

José Roberto Mendonça de Barros

São Paulo and the new economic geography

In the economist's opinion, infrastructure and the production of knowledge will help the state to drive growth in Brazil

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On the last Sunday of May, economist José Roberto Mendonça de Barros published an article in *O Estado de S. Paulo* newspaper with the title “Nova geografia econômica” [New Economic Geography], in which he argued that from 2011 onwards, the Southeast Region – and particularly São Paulo – would drive the country's growth in the forthcoming years at estimated rates of 4% to 4.5%. He explained in detail the main reasons for the state to become the epicenter of this change, which include the infrastructure available in São Paulo and the quality of the state's system of the production of knowledge. These are two fundamental factors that support investments in the technology-driven dynamic sectors that are about to boom, such as agribusiness linked to the production of second-generation ethanol or the exploitation of oil in the pre-salt layer.

The positive prognosis for São Paulo and the Southeast region followed an analysis of why the Northeast Region, “where the country's highest poverty rates are concentrated,” was the winner in the national growth process from 2003 to date. He explained that the income-related improvement of the E, D and C classes was linked to real minimum wage

gains (78%, from December 2000 to May 2010), to the dizzying growth of Social Security expenses and to the enormous expansion of income transfer programs – all of which produced an extraordinary impact on the economy of the Northeast. “It is widely known that the economic life of countless communities only moves forward when the population gets the family benefit and social security checks,” the economist wrote in the article.

On June 20, three weeks later, *O Estado de S. Paulo* published the following headline on the first page of its Sunday issue: “Industry brings the Southeast back to its leading position in terms of growth,” followed by the explanation “Less dependent on income transfer programs, the Southeast outdoes the Northeast as a hub of expansion.” This statement had been voiced in a study prepared by the MB Associados consulting firm, which had provided the empirical basis for the article's analysis.

José Roberto Mendonça de Barros is a founding partner of the consulting firm. However, his curriculum goes beyond his work as a consultant. Barros has a doctorate in Economics from the University of São Paulo (USP) and did his post-doctoral studies at Yale's Economic Growth Center. He is a former professor at USP's

School of Economics and Management and was the Ministry of Finance's Economic Policy Secretary (1995-1998) during the first term of former President Fernando Henrique Cardoso. In 1998, he was named Economist of the Year by Brazil's Economists Association.

In the interview below, Mendonça de Barros explores the new economic geography that he envisions for the country and tries to establish the relationship between scientific research conducted in São Paulo (i.e., one half of the knowledge produced in Brazil) and the reorganization of the economy's dynamics.

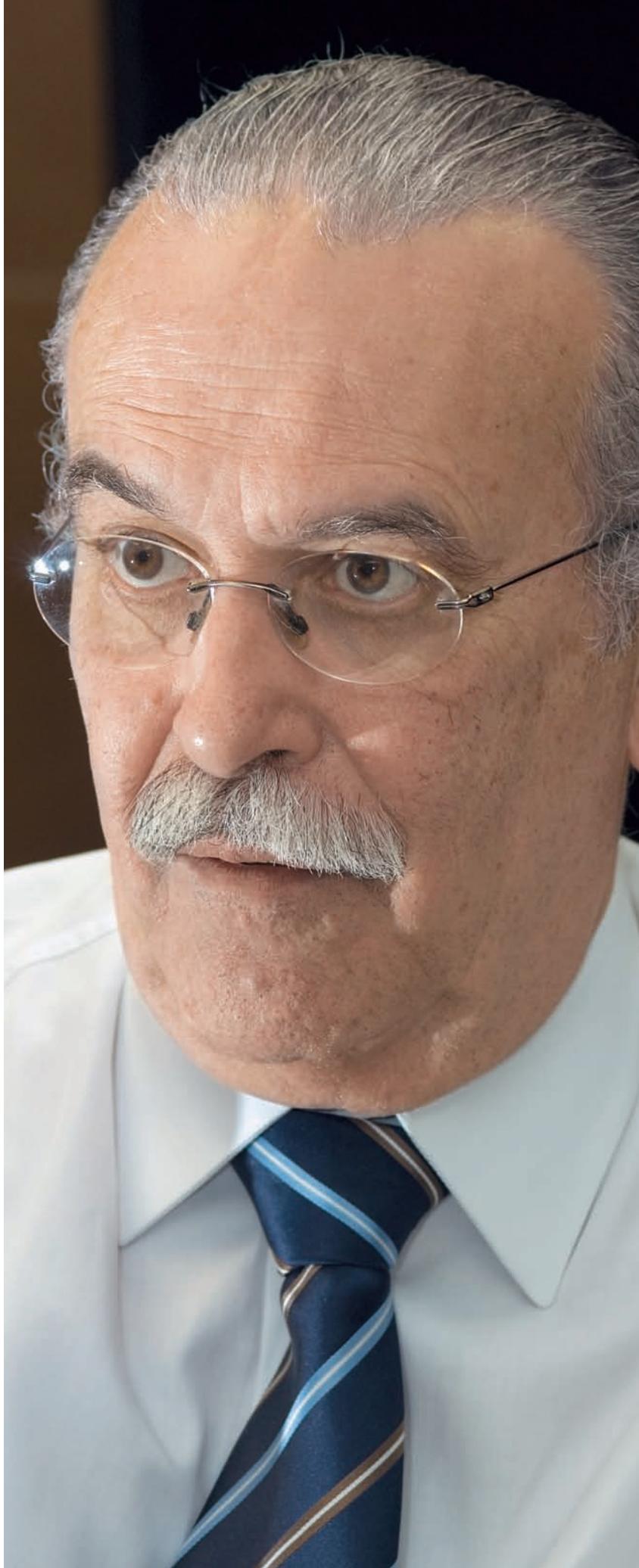
■ *The notion of the new economic geography that you refer to is broader than just the Brazilian case, right? This new geography has an international dimension.*

— [When writing the article for *O Estado de S. Paulo*] I was focusing on Brazil, even though the economic geography is always changing. In these terms, an existing universal phenomenon is the emergence of the Asian world, although the BRICs (Brazil, Russia, India and China) are not an analytical category as such because these countries have some similarities – in spite of their gigantic differences. Their similarity is their great potential to absorb people from the rural sector,

who become integrated into the productive system. This leads to the growth of consumption and to the creation of a consumer market with huge potential. This was thought about mostly in terms of Asia, especially China and India, the world's two most populous countries; but the phenomenon of emergence exists.

■ *Is it the same view of economic geography that Paul Krugman, the Economics Nobel Prize laureate, originally developed?*

— He wrote a famous book on economic geography, but before Asia became so important. He wrote this book about ten years ago. Economist Jim O'Neill, from Goldman Sachs, was the person responsible for the notoriety of this concept. So, although the BRICs lack an organic relationship among themselves, they have a basic similarity: the capacity to incorporate people and to transform this capacity into a huge domestic market. And this is the opposite of the rest of the world – even prior to the 2008 crisis – in the sense that this region is a center of growth and of changes in power, on account of the dynamic domestic market, which is exploited better in some places and less in others. In short, very strong leverage results from the domestic market, generating deep changes in the productive system, which in turn leads to the generation of wealth. The BRICs issue was ultimately erroneously interpreted, when people said that the BRIC countries would grow as if their growth were independent from the rest of the world. When the crisis blew up, the reaction was something like this: 'See? The idea of the BRICs doesn't work,' because they were not supporting the world as a whole. But in my opinion, this was never the idea; the concept behind this issue is much more modest: it is the potential to grow quickly, at a given moment, which will produce transformations. The geography is new in the sense that the world is growing toward Asia, from the Pacific, so to speak, as opposed to the Atlantic – I think there is something really important here that will generate dynamism for a long time. Brazil is somewhat distant from this model. We now have a major relationship basically with suppliers of natural resource chains, whether they are foodstuffs or industrial raw materials. But this was the initial part: as time goes by, economic relationships, especially with China, will grow stronger and this year Chinese investments in Brazil began to show. To some extent



similar to what happened between Japan and South Korea, a country first begins as a supplier of exports to a given country; the domestic market starts to grow until at a certain point it makes sense to start producing goods locally. The exporting of capital becomes increasingly important as countries become wealthier. This does not happen to the detriment of the exporting of goods, but the exporting of capital becomes more apparent. This happened in England, the United States, Japan; it is now happening in South Korea, and is beginning to happen in China. These are important relationships, hence my current perception that economic growth with a double base has consolidated in the country – the two bases add up and do not exclude each other. Many of my peers believe that there is a dynamic of exclusion between the exporting of products of the so-called natural resources chains and the domestic market.

■ *Does the domestic market grow on the basis of the leverage provided by currently existing re-distribution programs?*

— In principle, not only because of the re-distribution programs but, more recently, the domestic market has grown on its own. Now, more than ever, leveraged by the real possibility that Brazil will grow – and this is where productivity and technological innovation come in... This is not only growth in terms of extension, but also in terms of depth, which is the result of these new activities, of productivity gains. And, by doing so, we are transferring this potential to buy, and this willingness to buy, to the domestic market. I think Brazil has this plurality; it's nothing new. Continental-sized countries tend to have strong domestic markets – only rarely does a continental-sized country depend on imports, as might be the case of Holland, Belgium, Singapore, tiny countries that import and export... It's different in continental-sized countries – most of the local needs, by far, are met by domestic production.

■ *The paper that we mentioned, prepared by MB Associados, identifies three factors that might cause the shift of the dynamic center of the Brazilian economy in forthcoming years to the Southeast, with special focus on São Paulo: the exploitation of the pre-salt layer, the availability of infrastructure in general, and a broad educational system that results in the generation of knowledge. Could you please provide more details on this?*

— The stabilization process was a long one, because the increase in foreign imbalances started years ago, as evidenced by inflation. I'm talking about the 1990s onwards and not about the 1986 Cruzado monetary stabilization plan, an unsuccessful experiment. The opening of the economy to foreign investments, initiated by Fernando Collor, broke away from the import substitution model, which had become obsolete. The academic community will spend the rest of their lives discussing why that model became outdated, but some things cannot be explained by anyone in definitive terms. The increase in inflation rates was the most visible sign of this obsolescence; the State crisis had reached an absurd level and the fiscal crisis was also part of the inflationary process. To this was added a drastic drop in growth from the 1980s onwards. All of this is somewhat interconnected and, if we look at the sequence of the break with the old model, I think that the first step, still in the 1980s, was the perception that there was no solution with such high inflation. I was once on a TV show with Vicentinho [Vicente Paulo da Silva], at the time the president of the then powerful Steelworkers Union in São Bernardo do Campo; during the break, he told me something like this “Zé Roberto, I'm the president of the most powerful labor union in Brazil,” which was true, “and I deal with the most powerful industry in Brazil,” the automotive industry, which was also true at that time, “I negotiate the best collective labor agreements in Brazil,” which was equally true, “but I lose

everything to daily inflation,” also true. I was quite impressed by these words and after the TV show, I asked myself, “did Vicentinho really say that?” Inflation generated a race that he knew he was losing... This perception by society created room for stabilization. The Bresser, Cruzado and Verão monetary stabilization plans were feeble attempts.

■ *When did this conversation take place?*

— In 1989. The lesson learned from this period led us economists to professionally add two more things that were the basis for what came later on. The first was to exorcise monetary adjustment – and the three plans were clumsy measures that sought to undo the view everybody had of monetary adjustment and which was definitively eliminated by the Plano Real, the monetary stabilization plan. And finally, a definition was given to the inflationary coalition; this definition was largely based on the experience of Argentina, which had also dealt with hyperinflation in the period, and it was exactly what Vicentinho had described: even though he had managed to negotiate attractive salary increases, the automobile industry raised its prices accordingly and thus the inflationary process was constantly being fueled.

■ *That was the major discussion on the Brazilian economy from 1985 to 1990, wasn't it? How to effectively break inflation and the factors that fueled it?*

— Exactly. Two things were perceived in the late 1980s: one was that monetary adjustment could not be eliminated by measures that could be fought over in court – this would have meant a huge step backwards. The various attempts at doing so were unsuccessful. The second was that the economy had to open up so that competition with imported goods would take place. This is a quality-related shock. Easy to say, difficult to do. The fact is that, given the world's situation at that time – the crises in Asia, Russia, etc., it took ten years for the stabilization process to take off. And what happened in 2008, the global economic meltdown, when the US dollar to the real exchange rate suddenly shot up from R\$ 1.60 to R\$ 2.40 – without provoking inflation –, that was the best stabilization we could have had. For this to happen, it was necessary to open up the economy, eliminate indexation, align prices, improve the State's fiscal matters, reduce the foreign debt... And in the meantime, we experienced very



limited growth for 20 years, because in the pre-1990s we were going through hyperinflation and after 1990, 1993, we were exorcizing everything, eliminating all the deep-rooted barriers in the economy.

■ *So your evaluation at that time was that it was impossible for the country to grow during the 1990s?*

— I think so. Of course, economic policies make many errors. The positive point for those who look back afterwards is that they realize what was wrong. Today, for example, the economy is booming. But the fact remains that certain things take a long time to work out. Fiscal adjustment, for example. It is far harder for the economy to grow when the budget is being cut back than when it is expanding. Now, all our budgets are growing – the state and city budgets and certainly the federal budget; for the last eight years, these budgets have been openly expanding. One can discuss whether the expenditures are appropriate or not, but when expenditure is higher, the economy moves ahead. The opposite happens in the case of fiscal adjustment. Therefore, it was difficult for the economy to grow more, because of these major crises abroad. In short, it has been a long stabilization process that has not ended yet because we still have some indexation residuals. But most of the work has been done, such as the fiscal adjustment processes, the opening up of the economy, and the reduction of the foreign debt. The income gap becomes even more perceptible when we take away inflation. Shortly before the readjustments, the minimum wage stood at US\$ 60, or R\$ 100 in today's currency. But the truth is that it was such a tough battle to readjust, readjust, readjust, that nobody had a clear perception of this. One of the discussions of the stabilization plan [which created the real, the new currency] was that stabilization in itself is akin to income redistribution. This is illustrated by the fact that the country's economy grew quite significantly in 1995 and 1996. However, as income distribution was so unequal, this was merely the beginning of a process that had to continue.

■ *But weren't there any problems related to the policies for the opening of the economy and to privatization during this long, drawn-out stabilization process, problems that postponed stabilization itself?*

— There were some mistakes made in the privatization process, and the best example of this is the electric power

The association that is always made between natural resources and underdevelopment and low productivity is false. This might have been true in the past, but today it certainly is not

sector. But in general, the privatization process was highly successful; the fact that the State withdrew from situations that only generated deficits is something that very few people remember nowadays. The state-owned steel industry had wasted US\$ 20 billion. Privatization doesn't only mean paying taxes – it means that no deficits are generated. Although the privatization of the electric power sector was less successful, the telephony industry is a good example of successful privatization. However, in my opinion, the most complicated issue at that time was maintaining the overvalued exchange rate of the real relative to the US dollar for a long time, which implied keeping real interest rates high for too long, because one held back the other. During my term in government, this was one of the issues that the Central Bank grappled with and, unfortunately, the bank dealt with it inappropriately, with the 1999 currency devaluation. This devaluation was unplanned; it happened and I think this – more than anything else – is what delayed the process. Once inflation dropped, the second issue that needed to be addressed was income distribution. This is when the social network issue grew enormously.

This, in my opinion, ultimately resulted in the construction of two pillars of growth: the first was the competent production of the so-called natural resource chains, of which agribusiness is a component, minerals and metals are another component, and, more recently, oil and gas. And all of these are the result of a construction process that took 30, 40 years. The technology developed here – deep water offshore drilling for oil, the ability to farm in the Cerrado savannas, the work with high-quality minerals – all of this requires a lot of knowledge. I would like to add something to destroy the link that everybody makes between natural resources and underdevelopment and low productivity. This may have been true in the past, but today it definitely isn't. All these chains have very significant knowledge embedded in them, most of which comes from research. I think it is unfair to say that the states had no part in agricultural research, especially as regards São Paulo. Embrapa was instrumental in the development of grain and in the agricultural development of the Cerrado region; yet Embrapa never dealt with sugar cane, oranges, or coffee. Embrapa recently started doing research on fruit and vegetables. If we consider the major crops, all the technology for at least three such crops was generated in the State of São Paulo.

■ *Transgenic soya, the use of biotechnology in so many crops – all of this was crucial in the last five years, wasn't it?*

— They were decisive. One of the examples I often draw on to contradict the commonly voiced opinion that natural resources mean underdevelopment is the existence of an international evaluation according to which there are four sectors that have witnessed the most significant R&D efforts and advanced the most in the last ten years: aeronautics/astronautics, information technology, deep water oil drilling, whose technological paradigm is entirely different from land technology, and biotechnology. Two of these four sectors are related to natural resource chains.

■ *If we take the example of citrus fruit crops in São Paulo, we are talking about investments in studies that began in the 1960s, or even earlier, with research into the citrus greening disease in the 1950s.*

— That's right – 50, 60 years; this is not a project that started now. The same thing happened in the case of sugar cane and coffee. Soyabeans are a newer crop. I be-

gan writing my doctoral thesis in 1971 and submitted it in 1973. In my thesis, I argued that Brazil's soya exports could reach US\$ 300 million, which at the time was considered insane; this was a time when only people familiar with Japanese cuisine knew what soybeans were. Today, soya is a huge business. Soya was responsible for the trilogy – farming in the Cerrado; direct planting; and grain rotation – that produced a revolution: this work was done by Embrapa from the 1970s onwards.

■ *Why was soya included in your thesis?*
— Affonso Celso Pastore, who had some contact with agriculture, was my advisor. From 1968 to 1973, commodities boomed; however, this ended on a sour note because of the 1973 oil crisis. We had some familiarity with agriculture and Pastore suggested, “Why don't we study non-traditional exports?” I studied several crops: rice, peanuts...I didn't know much about soya when I started, but I realized that something extraordinary had happened. In the 1950s, the Americans had developed technology to produce battery hens. Poultry production needs animal feed and animal feed is produced by mixing minerals and corn, to provide bulk, plus some protein. The protein came from fishmeal, basically from anchovies fished off the coast of Peru. But a meteorological phenomenon occurred in that region and the anchovies disappeared. The market lacked a source of protein for animal feed and, as soybeans are a good-quality vegetable protein, farmers began to use soya meal. In Brazil, soybeans were planted mainly to replenish nitrogen in the soil, in the middle of the coffee crop. And the renowned researcher Johanna Döbereiner started to conduct pioneering research studies on the fixation of nitrogen in the soil.

■ *Going back to the natural resource chains...*

— In the early 2000s, this chain of natural resources became stronger due to the exporting of these products and to the creation of growth centers. Why? First, the 1999 currency devaluation allowed the export sector to reorganize itself more efficiently, with a floating exchange rate and everything else. Second, the supply side had already been strengthened through technology, knowledge, etc. Third, the 2001 recession was short and intense, and the world entered a growth phase, and – more than ever, China consolidated

São Paulo is much less susceptible to sudden fluctuations because it has a mature institutional structure that is the basis of its research studies, which actually began in the nineteenth century

that quick growth. The world's growth, together with that of Asia, produced this phase that is now consolidated. I think there are two erroneous perceptions: one concerns the level of technology involved in these chains, which is much greater than people realize. People think of a farm and of soya, of a mining company and of iron ore. However, if we look at the chain, we realize that we have increasingly sophisticated products. The fact is that we have renewable energy, because of water, and because we burn sugar cane bagasse thanks to increasingly improved technological development (high pressure). Not to mention oil drilling technology, which is highly sophisticated.

■ *Here we can see a great amount of accrued competency, including that resulting from the relations between research centers and the universities.*

— Exactly. I think the second erroneous perception is when one believes that natural resource chains are restricted to agricultural and mineral production. They go way beyond these and, therefore, the level of employment that they generate

directly and indirectly is enormous. In the soya chain, estimates indicate that we are getting close to 1 million jobs. As for sugar cane, I prepared a flow chart (see page 18) to illustrate exactly the chain's sophistication.

■ *But why did São Paulo grow less than the national average, even though it has experienced a stable scenario since the year 2000 and the country is prepared to grow?*

— Just to conclude what I was saying: once exports and agribusiness were consolidated, we could focus on the entire economy in greater detail. On the other hand, also mostly due to stabilization, some things began happening right from the start. First came the sound redistribution of certain economic activities, a result of the move to regions where salaries were lower. Thus, a substantial part of the footwear industry, previously concentrated in Franca and in Vale dos Sinos, relocated to the Northeast. The footwear industry is now based in the states of Bahia, Paraíba, Ceará, etc. The same thing happened with the textile industry, the best example of which is Coteminas, which has an industrial complex in the city of Campina Grande. Concurrently, production costs in São Paulo began to grow significantly, one of the reasons why activities were relocated. The ABC [the Metropolitan Region of São Paulo] was totally occupied and, during the industrial expansion phase, which began when the Real monetary stabilization plan went into effect, industry was able to spread nationwide. Tax incentives consolidated the industrial complex in the State of Minas Gerais, took Ford to the State of Bahia and General Motors to the State of Rio Grande do Sul. When a car assembly plant relocates, the company must have its suppliers in the same region, according to the just-in-time production technology.

■ *This coincides with the moment when São Paulo's GDP share began to decrease.*

— The downturn had started earlier, but these events drove it. This is when the income redistribution programs stepped in, leading to the dizzying growth of consumer goods markets. The Northeast is the prime example, but it wasn't the only region. What I mentioned previously concerning the textile, footwear and automotive industries – refers to the rationale of production. And now we are witnessing the rationale of demand: the consumption growth rocketed and this

has made the Northeast Region grow even faster, though it is still importing many of the goods consumed there. This is the peak of the process. This kind of growth naturally results in an investment boom in commercial expansion to meet the needs of the new emerging class. It is important to point out that the growth was primarily a growth of demand rather than of production.

■ *Does the money that drives demand come from the government?*

— Yes, it comes from the government, in the form of INSS social security benefits, minimum wage, and the Bolsas Escola, Família, etc. allowance programs. I would like to add a comment: in the chart that I prepared [see www.revistapesquisa.fapesp.br], the exporting of soybeans, beef, forest products, sugar, ethanol and some individually smaller industries in 2009 accounted for US\$ 17.2 billion. Meat exports generated US\$ 11.7 billion; forest products, US\$ 7.2 billion; sugar and ethanol, US\$ 9.7 billion; and coffee, US\$ 4.2 billion. I wanted to show the sugar cane industry. We analyzed its production, the industry's relation to the machinery and equipment industry, inputs, services, and the technological gains that result from research and from the interaction of research with machines, fertilizers, and everything else. Extraction from sugar cane is higher than it was 20 years ago, which is related to the nature of the equipment. The industry that only produced sugar in the past now makes juice, bagasse, and straw. Juice is used to make sugar, ethanol, bio-plastics – when the appropriate microorganisms are used –, and now we are witnessing research on second-generation fuels that come from cellulose.

■ *And this is unique to Brazil, correct?*

— Yes, there is nothing else like it in terms of size. In India, the sugarcane industry is small and basically produces sugar. Africa is at the very beginning of the process. Brazil is the only place in the world with a fleet of millions of ethanol-fuelled vehicles, which is an innovation. The dual fuel automobile, even the simple kind, is an innovation that has helped us deal with the crisis. There is an endless demand for bioplastics, if we look at it from the current standpoint. Existing projects in this respect are still rather expensive and future bioplastics will have to come from a renewable source and be biodegradable six months after being buried in the ground.



■ *Bioen, the Bioenergy Research Program, is one of FAPESP's top priority programs.*

— As it should be, because this is a real breakthrough. In the said chart, I show the production gains in the sugar cane chain, which is linked to variety, the regional nature of research, optimization of research (the sugar cane that generates energy is different from the sugar cane that produces sugar), transgenic varieties, new players, production system, outsourcing, mechanical harvesting, irrigation, extension of the harvest, organic sugar cane, relationship with equipment, list of inputs, biological control of pests... All of this adds gains. Let me resume what I was saying earlier; to summarize the first part, the combination of stability, credit, and income transfer programs generated an expansion in consumption that was far stronger in the North and in the Northeast. And now comes the second line of reasoning: why would the growth of the Southeast and of São Paulo rebound naturally? There are two sets of reasons. The first is simple: this movement, which we can refer to as inclusion, is reaching its limits. There are

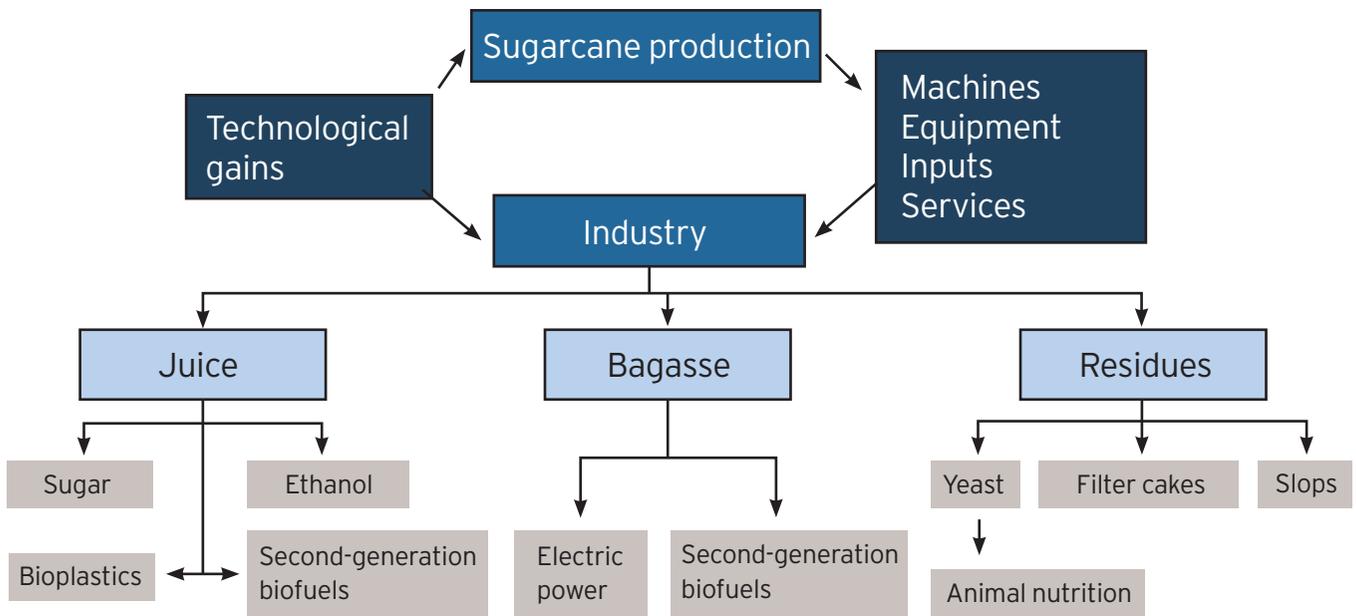
no longer 12 million families to enroll in the Bolsa Família, family allowance, program. Second, if I am right, the Treasury will no longer have the leeway in terms of funds that it has enjoyed so far, because expenditures have increased significantly and the government plans raise the minimum wage, which has a positive effect, but increases costs, Social Security, and all the rest. In this sense, the Bolsa Família program is the least problematic program: R\$ 12 billion a year is not that much. But it's the combination of things. So I believe it will be difficult to maintain the same income transfer growth rate because there will be less money available and because most of the population that qualified for inclusion has already been included. From now onwards, our needs will be much more closely related to education and incorporation into the job market. In my opinion, the North and the Northeast – the regions to which most of the inclusion program funds are allocated – will no longer benefit as much as they did in the past. A second point that one must add to this situation is that the traditional growth centers of the Northeast have matured. This doesn't mean that they will be moving backwards, but they are mature, as is the case of the petrochemical complex in the State of Bahia, or the fruit-growing complex in the region of Petrolina, which took a great leap forward. However, now, the pace of growth has slowed down; the chlorine chemical complex in the State of Alagoas, another traditional industry is also growing slowly nowadays. The Ford business in the State of Bahia, for example: either Ford decides to build another plant or its business will not expand. There is one exception to this in the State of Pernambuco.

■ *Linked to the port.*

— Yes – to the Suape Industrial and Port Complex. Recife was already dynamic, because of its reputation as the leading medical center in the Northeast; it also has a mature IT complex, but Suape and everything that revolves around it is the most important thing. The world's biggest PET resin manufacturing plant, owned by the Italian group Mossi & Ghisolfi, is there. Suape houses an enormous shipyard, one of the biggest owned by the Camargo Correa company; the first of the new Petrobras refineries is being built there. There are many significant business activities taking place in Pernambuco, but this is not true across the

The expansion of sugar cane

The GDP of the sugar/ethanol industry amounted to US\$ 28.2 billion in 2008, or nearly 2% of Brazil's GDP



entire Northeast. In my opinion, demand will no longer be as buoyant as it has been and, in terms of supply, according to various studies we have conducted on this, there is nothing going on at the moment – other than Suape – that will drive supply significantly.

■ *Have you analyzed projects that are about to start or that have already started?*

— We have analyzed many projects, some of which are already under way. The Transnordestina Project is running behind and changing the course of the São Francisco River is apparently not going anywhere. We believe that the oil refinery in São Luís and the other refineries basically involve political decisions and are unlikely to materialize. The Luís Eduardo Magalhães agricultural production complex in the western part of the State of Bahia still has room to grow.

■ *Let us concentrate now on the reasons for the probable growth of the Southeast.*

— Why is the Southeast – particularly São Paulo – going to grow more? First of all, because of nature: the pre-salt layer is concentrated in the region that extends from the State of Espírito Santo to the State of São Paulo. If we analyze the Petrobras projects, most of the related invest-

ments are to be made in Santos. Not only because of the oil wells, but also because – and rightly so, in my opinion – Petrobras doesn't want to depend too much on the State of Rio de Janeiro. The company was strongly affected by the two administrations of the two Garotinho governors [state governors Anthony Garotinho and later Rosinha Garotinho], who increased state taxes and threatened to levy higher VAT tax on equipment, which would have made many projects unfeasible... Strategically, the company increased its expenses in the State of Espírito Santo. The Southeast as a whole will grow because of the pre-salt layer, but the major leap will occur in São Paulo. Petrobras is building a huge office facility and is investing enormously in human resources. And oil is not only oil, but everything that comes with it. The impact on universities, on research, on capital goods producers, on vessels... And then the impact on the software industry. The oil business is based on massive hardware, but hardware is run on software. Norway is the benchmark reference in this respect: the country had never produced any oil until it was found in its territory, but the country's oil supplies are declining and today Norway exports oil technology. Petrobras is doing the right thing in this sense.

■ *Given that more than more than 50 theme-related research projects are supported by Petrobras at Brazilian universities, this will probably be disseminated more extensively and deepen knowledge on oil.*

— Exactly. Concurrently, the perception nowadays is that one must train intermediary-level technicians, besides supporting research projects conducted by universities. The platform operator needs to undergo specific training because he deals with a complicated system. This is not manual labor; it is something much more sophisticated. Therefore, the impact of the pre-salt layer should be huge. In fact, I think this impact is already being felt, in anticipation of an important new activity. For example, the real estate market in the city of Santos has already changed. Santos is going to become a city where big business deals will be conducted.

■ *Will this situation extend to the entire southern coast of the state?*

— Yes; this will affect the town of Caraguatuba as well, where the gas fields are located; Santos, however, will be the main hub. The state government set up a committee nearly two years ago to discuss how to maximize the benefits to be

had from the Petrobras investments. And this is not only related to infrastructure, but also entails human resources. As a result, many courses are being created at colleges. The core of this major research effort will be at the UFRJ [Federal University of Rio de Janeiro], but there will be more action in this respect. Regardless of how quickly the pre-salt layer is developed, this is a huge business and it is primarily located in the Southeast. And the innovation is in São Paulo. I repeat: Petrobras is interested in diversifying its three areas: Vitória, Rio de Janeiro and São Paulo, to dilute risk.

■ *How much of the R\$ 110 billion that Petrobras plans to invest in the pre-salt layer will be allocated to São Paulo?*

— At least 40%. Fund allocation is never a sure thing, because Petrobras makes slight changes from one document to the next.

■ *Is this what is going to drive São Paulo's move to the geographic center of the new economic geography?*

— No. The move stems from a combination of three or four concurrent factors. First, there is the pre-salt layer issue. Second, still in terms of natural resources, comes the growth in added value of the sugar cane chain. Because of this new reality, Santos will be consolidated as an exporting complex. Three ethanol pipelines are being planned, all of them running to Santos, because São Paulo State has the infrastructure and the center of information.

■ *About exporting?*

— Yes. Nowadays, most of the sugar is exported through Santos. And most of the ethanol will also be exported through Santos. Going back to the new economic geography, another fact is the growth of the sophisticated service industry in São Paulo, and this growth will intensify. I am referring to healthcare, for example. The Brazilian population is growing older and there is a growing demand for these kinds of services. This is not only related to hospitals, but to healthcare clusters, including software, equipment, maintenance, hospitals, and pre- and post-surgery facilities. And this extends to the concept of well-being, prevention, which involves physical fitness... This is a huge business and a highly productive one. We have prepared some studies about this and undoubtedly São Paulo is the hub, because of the concentration of knowledge, of new services,

excellent hospitals, etc. That doesn't mean that these services aren't available elsewhere; but São Paulo is the hub.

■ *Does this have a major impact on the service industry?*

— This has a considerable impact; the latest survey conducted by IBGE on this issue was done in 2007. This survey still doesn't encompass everything that has been going on in this respect. If it were possible to include real estate construction linked to this impact, we would see that this is concentrated in São Paulo.

■ *São Paulo is becoming a hub for a part of the world.*

— That's right, and this generates high quality employment and income. The internationalization of healthcare services is beginning to take hold here. This means that an individual comes from abroad for health treatment here – medical treatment, dental treatment – at accredited hospitals, because healthcare here is less expensive; this treatment is covered by the individual's American health insurance. Nowadays, the Sirio-Libanês Hospital and the Albert Einstein Hospital have international directors for the sole purpose of increasing their international services. Costa Rica has a huge business of this kind, but the biggest business is in Malaysia. More than one million people go to Malaysia for healthcare services, which are generally basic ones, but much less expensive. And this business doesn't stop at healthcare; the post-surgery part turns into a tourism industry, as is the case in Costa Rica. Of course, the hospitals have to be competent, be accredited in the United States, and so on. São Paulo has more and more people in this line of business. Another example concerns creative activities in general. I recently read an article in the *O Estado de S. Paulo* newspaper, which stated that São Paulo had become the world's foremost center for comic books. However, other activities such as advertising, films, internet production, fashion and architecture can be included.

■ *The production of a global city, right?*

— That's right. This is what we call creative economics. And this doesn't only occur in São Paulo; Rio de Janeiro has this status as well, because of the Rede Globo television network, especially when it comes to creative activities. But the epicenter is here, because of the sophistication of demand, income level, technical skills... Infrastructure is the

third element that will lead São Paulo to being the center of the new economic geography. Relative to the rest of the nation's precarious infrastructure, São Paulo is slightly better off in terms of the transportation of goods.

■ *What about the research-related infrastructure in São Paulo, within the new role that the study attributes to the state?*

— I think that all these highly productive activities – whether related to services or to natural resources – obviously demand and are supported by the ability to generate knowledge, in terms of training people and especially in terms of the research sector. I think São Paulo is a pioneer and has maintained its leadership in this respect. This includes biological, agronomy and agricultural research. This is what makes São Paulo special – first, the institutional scenario is very powerful and FAPESP is one of its pillars. The state is less susceptible to sudden fluctuations; it has a mature institutional structure that is the basis of its research studies, which actually began in the nineteenth century with agricultural research. The research conducted by the Polytechnic School led to the creation of IPT, the Institute of Technological Research. Research studies have been conducted for one hundred years already. Therefore, we have a tradition and a sound institutional model for funding that runs parallel to open-mindedness regarding new forms. The network of laboratories, the projects developed by networks, such as those on the yellowing disease exemplify this ability.

■ *Isn't it necessary to invest in personnel training to keep up the growth that your study has projected?*

— I think that economists have learnt that the strong or weak points of a country are nowadays measured by two characteristics: infrastructure (it's impossible to import a highway) and talent. I mean talent in general, encompassing the simplest to the most sophisticated training programs. You can import a thousand, 2 thousand, 5 thousand, 10 thousand talented professionals but you can't import 5 million talented professionals – it's impossible. This means that the State, companies, everybody has to focus on training talent. The hardware is in the infrastructure but the real battle is a software battle, which means people. This is a software world and that is where the value is. ■