IBCI

OPEN VS. PROPRIETARY AI MODELS:

Competition and Regulatory Strategies for Brazilś AI ecosystem

3rd Early Carrer Scholars Conference for Competition LAW:

Innovation and the “Revamping of Competition Law

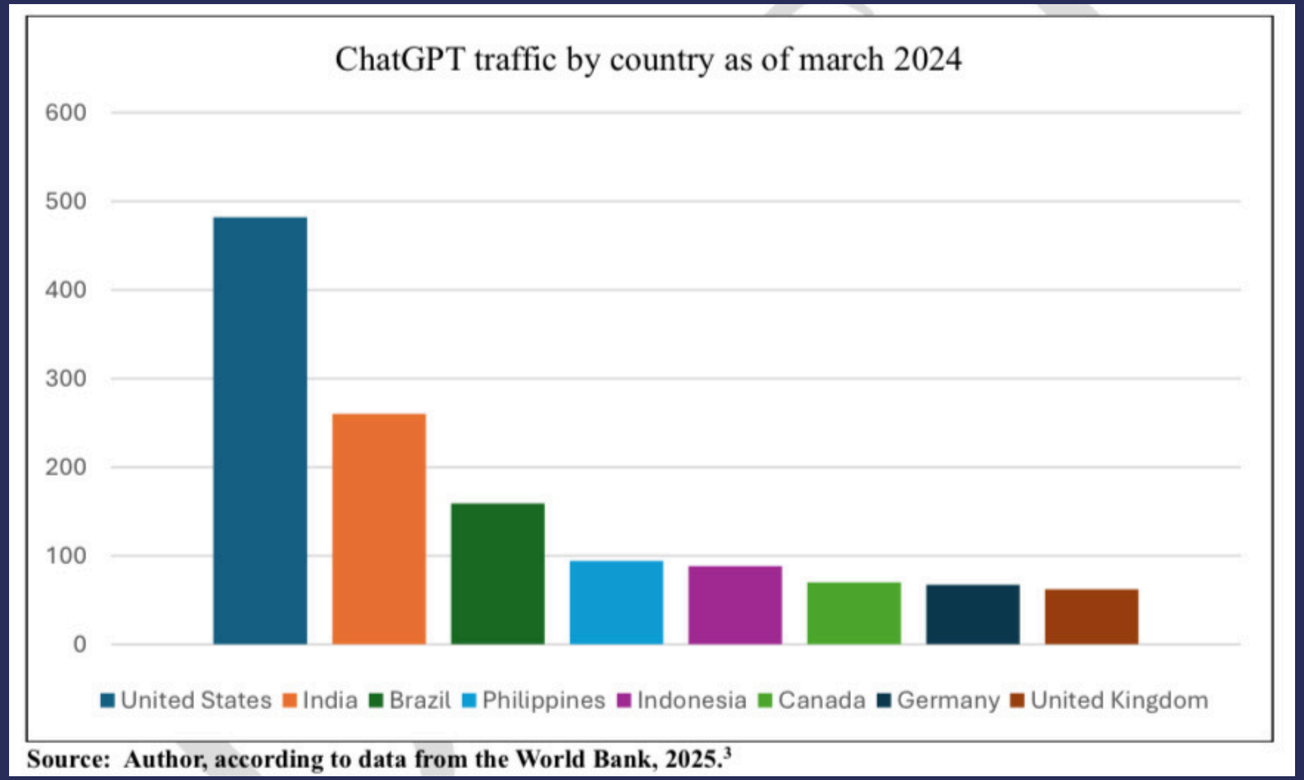
1. Preliminary Considerations

Generative AI context and value chain

Brazil's AI Adoption

Brazil has emerged as one of the world's leading markets for conversational artificial intelligence services.

Widespread adoption reflects a profound economic transformation across sectors.



Source: Author, according to data from the World Bank, 2025.[3]

Giovana Christ, 'Brasil está entre os países que mais usam o ChatGPT, diz estudo' [Brazil is among the countries that most use ChatGPT, study says] CNN Brasil (12 August 2025; updated 18 August 2025) https://www.cnnbrasil.com.br/tecnologia/brasil-esta-entre-os-paises-que-mais-usam-o-chatgpt-diz-estudo/. Accessed 15 August 2025

Yan Liu and He Wang, 'Who on Earth Is Using Generative AI?' (Policy Research Working Paper 10870, World Bank, August 2024) https://documents1.worldbank.org/curated/en/099720008192430535/pdf/IDU15f321eb5148701472d1a88813ab677be07b0.pdf . Accessed 16 August 2025

The AI Technology Stack

Generative AI operates through interconnected layers, each presenting distinct competitive dynamics and potential bottlenecks. Understanding this architecture is crucial for identifying where market power concentrates and how it can be leveraged.

01.
Applications Layer

Consumer-facing chatbots and services where users interact with AI

02.
Access Layer

APIs and SDKs that connect applications to underlying models

03.
Model Layers

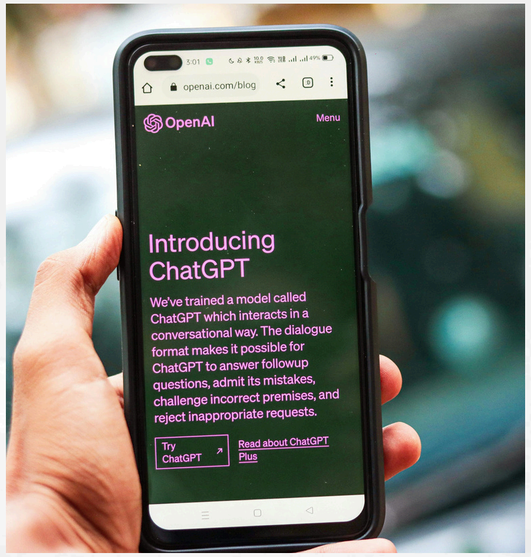
Both specialized fine-tuned models and general foundation models

04.
Infrastructure

Data storage, cloud services, and specialized hardware like GPUs

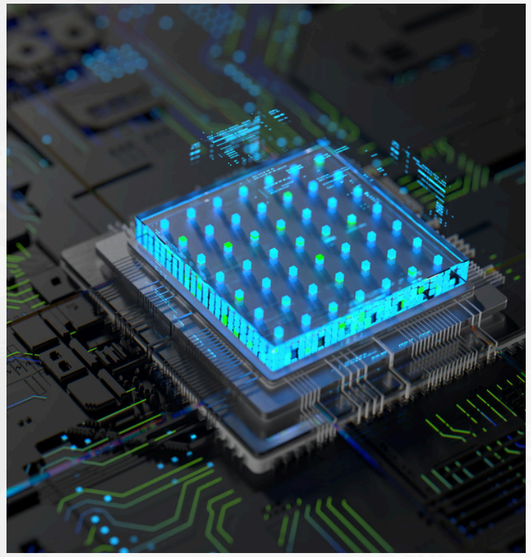
The AI Technology Stack

01. Applications Layer



02. Access Layer

03. Model Layers



04. Infrastructure

Market Concentration:

The GAMMA Dominance

Market structure reveals stark concentration across the AI value chain. In cloud infrastructure, AWS and Microsoft command 70-80% combined market share. In AI chips and accelerators, Nvidia holds over 90% of the training GPU market.

The "GAMMA" firms—Google, Amazon, Microsoft, Meta, and Apple—maintain presence across multiple layers of the AI stack, from compute infrastructure to end-user applications. This vertical integration creates both efficiencies and risks of foreclosure.

70-80%
Cloud Market Share

AWS and Microsoft's combined dominance in cloud infrastructure

90%+
GPU Market Share

Nvidia's control of AI training accelerators

5 GAMMA Firms

Tech giants present across the entire AI value chain

Sources: Friso Bostoen and Anouk van der Veer. 2024
Competition and Markets Authority, 2024

GenAI Value Chain

Sources: Höppner and Stratfeild, 2023.
Autorité de la concurrence, 2024.

Infrastructure

Computing Power

AI chips
Cloud services

Data

Collection, processing, storage

Knowledge

Engineers, researchers, and domain experts

Modelling

Foundation model development & corpora training

Proprietary models
Open-access models

Fine-tuning

Adapting models to specific tasks

Deployment

Commercially viable generative AI services for consumers (end users).

Examples

Infrastructure

GPUs (Nvidia) • TPUs (Google)

AWS (cloud service)

Modelling

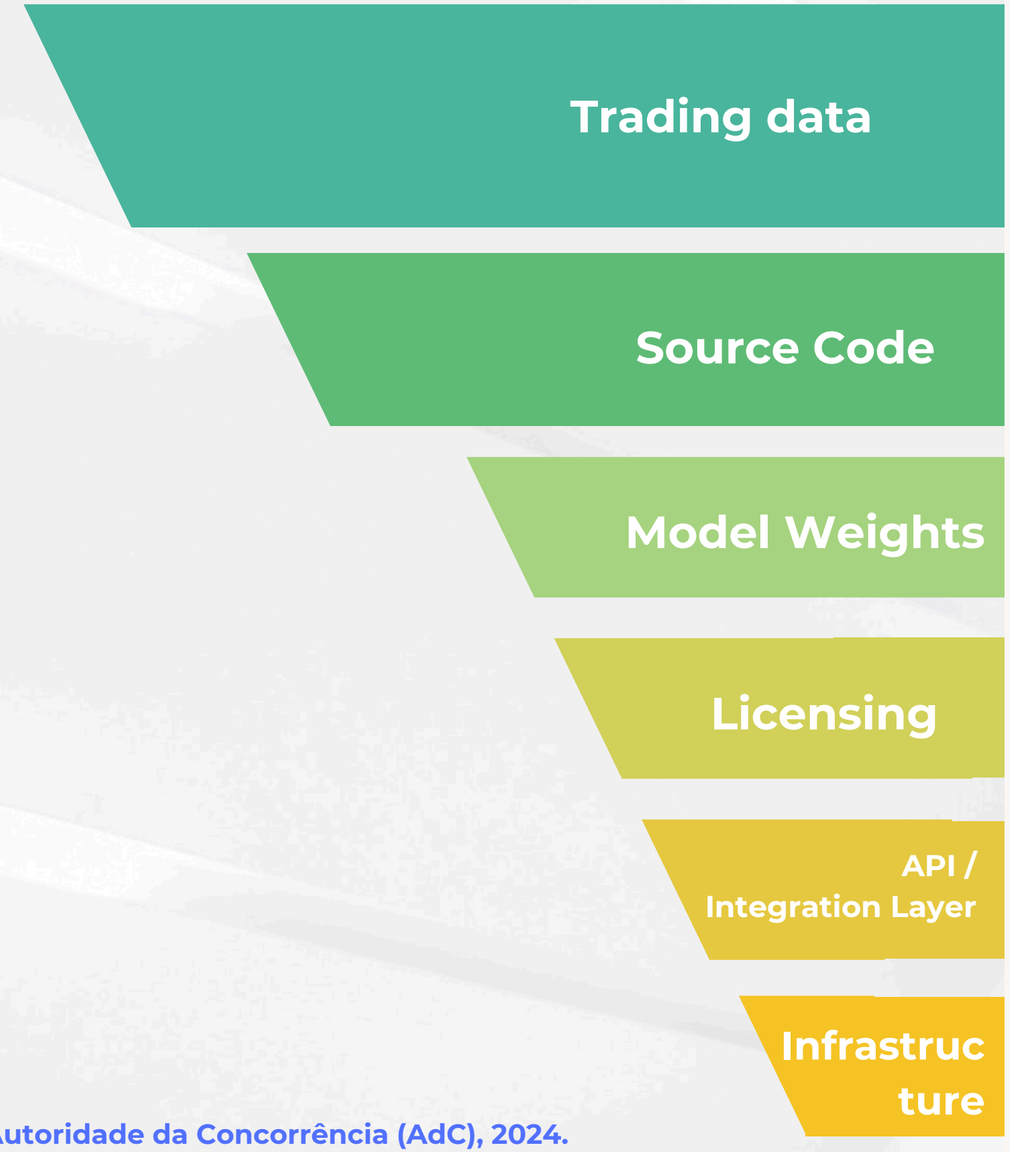
GPT-5 (OpenAi) · Gemini (Google)

LLaMA (Meta´s open acess model)

Deployment

ChatGPT

Google AI mode search



Source: Autoridade da Concorrência (AdC), 2024.

The Openness Spectrum

Beyond Binary Thinking

The dichotomy between "open-source" and "proprietary" AI systems is misleadingly simplistic. Openness exists on a spectrum shaped by which elements are shared: model weights, licenses, source code, training data, APIs, and infrastructure access.s

For regulatory and antitrust purposes, the central question is identifying which components are accessible to third parties and on what terms. This requires a holistic metric that simultaneously distinguishes and aggregates different dimensions of openness.

Open Source

Full code and weights publicly available with permissive licensing

Open Weights

Parameters disclosed but often with usage conditions and restrictions

API Access

Contractual functionality without revealing underlying technical assets

2. Competitive Dynamics of Gen AI Platforms

Layered Architecture and Competitive Bottlenecks

- Multiple competitive dynamics operating across different layers of the supply chain.
- Technical (knowledge) barriers to develop, fine-tune, or integrate models via API appears to be falling, which tends to reinforce network effects.
- Progress in infrastructure, on the other hand, requires extensive research and development and significant capital investments, often resulting in bottlenecks.
- Leading cloud service providers consolidate control by managing multiple layers of the infrastructure stack, from hardware components to the AI services provided to clients.

Lock-in, Gatekeepers, and Market Power

- APIs as gatekeepers - setting the technical rules and terms for using pretrained models.
- The concentration of control across multiple layers can intensify user and vendor lock-in, making the process of switching providers more costly in terms of financial resources, time, and computational capacity.
- High risk of digital incumbents quickly transposing their existing market power to the new “sides” of AI platforms, as generative AI becomes increasingly embedded in all kinds of digital platforms and consumer products.
- Control over distribution, data, and computational resources might be leveraged to prevent rivals from competing and to solidify the incumbent's position in the next digital layer.
- “Central contradiction" of creative destruction: the early control of critical layers by a few dominant firms risks entrenching market power and stifling the next wave of innovation.

2.1. General notion of opinions and decisions by competition authorities on AI markets

CADE (Brazil)

No public conduct investigations.

Merger control between IBM and software AG adopts IDC´s taxonomy as for market definition.

CMA (UK)

Microsoft/OpenAI: AI sector in layers: upstream model development, distribution often via cloud providers, model hubs and marketplaces, and downstream deployment in services such as chatbots.

(inquiry closed at Phase 1 without a formal market definition, treating these layers as related yet separable)

EC (EU)

Comission's Competition Policy Brief also reads the value chain by levels: upstream inputs (quality data, compute and chips, and specialized labor) and downstream supply of FM services, with possible segmentations.

Autorité (France)

Mapped infrastructure and hardware, model development, and deployment in services, and highlights bottlenecks and potential leveraging when essential infrastructure and distribution sit within the same group

Competition Concerns in AI Markets

01

Self-Preferencing

Foundation model developers favoring their own applications over competitors, leveraging control of essential infrastructure to advantage proprietary services.

02

Vertical Foreclosure

Market foreclosure arising from vertical integration with essential infrastructures like cloud services, data, and compute resources.

03

Lock-In Strategies

Initial openness attracts users and developers, but later versions restrict licensing and interoperability—"open today, closed tomorrow" dynamics.

04

Data Advantages

Incumbents leveraging massive proprietary datasets and user feedback loops to create insurmountable competitive moats.

05

API Gatekeeping

Control over access interfaces enabling discriminatory pricing, rate limiting, and preferential treatment of affiliated services.

Regulatory Implications

- The path for competition law demands calibrated choices (whether ex ante, ex post, or a hybrid approach), emphasizing the necessity of avoiding conduct that consolidates market foreclosure without unduly penalizing entrants.
- Maintaining competitive discipline requires more than nominal openness; it depends on practical requirements such as portability, interoperable interfaces, and non-discriminatory access to essential inputs.
- Antitrust analysis should map the technology stack and apply established doctrines (such as refusal to deal, essential facilities, and self-preferencing) to address specific conduct and effects.

2.2. Main Proposals and Metrics

2.2.1. Based on the level of openness

Schrepel and Potts propose a comprehensive methodology for assessing AI model openness based on innovation commons theory.

Their framework addresses **three institutional problems** crucial to fostering competitiveness.

Their research found that most models occupy the middle of the openness spectrum—none at the extremes.

Models generally perform well on knowledge access but poorly on fair contracting and community governance.

Knowledge Access

Implicit Contracting

Collective Governance

2.2.2. Based on a structuralist bias and state aid

Tejas Narechania & Ganesh Sitaraman, on the other hand:

- *argue that the AI technology stack inherently favors persistent concentration, resembling essential infrastructure.*
- *Note significant entry barriers in lower layers (cloud infrastructure, data, foundation models), which act as essential facilities due to high duplication costs.*
- *advocate for ex ante regulatory tools as more effective, enabling preventive market design in structurally concentrated sectors.*

Table - Narechania & Sitaraman Antimonopoly Propositions for AI Regulation

Proposed Tool	Rationale
Competition oriented state aid	State aid to incentivize chip and hardware manufacturing by new entrants.
Structural separations	In some instances involving essential inputs (e.g., cloud), a structural separation (prohibit vertical integration).
Non-discrimination and open-access rules	Cloud providers, AI model providers, and—even in times of scarcity—chip manufacturers must serve everyone equally, with uniform and transparent pricing.
Interoperability rules	Require that training data for AI models be shared on fair terms so that the benefits of model improvement are distributed among all users.
Creation of governmental alternatives	Government should provide AI goods or services that coexist alongside private-market options.
User-centred ownership structures	Promote AI firms owned by users, workers, or producers (e.g., a cooperative cloud service for researchers), rather than by distant shareholders.

3. Status of Brazilian regualtion

Overview of Brazil's Regulatory Landscape

Bill No. 2,338/2023: AI Legal Framework

Approved by the Chamber of Deputies in 2024, this bill establishes risk-based governance for AI systems. It categorizes systems by risk level—excessive, high, or standard—with obligations proportional to potential harm.

Key provisions include algorithmic impact assessments, transparency requirements, data governance standards, and interoperability mandates for public sector systems.

Bill No. 4,675/2025: Digital Markets

Proposes inserting a digital markets chapter into Brazil's Competition Law, creating a Superintendence of Digital Markets within CADE and defining "economic agents of systemic relevance."

Designation criteria include multifunctionality, vertical integration, network effects, and revenue thresholds (R$50B global or R$5B domestic).

Together, these initiatives create a hybrid regulatory regime combining risk-based AI governance with ex ante platform discipline and ex post competition enforcement capabilities.

Brazil's Regulatory Landscape

Table — Pillars of Brazil´s AI Bill

Foundation in human rights and values	The original text established 10 foundations (centrality of the human person, human rights, privacy and data protection, non-discrimination, free competition, technological development and innovation, among others). The final version expanded to 20, adding, among others, Integrity of Information, Strengthening of the Democratic Process, Protection of Copyright and Related Rights, and Promotion of Interoperability of systems.
Risk-based approach	Regulation is calibrated according to the risks of the application context. There are categories of Excessive Risk (prohibited), High Risk (subject to stricter controls), and systems outside these groups, considering the probability and severity of adverse impacts.
Mixed regulatory model	It combines preventive measures (risk assessment and governance) with civil liability and administrative sanctions.

- National System for AI Regulation (SIA) —coordinated by ANPD
- Expanded to include explicit objectives of promotion and competitiveness.
- Binding technical cooperation between SIA entities and CADE.

Brazil's Regulatory Landscape

Table — Special Obligations (to be) Applicable by CADE

Special Obligations (art. 47-E)	Rationale and Regulatory Relevance for AI Systems
Mandatory notification of any concentration operation, irrespective of revenue parameters (Item I).	Greater control over acquisitions and killer-acquisition strategies.
Transparency regarding terms of use, ranking criteria, and price structures (Item II).	Public disclosure improves accountability and reduces information asymmetries.
Advance communication to all types of users, not only consumers, of changes to terms of use or to the products offered (Item III).	Predictability and mitigation of opportunistic contractual changes for business users and others.
Prohibitions on specified conduct: limitations on competitors' participation; restriction of access to essential inputs; self-preferencing; tying or bundling; and the imposition of exclusive conditions. Interoperability and portability: provide tools enabling user-data portability and ensure interoperability with other services and hardware, including allowing installation and use of third-party apps; provide aggregated and disaggregated performance data to business users; and ensure non-discriminatory access to resources.	Prevents foreclosure and lock-in; fosters open ecosystems and contestability in AI-relevant markets.

- "agentes econômicos de relevância sistêmica em mercados digitais" - gatekeeper.
- Different procedures - designation and application of special obligations.

IBCI´s seminar “New Frontiers of Digital Regulation: AI, Antitrust and cosumer law”

On October 3, 2025, the IBCI held an international seminar at the São Paulo Lawyers’ Institute, aimed at empirically and dialogically collecting evidence, ideas, projections, and perspectives regarding regulatory initiatives and legislative forays focused on the regulation of digital platforms and Artificial Intelligence.

The event was structured into four panels and brought together experts from academia, the private sector, law firms, government, competition authorities, jurists who served as rapporteurs on the committees of jurists for AI regulation in Brazil, board members, and economists. Based on that debate, we systematized some of the main concerns and evidence relevant to this study.

IBCI´s seminar “New Frontiers of Digital Regulation: AI, Antitrust and cosumer law”

Objection vs. Counter-Objection (Systematized Points)

Objection[51]	Counter-Objection[52]
Timeliness of the regulatory model: Bills No. 4675/2025 and 2768/2022 were grounded in analyses of pre-GenAI digital markets; they risk targeting outdated problems.	The new, continually updated government bill already references generative AI, reducing this mismatch.
Leveraging across markets: Authorities’ focus on the thesis that big techs would transfer power from digital markets to AI is merely speculative.	The hypothesis may be realistic: big techs (Meta, Google, Amazon, Microsoft) operate across several layers of the GenAI stack, according to data already analyzed.
Marginal costs: Inference has costs (compute/energy); it is not zero-price. This weakens “winner-takes-all” logic.	Even so, integration into large platforms tends to preserve “winner-takes-most.” [53]
Network effects and lock-in: Little gain from “more users”; multi-homing is possible; interoperability and open models reduce lock-in; DMA-type rules would be unnecessary for AI.	Without portability/interoperability, multi-homing is difficult; RLHF and user-level personalization, integration, and compliance raise switching costs.
Feedback loops (data): Feedback loops do not depend on ads as in multi-sided platforms; advantages from massive data stockpiles matter less.	Usage telemetry, RLHF, synthetic data, and integrations can recreate cumulative advantages.
Disruptive force and “creative destruction”: AI increases rivalry and forces leaders to differentiate/innovate.	Incumbents can neutralize via bundling, self-preferencing, distribution, cross-subsidies, and cross-investments.
Incentives to foreclose: Hyperscalers tend to focus upstream (higher margin) and allow downstream competition to expand demand for compute; vertical foreclosure would be unlikely.	There is a risk of exclusionary practices: conditional discounts, conditioned API access, self-preferencing, exclusivity in chips/models, and prioritization of capacity.

[50] Juliano Maranhão, Beatriz Sousa, Marco Almada, Josie Menezes Barros e João Navas, Competition in A.I. Markets: Full Version (Legal Wings Institute 2025)

4. Final Considerations

Policy Recommendations

Adopt an Openness Index

Implement a comprehensive metric to guide CADE and ANPD in assessing proportionality of restrictions and obligations applied to AI systems and platforms.

Strengthen Interoperability

Mandate technical standards ensuring portability, non-discriminatory API access, and cross-platform compatibility to reduce switching costs.

Formalize Cooperation

Establish binding agreements between CADE, ANPD, and sectoral regulators with clear information-sharing protocols for AI-related cases.

Legal Exemptions

Provide regulatory relief for truly open AI systems that promote knowledge commons and lower barriers across the stack.

Economic Incentives

Introduce tax deductions, state aid, and preferential procurement for projects committed to genuine openness.

Transparency Requirements

Mandate disclosure of code, weights, and training data under specified conditions to enable competitive oversight.

Thank you for your attention!

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