McKinsey Global Institute

How Brazil Can Grow

December 2006

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Preface

This publication is the result of extensive collaboration between the São Paulo office of McKinsey & Company and the McKinsey Global Institute (MGI).

The project aspired to provide a fact base for the debate on how to increase productivity and economic development in Brazil. Very specifically, our goal was to identify, quantify, and rank the main barriers to productivity in the Brazilian economy, as revealed by an analysis of representative sectors.

In addition to benefiting from a previous study on Brazilian productivity performed in 1998, this work also draws on MGI's in-depth productivity analyses of more than 15 countries and over 30 sectors and research on global industry restructuring and foreign direct investment in development countries. Extensive input was provided by our external advisors, and over the course of this project, we benefited from the unique, global outlook and deep industry-level knowledge of McKinsey consultants in the sectors investigated in our case studies.

MGI Senior Fellow Martha Laboissiere and Bruno Pietracci, an Associate Principal in McKinsey's São Paulo office, worked closely with us to provide leadership to this project. The project team also included Rodrigo Couto, William Jones, Gianni Lanzillotti, and Leonardo Ribeiro from McKinsey's São Paulo office.

We would also like to acknowledge executives and experts who contributed their industryand local market insights to this study. In the residential construction sector we would like to thank Luiz Henrique Ceotto, Maria Angélica Covello, Mário Kosmiskas, and Ubiraci Espinelli Lemes e Souza. In the agricultural sector, Cristine Handel, Eliseu Alves, Plínio Itamar de Melo e Souza and Elisio Contini. To those who chose to remain anonymous, we also extend our gratitude.

As with all MGI research, this perspective is independent and has not been commissioned or sponsored in any way by any business, government or other institution.

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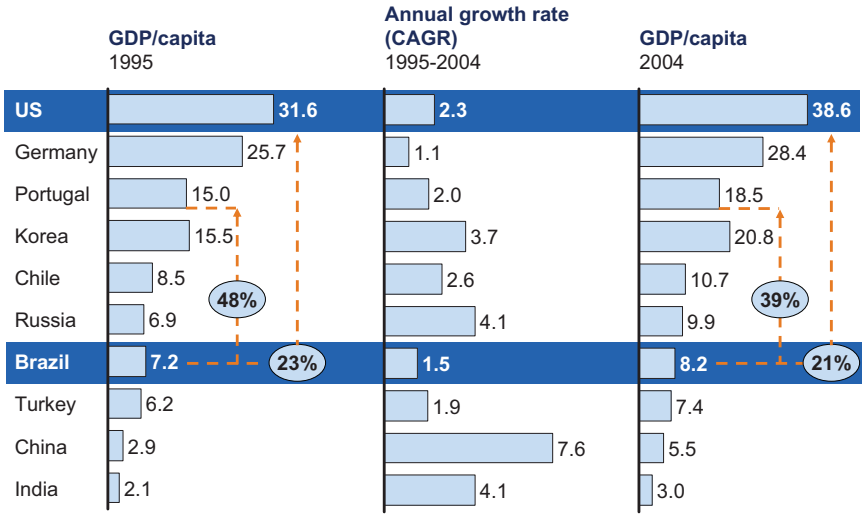
August 2006

How Brazil Can Grow

Brazil's immense economic potential is undisputed. Expectations run high within and beyond its borders that the country could be the next emerging economy, after China and India, to see GDP growth take off.[1] It has good universities, a huge domestic market, and copious natural resources. Yet according to the International Monetary Fund, Brazil's GDP per capita has grown by an annual average of only 1.5 percent over the past ten years. This is one of the lowest growth figures of all the countries monitored by the Fund, and particularly low for a developing nation (Exhibit 1).

Exhibit 1

BRAZILIAN ECONOMIC PERFORMANCE
GDP per capita in US$ thousand at PPP; CAGR (%)



* GDP per capital in US$ at PPP 2003 prices.
Source: International Monetary Fund - World Economic Database; team analysis

Hyperinflation, the economy's most pressing problem at the end of the past decade, is no longer a specter. Brazil's current fiscal and monetary policies have drawn praise for their role in stabilizing the macroeconomic framework.[2] Indeed some sectors of the economy, particularly retail banking , telecom and export agriculture, are flourishing. The problem is that these sectors employ only a tiny fraction of the workforce. Most people are employed in sectors that have very low productivity growth, particularly retail, residential construction and farming for the domestic market.

1 See Goldman Sachs Global Economics Paper 99 "Dreaming with BRICS: The Path to 2050" October 2003

2 See for example the OECD's Economic Survey of Brazil 2005 at www.oecd.org

For the mass of Brazilians trying to make a living, life has not become noticeably easier as inflation has subsided. Low GDP growth means their per capita incomes are falling behind relative to those in other developing countries. In 1995 Brazil's per capita GDP was 46 percent of the Korean level: now it is only 39 percent.

McKinsey's São Paulo office, in collaboration with the McKinsey Global Institute, has examined Brazil's economy to find out just how far its productivity is falling behind, and what stops it from improving. The five main barriers we identified look formidable: a very large informal economy, macroeconomic factors that hinder investment, inappropriate regulations, poor public services and weak infrastructure. The good news, however, is that all of them can be tackled with the right policies. Indeed, other countries, such as Spain and Ireland, have adjusted their economic policies to address similar problems and have succeeded. Brazilians should take hope.

BRAZIL'S PRODUCTIVITY PROBLEM

Building on a previous analysis conducted in 1998[3] and similar MGI studies undertaken in another 16 countries, we compared the performance of Brazil's economy with that of the United States in eight sectors—agriculture, automotive, food retailing, government, home construction, retail banking, steel, and telecommunications. Together, these sectors account for 37 percent of Brazilian employment and 46 percent of the country's GDP.

The new analysis makes clear that the chief culprit for Brazil's underperformance has been its failure to boost growth in labor productivity—the primary determinant of a nation's GDP per capita. Between 1995 and 2005, Brazil's productivity grew by only 0.3 per cent a year—compared with 2.8 percent in the United States, 8.4 percent in China, and the 3.5 percent achieved by neighboring Chile. Brazil's labor productivity gap with the U.S. rose from 77 to 82 percentage points during this decade (Exhibit 2).

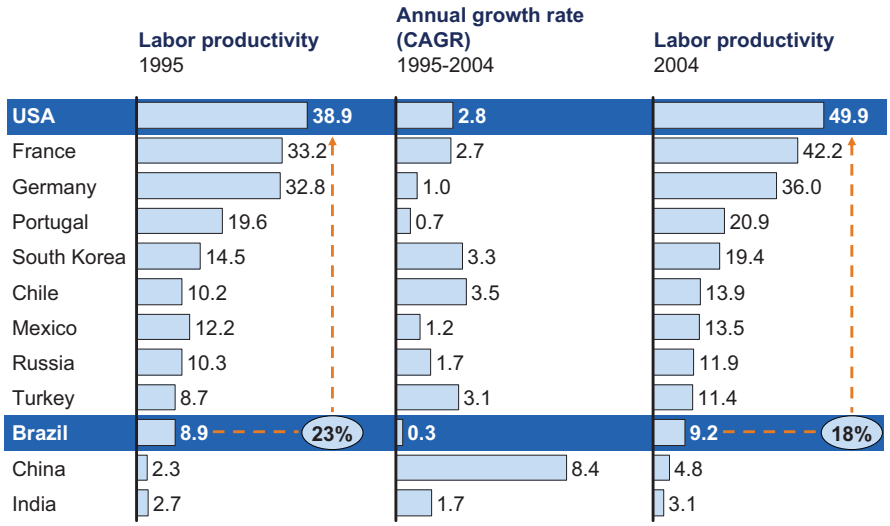
Our examination revealed that around one-third of the difference in productivity between the United States and Brazil is due to structural factors inherent to Brazil's position in the economic development curve, and will work themselves out over time

3 See "Productivity: The Key to an Accelerated Development Path for Brazil", McKinsey Global Institute, March 1998, at www. Mckinsey.com/mgi/ and Martin N. Baily et al, "Will Brazil Seize its Future", The McKinsey Quarterly 1998, Number 3,

(Exhibit 3). The first of these is the fact that, because Brazil has a modest per capita income, consumers generally can only afford lower-priced products and services (Exhibit 4). This effectively acts as a brake on Brazil's development of home-grown higher value added production; the country produces mostly smaller, low-priced cars, for instance, relying on imports for more expensive models (Exhibit 5). The second issue is that in Brazil labor is cheap compared with capital, and this discourages the kind of capital investment that would boost productivity (Exhibit 6 and 7). However, neither of these characteristics need hold Brazilian productivity back in the longer-term, as long as the economy achieves a healthier, sustained level of economic growth.

Exhibit 2

BRAZILIAN LABOR PRODUCTIVITY PERFORMANCE
GDP* /1,000 hour worked, CAGR (%)



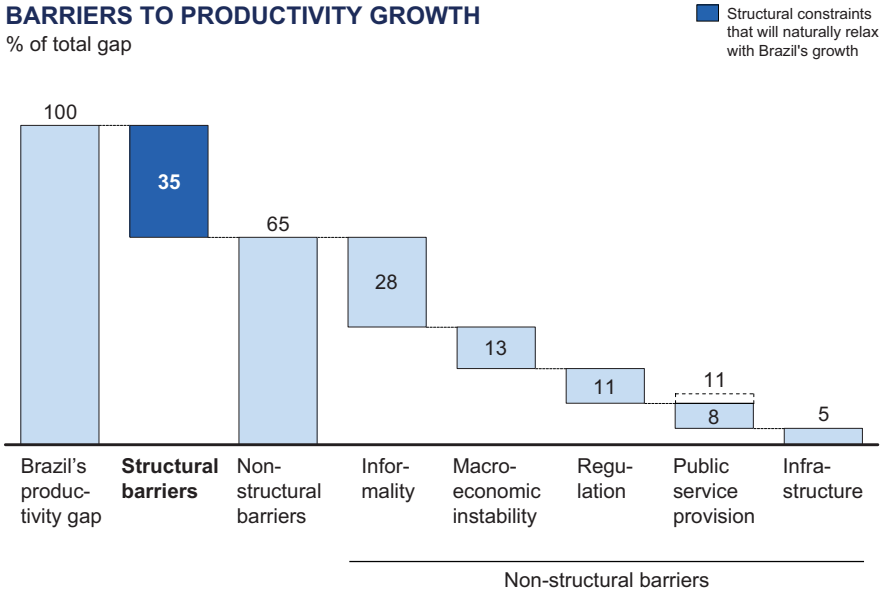
* GDP in US$ at PPP 2003 prices.
Source: International Monetary Fund - World Economic Database; Global Insight WMM 2005; IMD World Competitiveness Year Book 2005, team analysis

What matters most, however, are the non-structural hurdles that are responsible for the remaining two-thirds of Brazil's productivity gap. Our analysis has found five primary barriers to raising productivity in Brazil: the large informal sector, macroeconomic factors hampering investment, an onerous regulatory regime, and weaknesses in public service provision and the country's infrastructure (Exhibit 8). These barriers are distributed almost homogeneously across groups of industries (Exhibit 9). However, certain barriers have more pronounced effects in different sectors. All of these could be tackled through adjustments to Brazil's social and economic policies. By far the most important of these, however, is the drag on productivity exerted by Brazil's informal sector (Exhibit 10).

Exhibit 3

BARRIERS TO PRODUCTIVITY GROWTH

% of total gap



Source: Team analysis

Exhibit 4

RELATIVE IMPORTANCE OF "STRUCTURAL" BARRIERS BY SECTOR

PRELIMINARY

Low impact
Moderate impact
Strong impact

	Non-tradable				Tradable				
	Capital intensive		Labor intensive		Capital intensive				
	Retail banking	Telecom	Food retail	Residential construction	Steel	Auto OEMs	Auto parts	Agriculture	Public Sector
Low income per capita	• Lower penetration of bank services compared to US	• Lower ARPU compared to US	• Lower expenses per capita	• Lower quality of houses	–	• Lower purchasing power of population	–	–	–
Lower historical cost of labor vs. capital	–	• Possible due to automation of call centers	• Less use of equipment	• Less use of equipment and pre-fabricated materials	• Lower process automation	• Lower process automation	• Lower process automation	• Lower use of equipment	–
Size of the market/ Geographics/ Demographics	–	–	–	–	N/A	N/A	N/A	N/A	–

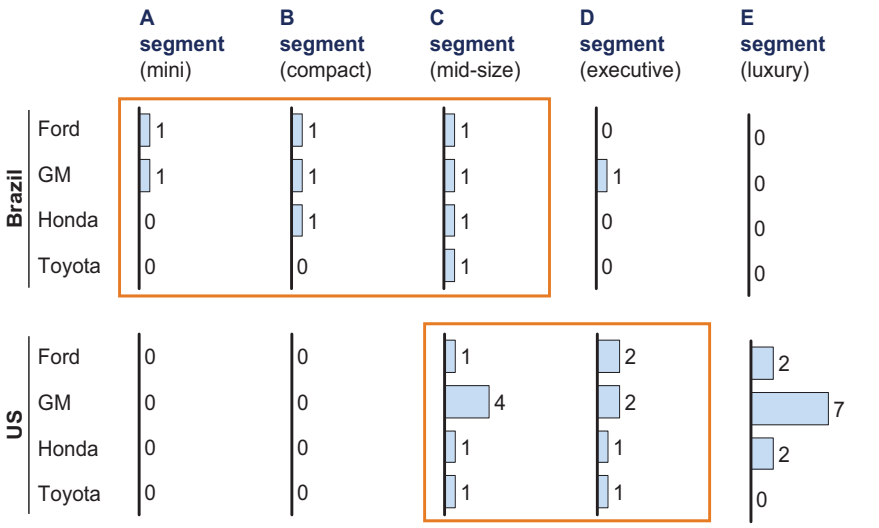
• No strong evidence of impact of the size of the internal market, geographic or demographic differences over labor productivity of non-tradable sectors

Source: Interviews; team analysis

Exhibit 5

NUMBER OF MODELS PRODUCED PER GLOBAL AUTO SECTOR

AUTO SECTOR EXAMPLE

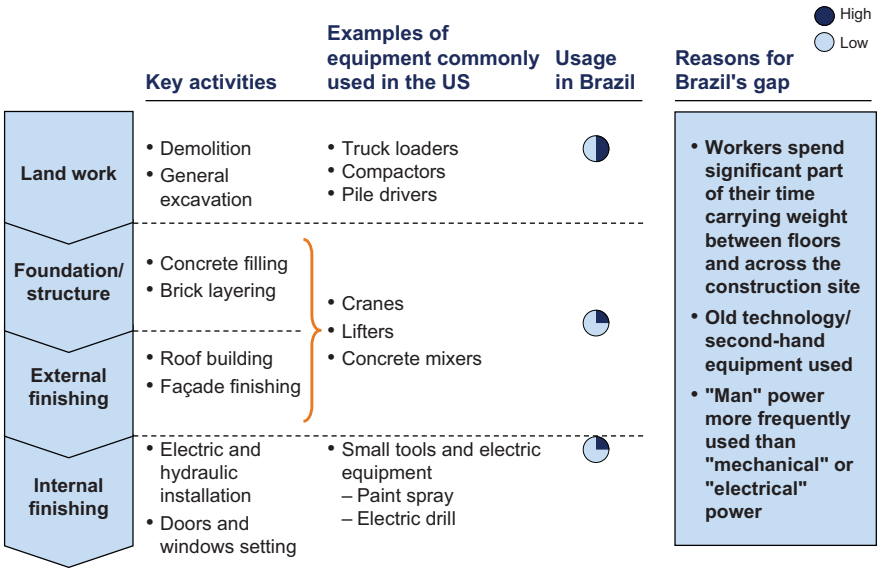


Source: Global insight; team analysis

Exhibit 6

CAPITAL INTENSITY AND USE OF EQUIPMENT

RESIDENTIAL CONSTRUCTION EXAMPLE



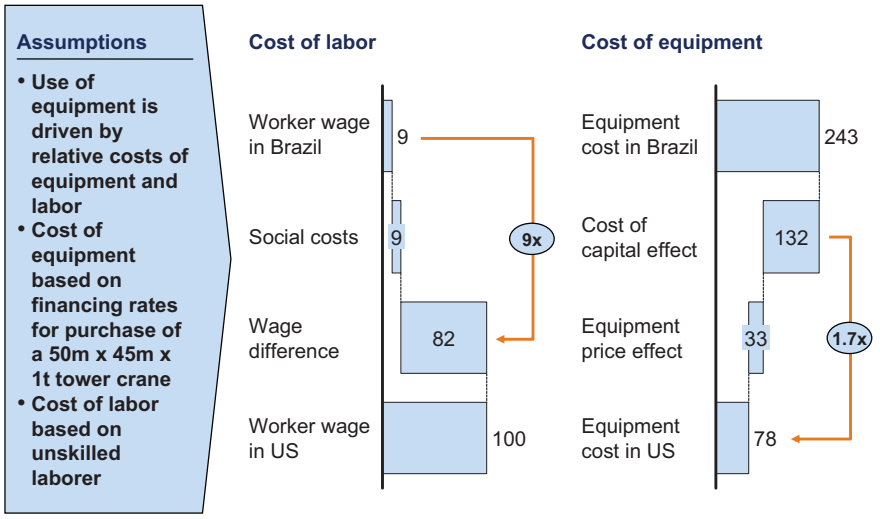
Source: Interviews; team analysis

Exhibit 7

COMPARISON OF LABOR AND EQUIPMENT RELATIVE COSTS IN RESIDENTIAL CONSTRUCTION

RESIDENTIAL CONSTRUCTION EXAMPLE

US$ per day



Source: Interviews; team analysis

Exhibit 8

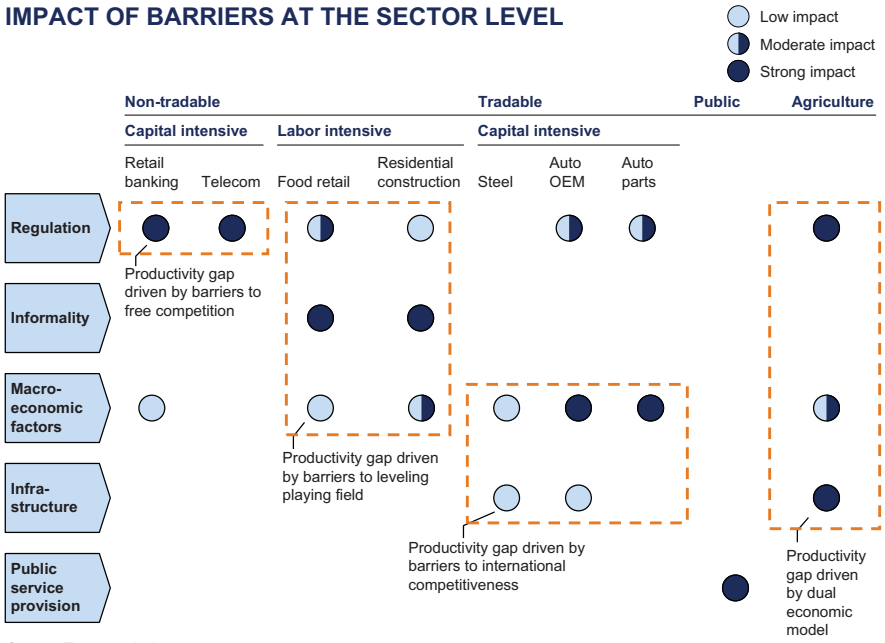
NONSTRUCTURAL BARRIERS TO PRODUCTIVITY

	Definition
I Informality	• Evasion of regulatory obligations that incur significant cost: tax obligations, labor market-related obligations, product-market related obligations
II Macroeconomic factors	• Poor macroeconomic fundamentals manifested in high interest rates, volatile asset prices and atrophied credit and capital markets all with negative implications for investment
III Regulation	• Existence of limiting regulations that result in reduced sector productivity: labor regulations, price, product ,service regulations, land market regulations, regulatory complexity and bureaucracy, trade barriers, government ownership
IV Public service provision	• Inefficient provision of public services to the private sector
V Infrastructure	• Deficient infrastructure capacity in key areas such as energy, roads, ports

Source: Team analysis

Exhibit 9

IMPACT OF BARRIERS AT THE SECTOR LEVEL

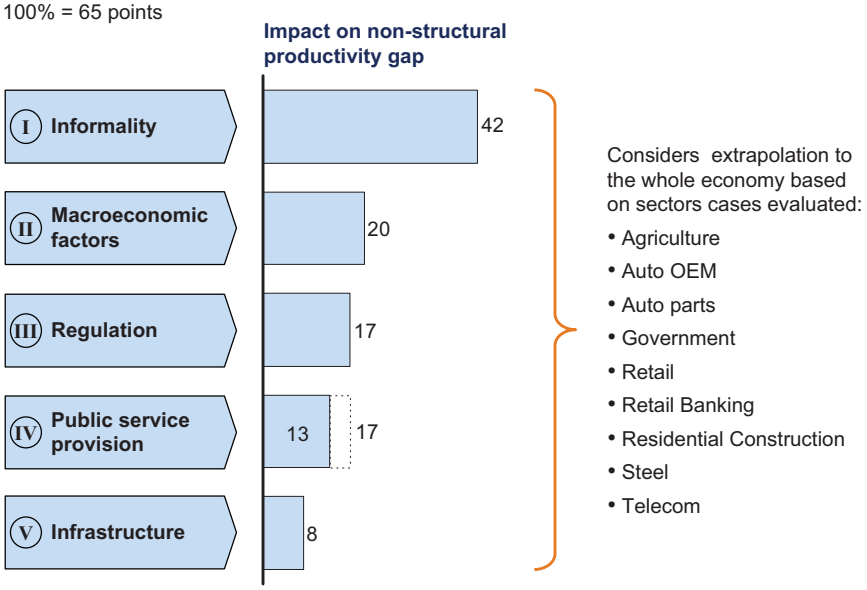


Source: Team analysis

Exhibit 10

RELATIVE IMPORTANCE OF EACH BARRIER

100% = 65 points



Source: Team analysis

BRAZIL'S INFORMAL ECONOMY IS THE BIGGEST OBSTACLE TO PRODUCTIVITY GROWTH

Brazil's informal economy accounts for an estimated 40 percent of gross national income, making it far larger than those in other emerging markets. Having such a huge informal sector saddles Brazil's economy with a set of competitive and corporate distortions that profoundly compromise its prospects.[4] Our analysis shows that it explains 42 percent of the country's nonstructural productivity gap with the United States.

By avoiding taxes, ignoring quality and safety regulations, or infringing copyrights, gray market players gain cost advantages that allow them to compete successfully against more efficient, law-abiding businesses. Honest companies lose market share, and thus make less money to invest in technology and other productivity-enhancing measures. Less efficient players tend to have a larger market share than they would have if they paid the taxes and labor fees they are supposed to (Exhibit 11).

In the Brazilian retail industry, a good example of a sector blighted by the gray economy, informal players enjoy higher margins than their formal competitors, and small and medium-sized enterprises, less productive than larger firms, derive an artificial advantage (Exhibit 12). In Brazil, small and medium-size retail outlets have a dominant 79 percent share of the retail market compared with 35 percent in the U.S. equivalent (Exhibit 13). The result is far lower sales-per-employee (Exhibit 14).

More labor tends to be retained in unproductive activities than is economically rational because it is artificially cheapened by tax and social security evasion. In Brazil's construction sector, for instance, the percentage of those working in the informal economy increased from 66 percent in 1996 to 72 percent in 2003 (Exhibit 15). Informality also discourages investment in automation and up-to-date equipment. There is no incentive for small, informal businesses to reach the scale required to innovate and adopt best practices because growing bigger increases the risk that the authorities will detect their informal practices.

4 See Diana Farrell, "The hidden dangers of the informal economy", The McKinsey Quarterly, 2004, Number 3

Exhibit 11

IMPACT OF INFORMALITY THAT HINDERS PRODUCTIVITY

Type of distortion	Description	Example of sector	Evidence found
Tax related	• Evasion of VAT and income tax through under reporting of sales and use of informal suppliers	• Food retail	• Evasion of VAT and social security obligations allow informal food retailers to enjoy additional return on sales
Labor market related	• Evasion of social security obligations and minimum wage payments by not reporting all employment or full employment working hours	• Residential Construction	• Evasion of social security obligations and VAT allow informal construction companies to enjoy cost advantage
Product market related	• Evasion of minimum product quality requirements, property rights and security/ environment standards that would increase the costs of goods or services	• Residential Construction	• Avoidance of security norms may induce additional cost advantage to informal players

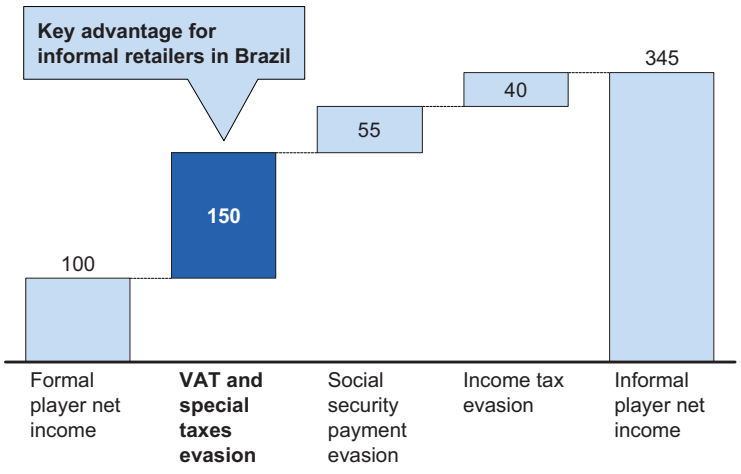
Source: Team analysis

Exhibit 12

ADVANTAGES OF OPERATING INFORMALLY IN RETAIL ARE EXTREMELY HIGH IN BRAZIL

ROUGH ESTIMATE
CASE EXAMPLE

Indexed to formal sector net margin = 100

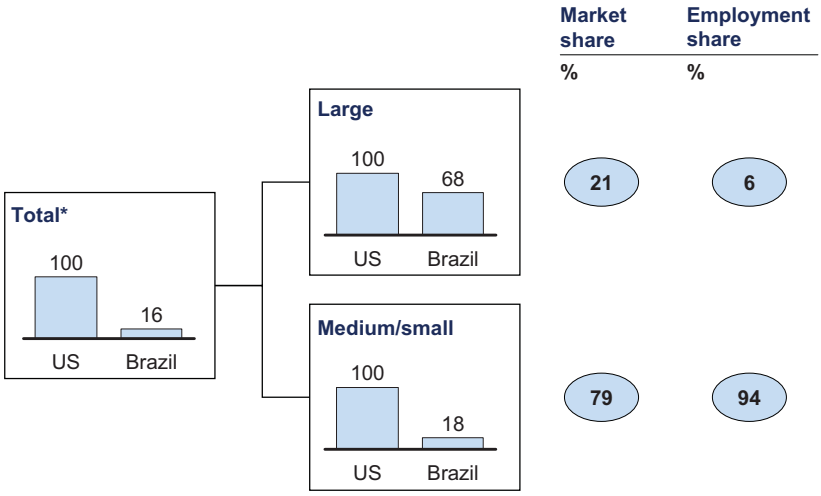


Note: Analysis modeled for a representative supermarket – informal sector assumption is that 30% net sales and employee costs go unreported.
Source: MGI – New Horizons Multinational Company Investment in Developing Countries, 2003

Exhibit 13

PRODUCTIVITY IS SIGNIFICANTLY AFFECTED BY THE MIX BETWEEN LARGE AND MEDIUM/SMALL FORMATS IN RETAIL

Indexed to same segment in US 2001 = 100

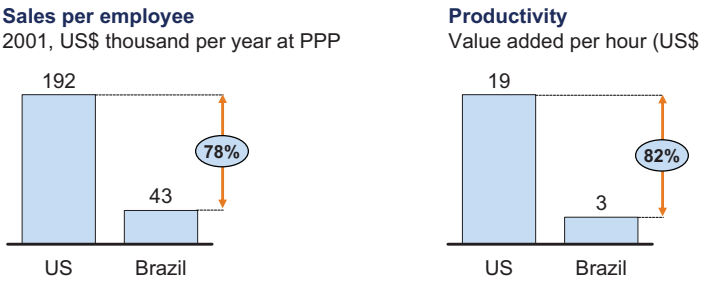


* Average productivity is lower than that of both segments because the less productive medium/small segment has higher employment share in Brazil than in the US.

Source: MGI – New Horizons Study; MGI France/Germany; team analysis

Exhibit 14

COMPARISON OF SALES PER EMPLOYEE IN MEDIUM/SMALL FORMATS IN RETAIL



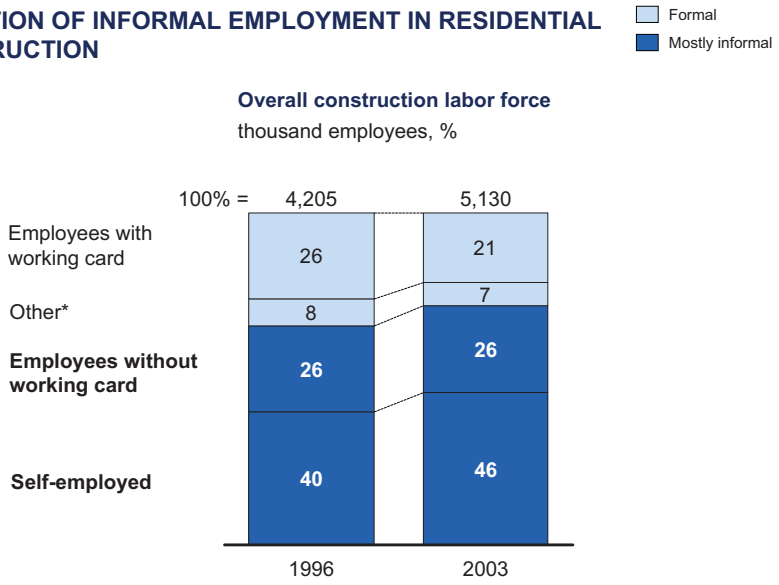
Main drivers

- Last-resort employment in food retail
- Low levels of automation in traditional stores
- Structural demand constraints due to low income/capita

Source: MGI – New Horizons Study; MGI France/Germany; FMI; US Retail Census

Exhibit 15

EVOLUTION OF INFORMAL EMPLOYMENT IN RESIDENTIAL CONSTRUCTION



* Employers, unpaid workers, workers in construction for own use and public servants.
Source: PNAD; team analysis

FURTHER BARRIERS TO HIGHER PRODUCTIVITY

While tackling the gray economy should be Brazil's first priority, four further hurdles to higher productivity also deserve policymakers' close attention.

Macroeconomic factors

Despite significant improvements, Brazilian business still suffers from uncertainty regarding the sustainability of (relative) economic stability (Exhibit 16). Brazil's interest rates are among the highest in the world, its governments debt remains below investment grade and long-term financing is virtually non-existent. These conditions reduce the willingness and raise the costs of investments to businesses, and discourage long term-investment. The distortions brought on by macro instability are seen throughout the economy. For example, sectors such as residential construction, which relies on long-term consumer credit, are hampered by the embryonic nature of Brazil's capital markets and therefore the limitations on mortgage finance. In agriculture, the limited mechanization observed may be explained by the high relative cost of agricultural equipment—due largely to the higher cost of capital (see exhibit 7).

McKinsey estimates that macroeconomic uncertainty accounts for 20 percent of the productivity deficit produced by the five primary barriers.

Exhibit 16

II MACRO ECONOMIC FACTORS THAT HINDER PRODUCTIVITY

Type of distortion	Description	Sector	Evidence found
Exchange rate volatility	• Exchange rate fluctuations impact company planning	• Auto OEM	• Planning for export is dependent on exchange rates. Automation/ expansion investments delayed/cancelled
Cost of capital – financing	• Impact of high interest rate on consumers of goods produced by sector	• Residential construction	• Unavailability of long-term capital results in underdeveloped mortgage market
		• Auto OEM	• High interest rate depresses auto loans. Most OEM are forced to provide subsidized financing to increase sales
Cost of capital – investment	• Impact of high interest rate on suppliers	• Auto OEM	• High return required on investment on factories and production lines
		• Agriculture	• High capital cost of agricultural equipment which limits mechanization

Source: Team analysis

Regulatory constraints

Brazil's complex, bureaucratic regulatory regime accounts for another 17 percent of the nonstructural productivity gap, according to our estimates. Our definition of regulations covers the gamut from labor and tax laws, to price controls, product regulations, trade barriers, and subsidies (Exhibit 17). Regulatory constraints on productivity are particularly marked in non-tradable, capital-intensive sectors such as retail banking and telecoms.

Labor laws. Brazil's labor legislation is rigid, particularly in comparison with the United States, and this significantly constrains productivity. The thorniest problem for businesses is limits on hiring and firing workers. This leaves them vulnerable to fluctuations in demand, particularly in highly cyclical sectors such as residential construction. The high cost of laying off workers encourages informal employment. All too many employers find this route attractive because

it allows them to avoid paying expensive payroll taxes, and gives them the flexibility—not available in the formal sector—to manage their work forces. Labor market rigidity, which affects all the industries we studied, is clearly hampering the ability of Brazilian companies to optimize their operations and create new jobs, and deters foreign direct investment in Brazil.

Exhibit 17

(III) REGULATIONS THAT HINDER PRODUCTIVITY

Type of distortion	Description	Sector	Evidence found
Labor regulations	• Restrictive labor laws regarding retaining policies	• Auto • Residential construction	• Rigid labor agreements increase employment levels • Low flexibility to adjust capacity to demand
Tax regulations	• High taxation	• Telecom • All sectors	• Taxes applied are highest worldwide • Taxes over salaries makes labor more expensive (favors informality)
Regulatory complexity and bureaucracy	• Legal requirements and completion times for business processes	• Residential construction • All sectors	• Smaller share of large scale construction • Excessive bureaucracy results in high time investments for companies
Price, product, service regulation	• Regulation restraining free development of players value proposition	• Retail banking • Telecom	• Restrictive occupation description • Forces investments where they are not necessarily the best business choice
Trade barriers/ subsidies	• Government subsidies/ international trade barriers	• Agriculture • Auto	• Disadvantage for Brazilian players vis-à-vis US subsidies • State Government subsidies are linked with job creation and maintenance
Government ownership	• Regulation that allows government ownership of players	• Retail banking	• Three government owned banks hold 40% of employment and 35% of assets and have half as productive as private sector banks

Source: Team analysis

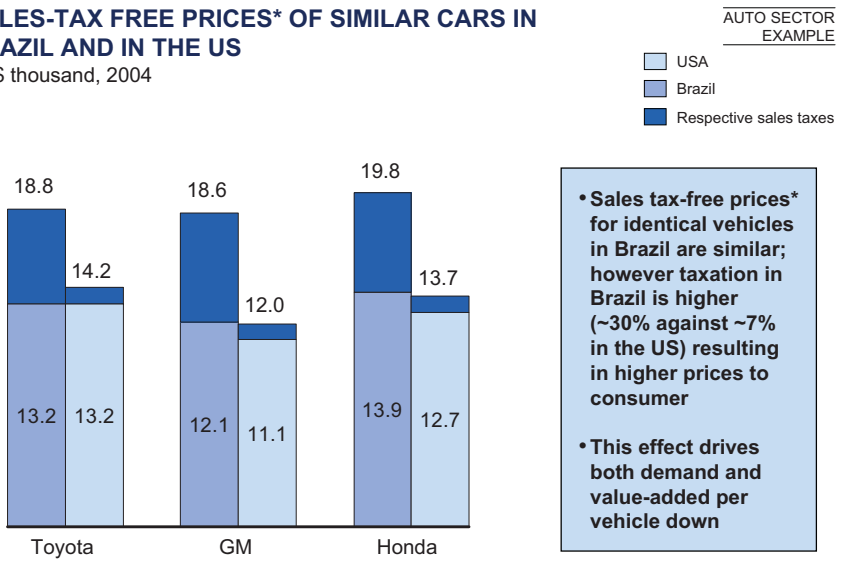
Tax regulation. High taxes drive costs up and demand down. For instance, the actual cost of making similar vehicles in the United States and Brazil is about the same; but add in Brazil's sales taxes, and prices rise significantly across the entire Brazilian manufacturing chain to the detriment of the final consumer (Exhibit 18). High prices not only reduce overall demand for new vehicles, but also the average value of automobiles sold in Brazil.

Regulatory complexity and bureaucracy. Brazil labors under a web of city, state, and federal taxes and regulations that hinder entrepreneurialism and make it difficult for the financial system to function. In the residential construction sector, standards are imposed that are prescriptive and not performance-based. For instance, they will stipulate how thick a wall must be, but say nothing about the structural resistance or thermal and acoustic insulation it should

provide. These imposed standards tend to delay the incorporation of innovative construction with superior properties. For example, drywall, widely used in the United States, has very low penetration in Brazil.

Exhibit 18

SALES-TAX FREE PRICES* OF SIMILAR CARS IN BRAZIL AND IN THE US
US$ thousand, 2004



* This is a consumer price comparison only. There are still value-added taxes distributed across the supply chain and included in "sales taxes free" prices, which are bigger in Brazil than in US.
Source: FIPE; IPE; Global Insight; McK research; team analysis

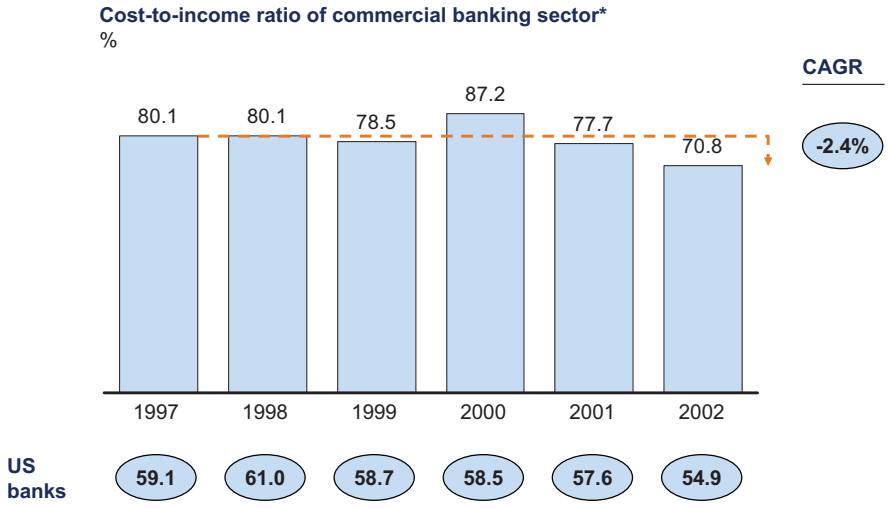
Price, product, service regulation. Certain regulations limit the proper functioning of a free market, raise obstacles for the entry of new players, set artificial price levels, or introduce standards and requirements that impede optimum operations or trade. For instance, the cost efficiency of Brazil's commercial banking sector—measured as a cost-to-income ratio—improved between 1997 and 2002, dropping from 80.1 to 70.8. But the ratio among US banks fell from 60 to 55 over the same period, leaving Brazil's banks still far behind (Exhibit 19). This difference is attributed to legislation relating to financial products, formats of service provision (e.g., hours of service), and other sectorial regulations in combination with labor and tax regulations.

Subsidies and barriers to free trade. Productivity is compromised by a panoply of regulations that hamper free trade, including prohibition on the entry of new competitors into a particular market, tariff protections, and subsidies that favor some players over others.

Exhibit 19

THE COST EFFICIENCY OF BRAZILIAN BANKS

RETAIL BANKING EXAMPLE



* Based on sample of 164 banks.
Source: Bankscope

State-owned businesses. Government-owned businesses overall have lower productivity than companies in the private sector. In the retail banking sector, for instance, state-controlled banks own 37 percent of all the assets of the banking system and account for 40 percent of its employment (Exhibit 20). This drags down the productivity of the sector as a whole. The productivity of Brazil's publicly-owned banks is only just over half of the country's leading private bank (Exhibit 21).

Public sector weaknesses

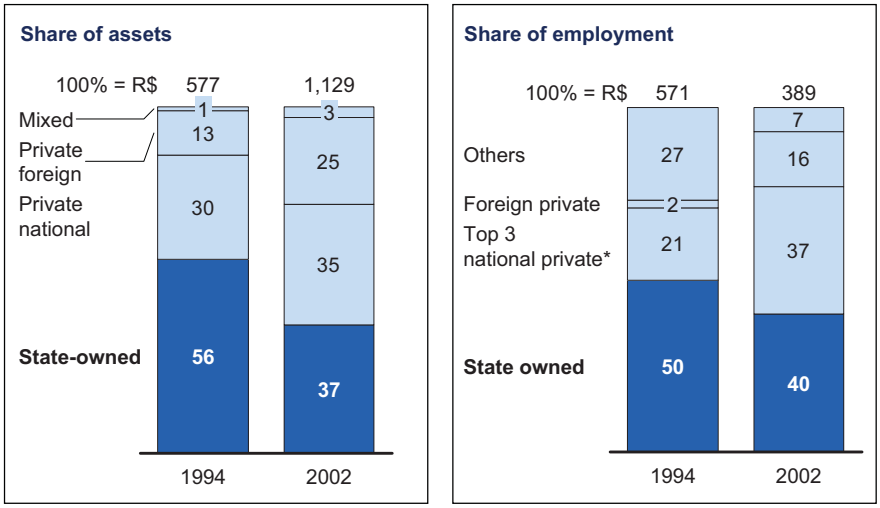
Inefficient public services account, we estimate, for up to 11 percent of the primary barriers to Brazilian productivity growth that we identified. Public services are responsible for 11 percent of total employment in the country (Exhibit 22). They do not deliver effectively, and that holds the private sector back. For instance, one-quarter of the population receives no secondary schooling; almost 12 percent of adults—some 15 million people—cannot read or write. This impedes the adoption and use of innovative new products and techniques in sectors such as agriculture.

Exhibit 20

GROWTH OF MID SEGMENT OF BRAZILIAN BANKS

RETAIL BANKING EXAMPLE

%



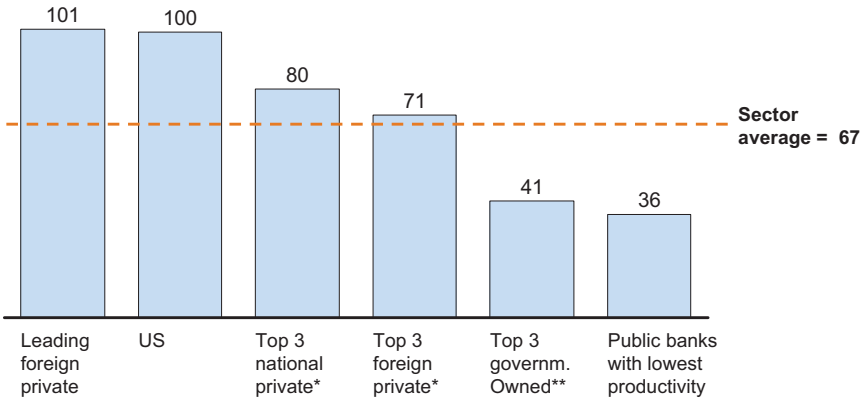
* Bradesco, Itaú, Unibanco.
Source: Austin Asis; Brazilian Central Bank; Febraban; team analysis

Exhibit 21

RELATIVE PRODUCTIVITY OF PRIVATE AND PUBLIC BRAZILIAN BANKS

RETAIL BANKING EXAMPLE

Indexed, US = 100



* Ranking based on share of assets.
Source: Austin Asis; team analysis

Exhibit 22

Ⓘⓥ PUBLIC SERVICE DISTORTIONS THAT HINDER PRODUCTIVITY

Type of distortion	Description	Sector	Evidence found
Inefficiency in public sector service provision	• Service provided by government is subpart for populations needs	• Education • Health	• High illiteracy rates • Infant mortality
Low public investment	• Inappropriate investment in necessary infrastructure	• Agriculture	• Low investment in necessary infrastructure results in high transportation costs, delays and product losses
High government spending	• High government spending increases interest rates	• All capital intensive and consumer finance dependent (e.g., residential construction, auto)	• Hampers consumer borrowing and investment by firms

Source: Team analysis

Infrastructural weaknesses

Finally, Brazil has a significant infrastructure deficit with inadequate highways, ports, railroads, and power generation and storage facilities (Exhibit 23). McKinsey estimates that this accounts for 5 percent of the primary barriers to greater productivity. In agriculture, for instance, up to 12 percent of rice produced in Brazil spoils before reaching ports or the end consumer (Exibit 24). Freight costs and port tariffs for Brazil's soybean producers are $16 a ton or 55 percent higher than the equivalent costs for their US competitors, reducing their margins on international prices by 10 percent (Exhibit 25). Costs in Brazil's automotive industry are raised by factors including relatively expensive transportation and long waiting times at dockside, which cause expensive build-ups of inventory.

THE WAY FORWARD

The barriers to improving productivity in Brazil's economy are formidably deep-seated. Dismantling them is bound to be hard work. But there is much cause for optimism. In our experience, once the sources of low productivity are identified, there is no impediment to governments adopting a program of long-term structural and economic adjustment.

Exhibit 23

(V) INFRASTRUCTURE DEFICIENCIES THAT HINDER PRODUCTIVITY

Type of distortion	Description	Sector	Evidence found
Ports	• Poor port infrastructure that results in higher export costs	• Steel • Agriculture • Auto	• Port tariffs for soybeans shipments are twice as high as in the US
Roads	• Poor road infrastructure causing delays and increasing transportation costs	• All sectors	• 83% of roads in Brazil are in bad condition • High freight costs and high product losses in transportation
Energy	• Risk of shortage	• All sectors, especially capital intensive	• Energy shortages that occurred in 2002 and are forecasted to happen again in the next 5-10 years
Storage	• Storage capability	• Agriculture	• High product losses due to lack of storage and poor storage conditions • Reduced producer bargaining power due to lack of storage capabilities
Other modes of transportation	• Underdeveloped rail and boat transportation	• Agriculture	• High usage of high cost road transportation relative to rail and boat transportation

Source: Team analysis

Exhibit 24

INFRASTRUCTURE – PRODUCT LOSSES DUE TO DEFICIENCIES IN TRANSPORTATION AND STORAGE

AGRICULTURE EXAMPLE

% of production, 2003

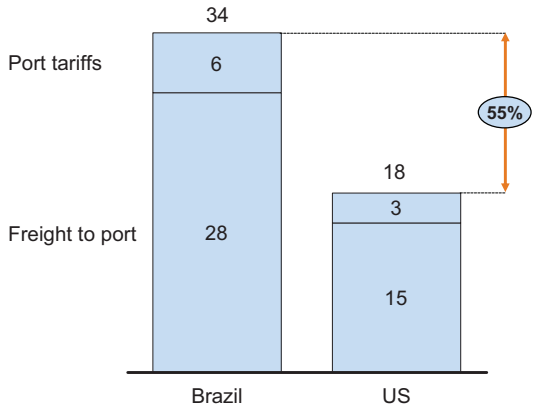
Source: IBGE; team analysis

Exhibit 25

INFRASTRUCTURE – COMPARISON OF TRANSPORTATION COSTS FOR SOYBEANS

US$/t/1,000 Km*

AGRICULTURE EXAMPLE



- **Freight costs and port tariffs are US$ 16/t higher in Brazil than in the US**
- **Brazilian producers' losses due to higher freight and port tariffs in Brazil amount to 6-10% of prices received in international markets****

* Average distance from farms to ports is approximately 1,000 km for both Brazil and US.
** Soybeans prices in the Chicago board of trade fluctuated between US$ 168.8 and US$ 277.8/t in the last 10 years.
Source: Veja; CBOT; team analysis

Take the informality barrier. The government of Brazil has started to undertake key structural reforms that will tackle this problem—passing public pension and tax bills and legislation to modernizing bankruptcy law. Predominantly informal sectors—such as retailing and construction—will require even more tailored, structural changes. By tackling informality sector by sector, and tailoring the approach, policymakers will be able to deliver the kind of quick wins that generate the political momentum required for further change. For instance, the federal tax collection agency now requires leak-measurement devices in all Brazilian beverage plants—a move that could quickly cut by some 70 percent the sector's estimated annual tax evasion of 720 million reais, or $360 million.

Brazil also needs to tighten up its legal system, and consider following the lead of other countries such as Ireland and the Netherlands in creating a special agency to fight evasion of taxes and social charges. More fundamentally, it should consider lowering the burden of both taxation and regulation—so that informality doesn't pay.

Such measures, along with policies to tackle Brazil's other major productivity barriers, have succeeded elsewhere. The government of the Republic of Ireland,

for instance, transformed the country's economic prospects and performance within a relatively short time-scale by embracing a well-articulated strategy to dismantle the kind of barriers we have found in Brazil.

Two-thirds of Brazil's productivity deficit can be tackled by changes in government policy. The rest will come when the economy moves onto a sustainable, healthy growth track. There is all to play for.

THE ROLE OF EDUCATION AND INNOVATION

Our research indicates that a combination of investments in training and evolution in production processes can result in significantly higher productivity in Brazil with the currently available labor pool, in spite of its low educational level. This conclusion is consistent with that reached in other countries studied by MGI. Therefore, we have not identified education as one of the key barriers to Brazilian economic growth.

This conclusion should not be interpreted as a suggestion that we do not believe education is important. We are aware of the empirical evidence in Brazil and abroad, indicating that investment in education can contribute to increasing output and improvements in the distribution of income, and that in almost all countries that reached a high per capita GDP, the labor force had more schooling than in Brazil. We also recognize the role of education in strengthening civil society.

Our conclusion implies that Brazil need not wait for a new generation of more highly educated workers to join the labor force before it can achieve rapid productivity growth rates and significantly higher GDP per capita levels. It also implies that the full potential of the Brazilian worker will remain unrealized if policy makers do not address the barriers limiting Brazil's near term growth prospects.

THE ROLE OF EXCHANGE AND INTEREST RATES

Relatively "high" interest rates and a "low" ("overvalued") exchange rate are frequently cited in Brazil's economic debate as key barriers to faster growth. Neither, however, is listed among the barriers we identify.

Regarding exchange rates, our research approach focuses on understanding differences in productivity levels of all the workers in an economy. The proportion of workers in "tradeable sectors", where a devaluation would presumably have the strongest direct effect, is typically relatively small. Further, an "overvalued" exchange rate favors the importation of capital inputs and increases the competitiveness of foreign goods and services, both of which are factors that tend to favor productivity growth. Reflecting this apparently ambiguity, despite the compelling "anecdotal evidence (e.g. China, Korea, …), our interpretation of the empirical evidence is that there is no clearly established link between FX rate levels and GPD growth rates. Clearly, an FX rate policy that deteriorates the country's external accounts and exposes it to significant external shocks is undesirable. However the very large positive trade balance and the recent current account surpluses suggest this is not the case in Brazil.

With respect to interest rates, we do believe that interest rate levels among the highest in the world adversely affect investment capacity and therefore Brazil's growth prospects. However, we also believe these interest rates are primarily a consequence of economic policy and a measure of the perceived soundness of its economic fundamentals. Direct (or "unilateral") efforts to reduce interest rates will almost certainly prove counterproductive. Measures that remove the anomalies around Brazil's fiscal condition (e.g. excessively high level of spending and taxation, excessively high public sector consumption) are what is needed to bring about sustained reduction in interest rates. Such measures will contribute to an increase in the overall level of investment in the economy, both because of impact on risk perception but also because they will restore the public sector's investment capacity.

Methodology

The methodology employed was developed by the MGI and has been used in more than sixteen developed and developing economies. It combines detailed analyses of labor productivity in different industries with a set of transverse analyses of the economy as a whole.

For this study we analyzed six sectors: agriculture, automotive (OEMs and auto parts), residential construction, government, food retail, and retail banking. The steel and telecom industries were also taken into account. These sectors were selected based on the criteria of providing significant coverage of different areas of the economy, including nontradable capital intensive (banks and telecom) and labor intensive (food retail and construction) sectors, tradable capital intensive (steel, automotive) and labor intensive (agriculture) sectors, as well as the public sector (government). Combined, these sectors are responsible for 37 percent of employment in Brazil and 46 percent of its gross domestic product (GDP).

There were three parts to this methodology:

We first calculated the financial productivity (and the gap compared to the United States) for different industries. This analysis was based on the value added and employment in each sector according to data published by the Brazilian Institute of Geography and Statistics (IBGE) and the National Research on Households (PNAD). For industries where IBGE or PNAD data could result in distortions, quantitative checks were made against the physical output of the sector. For example, in the automotive sector, data on the actual number of vehicles produced was used in addition to government-supplied data.

We subsequently mapped the operational causes that explained the differences observed between Brazil and the United States—factors such as differences in manufacturing processes, levels of automation, capacity utilization, and so on. These causes, said to be the root causes, were identified during the course of extensive interviews and were quantified based on sector markers.

Finally, we mapped the difference in productivity along each root cause against factors that impede parity with the United States. These factors are defined as the non-structural barriers, which can be grouped into informality, regulation, macroeconomic factors, infrastructure, and public service provisions. Although these groups can be isolated and analyzed, they are neither independent nor mutually exclusive. Throughout the course of this study we will point out the interdependencies between these barriers and demonstrate how one may feed into another.

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