

# The magnitude of Brazil's new economic opportunities

by Mark Sonnenblick

In a world filled with people who moan about "the exhaustion of natural resources," the surface of Brazil's natural wealth has barely been scratched. Carajás, a mountain estimated to contain \$333 billion worth of top-grade iron ore with separate deposits of copper, aluminum, nickel, manganese, and tin ore was discovered almost by accident in 1967. (See box, page 25 on plans for the development of Carajás.) Carajás alone could supply enough iron ore for 30 years of the entire world's steel production at current rates.

The Brazilians have started systematic mapping of their national territory using aerial photography and have discovered enough mammoth mineral deposits deep in the interior to keep alive the Brazilian belief that "God is Brazilian." The unexplored vastness of the country is illustrated by the discovery during mapping of a 700-mile long river system previously unknown to civilized man.

The government has given top priority to locating and developing domestic energy sources to replace the imported oil which eats up almost half of Brazil's export earnings. Brazil's state-owned oil company Petrobrás is investing over \$1 billion per year in exploration and development to meet its target of producing 500,000 barrels per day of crude in Brazil by 1985. Exploration efforts raised identified uranium reserves from 1,400 tons in 1974 to 266,300 tons in 1981, which is more than enough to power 43 large nuclear stations for their lifetimes.

## Industry

Brazil's industrial output is more than that of the rest of Latin America combined. In less than a generation, Brazil has transformed itself from a predominantly rural country to a modern industrial giant whose progress alarms technologically stagnant competitors.

Brazilian industrialization lagged—even by Latin American standards—until the 1950s. Brazil then began a rapid process of domestically manufacturing articles which had been imported. This import substitution has gone in phases, starting with the easiest consumer products, then consumer durables, then the inputs which go into the products, and the machines which make them. The chart on page 20 shows the rapid

annual growth rates achieved over the course of the 1970s, a pace unmatched except by such developing sector leaders as Mexico and by Japan's postwar reconstruction.

Even when the 1974 oil shock hit, the government of Gen. Ernest Geisel decided that Brazil, which then imported 80 percent of its oil, should not join the industrialized West in recession. Brazil would "grow its way out of the crisis," Geisel announced. The Geisel government aggressively sought to substitute imported oil with fuels found in Brazil. It signed the remarkable "nuclear deal of the century" with West Germany in 1975, but only after Henry Kissinger made the United States an unreliable supplier. (In July 1974 the United States had informed Brazil that it would no longer guarantee supplies of enriched uranium fuel for the Angra 1 power station being built by Westinghouse.) Under this deal, Brazil is building its own nuclear industry, including the recently completed \$250 million engineering facility, the world's most advanced.

Brazil's planners simultaneously began the heavy investments needed to reduce the economy's dependence on the other big items in the swollen import bill.

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## How Brazil ranks in the world economy

**Area:** #5; bigger than continental United States

**Population:** #6; 125 million people

**Economy:** #10; #8 in the West; \$226 billion GNP in 1981

**Steel production:** #10

**Manufacturing:** 25 percent of all developing sector manufacturing

**Auto production:** over 1,000,000 cars produced in 1980

**Iron ore production:** #2, second only to U.S.S.R.

**Iron ore exports:** #1

**Agricultural production:** #7

**Agricultural exports:** #5

**Coffee production:** #1

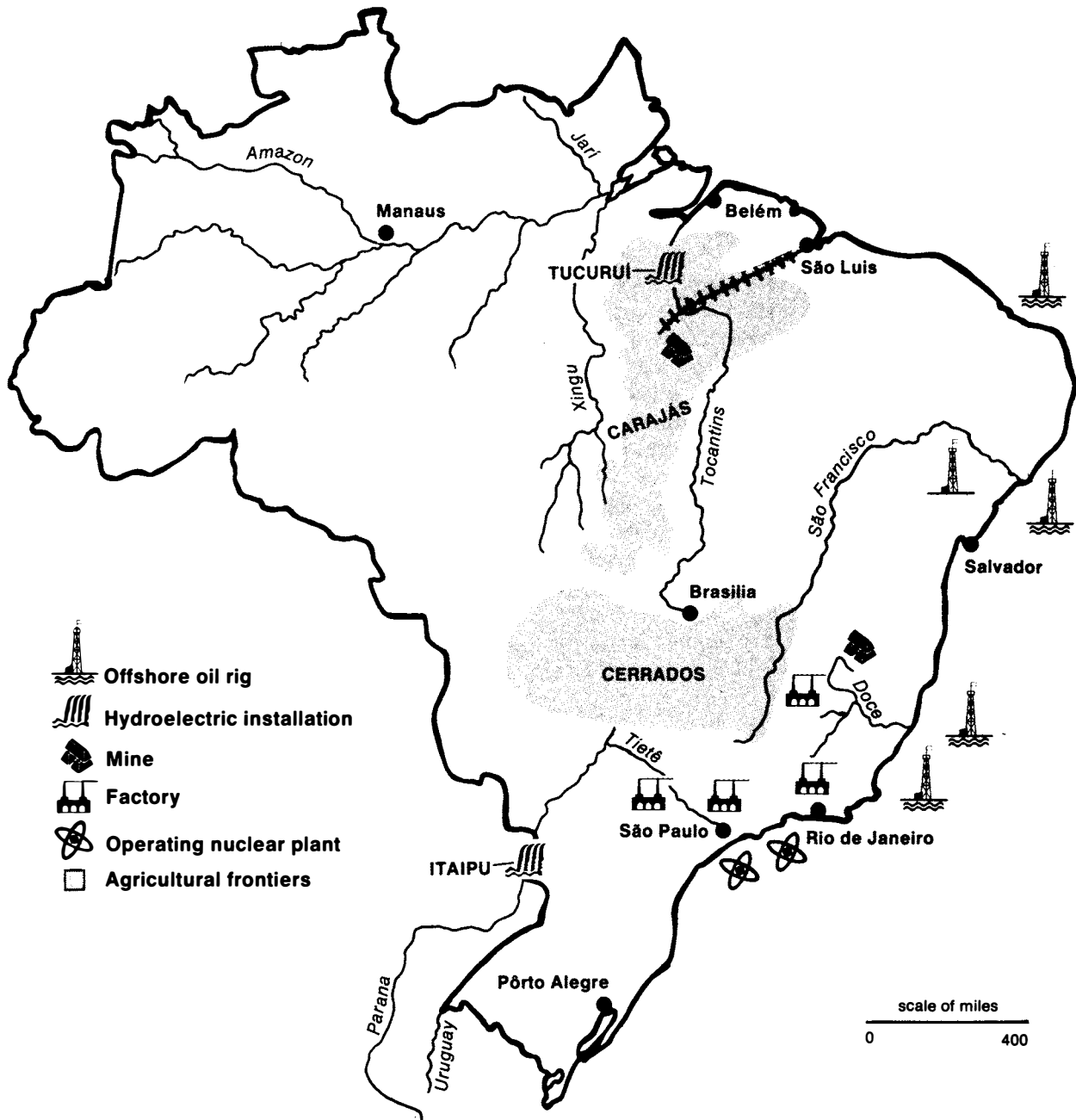
**Sugar exports:** #1

**Hydroelectric power production:** #4; building world's largest hydroelectric dam (12.6 million KW capacity)

**Inflation:** #3; after Israel and Argentina (95 percent in 1981)

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## Brazil's development frontiers



This map highlights just a few of Brazil's biggest development projects.

**Dams:** Itaipu Dam on the Paraná River border with Paraguay is the world's largest. Its 12,600 MW is double that of Grand Coulee Dam. Its cost, \$13 billion, is a bargain. Tucuruí Dam, in the Amazon region on the Tocantins River, will be Latin America's third-largest dam. It will provide cheap electricity for aluminum smelting, the huge Carajás project, and industrializing the impoverished Northeast hump of Brazil. The Amazon region has 200,000 MW hydroelectric potential.

**Mining:** Carajás and traditional Rio Doce valley are shown. Brazil has hundreds of other mining sites.

**Industry:** Manufacturing is heavily concentrated in São Paulo and Rio states; but processing of crops and minerals takes place at dozens of centers throughout the country.

**Nuclear:** First power stations are sited near Rio and São Paulo.

**Agriculture:** The "cerrados" in the Center-West are arable prairies more than double the size of Texas. The area shaped like Italy (but twice as big) around Carajás includes some of Brazil's 27 million hectares of lowlands fit for basic food crops.

**Oil:** Only the United States and Britain are doing more offshore drilling than Brazil. Brazil is bringing four offshore finds into production to supplement old shore fields. Reserves are over 1.3 billion barrels.

Between 1974 and 1980, Brazil added at least 70 percent to its capacity to make steel, non-ferrous metals, cement, and paper. Petrochemical capacity was increased 138 percent; agricultural chemicals and alcohol tripled; fertilizer capacity multiplied nine times.

The real miracle was in the area of capital goods, the machine tools and heavy engineering which are the mark of a truly industrialized nation. At the end of World War II, Brazil was making only \$30 million worth of such items per year. In the midst of the 1971 industrial boom, its \$400 million production had to be supplemented by \$1.3 billion in imports. Imports shot up to a peak of \$3.9 billion in 1975, as Brazil tooled up for basic and machine-making industry. By 1978, machinery production was already over \$3 billion.

The rapid capitalization of Brazilian industry ended abruptly in 1980, as the impact of the world recession brought on by U.S. Federal Reserve Chairman Paul Volcker's high interest rates was felt in Brazil, and both private and public sectors put off investments in new production capacity. Brazil's capital goods producers have sought to counteract the decline of investments. In 1981, they diverted \$1.5 billion worth of machinery, boilerwork, and equipment, plus \$2 billion of automobiles and other transport equipment, into the world market. They are also retooling for the surest growth market in today's world: armaments. Brazil now reportedly makes over \$5 billion in military equipment and exports \$2 billion each year, making it the number-five exporter.

### The agricultural sector

Brazil, long a world leader in coffee, sugar, and cocoa, threw its efforts into soybeans over the last decade, harvesting 16 million tons of soy in 1981. Thirty-five percent of Brazil's people are employed farming 50 million hectares. But there is enough arable land in the interior to feed several billion people. The map on page 20 shows an area in the center of the country called the "cerrados." Of 180 million hectares of savannah lands there, 150 million hectares are suitable for agricultural use, but only 6 million are presently being cultivated. All these plains need to be bountiful is lime to correct soil acidity and irrigation from readily accessible aquifers and rivers.

This rich land of the future—Brazil is already the world's fourth-largest agricultural exporter—however, cannot yet provide 76 percent of its population with incomes adequate for basic nutrition, according to the Food and Agricultural Organization.

The underdevelopment of human resources is as serious an obstacle to Brazil's achievement of its tremendous potential as its lack of capital. The problem is apparent in Brazilian agriculture, which has achieved a deceptive prosperity on the basis of paying illiterate peons \$3 per day. Wellington Barros, head of the

National Rural Professional Training Service, reports that "Brazil loses about 50 percent of its grain production due to lack of professional qualification of the workers and small farmers." He explained that losses during mechanical harvesting of soybeans fell from 18 percent to 5 percent with a minimum of training of operators, but most owners had "a declared fear" that educated tractor-drivers would want more than the minimum wage. Anthropologist Daniel Gross found fleets of sugar-cane cutting machines designed and made in Brazil parked next to the mills because human sweat of canecutters is cheaper than fuel for the mechanical harvesters. It is doubly ironic that the sugar was headed for making alcohol to be used for automotive fuel.

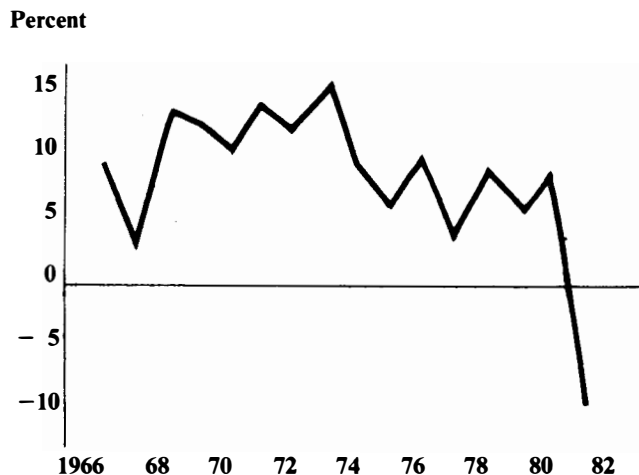
The bottom line on the short-changing of both man and land in agriculture is crop yields, which have stagnated at half world levels and a third of U.S. productivity. Corn, for example, averages 1,442 kilos per hectare in Brazil compared with 6,865 in the United States. And 25-30 percent of Brazil's corn crop is lost after harvest because only 0.5 percent of Brazil's farms have on-farm storage, compared with 60 percent in the United States. With adequate capitalization of human and land resources, Brazil could double and triple the effective harvest on present lands. With the incorporation of new lands, it could bring a hungry world ten times its current 55 million ton grain harvest.

### The development of technology

One of the reasons for Brazil's extraordinary indus-

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### Brazil's annual rate of industrial growth



Note: Annual rate of change of real industrial output, including manufacturing, mining, construction, and public utilities.  
Source: Getulio Vargas Foundation, Rio de Janeiro, Brazil

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trial progress has been its emphasis on assimilating the world's most modern technologies. Like Japan, Brazil has a very strong orientation toward developing its own technological capabilities beyond those available abroad, and of preparing technical manpower to assimilate the most advanced discoveries made elsewhere. That is one of the motivations of the country's extensive nuclear program.

Brazilian scientists are proud that they have thermonuclear fusion programs in half a dozen universities. The University of São Paulo has its own experimental tokamak, made in Brazil. The University at Campinas continues the work of the late Dr. Sergio Porto, a world leader in laser separation of chemical isotopes—the kind of process which could forever end the problem of resource scarcity.

In sharp contrast, Brazil has also made a priority national commitment to the most backward energy technologies: those based on the harvesting of biomass. Millions of hectares of good farmland and hundreds of peons have been locked into labor-intensive programs for producing alcohol, charcoal, and more exotic substitutes for modern fuels. This degradation of man and land threatens Brazil's future as a developed industrial nation.

### 'Big is beautiful'

During the Geisel administration (1974-79) when

the idea of Brazilian "grandeza" (greatness) reigned unchallenged, plans were carefully formulated to continue Brazil's rapid growth. A recent Federal University of Rio study lists 33 ongoing projects, each requiring an investment of over \$1 billion. The total cost of these projects over the next four to sixteen years is \$230 billion (almost as much as a year's GNP).

Most of these plans—and the very idea of hubristic big projects—are now under fierce attack by the "little people"—the world's zero-growth forces. The World Bank and Brazil's foreign creditors would like to compel Brazil to abandon its struggle to become a major world power by the end of this century. Planning Minister Delfim Netto will soon unveil a centralized budgetary process to aid the World Bank in axing projects managed by autonomous state agencies.

But the most important attack of the enemies of Brazilian development focuses on the frontier-style optimism which still infects Brazil's entrepreneurs, its state sector managers, and its military leaders. In its 1977 secret report on the Brazilian economy, the World Bank complained that Brazil's experience with rapid growth "rarely achieved by developing countries . . . established great confidence in the long-term growth potential of the country, which has made it difficult to adjust to the necessity of moderating the growth rate as a means of combating the balance of payments and inflation problems Brazil faces today."

### Brazil's balance of payments: 1970, 1979-82

(in billions of current dollars)

	1970	1979	1980	1981	1982*
<b>Trade balance</b> . . . . .	+ 0.2	- 2.7	- 2.8	+ 1.2	+ 3.0
Exports . . . . .	2.7	15.2	20.1	23.3	26.0
Manufactures . . . . .	0.4	6.7	9.0	11.9	15.0
Imports . . . . .	- 2.5	-19.9	-22.9	-22.1	-23.0
Oil . . . . .	- 0.3	- 6.4	- 9.8	-10.6	- 9.5
<b>Service account</b> . . . . .	- 0.9	- 7.8	- 9.5	-13.3	-13.3
Interest on debt (net) . . . . .	- 0.2	- 5.3	- 5.9	- 9.1	- 9.5
<b>Current account</b> . . . . .	- 0.8	-10.5	-12.1	-11.7	-11.1
<b>Capital movement</b> . . . . .	1.0	7.7	9.3	11.5	11.1
Loans and investment inflow . . .	1.7	14.1	16.3	18.2	18.3
Amortizations . . . . .	- 0.7	- 6.4	- 7.0	- 7.6	- 7.2
<b>Total debt service</b> . . . . .	- 0.9	-11.7	-12.9	-16.9	-16.7
<b>Debt service as a percent of exports</b>	32.8	77.0	64.2	72.5	64.2

Source: Central Bank of Brazil, 1970, 1979-81.

\* Year 1982 is projected on the basis of official statements in April which assume the world market will recover in second semester. If not, Brazil will have to make extreme sacrifices to repeat nominal 1981 trade performance.

