Is Brazil New Industrial Policy Working?

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President, Brazilian Agency for Industrial Development

March 29, 2012
1. Brazil: an economic outlook
2. The *Plano Brasil Maior*
3. How is the policy performing?
4. Opportunities for innovation projects in/with Brazil
5. Final remarks
Brazil's Economic Outlook
Brazil now ranks as the 6th largest economy in the world.

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>United States</td>
<td>15.1</td>
</tr>
<tr>
<td>China</td>
<td>7.0</td>
</tr>
<tr>
<td>Japan</td>
<td>5.9</td>
</tr>
<tr>
<td>Germany</td>
<td>3.6</td>
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<tr>
<td>France</td>
<td>2.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.6</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2.5</td>
</tr>
<tr>
<td>Italy</td>
<td>2.2</td>
</tr>
<tr>
<td>Russia</td>
<td>1.9</td>
</tr>
<tr>
<td>India</td>
<td>1.8</td>
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</tbody>
</table>

* 2011 GDP: IMF
** GDP Growth in 2012: WEO/IMF updated in January 2012
For Brazil Ministry of Finance Estimates
In the macroeconomic scenario, the interest rate shows a downward trend...

...going down from 26.5% in 2003 to 9.75% in 2012.
...while the investment rate experiences a steady growth over the years...

...being forecasted to reach 24% of GDP by 2014.

* Projection from the Ministry of Finance
Source: IBGE and MF
The public sector effort to reduce the nominal deficit is paying off...

![Nominal/Fiscal Public Sector Result (%PIB)](image)

Source: Ipeadata and Ministry of Planning
2012 to 2013: Ministry of Planning target
... and the public sector debt has decreased from 60.4% to 36.5% of GDP.

* Preliminary data from the Central Bank of Brazil
Source: Central Bank and Ministry of Finance
Macroeconomic stability paved the way for the 2003-2011 growth cycle, during which 17.3 million new formal jobs were created...

... and Brazil’s unemployment level came to be one the lowest in the world.

Source: Bloomberg
Elaboration: Ministry of Finance
The economic cycle of growth with social inclusion fostered the expansion of the middle class.

Composition of Brazilian Social Classes (millions of people)

<table>
<thead>
<tr>
<th>Class</th>
<th>2002</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Class</td>
<td>7.2</td>
<td>9.6</td>
</tr>
<tr>
<td>B Class</td>
<td>7.3</td>
<td>10.4</td>
</tr>
<tr>
<td>C Class</td>
<td>67.5</td>
<td>95.0</td>
</tr>
<tr>
<td>D Class</td>
<td>46.1</td>
<td>44.5</td>
</tr>
<tr>
<td>E Class</td>
<td>46.6</td>
<td>28.9</td>
</tr>
</tbody>
</table>

Total: 175 million

Total: 188 million

Source: FGV
Elaboration: Ministry of Finance
Growth with social inclusion brought about falling inequality...

Gini Index

<table>
<thead>
<tr>
<th>Year</th>
<th>Gini Index</th>
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</thead>
<tbody>
<tr>
<td>1960</td>
<td>0.5367</td>
</tr>
<tr>
<td>1970</td>
<td>0.5828</td>
</tr>
<tr>
<td>1979</td>
<td>0.5902</td>
</tr>
<tr>
<td>1990</td>
<td>0.6091</td>
</tr>
<tr>
<td>2001</td>
<td>0.5957</td>
</tr>
<tr>
<td>2009</td>
<td>0.5448</td>
</tr>
<tr>
<td>2010</td>
<td>0.5377</td>
</tr>
<tr>
<td>Jan/12</td>
<td>0.519</td>
</tr>
</tbody>
</table>

Source: CPS/FGV
... and poverty in being eradicated due to the implementation of smart welfare programs.

* Poverty rate correspond to the relation of E-class individuals by total population
** Preliminary data
Source: FGV
Brazil experienced a strong growth in manufacturing in the period before the 2008 crisis...

Production Index – Manufacturing Industry
(average 2002 = 100, seasonally adjusted)
...but after the 2010 recovery, manufacturing growth lagged behind other countries in 2011.
In fact, because of structural weaknesses, the share of manufacturing in Brazil’s GDP has been being reduced.
Brazil has been seriously affected by the supremacy in manufacturing of emerging Asian countries...

Manufacturing industry (% of value added)
...and the Country is underperforming in manufacturing productivity growth: productivity gains are not steady and depend mainly on excess capacity.

(Output / Worked Hours)

Source: Ipeadata
A symptom of that is a worrying 2.3% current account deficit in 2011, from a 1.8% surplus in 2004.

Source: Ipeadata
The hard fact is that manufacturing exports are growing slower than imports.
On the other hand, manufacturing competitiveness also depends on value creation through R&D...

... and Brazil still has a long way to go in that front...

R&D Expenditure for Selected Countries (% of GDP, 2008)

Source: Ministry of Science, Technology and Innovation
...despite the fact that R&D expenditure in Brazil has been growing since 2004.

Source: Ministry of Science, Technology and Innovation
The Brazilian Industrial Policy

"Plano Brazil Maior"
The main challenge for Brazil’s Industrial Policy is to increase productivity.

- 2012 onwards: intensive growth driven by production efficiency and innovation!

### Value creation
- Labor force qualification
- Production efficiency
- Innovation

### Cost reduction
- Energy & basic materials
- Labor force
- Capital
Brazil counts with some important assets for the productive transformation that is being aimed...

- A large and dynamic domestic market that can sustain growth
- Trade surplus from commodities
- Clusters of innovative companies that can lead manufacturing upgrade
- Scientific competencies that can be linked to innovative companies
- Abundance of natural resources creates business opportunities
- Public procurement to support the development of new technologies, like in health and infrastructure projects
...and the challenges to be faced are clear for the Government and the manufacturing sector.

**Challenges**

- To modernize manufacturing and resume productivity growth
- To deal with the currency appreciation under East Asian competition
- To accelerate investment in physical infrastructure
- To leapfrog the performance of basic education
- To promote professional and engineering training in large scale
Plano Brasil Maior has a clear focus and puts emphasis on innovation and the development of technology capabilities in complex manufacturing and production services value chains and systems.
The *Plano Brasil Maior* is organized in three main dimensions:

**Structural Dimension:** sectoral guidelines
- Strengthening Production Chains
- New Technological and Business Competencies
- Energy Supply Chain
- Diversification of Exports and Internationalization
- Competence in the Natural Knowledge Economy

**Systemic Dimension:** cross-sectional topics
- Foreign Trade
- Investment
- Innovation
- Professional Development and Qualification
- Sustainable Production
- Competitiveness of Small Businesses
- Special Regional Development Actions
- Consumer Well-Being
- Labor relations and working conditions

**Sectorial Organization**
- Mechanics, Electro-electronics and Health Systems
- Scale Intensive Systems
- Labor Intensive Systems
- Agribusiness Systems
- Trade, Logistics and Services
<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Oil &amp; Gas and Shipbuilding (supply chain); Health Complex; Automotive; Aeronautics and Space; Capital Goods; ICT; Defense Complex</td>
<td>Chemical-Petrochemical; Fertilizers; Bio-ethanol and Renewable Energies; Mineral-Metallurgy; Cellulose and Paper</td>
<td>Plastic; HPPC; Footwear and Artifacts; Textile and Apparel; Furniture; Toys; Civil Construction complex; Production Support Services</td>
<td>Meat and Derivatives; Grains and Pulse; Coffee and related Products; Fruit and Juices</td>
<td>Retail and Wholesale; Trade Logistics and Personal Services for family consumption</td>
</tr>
</tbody>
</table>
Such a complex endeavor will only be possible with a robust public-private governance scheme.
Main Actions

- **Incentives to Investment and Innovation**
  - Tax Relief
  - Financing for Investment and Innovation
  - Legal Framework of Innovation

- **Foreign Trade**
  - Tax Relief on Exports
  - Trade Defense
  - Financing and Guarantee for Exports
  - Trade Promotion
Main Actions

- Industry and Domestic Market Defense
  - Tax Exemption on Payroll
  - Special Automotive Regime
  - Government Procurement
  - Harmonization of Funding Policies
Is Plano Brasil Maior working?
Reduction of factors’ costs & economy wide costs

- Relief of the tax burden over the payroll
  - Welfare tax over the payroll (20%) was zeroed for different sectors
- Improved set of BNDES’ long term funding mechanisms
- Taxes on capital goods were lowered
- The interest rate has been steadily reduced
- Tax regimes for businesses’ incorporation were enlarged – Simples & MEI
- Mesures to lower energy costs are being designed
Innovation and Technological Development

- Brazil’s Innovation Agency (Finep) expenditure grew 24 x since 2002
- Finep’s disbursement: ~R$ 6.5 bi in 2011 → + R$9 bin in 2012 (target)
- Science and Technology Development Fund grew +3 x since 2004 (R$ 1.96 bi)
- New and/or improved BNDES financial lines to support innovation
- Innovation Law (Bayh-Dole Act like) – 2005
  - Amended in 2011 to support advanced procurement for innovation
- New legal mandate for the Brazilian Institute for Metrology, Quality and Technology
- Science Without Borders – 100,000 STEM students to be sent abroad
- Brazilian Industrial Innovation Corporation (Embrapi) set up in 2011 – 6 institutes
- Public procurement for innovation – preference margins mechanism set in 2012
- 9 PPPs in the health industry complex
- Number of companies using R&D incentives grew + 5x since 2006
Efficiency and Productivity

- National vocational and technical training program - Pronatec
- US$ 2 bi for SENAI’s new training centers
  - Funded by BNDES and the National Confederation of Industry
- New tax regimes for a selected set of industrial systems
  - Automotive, PADIS, REPNBL, RETID, PATVD, Reporto, Repetro etc.
- Focus on supply chain development
Where are the opportunities?
Health care & the health industrial complex in Brazil

- 8% of GDP
- ½ public system (Unified Health system – SUS) + ½ private sector
- Unified Health System (SUS)
  - 70% of the Brazilian population depend on SUS
  - 5,900 hospitals
  - 64,000 primary care units
  - 2.3 billions ambulatory appointments
  - 12 millions hospital admissions
  - 9 millions chemo- and radiotherapy procedures
  - 300 millions laboratory tests
  - 1 millions CT scans and 160,000 MR
  - 6.5 millions echographies
  - 8 millions hemodialyses procedures
AN INVESTMENT THAT WILL BRING BROADBAND TO AT LEAST 90 MILLION ACCESS POINTS
Brazilian investment plan – PAC 2 supports future growth

In US$ billion

<table>
<thead>
<tr>
<th>PAC Projects</th>
<th>2011-2014</th>
<th>After 2014</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC Better Town</td>
<td>34.2</td>
<td>0</td>
<td>34.2</td>
</tr>
<tr>
<td>PAC Citizen Community</td>
<td>13.8</td>
<td>0</td>
<td>13.8</td>
</tr>
<tr>
<td>PAC My Home My Life</td>
<td>166.6</td>
<td>0</td>
<td>166.6</td>
</tr>
<tr>
<td>PAC Water and Light for All</td>
<td>18.3</td>
<td>0</td>
<td>18.3</td>
</tr>
<tr>
<td>PAC Transportation</td>
<td>62.6</td>
<td>2.7</td>
<td>65.3</td>
</tr>
<tr>
<td>PAC Energy</td>
<td>276.4</td>
<td>375.4</td>
<td>651.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>571.9</strong></td>
<td><strong>378.1</strong></td>
<td><strong>949.9</strong></td>
</tr>
</tbody>
</table>

* PAC – Growth Acceleration Program

Source: Ministry of Planning, Budget and Management
Produced by: Ministry of Finance
Energy Investment next 10 years

38 US$ billion
Offer Liquid Biofuels

125 US$ billion
Electricity Supply

391 US$ billion
Oil and Natural Gas

Source: EPE
Investments Program

2011-15

BP 2011-2015 INVESTMENTS VS. BP 2010-14

2010-14 Business Plan
US$224.1 billion

2011-15 Business Plan
US$224.7 billion

- 5% of investments will be made overseas, 87% of which in E&P.

(*) US$22.8 billion in Exploration

2020 PETROBRAS STRATEGIC PLAN
TECHNOLOGICAL CHALLENGES

Expanding the limits

- New Exploratory Frontiers
- Maximizing Recovery Factor
- Developing production, operations and pre-salt logistics
- Development of new generation sea and subsea Production systems
- Sediments and fluids characterization of the pre-salt and other complex reservoirs
- Solutions for natural gas logistic in harsh environments
- Operational optimization
- Middle distillates maximization

Adding value and diversifying products

- Fuels, lubricants and special products innovation
- Petrochemicals
- Gas chemical
- Biofuels
- Other renewable energy sources

Sustainability

- Water management
- CO₂ and other gases management
- Energetic Efficiency

Expenses (investments and costs): US$ 1.3 bi / year
World Floating Production

Latin America will account for half of all FPS expenditure over the period 2012-2016. Much of this activity will take place off Brazil where Petrobras and OGX plan to install a large number of locally sourced units. Many of Petrobras’ units will be installed in the deepwater Santos basin where the company is using multi-FPS developments as a way of exploiting its pre-salt reserves.
Opportunities for joint business and cooperation

- Brazil: capital and know-how
- R&D expenditure associated to Petrobras (MCTI forecast)
- Natural assets + clean energy + know-how
- Countries well positioned to face today’s global challenges
- Global players with financial and technology capabilities
- “Brasil Maior”: focus on innovation

Thinking joint solutions for global/manufacturing crisis
Developing bilateral instruments to make it happen
Thank you!

Mauro Borges Lemos
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Brazil-United States Relations
Employment cost is decreasing but it still is high

Payroll by Worker Index – Manufacturing Industry
(2002=100)

Source: Ipeadata
Brazil-United States Bilateral Trade by type of product (US$ million)
Brazil-Unites States Balance of Trade (US$ million)

- Trade Balance BRA-USA
- Trade balance in manufactured goods BRA-USA
13 Innovation Learning Labs (2009-2011): 1,000 participants from industry, government and universities

2 Innovation Summits (2007 and 2010):
- Sustainable technologies
- Energy and energy efficiency
- Technology transfer
- Training and promotion of executives and researchers networks
- Legal environment for innovation

To generate new connections and joint business/technology projects
Since 2004 investment growth rates have been higher than GDP growth, except for 2009.

* Estimated data
Source: IBGE and Ministry of Finance
Job Creation (millions)

* Ministry of Finance forecast
Source: RAIS/Ministry of Labour
Elaboration: Ministry of Finance
International reserves have been rising steadily.
Credit supply in a steady growth

Credit (% of GDP)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>Jan/12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>24.6%</td>
<td>25.7%</td>
<td>28.3%</td>
<td>30.9%</td>
<td>35.2%</td>
<td>40.5%</td>
<td>43.7%</td>
<td>45.2%</td>
<td>49.1%</td>
<td>48.8%</td>
</tr>
</tbody>
</table>

Source: Central Bank of Brazil
Energy costs have been increasing.
The exchange rate is the highest compared to China, Germany and US

Real Effective Exchange Rate* (index number, 2005=100)

* Deflator: Consumer Price Index from each country. A rise means exchange appreciation and a fall means depreciation
Source: BIS
Elaboration: Ministry of Finance