (especially the U.S. market) awash with subsidized Brazilian mahogany forced export prices down 24 percent, from an average of US\$336/m^3 in August of 1984 to US\$255/m^3 in July of 1985.[38] Letters of credit were rescinded, leaving producers with bloated inventories of mahogany logs. Within the short span of 5 years, the lumber industry in Rolim de Moura, in which 47 percent of the urban labor force was employed, endured a complete 1-commodity export cycle, from boom to bust, based on mahogany.[39] By July 1985 mahogany lumber accounted

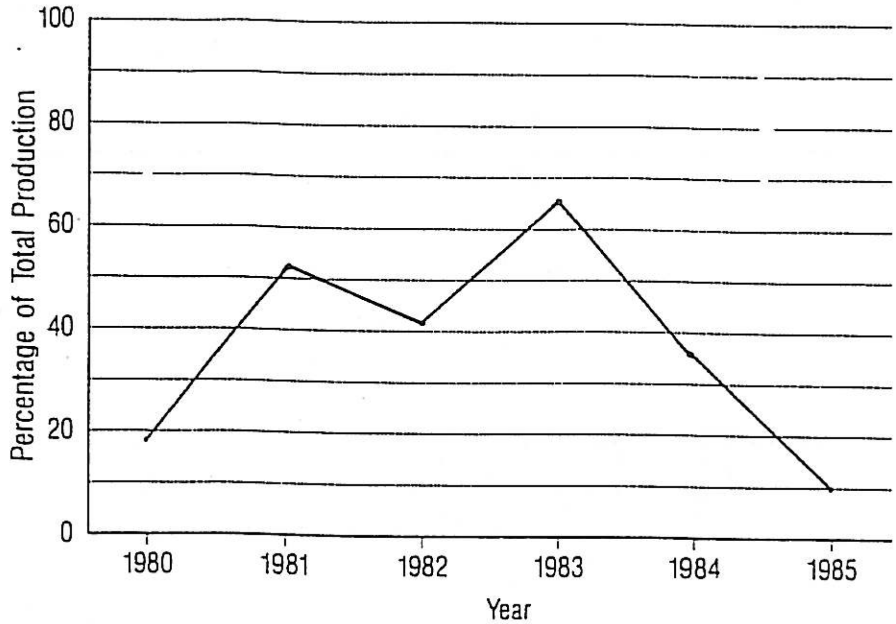

Fig. 2. Foreign Market Consumption as Percentage of Total Lumber Production in Rolim de Moura, Rondonia (by Year).
SOURCE: Browder, "Logging the Rainforest," p. 222.
NOTE: Decline between 1981–1982 is attributed to recession in U.S. construction industry. Decline between 1983–1984 (when mahogany constituted 80 percent of total lumber production) is attributed to declining recovery rates.

for only 23 percent of Rolim de Moura's total sawnwood production, of which foreign markets accepted only 10 percent (see fig. 2).

The mahogany boomlet in Rolim de Moura, to a certain extent, reflected a regional trend. In 1979, prior to the export subsidy programs in question, mahogany lumber exports accounted for less than 10 percent of all Brazilian lumber exports. By 1983, when the subsidy programs were in full operation, mahogany lumber had grown to more than 30 percent of all Brazilian lumber exports.[40] More striking is the trend in U.S. imports of Brazilian mahogany lumber during this period. From 1974 to 1979, mahogany lumber from Brazil constituted an average of 25.9 percent of all Brazilian lumber imports into the United States. From 1980 through 1984, corresponding with the period of the Resolutions 643/674 export promotion programs, mahogany lumber from Brazil averaged 58.6 percent of all Brazilian lumber imported into the United States (see fig. 3).

The immediate consequences of the rupture in the Brazilian mahogany trade were disastrous for some producers, but liberating for most. Mills that were incorporated by traders were shut down. Exporters abruptly terminated advance purchase agreements and called-in back debts from the lumbermen. Many lumber producers, while acting on the terms of such agreements, had stocked large inventories of mahogany logs from trading company loggers at exorbitant prices, only to see the value of their labor and fixed capital assets embodied in those logs instantly dissolve. In Rolim de Moura alone, nearly 6,000 cubic meters of mahogany logs had been left to rot in millyards rather than left to grow in the

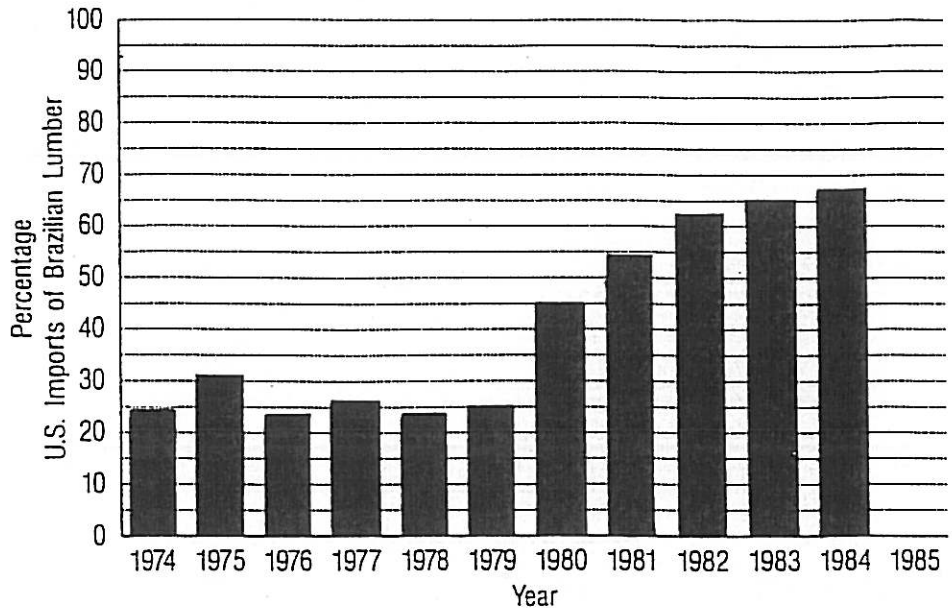

Fig. 3. Brazilian Mahogany Lumber Exports to the United States as a Percentage of All Brazilian Lumber Exports to the United States: 1974–1984 (Percentage of Total Volume, m³).
SOURCE: U.S. Department of Commerce, "Commodity by Country of Origin," *Imports for Consumption and General Imports* (Washington, DC: GPO, various years).

forest.[41] While many lumber producers languished, exporters dumped export-grade mahogany in local markets to free dock space at major ports. One trading company alone allegedly disposed of 2,000 cubic meters of mahogany in this fashion.[42] While most producers in Rolim de Moura survived the crash of 1985 (only three went out of business) by returning to diversified domestic market production, Brazil's export promotion policy brought havoc to the mahogany trade and reinforced a merchant system of unequal exchange that effectively drained capital from the industrial woods sector.[43]

Unequal Exchange and Producer Decapitalization

While the complete economic history of the Brazilian mahogany trade has yet to be written, the production impacts of Brazil's export promotion program are abundantly clear. The Central Bank had indulged the merchant class of trading companies in excessive subsidization. These traders quickly discerned several profit opportunity centers in which they shrewdly applied their government-subsidized capital (i.e., money markets, monetary correction, mahogany log markets, and predatory financial relations).

The consequences of the exploitative tactics employed by trading companies in their relations with lumber producers during the government-induced mahogany boom of 1980–1984 were manifest by the distribution of profits from the mahogany trade. In 1984, the total forest-to-port cost of export-grade mahogany lumber was US$243.36 per cubic meter.[44] Foreign merchants paid Brazilian exporters an average FOB price of US$336.43 per cubic meter in 1984, indicating a total profit rate of 38.2

percent from the mahogany trade in that year.[45] Clearly the external exchange of mahogany lumber was a profitable one for exporters.

The internal exchange of mahogany lumber between producers and exporters was another matter, however. Average production costs in 1984 were US$161.25 per cubic meter, or 62.5 percent of the total unit export cost of mahogany lumber.[46] Nevertheless, the mahogany merchants, whose relations with producers drove production costs upward, compensated producers with an average price of only US$146.99 per cubic meter, indicating a negative return to producer investment of about −8.8 percent in 1984 (see table 2). In other words, for every cubic meter of mahogany lumber produced, trading companies extracted approximately US$14.00 of producer equity value in that product, an internal form of unequal exchange.[47]

During the 5-year period (from 1980 to 1984) in which the versions of Resolutions 643/674 were in effect, the average annual trading company profit rate from mahogany exports was 49.4 percent; the average mahogany lumber producer profit rate was 3.4 percent, roughly equivalent to the estimated average rate of producer fixed capital depreciation in Rolim de Moura's lumber industry.[48] From a cost-of-production perspective, the Brazilian mahogany trade was a losing proposition for the majority of Rolim de Moura's lumber mills, resulting in the appropriation of producer profits and fixed capital investment by the Brazilian mercantile elite.

A Theoretical Reckoning

Clearly, at the microeconomic level, the consequences of Brazil's export promotion policy (from 1980 to 1984) on the Amazon's industrial wood

TABLE 2
COMPARISON OF PROFIT MARGINS OF MAHOGANY EXPORTERS AND PRODUCERS (1980–84)
(US$/m³ and Percentage Profit)

	1980	1981	1982	1983	1984
Export prices[a]	328.40	340.33	367.20	346.45	336.43
Exporter costs[b]	185.22	197.32	256.51	298.57	243.36
Exporter profit rate (Percentage)	(77.3)	(72.5)	(43.2)	(16.0)	(38.2)
Producer prices	120.95	128.85	167.50	194.97	146.99
Producer costs[c]	111.61	138.04	159.19	164.06	161.25
Producer profit rate (Percentage)	(8.4)	(−6.7)	(5.2)	(18.8)	(−8.8)

SOURCE: Browder, "Logging the Rainforest," pp. 260, 286.

[a]Export prices as given in exporter interviews for padrao grade mahogany lumber (30 percent—FAS; 40 percent—selects; 30 percent—no. 1 common).

[b]Exporter costs assume cost structure from 1980 to 1983 is identical to 1984 (i.e., identical proportions of internal cost elements to total costs). Export cost for 1984 includes below-cost price paid for mahogany lumber.

[c]Production costs during this period are assumed to be a constant proportion (12.1 percent) of total costs. Administration and overhead costs for each year are assumed to be a constant 15 percent of direct costs, excluding log acquisition. Sales tax (ISS) is assessed at 5 percent of average mahogany prices in each year. Monetary exchange rates are based on the *taxa de cobertura* as indicated by the Central Bank for the following dates: 12 August 1980, 19 August 1981, 13 August 1982, 11 August 1983, 16 August 1984.

sector are not those usually espoused, or even foreseen, by advocates of export promotion in most developing countries. Nevertheless, distributional fiscal policies, such as Brazil's export financing policy, often have dual objectives, as the experience of Brazil's mahogany trade suggests. Apart from its explicit goal to promote foreign trade and internal development, Brazil's 1980–1984 export promotion policy encouraged capital accumulation within a specific socioeconomic class of Brazilian society, the mercantile class, and drained capital from the small-scale producer class. Is this the normal course of capitalist economic transition (from primary to secondary societal modes of production), or an aberration that discourages individual entrepreneurship and economic advancement?

There are three alternative theses that might explain the pattern of state-sponsored "unequal exchange" to which producers were subjected in the mahogany trade. The first is simply that Brazilian policymakers were misguided and myopic and that the costly consequences of the export policy on Amazon lumber production, for which the policy was not specifically designed, were either unintentional or acceptable (in terms of the larger social good).

In contrast, the pattern of unequal exchange observed in the Brazilian mahogany trade may be seen by others as giving empirical validation to the neo-Marxian "state legitimization" thesis. State action preferentially supports the interests of specific client groups that possess the political and financial capacity to reaffirm the legitimacy of the state (however tyrannical). This thesis would seem to be particularly pertinent in view of the lack of popular support enjoyed by the Brazilian military authoritarian government during this period. This perspective is also consistent with Gramsci's definition of the function of the state:

> The state is an organism belonging to one group, destined to create the conditions favorable for the maximum expansion of the group; but this development and expansion are conceived and presented as the driving force of a universal expansion of development, of all the national interests.[49]

Thus, state action continually reproduces social structure and relations of production that serve, above all, to ensure the continuation of the state.

The third thesis is historical: economic activity in Brazil, and other postcolonial societies, is seen as merely an extension of a colonial past. In colonial empires, resources are generally extracted, not created or cultivated. The economic history of Brazil, from the early Brazil-wood era (sixteenth and seventeenth centuries) to the modern Amazon mahogany years of the 1980s, neatly fits into an historical scheme defined by a sequence of self-impoverishing extractive commodity cycles. In this scheme, economic activity is regarded as expeditionary, and social structure is regimented by the obsessive preoccupation with resource extraction. In 1942, the geographer Preston James offered a frank, if unflattering, appraisal of the historical dilemma of the Amazon:

> In this [Amazon] region the temporary, exploitative character of Brazilian economic life is carried to an extreme; here we find again and again illustrations of the disaster which follows the attempt to collect the fruit without planting the tree; here is the land abundantly endowed with resources only waiting to be collected.[50]

Perhaps no single thesis alone explains fully the economically self-destructive pattern of unequal exchange manifest in the state-induced

Brazilian mahogany trade of the mid-1980s. Policy is the preeminent factor, and history is contextual, and both are equally pertinent. Nevertheless, the consequences of this episode in the economic history of Brazil once again cause some of us to reconsider the validity of the old metaphor of foreign trade as the "engine of economic growth."

NOTES

[1]Cited in Robert Lekachman, *A History of Economic Ideas* (New York: McGraw-Hill, 1976), p. 33.

[2]Cited in C. B. Tigadi, "The Balance of Payments and Economic Growth," in *The Theory of Economic Development*, ed. K. S. Sonachalam (Papers and Proceedings of the UEC Seminar, 14–18 October 1964), p. 299.

[3]Economists are not altogether unanimous in their appraisal of the benefits of foreign trade. A large literature critical of export-oriented policies came to fruition in the 1970s among such dependency scholars as Ronald H. Chilcote, "A Critical Synthesis of Dependency Theory," *Latin American Perspectives* 1 (Spring 1974): 4–29; "A Question of Dependency," *Latin American Research Review* 13, no. 2 (1978): 55–68; and Ciro F. S. Cardoso and Hector Perez Brignoli, "Economia de Exportacion y Desarrollo Capitalista," *Historia Economica de America Latina* (Barcelona: Editoria Critica, 1979). For a brief review of the literature on foreign trade, see John O. Browder, "Logging the Rainforest: A Political Economy of Timber Extraction and Unequal Exchange in the Brazilian Amazon" (Ph.D. diss., University of Pennsylvania, 1986), pp. 162–63.

[4]Jose L. Carvalho and Claudio L. S. Haddad, "Foreign Trade Strategies and Employment in Brazil," in *Trade and Employment in Developing Countries*, ed. Anne O. Krueger et al. (Chicago: University of Chicago Press, 1981), p. 68.

[5]"Industrial wood" comprises sawnwood and pulp at various unfinished stages of processing that are used as inputs to some final demand manufacturing process (excluding industrial fuelwood). The Industrial Wood Sector (IWS) is that sector of economic activities engaged in the production of industrial wood products. Presently, in the Amazon, the IWS is comprised mainly of some 2,000 lumber mills. The "Brazilian Amazon" refers to either the "North Region," as defined by the Brazilian census agency (IBGE) to include the states of Para, Amazonas, Acre, Rondonia, and Amapa and the federal territories of Roraima (an area of 3.58 million square kilometers), or to the "Legal Amazon" which, in addition to the North Region, includes the state of Mato Grosso and portions of the states of Goias and Maranhao (an area of 5.0 million square kilometers). The time frame of 1980–1984 corresponds with the period of Brazil's export financing policy defined by CACEX Resolutions 643 and 674, on which this paper focuses. The texts of these resolutions as approved by the Monetary Council of the Brazilian Central Bank are found in *Manual de Normas e Instrucoes—MNI* and in *Documentos Normativos: Resolucoes, Circulares e Cartas-Circulares*, vol. 4 (Brasilia: Banco Central do Brasil [BCB], n.d.).

[6]My research focused primarily on the mahogany trade. Between November 1983 and July 1984, I interviewed 35 Brazilian wood product exporters in 6 major Brazilian export centers (Curitiba-Paranagua, Sao Paulo-Santos, Rio de Janeiro, Vitoria, Belem, and Manaus) using a standard questionnaire. Of these, a subset of 29 (83 percent) had exported mahogany lumber in either 1982 or 1983. Of this subset, 17 (59 percent) were registered with the Brazilian export agency, CACEX, as "producer-exporters" (*industrias produtoras das manufaturas de exportacao*) and 10 (34.5 percent) as "trading companies" (*empresas comerciais exportadoras nacionais*). The remaining two lumber companies were in the process of obtaining CACEX trading company registration. In 1983, these 29 companies surveyed represented 35.9 percent of all mahogany exporters and were responsible for 87.9 percent of all Brazilian mahogany lumber export sales. Seventy-five percent of the producer-exporters and 87.5 percent of the trading companies interviewed had obtained export financing from the Central Bank under Resolutions 674 and 643, respectively. For further details about the sample selection procedure and selected characteristics of the sample in relation to the population of Brazilian mahogany lumber exporters, see Browder, "Logging the Rainforest," Appendix A-2 and A-3, pp. 321–26.

I selected Rolim de Moura, Rondonia, as the site for my study of the financing program's impact on the lumber industry since it was indicated by 13 (48 percent) of the exporters as a major source of export mahogany lumber. Between 4–16 August 1984, and using a standard questionnaire, I interviewed 23 (68 percent) of the lumber producers operating in Rolim de Moura. In July 1985 I returned to Rolim de Moura and interviewed 27 (77 percent) of the active lumber companies, including all those still operating that were surveyed in the preceding year. The production relations established between trading companies and the 23 mahogany lumber producers I surveyed in Rolim de Moura, I believe to be characteristic of the relations affecting about one-half of the 400 to 500 mills operating in Rondonia between 1982 and 1984. Rolim de Moura is characteristic of 15 major lumber towns in Rondonia that together were responsible for between 30 percent and 55 percent of Brazil's total mahogany export during this period. In 1982, Rolim de Moura's estimated mahogany output (12,640 m^3) accounted for 30 percent of Brazil's total mahogany exports as reported by CACEX (see note 7, below). Accordingly, the case of Rolim de Moura is neither inconsequential in terms of Brazilian foreign trade overall, nor irrelevant to the development of the Industrial Wood Sector in the Amazon.

[7]Carteira de Comercio Exterio (CACEX), *Comercio Exterior-Exportacao: Mercadorias por Paises e Portos, 1983* (Rio de Janeiro: CACEX, 1983).

[8]For an insightful discussion of the aviamento system, see Barbara Weinstein, *The Amazon Rubber Boom, 1850–1920* (Stanford, CA: Stanford University Press, 1983).

[9]Import substitution and industrialization in Latin America are succinctly described by Werner Baer in "Import Substitution and Industrialization in Latin America: Experiences and Interpretations," *Latin American Research Review* 7 (Spring 1972): 95–111.

[10]Banco Central do Brasil, *Manual de Normas e Instrucoes, Resolucao no. 71* (Brasilia: BCB, 1 November 1967).

[11]The Brazilian trade regulatory agency, the Carteira de Comercio Exterio (CACEX), maintains a registry of two types of exporters for purposes of government export financing: producer-exporters and trading companies. The major difference between producer-exporters and trading companies is that the latter must be publicly incorporated entities, with majority ownership held by Brazilian nationals; in contrast, producer-exporters may be foreign-controlled entities. Although initiated in 1967 to assist producer-exporters, by 1973 Brazil's export policymakers had added a parallel line of credit for trading companies. The inclusion of professional Brazilian-owned merchant groups in 1973 in the export promotion policy would suggest three potential concerns of Central Bank policymakers: first, a concern that foreign trade benefits be retained by Brazilian nationals; second, the notion that merchants who specialized in foreign trade would be more successful in obtaining foreign exchange than producers, who must necessarily concern themselves with distracting daily problems of production; and, third, the increasing political influence of an emerging foreign-trained MBA venture-capital class in Brazil that sought access to the compulsory savings deposits they were obliged to remit to banks in Brazil rather than expatriate to more lucrative investment opportunities abroad. Both credit lines underwent numerous revisions before 1980–1981, when the policies of our present concern (Resolutions 643 and 674) were instituted. The distinction between these two exporter groups is sometimes ambiguous, as many trading companies have invested in or acquired production facilities and some producer-exporters have incorporated trading divisions. It is important, however, to emphasize the distinction between "producer-exporter" and "lumber producer," as used in this paper: the latter refers to the majority of small, family-owned lumber millls that, for lack of resources and pertinent market information, have not developed the capacity to export their output directly and therefore participate in foreign trade only through the intermediation of a producer-exporter or trading company.

[12]Given an average commercial lending rate of 157 percent in 1982, the policy rate of 40 percent charged to qualifying producer-exporters indicates a nominal subsidy rate of 74.5 percent. Therefore, borrowers participating in this Resolution 674 financing program secured short-term capital for 25.5 percent of its actual cost.

[13]Trading companies were charged a 2 percent annual interest rate for export loans under the Resolution 643 financing program, but they were also assessed monetary correction charges of 20 percent of the change in the value of Brazilian treasury bonds as

indicated by the index of ORTN (Obrigacoes Reajustaveis do Tesouro Nacional). During calendar year 1982, the year of the program's midlife, the value of ORTN increased by 100 percent. Given a prevailing commercial lending rate of 157 percent in 1982, Resolution 643 loans to trading companies conferred a subsidy rate of 73.3 percent. Meanwhile, producer-exporters obtained a subsidy of 74.5 percent on Resolution 674 loans (see note 12, above).

[14]Personal communications, Luis Gustavo da Matta Machado, former coordinator of the Central Bank's Department of Banking Operations in Brasilia, July 1984.

[15]Personal communications, Joao Carlos Cardoso, then manager of foreign exchange for Bamerindus in Belem, June 1984.

[16]It is unclear how commercial banks authorized to operate in foreign exchange benefited from such expensive short-term time deposit schemes—a topic of interesting future research.

[17]The 73 percent estimate is based on a sample of 11 mahogany exporters interviewed in Belem in June 1984. This sample represents 17.2 percent of the 64 mahogany exporters listed in the *Guia Brasileiro de Exportacao* (Rio de Janeiro: Telefonicas Brasileiras, 1984) for year-end 1983.

[18]Mr. Kuhn is quoted in "Latin Paradox," *Wall Street Journal*, 5 December 1985, p. 1.

[19]Brazil's policy of monetary adjustment to promote exports during this period resulted in almost weekly minidevaluations of the Brazilian currency against the U.S. dollar. Since Central Bank loans to exporters were executed in cruzeiros based on the dollar value of the borrower's previous year's exports, monetary correction simply deflated the applicable cruzeiro values of the dollar-based loan principals. The obvious social costs implicit in the concession of monetary correction benefits to exporters prompted the Central Bank to assess full monetary correction costs to exporters in subsequent revisions of the financing policy beginning in 1984.

[20]The case of company X was recounted during my confidential interview of that company's Brazilian operations director in Belem in May 1984.

[21]Banco Central do Brasil, *Credito das Autoridades Monetarias ao Seto Exportador, 1981–1984* (Brasilia: BCB, n.d.).

[22]The US$10.5 billion aggregate subsidy costs to the Brazilian government associated with the export promotion program are calculated as follows: [(US$9 billion in total export loan programs × 2.57 commercial rate) − (US$9 billion in total export loan programs × 1.40 policy rate)]. The fact that this amount of capital dedicated to export subsidization (US$10.5 billion) represented 51 percent of 1982 claims (including foreign liabilities) against Brazilian monetary authorities and commercial banks (as reported in the IMF's *International Financial Statistics*) points to the important contribution made by Brazil's export subsidization policy to Brazil's current debt dilemma.

[23]Personal communications, Otavio Reis of MAKNA, S.A., one of Brazil's largest skidding companies, in August 1984 and 1985. Given the sparse and irregular distribution of mahogany in those parts of the Amazon where it occurs, access to relatively large areas of forestland are necessary for several skidders working together to be operationally economical.

[24]Personal communications, Alipio Motta, director of Dinamo, Comercializacao, Distribuicao, Importacao e Exportacao, Ltda., in August 1984.

[25]John O. Browder, "Logging the Rainforest," p. 184.

[26]Ibid., p. 188.

[27]Ibid., p. 189.

[28]See, for instance, "Gabriel Tambem Condena Madeireiros," in *O Imparcial* (Porto Velho), 15 July 1986; and "SEAGRI Critica Falta de Consciencia dos Madeireiros," *Alto Madeira* (Porto Velho), 15 July 1986.

[29]The specific ethnolinguistic identity of this indigenous group was not established at the time of my field research (August 1984), but evidence of their existence (i.e. abandoned hunting camps, rudimentary stone and basket artifacts) was encountered by the author on a photographic expedition some 20 kilometers into the Reserve.

[30]Author's unpublished 1984 survey data.

[31]Browder, "Logging the Rainforest," p. 218.

[32]Interview, Jose Mario Tiussi, owner of Serraria Nova Horizonte, Rolim de Moura, August 1984.

[33]1980 Brazilian Industrial Census (does not include extractive industries, such as metallic mineral extraction).

[34]Marc J. Dourojeanni, "Brazil: Report of the Forest and Environment Components of Projects I, II, and III of the Northwest Regional Development Program," memorandum to M. Asseo, World Bank, 14 April 1984, p. 20.

[35]Browder, "Logging the Rainforest," p. 218.

[36]Ibid., p. 222.

[37]Ibid., p. 218. While 81 percent of Rolim de Moura's 1984 lumber output was mahogany, because of diminishing log quality (due to depletion), foreign markets accepted only 42.6 percent of the town's total lumber output.

[38]Ibid., p. 285, and unpublished quotations reported to me by two Belem-based exporters in June 1985. Prices refer to Brazilian "*padrao*" grade lumber (a mix of FAS, select, and common grades).

[39]Ibid., p. 364.

[40]Derived from CACEX export tables, *Exportacoes por Mercadoria* (Rio de Janeiro: CACEX, various years).

[41]The estimate of 6,000 cubic meters left to rot in Rolim de Moura after the collapse of Rondonia's mahogany boom pertains to only one of 34 lumber mills in Rolim de Moura (Brasforest), a subsidiary of Banco Real Trading Company.

[42]Personal communication, Olavo Malheiro Quintella, former director of the Lumber Division of COTIA Trading, S.A., in May 1985.

[43]Browder, "Logging the Rainforest," pp. 222–27, 248–52.

[44]Ibid., p. 286.

[45]Ibid., p. 286.

[46]Ibid., p. 283.

[47]The "unequal exchange" argument, formulated by Arghiri Emmanuel in *Unequal Exchange: A Study in the Imperialism of Trade* (New York: Monthly Review Press, 1972), attempts a modified neo-Marxian analysis of the problem of international trade. Unfortunately, the acrimonious debate that has ensued between "world systems" proponents and "mainstream" Marxists over the international dimension of exploitation has obscured many interesting and more subtle applications of the unequal exchange concept to analysis of the economic impoverishment process within certain (neocolonial) social systems. This case study of the Brazilian mahogany trade illustrates one such alternative application based on a simple corporate cost-of-production framework.

[48]Browder, "Logging the Rainforest," pp. 248, 286.

[49]Antonio Gramsci, "Analise das Situacoes: Relacoes de Forca," in *Obras Escolhidas*, vol. 1 (Lisbon: Estampa Press, 1974), p. 330.

[50]Preston James, *Latin America* (New York: Odyssey Press, 1942), p. 399.