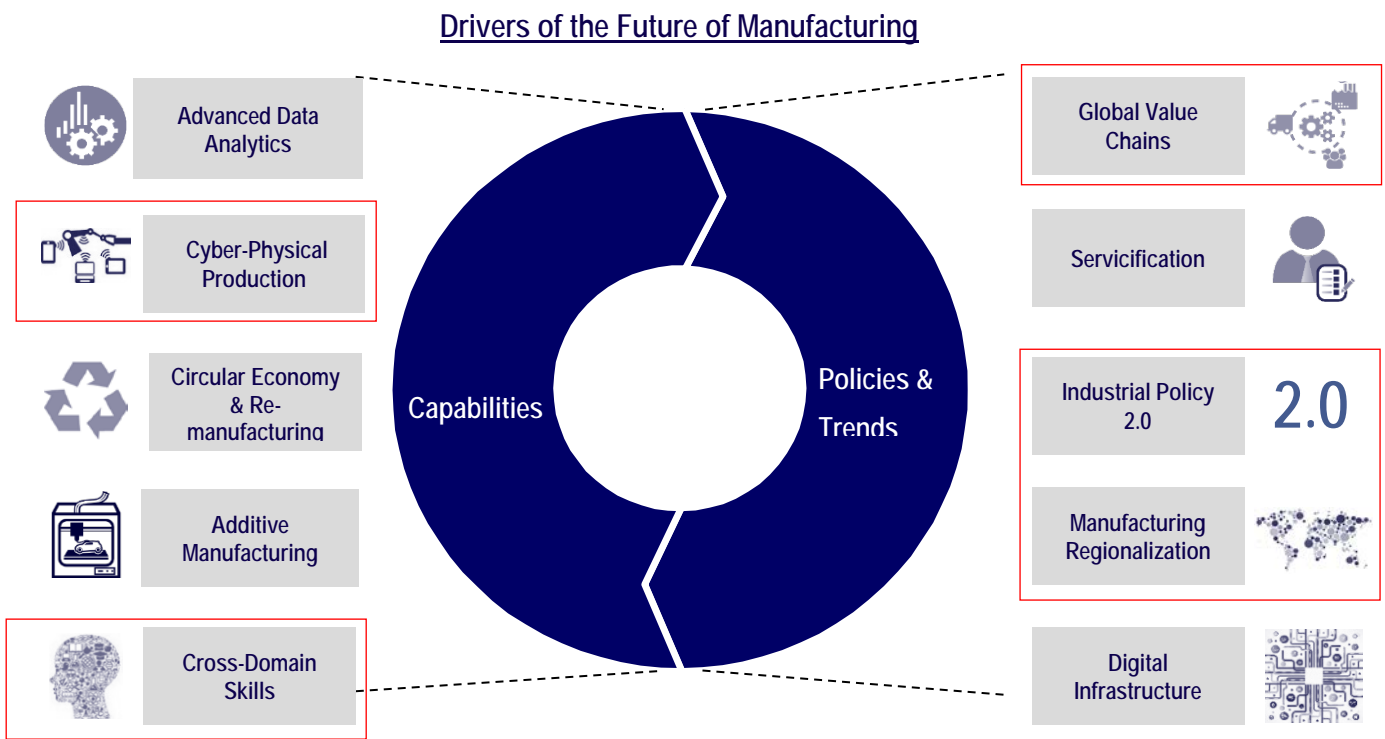


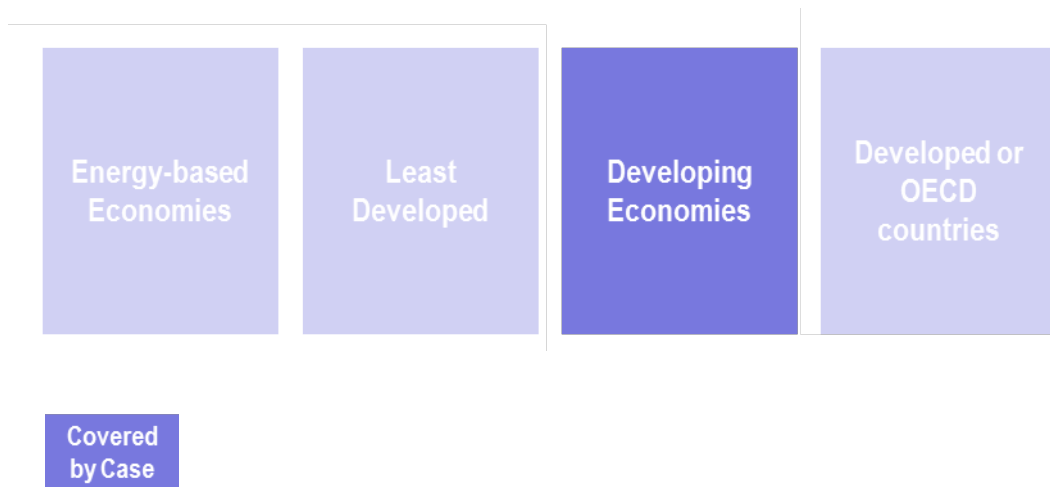
Case 6

Long-Term Public Funding Support in Capital-Intensive Global Industries

The Case of Embraer and the BNDES



Source: World Economic Forum Global Agenda Council on the Future of Manufacturing, Whiteshield Partners framing



1. Challenge Confronted

Providing **long-term, committed, patient finance** (Mazzucato & Wray, 2015, p. 27-32)¹ for a high-technology and capital-intensive global industry, such as **aeronautics**, is a defying task. Both the development of new products and commercialization are **strongly supported** by innovation incentives and Export Credit Agencies. Brazil faced this challenge in the **consolidation of Embraer** (a Brazilian aeronautics company), the third largest manufacturer of commercial aircraft globally, and still faces it, as the **pace of competition, technological change and sustainability requirements** accelerate in the sector.

2. Solution Used

The mission of **development banks** is to provide long-term, committed, patient finance; they are a pillar of **resilient financial ecosystems** that foster dynamic economies capable of effectively **tackling local and global challenges** (Coutinho, Ferraz & Marques, 2015, p. 100).² In Brazil, **Embraer benefits from a long-term relationship with BNDES, the national development bank**. The bank supports research and development (R&D) and innovation in partnership with Brazilian innovation agency Finep, and regional agencies, and acts as an Export Credit Agency, with its Exim arm. This partnership proved important during times of crises at Embraer, when **BNDES backed important new product development and structured international commercialization**. Today, BNDES finances Embraer's **efforts to reduce the fuel consumption, CO₂ emissions, noise and maintenance costs** of its second-generation E-Jet family, and the development of biofuels and sustainable innovative material for the aeronautics innovation ecosystem.

3. Lessons Learned

1. The **development of cross-domain skills** evolves in a long process that often requires **long-term, committed, patient finance** and **other public policies**.
2. **Development banks**, as a major source of long-term finance, are important for the **capital development** of countries, especially in capital-intensive sectors.
3. **Finance instruments** should be adapted to **emerging challenges**, such as the sustainability of the aeronautics sector, and to **clients' needs**.
4. **Long-term public policies for high-technology sectors** can play a **leading role in global value chains**, the creation of **highly-specialized jobs** and the promotion of exports and R&D investments.

Long-Term Public Funding Support in Capital-Intensive Global Industries

Dates: 1991 - today

Keywords: financial support, competitiveness, official source of support, export credit

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Key facts:

- Official credit support for Embraer's long-term expansion fostering know-how and enabling technology development
- Ability to face international competitors and greater competitiveness of the Brazilian aerospace industry
- Increased exports, R&D and number of highly-specialized jobs

Description of the Work Performed

The successful development of Brazil's aeronautics industry is based on Embraer's global strategy. Embraer was created in 1969 as a government-owned corporation to develop aircraft. It was privatized in 1994. Its origins go back to 1945, when the Aerospace Technical Center (CTA) was created, giving rise to the first aeronautical engineering school, the Technological Institute of Aeronautics (ITA), through cooperation with the Massachusetts

Institute of Technology. The Research and Development Institute (IPD) was created in 1954, where, later, Embraer's first products were designed. The ITA is still vital to Embraer's technological capacity.

Support from the BNDES to commercialize and develop aircraft and offer financing conditions consistent with those of competitors was decisive for Embraer's growth (Fonseca, 2012).³ Since Embraer was privatized, the BNDES has supported its operations in two main ways as outlined below, already representing around 20 years of successful partnership.

1. Long-term finance for innovation

The BNDES financed the development of the ERJ-145 jet with R\$ 126 million⁴ in 1995. This model was highly successful, since the regional aviation market in the mid-1990s was replacing turboprops with jets.

In 2013, the BNDES backed the development of a second generation of E-Jet, called E-Jets E2, consisting of three new aircraft (E175-E2, E190-E2 and E195-E2), with R\$ 1.2 billion. Since 2011, the bank has also supported the development of the Legacy 450 and 500 executive jets, with around R\$ 582 million. These jets consume less fuel, emit less CO₂, and generate less noise and maintenance costs than the previous models.

The BNDES also financed important science and technology infrastructure related to the aeronautics innovation ecosystem. In 2008, the bank helped finance (with R\$ 27.5 million) the construction of a lightweight structure lab that develops advanced metallic and composite structures.

Finally, the BNDES finances important developments in the supplier chain. One of its main challenges is to develop a commercial biofuel for the aeronautics industry to reduce CO₂ emissions. Certain multinational companies and science and technology institutions are investing in R&D in this area with BNDES's support.

2. Long-term finance for commercialization

The BNDES offers export credit lines and supports sales in the Brazilian domestic market. In 1997 it supported the campaign to sell ERJ-145 jets to American Airlines, amounting to over US\$ 1 billion. This sale was crucial for the Brazilian manufacturer to gain credibility among international airlines.

BNDES's support peaked in 2002 and 2003, which, not coincidentally, was a difficult time for the aviation industry worldwide, after the attacks of 11 September 2001, when the demand for flights fell significantly, especially in North America and Europe (which were key markets for Embraer at the time). As a result of the crisis and prevailing uncertainty, private financing sources decreased. Aircraft financing only slowly returned, and stabilized in 2007. The financial market liquidity crisis of 2008 then affected the airline industry. Embraer aircraft purchasers again had to resort to financing from the bank. Starting in 2008, the volume of sales financed with BNDES resources grew, reaching 52% of sales of commercial aircraft and 29% of sales of business jets delivered in 2010. In addition to the resources used to finance commercial jet sales, since 2003 Embraer has also received BNDES's support in pre-shipment operations, providing resources to produce aircrafts.

For the Brazilian government, the dispute with Canada at the World Trade Organization regarding official support to the aeronautics industry from 1996 to 2003 represented its first major challenge in an international forum in defence of its own interests. The World Trade Organization ruled that the Brazilian and Canadian systems to boost the export of civilian aircraft were illegal and forced the two countries to modify their export promotion programmes. The BNDES therefore had to review its support for Embraer and had to modify its financing mechanisms to avoid future disputes. With specific regard to aircraft financing, Brazil joined the 2007 Aircraft

Sector Understanding (ASU), becoming a signatory to the OECD's multilateral understanding. The BNDES participated actively in its formulation in 2007, as well as in its revision in 2010, integrating the Brazilian delegation in all working meetings. Today, the BNDES's support for Embraer complies with all ASU rules.

Key Outcomes

- Brazilian aircraft exports increased from US\$ 3.71 billion in 2001 to US\$ 6.45 billion in 2015.⁵
- The number of employees increased from approximately 11,000 in 2001 to over 19,300 in 2015.⁶
- Investment in R&D increased from R\$ 301 million in 2001 to R\$ 671 million in 2014.⁷

Drivers & Enablers

Innovation & technical skills



Policy & public funding



- Exports
- R&D
- Highly specialized jobs

Barriers

- The growing competitiveness of new players (Mitsubishi, Sukhoi, Comac)⁸
- The limited development of local suppliers⁹

Endnotes

¹ Mazzucato, M.; Wray, L. R. (2015) "Financing the Capital Development of the Economy: A Keynes-Schumpeter-Minsky Synthesis", *Working Paper*, n. 837, Levy Economics Institute. Available at: http://www.levyinstitute.org/pubs/wp_837.pdf.

² Coutinho, L.; Ferraz, J.C.; Marques, F.S. (2015) "Development, Uncertainty and the Role of State Investment Banks" in M. Mazzucato and C. Penna (eds) *Mission-Oriented Finance for Innovation: New Ideas For Investment-Led Growth*. London: Rowman & Littlefield International. Available at: <http://www.policy-network.net/publications/4860/Mission-Oriented-Finance-for-Innovation>.

³ Fonseca, P.V. (2012) "Embraer: um caso de sucesso com o apoio do BNDES", *Revista do BNDES*, n. 37, June, 2012. Available at: http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/revista/rev3702.pdf.

⁴ In April 2016, one real (R\$) equals 0.29 dollars.

⁵ <http://www.mdic.gov.br/sitio/interna/interna.php?area=5&menu=5294> (only in Portuguese).

⁶ <http://ri.embraer.com.br/show.aspx?idCanal=y+WJJM+h6a4PAI2D3JKI1w==&linguagem=en>.

⁷ <http://ri.embraer.com.br/show.aspx?idCanal=ZEngHFO1IBuqQFOaglZ5JA==> (only in Portuguese).

⁸ Ruttimann, A.; Fonseca, P.V.; Pinto, R. (2014) "Perspectivas para o apoio do BNDES à Embraer à luz de seu posicionamento competitivo e estratégia de crescimento", *BNDES Setorial*, n. 40, September, 2014. Available at: https://web.bndes.gov.br/bib/jspui/bitstream/1408/3082/1/BS%2040%20Perspectivas%20para%20o%20apoio%20do%20BNDES%20a%20Embraer_P.pdf.

⁹ Franco, G.; Migon, M. (orgs) (2009) *Cadeia Produtiva Aeronáutica Brasileira: Oportunidades e Desafios*. Rio de Janeiro: BNDES. Available at: http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/livro/cadeia_aeronautica.pdf.