The BRAZILIAN ECONOMY

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The IBRE Letter

Absorbing foreign savings successfully

Because Brazilians and their government do not save enough, foreign savings will be needed to finance growth for the foreseeable future. The pressing issue, then, is what the country needs to do to live with this unavoidable reality. Will what worked for Australia work for Brazil? It might — if Brazil commits to maintaining fiscal balance and the floating exchange rate, and is vigilant to avoid currency mismatches between bank assets and liabilities.

Interview: Betting heavily on pre-salt oil

The Usiminas steel group is investing heavily in, among other things, technology to meet the needs of oil exploration. It is also active in promoting the use of steel in the building industry. The intent, group CEO Marco Antônio Castello Branco tells Klaus Kleber, is to make Usiminas and its units more competitive. That is also why it is creating a new corporate culture that values the participation of employees throughout the company.

Electric Power Sector

Plenty of energy, but high costs

According to the Energy Research Corporation (EPE), the share of hydroelectric power in Brazil's energy mix ought to continue to be significant, because two-thirds of its total potential, 260,000 MW, is yet to be utilized. The fact that most of it is not located where the consumers are would make exploiting it uneconomic if Brazil did not have such an effective electricity transmission network. What push up costs are environmental issues and the numerous taxes and sector charges that must be incorporated into energy prices, which may ultimately undermine the competitiveness of Brazilian businesses. Ana Lúcia Barros Magalhães reports.

International Finance

Financial innovation and the crisis

Berkeley Professor Barry Eichengreen distinguishes between financial innovation itself, which can be a good thing for shifting risk to those who can handle it, and how we have permitted it to be used, which, given the number of unsophisticated users in the marketplace and the asymmetry of the information available to them, can have undesirable effects. Following Schumpeter, he sees as the way out an economics better informed by history — for instance, history will remind us that asset booms will not last forever.

IBRE's Business Cycle Dating Committee

Following up on its quarter-by-quarter chronology of recessions for the Brazilian economy between 1980 and 2009, the committee has established a more accurate month-by-month chronology.

Brazil's economic and financial indicators

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The electric power issue is the main story of this edition.

Despite the shock caused by the blackout last November that left 18 states without power, Brazilian society does not fear that electricity shortages might jeopardize Brazil's economic development. The country has enormous hydroelectric potential, which already accounts for 85% of electricity generation. But there are some obstacles to developing this potential, such as the time it takes to obtain environmental permits — which can cause Brazil to use more thermal coal and fuel oil, sources of energy more expensive and dirtier — and the high cost of energy due to taxes and charges.

Business has harshly criticized the environmental licensing situation. "In the first five years of the Lula government, no environmental licenses for hydroelectric plants were granted," lamented the director of energy association FIESP, Carlos Cavalcanti. "The Environment Ministry has licensed oil and coal projects and no hydroelectric project, when that is the source of cleaner and cheaper energy."

Eletrobrás CEO José Antonio Muniz Lopes disagree. He does not believe that delays in obtaining environmental permits for some hydroelectric projects will create bottlenecks that jeopardize Brazil's economic growth.

Though they may not fear a blackout, most Brazilian industries fear that there is a risk of rationing due to high energy prices. According to studies by the Brazilian Association of Large Industrial Energy Consumers and Free Consumers (EMBRACE), the sum of taxes and other charges represents 52% of an electric bill, compared with 12% in France and 8% in the United Kingdom. The National Confederation of Industry (CNI) considers that this has led to Brazil losing competitiveness in a wide range of products.

Absorbing foreign savings successfully

Brazil's low domestic savings seem embedded in political and electoral choices, made in a democratic environment, that are not easily reversible. A generous pension system — with rules to ensure the transfer to retirees of productivity gains from active workers — is one of the main factors explaining why Brazilians save so little. This can be addressed by public policies related to taxation and social security, but it would be unrealistic to suppose that the political economy that has led to a progressive increase in benefits granted by the government can be changed radically overnight.

Because low savings are a national reality difficult to change, foreign savings are needed to finance Brazil's growth. The expectation with the current vigorous economic recovery is that Brazil will live many years with high external current account deficits financed by foreign savings. The most pressing issue is not whether Brazil should absorb foreign savings but what the country needs to do to live with this unavoidable reality.

External vulnerability — The main concern about using foreign savings is the return of external vulnerability: in the past, overborrowing in foreign currency combined with a reluctance of foreign investors to finance Brazil has led to sudden reversals in capital flows that caused exchange rate and financial turmoil. Another concern is that the overvalued exchange rate that usually follows absorption of increased foreign savings depresses the industrial sector.

Australia is a good demonstration of the long-term implications of using foreign savings and amassing current account deficits. Although we should be careful with any international comparison, the Australian experience holds lessons that can be useful to policy makers in Brazil. In the 1980s, Australia's external current account deficit increased from 2.5% to 4.5% of GDP, where it still remains. Expansion of the deficit meant net external debt rose to 65% of GDP, about twice the rate of Brazilian debt.

Just as Latin Americans worried for decades, many Australians were concerned that the rapid growth of external debt was unsustainable and would constrain economic growth. In 1986, when Australia was downgraded by international rating agencies, its Treasury Secretary, Paul Keating, suggested that Australia might be becoming a "banana republic," with the same kind of irresponsible economic policies that had brought about so many crises in Latin America.

The Australian economist John Pitchford expressed an alternative view, the "consenting adults view," that the current account deficit is the result of decisions taken by various market participants. Any attempt of economic policy to change the current account would carry costs for society. The problem is not the current account deficit in itself, but rather the economic and institutional mechanisms the country must have to manage external financing.

Despite huge external deficits and high external debt, Australia overcame not only the international crises of the 1990s but also the recent crisis. Its economic performance was outstanding, with low exchange rate volatility and average growth (in purchasing power parity) of 3.6% per year, the highest rate among developed countries.

What worked for Australia — Since continuation of the trend of deficits and external debt in Brazil seems inevitable, it is worth looking at what allowed Australia to absorb foreign savings successfully. What made the Australian economy relatively resilient to external shocks, even though it had so much debt denominated in foreign currency?

First, we can see, is that the central bank has to have a single objective: control inflation. Here there is no significant difference between Australia and Brazil, where the central bank also works to achieve an inflation target.

Second, the Australian dollar is an international currency, traded freely against other currencies used in contracts, including bank deposits and bonds. Nonresidents may issue bonds and charge in Australian dollars, and there is a market for trading the currency fully off-shore. In fact, off-shore operations account for 60% of all transactions using the Australian dollar. The existence of large and liquid markets in Australian dollars, internal and external, is an important channel for financing the country's current account deficit. Borrowing externally is less risky because it is cheap to hedge, in futures and options, against exchange rate fluctuations because the difference between domestic and foreign interest rates is virtually zero.

Because low savings are a national reality that is difficult to change, foreign savings are needed to finance Brazil's growth.

Clearly, Brazil is far from having as large a market in local currency debt as Australia, but it is moving in that direction as foreign investors buy treasury bills in the domestic market and government bonds denominated in the national currency issued in international markets. However, as long as there is a wide spread between domestic and foreign interest rates, the price of hedging against exchange rate fluctuations will be high, making it difficult to finance a large current account deficit by borrowing externally.

Foreign direct investment — Brazil should therefore avoid as far as possible borrowing in foreign currency. Instead, it should rely on using foreign savings, mostly

in the form of portfolio and foreign direct investment, which does not carry the risks of borrowing in foreign currency. Here Brazil is faring well. In December 2009 portfolio and direct foreign investment was US$751 billion, while net external debt was just US$76.4 billion; debt exposure in foreign currency was thus well below Brazil's international reserves of US$241 billion.

In this connection, it should be made absolutely clear to the private sector that the government will not protect (hedge) against exchange rate fluctuations. It is essential that the external current account deficit be financed without raising systemic financial risks for the public sector. The BNDES (National Bank for Economic and Social Development) therefore set a bad precedent recently when it decided to participate in the restructuring of companies that had suffered heavy losses on derivative transactions in foreign currency during the global financial crisis.

The problem is not the current account deficit in itself, but rather the economic and institutional mechanisms the country must have to manage external financing.

Minimizing risks — To emulate the Australian model and live with large current account deficits, Brazil needs policies and institutional reforms to minimize the risks arising from its absorption of foreign savings and to prevent any external crisis from becoming a sovereign risk for the country.

The most important requirement is fiscal balance. Since 1998 a policy of primary surpluses and gradual reduction of net public debt has put Brazil in a solid position. Also, as government became a net creditor in dollars by accumulating large international reserves, its financial position in times of stress and devaluation also became better.

The second requirement is to maintain the floating exchange rate, which, besides automatically correcting current account imbalances, discourages borrowing in foreign currencies without hedging. It will also be important to resume the legal and institutional reforms needed to make domestic capital markets more efficient. Studies have demonstrated that this also helps an economy to expand and internationalize its financial markets and currency. For example, given the need to attract foreign savings to finance the current account, it does not seem sensible to tax the stock market transactions of foreign investors.

Finally, Brazil's banking regulation should be particularly concerned with problems caused by currency mismatches between bank assets and liabilities. This issue becomes pressing when there is a substantial increase in the volume of real estate loans, an area that is at risk of speculative bubbles, as we saw all too clearly in the global financial crisis.

Betting heavily on pre-salt oil



Marco Antonio Castello Branco

Usiminas CEO

Klaus Kleber, from São Paulo

The Usiminas steelmaker group works earnestly to promote use of steel in the building industry and has recently signed a contract with the My House, My Life program for construction of 43 residential buildings in steel in Volta Redonda (Rio de Janeiro state), targeted to families earning from zero to three times the minimum wage. "We have initiated negotiations with other municipalities for similar projects," Usinimas CEO Marco Antonio Castello Branco adds. The international crisis suppressed the group's exports, the fall of which was not offset by increased domestic demand, but the group sustained its strategic investments. "We are investing in technology to meet the needs of the shipping industry and of the pre-salt oil field exploration with the fast plate cooling unit at the Ipatinga mill (Minas Gerais state), which should be operational before the end of the year," the CEO explains. "The technology comes from Nippon Steel, and ours will be the only steelworks outside Japan to use this process, which will enable us to produce more resistant steels."

***The Brazilian Economy* — You have been CEO of the Usiminas group since July 2008. What have been the main objectives of your management?**

Marco Antônio Castello Branco — The principal focus, for me and for the entire Usiminas management, is to make the group more competitive. For this we are developing a new corporate culture with guidelines based on increasing professionalization of management, meritocracy and autonomy of employees, and transparency of processes and relationships. At the same time, Usiminas has been restructured into four units: mining and logistics, steelworks, steel processing, and capital goods, which have begun to operate in an integrated manner so that we can increase the supply of products and services that have higher added value.

Usiminas is known for encouraging the contribution of workers at all levels to improving operations and increasing productivity. How does that work?

We value the participation of employees throughout the company. We gave workers outside upper management more autonomy, which we consider essential to this process of change. We have implemented several projects

to give voice to the employees, and we have obtained very clear benefits from such participation. In the first three quarters of 2009 alone, the Productivity and Action program has allowed us to reduce costs by US$246 million by applying employee suggestions. Eventually that figure could be as high as US$778 million.

The Development Program Usiminas announced in early 2008 included investments totaling US$9 billion to expand production to 6.5 million tons of steel. How is that program progressing? Have there been changes in view of the international scenario?

The financial crisis severely affected the steel market; international demand plunged. The Usiminas Management Board therefore deemed it necessary to postpone construction of a new plant that was projected for Santana do Paraíso (Minas Gerais state) that will have a production capacity of 5 million tons of steel a year. The project has only been suspended and should be reassessed this year.

What are the recent developments at Usiminas, particularly concerning the introduction of new technology?

Although the expansion of production capacity has been postponed, we continue to make strategic investments aimed at adding value. In 2011 Usiminas will open a new hot strip line at the old Cosipa steelworks in Cubatão (São Paulo state), a US$1.4 billion project, and a new galvanization line at the Ipatinga plant costing nearly US$556 million. We have also been investing in technology to meet the needs of the naval industry and pre-salt oil field exploration; the fast plate cooling unit at the Ipatinga mill (Minas Gerais state) should be operational before the end of the year. The technology comes from Nippon Steel, and ours will be the only steelworks outside Japan to use this process, which will allow us to produce more resistant steels.

We have also been investing in technology to meet the needs of the naval industry and pre-salt oil field exploration.

What is happening in the system of partnerships with industry, such as the automotive industry, through Usiminas Mecânica S.A. (Usimec) and other holding companies?

Through Automotiva Usiminas, Usiminas supplies the automotive industry with both rolled steel and more elaborated products such as stamped pieces and complete cabins. This is a key segment of our activity and we have developed a very close relationship. In addition to Automotiva Usiminas, we have other companies geared to specific segments, such as Usiminas Mecânica, which is dedicated to the oil and gas industry and is building a plant for offshore platform modules exclusively to meet the demand arising from exploitation of the pre-salt oil field.

What changes have been introduced to the steel distribution system?

At the end of last year we created Soluções Usiminas branch, which will be active in steel distribution and processing. It will be able to meet smaller demands faster than the steel mill. It will also supply blanks to the automotive industry, expanding the group's partnership with that sector.

Industry, the segment most severely affected by the international crisis, has been recovering gradually, reaching levels close to those before the crisis, according to the National

Foto: Credito da foto

Confederation of Industry (CNI). Has domestic demand for steel products, stimulated by the tax exemptions on automobiles, construction, and durable goods, offset the decrease in exports?

The incentives to consumption were vital to maintaining domestic market demand and cushioning the impact of the international crisis on the country's economy. But even though the behavior of the domestic economy has been better than that of the international economy, demand for steel fell on both fronts. According to the Brazilian Steel Institute (IAB), domestic steel sales fell by 25% in 2009 compared with 2008. Thus, domestic demand has not been able to offset the decline in exports.

Today, the major developed countries' barriers are against steel from Asia, which has distorted competitive conditions.

What initiatives has Usiminas taken to promote greater use of steel in the building industry?

Using steel in building is a cultural issue, because from a technical point of view steel offers advantages such as higher speed in project completion. Yet even in engineering colleges, technical training on the use of steel in residential construction is overlooked, resulting in graduates without this know-how and culture. There is a notion that steel renders housing projects unviable, and that it should be used exclusively in industrial structures. In that sense, Usiminas has been developing steel structures in projects dedicated to construction of social housing that attest to the feasibility of the metallic structures in several building types. Furthermore, we have solutions in steel for stadiums and infrastructure projects for the 2014 soccer World Cup.

Is Usiminas participating in the My House, My Life program launched by the federal government?

The My House, My Life program is an excellent opportunity to open an important market and to show the potential of steel in construction. We have agreed to build the first apartment buildings in steel within the program in Volta Redonda, Rio de Janeiro state. Those units will be directed to low-income households. The total of 688 apartments is divided into 43 buildings, each with 16 units. We are already negotiating similar projects within the program with other municipalities. We can deliver a finished building: in addition to structural beams, profiles, and columns, the building is enclosed with thermally-coated steel walls.

The difficulties caused by the overvalued exchange rate for Brazilian exports, particularly industrialized products, are well known. Do you believe a recovery of exports of higher-value-added products is possible?

The overvalued currency is a reality that exporting businesses will have to learn to live with. When the national currency is expensive, the difficulties of competing in the global market increase exponentially, particularly for commodities. One way of averting direct price competition with countries of devalued currencies is to add value. Usiminas has been investing heavily in increasing the supply of higher-value-added products, concentrating on finished products produced by Usinimas Mecânica. According to our plans, between 2014 and 2015 added-value products should

account for 50% of our total sales, both domestic and foreign. Today, they account for 22%.

What were the volume and value of Usiminas exports in 2009, and what are the projections for the current year?

The figures for 2009 have not yet been finalized, but through the third quarter of last year exports reached US$740 million. That accounts for about 17% of our net revenues for the period. The expectation is that in 2010 the international market will improve. We already saw a strong reaction in China in late 2009, which indicates that demand from China and other emerging countries will pick up rapidly in 2010. Developed countries will move more slowly but will also recover.

IAB has revealed that the overvalued currency also makes importing some products more attractive, including low-quality steel, such as steel bars from Turkey. What do you have to say about that?

Importing products is a normal and healthy practice in an economy, but today the inflow of foreign steel is a major problem for domestic steelworks. Imports motivated by macroeconomic distortions constitute a risk. Price conditions in other countries, such as China, are better because production costs are lower. There are government subsidies, labor-related costs are insignificant, and the requirements of financial return are infinitely lower.

Importing products is a normal and healthy practice in an economy, but today the inflow of foreign steel is a major problem for domestic steelworks. Imports motivated by macroeconomic distortions constitute a risk.

To give you an idea, business margins in China are about 1.4%. Margins like that would make any company in Brazil file for bankruptcy within a month. This entire scenario makes it even more difficult to be competitive when the exchange rate is somewhat distorted.

In a recent interview, Pascal Lamy, Director-General of the World Trade Organization, predicted that protectionism in developed countries would remain highly sensitive over the next few years because of their high unemployment rates. How has that affected Usiminas' sales abroad, and what are your views on the issue?

So far, this shift in the world economy has had little effect on Usiminas. Today, the major developed countries' barriers are against steel from Asia, which has distorted competitive conditions. However, the trend is for barriers of all types to increase, and for world trade to suffer a period of rising protectionism. Although it is a natural reaction in times of economic turbulence, it is still worrying. This type of protectionism affects the developing countries directly because they are the first to recover from the crisis and may show a sharp economic turnaround before the developed countries lift their trade barriers. This may end up slowing the growth rate of the developing countries, and consequently affecting the growth of the entire global economy.

Foto: credito das fotos

Infrastructure deficiencies have been major stumbling blocks to Brazilian exports. How can Usiminas overcome them?

One of Usiminas's strategic objectives is to vertically integrate our production, particularly by investments in the areas of logistics and infrastructure. We have shares in railways and in a port terminal in the state of Espírito Santo. The plan in the next few years is to build our own port close to Sepetiba Bay in Rio de Janeiro state.

An appreciated currency gives Brazilian multinational companies opportunities to expand their presence abroad, as some large Brazilian companies have done. Has Usiminas been expanding its presence abroad?

It is a sensitive moment to expand internationally. Usiminas has concentrated on domestic investment to consolidate its position and add value to its products. Internationalization has not been excluded, but we seek a more favorable moment, especially in terms of world steel demand, before we begin to move more forcefully in that direction.

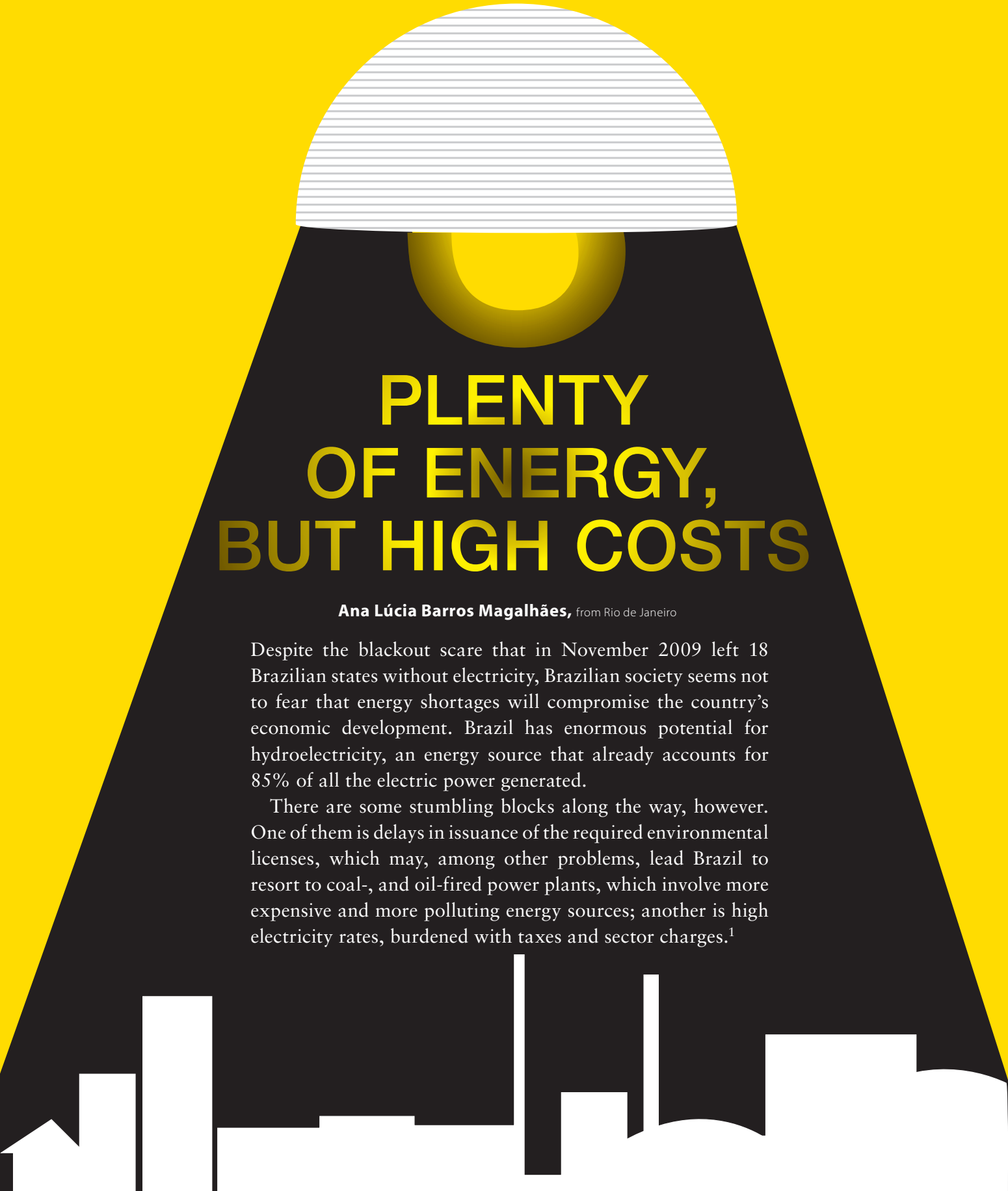
Internationalization has not been excluded, but we seek a more favorable moment, especially in terms of world steel demand, before we begin to move more forcefully in that direction.

What share of investment does Usiminas earmark for research and development?

This is a central area for Usiminas, because innovation is crucial to develop new markets that demand products with higher added value. In 2008 the Directorate for Research and Innovation was created to focus all our initiatives in that area. We have been able to keep the budget for it unchanged even at the peak of the crisis: US$11 million in 2008, plus R$11 million in 2009. The forecast for 2010 is US$14 million in investment, a 30% increase.

Usiminas is also a mining company. Is the iron ore extracted directed only to your plants? Or do you sell part of it to third parties or export it because of favorable prices in the global market?

The ore currently extracted from our mines in Itatiaiuçu (Minas Gerais state) is, for the most part used in two of the group's plants, Ipatinga and Cubatão. Eventually, some surplus ore may be sold in the spot market; however, that is not our objective at the moment. Even when ore prices in the global market are high, the best plan for the company at the moment is to cover itself against increases in raw material prices by being self-sufficient.



PLENTY OF ENERGY, BUT HIGH COSTS

Ana Lúcia Barros Magalhães, from Rio de Janeiro

Despite the blackout scare that in November 2009 left 18 Brazilian states without electricity, Brazilian society seems not to fear that energy shortages will compromise the country's economic development. Brazil has enormous potential for hydroelectricity, an energy source that already accounts for 85% of all the electric power generated.

There are some stumbling blocks along the way, however. One of them is delays in issuance of the required environmental licenses, which may, among other problems, lead Brazil to resort to coal-, and oil-fired power plants, which involve more expensive and more polluting energy sources; another is high electricity rates, burdened with taxes and sector charges.[1]

According to the Energy Research Corporation (EPE), the share of hydroelectric power in our energy mix ought to continue to be significant, because two-thirds of its total potential, 260,000 MW, is yet to be utilized. The issue, however, is that more than 70% of the potential to be exploited is located in Brazil's Northern region, far from the large consuming centers in the Southeastern and Center-Western regions.

In spite of the enormous distance, EPE Chairman Mauricio Tolmasquim recalls that the auction for the sale of energy from the Santo Antônio and Jirau power plants (the Madeira River Complex) revealed that even considering the transport costs, the price of energy reaching the consuming region is very competitive. "The price of energy from Jirau is US$49 per Mwh, while energy from Santo Antônio costs US$43 per Mwh. Thermal energy costs almost twice as much," he underlined. "And hydroelectric power derives from a renewable energy source that produces practically no greenhouse gases."

But there is still an environmental issue. João Carlos Mello, chairman of Andrade & Canellas, an independent consulting firm, points out that power plants in the Amazon cannot have large reservoirs, because an excessive increase of flooded areas would have a severe impact on the environment. Thus, the plants have to adopt the run-of-river system. "Consequently, if there is no rain, there is no power generation, as those plants are not able to store water," Mello explains. In his opinion, this will force Brazil to complement its energy mix with either coal- and fuel-fired power plants, both sources that are more pollutant and expensive, or with gas and nuclear energy.

The difficulty associated with obtaining environmental licenses for those plants is also a serious concern for the Federation of Industries of the State of São Paulo (FIESP). "During the first five years of the Lula administration, no environmental licenses were granted for hydroelectric plants," Carlos Cavalcanti, FIESP's energy director, says ruefully. "The Ministry of the Environment granted licenses to projects involving oil and coal but none to hydroelectric projects, yet this is the cleanest and cheapest energy source." He recalls that in a wind energy auction carried out late last year, the average energy price was US$80 per Kwh. Energy from an oil-fired thermoelectric plant costs US$100 per Kwh, whereas the average price of hydroelectric energy is US$39–US$44 per Kwh. Cavalcanti adds that in the energy auctions no hydroelectric projects have come up: "The government has to buy energy from thermoelectric plants because of an absolutely wrong decision made by the Ministry of the Environment."

On the other hand, José Antonio Muniz Lopes, Chairman of Eletrobrás does not believe that the delays in some hydroelectric projects caused by the lengthy environmental licensing process will create bottlenecks that may compromise growth of the Brazilian economy; nor does he believe that this issue will make our energy mix more pollutant. He says, "From our side, we are working hard to ensure that the requirements imposed by the

The greatest challenge in the electricity sector is delays in the granting of environmental licenses

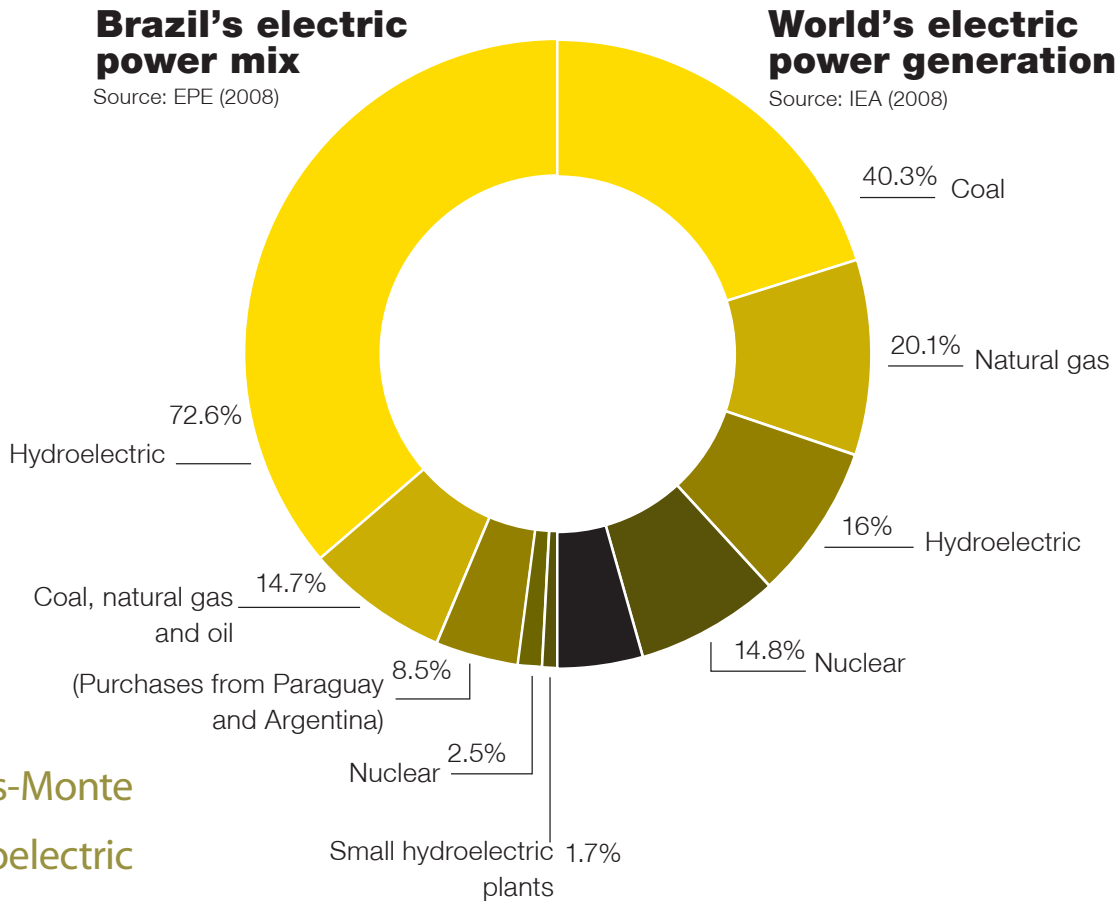


MAURICIO TOLMASQUIM
(EPE Chairman)
Photo: Public Relations/EPE

There is no reason to fear power supply shortages.



CARLOS CAVALCANTI
(FIESP's energy director)
Photo: Public Relations/FIESP



The Tapajós-Monte Belo hydroelectric complex includes two of the most important power plants for the country's near future.



JOSÉ ANTONIO MUNIZ LOPES (Eletrobrás CEO)
Photo: Jorge Coelho/Eletrobrás

environmental agencies are met, and I believe for this same reason that energy security is guaranteed in the years to come."

In addition to Santo Antônio, Jirau (under construction), and Belo Monte, for which an environmental license was granted in early February, though with more than 40 restrictions, Muniz Lopes notes that Eletrobrás is thinking about building five new plants on the Tapajós River in the state of Pará. The installed capacity of the Tapajós complex would be about 11,000 MW, generating 50 million MWh per year — enough energy to serve 28.5 million households.

"The Tapajós-Belo Monte hydroelectric complex includes two of the most important plants for the country's near future," Muniz Lopes emphasizes. He believes Brazil is currently working on completing projects that will ensure all the energy Brazil needs to grow in the years to come. "Those new plants will strengthen the country's energy system and provide energy security," he notes. "This year alone we are authorized to invest US$5 billion in energy generation, transmission, and distribution."

Environmental concerns

Carlos Cavalcanti says he is not concerned about energy supply either: "There is no reason to fear supply shortages. What we fear is that the international debate on climate change may give rise to unilateral

domestic legislation according to which the quality of the energy in a product will be a determining factor for its access to the world market." Cavalcanti believes that new legislation may hinder the exports of goods unless their production process has taken into account low-carbon-emission technology. "This could become an important trade barrier," he warns.

In principle this would not be at all bad for Brazil, where 85% of all electricity is generated from hydroelectric plants, which emit very little carbon. In China and India, for instance, coal generates 80% of total electricity.

EPE's Tolmasquim thinks the greatest challenge in the electricity sector is delays in the granting of environmental licenses: "The problem is that, because of the delays in obtaining environmental licenses for a hydroelectric plant, we may come to the auction and end up contracting an amount of hydroelectric energy that is less than adequate." The EPE chairman reports that he has been negotiating with government environmental agencies to shorten the licensing period. But he says that Public Attorney's Office lawsuits have delayed the process.

Tolmasquim says that carrying out an auction before the end of the first quarter of 2010 for the Belo Monte hydroelectric plant — to be the world's third largest, generating 11,000 MW — will be a significant step forward. This project has been on the drawing board for the last 20 years.

As to the energy mix, EPE research demonstrates that it is possible to outline a strategy whereby, within the next 20 years, 45% of all energy

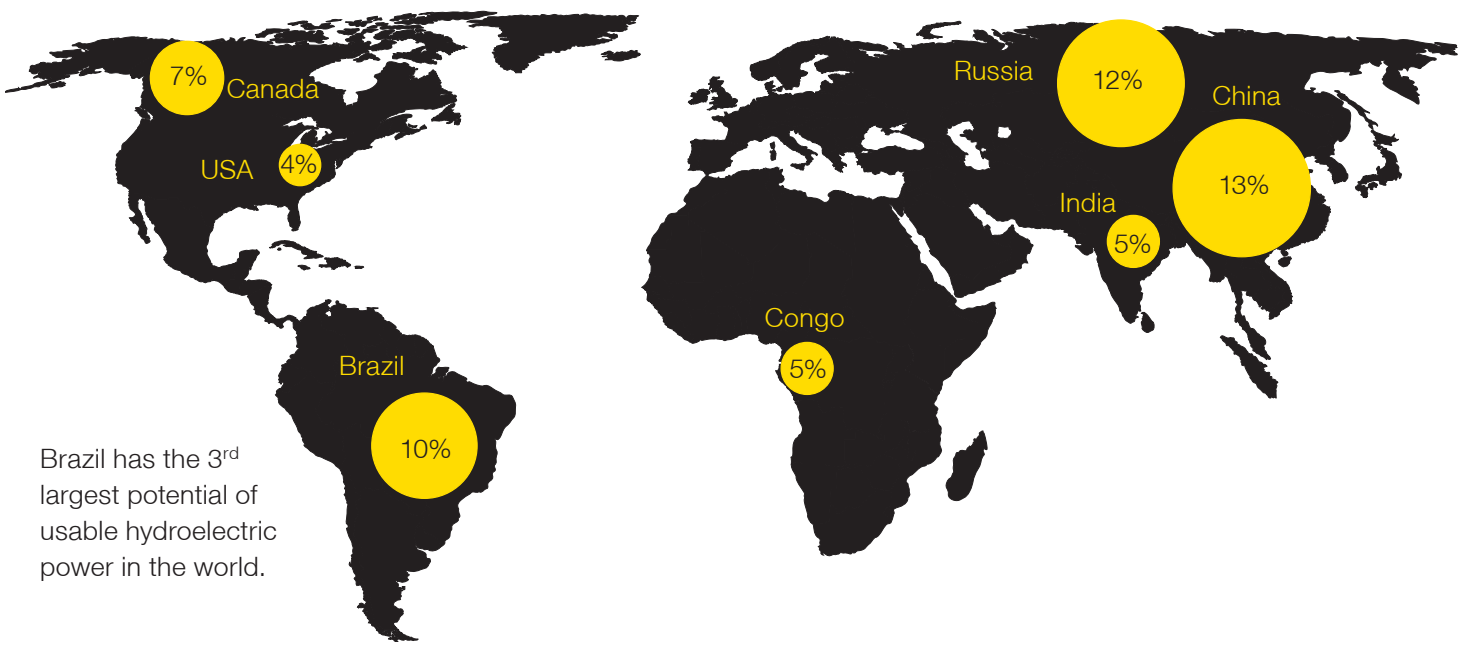
Energy in Brazil is among the most expensive in the world, mainly due to taxes and sector charges.

RICARDO LIMA
(CEO of Abrace)

Hydroelectric power

Source: EPE (2007)

Countries with largest hydroelectric power potential in the wold



Brazil has the 3rd largest potential of usable hydroelectric power in the world.

The industrial energy rate in dollars went up 22% a year between 2002 and 2007.



EDUARDO CARLOS SPALDING (Abrace)
Photo: Public Relations/CNI

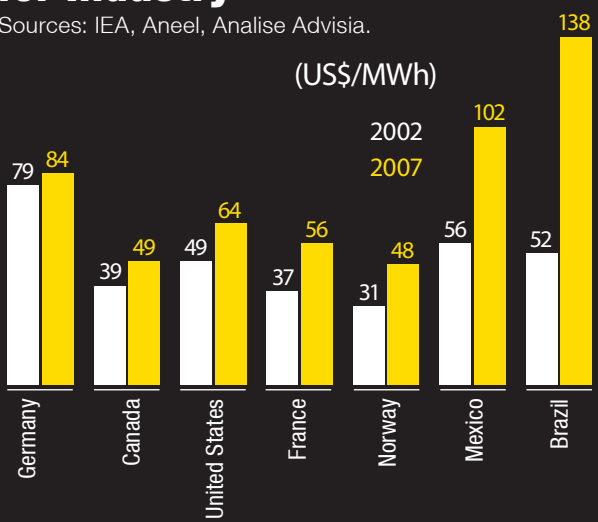
consumed in Brazil will be produced from renewable sources, because economic growth with reduced environmental impact is the major challenge around the world. Tolmasquim argues that "Countries with better access to clean, renewable, and low-cost energy resources, such as Brazil, may have significant competitive advantages."

Taxes and sector charge burden

If, on the one hand, there is no fear of a blackout, on the other, Brazilian industry, the major power consumer, believes there is a risk of rationing

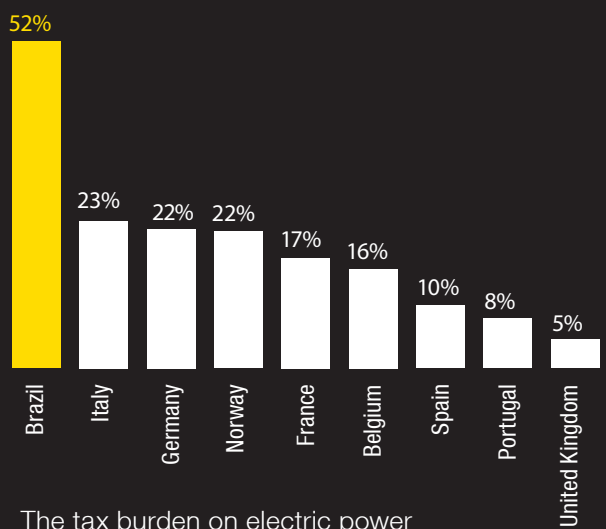
Electric rates for Industry

Sources: IEA, Aneel, Analise Advisia.

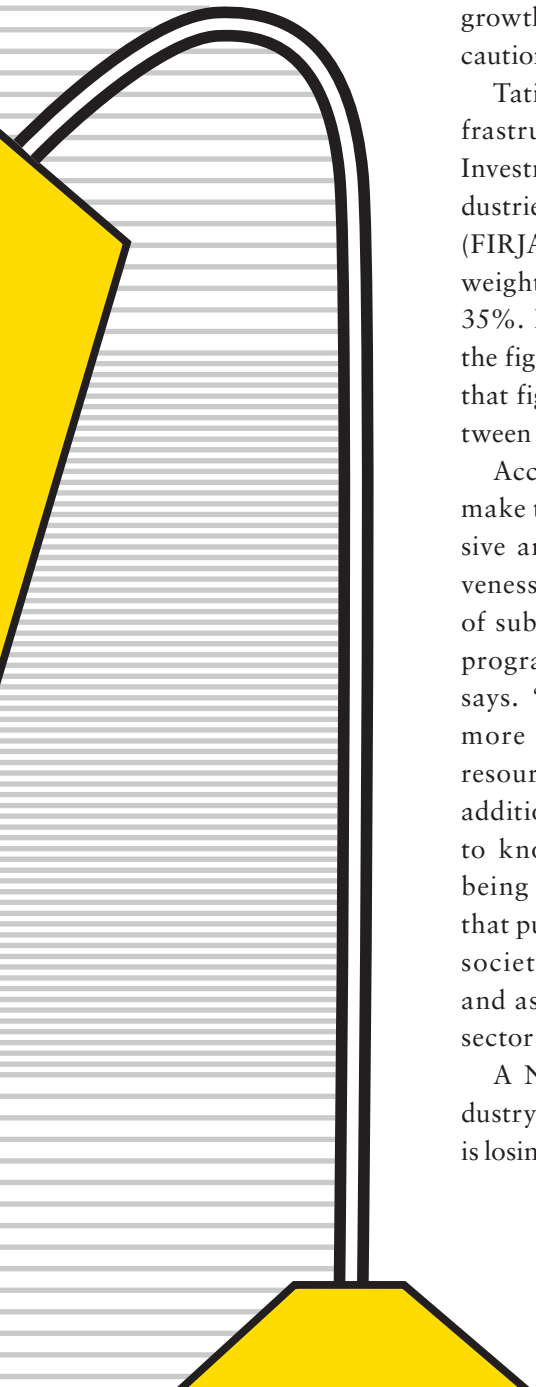


Tax burden on electric rates

Sources: Brazilian Securities Exchange Commission (CVM), Eurostat, IEA, Analise Advisia (2007).



The tax burden on electric power increased 11.5 percent points between 2003 and 2007, resulting in a 107% increase in the electricity rate.



caused by high energy prices. Ricardo Lima, CEO of the Brazilian Association of Major Industrial Power Consumers and Free Consumers (ABRACE), claims that energy in Brazil is among the most expensive in the world, mainly due to taxes and sector charges. "The price issue may be a catch. Taxes and sector costs account for 52% of the average Brazilian consumer's electricity bill. We risk compromising the country's growth because of energy costs," he cautions.

Tatiana Lauria, an expert in infrastructure at the Office for New Investment at the Federation of Industries in the State of Rio de Janeiro (FIRJAN), agrees with Lima: "The weight of taxes on energy rates is 35%. If you add the sector charges, the figure increases to 42%, whereas that figure is 12% in France and between 6% and 8% in the UK."

According to Lauria, those costs make the final product more expensive and cause a loss of competitiveness. "FIRJAN advocates repeal of subsidies and that no new grant programs should be created," she says. "Furthermore, we encourage more transparency in where the resources collected in the form of additional charges go. Society needs to know how those resources are being utilized." She also suggests that public hearings be held to allow society to put forward solutions and assess the costs and benefits of sector charges.

A National Confederation of Industry (CNI) study found that Brazil is losing competitiveness in international markets because of its high energy prices. According to Eduardo Carlos Spalding, who represents ABRACE on the CNI infrastructure committee, industries like steel, aluminum, petrochemicals, paper and cellulose, and soda chlorine are already feeling the consequences.

Spalding explains that unfortunately, to remain competitive, large Brazilian multinational companies such as Vale, Votorantim, and Gerdau are forced to direct new investment to other countries. The prices paid in Brazil are much higher than in countries we compete with. That is why Votoratim is producing aluminum in Trinidad & Tobago, Vale and Alcoa are considering building in Colombia, and Rio Tinto-Alcan has already discussed establishing an aluminum reduction plant in Paraguay.

Spalding says that the industrial energy rate in dollars went up 22% a year between 2002 and 2007. He believes that the costs built into the energy rates to support subsidies, such as low rates for low-income families, contribute to this price hike. He adds, "When we compare the average price of hydroelectric power, US$67 per MWh, with that of thermal power, US$83, this is clearly a fantastic opportunity. The problem is that we are pushing up the rates with additional charges and taxes."

[1] The main sector charge is the ESS (service charges of the system), which represents the cost incurred to keep the National Interconnected System reliable and stable.

Challenges for Eletrobrás

Our biggest challenge is to generate power where we have the greatest potential, which is in the Northern region.

The largest company in the electricity sector in Latin America, Eletrobrás is responsible for about 40% of installed capacity for power generation in Brazil. It has 30 hydroelectric plants, 15 thermal plants, and 2 nuclear plants. Moreover, it accounts for about 60% of the transmission lines in Brazil. Its CEO, José Antonio Muniz Lopes, knows that in a competitive market like the current one, Eletrobrás has to keep moving forward. He talks of its plans for maintaining its leadership position:

"We have to move forward. That is why we are building the Santo Antônio and Jirau hydropower operations on the Madeira River in the state of Rondônia, and working on construction of the Belo Monte plant in the state of Pará." At the beginning of February, Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) granted the environmental license for construction of the Belo Monte plant, with a number of restrictions. According to Muniz Lopez, these are currently the most important electric power projects in Brazil.

Muniz Lopes notes that Belo Monte is a particularly important project for him. He has been working on it for over 20 years. "Finally, it will leave the drawing board," he celebrates, adding that "as in the bidding for Santo Antônio and Jirau, Eletrobrás will participate in Belo Monte by means of a consortium."

Eletrobrás has some challenges ahead. One is that the most potential for hydroelectric power is in the north, far from the major consuming centers in the Southeastern and Center-Western regions. "Our biggest challenge is to generate power where we have the greatest potential, which is the North. Brazil is very big, but we have one of the most complete and complex transmission systems in the world. Other countries come to learn our technology. The National Interconnected System (SIN), which covers 98% of the Brazilian consumer market, ensures that more people have electricity, no matter where and from which source it is generated," he says.

The importance of transmission

Last year transmission lines to integrate distant regions of the country to SIN came into operation at Jaurú and Vilhena, which connected Rondonia and Acre estates to the SIN and will improve energy supply and make it more secure.

"The construction of the Tucuri-Macapá-Manaus transmission line will further reduce the area that is isolated in terms of energy from the rest of the country," Muniz Lopes stresses. He says the line from Porto Velho to Araraquara in São Paulo state, which is more than 2,300 kilometers long, is another big win for the Brazilian electrical system.

With these transmission lines, Muniz Lopes says, he is thinking about the future. "In addition to

meeting the needs of these states, we are shortening distances. When the Jirau, Santo Antônio, Belo Monte, and Tapajós plants are ready, the transmission lines will be interconnected even more to carry energy from one point to another in Brazil at the lowest possible cost."

He does not worry about delays in obtaining environmental licenses for hydroelectric projects, which will make the energy mix more pollutant. For the Eletrobrás CEO, important projects are already in progress right now, such as the Jirau and Santo Antônio hydroelectric power plants, and others will begin soon, like the Angra 3 nuclear power plant. These large projects make him more confident that the country is headed for an increasingly clean energy mix.

"This is our flag, it is what we stand for," he says. "So we have to work with all possible energy sources. Yet in the short term we should use more of our potential and invest mainly in hydroelectric plants and also in some nuclear plants, without losing sight of sources such as wind and biomass, as well as working for improving energy efficiency."

Growth and sustainability

Muniz Lopes knows that the biggest challenge for the sector is to expand power generation capacity while preserving the environment: "Sustainability is the watchword. Thus, the plan for sustainable development of hydropower projects in the Amazon region, for example, should focus on increasing income and employment of the local population and improving public health, among other priorities for the region."

To meet this challenge, for example, the Tapajós Complex, which will have five plants in Pará state, has developed a new concept for electricity generation — the platform power plant. This type of power plant adopts the technology used in oil platforms to minimize impact on the environment.

"It's a revolution because, despite working in the jungle, there will be a minimum of intervention," Muniz Lopes says. "During construction, the workers will be in nearby towns and shuttle to the work area, as is done for oil platform operations. Once they are in operation, the professionals in charge of hydroelectric plants will work the same way."

For Muniz Lopes, Brazil should take advantage of all resources, including nuclear energy. In addition to the Angra 3 nuclear power plant, Eletrobrás is already working to identify a location for the first nuclear operation in the Northeast, which should cover one or two power plants. "Then we are thinking about two more for the Southeast."

Another challenge for Eletrobrás will be the integration of electrical systems in Latin America, Muniz Lopes thinks. "If Latin America were a single country, we would have connected Venezuela with Brazil, we would have linked Peru with Brazil, and we would have closer integration between Argentina and Brazil. Rather than look to another source, our challenge is to think of our capabilities and how to generate and transmit renewable energy." (A.L.B.M.)

Rather than look to another source, our challenge is to think of our capabilities and how to generate and transmit renewable energy.

BNDES finances expansion of the electricity sector

From 2003 through 2009 the BNDES (National Bank for Economic and Social Development) funded over US$30billion of investments out of US$51billion in 293 electricity projects. Of this, US$22 billion was for generation, US$4 billion for transmission, and US$4.4 billion for distribution. According to the manager of the infrastructure sector of the bank, Nelson Siffert, some of these projects have been completed and some will be completed by 2013.

"The electricity sector is capital intensive but operating costs are low. BNDES has improved its financing conditions in the last eight years, extending loan maturity from 12 to 16 years for hydroelectric plants up to 2,000 MW, and to 25 years for power plants with generating capacity of more than 2,000 MW. It has also reduced the interest spread from 2.5% to 0.9%," Siffert says.

BNDES technicians estimate that the improvement in financing terms may bring tariffs down by about 25%. "This is the contribution of the FAT (Workers' Fund) to Brazilian society," Siffert says, adding that "BNDES financing is appropriate to the nature of the infrastructure being built."

The expansion of Brazil's infrastructure has had a new model of funding in the last 10 years. It is based on the concept of project financing, where the main guarantee for a loan during the operational phase is receivables arising from power plant production and the collateral is shares of the power company. In this model, the investor who wins a bid for construction of the power plant establishes a special purpose company (SPE), becoming a dealer with the obligation to sell power on the basis of the contracted value at auction. Then the investor applies for a BNDES loan to build the power plant.

"Our operational policy allows us to finance up to 75%, but usually we have funded 60% to 65% because we have to project the revenue-to-debt service ratio, which has to be greater than 1.2. Cash flow has to be sufficient to pay debt service (principal and interest). The payments are greatest in the early years," Siffert explains, adding that project financing allows the public sector to partner with the private sector, since the debt of an SPE is not considered public debt.

Also new are social and environmental concerns. The power plant has to spend 10% of the investment on social and environmental projects. BNDES only releases the financing when the environmental license is granted. "BNDES does not just build the power plant in a region, it also develops the town," Siffert says.

In the case of the Santo Antônio power plant, which is part of the Madeira River Complex, over 70% of the 20,000 workers are from Rondônia state. BNDES is also concerned with training the labor force and with the sanitation and health of local people. "Furthermore," Siffert points out, "New capital goods industries are being installed in Porto Velho city, Alstom, and Votorantim, generating regional development." (A.L B.M.)

Investments in the electricity sector

(Billion of US dollars)	2003	2004	2005	2006	2007	2008	2009	Total
Generation	4.2	0.6	1.4	0.7	7.4	11.3	11.1	36.7
Hydreletric	3.5	-	0.2	0.4	5.7	9.5	5.6	24.9
Thermal power	0.6	0.5	-	-	-	-	3.2	4.3
Small hydreletric	0.1	-	0.7	0.2	1.4	1.0	0.9	4.3
Biomass	0.1	-	0.2	0.0	0.3	0.6	0.3	1.5
Wind	-	-	0.2	0.1	-	0.2	1.1	1.6
Transmission	0.5	0.4	0.4	0.9	2.1	0.9	1.5	6.6
Distribution	0.1	0.2	0.4	0.8	1.3	4.0	0.7	7.6
TOTAL	4.7	1.2	2.2	2.4	10.8	16.2	13.3	50.9

BNDES financing

(Billion of US dollars)	2003	2004	2005	2006	2007	2008	2009	Total
Generation	1.7	0.3	0.9	0.5	5.2	6.3	6.8	21.7
Hydreletric	1.5	0.0	0.1	0.2	4.0	4.9	3.8	14.6
Thermal power	0.1	0.2	-	-	-	-	1.6	2.0
Small hydreletric	-	-	0.5	0.1	1.0	0.7	0.6	3.0
Biomass	-	-	0.2	-	0.2	0.5	0.2	1.2
Wind	-	-	0.2	0.1	-	0.1	0.6	1.0
Transmission	0.3	0.3	0.2	0.6	1.3	0.5	0.6	3.7
Distribution	0.2	0.1	0.3	0.4	0.7	2.4	0.4	4.4
TOTAL	2.1	0.7	1.4	1.5	7.1	9.1	7.8	29.7

Source: BNDES.

Financial innovation and the crisis



Barry Eichengreen

Joseph Schumpeter famously defined capitalism as "innovation financed by credit." It is interesting, therefore, to ask what he would have thought of the role of financial innovation in the current crisis.

Schumpeter was, of course, a firm believer in the merits of financial innovation and development. He insisted that many of the most important technological and commercial innovations of the 19th and 20th centuries would have been impossible without the joint-stock company and limited liability. But what would he have thought of collateralized debt obligations and credit default swaps? There is a spirited debate about whether recent financial innovations have had any positive social value whatever. On the one hand, there is the presumption that financial innovation has encouraged efficient risk-sharing and relaxed financing constraints. On the other, there is the view that its main purpose has been to facilitate regulatory arbitrage. It has been to shift risk to poorly informed investors and to investors who are confident of being bailed out if things go wrong.

Here, I would distinguish between financial innovation itself and how we have permitted it to be used. Many financial innovations, including complex financial instruments, are in principle good things: They can be used to shift risk to those best able to handle it. They can provide insurance for those with limited risk-bearing capacity. They can reduce financing costs for those engaged in production, investment, and innovation. But given the number of unsophisticated users in the marketplace and the asymmetry of the information available to them, nothing ensures that a specific innovation will have these desirable effects.

An obvious analogy is pharmaceuticals. Modern biological science holds out the promise of progress on difficult diseases. But, given the incentive of producers to rush to market products to consumers who have less than complete information, it can be abused. Consequently, pharmaceuticals are regulated; in many cases the individual must first get a prescription from

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a qualified professional. Because of the complexity of applications and how quickly the technology changes, the qualified professional works under restrictions laid down by a board of experts.

Given the complexity of modern financial instruments and the asymmetry of information about them, it seems obvious that we should do the same for financial products. The United States for one is moving in that direction: the House Banking Committee has voted out a bill that includes a provision to create a Consumer Financial Products Safety Commission.

This approach assumes, of course, that we do a good job of regulating, which has not been the case. How would Schumpeter have understood this failure? He would have emphasized the role of excessive confidence in the ability of social scientists to use mathematical tools to capture the uncertainties of economic life. Schumpeter spent his early life pursuing "an exact economics" in which problems could be specified in mathematical terms and analyzed using tools like the calculus. This ultimately quixotic effort on Schumpeter's part did not prevent others from taking the same road. It did not prevent financial engineers from embracing mathematical tools and applying them in the form of concepts like "value at risk." This gave them false confidence that they were capable of reducing economic and financial uncertainties to a series of mathematical formulae and of managing their consequences.

So long as things went well, those utilizing the technique were well compensated, so its applications were widely applied. More MBA students were trained in its use. Meanwhile, the fact that the structure of the market can change and that uncertainty, unlike risk, cannot be captured by a simple set of mathematical formulas was out of sight, out of mind. The older Schumpeter abandoned his quest for an exact economics in favor of a more sociological approach. The problem for financial stability, one supposes, is that there is always a new generation naively confident in the power of technique and less appreciative of the importance of the social context.

Schumpeter, who recognized this excessive confidence in the power of mathematization, would also have pointed up the role of ideology in shaping views of regulation. The idea that markets get it right and governments can only get it wrong became deeply ingrained in our intellectual discourse. The idea that banks can be relied on to manage their risks using internal models reflected this ideology. So did policies to starve the regulators of the financial and human resources needed to do their jobs.

Knowledge of financial history will serve as a caution that when an asset class is booming, that boom will not last forever.

Schumpeter in his later years was sensitive to the role of ideology in scholarly and policy analysis. This was the theme of his 1948 presidential address to the American Economic Association. In it he emphasized that where you stand depends on where you sit — that an individual's outlook is fundamentally colored by his or her personal and cultural background. This is more of a

Social processes, including economic and financial processes, are complex and nonlinear in ways that can render counterproductive efforts to reduce them to simple formulae.

problem in the social sciences than in mathematics and physics, Schumpeter concluded, where "all falling stones look alike."

Some natural scientists would dispute this. But they would not dispute Schumpeter's final point, that when ideological biases gain currency in scholarly and policy debate they become reinforcing. When in boom times other banks are making money originating collateralized debt obligations and using credit default swaps to insure them, the ideological bases for these practices provide further justification for the activity. When other banks are investing more of their funds in high-yielding investments and holding less capital because their models tell them that a small capital cushion will suffice, the argument that modern bankers have mastered the science of risk management and should go along with these practices becomes irresistible. Without that kind of self-justifying and self-reinforcing ideology, it is hard to imagine that the privatization of risk management and the excessive risk-taking that caused our current crisis could have proceeded as far as they did.

What was Schumpeter's solution? In *Science and Ideology* he saw as the way out an economics better informed by historical events and processes. It is not that economic historians are less subject to ideological biases — they have social origins, too — but that they are more aware that such biases exist because they are in the business of analyzing social origins and their consequences.

While the crisis has damaged the reputation of mainstream macroeconomics, it has burnished that of economic history. The case made in the wake of recent events is that policy makers and participants in financial markets should study more history so that they can look beyond recent events. Knowledge of financial history will serve as a caution that when an asset class is booming that boom will not last forever. History will remind them that what goes up can come down.

But the role of history is larger than just this. It also reminds us that modeling choices are not independent of the social milieu of the modelers. It reminds us that social processes, including economic and financial processes, are complex and nonlinear in ways that can render counterproductive efforts to reduce them to simple formulae that float in their own mathematical ether. Finally, it reminds us that it can be equally counterproductive and dangerous to make policy on that basis.

Dating business cycles in Brazil

At a meeting on February 3, 2010, the Business Cycle Dating Committee (CODACE)[1] established a month-by-month chronology of recessions for the Brazilian economy between 1980 and 2009.[2]

The committee defines a recession as a significant decline in economic activity occurring simultaneously in different sectors for an extended period. Besides analyzing events that mark major periods of recent economic history, the committee based the monthly dating of business cycles on analysis of the monthly economic series that best depicted the position of industrial production, retail sales, and employment and labor income.

The monthly chronology of business cycle peaks and troughs is coincident with or very close to the quarterly chronology previously defined by CODACE. The

Brazil: Business Cycles – Dates and Durations

Reference dates		Duration in months			
		Contraction	Expansion	Cycles	
Peak 1	Trough [1]	Peak to Trough	Previous Trough to this Peak	Trough from Previous Trough	Peak from Previous Peak
October 1980 (4th Quarter)	February 1983 (1st Quarter)	28	–	–	–
February 1987 (2nd Quarter)	October 1988 (4th Quarter)	20	48	88	68
June 1989 (2nd Quarter)	December 1991 (1st Quarter 1992)	30	8	28	38
December 1994 (1st Quarter 1995)	Setember 1995 (3rd Quarter)	9	36	66	45
October 1997 (4th Quarter)	February 1999 (1st Quarter)	16	25	34	41
December 2000 (1st Quarter 2001)	September 2001 (4th Quarter)	9	10	38	31
October 2002 (4th Quarter)	June 2003 (2nd Quarter)	8	13	22	33
July 2008 (3rd Quarter)	January 2009 (1st Quarter)	6	61	69	67
Average duration		16	29	49	46

Sources: Brazilian Institute of Geography and Statistics (IBGE), and Business Cycle Dating Committee (CODACE/FGV).

[1] The dating cycles in quarters are shown in parentheses.

Since 1994, a period characterized by lower inflation, . . . there has been a marked reduction in the average duration of recessions to 9.6 months. . . between the peak in July 2008 and the trough in January 2009 the most recent recession was only 6 months long.

possible mismatch is because the two chronologies use series that have different frequencies. Peaks and troughs found in series with monthly frequency may occur in different trimesters from those detected in the quarterly series.

The monthly timing defined by CODACE is presented in the table on p. 25. The peaks represent the beginning of a recession and the troughs indicate the beginning of a recovery (expansion) of the economy. In the three decades CODACE analyzed, the Brazilian economy went through eight business cycles with an average duration of 46.1 months between trough and trough and 47.6 months between peak of and peak.

Since 1980 Brazilian recessions have lasted 15.8 months on average, and the periods of expansion averaged 28.7 months. The longest recession lasted 30 months, from the peak in June 1989 to the trough in December 1991. The longest expansion lasted 61 months, from the trough in June 2003 to the peak in July 2008.

Since 1994, a period characterized by lower inflation, the average duration of expansion has been 29 months. There has been a marked reduction in the average duration of recessions, to 9.6 months. Only one of the five recessions in this period reached 16 months; between the peak in July 2008 and the trough in January 2009 the most recent recession was only 6 months long — the shortest in the last 30 years. ■

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[1] The members of CODACE are Affonso Celso Pastore (Coordinator, former Governor of the Central Bank of Brazil); Dionísio Dias Carneiro (Institute for Economic Policy Studies; Casa das Garças); João Victor Issler (Graduate School of Economics of FGV, EPGE/FGV); Marcelle Chauvet (Secretary; University of California); Marco Bonomo (Graduate School of Economics of FGV, EPGE/FGV); Paulo Picchetti (São Paulo School of Economics of FGV, EESP/FGV); and Regis Bonelli (Brazilian Institute of Economics, Ibre/FGV).

[2] See *The Brazilian Economy* (June 2009) for a discussion of the quarterly chronology of business cycles and methodology.

BRICs enter a boom phase

The business cycle clock shows that between October 2009 and January 2010, Brazil consolidated its growth. The speed with which the country came out of the global crisis explains the favorable assessment and expectations for the first half of 2010. The Brazilian recovery was consolidated in the last quarter of 2009, when there was an acceleration of investment. Almost exclusively on the strength of the domestic market, production of capital goods grew 3.6% in the fourth quarter of 2009 compared to 2.8% in the third quarter. Among the BRICs, China also advanced into a phase of strong growth (boom) in January, followed by India and Brazil. Russia still lags behind. With solid growth all the BRICs will have to pay more attention to domestic demand and inflation. Recently, China and India have raised reserve requirements for their banks to slow credit growth and curb inflation.

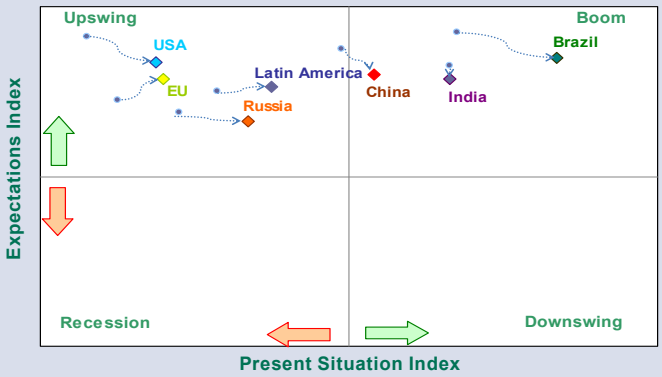
Industrial capacity utilization stabilizes

After nine months of rises, capacity utilization of Brazilian industry stabilized between December and January. The deceleration was caused by a sharp slowdown in purchases of durable goods at the end of the year, influenced by higher household debt and an industrial inventory adjustment that anticipated the phase-out of tax exemptions before July. Since September capacity utilization has been above its 10-year average of 82.3%, which usually marks the turning point when industry recovers confidence and starts investing more. The Central Bank closely monitors capacity utilization: when it reaches 86%, supply becomes less able to meet demand, causing price increases.

Inflation is speeding up

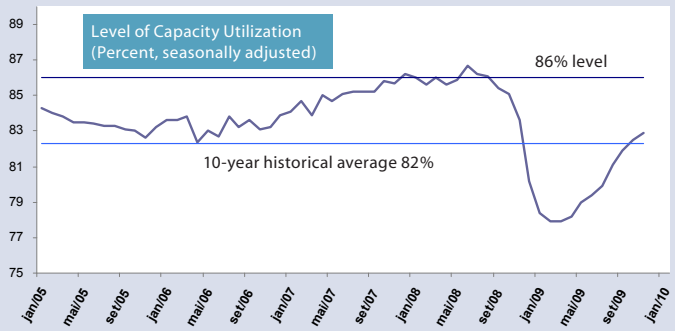
Inflation accelerated in January. The consumer price index, calculated by the FGV, recorded an increase of 0.47%, the highest rise since October 2008. Also, the IPCA price index, calculated by the Brazilian Institute of Geography and Statistics (IBGE) and used by the central bank as a reference for its inflation targeting policy, surprised the market with an 0.75% increase; 12-month IPCA inflation came very close to the inflation target of 4.5%. There is therefore no longer any doubt that the central bank will soon raise interest rates. The monetary policy committee (COUPOM) could do so as early as March, depending on what happens with inflation and other indicators of economic activity in February.

Business cycle clock: Position in January 2010 from October 2009



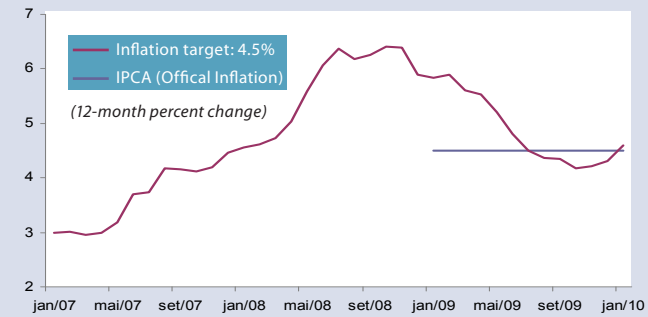
Sources: Ifo (University of Munich) and IBRE (FGV).

When capacity utilization reaches 86%, supply becomes less able to meet demand, causing price increases.



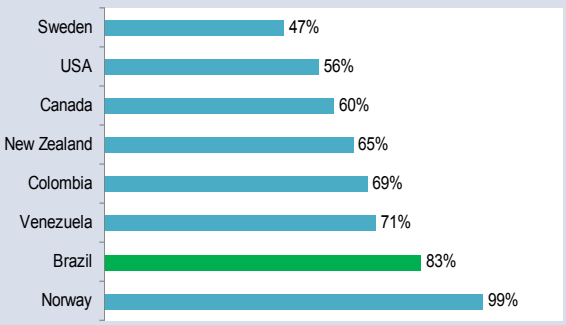
Source: IBRE (FGV).

Inflation speeded up the last three months making more likely that central bank raises interest rates sooner than latter.



Sources: IBGE and Central Bank of Brazil.

Hydroelectric power share of total supply of electricity



Source: International Energy Agency.

Brazil's clean electric power

Brazil has enormous potential for hydroelectricity, a clean energy source that accounts for 83% of all the electricity supply. Two-thirds of its hydroelectric potential, 260,000 MW, is yet to be utilized. However, more than 70% of the potential that is not yet used is located in Brazil's Northern region, far from the large consuming centers in the Southeast and Center-West. To exploit this potential, Brazil has built 89,200 Km of transmission lines to distribute electric power throughout the country, 89,200 Km.

For additional series and methodology contact: Industry and consumer surveys: (55-21) 3799-6764 or sondagem@fgv.br; Price indexes and data bank services: (55-21) 3799-6729 or fgvdados@fgv.br. IBRE website: http://portalibre.fgv.br/