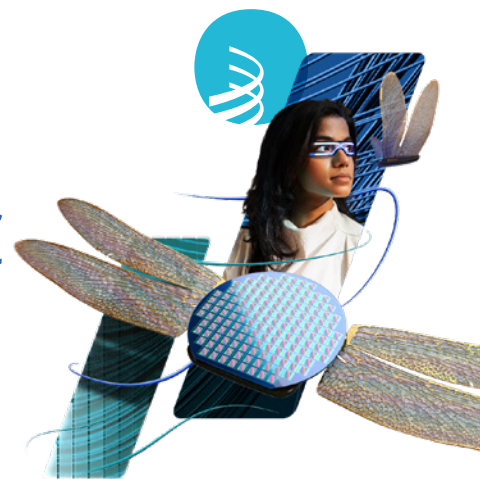


Brazil's deep-science promise: from scientific creation to scalable ventures



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1. The paradox of Brazil's creation engine

Fundamental discoveries at the frontiers of science and engineering are driving a new wave of industrial transformation. Brazil has strong scientific institutions and highly trained researchers, yet the domestic system often struggles to translate scientific output into market applications. This gap is central to the Brazilian deep-tech debate.

Emerge's Deep Tech Radar identifies Brazil as Latin America's largest base of science-based ventures, with 952 active start-ups, or 72.3% of the regional ecosystem (Emerge, 2025a; EmERGE, 2025b). At the same time, the same data set indicates that Brazil attracted USD 216 million in science-based venture investment, compared with USD 607 million for Chile and USD 486 million for Argentina during the measurement period covered by the report (Emerge, 2025b). These figures should be read as EmERGE data-set estimates and should be accompanied by the underlying data file for publication purposes.

The contrast between venture volume and investment volume suggests that Brazil has a strong creation engine but a weaker scaling engine. Public grants and academic research can help generate prototypes and new ventures, but many firms face a valley of death during technical validation, market validation and international scaling.

2. The academic engine: excellence without sufficient bridges

Brazil maintains a significant position in scientific production. Leading public institutions such as the University of São Paulo (USP) and the State University of Campinas (UNICAMP) operate as major research hubs. The Global Innovation Index also recognizes Brazil's scientific strengths, including São Paulo's position as a leading science and technology cluster in Latin America (WIPO, 2025).

However, the interface between academic research and industrial application remains uneven. Doctoral candidates and researchers often participate in international scientific collaborations, but their training may not include corporate R&D, product development, regulatory strategy, venture finance, or intellectual property (IP) management. As a result, many science-based ventures are led by founders with strong technical capabilities but limited experience in market validation and commercial scaling.

According to EmERGE's classification, university spin-offs account for 55% of Brazil's deep-tech start-ups (EmerGE, 2025a). This confirms the central role of universities, but it also highlights a need for stronger business co-founders, professional technology transfer capabilities and structured venture-building support.

3. Academic incentives, patents and technology transfer

A key barrier lies in the incentive framework of public universities, which generate much of Brazil's frontier research. Faculty advancement still depends heavily on teaching and publication metrics. Patent filings can count toward academic recognition, but patents do not automatically become commercial assets. Instituto Nacional da Propriedade Industrial (INPI) data on patenting activity and depositor profiles indicate the continuing importance of universities and public research institutions in Brazil's patent landscape (INPI, 2024).

The risk is that patents become administrative outputs rather than market-facing assets. In long-cycle sectors such as biotechnology and pharmaceuticals, premature patent filing can reduce commercial value if international protection, freedom-to-operate analysis, market validation and regulatory strategy are not developed in parallel.

The experience of gen-t illustrates both the potential and the cultural challenge of academic entrepreneurship. The company, founded by Professor Lygia Pereira, has attracted private investment to build a large genomic database for precision medicine in Latin America (Valor Econômico, 2023). Yet the path from academic laboratory to venture creation remains culturally and institutionally demanding in many public universities.

Technology transfer offices, or núcleos de inovação tecnológica (NITs), play an important role in this process, but many lack the staff scale, financial autonomy and specialized legal and commercial capabilities needed for complex licensing and venture formation. Strengthening these offices is therefore a practical requirement for science-based entrepreneurship, rather than a peripheral administrative reform.

4. Macroeconomic headwinds and the high cost of risk

A second constraint is financial. Brazil's high real interest-rate environment affects risk allocation. When relatively low-risk public debt instruments offer attractive real returns, private investors have less incentive to commit capital to high-risk, long-horizon science-based ventures. The result is that many domestic venture funds concentrate on shorter-cycle models, such as financial technology, software, platform businesses and applied AI, rather than capital-intensive frontier technologies.

Public agencies and corporate investors have begun experimenting with hybrid funding structures, including corporate venture capital (VC) funds and public-private investment vehicles. However, the scale of domestic capital dedicated to science-based ventures remains limited relative to the needs of sectors such as biotechnology, advanced materials, energy transition and industrial technologies.

High-net-worth individuals and family offices have become important sources of patient capital. Examples include investments associated with Pitanga and with Vesper Biotech, a Florianópolis-based venture builder focused on biotech companies (NeoFeed, 2024; Brazil Journal, 2026). These actors can provide capital, governance and industrial networks, but they cannot carry the national ecosystem alone.

The challenge of late-stage capital is not unique to Brazil. European policy debates also point to the relocation of innovative start-ups and scale-ups when firms seek deeper capital markets abroad (European Investment Bank and European Commission, 2025). For Brazil, the lesson is that financing mechanisms must be designed around domestic macroeconomic constraints while still connecting companies to global capital networks.

5. Clusters of market excellence

Despite these structural constraints, Brazil has developed areas of genuine market promise, especially at the intersection of biotechnology, health, agribusiness, industrial biotechnology and biodiversity. In these areas, scientific expertise and national resource endowments can become sources of competitive advantage if paired with experienced management, patient capital and clear IP strategy.

In health and life sciences, companies such as Nintx, Brain4care and gen-t illustrate the emergence of science-based ventures addressing biodiversity-derived therapeutics, medical devices and genomic data. The gen-t case has attracted attention because it links Brazil's diverse population profile with precision-medicine opportunities (Valor Econômico, 2023).

Specialized venture builders can help address the management gap. Vesper Biotech, backed by private industrial families, has built a portfolio of biotech companies and has reported internationally filed patents and planned investment mobilization (Brazil Journal, 2026). Such models suggest that stronger founder and management infrastructure can make scientific assets more investable.

The broader lesson is that scientific excellence is necessary but not sufficient. Investors finance scalable ventures, not open-ended research projects. Brazil therefore needs mechanisms that connect technical researchers with experienced commercial executives, regulatory specialists, IP professionals and industrial customers.

6. Evolution of innovation financing

Brazil's innovation financing model has historically relied heavily on grants and public instruments. These remain important, but science-based entrepreneurship requires a more continuous funding journey, combining grants, milestone-based finance, equity, corporate partnerships, procurement and late-stage capital.

International examples provide useful comparators rather than templates. Germany's Zukunftsfonds uses a large fund-of-funds approach to strengthen venture and growth finance (Federal Ministry of Finance, 2021). The European Innovation Council combines grants and equity instruments for high-risk, high-impact innovation under Horizon Europe (European Innovation Council, n.d.). The United Kingdom's Advanced Research and Invention Agency and Germany's SPRIND illustrate efforts to create more agile, high-risk public innovation agencies (ARIA, n.d.; SPRIND, n.d.).

For Brazil, these models suggest that public innovation funding could play a more catalytic role. Rather than simply expanding grant volumes, Brazil could test larger milestone-based demonstration funds, matching mechanisms that draw in private investors and technology demonstration consortia involving industry, universities, start-ups and public research organizations.

Recent changes to Brazil's National Fund for Scientific and Technological Development (FNDCT), including Law No. 15.184 of 2025, indicate continued policy attention to science and technology funding (Brazil, 2025). The challenge is to ensure that funding execution supports fewer, larger and more integrated translation projects where appropriate, rather than being dispersed across many small disconnected initiatives.

7. Operational friction: logistics, tax and research inputs

Beyond capital, science-based entrepreneurship depends on the day-to-day speed of research. Brazil faces logistical and fiscal frictions in importing laboratory equipment, biological materials, consumables and specialized inputs. Bértola, Stubrin and Anlló (2025) show that delays in importing biological research materials can become a silent barrier to biotechnology in the Global South. In Brazil, these delays can slow experiments, increase costs and reduce the effective purchasing power of research grants.

These frictions matter because public resources and public entities account for a large share of national R&D expenditure (MCTI, 2025). When imported inputs are delayed or made more expensive, the effect is not only private-sector inconvenience but lower efficiency in publicly funded research.

The tax architecture can also create contradictions. The CIDE-Tecnologia contribution, established by Law No. 10.168 of 2000, applies to certain payments linked to technology,

royalties and technical services from abroad (Brazil, 2000). Although the instrument was created to support technological development, it may increase costs for start-ups and research groups that depend on global software, technical services, IP advice and frontier research inputs.

Brazil also possesses major scientific infrastructure, including Sirius at CNPEM, a fourth-generation synchrotron light source and a landmark research facility in the Global South (CNPEM, n.d.). Such infrastructure is valuable, but it needs to be connected more systematically to industrial validation, start-up access and high technology readiness levels (TRL) demonstration projects.

8. Public procurement and the health-care opportunity

Brazil's Unified Health System, Sistema Único de Saúde (SUS), is one of the largest public health systems in the world. It could become a powerful source of demand for science-based ventures in diagnostics, medical devices, digital health, biologics and advanced therapeutics. However, procurement frameworks often have limited capacity to absorb early-stage technology risk.

Historically, Brazil's health-sector technology policy has relied in part on productive development partnerships, or *parcerias para o desenvolvimento produtivo* (PDPs). These partnerships have supported technology transfer and local production of strategic health products, but they have often focused on established technologies and supply-chain security rather than early-stage frontier innovation (Ministry of Health, n.d.).

The Brazilian case suggests that public procurement could be used more strategically as an innovation offtake mechanism. This would require procurement pathways that allow controlled pilots, regulatory learning, reimbursement planning and first-reference customers for validated domestic technologies. It would also require stronger contract research organizations, contract development and manufacturing organizations, certified clinical sites and regulatory capabilities at Anvisa for novel therapies and medical technologies.

9. Summary of bottlenecks and possible responses

Table 1 Key bottlenecks in Brazil's science-based entrepreneurship ecosystem and possible responses

Bottleneck	Evidence or signal	Effect on science-based start-ups	Possible response
Academic incentives	Publication and patent outputs remain stronger than venture-building incentives	Patents and discoveries may remain under-commercialized	Recognize translational outcomes, strengthen NITs and support entrepreneurial PhDs
Capital constraints	High real interest rates and limited domestic deep-tech capital	Private VC favors shorter-cycle models	Use milestone-based blended finance and matching funds to crowd in private capital
Operational frictions	Import delays and taxes on critical research inputs	Longer R&D cycles and lower grant efficiency	Fast-track research inputs and review tax treatment for frontier R&D tools
Procurement limits	Health procurement often focuses on established technologies	Few early reference customers for frontier ventures	Pilot innovation procurement pathways through SUS and other large public buyers
Management gap	Academic founders often lack commercial scaling experience	Strong science may not become investable ventures	Connect scientists with experienced operators, investors and industrial customers

Source: Authors' synthesis based on Emerge (2025a, 2025b), INPI (2024), MCTI (2025), Bértola et al. (2025) and policy references cited in the paper.

10. Conclusion: toward a Brazilian model

Brazil has the foundations for a stronger science-based entrepreneurship ecosystem: world-class scientific institutions, highly trained researchers, biodiversity, large public systems and a growing cohort of science-driven entrepreneurs. The challenge is to connect these assets through a more coherent translation architecture.

The paper's analysis reflects the authors' experience in science entrepreneurship, venture investment and the business MEI dialogues coordinated by the National Confederation of Industry. MEI has provided a platform for private-sector and public-sector dialogue on Brazil's science, technology and innovation agenda since 2008 (CNI, n.d.).

The Brazilian case suggests that emerging economies should not simply copy the financing and institutional models of Silicon Valley or Boston. Instead, they need models that account for local macroeconomic conditions, public research structures, industrial strengths and procurement systems. For Brazil, this means moving from isolated scientific excellence toward a coordinated system that professionalizes founders, mobilizes patient capital, reduces operational friction and uses public demand more strategically to support validated technologies.

References

Advanced Research and Invention Agency (ARIA). (n.d.). About ARIA. Available at: <https://www.aria.org.uk/>.

Bértola, G., Stubrin, L. and Anlló, R. (2025). The import of biological research material is a silent barrier to biotechnology in the Global South. *Nature Biotechnology*, 43(2), 180-183. Available at: <https://doi.org/10.1038/s41587-025-02903-6>.

Brazil. (2000). Lei No. 10.168, de 29 de dezembro de 2000. Presidência da República. Available at: https://www.planalto.gov.br/ccivil_03/leis/l10168.htm.

Brazil. (2025). Lei No. 15.184, de 27 de agosto de 2025. Presidência da República. Available at: https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2025/lei/L15184.htm.

Brazil Journal. (2026). Famílias Lafer e Klabin investem na Vesper e seu portfólio de biotech. *Brazil Journal*, May 7. Available at: <https://braziljournal.com/familias-lafer-e-klabin-investem-na-vesper-e-seu-portfolio-de-biotech/>.

CNI. (n.d.). Mobilização Empresarial pela Inovação (MEI). Confederação Nacional da Indústria. Available at: <https://www.portaldaindustria.com.br/cni/canais/mei/>.

CNPem. (n.d.). Sirius: Brazilian synchrotron light source. Brazilian Center for Research in Energy and Materials. Available at: <https://cnpem.br/en/sirius-en/>.

Emerge. (2025a). Deep Tech Radar Brazil 2025: Profiling science-based start-ups. Emerge Brasil. Available at: <https://emergebrasil.in/inscricao-panorama-deep-techs-2025/>.

Emerge. (2025b). Deep Tech Radar Latam 2025: Profiling science-based start-ups in Latin America. Emerge Brasil. Available at: <https://emergebrasil.in/inscricao-panorama-deep-techs-2025/>.

European Innovation Council. (n.d.). European Innovation Council funding opportunities. European Commission. Available at: https://eic.ec.europa.eu/eic-funding-opportunities_en.

European Investment Bank and European Commission. (2025). *Drivers of relocation by innovative EU startups and scaleups*. Luxembourg: European Investment Bank. Available at: <https://www.eib.org/en/publications/20250217-drivers-of-relocation-by-innovative-eu-startups-and-scaleups>.

Federal Ministry of Finance. (2021). *Future Fund to strengthen venture capital financing for start-ups in Germany*. Berlin: Federal Ministry of Finance. Available at: <https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Topics/Europe/Articles/2021-03-24-future-fund.html>.

INPI. (2024). Indicadores de Propriedade Industrial: Atividade de patenteamento e perfil dos depositantes no Brasil. Instituto Nacional da Propriedade Industrial. Available at: <https://www.gov.br/inpi/>.

MCTI. (2025). Indicadores Nacionais de Ciência, Tecnologia e Inovação 2024. Brasília: Ministério da Ciência, Tecnologia e Inovação. Available at: <https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/indicadores>.

Ministry of Health. (n.d.). Parcerias para o Desenvolvimento Produtivo (PDP). Government of Brazil. Available at: <https://www.gov.br/saude/>.

NeoFeed. (2024). Com cheque do fundo Pitanga e de Guilherme Leal, biotech brasileira levanta US\$ 10 milhões. *NeoFeed*, December 12. Available at: <https://neofeed.com.br/startups/com-cheque-do-fundo-pitanga-e-de-guilherme-leal-da-natura-biotech-brasileira-levanta-us-10-milhoes/>.

SPRIND. (n.d.). Federal Agency for Disruptive Innovation. Available at: <https://www.sprind.org/en/>.

Valor Econômico. (2023). Gen-t, que planeja ter maior banco genético da América Latina, recebe aporte da Eurofarma. *Valor Econômico*, October 9. Available at: <https://valor.globo.com/empresas/noticia/2023/10/09/gen-t-que-planeja-ter-maior-banco-genetico-da-america-latina-recebe-aporte-da-eurofarma.ghtml>.

World Intellectual Property Organization (WIPO). (2025). *Global Innovation Index 2025: Innovation at a Crossroads*. Geneva: WIPO. Available at: https://www.wipo.int/global_innovation_index/.

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