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Institutional Adaptation and State–Led AI Governance: Analyzing China's Industrial Policy Architecture through a Co–Evolutionary Lens

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Abstract

The rapid development of artificial intelligence (AI) and the intensifying technology competition on a global scale have made AI governance a central policy priority. Based on an evolutionary economics approach, this study develops a three-dimensional analytical framework encompassing policy actors, policy instruments, and policy objectives to examine the co-evolution of technology and institutional arrangements. Using 101 Chinese AI policy documents issued between 2015 and 2025, the study conducts systematic policy text analysis to map the structure and evolution of China's AI governance system. The results reveal that China's AI governance system features centralized strategic leadership, multi-level coordination, and a persistent developmental orientation prioritizing industrial transformation. The framework change from "1+N" framework to "AI Plus" paradigm indicates that AI will extend capabilities to various industries under a comprehensive adaptation strategy.

Keywords

Industrial policy; China; Science policy; Artificial intelligence industry

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1. Introduction

The Artificial Intelligence (AI) industry in China has experienced rapid growth. As of June 2024, the core AI industry in China reached a scale of $79.6 billion, making China world's second biggest contributor to the industry. The number of AI-related enterprises nationwide has exceeded 4,500 (Yan, 2024). At the end of 2024, Deep Seek, a Chinese AI company, made headlines with its open-source large model technology. In the current era of rapid technological evolution, the field of AI has emerged as a strategic force, with nations worldwide actively competing to develop this burgeoning industry (Mariani *et al*., 2023). In China the government has actively intervened in the development of the AI industry, using numerous policy tools, strategic plans, and regulatory frameworks.

This rapid increase of China's investment in an AI industrial policy can be attributed to two structural pressures: domestic socioeconomic pressures and a complex global technological governance framework. Domestically, China's response to demographic ageing and economic restructuring is a dual one of upgrading industrial structure and expanding domestic demand, connected with a "dual circulation" development pattern (Javed *et al*., 2023). AI is therefore positioned as a core enabling technology which supports both supply-side upgrading and demand-side expansion. The international governance environment of AI is becoming increasingly fragmented. U.S. export controls on semiconductors and AI computing hardware have been steadily tightened since 2022. The formal implementation of the EU AI Act (European Parliament, 2024) has introduced another major regulatory paradigm into the global AI governance landscape. The EU's approach is characterized by a horizontal, risk-tiered regulatory framework and a "rights-first" governance philosophy (Gregorio and Dunn, 2022).

Although China's AI policy system has developed rapidly over the last couple of years, existing studies have primarily focused on mapping policy evolution, policy instruments, or inter-agency coordination. Nevertheless, a quickening technological transformation drives AI development to constantly reshape governance demands. The more fundamental question of how technological change and institutional arrangements co-evolve in time is raised. In particular, it remains uncertain how policy actors, tools, and objectives adapt to increasing technological complexity while at the same time determining the path of AI. Grasping how these two processes shape one another is important for explaining the integration of fragmented policy elements into a governance architecture under conditions of rapid technological change.

This paper is structured as follows. Section 2 will provide a literature review and theoretical framework. Section 3 describes the data sources and coding procedure. Section 4 examines how China's AI industry policies have evolved. Sections 5 analyzes the characteristics of China's AI policy system from three dimensions: policy actors, policy tools, and policy objectives. In section 6, we will detail the unique characteristics of China's AI governance model, and then offer some policy implications for latecomer economies. Finally, Section 7 concludes the paper.

2. Literature Review and Theoretical Framework

2.1. Literature review

While studies of China's AI industry policies have given attention to a variety of dimensions, yet they remain analytically fragmented. Existing studies have generated valuable insights into the evolution of policy priorities, the configuration of policy instruments, and the multi-level governance frameworks for

AI development. A first strand of literature conceptualizes China's AI policy as a temporally evolving strategy shaped by shifting national priorities. A policy analysis of the key policy documents, including the Five-year New Generation Artificial Intelligence Development Plan (AIDP) from 2017, reveals that policy signals from the top represent a way of setting expectations and supporting local experimentation (Roberts *et al*., 2021). Likewise, quantitative analyses of policy development highlight a transition from fragmented regulatory initiatives toward more coordinated and targeted implementation frameworks (Yang and Huang, 2022). While the existing literature is effective in mapping how policy attention evolves over time, it tends to implicitly equate observed policy convergence with systemic coherence, without explaining how such coherence is institutionally produced.

Another set of studies examines the AI policy through the lens of the innovation policy mix. Drawing on the typology of supply-side, demand-side, and environmental instruments, this literature highlights how governments combine different policy tools to address system-level constraints on innovation (Edler and Fagerberg, 2017). The analytical framework of this study relies on this threefold typology. Studies on innovation governance in China reveals that there is an increasingly diverse set of instruments, including subsidies, infrastructure investment, regulatory standards, and pilot programs. It classifies instruments but does not fully explain how such combinations evolve in response to technological change.

Studies show that policy actors are connected in various ways, such as those between the government and enterprises, or between different levels of government (Huang *et al*., 2024). Lundvall and Rikap examine the co-evolution of China's national innovation system and corporate innovation systems, arguing that Chinese tech giants like Alibaba and Tencent are key drivers of AI adoption, while the state simultaneously relies on these firms for global competitiveness (Lundvall and Rikap, 2022). Khanal *et al*. (2025) have demonstrated empirically that this logic of central-local policy diffusion is not a purely top-down affair: local governments exercise considerable agency in interpreting and selectively implementing central directives, generating significant variation in AI policy configurations across China's provincial landscape. The literature on governance explores the relationships within governance systems, but it has mainly concentrated on their relational patterns and communication. It has not focused on how we link these communications.

China's AI governance is also seen and compared with progress elsewhere in the world, in particular with the European Union and the United States. These studies highlight China's developmental orientation, in which technological advancement and industrial upgrading are prioritized over rights-based regulatory concerns (Roberts *et al*., 2023). The comparative perspective suggests that the Chinese policy system regards matter of technology and economic transformation as the main objectives, while governance and regulation issues are structured to serve rather than constrain these developmental goals.

While recent studies have greatly contributed to the understanding of China's AI policy landscape, this body of literature remains largely uncoordinated. Moreover, these existing accounts often overlook the dynamic interplay among policy elements and their potential to form an integrated governance framework amid rapid technological change. This study fills a gap by theorizing AI policy as a co-evolving system in which institutional arrangements and technological change mutually shape one another, yielding an internally structured governance architecture.

2.2. Theoretical framework

Drawing from evolutionary economics, this paper aims to provide a theoretical perspective to the AI policy game and its analysis. Unlike neoclassical economics, which treats innovation as an exogenous

shock within a static equilibrium model, evolutionary economics conceptualizes innovation as an endogenous force that continuously disrupts equilibrium and drives systemic transformation (Lipieta and Lipieta, 2023). Innovation, in this perspective, encompasses not merely technological change but also institutional, managerial, and social transformation (Saviotti, 2023). Evolutionary economics emphasizes the co-evolution of technology and institutions: technological breakthroughs generate pressure on existing institutional arrangements, thereby triggering institutional change to accommodate the demands of emerging technologies (Zhang, 2020; Witt, 2022). The study's main aim is to use this framework to gain insights into the changes in China's AI governance architecture. The co-evolutionary perspective provides a framework of analysis that can be used to study the way in which policy outcomes develop in a specific direction, as well as the structural makeup of these outcomes, such as the relationship between actors, instruments and objectives.

Evolutionary economics indeed sees public policy as much a part of the innovation system as it is a rule enforced by an otherwise free market. In governance terms of AI, this framing implies that AI is not just one type of policy, but the various systemic attributes that evolve from a package of policy elements. It is in this context that the 3-dimensional analytical approach of the present study is motivated. The dimensions of the framework, namely policy actors, policy instruments and policy objectives, each derive their analytical justification from distinct but complementary theoretical traditions within evolutionary and innovation studies.

To systematically analyze the internal structure of AI industry policies, this study designs a three-dimensional analytical framework with policy actors, policy instruments, and policy objectives. Policy actors refer to the institutional entities responsible for policy formulation and issuance. According to China's administrative structure, there are different types of policy actors, including the State Council, ministries and commissions, and other central government agencies. The policy structure consists of both vertical and horizontal dimensions. The vertical dimension refers to the hierarchy of policy authority, which includes department working documents, department normative documents, department rules, and State Council normative documents. The horizontal dimension are classified into three broad categories: supply-side, demand-side, and environmental instruments. Policy objectives refers to strategic intentions in the policy document. Based on the AI-related policy content, four principal categories are identified: technological innovation, application promotion, governance regulation, and industrial transformation.

3. Research Design

3.1. Data sources

In this study, we use policy document analysis as the main research method to analyze the structural characteristics of China's AI industry policies. The text analysis is especially helpful in systematically capturing the content, orientation, and internal configuration of policy systems, with a focus on state-led innovation governance. The empirical data set is made up of 101 policy documents related to the AI industry issued between 2015 and 2025, which mainly encompasses central-level policy documents. All policy texts were selected from the authoritative and public documents of the central government, and the official websites of relevant ministries. These comprise national development plans and ministerial regulations, policy guidelines and so on. To ensure the reliability and validity of data, the core sample (Table 1) includes only the policy documents that are officially issued and publicly available. Secondary

sources, including academic literature and policy reports, were used to provide contextual interpretation, but were not included in the primary data set.

Table 1
Selected AI policy documents (2015-2025).

No	Document Title	Implementation Date	Issuing Organization
1	Guiding Opinions of the State Council on Vigorously Advancing the "Internet Plus" Action	2015.07.04	State Council
2	Notice of the Ministry of Industry and Information Technology, the National Development and Reform Commission, and the Ministry of Finance on Printing and Distributing the "Robot Industry Development Plan (2016-2020)"	2016.03.21	Ministry of Industry and Information Technology; National Development and Reform Commission; Ministry of Finance
3	Regarding the issuance of the "Internet +" artificial intelligence Three-year Action Implementation Plan	2016.05.18	National Development and Reform Commission; Ministry of Science and Technology; Ministry of Industry and Information Technology; Central Cyberspace Administration
...	...	...	...
101	Notice by the General Office of the Ministry of Industry and Information Technology of Issuance of the Action Plan for Integrated Facilitation by the Industrial Internet and Artificial Intelligence	2025.12.30	Ministry of Industry and Information Technology

3.2. Coding procedure

This study on how structured coding can facilitate the analysis of qualitative policy texts aims to convert qualitative policy texts into structured data. Each document represented a unit for analysis purposes. The policy measures, implementation guidelines, and stated objectives sections were reviewed according to the framework. The coding manual has been provided in Appendix. For each dimension, categorical variables captured presence of the specific type: actors were coded by issuing authority, and instruments and objectives were coded individually against each category that appeared in the text. When the document contained various instruments or objectives, simultaneous assignment preserved the multidimensional structure of real policy design. The resulting data were used to produce a structured data set to support aggregation and comparison across the full sample.

The study employed a systematic coding with NVivo 15. This was further undertaken in three phases. At the initial stage, two coders independently coded a random subset of 25 documents against a preliminary scheme. Agreement rates exceeded 87 percent. The kappa values for actors, instruments and objectives were 0.84, 0.81 and 0.86 respectively. Discrepancies were reviewed, and the scheme was refined. In the second stage, the refined scheme was applied to all 101 documents by both coders. A document was created that defined each category, what was included or excluded with examples. It is provided as supplementary material. In the third stage, remaining discrepancies were resolved through discussion. Presence of a category was only coded when present in a text in substantive provision.

4. The Evolutionary Trajectory of China's AI Policy

The quantitative distribution of AI-related policies from 2015 to 2025 (see Fig. 1) illustrates a clearly discernible upward trend in state prioritization. Overall, the number of policies shows a significant upward trend, indicating the growing importance of AI within China's national development agenda. However, this is a rather small policy output for the first phase (2015-2016), in the context of an immature AI industry. There were random and uncoordinated policy interventions. The pattern reflects an early form of thinking about considering AI as part of a science and technology policy. One of the reasons has been that this institutional void was those that required a more centralized approach after AI has been elevated to the new status of a national-level strategic priority.

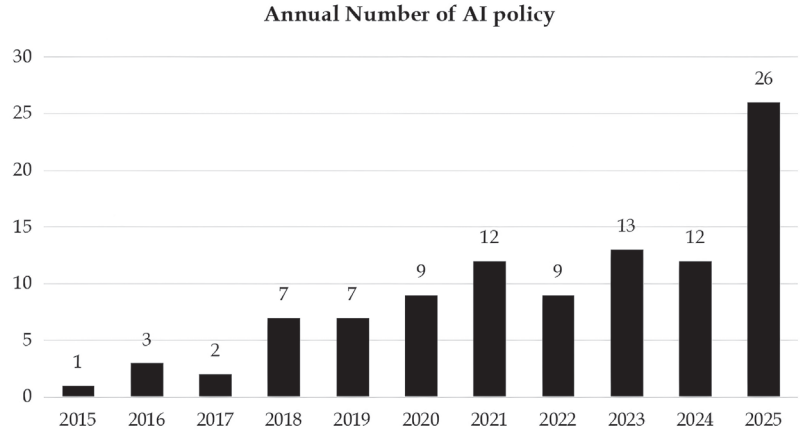

Fig. 1. Annual number of AI policies between 2015 and 2025.

In 2017, the AIDP was formally adopted as part of the national strategic direction, and guidance for the drive towards industrial development was provided in a general way. From 2017 to 2022, China's AI policies were mostly oriented towards facilitating the development of standards and expanding the scope of applications. It shows that the policy focus during this stage was primarily on building capacities and sharing AI technologies.

China has established an AI policy framework characterized by the "1+N" structure. General and broad guidance about AI is provided in the form of "1" for AIDP, in the framework. The letter "N" signifies the set of policies/plans, which have been issued by various government ministries and offer specific assistance. There were several ministries which had been a component of the AI industry, but no particular ministry was accountable for AI governance. The "1+N" arrangement enabled the central government to provide a common direction through the AIDP. At the same time, it left each ministry room to design instruments suited to its own sector.

Now the AI policy of China has soon entered a high-yield period since 2023. This change is happening at a time when new technologies are taking birth, including Generative AI, and the concept of "New Quality Productive Forces" has been introduced. Until now, AI application areas such as industrial robots were confined to a single part of the industry, and were easily controlled and handled by a single ministry. Conversely, generative AI can be implemented throughout numerous industries at the same time. The use of Generative AI technologies has led the government to put more focus on regulatory measures and innovations in the field of AI. As the first regulation regarding generative AI services, the Interim Measures for the Management of Generative AI Services was a milestone in generative AI history. Concurrently, the

concept of "New Quality Productive Forces", formally introduced in 2023, represents a critical institutional context for understanding the strategic orientation of China's AI industrial policy. This concept is defined as a productivity paradigm driven by technological innovation, particularly AI (Xie *et al.*, 2025).

Most importantly, the Government Work Report for 2024, for the first time, officially introduced the "AI Plus" (AI+) paradigm, indicating a new policy direction to integrate AI in the whole economic system. Further, the State Council advanced its policy-making process of AI at the highest level. The large number of policy outputs in 2025 is a sign of the paradigm shift towards the "AI+".

This move is in keeping with the government's efforts to promote a sector, but also its attempts to seriously penetrate across different sectors with AI technologies as a productive factor. As AI reshapes the productive possibilities of the economy, the institutional framework is changing to govern AI and speed up its adoption.

5. Empirical Findings

5.1. The coordinated leadership of the central government

The collaboration of different agencies has increased over time, with coordination. The number of policy documents issued together is steadily growing over time, as illustrated in Fig. 2. In the previous "1+N", the ministries primarily published their own documents, while AIDP provided guidance for each ministry. With the advent of the "AI+" paradigm, there is a phenomenon where AI tools developed in one field are increasingly being transferred to another. These applications across different sectors could not be undertaken by any single ministry alone. This led to a practical need for more joint policy documents.

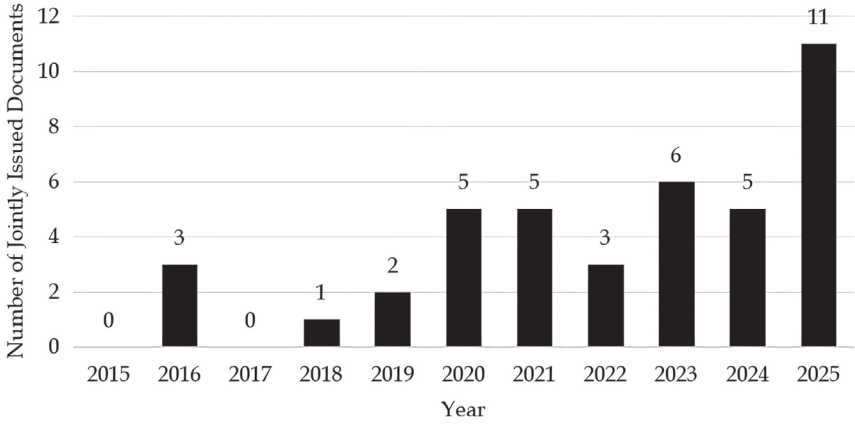

Fig. 2. Annual number of jointly issued AI policy documents (2015-2025).

Table 2, which shows how many policies are issued by top 10 central departments, further highlights the multi-dimensional and coordinated nature of China's AI governance. The Ministry of Industry and Information Technology (MIIT) is the most active one, indicating the importance of industrialization in China's AI policy. The second and third most active contributors are the Ministry of Science and Technology (MOST) and the National Development and Reform Commission (NDRC), showing the importance of technology innovation and macro-level coordination, respectively. Unlike in China's AI governance system, the application and diffusion of AI in the industry is given greater weight than basic research itself. In addition to three key agencies, a large number of agency heads within individual ministries and departments are also participating in policy formulation, indicating the cross-departmental reach of China's AI governance.

Table 2
Top 10 Promulgation Departments of AI policy.

Promulgation Department	The number of occurrences	Proportion
Ministry of Industry and Information Technology	46	17.76%
Ministry of Science and Technology	18	6.95%
National Development and Reform Commission	17	6.56%
State Administration for Market Regulation	16	6.18%
Ministry of Education	15	5.79%
Ministry of Transport	11	4.25%
Ministry of Finance	10	3.86%
Ministry of Public Security	10	3.86%
Central Cyberspace Administration	9	3.47%
National Medical Products Administration	9	3.47%

The semantic network of the AI policy texts (see Fig. 3) offers a complementary structure-based lens on inter-agency collaboration. Analysis reveals that the nodes of MIIT, NDRC and MOST are the most central ones, and that there are close ties between these nodes. These are the key actors that provide the backbone to the governance system, who coordinate with a larger functional grouping of ministries such as MOE and MOT. The regulatory agencies, such as the Central Cyberspace Administration and the State Administration for Market Regulation, play an important role in bridging the gap between the domains of technological development and market regulation. Network structure, as a whole, is that of horizontally integrated governance. Several departments work together under a common policy, whilst development-oriented agencies have a key role in the structure. Network structure represents a horizontally integrated governance system, where a number of departments work together on common policy.

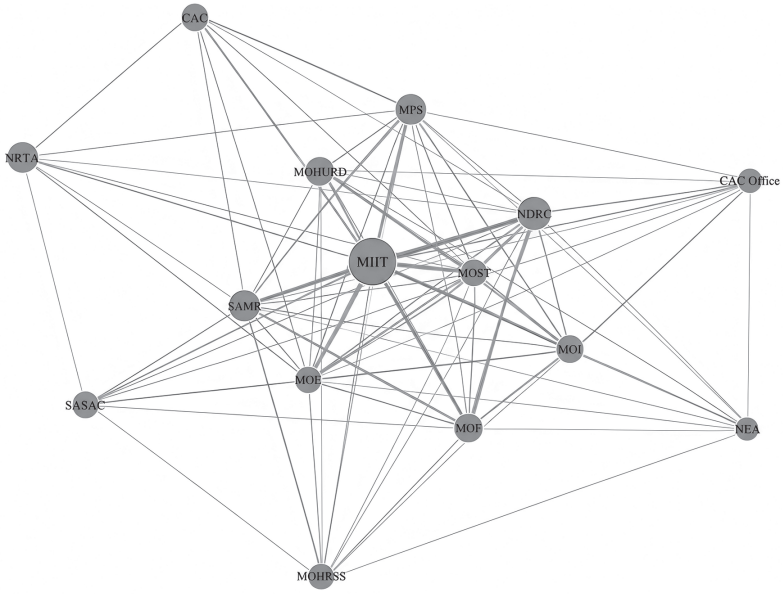

Fig. 3. Inter-agency collaboration network of China's AI policy system.

5.2. Hierarchical and multi-functional policy structure

The AI policy framework is multifaceted and includes legal legislation, strategic planning, technical standards, and norms. The vertical differentiation of the configuration of policy instruments is based on authority and functions. By doing this, the central government can ensure that the long-term strategic plan is executed with sufficient flexibility in its operational implementation, thereby creating a robust governance framework that can adapt to the changing needs of AI development.

The national laws are at the top, as illustrated in Fig. 4, which offer the basic principles of law of AI governance. High-level documents like laws and directives of the State Council make up only a small part. At the highest level of the hierarchy, the AI regulatory framework in China is premised on various laws. China's AI industry is regulated by various key pieces of legislation, such as the Cybersecurity Law, Data Security Law, and Personal Information Protection Law. It is worth noting that China has not adopted a single, comprehensive AI law. Instead, AI is governed mainly through laws that address the underlying data infrastructure on which AI depends. China's approach instead regulates AI indirectly, through the data and network infrastructure that AI relies on, which may reflect a sequential legislative process.

China coordinates AI development through strategic planning instruments and technical standards. According to the "National Artificial Intelligence Industry Comprehensive Standardization System Construction Guidelines," guidance was given on the construction of an AI standardization system. China has gradually established technical specifications and industrial standards for large models of AI. Standardization acts as a tool for policy diffusion in this context, and at the same time, this brings some room for central directives to be applied to different industrial and regional conditions.

In contrast, administrative lower-level instruments prevail in numbers. More than 90% of the documents are department working documents and department normative documents. This means that strategic direction is highly centralized, while the AI governance is heavily based on a strong AI governance policy layer. AI is an ever-evolving field. The laws and the State Council directives take time and money to change; department-level documents are less costly and can be revised more quickly and with less political cost. These documents offer comprehensive guidance for operational implementation, such as implementation rules and pilot programs. Their high volume reflects two practical needs. Initially, the governance of artificial intelligence should be adaptive with various risks, including new applications and their risk factor. Another point is that department-level documents can be issued without the lengthy procedures required for laws or State Council directives.

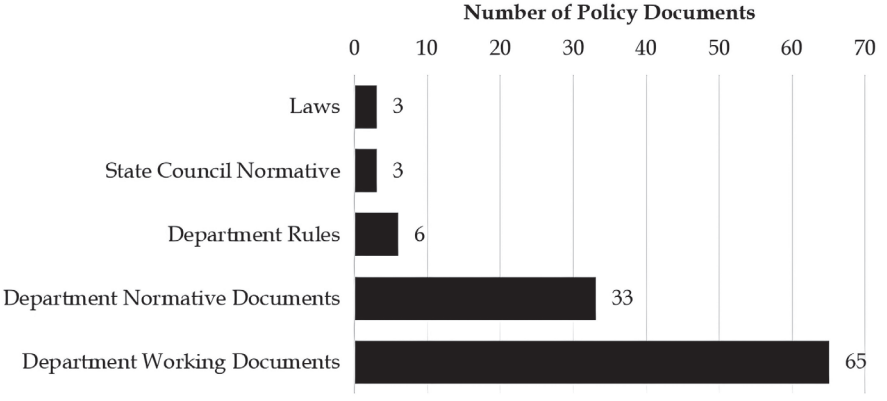

Fig. 4. Distribution of China's AI policy documents by hierarchy level

As shown in Table 3, supply-side instruments and environmental instruments together account for 80.4% of coded entries, with demand-side instruments contributing only 125 coded entries. As for the supply-side category, there is a strong bias towards providing R&D support and infrastructure development rather than providing financial subsidy or tax incentives, meaning that direct provision is preferred over indirect market-mediated incentives. Standards, specifications, and strategic planning are much more prevalent than formal laws among the environmental instruments, indicating that the approach is more one of flexible evolving guidance than of codification. The fact that the demand side instruments are largely underused, with demonstration applications prevailing over market cultivation and international cooperation, also suggests that the state prioritizes state-controlled pilot applications over decentralized market processes. With a co-evolutionary perspective, this combination represents a policy framework that is both aimed at building capacities and is based on institutional scaffolding in this phase of technological evolution rather than fine-tuning a mature market by way of demand-side interventions

Table 3
Distribution of policy instruments in China's AI policy.

Type of policy instrument	Specific instrument	Frequency	Proportion
Supply-side Policy Instruments	Financial Subsidies	17	2.67%
	Tax Incentives	3	0.47%
	R&D Support	66	10.36%
	Talent Development	44	6.91%
	Infrastructure Development	62	9.73%
	Public Services	51	8.01%
	Information and Data Support	29	4.55%
Demand-side Policy Instruments	Demonstration Applications	68	10.68%
	Market Cultivation	36	5.65%
	International Cooperation	21	3.3%
Environmental Policy Instruments	Strategic Planning	67	10.52%
	Laws and Regulations	10	1.57%
	Financial Support	34	5.34%
	Regulatory Measures	48	7.54%
	Standards and Specifications	81	12.72%

5.3. Policy objectives across multiple dimensions

Between 2015 and 2025, policy goals have changed overall following particular strategic shifts due to the wider technological and institutional developments (see Fig. 5). During the initial period from 2015 to 2017, all four objectives remained at low frequencies, which is consistent with the exploratory and early-stage character of AI governance. The first prominent inflection is in 2018, where there is a relative increase in the Industrial Transformation indicator and a sharp decrease in Technological Innovation. With the escalating conflict between China and the U.S. in 2018, there was increased pressure

to use existing AI technologies in the domestic industry. In such a scenario, the use of AI in production was more pressing than basic research. This is why, for a while, application-oriented objectives have outstripped the foundational targets for innovation.

The level of activity was moderate in all categories during 2019 to 2021, with Technological Innovation being the highest in 2020 and decreasing afterwards. There is a significant contraction in 2022 in all dimensions, perhaps as a result of a policy consolidation phase and institutional reshuffle in the run-up to the structural reforms in 2023. This contraction probably reflects two concurrent pressures. The government were distracted with pandemic-related governance issues in this period on domestic policy. Second, the peak of a broader regulatory tightening phase towards major technology platforms was 2022. These pressures led to a period of policy consolidation and institutional reconfiguration, preceding the structural reforms of 2023.

After 2022, there is a qualitative break. In 2023, Application Promotion surges distinctly ahead of the other three categories. This trend is consistent with the government's effort to introduce the generative AI-driven productivity to various sectors following the emergence of large language model capabilities. From 2024 through 2025, all four categories escalate sharply and in broad convergence, peaking in 2025. The government pursues technological innovation, application deployment and industrial restructuring as mutually reinforcing objectives rather than sequential priorities. Earlier in this section, we reported on two findings to which this pattern connects. Initially, the simultaneous escalation of all four objective categories means that different ministries were issuing documents at the same time and on related topics. This naturally increases the incentive for joint issuance. Second, when various ministries simultaneously produce documents, the quickest route to this is through normative and working documents at the department level.

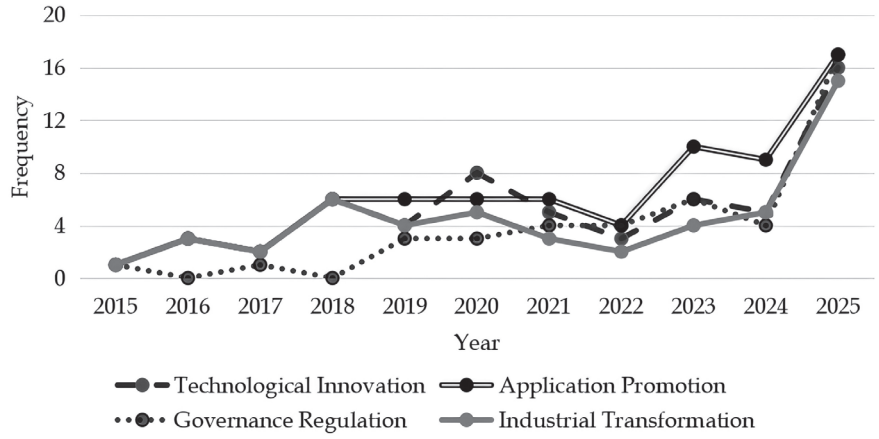

Fig. 5. Temporal evolution of policy objectives in China's AI policy.

China's governance objectives are beyond advancing industries, but also the systemic implications of technological diffusion. Governance objectives in this dimension are designed to ensure that AI-driven growth proceeds within institutionally bounded and legally accountable parameters. Together, these findings suggest that China's AI policy system relies primarily on institutional mechanisms to enable and coordinate development rather than restrict it. This extension of the policy objective reflects a paradigm shift: from isolated technical support toward a comprehensive regulatory and ethical governance framework that balances developmental imperatives with institutional oversight.

6. Discussion

The empirical findings reveal three characteristics of China's AI policy system. As far as actors are concerned, the system is organized through centralized strategic leadership combined with functionally differentiated coordination. In terms of instruments, the system relies on adaptive instrumentation, where policy tools are continuously adjusted as technological conditions change. In terms of objectives, the system follows a development-oriented priority, in which industrial transformation and technological innovation consistently outweigh regulatory constraint. These three features are not independent. In a development-oriented strategy, the use of policy tools will be employed that can rapidly make changes in response to technological requirements. Adaptive tools, in turn, requires coordination across many functionally specialized actors.

6.1. Centralized leadership through functionally differentiated coordination

A defining characteristic of China's AI governance is the strengthening of cross-departmental coordination under centralized strategic guidance. The central government sets strategic direction through programmatic documents. From this direction, specialized ministries then translate this direction into sector-specific measures. The empirical analysis demonstrates dense inter-agency collaboration networks is centered on a few core institutions such as the MIIT, MOST, and NDRC. This centralized yet functionally differentiated system enables the state to guide the development of the AI industry in a consistent and efficient manner.

Institutionally, China's AI governance has a certain "adaptive centralization" characteristic. The creation of the National Data Bureau in 2023 reflects the changes in institutional structures to address the coordination needs of AI development. The governance is fractured and even less able to facilitate national strategic coordination as AI increasingly relies on large-scale data circulation and computing infrastructures. This reform laid the groundwork for a comprehensive data governance structure by establishing a dedicated institution under the coordination of the NDRC, thereby creating the necessary institutional framework. Likewise, the institutional arrangement of "one institution with two names" further enhances the linkage between strategic decision-making and policy implementation. China's strong policy consistency between strategic goals and operational governance is due to the linkage between Party leadership and administrative execution in close institutional settings.

6.2. Adaptive policy mix and instrument synergy

Another important characteristic of China's AI governance lies in the functional adaptation of policy instruments. This flexible structure differs from the European Union's approach. The EU's "rights-first" governance philosophy treats regulatory constraints as prior conditions that AI development must satisfy. China's instruments prioritize flexibility and quick adjustments instead of fixed constraints. The EU regulates AI through a single horizontal law that applies across all applications. China instead governs AI through a layered set of instruments, issued separately for different sectors and risk types, as discussed. This enables the addition, amendment or withdrawal of China's policy tools at the department level, without requiring legislative amendment. Therefore, the instrument dimension is built for adjustment, not for stability alone.

Beyond the aggregate distribution, two alterations in China's policy structure are worth being attentive. China's AI policy paradigm has also been changed strategically from funding R&D to cultivating the AI ecosystem. In the initial stage, financial instruments were mostly aimed at creating a technological capability-building process through direct subsidies, taxes, and venture capital. The policy rationality has shifted to creating an institution for an AI innovation ecosystem. The evolution in policy tools is a change in mindset, recognizing that innovation frontier AI relies more and more on collaborative, open infrastructure. China's talent cultivation has also been shifting from a discrete to a system supply chain approach. In addition, the Chinese government introduced AI into the courses for undergraduates and higher vocational students in 2019. This treats talent supply as part of a broader pipeline, rather than as a series of separate funding decisions.

China's AI regulatory policy also moves toward scenario-specific granular governance. The foundational regulatory architecture (Su *et al*., 2023) has been progressively refined to address specific application risks as new use cases emerge. There is the policy that tackles the social risks posed by AI companion services. As newly visible risks increase, there are more targeted documents from the Chinese authorities. In China, the public welfare aspect is emphasized in the AI ethics policies. Code of Ethics for New Generation Artificial Intelligence provides concrete guidelines for ethical standards throughout the life cycle of AI technologies. The Global Artificial Intelligence Governance Initiative is recognized as a groundbreaking step in promoting ethical guidelines for AI development, and China has made a significant proposal for its adoption.

6.3. Persistent development-oriented priority

The findings indicate that industrial upgrading continues to be the main aim of China's AI policies. This development-oriented governance logic is closely connected to the broader national strategy of cultivating "New Quality Productive Forces". AI facilitates change in the manufacturing process. Together, the transformation creates conditions for non-linear gains in Total Factor Productivity (TFP) (Pan *et al*., 2022). If AI is a general-purpose technology that is one of the most important factors in economic modernization, then the government policy agenda will not be narrow. It has to embrace technological innovation, industrial application, and a minimum level of regulation as these are also necessary conditions for scale development.

Step by step, China's vision has been translated into realities with targeted manufacturing transformation programs. The deep integration of AI and manufacturing in China has exhibited considerable potential to significantly enhance TFP in manufacturing enterprises (Wang *et al*., 2025). The adoption of industrial robots influences the optimal allocation of labor resources, playing a pivotal role in guiding industrial digital transformation and strengthening technological innovation capabilities (Shen and Zhou, 2024). Smart Factory Tiered Development Action is an institutionalization of a four-tier certification framework to help enterprises advance through the entire stages of digital and intelligent transformation. China has adopted the New Infrastructure Development policy to foster the transformation of traditional manufacturing industries. The initiative has three pillars: information infrastructure, convergence infrastructure (convergence of digital technologies with traditional industries), and innovation infrastructure, which includes scientific research platforms.

China expands its digital infrastructure, with a particular emphasis on data centers and high-performance computing platforms. The National New Generation Artificial Intelligence Innovation

Development Pilot Zones serve to promote AI applications and digital infrastructure (Huang *et al*., 2024). These pilot zones serve as hubs for AI in the region, and are responsible for developing and testing application models in various industrial and economic sectors and for spreading the successful models throughout the region. China aimed to create a coordinated structure of energy-resource coordination between western regions and eastern computing demands (Liu, 2026). Additionally, the government issued the guidelines for building basic systems for data to promote the efficient use and circulation.

A particularly significant dimension of China's AI governance agenda concerns the relationship between AI and sustainable development. These latest policy papers characterize AI as playing a dual role in sustainability transition. AI consumes more energy than ever before; however, it is increasingly being used in the promotion of green energy. This dual framing, increasingly explicit in recent policy documents, marks a conceptual advance over earlier approaches that treated AI primarily as a passive beneficiary of green infrastructure investment. On the consumption side, the rapid scaling of AI infrastructure has generated substantial energy demand pressures. In response, China has developed a system for managing computing power and electricity coordination mechanism to manage this demand while maintaining progress toward carbon neutrality goals.

On the management side, AI is increasingly used as an operative green energy management tool. The use of robotics is one of the main factors mentioned for the emergence of green industries which help in reduction of pollution caused due to economic growth. AI plays a pivotal role in achieving climate goals (Akram *et al*., 2024), as demonstrated by its ability to lower corporate energy consumption and accelerate the advancement of renewable energy sources (Zhang *et al*., 2024; Fu *et al*., 2024). The Chinese government integrates AI technology with environmental protection and green growth through various policies and plans. As laid out in the 15th Five-Year Plan (2026-2030), China will promote the coordinated layout of green power and computing power. As AI infrastructure expands to drive economic transformation, the governance system must simultaneously evolve to manage the sustainability implications of that expansion.

6.4. Policy implications for latecomer economies

China's experience is essential for countries and states to develop AI. In latecomer economies, there is a tendency towards disjointed AI governance, with ministries operating independently. In China, this is solved by adaptive centralization with the setting up of coordination hubs that have real power. Through a small but powerful committee situated at the center of government, strategic planning and implementation. Vertical authority to bind agencies to a common framework is key. This institutional structure is more important than the particular policy ideas.

The concept of hierarchical policy coordination means that general national policies are progressively realized through a hierarchy of ministerial and local-level policies. What is portable is the structural logic of the pyramid, not its actual content. A latecomer economy might want to have the pyramidal structure, but a much more modest programmatic document with fewer ministerial implementing instruments, more suited to its own administrative abilities and industrial base. To make this principle work, a reasonable amount of vertical coordination authority is a minimum institutional condition for the programmatic framework to be followed by ministerial agencies, that is, to be implemented instead of following different agendas.

The example of DeepSeek and Qwen, which was created by an open-source ecosystem strategy,

shows that latecomer economies can invest in inexpensive and openly available model infrastructure. In South Asia and Southeast Asia, where affordability is an issue, this is a tangible strategy to achieve capacity development. In the world of open-source, this means that access to models is separated from ownership of them in the case of China. In the context of AI, the cost-effectiveness and ease of access of powerful foundation models could enable firms, universities, and government agencies in developing economies to fine-tune and deploy AI capability without the cost of training becoming prohibitive. When paired with strategic investments in the capacity to fine-tune general-purpose foundation models for the languages and regulatory contexts in which they are needed, and in the application-layer development ecosystems that enable this fine-tuning, this approach can be very powerful.

7. Conclusion

This study has analyzed the architecture and evolution of China's AI industry policy system through a systematic examination of the 101 policy documents issued between 2015 and 2025. With the guidelines of evolutionary economics, it develops a three-dimensional analytical framework consisting of policy actors, policy instruments, and policy objectives. The analysis examines how these dimensions jointly structure China's AI governance architecture under conditions of rapid technological change. According to the results, China's system relies on centralized strategic leadership, adaptive instrumentation in the instrument dimension and a development-oriented priority. Together, they form an integrated governance architecture whose internal logic explains the shift from sector-focused capability building toward economy-wide AI integration. The study also identifies a clear transition from the "1+N" framework toward the emerging "AI Plus" paradigm.

The single key innovation of this study lies in conceptualizing China's AI governance as a co-evolutionary process of technological change and institutional adaptation from the perspective of evolutionary economics. This framing explains how fragmented policy components are tied together into a coherent governance architecture through adaptive interactions among actors, instruments, and objectives. However, the study relies on the analysis of policy documents, which may not reflect the dynamics of policy implementation at the sub-national level. In addition, the coding-based approach may simplify complex policy meanings embedded in official texts. Future research should incorporate micro-level empirical evidence and comparative cross-national data should be brought in for more robust generalization.

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Conflicts of Interest

The authors declare no conflict of interest.

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