Dedication:
Prof. Werner Baer, 1931-2016
Genesis

• The need for a volume covering multiple aspects of the Brazilian economy – historical, contemporary, international – to help specialists and non-specialists alike gain a broader view of one of the world’s most important economies

• To do so in a way that all the key issues are individually addressed in an engaging, accessible, yet academically rigorous manner

• To gather together leading specialists in the field to contribute. Participants stem from Brazil, North America and Europe

• OUP commissions volume in 2015.

• Following passing of Prof. Baer in March 2016, Profs. Amann and Azzoni assume all editing responsibilities and see volume through to completion. It is published in August 2018
A multi-institutional effort

(editors and authors)
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Core objectives of the book

• To offer real insight into the Brazilian economy’s development in contemporary context

• To understand its most salient characteristics and analyze its structural features across various dimensions

• At a more granular level, to accomplish the following tasks:

1. To provide an understanding the economy’s evolution over time and the connection of its current characteristics to this

2. To portray and explain Brazil’s broader place in the global economy and consider the ways in which this role has changed and is likely to change over coming years

3. To provide an understanding not only of how one of the world’s key economies has developed and transformed itself, but also of the ways in which this process has yet to be completed. This involves understanding the current challenges facing the Brazilian economy and the kinds of issues that need to be tackled for these to be addressed
Characterizing the long-run evolution of the Brazilian Economy
1. Characterizing the long-run evolution of the Brazilian economy

• Colonial beginnings marked by mercantilism, slavery and commodities production

• Tremendous structural transformation since the start of the 20th Century. Key elements were mid-20th century industrialization process and agricultural renaissance since the start of the 21st century

• Despite periods of rapid progress and accelerated growth, a failure to sustain these and a proneness to repeated crisis. Growth volatility high
Enduring growth volatility

Figure 8.4. Brazil’s backward 10-year moving average growth and standard deviation (%).

Data source: Instituto de Pesquisa Econômica Aplicada (IPEA); authors’ calculations.
1. Characterizing the long-run evolution of the Brazilian economy (cont.)

• With notable exceptions (e.g. c. 1995-2013) a failure to secure sustained, inclusive growth

• As a result poverty remained ingrained and income inequality high. Gini typically lies in 0.5-0.6 range

• Periods of price instability and external disequilibrium

• A strong role for the state in the economy and complex and problematic business government relations. After a period of reform, the scope of state activity expanded once more between 2002-2016

• The build up of strong technological capabilities in certain sectors

• The presence of marked regional inequalities/structural heterogeneity
Regional inequalities are a significant feature
Though progress was made on poverty and interpersonal inequality

**Figure 24.1.** Poverty and inequality trends in Brazil, 1992–2014.

*Data source: IPEA Data, accessed June 19, 2016.*
Brazil’s changing place in the global economy
2. Brazil’s changing place in the global economy

• Historically reliant on commodities production and export for sustenance in the global division of labor

• 20th century industrialization brought about export diversification

• Rise of Brazilian MNCs partly counterbalances tide of inward FDI especially after price stabilization in the mid 1990s

• Since 2000 refocus on export specialization linked to commodities production. Agriculture is very dynamic and high tech component

• But export intensity in Brazil remains low...
Despite competitive strengths, Brazil is not export intensive
Unaddressed challenges
3. Unaddressed Challenges..

• Need to diversify and broaden areas of competitive strength. This would address growth and export volatility

• Central to this is to boost productivity growth, infrastructure, human capital development and technological capabilities accumulation across a broader range of sectors

• As this volume shows, productivity growth outside the lead sectors has been lethargic
The productivity question

**Figure 16.1.** Labor productivity per person employed in 1990 US$.  
*Source: The Conference Board.*
Education is a key challenge

• Meeting the productivity challenge and preventing the intergenerational replication of poverty provide key arguments for addressing educational gaps

• This volume suggests that some, but not sufficient progress has been made

• Moura Castro in Ch 23 concludes as follows:

1. Contrary to popular belief, the distance between poor and rich students is considerably below the average for other countries (the top 10% are 27 points from the lower end, compared to 47 points for the OECD as a group). However, this is less to do with the poor performing well than with the rich faring less well compared to their counterparts in rich countries.

2. Brazilian students perform at a level that equates to four years less schooling than students from Organisation for Economic Co-operation and Development (OECD) countries.

3. The proportion of Brazilian students performing below the lowest level initially defined by PISA is substantial. It necessitated the creation of a new lower category.

4. Poorer countries such as Albania, Colombia, Moldova, Malaysia, and Thailand all perform better than Brazil, while Chile, with around the same income per capita, performs considerably better.

5. The degree of Brazil’s improvement in its PISA score was higher than almost any other country between 2003 and 2012. In mathematics, scores increased from 356 to 391 points. Tempering this good news is the fact that the 2015 test suggests stagnation.

6. Brazil currently sits on the boundary between the third and fourth quartiles in terms of PISA results. However, bearing in mind that the countries participating in PISA testing tend to be the top performing in the world, we can say that roughly 50 countries display higher educational attainment than Brazil, and 150 lower attainment.
As is infrastructure...

Figure 4.10: Quality of Railroad Infrastructure Rank, 2015

Figure 4.11: Quality of Port Infrastructure Rank, 2015

Investing in pro-growth areas requires tackling the fiscal constraint

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<td>Central government primary balance 2/</td>
<td>-2.6</td>
<td>-1.8</td>
<td>-2.3</td>
<td>-1.8</td>
<td>-1.3</td>
<td>-0.6</td>
<td>0.0</td>
<td>0.5</td>
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<td>NFPS primary balance</td>
<td>-2.5</td>
<td>-1.7</td>
<td>-2.4</td>
<td>-1.8</td>
<td>-1.1</td>
<td>-0.4</td>
<td>0.2</td>
<td>0.7</td>
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<td>NFPS cyclically adjusted primary balance</td>
<td>-1.2</td>
<td>-0.5</td>
<td>-1.4</td>
<td>-1.2</td>
<td>-0.8</td>
<td>-0.3</td>
<td>0.2</td>
<td>0.7</td>
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<td>NFPS overall balance (including net policy lending)</td>
<td>-9.0</td>
<td>-7.9</td>
<td>-8.5</td>
<td>-7.8</td>
<td>-7.5</td>
<td>-7.1</td>
<td>-6.8</td>
<td>-6.5</td>
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<td>Net public sector debt</td>
<td>46.2</td>
<td>51.6</td>
<td>56.2</td>
<td>59.9</td>
<td>62.9</td>
<td>65.7</td>
<td>67.7</td>
<td>68.9</td>
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<td>General Government gross debt, Authorities' definition</td>
<td>70.0</td>
<td>74.0</td>
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<tr>
<td>NFPS gross debt</td>
<td>78.4</td>
<td>84.0</td>
<td>88.2</td>
<td>90.4</td>
<td>92.4</td>
<td>94.2</td>
<td>95.1</td>
<td>95.6</td>
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<td>Of which: Foreign currency linked</td>
<td>3.8</td>
<td>3.6</td>
<td>3.5</td>
<td>3.2</td>
<td>3.0</td>
<td>2.8</td>
<td>2.8</td>
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% GDP  
Source: IMF
Overcoming corruption

• Chapter 35 analyzes the evolution of corruption in Brazil over time, the attempts made to contain it and its potentially harmful economic impacts.

• What becomes clear is just how systemically corrupt practices have become woven into the fabric of business-government relations.

• Looking ahead, any resurgence of sustainable growth will require a new set of rules and greater transparency. This will imply, in all likelihood, a more arms-length, formalised relationship between the state and the private sector.

• In other words, the corporatism which has continued to characterise Brazilian capitalism will need to be discarded or radically reconfigured.
Productive sectors: an example

“Brazil’s agriculture modernization and Embrapa”

Geraldo Martha & Eliseu Alves
Brazilian agriculture in the 1960’s and early 1970’s

- Low ag. production and low yields;
- Production concentrated in South/Southeast;
- Repeatedly food supply crisis;
- Rural poverty + migration to cities;
- Lack of specific knowledge on “tropical agriculture”;
- Institutional void (ag.research, education, markets, etc.).

The task: to move from a traditional agriculture to one based on science & technology!
The Embrapa model

- A public corporation;
- A focused research approach;
- Human resources;
- International cooperation is key;
- Continued support of the Brazilian Government;
- Science-policy links;
- Strategic planning;
- Monitoring of the payoffs to Brazilian society.

*Established in 1973, is the research-arm of the Brazilian Ministry of Agriculture, Livestock and Food Supply (MAPA), and has the mission of generating and promoting knowledge, science-based solutions and technologies for Brazilian agriculture.*

- Employees (2016): 9,695;
- Researchers (2016): 2,444 (2,114 w/ Ph.D.);
- 2016 budget: ~ USD 940 million;
- R&D projects (2016): 1,153 (101 themes);
- Present in all Brazilian biomes, counts with 42 Decentralized Research Units; 5 Administrative Units; and offices abroad for scientific cooperation (Labex) and technology transfer.
- Avg. benefit to cost ratio to Brazilian society, 11:1.

Source: Embrapa
A science-based approach to a modern agriculture in Brazil

Agricultural R&D in Brazil

INSTITUTIONAL PROFILE, 2013

- Higher Education: 26%
- Other Government: 29%
- Nonprofit: 3%
- Embrapa: 42%

RESEARCHER PROFILE, 2013

- Male: 63%
- Female: 37%

Number by qualification (FTEs)

- PhD: 4,255.8
- MSc: 1,259.4
- BSc: 354.1

RESEARCH FOCUS, 2013

- Crops: 55%
- Livestock: 17%
- Natural Resources: 10%
- Fisheries: 3%
- Forestry: 3%

Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 31 percent of total crop researchers focused on a wide variety of other crops.
The sustainability dimensions of Brazilian agriculture

**Index of productivity growth in Brazilian agriculture (1950=100)**

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<td><strong>Relative yield (1950=100)</strong></td>
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<tr>
<td>Corn</td>
<td>100</td>
<td>106</td>
<td>118</td>
<td>195</td>
<td>288</td>
<td>445</td>
<td>2.25%</td>
<td>4.01%</td>
</tr>
<tr>
<td>Soybean</td>
<td>100</td>
<td>206</td>
<td>236</td>
<td>311</td>
<td>347</td>
<td>452</td>
<td>2.28%</td>
<td>1.80%</td>
</tr>
<tr>
<td>Wheat</td>
<td>100</td>
<td>96</td>
<td>215</td>
<td>241</td>
<td>246</td>
<td>314</td>
<td>1.72%</td>
<td>1.27%</td>
</tr>
<tr>
<td>Rice</td>
<td>100</td>
<td>104</td>
<td>135</td>
<td>211</td>
<td>305</td>
<td>477</td>
<td>2.36%</td>
<td>3.97%</td>
</tr>
<tr>
<td>Beans</td>
<td>100</td>
<td>78</td>
<td>72</td>
<td>97</td>
<td>137</td>
<td>204</td>
<td>1.07%</td>
<td>3.61%</td>
</tr>
<tr>
<td>Cotton</td>
<td>100</td>
<td>244</td>
<td>282</td>
<td>353</td>
<td>791</td>
<td>1095</td>
<td>3.64%</td>
<td>5.54%</td>
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<tr>
<td>Sugarcane</td>
<td>100</td>
<td>160</td>
<td>225</td>
<td>231</td>
<td>256</td>
<td>276</td>
<td>1.52%</td>
<td>0.84%</td>
</tr>
<tr>
<td>Beef cattle</td>
<td>100</td>
<td>107</td>
<td>123</td>
<td>227</td>
<td>431</td>
<td>622</td>
<td>2.76%</td>
<td>4.93%</td>
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</table>

The sustainability dimensions of Brazilian agriculture
The huge growth in Brazilian agricultural production resulted in reduced prices to consumer. This alleviated inflationary pressures and generated an “income-effect” that benefited mostly the poor.
Market imperfection: a major barrier to widespread technology adoption in Brazilian agriculture

Incentives to Brazilian agriculture

The incentives to Brazilian agriculture have been low compared to other major players. The PSE to Brazilian farmers averaged 1.6% of the total farm receipts from 1995-2017. The corresponding values to farmers in the US, EU, and China were 13.0%, 27.2%, and 14.5%, respectively.

Thus, farmers will strongly respond to market signals and will adopt technologies based on individual benefit-cost analysis!
Two-cents of thoughts

• Future challenges on both the demand and the supply side remain substantial for the agricultural sector;

• Remarkable scientific advances are taking place in various fields of knowledge (genomics, nanotechnology, automation and robotics, information and communication technology, ...);

• The choice of technology will vary according to priority problem to be solved (land-, labor-, product-saving technologies);

• The research system and the extension service must receive adequate financial support in order to sustain continuous gains in agricultural yields in farms;

• The success of any given strategy will be strongly influenced by the relative prices and terms of trade in a given region;
Two-cents of thoughts

• A breakthrough in Brazilian agriculture would come from a greater dissemination – and effective implementation – of modern technologies by a significant number of farmers in the country;

• One of the greatest barriers to the effective adoption of modern technologies is market imperfection, which alters the relative prices for farmers and thus the return to investments in technologies;

• It is imperative to expand investments in human resources training. Human capital remains the most severe restriction on the potential productive capacity of the agricultural sector, in that this form of restriction requires considerable time to overcome.

As a final thought, in the coming decades the world can expect from Brazilian agriculture innovations that will increase our ability to understand and respond to present and future risks and challenges in diverse areas of knowledge in tropical and subtropical environments.
Regional Aspects

Carlos R. Azzoni
Eduardo A. Haddad
Long-lasting regional disparities
Economic Center of Gravity

Average Latitude

\[ LAT_t = \sum_m LAT_m \cdot k_{m,t} \]

Average Longitude

\[ LON_t = \sum_m LON_m \cdot k_{m,t} \]

% of state in National GDP

\[ k_{m,t} = \frac{GDP_{m,t}}{GDP_{BR,t}} \]
CENTRO DE GRAVIDADE DA ECONOMIA BRASILEIRA, 1939-2013

Longitude

Latitude

PIB estadual

1939
CENTRO DE GRAVIDADE DA ECONOMIA BRASILEIRA, 1939-2013
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CENTRO DE GRAVIDADE DA ECONOMIA BRASILEIRA, 1939-2013
CENTRO DE GRAVIDADE DA ECONOMIA BRASILEIRA, 1939-2013
By sector
Gross Value Added, 1995-2013
Income (PNAD)
By labor income level (percentiles)
Concentration
Manufacturing Value Added/km$^2$
Scientists collaborations
Ciências Agrárias

Ciências Biológicas

Ciências da Saúde

Ciências Exatas e da Terra

Engenharias

Ciências Sociais Aplicadas
Concentration within SP Metro

Wage Bill

Ano Corrente: 2014

LEGENDA
Massa Salarial (RS)
- 0 a 5,000,000
- 5,000,000 a 10,000,000
- 10,000,000 a 20,000,000
- 20,000,000 a 40,000,000
- 40,000,000 a 80,000,000
- 80,000,000 a 160,000,000
- 160,000,000 a 320,000,000
- 320,000,000 a 640,000,000
- 640,000,000 a 1,280,000,000
- 1,280,000,000 a 2,560,000,000
Living costs ...
Rent costs by city and state
### Effect on welfare

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<th>São Paulo</th>
<th>Campina Grande</th>
<th>Difference</th>
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<td>Per capita income - nominal</td>
<td>1.798</td>
<td>748</td>
<td>42%</td>
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<td>Adjusted for cost of living</td>
<td>1.077</td>
<td>934</td>
<td>87%</td>
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### Inequality across cities (Gini)

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<td>Nominal</td>
<td>0,26</td>
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<td>Adjusted</td>
<td>0,16</td>
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Productivity and regional competitiveness
Agriculture: technical efficiency, 2006
Manufacturing: technical efficiency 2000/06

Better than SP Metro

Same as SP Metro

Worse than SP Metro
Returns to agglomeration ...

Private sector only
Wage premium in the largest LMAs (ref.: non LMA cities)

$R^2 = 0.606$

$R^2 = 0.917$

With worker Fixed effects

CONDICIONAL FEi
### POLS

![Graph showing R² = 0.606](image)

- Significante a 1%, 5% ou 10%
- Não significante

### CONDICIONAL FEj

![Graph showing R² = 0.784](image)

- With firm
- Fixed effects

- +17%
- +44%

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<th>City</th>
<th>With firm</th>
<th>Fixed effects</th>
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#### Significância

- **Significante a 1%, 5% ou 10%**
- **Não significante**
Politics, policy ...
2018 Election
2nd Round

100% URNAS APURADAS

Bolsonaro (PSL)

50% |  | 100%

Haddad (PT)

50% |  | 100%
HDI (Source: PNUD)
Welfare x Votes
NORDEXIT?

Are there economic foundations for regionalism in Brazil?
Economic flows should Balance

Money flow Poor → Rich

- 18  17%
- 94  24%
- 40  14%
- 24  7%
- 26  22%
- 9  5%
Money flow poor → rich

TAX REVENUE

TRADE BALANCE

WITH OTHER COUNTRIES

EXTERNAL TRADE BALANCE % GRP

- São Paulo - 18 2%
- Amazonas - 20 44%
- Esp. Santo + 0.5 1%
- Paraná - 2 2%
- Sta Catarina - 3 2%
- North (-AM) + 18 17%
- Northeast - 6 1%
- Minas Gerais + 22 8%
- Rio de Janeiro + 4 1%
- Dist. Federal - 4 4%
- R. Grande Sul + 4 2%
Infrastructure and competitiveness


Roadways
(quantity and quality)
km of roads/km²

2010

Extention: DNIT
Quality: CNT
Estimated productive efficiency, 2010

Gross, no infrastructure included

Infrastructure included

Efficiency loss due to lacking infrastructure (2010)
Place-centered or People-centered?

• Subsidies to firms
• Social programs
• Human capital
• Comparative advantages
Thanks!
Some future challenges ahead
Can the challenges be addressed? Is reform likely?
The new context

• The book was completed well before this October’s elections

• The outcome was not taken into account

• However, the principle axes of reform which would need to be taken by any administration are clear

• These structural reforms center on education, productivity, structural diversification, recasting the state-business relationship and fiscal reforms necessary to open up space for growth critical areas

• What are the likely prospects under the Bolsonaro administration?
Likely pathways for reform

• Fiscal orthodoxy a likely mainstay but pensions reform opens up the possibility for an expansion in growth-facilitating discretionary spending

• Growth fillip possible from surge in investor confidence and influx of FDI

• Recasting of state business relations and reduced role for the BNDES – will the private capital market be able to supplant the role of the state in enterprise finance?

• Privatizations may expand the scope for private infrastructure investment; this may also be facilitated through liberalized environmental regulation

• No obvious priority assigned to education

• While pledge has been made to preserve Bolsa Familia, no clear wish to expand scope of social programs established in PT years
The new context

• The next four years will most likely be characterized by market reforms

• In this sense there may be a parallel with the Collor administration (1990-92) though without the macroeconomic crisis associated with that period

• The role of the state in tackling the structural challenges we highlighted is likely to diminish relative to that of the private sector

• In many ways this is desirable. However, state will need to continue to play a vital role in critical fields such as education and science and technology policy
Thank you!