

People, Productivity, and Policy: Product Growth Perspective in the Medium and Long Run in Brazil

Sergei Soares

Abstract

In spite of the attention received by the short-term crisis, Brazil faces a more serious problem, namely a long-term lack of growth or even perspectives of growth. The crucial indicator is labor productivity, which has averaged 0.7% growth per year since 1980. Even during the commodity boom, labor productivity grew by only 0.8% per year. There are various ways to make labor productivity grow again: (i) increase investment, (ii) improve human capital, and (iii) improve economic institutions. Though Brazilian savings and investment are among the lowest in Latin America, there are limits to their growth. In education, Brazil has

been doing reasonably well, but this has been the case during the last twenty low productivity growth years. Neither human nor physical capital is likely to improve productivity growth significantly on its own. On the other hand, the institutional mixture of state capitalism and economic nationalism that Brazil depends on today, though functioning well up to 1980, has shackled Brazilian productivity since 1980. If Brazil reforms its economic institutions and puts an end to state capitalism and economic nationalism, its labor productivity will grow again at high rates.

Sergei Soares. 2016. "People, Productivity, and Policy: Product Growth Perspective in the Medium and Long Run in Brazil." CGD Policy Paper 088. Washington, DC: Center for Global Development. <http://www.cgdev.org/publication/people-productivity-and-policy-product-growth-perspective-medium-and-long-run-brazil>

CGD is grateful for contributions from its funders and Board of Directors in support of this work.

The author would like to thank Alan Gelb, Anit Mukherjee, Daniel Lederman, João Pedro Azevedo, Justin Sandefur, Glaucio Soares, Laura Randall, Liliana Rojas-Suarez, Luis Henrique Paiva, Marc Schiffbauer, Martin Raiser, Masoomeh Khandan, Mead Over, Nancy Birdsall, Pedro Arruda, Yuri Soares, and other participants at seminars at the IDB, at ILAS/Columbia University, at the World Bank, and here at the Center for Global Development for their useful comments. Errors are his own.

Center for Global Development
2055 L Street NW
Fifth Floor
Washington DC 20036
202-416-4000
www.cgdev.org

This work is made available under
the terms of the Creative Commons
Attribution-NonCommercial 4.0
license.

Contents

| | |
|--------------------------------------------------------------------------------------|----|
| 1. Introduction..... | 1 |
| 2. GDP Growth in Two Periods..... | 1 |
| 3. The Brazilian Labor Force from 1981 to 2014..... | 3 |
| 4. Labor Productivity in Comparison with Other Latin American Countries..... | 7 |
| 5. The Path to Productivity: Capital Deepening..... | 8 |
| 6. The Path to Productivity: Human Capital..... | 11 |
| 7. The Path to Productivity: Less State Capitalism..... | 14 |
| Economic Openness..... | 14 |
| Bureaucracy..... | 16 |
| Taxes..... | 17 |
| 8. High Labor Productivity in Latin America: Is Pain a Prerequisite for Reform?..... | 19 |
| 9. Let Us Now Look at Brazil..... | 23 |
| 10. Conclusion..... | 28 |
| References..... | 29 |
| Annex: Data..... | 31 |

1. Introduction

The current short-term economic crisis in Brazil has received considerable and understandable attention, and the year 2016 is likely to see the largest fall in the aggregate product since 1981 and a fiscal crisis of herculean proportions haunts the country, all in the context of a political crisis that has led Congress to impeach the President for the second time in Brazilian history. The country is politically divided and the strain placed upon political and legal institutions is heavy. The short term crisis the country faces is no small thing. But short term it is. One way or another, the fiscal situation will be addressed. One way or another, the political crisis will be solved, and sometime in the next couple years some economic growth will take place again.

The purpose of this paper is to show that Brazil faces a more serious, *long term* problem, which is lack of growth, not over a period of semesters, but rather years or decades. I will argue that this problem will become more acute as time goes by, with no end in sight. If nothing is done to change the institutions that underlie its economic organization, in a few decades Brazil will be among the poorer nations in Latin America. The succession of short-term crises and equally short-lived growth spells has thrown a veil over the fact that the long term growth trend is comparable to that of wealthy, slow-growing economies in the OECD, with the difference that Brazil is still much poorer than they.

To see why this is this case, I will begin with a quick look at a well-known phenomenon: the slowdown in GDP growth which occurred around 1980.

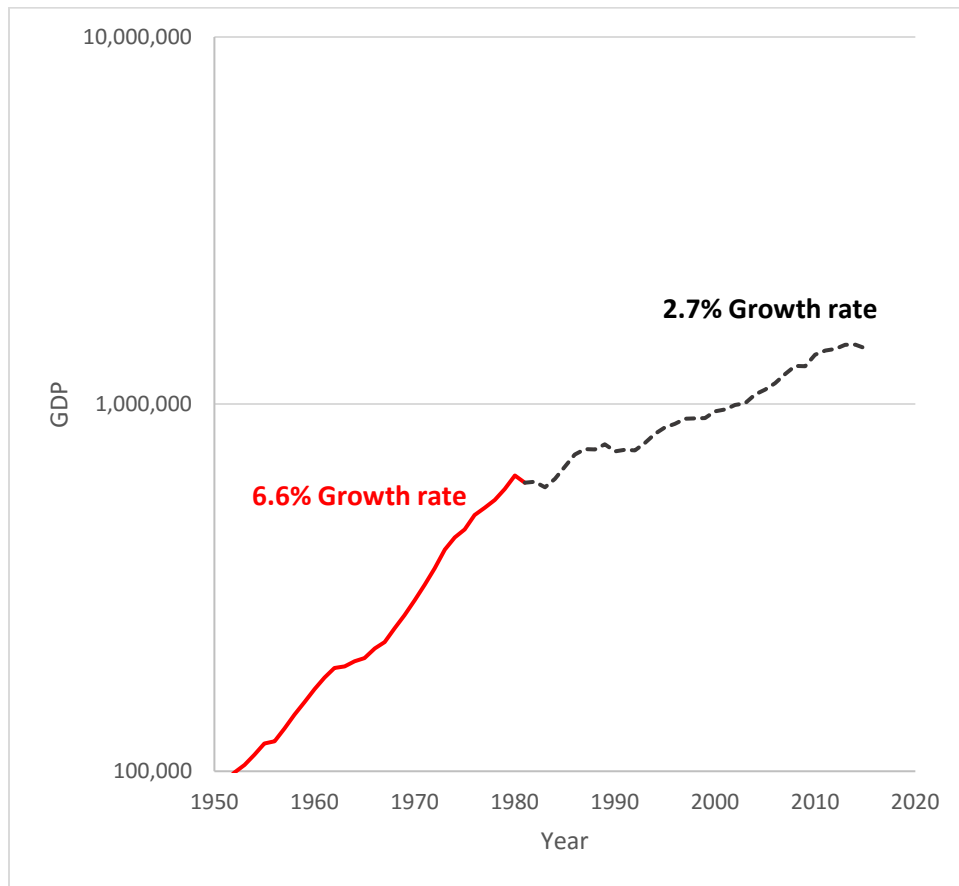
2. GDP Growth in Two Periods

As shown in Figure 1, Brazil's postwar economic growth falls into two very well-known periods. From the end of the Second World War until the explosion of the Debt Crisis in 1980, Brazil's national product grew at an average of 6.6% per year, which means that it was almost nine times larger in 1980 than in 1945. This growth rate put Brazil in the company of Korea and Japan as one of the fastest growing nations on earth. This all ended 1980: from 1980 to 2014 the growth rate of the economy was a mere 2.7% per year.

None of this is exactly news and much has been written on the growth collapse in 1980. Most of what has been written on our growth collapse is in relation to the Debt Crisis, which today is long past. I believe that from 1945 to 1980 Brazil was a highly successful case of extended Lewis Model growth. People migrated in mass from very low productivity jobs in agriculture to higher productivity jobs in the cities. Once in the cities, they migrated from lower productivity sectors to higher productivity ones. These structural changes alone led to higher productivity.

But the Lewis Model only works as long as there are people to move between sectors in which labor productivity is very different.

Figure 1: Brazilian GDP Growth from 1950 to 2015



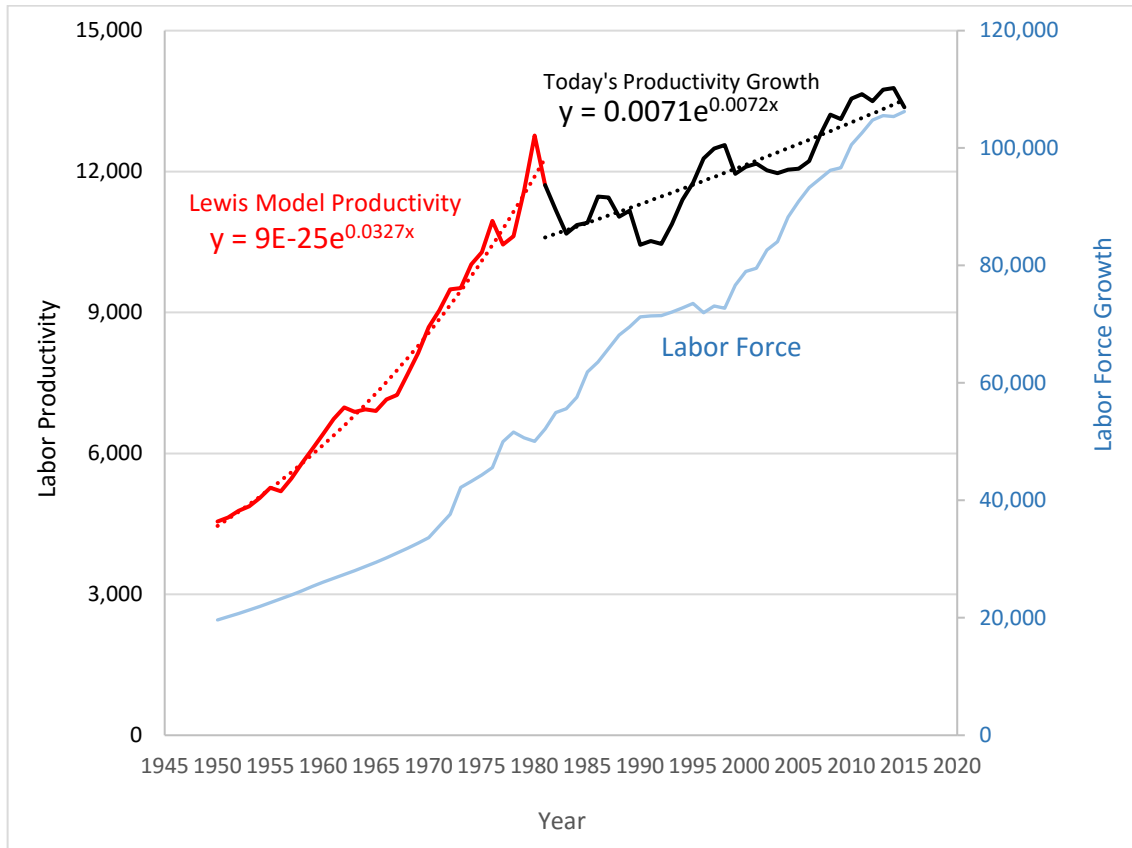
Source: The Conference Board

An easy way to decompose the growth of an economy is into labor productivity and size of the labor force: $\Delta \text{GDP} = \Delta \text{labor productivity} + \Delta \text{labor force}$.

Figure 2 shows the evolution both of labor productivity, in red then in black, and of the labor force, in light blue. It shows that labor productivity in Brazil grew by 3.3% per annum during the high growth years but only 0.7% after 1980. But if labor productivity was growing at only 0.7% per year, how did GDP grow at 2.7%, two percentage points higher? The obvious answer is that the labor force was growing.

Before going into the growth of the labor force, a word about labor productivity growth during the two periods is in order. While the departures from the trend during the 1950 to 1980 period are not large, this is clearly not the case from 1980 to 2015. The troughs around 1990 and 2005 are markedly lower than the trend, as are the peaks around 1998 and 2012. Does this mean we should divide labor productivity into more sub periods and look at each one in greater detail?

Figure 2: Productivity and Labor Force from 1950 to 2015



Source: The Conference Board

I believe not. While it is certainly possible to find lower and higher productivity periods (the 1980s in particular were a negative productivity decade), these are fluctuations around a trend. If the period is divided into two halves, a Z-test will show no statistically significant differences (at 10%) in productivity between them. The fluctuations are large, but the trend is much the same.¹

3. The Brazilian Labor Force from 1981 to 2014

Back to the growth of the labor force, Figure 3 is slightly more complicated than the previous two. The dotted red and blue lines represent, respectively, the labor force participation rates of men and women fourteen or older. The solid red and blue lines are counterfactuals that represent what participation rates would have been like if only the age structure of the population had changed over time. More specifically, the solid lines represent the following: $P_{cf,y} = \sum_a P_{1988,a} W_{y,a}$ where

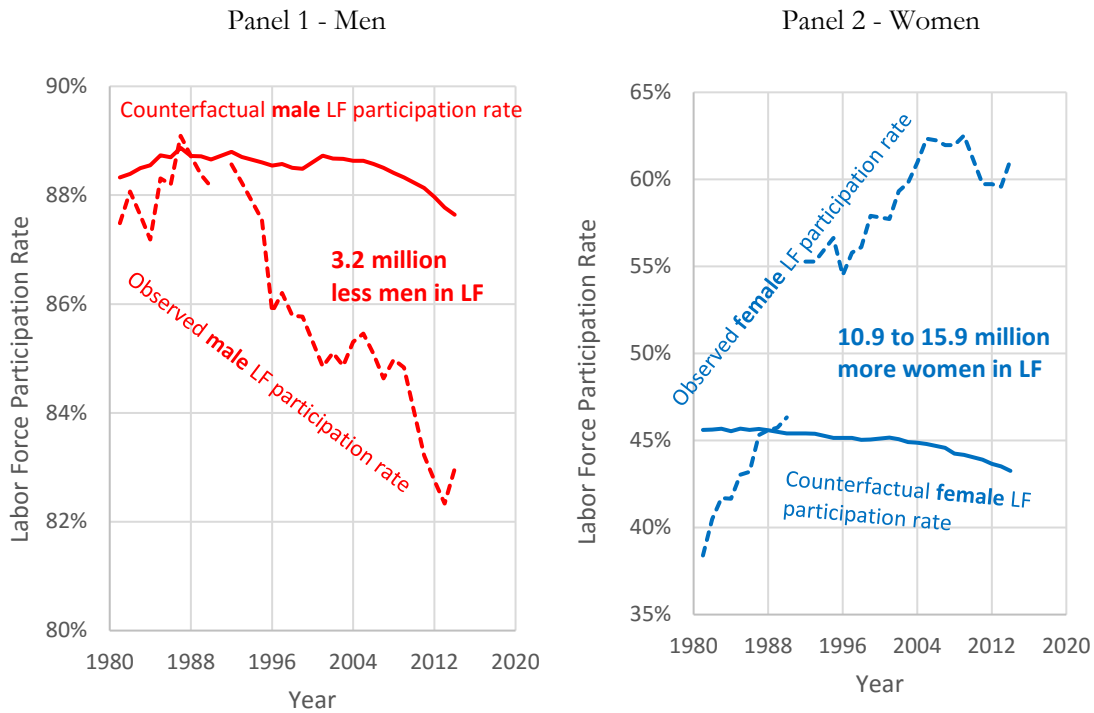
¹ I thank Fernanda DeNegri for alerting me to the fact that our productivity has been growing at 0.7% on average for the last thirty-five years.

$P_{1988,a}$ represents the participation rate for men or women aged a years in 1988 and $W_{y,a}$ represents the weight of men or women aged a years in year y .²

What the two panels of Figure 3 show is that population aging has had a small negative influence upon labor force participation rates for both men and women. The effect of aging is dwarfed by the real observed changes in labor force participation behavior.

In the case of men, labor force participation rates fell as a result of the lower retirement age in the 1988 Constitution. By 2015 there were about three million fewer men in the labor force than there would have been had there been no change in the retirement age.

Figure 3: Counterfactual and Observed Labor Force Participation Rates for Men and Women



Source: PNAD household survey

In the case of women, the opposite happened. Women joined the labor force in mass. Female labor force participation rates soared and by 2015 there were between eleven and sixteen million more

² 1988 was chosen because it is the date for the 1988 Constitution, which had an important effect upon the labor market participation rate for men.

women in the labor force than there would have been had women remained in their previous roles as housewives and mothers.³

Why the uncertainty in the number? Eleven and sixteen million are not close numbers. The uncertainty is due to methodological changes from the 1981-1990 household surveys to the 1992-2015 series. The questionnaire of the PNAD household survey changed radically between 1990 and 1992 and labor force participation was one of the areas in which the changes were most profound. These changes in methodology produce changes in numbers that are of uncertain magnitude, since a bridge survey with both questionnaires was never carried out, and that affected more women than men, since they are strongly related to part time, unpaid, and family work.⁴ A good analysis can be found in Rocha (2002), but there is no way to know exactly what the impacts of the methodological changes are. In this study I will suppose that 2/3 of the increase from 1990 to 1992 is due to methodological changes and about 1/3 is real. If this is the case, then in 2015 there were about 12.5 million more women working than would have been the case had there been no behavioral changes since 1981.

In a sense, Brazilian GDP growth was saved by women, but only partially. Of the 2.4% per year increase in the labor force from 1981 to 2015, 0.5% is due to the increase in women's labor force participation and 1.9% is due to simple population growth.

In any case, this 2.4% growth in the labor force when added to the 0.7% growth rate of labor productivity slightly over explains the growth rate of GDP since 1981.⁵ It is clear that that GDP growth over the last thirty-five years was driven basically by increases in the labor force, not by labor productivity.

The good thing about demographics is that it is easy to predict how many people will be in the work force in a given country – at least it is easier to predict that than, for example, the inflation rate. The Brazilian Statistical Institute, IBGE, has predictions for population by age until 2060 and given demographic inertia and the relative stability of fertility rates, these are very detailed and trustworthy predictions. Applying IBGE's numbers to the age-specific labor force participation rates for 2011-2014, in an exercise similar to that used in Figure 3, yields Figure 4, which is a prediction of how much the labor force will grow in coming years.

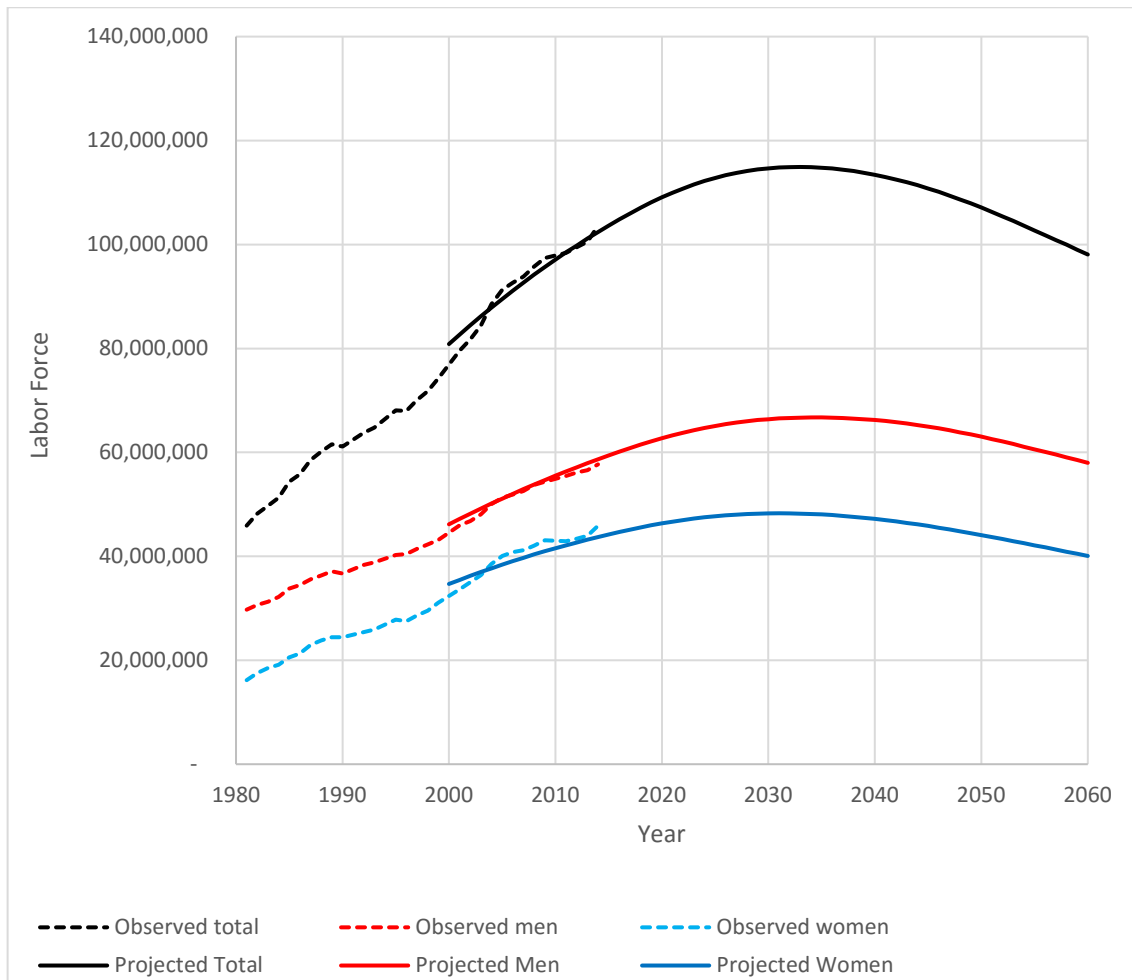
The dotted lines represent the observed female (blue), male (red), and total (black) labor force. The solid lines of analogous colors represent the labor force projections using IBGE population projections and 2011-2014 labor force participation rates. As we have seen before, the labor force grew at an average rate of 2.4% from 1981 to 2014.

³ This is more or less in agreement with previous work on the subject, such as that of Ana Luiza de Holanda Barbosa (2015).

⁴ See the Annex to this paper.

⁵ The reason for that is that I used data from the Conference Board, which has a slightly different definition of the labor force than the one in the PNAD. As will become clear later on, I used Conference Board data not because I do not know how to calculate labor productivity from the national accounts but because I need data that is as comparable as possible with other Latin American countries.

Figure 4: Observed and Projected Labor Force from 1981 to 2060



Source: PNAD and IBGE Population Projections

The future will be different. During the next fifteen years until the labor force peaks in 2030, the number of people working in Brazil will grow by about 0.7% per year. If labor productivity growth continues at about 0.7% per year, GDP will grow at about 1.5% per year for the next decade and a half. During the following thirty years, the labor force will fall by about 0.5% per year. If labor productivity continues at 0.7%, GDP growth will be a thing of the past, as has been the case in Japan over the last few decades.

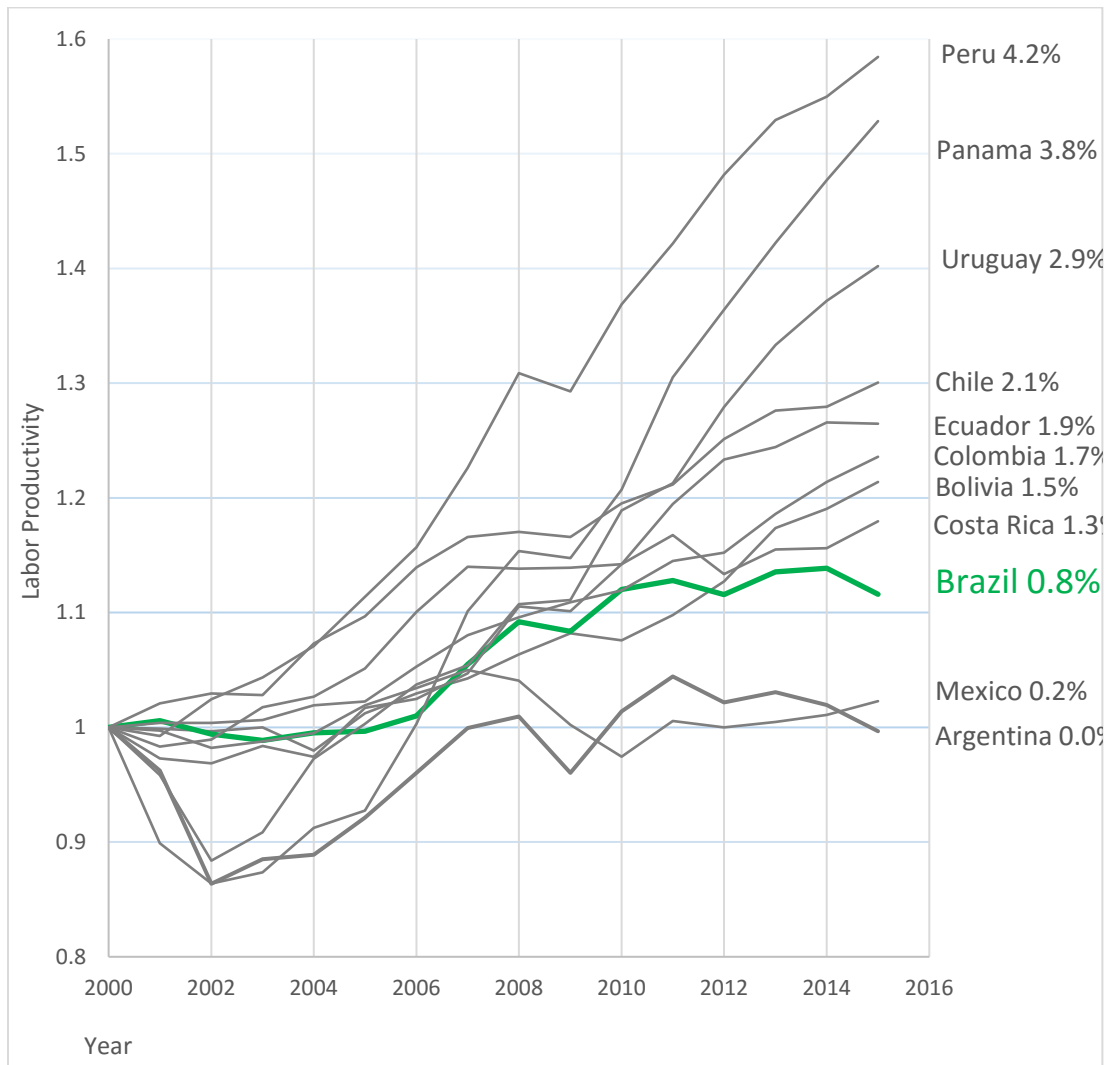
This does not mean that living standards will not rise. Since both the labor force and the population will be falling people will continue to get richer, although slowly. Brazil will become a poor version of Japan.

4. Labor Productivity in Comparison with Other Latin American Countries

I hope to have shown that there is considerable cause for concern when the issue is the future of the living standard in Brazil. A growth rate of 0.7% is not bad in historical terms for Brazil – during the nineteenth century Brazilian per capita GDP was essentially flat – nor is it that bad if the comparison period is the Roman Empire or the Renaissance. But if the comparison is with other middle income twentieth and twenty-first century economies, then 0.7% is dismal. To see exactly how dismal, let us compare labor productivity in Brazil with that of other Latin American economies.

The time period I will use is from 2000 onwards. This includes the natural resource boom but also the ensuing, inevitable, and predictable natural resource bust. Once again the data is from the Conference Board, so as to maximize comparability.

Figure 5: Labor Productivity in Latin America Since 2000



Source: Conference Board

Each line shows the labor productivity of a Latin American country since 2000, normalized by their productivity in that year, and the green line shows Brazil. The numbers on the right are nothing more than the average rates of growth during the entire period. Brazil, for example, did slightly better since 2000 than during the whole post-debt crisis period: 0.8% vs 0.7%. The difference is not impressive, particularly considering the natural resource boom years from 2000 to 2012.

Brazilian labor productivity looks even less impressive when compared to that of its neighbors. Only Venezuela (which is not on the graph because it would require a resized axis, since its labor productivity has been growing at negative 1.1 since 2000), Mexico (whose economy is highly dependent of the American economy, which was suffering the Great Recession during this time), and Argentina (whose economic policies were very close to those of Brazil) have fared worse. Four Latin American countries – Peru, Panama, Uruguay, and Chile – have fared much better with labor productivity growing above 2% per year. These numbers will look even worse as Brazilian GDP falls during this year and probably again during 2017.

While there are certainly important differences between Latin American countries, there is a lot in common among them. They are all former colonies of Iberian countries, all have strong Roman Catholic traditions, almost all are highly stratified and unequal societies and, more often than not, with racial divisions between whites and afro descendants or whites and indigenous peoples. While the political systems vary, the legal traditions are similar and all have love-hate relationships with the Northern Giant and their former colonial masters across the Atlantic. Finally, almost all (Mexico is the main exception) are commodity exporters who did well during the now dead commodity boom of the beginning of the century.

These resemblances mean that there is no ontological reason why Brazil could not attain the growth in labor productivity of Peru or Chile. We are talking about comparing like with like. If the differences among the successful Latin American countries and Brazil are not historical, cultural or institutional, then they must come from *policies*. If they come from policies, it is possible to figure out what, for instance, Peru or Uruguay are doing correctly and then emulate it.

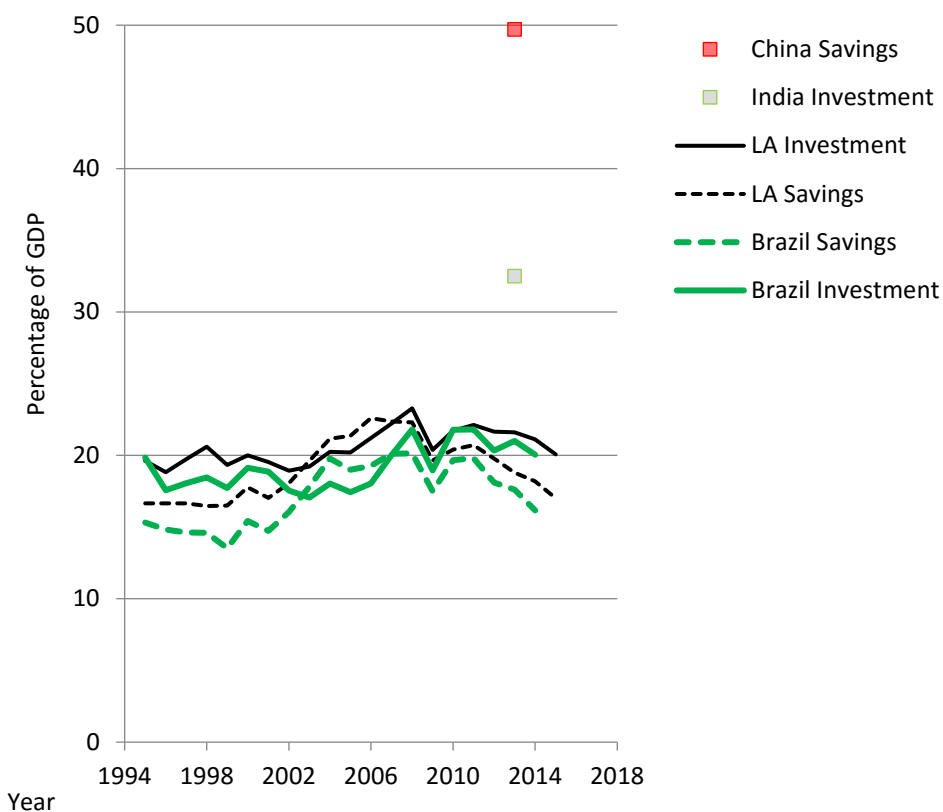
5. The Path to Productivity: Capital Deepening

The first and obvious way to increase the productivity of labor, analyzed in depth since David Ricardo or Karl Marx, is to give labor more capital to work with. A man with a horse plough can plant more than one with a hoe and a man with a tractor can outdo the one with the plough. China, and to a lesser extent, India, have shown us over the last three decades how massive savings and investment rates can lead to massive increases in product per worker.

Figure 6, however, suggests that taking investment to Chinese or even Indian levels is a very difficult mission. Brazil's investment rates since 1995 oscillated between 17% and 22% of GDP and its saving rates varied between slightly more than 13% to about 20% of GDP. Both investment and savings reached their peak during the natural resources boom peak of 2004 to 2011, under conditions that are unlikely to be repeated in the near future.

Compare this with the Chinese investment and savings rates of almost 50% of GDP and even with Indian investment and savings of more than 30% and the picture looks quite dismal.

Figure 6: Savings and Investment as a Percentage of GDP, Brazil and Latin America



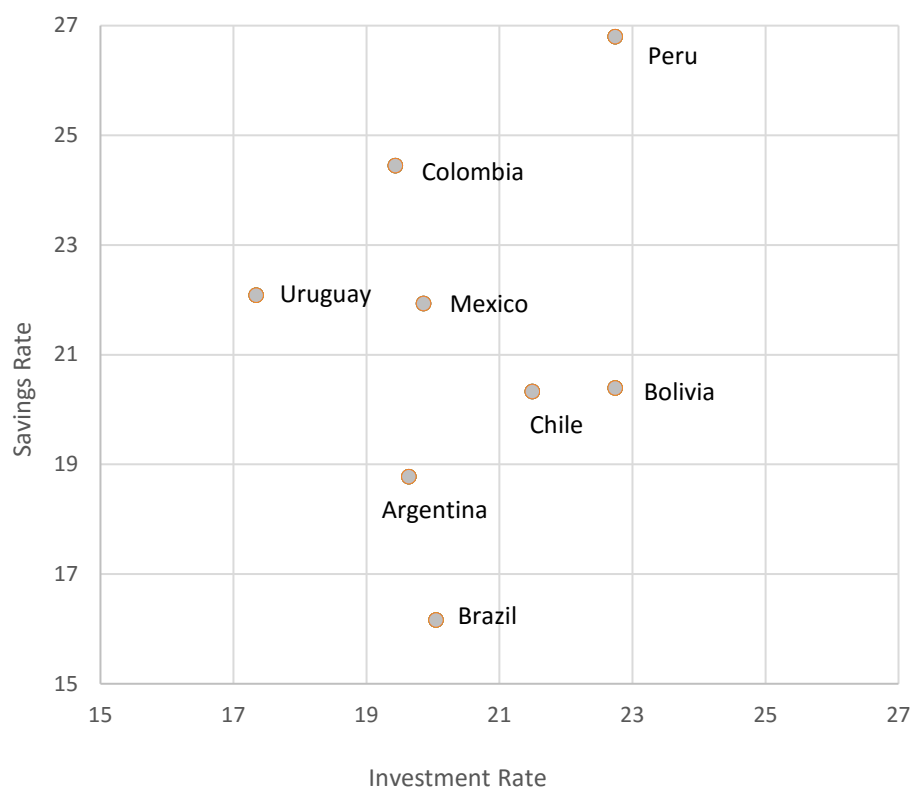
Source: IMF.

Now compare the Brazilian rates to the average Latin American rates and the picture brightens a little. Brazilian savings and investment rates are, respectively, on average only 1.9 and 1.4 percentage points lower than those of its neighbors. Taking 2014 – admittedly not the best year for Brazil but the last for which the IMF has data for all Latin American countries – Figure 7 shows savings (vertical axis) and investment (horizontal) for both Brazil and its neighbors. Although Brazil is more or less in the middle as far as investment is concerned, it is the country which saves the least in Latin America. The major difference between Brazil and other Latin American countries is the government deficit coupled with low government direct investment. A persistent deficit on the order of 2-3% of GDP with direct investment on the order of 1-2% mean that the public sector is dissaving and/or disinvesting from 1% to 2% of GDP. These constant and elevated public sector financing needs mean that the public sector is drawing resources from savers and ploughing them into its consumption and transfers. Figure 6 shows the situation before the public sector financing needs reached 6% of GDP as a result of the recession in 2016.

While Brazil is a democracy and massive increases in government savings at the expense of social expenditures are more likely to lead to lost elections than to sustained higher growth, its equally democratic Latin American neighbors have shown that it is possible to do somewhat better.

Nevertheless, even if Brazil were to bring public sector financing needs to zero percent of GDP, this would elevate its savings by maybe three percentage points – enough to bring it up to par with Chile or Bolivia but not enough to bring it up to par with the likes of Peru or Colombia.

Figure 7: Savings and Investment, Various Latin American Countries.



Source: IMF

But it is worse than it looks.

The low Brazilian investment rate happens in spite of a highly pro-investment industrial policy. The Federal Government has used both the BNDES development bank and a host of state owned enterprises, most importantly Petrobras, to increase investment “by decree”. According to Fernanda De Negri and Luiz Ricardo Cavalcante (2014), BNDES lending increased from 13% of total investment in 2006 to 23% in 2009. While it has come down to 20% in 2010, until the recession there were no signs that it would recede further. Petrobras and other state owned enterprises have contributed an equivalent amount.

The consequence is that nearly half of Brazil's already low investment is decided upon under considerable government influence. In the best of cases, this means that a well-meaning technocrat that has no vital stake of the outcome will make very important investment decisions. In the worse of cases, this means billions of dollars evaporating in shady deals in smoke filled rooms.

All this means that not only is investment low, but it is also inefficient.

In sum, Brazil needs to increase savings and investment rates by several percentage points, and this is possible through public finances under better control. But it also needs to do this while avoiding the inefficiencies that come with investment decided by bureaucrats and/or politicians.

Unfortunately, it is also clear that there are limits to how far Brazil can go with more saving and investment. There is no way in which the country will rapidly become a China – or even a Peru – and it cannot count on a colossal increase in investments to significantly increase the growth rate of its labor productivity.

6. The Path to Productivity: Human Capital

Since Gary Becker (1964) and Jacob Mincer (1958) argued that formally educated people were more productive than those who had not attended school, human capital has become a fixed feature in the economic debate. Although some researchers, like Lant Pritchett (1996), have argued that the link between education and GDP growth is less apparent than the link between education and income seen in labor market studies, the consensus as shown by such authors as Barry Bosworth and Susan Collins (2003), is that there is a link and that it is causal,⁶ even if it appears to be considerably weaker than that suggested by microeconomic evidence.

In human capital, Brazil has actually been doing reasonably well. This is not the impression that one will get when visiting Brazilian schools, troubled as they are by violence, underqualified and still underpaid teachers, and the lack of a culture of excellence. Just to be clear, when I say “doing well” I mean that schools are improving rapidly, not that they are great.

The first panel in Figure 8 shows average educational attainment of the labor force from 1990 onwards. Each line shows the average number of years of successful schooling until 2013 for each Latin American country. Some lines start earlier and some later, depending on data availability. The number on the right side of the Figure shows how fast educational attainment has been growing, with the numbers expressed in average years of successful schooling per decade. While Brazil's labor force still has the lowest educational attainment⁷ level in Latin America, it is also the one whose attainment has been growing the fastest. The educational attainment of the Brazilian labor

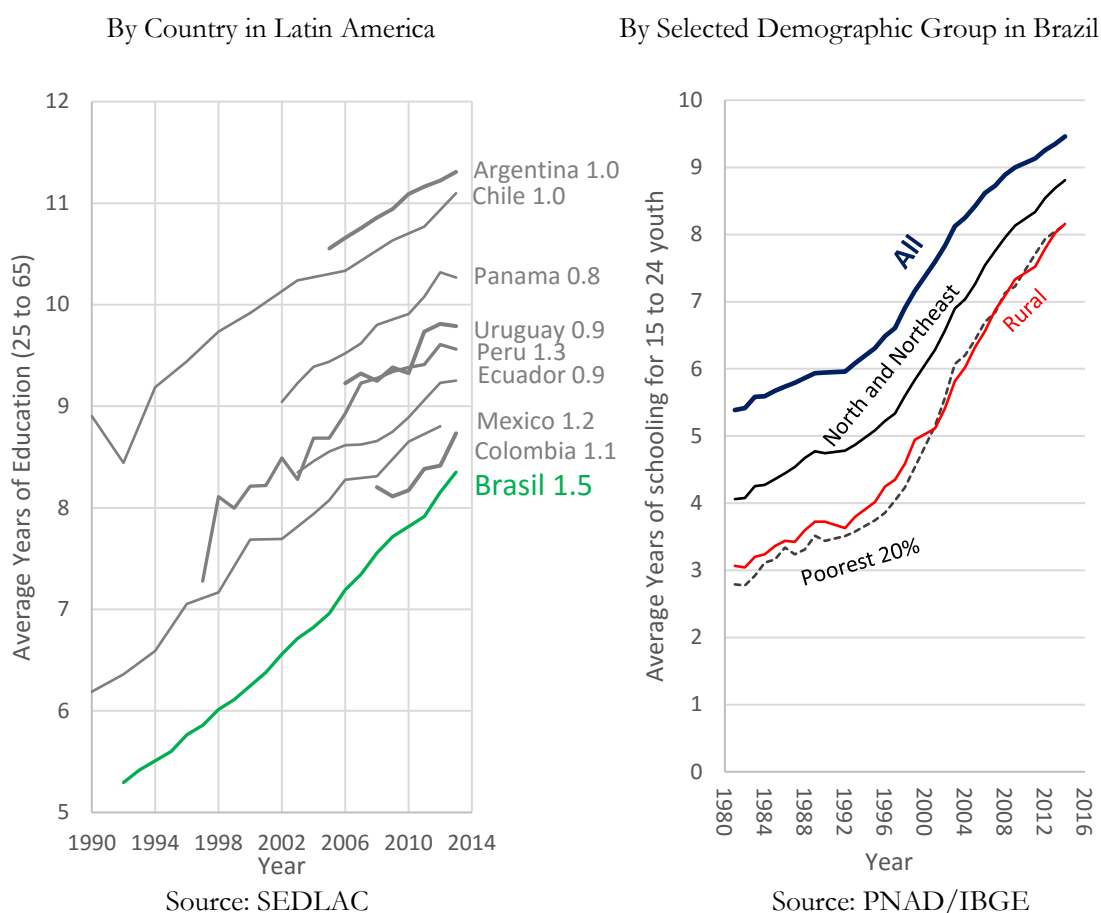
⁶ Hanusheck and Woessman (2008) argue that the link is as strong as suggested by the microeconomic evidence once quality is taken into account, but I do not find their arguments compelling.

⁷ In education jargon, attainment is how many years of successful education or how many grade levels a child (or adult) completes. Achievement, on the other hand, means how much was learned during these years. Achievement is almost always measured by some kind of standardized test.

force has been increasing by 1.5 years of education per decade. This compares to 1.0 for Argentina and Chile or even 1.3 for Peru, the second best placed country.

This is mostly due to good educational policies implemented from the 1990s onwards both by the Federal Government and by several state governments, such as São Paulo, Minas Gerais, and Ceará. This timing becomes clear in the second panel in Figure 8, which shows educational attainment for youth during the same period. It also shows increasingly equal educational attainments, with youth in the two bottom quintiles, rural youth, and youth in the North and Northeast catching up with the national average educational attainment of youth.

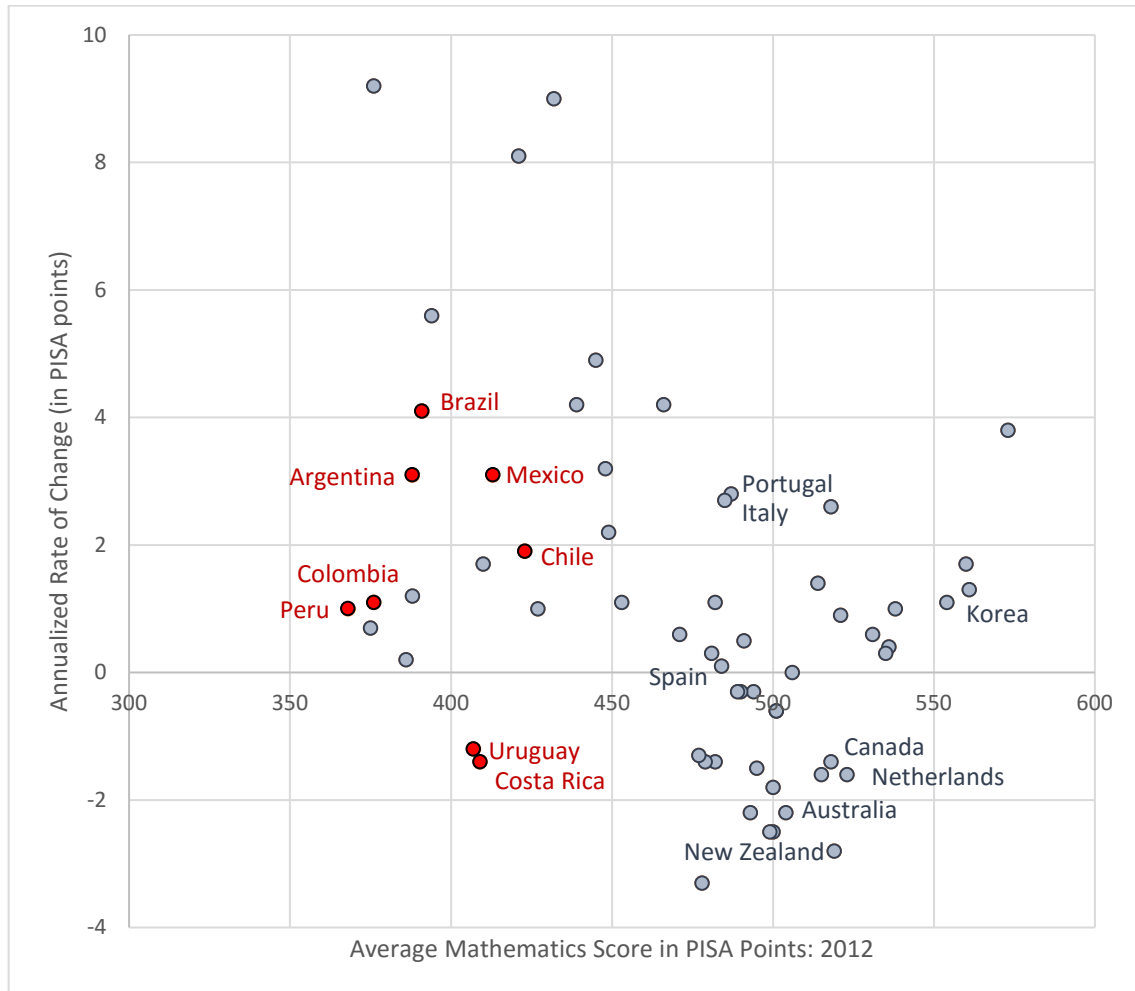
Figure 8: Average Educational Attainment



Finally, Figure 9 shows each country’s position in PISA 2012 in the horizontal axis and how much it improved per year on average since it joined PISA on the vertical axis. Different countries have been in PISA for a different number of years, so the improvement is annualized improvement. Brazil has been in PISA since it began in 2000, and the achievement of our students has been increasing by about 4 PISA points per year for the last fifteen years. Latin American countries are in red and the remaining countries are in blue.

Once again, Brazil is the Latin American country which shows the most improvement. This is no surprise since Figure 9 is the same as Figure 8, from a different point of view. The grade-specific PISA score has not changed much over the last 15 years. The big change is that 16-year-old kids are now in the grades they are supposed to be and this has led to the largest increase in PISA scores in Latin America and one of the largest in the world. This is why in Brazil attainment and achievement are really the same thing – the country increases achievement by improving attainment.

Figure 9: Educational Achievement (PISA)



Source: OCDE

What is the problem with relying on human capital to save GDP? The problem is that Brazilian human capital increased rapidly over the last fifteen years and during this period, labor productivity increased by only 0.7%. For some reason rapidly rising schooling levels are not translating into rapidly rising productivity.

Perhaps as fifteen years of incremental changes in education policy continue to produce increasingly better educated cohorts of youth, more educational attainment will have an effect upon labor productivity, but I believe it will be along the lines of physical capital. There are limits to how much Brazil can get out of it and the limits are low.

7. The Path to Productivity: Less State Capitalism

Economic activity does not occur in an institutional vacuum. Laws, cultural norms, and regulation define in great measure how much each economic agent will make in a given undertaking, and with how much risk. This means that institutions define both the size of the product and how it is divided. In other words, institutions define incentives. Although this has long been accepted as reality, in recent decades, influential authors such as Douglass North (1991), Mancur Olson (2000), and Acemoglu, Johnson, and Robinson (2001) have brought institutions and the incentives they engender into the limelight of studies on economic growth.

Brazil's economic institutions are a result of more than six decades of economic nationalism, state capitalism, and import substitution industrialization. In Latin America, perhaps only in Argentina do economic nationalism and state capitalism have such deep roots. In Brazil, continuous and profound state intervention in the economy through state owned companies, development banks, selective tax breaks, high tariff barriers, and rules such as minimum national content⁸ are legitimate and popular with large swathes of the public, with most politicians, and in academia. These highly interventionist institutions served the country well and long from the end of the Second World War until the debt crisis of the 1980s. Considering that during this period Brazil's product grew at rates close to those of Japan, Korea, or the other superstars of industrialization, the legitimacy of state capitalism and economic nationalism appears to be well deserved.

I will argue here, however, that these institutions have long outlived their usefulness and that today they are leaden chains keeping Brazil from high economic growth. To do so, data on institutions is important. Unfortunately, data on these types of institutions is sorely lacking. I will try to make do with what is available.

Economic Openness

One of the most important characteristics of Brazilian economic nationalism has been a closed economy. Although our economy today is a far cry from the almost total autarky of the 1970s, and there was an important liberalization of foreign trade during the early 1990s, it is still the most closed economy of Latin America. The three panels of Figure 10 show each an indicator of how closed each Latin American economy is: the number of days for imports to clear customs,⁹ the number of days for exports to clear customs, and the average industrial tariff. Each of these indicators is found in the vertical axis of each of the three panels. On the horizontal axis is the

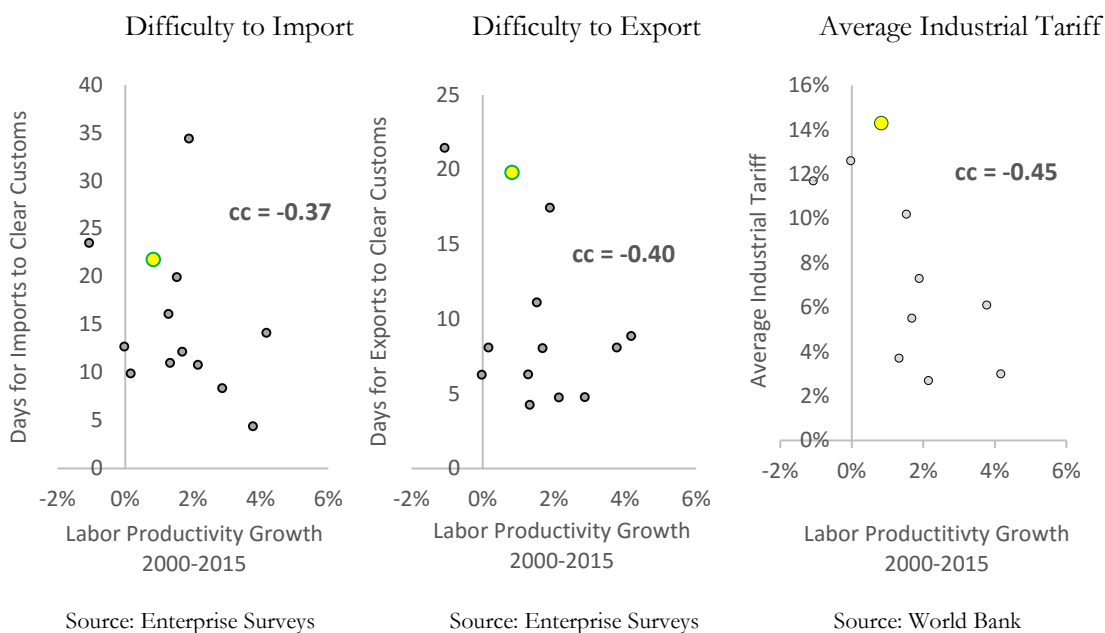
⁸ Matthew Taylor (2015) has a very good list of the characteristics of State Capitalism in Brazil. Although inspired on his, mine is slightly different.

⁹ I thank Masoomah Khandan for the suggestion to use the enterprise surveys.

average growth rate of labor productivity (the numbers on the right side of Figure 5). Each dot represents a country and the yellow and green dot represents Brazil. The number in grey is the simple unweighted correlation coefficient between labor productivity growth from 2000 to 2015 and whatever indicator is on the vertical axis.

What the three panels above show, with alarming clarity, is that Brazil ranks consistently among the worse in each indicator and that each indicator appears to be inversely related to labor productivity growth.

Figure 10: Relationship Between Labor Productivity and Openness of the Economy



Alexandre Messa (2014) analyzes the recent fall in productivity in our manufacturing (yes, both labor and total factor productivity have been actually falling in Brazilian manufacturing since 2002). His main conclusion is that the principal reason for this fall is that high tariffs for capital goods make investment too expensive and have led to a decrease in the worker-capital ratio.

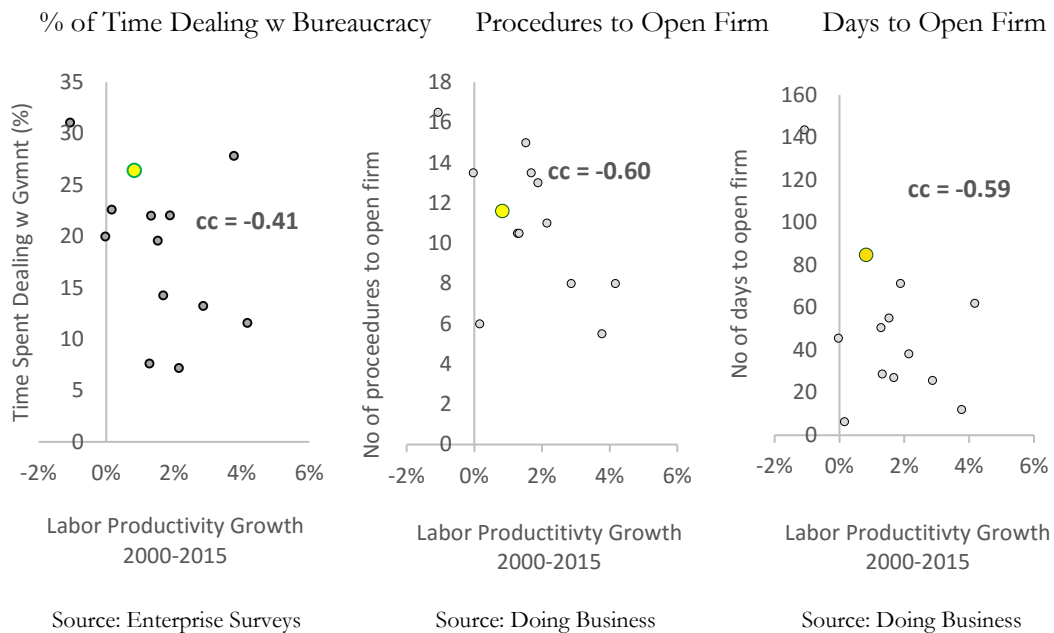
Evidently, three correlation coefficients do not constitute a theory, but it is alarming that in all three cases Brazil is among the worse countries in trade openness. Several authors compare highly interventionist industrial policy in countries such as Korea or Japan to those in Mexico or Brazil. The former successfully negotiated the middle-income trap, while the latter appear trapped in middle-income quicksand with little sign of escape. A conclusion drawn by many is that an outward orientation makes all the difference. Richard Auty (1994), a defender of interventionist industrial policy, classifies interventionist industrial policy as “competitive” and “autarkic”. According to this scheme, while competitive industrial policy provides national producers with the instruments to compete in foreign markets, autarkic policy shields national producers from competition in internal markets. I will leave it to your imaginations as to in which category Brazil falls.

Bureaucracy

Another group of indicators are those related to general government bureaucracy and how much of a toll it takes on the companies and their managers and this is the information shown on Figure 11. Once again the horizontal axis is labor productivity growth from 2000 to 2015 and once again Brazil is the yellow green dot.

Unfortunately, once again, Brazil is at the top of the negative Latin American ranking. It does particularly poorly in days to open a firm and percent of management time dealing with bureaucracy. According to the 2009 Enterprise Survey, more than a quarter of a manager's time was spent dealing with the government. In Chile and Peru, the numbers were 7% and 11%, respectively. A man or woman trying to open a new business will take about seven times longer and have to follow twice as many procedures in São Paulo than in Panama City.

Figure 11: Relationship Between Labor Productivity and Bureaucracy



And it is worse than it looks. Lucas Mation and Diego Mambrin (2015) have taken a look at all proposed Federal, state, and municipal legislation, which, if passed, will have positive effects upon the Doing Business indicators. They assumed that all the legislation is successfully approved and that the effects were those imagined by the proponents of the legislation. They then recalculated counterfactual Doing Business indicators supposing the frontier did not change.

Today, Brazil is in position 120 out of 189 countries in Doing Business and its distance from the frontier indicator is 58 (100 means a country is at the frontier). If the all the legislation passes the Federal, state or municipal legislatures and its effect is that imagined by those proposing the new laws and regulations, Brazil will go from 120 to 109 in rank and its distance from the frontier indicator will increase from 58 to 60 (meaning it will be 2% closer to the frontier). Once again, this

paltry result is what would happen if all the legislation were to be approved and its effects were to be the desired ones.

It is important to note that bureaucracy, whether it is intentional or not, protects incumbents. A firm already in the market has figured out, one way or the other, how to deal with the red tape. This means that bureaucracy reduces productivity both by making managers (and bureaucrats) waste time with pointless paperwork and also by reducing competition by keeping potential new firms out of the market.

Taxes

The final group of indicators available are on taxes. I will abstain here from the high tax/low tax debate as I am abstaining from the debate on the role of an interventionist state to redistribute income, do social policy, and care for the poor.¹⁰ What concerns me in tax policy is how complicated the tax system is (as opposed to how high tax rates are) and whether tax policy is used as industrial policy to concede advantages to one type of industry as opposed to another, thereby reducing competition. For that I have three indicators: indirect tax expenditures as a percentage of GDP, on the one hand, and two measures of how burdensome tax administrations are, on the other.

I hope to capture through indirect tax expenditures how relevant tax breaks for one particular sector are. The indicator is imperfect since it considers “social” tax expenditures, such as taxing food or essential medicines lightly, in the same basket as “industrial policy” tax expenditures, such as tax breaks for automobiles. It does not entirely satisfy me, but it is what I have to work with.

The other two indicators bother me even more. They come from the Enterprise Surveys, as do various other indicators presented here, but they are subjective questions. The Enterprise Surveys contain questions such as “How many days did your imports take to clear customs?” which, however imprecise their measurement, are objective. These are the questions I have used thus far. But the Enterprise Surveys also have some subjective questions such as “How much of a burden are tax administrations?” which can be answered in the categories: None, Minor, Moderate, Major and Severe. These are subjective categories and nothing guarantees that what is considered “severe” in one culture will be “severe” in another.

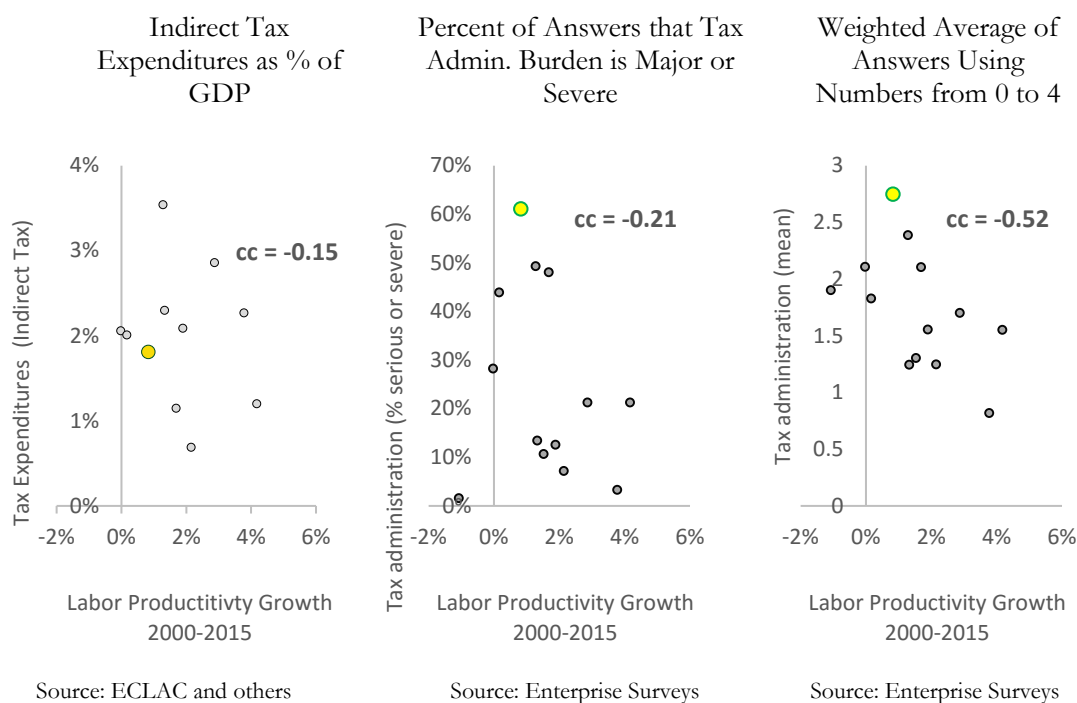
Nevertheless, it is what we have. These subjective questions can be put into two different indicators. The first is the percentage of respondents who state that the burden placed on their firm by tax administrations is either Major or Severe. The second hopes to take into consideration information from all answers by taking the weighted average of all answers by assigning numbers from 0 to 4 for the categories from None to Severe. Neither is very good but the results do make my point with clarity.

What are the results? Indirect tax expenditures/GDP reflects more the tax breaks aimed at improving the lives of the poor as opposed to improving the profits of the very rich. The countries

¹⁰ For the record, I am entirely in favor of a distributive interventionist state, as opposed to a developmentalist distributive state. I highly in favor of taxing the rich and giving the money to the poor.

with the highest ratios are Costa Rica (3.5%), Uruguay (2.9%), and Panama (2.3%). All three uses tax expenditures to make food, medicine, and other essential goods cheaper but none of them use tax breaks as industrial policy. Argentina and Brazil, which do so with relish, come in at 2.1% and 1.8%, respectively. In any case, the correlation between this indicator and productivity is not impressive at -0.15, probably because it measures two things at once.

Figure 12: Relationship Between Labor Productivity and Taxation



With regards to the administrative burden placed by the tax system upon managers, Brazil is back at the top of the negative ranking. Sixty per cent of managers say tax administration in Brazil place a Major or Severe burden upon their firms; in second place comes Costa Rica at 49%. Using the weighted average of answers, Brazil again comes out on top at 2.7 with Costa Rica again in second place at 2.4.

To anyone familiar with the Brazilian tax code, these ratings should not come as surprises. The country has value added taxes at the federal (IPI, COFINS), state (ICMS) and even municipal (ISS – on services) levels. Calculating what percentage of a given product’s price is due taxes is a major undertaking. Valued added taxes have different rates for different products in different states, creating in effect trade barriers within the country that vary by product. Brazil’s tax system is a nightmare it has become used to living in, but the evidence above points to tax administration as one of the prime culprits for low productivity.

Limited as I am to available information, I will not be able to compare the economic performance of countries according to the weight of state-owned enterprises in their economies, nor according

to minimum national content rules, nor the percentage of investment financed by national development banks at concessional rates. But given the information I have shown, Brazil is consistently close to the top of the negative Latin American rankings.

In sum, seven decades of state capitalism and economic nationalism have bequeathed upon Brazil a series of growth-stifling institutions and there are no significant plans, anywhere, to reform them. Many other Latin American countries have been doing much better than Brazil over the last 15 years. Is there anything to be learned from these countries and the changes in their institutions that led them from stagnation to growth?

8. High Labor Productivity in Latin America: Is Pain a Prerequisite for Reform?

Figure 5 shows that while Brazil wallowed with annual labor productivity growth of 0.8% from 2000 to 2015, the same indicator grew by more than 2% in Peru, Uruguay, Panama and Chile. One difference between these two growth rates is that in 35 years the standard of living doubles at 2% but increases by only a third at 0.8%. Another difference is whether labor productivity is falling behind or catching up to the efficiency frontier. Robert Shackleton (2013) estimates the secular rate of labor productivity increase in the United States at slightly less than 2% over the last two centuries. He also expects it to be about 1.7% for the next few decades. If we consider the United States to be the efficiency frontier, then growth of 2% or more means an economy is approaching that frontier, even if slowly. Labor productivity growth of less than 1.7%, on the other hand, means that economy is falling further and further behind this efficiency frontier. So labor productivity growing at a rate above 2% is a goal that must be reached.

If 2% is the goal, what can we learn from the countries in Latin America that have attained it? There are four: Peru, Chile, Panama, and Uruguay. I believe that growth in Panama may be related to a huge capital investment (the Canal expansion) in a small economy. Panama is a showcase for liberal economic policy, but it may be largely capital-driven, so I will concentrate on the other three.

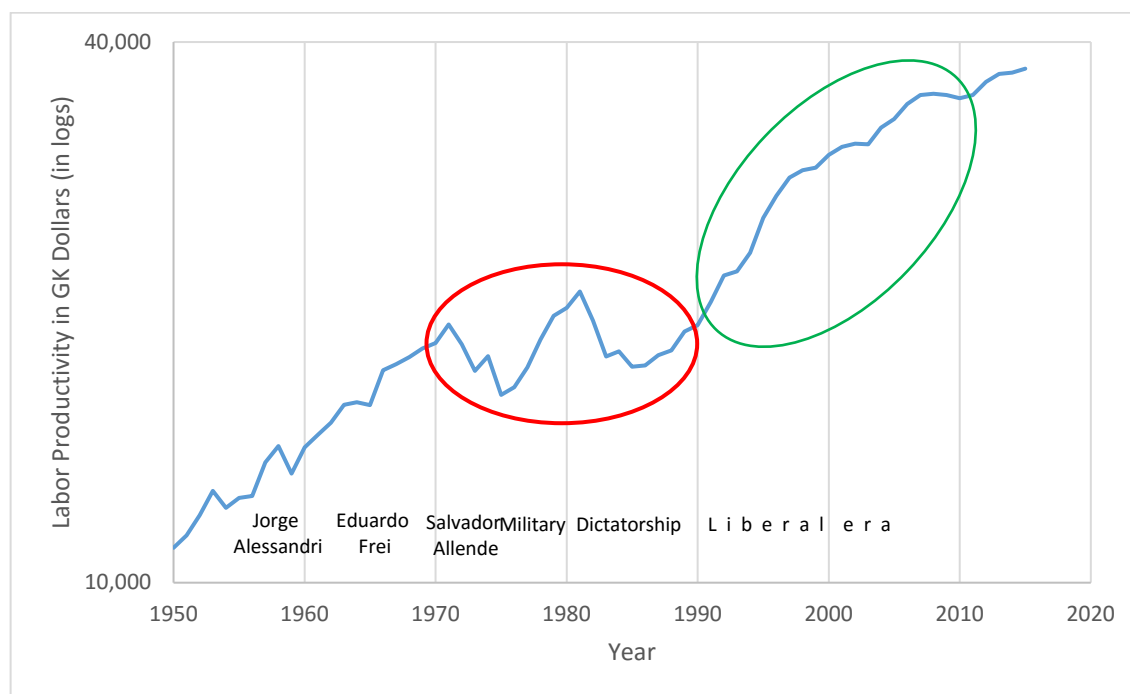
So what is the story of labor productivity in Chile, Peru, and Uruguay?

For each of these three countries I will show how labor productivity evolved from 1950 to 2015. All three have something in common, although Uruguay differs from the other two in crucial aspects.

Figure 13 shows labor productivity in Chile and there are three phases. From 1950 to 1970, productivity grew at a healthy 2.6%. As in the case of most of Latin America, this was a period of import substitution industrialization, high protectionism, and state capitalism. The second phase comprises the Allende Government and the military dictatorship. Labor productivity growth was zero. In addition, there was a hyperinflation, civil unrest followed by a US-supported military coup, more than four thousand people were shot or tortured to death, tens of thousands others survived torture, and hundreds of thousands fled the country. It was an exercise in horror no country should have to live through.

During the dictatorship trade policy was liberalized, and Chile by and large abandoned economic nationalism. The changes were large but should not be exaggerated. Some very important state owned enterprises were never privatized: CODELCO to this day is the world's largest copper producer and CORFO is still financing innovation in Chile, which also has capital controls on the books to this day.

Figure 13: Chilean Labor Productivity Growth from 1950 to 2015



Source: The Conference Board

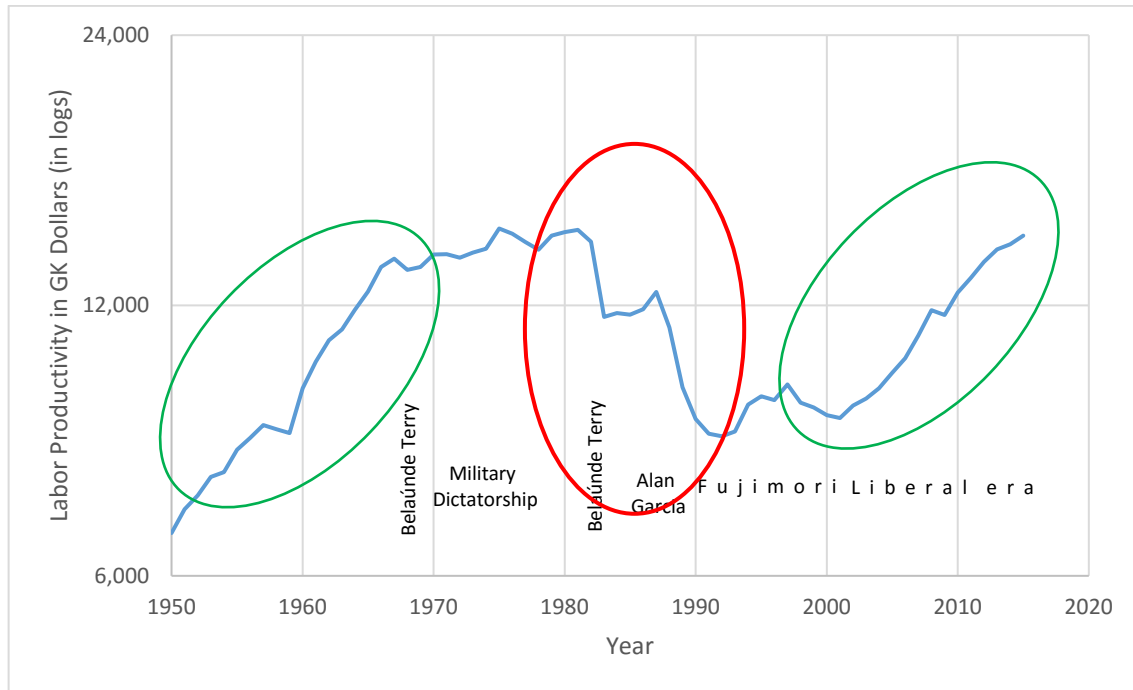
When democracy returned in 1990, the main worry of the *Concertación* governments was how to keep these horrors from happening again. Their recipe was to maintain liberal economic policies begun under the dictatorship and combine them with slowly expanding social policies to reduce poverty and inequality. This is the third phase, when labor productivity expanded once again at 2.6%, although this growth rate has fallen somewhat since about 2005.

While Chile has a history that is different from most Latin American countries and undoubtedly counts on better institutions, the lesson is that a tremendous trauma led to scrapping economic nationalism and to pro-productivity economic institutions.

The trauma is even more evident in Peru. Figure 14 shows four different periods. From 1950 to the beginning of the nationalist military dictatorship in 1968, labor productivity grew at an impressive 4% per year. This was accomplished with economic nationalism and import substitution industrialization, and Peru not only maintained but doubled down on these institutions during the

nationalist military dictatorship from 1968 to 1980. The result was stagnation with labor productivity growing at a mere 0.2% per year.

Figure 14: Peruvian Labor Productivity Growth from 1950 to 2015



Source: The Conference Board

With the return of democracy in 1980, Belaúnde Terry turned once again to the same institutions that had served him so well from 1963 to 1968: economic nationalism and import substitution industrialization. Only this time the result was disastrous. Under Belaúnde Terry and Alan García, labor productivity fell 4.2% per year for an entire decade and inflation exploded to 2775% in 1989. At the same time, the country was taken to the brink of civil war by the *Sendero Luminoso* insurrection and close to 60 thousand people died. This was, to put it lightly, a tremendous trauma and an exercise in horror no country should live through, ever.

In 1990 Fujimori was elected president and looked south. He copied the policies implemented by Chile which seemed to be working out in that country and began to dismantle the institutions of state capitalism and economic nationalism. When power passed to his successors there was no question of changing the liberal economic policies. Even Alan García returned to the presidency in 2006 under a liberal platform, that he unwaveringly adhered to. Labor productivity has grown by 2.1% per year since 1991 and by 3.6% since 2000.

Finally, there is Uruguay. The success after reform after trauma story is harder to sell here. There was success, there was reform, and there was some trauma (thankfully much less than in Peru or Chile), but the order is not trauma, reform, success. Another crucial difference is that no amount of

talk can transform Uruguay into a liberal icon: high growth occurred in a high tax, high spending, and during the last 12 years, socialist governed economy.

From 1950 until the end of the military dictatorship¹¹ in 1985, labor productivity was basically stagnant, growing by only 0.4% per year over a period of 35 years. This was a period of economic nationalism for Uruguay as well. Tariffs were high and productivity low.

With the return to democracy, the economy was opened and labor productivity picked up to 2.9%. According to Luis Bértola and Reto Beronti (2014), the return to democracy was characterized by a policy duality. It was liberal in all aspects related to production: the economy was opened during the 1990s and there was no aggressive industrial policy.¹² It was, however, not at all liberal in social policy: social spending was at around 15% of GDP and the tax burden was above 20% of GDP. My argument is that the policies in favor of labor productivity date from this period.

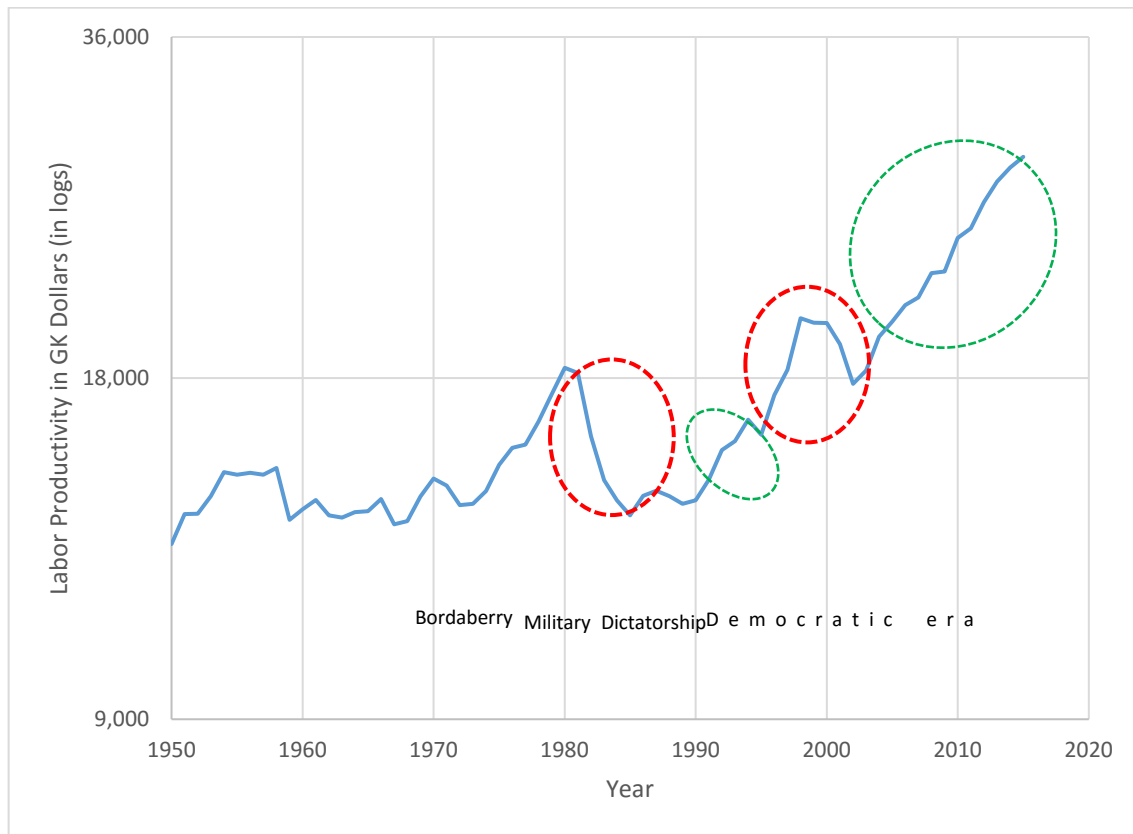
The Brazilian and Argentinian crises in 1998 led to a tremendous contraction of labor productivity by more than 12% in three years. While relatively short, this crisis was particularly acute with deep consequences for poverty and inequality. According to Veronica Amarante and her co-authors (2005), poverty doubled from 15% to 30% of the population from 1999 to 2003. The Gini index increased by three Gini points. Unemployment jumped by about 10 percentage points. While nobody was shot or tortured to death, it was certainly a profound economic crisis that led to a socialist government led first by Tabaré Vasquez and then Pepe Mujica.

While Tabaré Vasquez and Pepe Mujica are certainly no liberals, neither are they economic populists. They wanted to spend even more on social policy and instead of going into debt or printing money they maintained a responsible fiscal policy and increased taxes. In fact, a generalized income tax was introduced for the first time in 2007. Social expenditures rose to more than 20% of GDP and the tax burden increased to 27% of GDP. The minimum wage tripled in real terms, going from 20% to 40% of the median wage. Wage councils increased wages across the board as well. This was inequality-reducing, high tax, high spending socialist government policy. And labor productivity increased during the Tabaré Vasquez and Pepe Mujica years by 3.6%. But the policy duality persisted: the economy remained open and industrial was limited to a horizontal pro-innovation policy.

¹¹ The dictatorship was, as are all dictatorships, traumatic, but it was much less violent than its equivalents in Chile or Peru. Although many were jailed, the dead number in the low hundreds.

¹² As in the case of Chile, changes should not be exaggerated, Uruguay still has plenty of state owned enterprises, particularly in infrastructure.

Figure 15: Uruguayan Labor Productivity from 1950 to 2015



Source: The Conference Board

Uruguay is perhaps the most hopeful story to tell. The main takeaway policy lesson is that one can keep a strongly interventionist social state and still have high productivity growth as long as one keeps one's distance from economic nationalism and state capitalism. Another, equally hopeful, takeaway lesson is that the reforms necessary for increasing productivity in middle income nations in this century does not require thousands of dead, hyperinflation, or tremendous falls in the standard of living.

9. Let Us Now Look at Brazil

No other Latin American country enjoyed so much growth for so long as Brazil from 1950 to 1980. Labor productivity grew by 3.3% over three decades with colossal doses of state capitalism, economic nationalism, and import substitution industrialization. Growth was high both during civilian rule and the dictatorship. Furthermore, the economic institutions used by Juscelino Kubitschek or General Ernesto Geisel to spur on industrialization were much the same.

During these golden growth years, Brazil was a very different country from today. According to the 1960 Census, more than half of our labor force was employed in agriculture, which produced only

18% of GDP. Dividing one by the other shows that labor productivity in agriculture was about 40% that of the rest of the economy. Moving people out of agriculture (preferentially into industry) was the best way to increase labor productivity. When the productivity differences between sectors are that large, the objective is to move labor out of agriculture as quickly as possible.

Table 1 shows that in the 31 years from 1950 to 1981, 30% of the labor force quit agriculture (netting population growth, of course), meaning that every year 1% of the labor force was leaving agriculture, a sector in which productivity was on average one third that of the economy as a whole. Conversely, 10% of the labor force (netting population growth) entered industry, whose productivity was on average twice that of the economy as a whole, during the same period. On the other hand, in the 15 years from 1981 to 1996, only 5% of the labor force left the agricultural sector, which is a rate 1/3 that of the high growth years.

Table 1 – Labor, Value Added, and Relative Labor Productivity from 1950 to 1996

| Year | 1950 | 1960 | 1970 | 1973 | 1981 | 1990 | 1996 |
|-----------------------|------|------|------|------|------|------|------|
| Labor Share | | | | | | | |
| Agriculture | 59.9 | 54.0 | 45.8 | 40.8 | 29.3 | 23.5 | 23.5 |
| Industry | 13.7 | 12.9 | 18.6 | 20.2 | 24.7 | 22.5 | 20.2 |
| Services | 21.0 | 26.4 | 29.0 | 30.4 | 36.2 | 42.7 | 45.5 |
| Value Added Share | | | | | | | |
| Agriculture | 25.1 | 18.3 | 12.3 | 12.6 | 11.2 | 8.1 | 5.5 |
| Industry | 25.0 | 33.2 | 38.3 | 41.9 | 44.3 | 38.7 | 26.0 |
| Services | 53.3 | 51.5 | 56.2 | 51.3 | 55.2 | 70.3 | 68.5 |
| Relative Productivity | | | | | | | |
| Agriculture | 0.42 | 0.34 | 0.27 | 0.31 | 0.38 | 0.35 | 0.23 |
| Industry | 1.82 | 2.57 | 2.06 | 2.08 | 1.80 | 1.72 | 1.29 |
| Services | 2.54 | 1.95 | 1.94 | 1.69 | 1.52 | 1.65 | 1.50 |

Source: IBGE Estatísticas do Século XX and PNAD

Even increases in industrial labor force productivity came from mostly from structural change as labor shifted from less productive industries, such as textiles, to more productive ones, such as metallurgy and automobiles. A simple shift-share counterfactual shows that 67% of the increase in the productivity of manufacturing from 1950 to 1960 came from in changes in the composition of the labor force within manufacturing.¹³ Particularly important was a decrease in the share of employment in textiles (alone responsible for 22% of the increase in industrial labor productivity) and an increase in metallurgy.

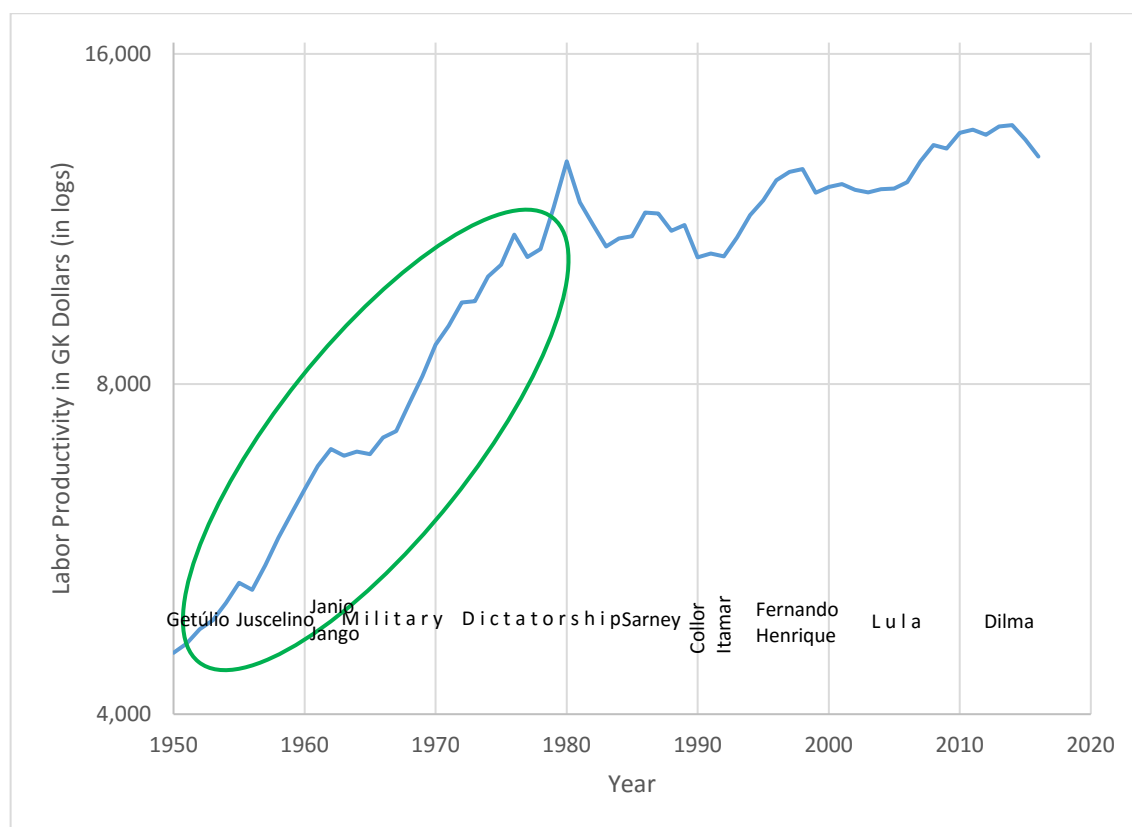
These were the years in which labor productivity was a result of structural change as the composition changed between one digit (agriculture to industry) and two digit (textiles to metallurgy, for example) sectors. And for that, Brazil had the perfect institutions.

¹³ This decomposition uses 18 two-digit sectors.

With concessional loans from BNDES and a host of other state financing institutions, companies needed not worry about lack of financing for investments in manufacturing. With almost infinite import barriers, they did not need to worry about competition from abroad. With internal barriers to entry, incumbents needed not worry about internal competition, either. The incentives were to speed up structural transformation, which is the best policy when labor productivity differences are large and the employment profile is very different from that of the countries on the frontier.

Profits were assured and the race to industrialize was on.

Figure 16: Brazilian Labor Productivity from 1950 to 2015



Source: The Conference Board

The somber side of these same institutions was that they encouraged complacency and low productivity. Why make the immense effort searching for productivity if there is no competition and more profits can come merely from increasing scale? Even as the seeds of success matured, the seeds of demise were sown.

Industries established themselves with low productivity and as import substitution industrialization reached further and further down the productive chains, this lack of productivity was likewise propagated to the whole economy. Since they were protected, there was scant incentive to

undertake the gut-wrenching changes that bring on higher productivity. Even if, when established, Brazilian industries were on the frontier, as the frontier moved on they fell behind. The result was an accumulation of inefficiency: when the economy was partially opened in the early 1990s, industrial productivity jumped by over 7% per year for almost a decade, as shown by José Luis Rossi and Pedro Ferreira (1999).

With the increasing importance of politically determined investment, such as that financed by BNDES and undertaken by Petrobras, the marginal productivity of capital also decreases. The first bump of BNDES-financed investment may stave off a recession, but the tenth will simply increase the stock of low productivity capital.

The external environment also changed for the worse for countries with institutions such as ours. As has been amply discussed in the literature, the pace of innovation has increased and the massive pyramidal corporation à la General Motors has given way to decentralized global value chains. Economic nationalism policies such as high tariffs and national content rules have locked Brazil out of these chains.

Finally, the explanation most favored along the lines of this paper is the gradual exhaustion of the very low productivity labor force. The very low productivity rural labor force of yesterday is today almost all in industry or in services. Women have already gone into the labor force. The population will no longer grow meaning that this channel for labor force growth is also gone. The low hanging fruits of structural change moving people between sectors have been taken.

While the crisis in the early eighties and the subsequent hyperinflation were certainly no laughing matter, at the time nobody looked to Brazilian economic institutions when searching for culprits. On the contrary, the military dictatorship and the debt crisis received all the blame. How could anyone find fault in institutions that had given Brazil such fantastic growth for so long?

By now it will have dawned upon the reader that I am trying to explain something that changed – the rate of growth in productivity in Brazil – by something that has not – its economic institutions. While arguably philosophically this requires some explanation, it is no invention of mine.

Daron Acemoglu, Fabrizio Zilibotti, and Philippe Aghion (2006) show empirically that in countries with high internal barriers to entry into their markets (those with economic nationalism and state capitalism in my terminology), there is a strong negative relationship between their distance to the frontier and their growth rate – poor countries will grow faster than rich ones. In countries with low internal barriers, the relationship is almost flat. This means that the ideal growth strategy is to use economic nationalism when a country is very poor but then circumvent the middle income country trap by liberalizing the economy and adopting an outward orientation.

The authors explain these observations with a model in which firms engage in copying and/or adopting technologies from the world frontier and also in innovation activities. The closer an economy is to the world technology frontier, the higher the relative importance of innovation relative to imitation as a source of productivity growth. This means that once countries reach a certain GDP level, if they do not switch to low barrier mode, they fall into the middle income country trap. While I do not believe in explaining productivity entirely as a consequence of innovation, their model does replicate the facts I have shown here.

Closer to the explanation I prefer, Thomas Holmes and James Schmitz (2010) look at eight studies of natural experiments which increased competition – sometimes dramatically – in various US markets. Some examples are the impact of the arrival of railroads on long range river and coastal shipping, the impact of Walmart entry on pre-existing retail firms, and the impact of ADM on Intel’s production of microprocessors. All the studies find that productivity increased – sometimes dramatically – with the arrival of the competition. Furthermore, almost all studies find that the increase in productivity was due mostly to within-firm increases rather than unproductive firms being driven out of the market. Being from the Minneapolis Fed, Holmes and Schmitz mostly blame the unions for the inefficiencies that were destroyed by the arrival of competition.¹⁴ But even when no union story is remotely possible, such as in the case of Walmart’s arrival in a given market, the studies find large increases in with-in firm productivity.

My interpretation once again related to the relation between structural transformation and competition. When you have large gains to be made through changing sectors high competition policy may not be the best since state capitalism may encourage capital and labor to move faster. But when the objective is within firm or within sector increases in productivity, competition is the best policy to bring this about.

In conclusion, economic nationalism or state capitalism may increase the rate of growth of labor productivity by accelerating structural transformation as occurred in Brazil from 1950 to 1980, but once the gains of productivity depend upon changes that occur within a given sector, or even within a given firm, these same institutions retard productivity growth.

Back to recent history, there was some reform by the Collor and Fernando Henrique administrations – and it appears to have led to increases in productivity (particularly in the tradeable sector) from 1992 to 1998, documented by José Luis Rossi and Pedro Ferreira (1999). But the changes have been hesitant and many of them have been since undone. No politician – certainly not Fernando Henrique – wants to wear the “neoliberal” label pinned to his collar.

When Lula was elected president he kept the economic policy of his predecessor for his first four-year mandate, then he reversed course and began increasing state capitalism and economic nationalism. BNDES increased its lending to a quarter of national investment, Petrobras increased national content rules, tariffs began to creep upwards again, all in addition to rampant post-Keynesian macro policy with declining budget surpluses. In response to the commodity price fall, Dilma Rousseff doubled down on these same policies. The result has been the worst recession since the early 1980s. In 2017 or 2018 our labor productivity may be growing again, but it will be at the same snail’s pace as before.

¹⁴ In some cases, such as long distance river and coastal shipping, their case is quite compelling.

10. Conclusion

And this is where Brazil is today: burdened by obsolete institutions, falling further and further away from both the efficiency frontier and its more successful Latin American neighbors. The numbers are damning, the international comparisons even more, and yet there is little movement towards change.

Why is it so hard? That firms receiving concessional loans will kick and scream, lobby, and pay lawyers and congressmen to keep their privileges is not news. That firms shielded from competition by the highest tariffs in Latin America will do the same to keep out foreign products is expected. That the politicians who run a state owned enterprise to their benefit will do anything to keep it is likewise not surprising. All of the state capitalism and economic nationalism institutions that Brazil has built over the last seventy years have powerful constituencies defending them today.

What is surprising is the degree of academic, political, and popular legitimacy that these institutions enjoy. Among economists, those aligned with state capitalism are not a small minority but a large group (perhaps even a majority). Among politicians, precious few are those who would openly defend that “our” firms should not receive preferential treatment and that “our” market should not be used to benefit “our” firms. Reforming economic institutions in Brazil will be, to put it lightly, an uphill battle.

But change them we must if we are to get labor productivity growing at 2% or more. Those constituencies who reap benefits from the numerous monopolies we have created will scream in pain as their rents are lost. But we must not listen, for these screams will be none other than the sweet music of productivity.

References

- Acemoglu, Daron, Fabrizio Zilibotti, and Philippe Aghion (2006). "Distance to Frontier, Selection and Economic Growth" in *Journal of the European Economic Association* 4(1):37–74. March.
- Amarante, Verónica; Arim, Rodrigo; Rubio, Mónica; Vigorito, Andrea (2005). *Pobreza, red de protección social y situación de la infancia en Uruguay*. Inter-american Development Bank. February. (<https://publications.iadb.org/handle/11319/3984>)
- Auty, Richard (1994). *Economic Development and Industrial Policy: Korea, Brazil, Mexico, India and China*. Mansell Publishing.
- Becker, Gary S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.
- Bertola, Luis and Bertoni, Reto (2014). *Sinuosa y Convulsiva: La Economía Uruguaya en el Último Medio Siglo*. In *Uruguay + 25: Documentos de Investigación*. Eds. Harari, Leo; Mazzeo, Mario; Alemany, Cecilia. Fundación ASTUR.
- Bosworth, Barry and Collins, Susan M. (2003). *The empirics of growth: An update*. *Brookings papers on economic activity*, 2003(2), 113-206.
- Daron Acemoglu, Simon Johnson, James A. Robinson (2001). *Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution*. NBER Working Paper No. 8460. September.
- De Negri, Fernanda and Cavalcante, Luiz Ricardo (2014). *Os Dilemas e os Desafios da Produtividade no Brasil*. In *Produtividade no Brasil: Desafios e Determinantes*. Eds: De Negri, Fernanda and Cavalcante, Luiz Ricardo.
- Douglass C. North (1991). *Institutions in The Journal of Economic Perspectives*, Vol. 5, No. 1 Winter, pp. 97-112.
- Gordon, Robert J. (2010) *Revisiting U. S. Productivity Growth Over the Past Century with a View of the Future*. NBER Working Paper 15834. (<http://www.nber.org/papers/w15834>)
- Hanushek, Eric A. and Wößmann, Ludger (2008). *The Role of Cognitive Skills in Economic Development*. SIEPR Discussion Paper No. 07-34. Stanford University. March. (<http://www-siepr.stanford.edu/repec/sip/07-034.pdf>)
- Holanda Barbosa, Ana Luiza N. (2014) *de Um Retrato de Duas Décadas do Mercado de Trabalho Brasileiro*. In *Novo Regime Demográfico: Uma Nova Relação Entre População e Desenvolvimento*. IPEA. Ed: Camarano, Ana Amélia.
- Homes, Thomas J. (2010) *Competition and Productivity: A Review of Evidence*. Federal Reserve Bank of Minneapolis Research Department Staff Report 439 February.
- Mation, Lucas F. and Mambrin, Diego R. (2015) *Impactos das Reformas em Curso para Melhoria do Ambiente de Negócios no Brasil no Indicador Doing Business Report*. Radar no 40, August. (http://www.ipea.gov.br/portal/images/stories/PDFs/radar/150917_radar_40_cap3.pdf)
- Messa, Alexandre (2014). *Determinantes da Produtividade na Indústria Brasileira*. In *Produtividade no Brasil: Desafios e Determinantes*. Eds: De Negri, Fernanda and Cavalcante, Luiz Ricardo.
- Mincer, Jacob (1958). *Investment in human capital and personal income distribution*. *The journal of political economy*, 281-302.
- Olson, Mancur (2000). *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships*, Oxford University Press
- Pritchett, Lant (1996). *Where Has All the Education Gone?* World Bank Policy Research Working Paper No. 1581. March.

- Rocha, Sonia (2002). A Investigação do Rendimento na PNAD – Comentário e Sugestões à Pesquisa nos anos 2000. IPEA Discussion text no 899. Rio de Janeiro, August de 2002
- Rossi Jr, José Luiz, and Pedro Cavalcanti Ferreira. (1999) "Evolução da produtividade industrial brasileira e abertura comercial." Pesquisa e Planejamento Economico, v. 29, n. 1, April.
- Shackleton, Robert (2013). Total Factor Productivity Growth in Historical Perspective. Working Paper Series 2013-01. Congressional Budget Office Washington, D.C. March.
- Taylor, Matthew (2015). The Unchanging Core of Brazilian State Capitalism, 1985-2015. American University School of International Service Research Paper No. 2015-8. October.

Annex: Data

Labor productivity

The Conference Board (<https://www.conference-board.org/data/economydatabase/>) publishes labor and total factor productivity studies. What I use is labor productivity (1) which is GDP divided by employment. There is also labor productivity (2) which is GDP divided by hours worked. Comparisons in levels between countries (which I do not use) are by Geary-Khamis Purchasing Power Parity.

The PNAD

The Pesquisa Nacional por Amostra de Domicílios (PNAD). The first PNAD dates from 1976 and the last one from 2015 (to be released at the end of 2016). The PNAD has always been a large survey, with over a hundred thousand households and close to four hundred thousand individuals. This large sample is necessary because it covers the entirety of the country (bar the rural north until 2004) and the results need to be statistically significant for each of the 27 states in the Federation. It is carried out once per year, except during census years, and goes to the field in the third quarter of each year. From 1976 until 1979 there were four PNADs, whose questionnaires differed from year to year as IBGE struggled to find the right approach. In 1981 a standard questionnaire was agreed upon and the PNAD became highly comparable from 1981 to 1990.

After the 1991 Census, the PNAD was back in 1992 but with an entirely new remodeled questionnaire. While much better than the previous one, there was no transition period so to this day we are unsure whether some changes from 1990 to 1992 are real or merely reflect the new instruments. While the changes were everywhere in the questionnaire, the most relevant change in labor market participation was that for the 1981-1990 series the question was not structured and thereafter it was. For the 1981-1990 series the participation question asked what each individual did allowing him or her to choose between working, looking for work, studying, taking care of the home, and being retired. This was asked in one question so that the individual could not reply that he or she both worked and did chores at home, for example. The 1992 to 2015 series, on the other hand, asked each question separately, allowing someone to declare that he or she had both worked and studied or both worked and took care of the home. This methodological change will not greatly affect the answers of prime age males but will greatly affect the answers of secondary workers such as wives, sons, and daughters. The new design was more or less kept the same from 1992 until the last PNAD in 2015. This means that the period covered by the PNAD is 39 years although there are only 35 surveys. Overall, it is a brilliant achievement. The PNAD provides a history of yearly statistics reflecting numerous aspects of Brazil's society as it changed from a mostly rural rapidly industrializing nation to a post-industrial intensely urban economy suffering from endemic slow growth.

Savings and Investment

Data are from the 2016 IMF World Economic Outlook Database (<http://www.imf.org/external/pubs/ft/weo/2016/01/weodata/weoselgr.aspx>).

Education

Attainment data are calculated using homogenized household surveys and can be found on SEDLAC tables (<http://sedlac.econo.unlp.edu.ar/esp/estadisticas.php>). PISA data comes from the 2012 PISA report <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf> (Page 5). PISA refers to the Programme for International Student Assessment, which is a standardized test that assesses the extent to which 15-year-old students have acquired key knowledge and skills in the areas of language, mathematics, and science. PISA rounds occur every three years and Brazil has been with PISA since the first round in 2000.

Enterprise Surveys

These are firm-level surveys undertaken in a sample of firms for a 135 economies. The surveys cover business environment topics. They have been collected since 2002 from face-to-face interviews with managers and owners in over 130,000 companies in 135 economies. They are collected by the World Bank. For Latin America two years are available. Microdata can be found at:

(<https://www.enterprisesurveys.org/Portal/Login.aspx?ReturnUrl=%2fportal%2felibrary.aspx%3fclid%3d14&clid=14>).

Doing Business

This is another World Bank based project which provides measures of business regulations and their enforcement across 189 economies and selected cities at the subnational and regional level. The 2016 covers 11 indicator sets and 189 economies. The data do not come from surveys but rather from experts (accountants and lawyers) who estimate how much time it takes to pay taxes, how long it takes to open a firm, how hard it is to obtain electricity and so on. Detailed information is on: (<http://www.doingbusiness.org/>).

Indirect Tax Expenditures

Tax expenditures are not really expenditures, but they are forgone income from tax breaks. They have been collected primarily by CEPAL: *Gastos Tributarios: La Reforma Pendiente*. Luiz Villela, Andrea Lemgruber y Michael Jorratt.

(http://www.cepal.org/ilpes/noticias/paginas/5/38375/luiz_villela_gtlareformapendiente.pdf) Information can also be found at: Centro Interamericano de Administraciones Tributarias. *Gastos tributarios en América Latina: 2008-2012*. Miguel Pecho Trigueros. Marzo 2014. Dirección de Estudios e Investigaciones Tributarias Documento de Trabajo N° 2-2014.

Estatísticas do Século XX

IBGE consolidated a considerable amount of information on the Twentieth Century in the site <http://seculoxx.ibge.gov.br/>. While no microdata area available here – these are still available only in each survey's specific site – there are long series of population and economic statistics. In particular, data on industrial value added and employment are available here <http://seculoxx.ibge.gov.br/economicas/contas-nacionais> for the 1947 to 1989 period.