Innovation in Brazil: Advancing Development in the 21st Century

Elisabeth Reynolds, Executive Director, MIT Industrial Performance Center and MIT Work of the Future

Brazilian Academy of Sciences
May 16th, 2019
MIT’s Industrial Performance Center is a multi-disciplinary research center concerned with industrial innovation, productivity and competitiveness in the global economy.
MIT IPC – SENAI Project Objectives

• Launched in June, 2014 as a five-year research project sponsored by SENAI with the following objectives:

• Examine SENAI’s Innovation Institutes, how they fit within the larger ecosystem in Brazil, and how they can foster greater innovation at the regional and national level

• Examine the Brazilian innovation ecosystem more broadly and make recommendations for increasing innovation capacity

• Foster greater links with Brazil, through education, research and development, business and other points of connection
Accelerating Innovation in Brazil: MIT IPC-SENAI Project Research Pillars

- Key firms and industries
  - GVC insertion and upgrading
  - Carving out role in R&D networks

- Institutional fragmentation
  - Industrial and innovation policies
  - Emerging innovation agenda

- Institutional innovation
  - Universities as engines of innovation
  - RTOs and innovation intermediaries

- Organizational transformation
  - Organizational dynamics
  - SENAI/SESII call for projects

Diagram:
- Global Value Chains
- Institutions & Policies
- Networks & Ecosystems
- SENAI and ISIs
Brazil’s Innovation Agenda: Progress, challenges and diagnoses

• The **gains associated with Brazil’s innovation policies and programs have been limited**. Many factors contribute to this, but three primary reasons are:

  – **Global integration:** Brazil needs to be better integrated in the global economy to benefit from the global flow of goods, services, and ideas

  – **Costs and risk:** the cost of knowledge-intensive inputs and the risks associated with investing in innovation are too high

  – **Specialization:** programs and incentives are spread too broadly, and should be more focused on Brazil’s areas of comparative advantage to support specialization
Priorities for Brazil’s Innovation Agenda in 2019 and Beyond

- Engage the global economy
- Align industrial and innovation policies
- Promote strategic sectors
- Support institutional innovations
- Strengthen translational capacity at universities
1. Align Industrial and Innovation Policies

PPB: Selected Local Content Requirements for Tablets

<table>
<thead>
<tr>
<th>Component</th>
<th>Local Content (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
<td>2012</td>
</tr>
<tr>
<td>PCBs (processing)</td>
<td>50%</td>
<td>80%</td>
</tr>
<tr>
<td>PCBs (communications)</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Mobile Chipsets</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Chargers</td>
<td>0%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Informatics Law R&D Spending and Outsourcing Requirements

<table>
<thead>
<tr>
<th>Internal Expenditures (Can also be spent via third parties)</th>
<th>2.16%</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Expenditures</td>
<td></td>
</tr>
<tr>
<td>Certified institutes anywhere in Brazil</td>
<td>0.80%</td>
</tr>
<tr>
<td>Certified institutes in North, Northeast and Center West</td>
<td></td>
</tr>
<tr>
<td>Public or private entities</td>
<td>0.45%</td>
</tr>
<tr>
<td>Public entities only</td>
<td>0.19%</td>
</tr>
<tr>
<td>Science and Technology Fund (FNDCT)</td>
<td>0.40%</td>
</tr>
</tbody>
</table>

These industrial and innovation policies should not be eliminated, but should be made more flexible and brought into greater alignment.
2. Support Institutional Innovations

- Innovation intermediaries play critical roles in innovation systems, including: technology development and diffusion, stakeholder convening, and the provision of public goods and services.

- Brazil counts on a number of novel, innovative models such as SENAI’s network of Innovation Institutes, EMBRAPPII, and FAPESP’s Engineering Research Centers, and MEI (Business Movement for Innovation).

- There should be continued experimentation with different models; however, if a model proves ineffective over time, it should be sunsetsed to ensure that resources are not unnecessarily fragmented.

EMBRAPPII has expanded significantly since its inception drawing significant private R&D funding.
3. Strengthen Translational Capacity at Universities

- Minimize bureaucracy, create incentives, and foster the right environment to support risk-taking and streamline interactions with industry partners

- Support and reward specialization in universities that can show national and global excellence in particular disciplines or fields

- Focus technology transfer offices on translation and impact more so than revenue
  - Patenting bottleneck in Brazil is inhibiting translational impact
  - “A patent without a license is the worst of all worlds. You spend money and tie up technology”

Flowchart for the Unicamp contracts and agreements approval process

Source: Flowchart sent by Inova/Unicamp
4. Promote Strategic Sectors

• National strategies should be focused and limited to areas in which Brazil has an established or emergent comparative advantage

• Priorities should be pursued through mission-driven, long-range programs that are stable and involve collaborative partnerships across industry, government, and academia
5. Engage the Global Economy

Brazil’s Trade Balance in Three “GVC” Industries, 2002-2014, US$ thousands

Brazil’s Foreign Direct Investment Inflows and Outflows, 1970-2016 US$ million


Note: figures are in constant dollars.
Encourage entrepreneurial pathways

Successful startups in Brazil:

• Leverage Brazil’s innovation ecosystem for technology, funding, and mentorship

• Seek foreign partners to raise capital, acquire technology, and/or develop markets overseas

• Address problems in Brazil and in other countries, rather than focusing on the domestic market alone
The Innovation Narrative
Building a Forward-Looking Innovation Agenda

• There has been significant progress in the last 20 years on Brazil’s innovation agenda.

• However, ongoing political and economic crises have threatened to derail the country’s innovation agenda.

• As the pace of technological change quickens and the globalization of production & innovation grows in scale and scope, Brazil needs to actively engage with new technology and global markets.

• Brazil’s social policy agenda is tightly linked to its innovation and growth agenda. Without the latter, there is limited ability to support the former in the long run.
Thank you!

lbr@mit.edu
Appendix
Align Industrial and Innovation Policies

- Brazil has sought to ‘trade markets for technology,’ granting preferential market access in exchange for technology-intensive investments (i.e. R&D)

- These policies have been layered on top of long-standing local-content, import substitution policies in the auto, electronics, and oil & gas industries

- These policies are limited by the global nature of manufacturing, by characteristics of the R&D function itself, and by the government’s limited ability to shape MNCs’ R&D strategies

- These industrial and innovation policies should not be removed, but should be made more flexible and brought into greater alignment with one another