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Governing Artificial Intelligence Risk in the Administrative State: A Steinian Social State Perspective

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ABSTRACT

This article examines the governance of artificial intelligence (AI) risks through the lens of Lorenz von Stein's theory of the state (Staatswissenschaft), situating contemporary AI regulation within the conceptual framework of the administrative state. Stein conceptualized the state not as a passive guardian of formal legality, but as an active and mediating institution tasked with reconciling social contradictions and fostering the integrated development of society. His theory of the social state (Sozialstaat) provides a normative and institutional foundation for understanding the role of the modern administrative state in responding to the systemic risks generated by emerging technologies. In the age of rapid AI development, administrative states confront multiple and interrelated challenges: technological opacity and complexity, concentration of economic and informational power, structural asymmetries between public and private actors, algorithmic discrimination, and the amplification of social inequality. Traditional liberal regulatory paradigms—centered on ex post liability and market self-correction—are increasingly inadequate to address these anticipatory and systemic risks. Drawing on Stein's insight that the state bears responsibility for harmonizing social development and preventing destabilizing inequality, this article argues that AI governance requires a proactive and integrative regulatory approach.

Building upon Stein's conception of the social state, the article advances three normative propositions. First, the administrative state should adopt preventive and anticipatory regulatory frameworks, including risk-based supervision, adaptive oversight mechanisms, and institutionalized impact assessment. Second, AI governance must incorporate mechanisms that promote technological democratization, ensuring meaningful public participation, transparency, and accountability in algorithmic decision-making. Third, the state must safeguard substantive social justice by addressing distributive and structural inequalities exacerbated by AI systems, particularly in areas such as labor markets, social welfare administration, and access to public services.

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The analysis further contends that effective AI risk governance requires balancing technocratic expertise with democratic legitimacy. While AI regulation demands high levels of technical specialization within administrative agencies, such expertise must be embedded within constitutional and participatory structures to prevent unchecked bureaucratic expansion or regulatory capture. Cross-sector collaboration, inter-agency coordination, and public-private partnerships are thus not merely managerial tools but institutional expressions of Stein's vision of the state as a mediator between social forces.

Ultimately, this article argues that AI risk governance should be understood as a contemporary manifestation of the social state's responsibility to guide societal transformation while preserving cohesion and justice. By reinterpreting Stein's state theory in the context of the administrative state, this study offers a normative framework for constructing adaptive, socially responsive, and democratically grounded AI governance regimes.

Keywords: Artificial Intelligence; Risk Governance; Administrative State; Lorenz von Stein; Staatswissenschaft; Social State

I. INTRODUCTION

A. Research Background and Motivation

The rapid development of artificial intelligence (AI) technologies is profoundly transforming multiple dimensions of human society. From autonomous driving, medical diagnosis, and financial trading to judicial decision-making, AI systems are gradually permeating decision-making processes in both public life and private domains. However, the advancement of AI also generates unprecedented risks: algorithmic bias may exacerbate social discrimination; automated decision-making may affect individual rights and interests; data surveillance may threaten privacy and security; and technological monopolies may widen the digital divide (O'Neil, 2016; Zuboff, 2019). These risks do not merely concern technical issues; they also implicate fundamental questions of social justice, democratic governance, and the protection of human rights.

In the face of the multifaceted risks brought by AI, the question of how the state can exercise its governing functions becomes crucial. Traditional models of market self-regulation and ex post regulation have become increasingly inadequate to cope with the complexity and rapid evolution of AI technologies (Yeung, 2018). At the same time, excessive state intervention may stifle innovation and infringe on individual freedom. Against this backdrop, the role and governing capacity of the administrative state are subject to fundamental challenges.

The theory of the state developed by nineteenth-century German scholar Lorenz von Stein (1815–1890) provides an important analytical framework. Stein argued that the state should not remain a merely passive “night-watchman,” but instead should function as an active “social state” (Sozialstaat) that promotes the overall development of society and mediates class conflicts. This perspective offers significant insights for understanding the role of the contemporary administrative state in the governance of new technologies.

B. Research Objectives and Questions

This study aims to analyze the role and mechanisms of the administrative state in AI risk governance through the lens of Stein’s Staatswissenschaft (science of the state). More specifically, it seeks to address the following research questions:

1. How can Stein’s theory of the state be applied to contemporary understandings of AI risk governance?
2. What structural challenges does the administrative state face in governing AI risks?
3. Based on Stein’s concept of the social state, how should the administrative state construct an institutional framework for AI risk governance?

C. Research Methods and Structure

This study adopts theoretical analysis and literature review as its primary methods. It first reconstructs Stein’s core concepts of Staatswissenschaft, including his theory of the social state, his account of administrative power, and his ideas on social reform. It then analyzes the nature of contemporary AI risks and the governance challenges confronting the administrative state. Finally, it integrates Stein’s theory with current governance practices to develop normative proposals for AI risk governance.

This article is organized into six chapters. Chapter 1 provides the introduction. Chapter 2 examines Stein’s theory of the state. Chapter 3 analyzes the nature and types of AI risks. Chapter 4 investigates the role and challenges of the administrative state in AI governance. Chapter 5 proposes an AI risk governance framework grounded in Stein’s theory. Chapter 6 offers conclusions and policy recommendations.

II. LORENZ VON STEIN’S THEORY OF THE STATE

A. Stein’s Life and Historical Context

Lorenz von Stein was born in 1815 in the region of Holstein and became one of the most important German scholars of the state, as well as a jurist and economist, in the nineteenth

century. He lived during the era in which the Industrial Revolution swept across Europe, with the rapid development of capitalism intensifying social class antagonisms; the revolutionary waves of 1848 shook the foundations of the traditional European order. Deeply influenced by these social transformations, Stein devoted himself to examining how the state could play both stabilizing and reformist roles amidst profound social change.

Stein personally observed socialist movements in Paris and studied in depth the ideas of socialist thinkers such as Saint-Simon and Fourier. In 1842, he published *Socialism and Communism in Contemporary France*, which systematically introduced socialist thought into the German-speaking world for the first time. His scholarly concern centered on the “social question”: how to address poverty, exploitation, and class antagonism brought about by industrialization while maintaining the institutions of private property and the market economy (Blasius, 1971).

B. Core Concepts of the Social State

The core of Stein’s Staatswissenschaft is the concept of the “social state” (Sozialstaat). In contrast to the traditional liberal model of the “night-watchman state” and Hegel’s more abstract theory of the state, Stein contended that the state should actively intervene in social relations and promote the free development of all members and the overall welfare of society.

Stein distinguished between “society” (Gesellschaft) and “state” (Staat). Society is the arena of economic activity and interest competition, where structural inequality and antagonism exist between the propertied and the propertyless classes. While capitalist economies can generate wealth, they also lead to wealth concentration and the exploitation of workers. Market mechanisms alone cannot resolve these contradictions and may instead drive society toward fragmentation and instability (Stein, 1850/1964).

The function of the state is to transcend particular class interests and to represent the general interests of society by using the dynamism of administrative power to mediate social conflicts. Stein regarded the state as the “self-consciousness of society,” with a mission to ensure that every member of society can freely develop his or her personality and achieve genuine freedom and equality. This mission is not to be accomplished through revolution or the abolition of private property, but through the state’s active measures—such as social legislation, the expansion of education, and labor protection—to improve the living conditions and development opportunities of the lower classes (Blasius, 1971).

C. The Active Role of Administrative Power

In Stein’s theoretical framework, the administrative power of the state plays a pivotal role. Traditional constitutionalism emphasizes the primacy of the legislature and views the executive

as merely an implementer of laws. Stein argued, by contrast, that in a complex industrial society, administrative power must possess professional competence and dynamism to respond effectively to social problems.

For Stein, “administration” (Verwaltung) is not limited to the execution of statutes; it is a proactive force in shaping society. Administrative agencies must possess specialized knowledge enabling them to diagnose social problems, design reform programs, coordinate diverse interests, and implement public policies. The legitimacy of administrative power derives from its professionalism and its orientation toward the public interest: it represents the interests of society as a whole and relies on rational knowledge to advance social progress (Stein, 1865–1868/1976).

At the same time, Stein was acutely aware of the dangers of administrative expansion. He maintained that administrative power must be constrained by the rule of law and embedded within constitutional mechanisms that ensure its service to the public interest rather than its degeneration into a tool of authoritarianism or class domination. Thus, the social state must strike a balance between administrative effectiveness and democratic control.

D. Social Reform and State Neutrality

Stein’s approach to social reform is neither a conservative defense of the status quo nor a radical revolutionary program; instead, it follows a gradualist reform path. He opposed Marxian theories of class struggle, claiming that class antagonisms could be mitigated through the neutral intervention of the state. The state must not become a mere instrument of the propertied classes; rather, it should occupy a position of neutrality above class interests and seek to improve the conditions of workers through social policies so that the propertyless can also share in the fruits of social progress.

Stein’s social reform proposals included: labor legislation to protect workers’ rights, educational reforms enhancing the general level of citizens’ capabilities, the establishment of social insurance systems, and progressive taxation to adjust wealth distribution (Pankoke, 1970). The purpose of these measures is not to abolish the market economy but to correct market failures so that capitalism can operate on a sustainable basis while taking social fairness into account.

Stein’s theory has exerted a lasting influence. His notion of the social state provided a theoretical foundation for Bismarck’s social insurance legislation in Germany and shaped the development of the twentieth-century welfare state. In the contemporary context, when societies are faced with new risks created by emerging technologies, Stein’s theory remains an important

point of reference.

III. THE NATURE AND TYPES OF AI RISKS

A. Characteristics and Development Trends of AI Technologies

Artificial intelligence refers to technologies that enable machines to simulate human intelligence, including learning, reasoning, decision-making, and language understanding. Modern AI is primarily based on machine learning, especially deep learning, which trains algorithmic models with large-scale data so that machines can autonomously perform complex tasks.

The core characteristics of AI include: (1) autonomy: AI systems can make decisions without direct human intervention; (2) opacity: the operation of deep learning models is often difficult to interpret, giving rise to the “black box” problem; (3) scalability: AI systems can process massive amounts of data and simultaneously affect large populations; and (4) adaptability: machine learning systems continuously adjust their parameters based on new data, meaning their behavioral patterns may change over time (Mittelstadt et al., 2016).

In recent years, the emergence of generative AI, such as large language models, has further enhanced AI capabilities, enabling the generation of text, images, audio, and video content. These developments have significantly expanded the scope of AI applications while introducing new categories of risk.

B. Multiple Dimensions of AI Risk

The risks associated with AI technologies can be analyzed across several dimensions:

- **Technical risks:** These include algorithmic errors, system vulnerabilities, and cybersecurity threats. AI systems may generate erroneous decisions due to poor data quality or flawed model design. Certain AI applications, such as autonomous weapons or AI-driven cyberattacks, may lead to tangible physical harm (Russell et al., 2015).
- **Social risks:** AI transforms labor markets, widens digital divides, reinforces algorithmic discrimination, and undermines privacy through surveillance. AI systems often reproduce and amplify existing social biases and structural inequalities, as illustrated by recruitment algorithms that discriminate against women or minority groups (O’Neil, 2016; Noble, 2018).
- **Economic risks:** The development of AI technologies contributes to the concentration of power and wealth in the hands of a small number of technology giants, forming what has been called “surveillance capitalism.” Data becomes a new means of production;

firms controlling data and algorithms acquire enormous market advantages, which further aggravate economic inequality (Zuboff, 2019).

- Political risks: AI technologies may be used to manipulate public opinion, spread disinformation, and interfere with elections. Algorithmic recommendation systems can generate “filter bubbles” that polarize political discourse. Authoritarian regimes may deploy AI for social control, posing significant threats to democracy and human rights (Nemitz, 2018).
- Ethical risks: AI raises fundamental questions about responsibility for automated decisions, the moral status of autonomous systems, and the impact of AI on human dignity and autonomy. When AI systems make decisions that affect individual rights and interests, ensuring that these decisions conform to ethical principles and respect human values is a major challenge (Floridi et al., 2018).

C. Structural Features of AI Risks

AI risks exhibit several structural characteristics:

- Complexity and uncertainty: AI systems involve complex technological architectures embedded in intricate social contexts, making their impacts difficult to predict. The “black box” nature of deep learning further complicates risk assessment.
- Systemic and cascading effects: AI systems are interconnected; risks may propagate across different domains and be amplified through feedback loops. Errors in AI-driven financial systems, for instance, may trigger systemic crises affecting overall economic stability.
- Power asymmetries: AI development and deployment are concentrated in a small number of enterprises and countries. Ordinary citizens lack the knowledge and capacity to understand or control algorithmic decisions, giving rise to severe asymmetries of power.
- Cross-sectoral and externalized impacts: The effects of AI transcend traditional regulatory boundaries, making it difficult for any single country or agency to govern AI risks in isolation. The negative consequences of AI are often borne by society at large, creating significant negative externalities.

These features indicate that AI risk governance requires new institutional arrangements and cannot rely solely on traditional market mechanisms or ex post regulatory strategies.

IV. THE ROLE AND CHALLENGES OF THE ADMINISTRATIVE STATE IN AI RISK GOVERNANCE

A. Role of the Administrative State

In AI risk governance, the administrative state plays multiple roles:

- **Regulator and rule-maker:** Administrative authorities are responsible for formulating laws, regulations, standards, and guidelines related to AI, thereby establishing a governance framework. For example, the European Union's Artificial Intelligence Act adopts a risk-based approach, classifying AI systems according to their risk levels and imposing strict requirements on high-risk applications (European Commission, 2021).
- **Supervisor and enforcer:** Administrative agencies implement AI-related regulations, monitor whether enterprises and organizations comply with standards, and impose sanctions for violations. This requires sufficient technical expertise and resources within administrative bodies.
- **Risk assessor:** Administrative authorities must build mechanisms for AI risk assessment, identifying potential risks, evaluating the severity of harms, and proposing mitigation strategies. This task involves interdisciplinary expertise and continuous monitoring.
- **Provider of public services:** Governments themselves are major users of AI technologies, applying them in tax administration, social welfare distribution, predictive policing, and more. When deploying AI, the administrative state must ensure compatibility with the public interest and the protection of human rights.
- **Mediator of social interests:** Administrative authorities must balance the interests of diverse stakeholders, including the technology industry, labor groups, consumers, and civil society, seeking an equilibrium between innovation and rights protection.

From Stein's perspective, the administrative state should not be a merely passive supervisor of markets but should actively intervene to ensure that AI development serves the general interests of society, prevents technological power from being monopolized by a few actors, and uses AI to promote the free development of all social members.

B. Structural Challenges of Administrative Governance

The administrative state faces a series of challenges in AI governance:

- **Knowledge gaps:** AI technologies are highly specialized and rapidly evolving. Administrative officials often lack sufficient technical knowledge to understand and

evaluate AI systems. This epistemic asymmetry weakens regulatory effectiveness and may lead to “regulatory capture,” whereby agencies become overly dependent on industry-provided information and lose their capacity for independent judgment (Yeung, 2018).

- **Lagging pace of governance:** The speed of AI innovation far outstrips the pace of legal and regulatory reform. Traditional legislative and administrative procedures are slow and cannot promptly address new risks. By the time norms are adopted, technologies may have already moved to a new stage, creating a persistent “catch-up problem.”
- **Ambiguous jurisdiction:** AI applications span multiple sectors and administrative departments—communication, transportation, healthcare, finance, and more. The boundaries of jurisdiction among agencies are often unclear, leading to regulatory gaps or overlaps. The transnational nature of AI further limits the effectiveness of domestic regulation.
- **Blurred public–private boundaries:** Technology giants hold key technologies and data, and in some domains may wield greater influence than governments. Administrative states must rely on industry cooperation while maintaining regulatory authority. Finding a balance between public–private collaboration and the prevention of conflicts of interest and undue influence is a central challenge.
- **Questions of democratic legitimacy:** AI governance involves highly technical decisions that may be dominated by administrative bureaucracies or technical experts, with limited democratic participation. While technocratic governance may enhance efficiency, it risks neglecting pluralistic values and social concerns, thereby inviting legitimacy problems. Striking a balance between expertise and democracy is a key issue.
- **Resource constraints:** Effective AI regulation requires significant human, financial, and technical resources. Administrative agencies often face budgetary constraints and talent shortages, limiting their regulatory capacity. Private-sector salaries are typically much higher, making it difficult for governments to attract and retain technical experts.

C. Limitations of Traditional Governance Models

Conventional modes of administrative governance exhibit clear limitations when confronted with AI risks:

- **Rigidity of command-and-control regulation:** Traditional rule-based regulation relies on detailed rules to constrain behavior. Yet the diversity and dynamism of AI technologies

make it extremely difficult to formulate concrete rules. Overly detailed regulations may stifle innovation, while overly general principles may be difficult to enforce.

- **Passivity of ex post regulation:** Traditional regulatory approaches often intervene only after damage has occurred. For AI risks—especially those with large-scale or irreversible impacts—ex post regulation is obviously inadequate. Preventive and forward-looking governance mechanisms are required.
- **Fragmentation due to departmental silos:** Conventional administrative organizations are vertically divided by functional sectors, with each department operating independently. The cross-sectoral nature of AI applications demands interdepartmental collaboration, but bureaucratic structures and organizational cultures often impede effective integration.
- **State-centric vision:** Traditional governance models are state-centric and emphasize unilateral government control. AI governance, however, requires the participation of multiple stakeholders, including industry, academia, and civil society. Purely top-down state commands are unlikely to ensure effective implementation or secure broad social support.

These limitations demonstrate that the administrative state must develop new forms of governance that transcend traditional regulatory logic.

V. AN AI RISK GOVERNANCE FRAMEWORK BASED ON STEIN’S THEORY

A. Applying the Social State Ideal to AI Governance

Applying Stein’s social state theory to AI governance yields several core propositions:

- **Active role of the state:** In the face of AI-related social risks, the administrative state should not adopt a laissez-faire attitude but should intervene proactively. Just as Stein urged the state to mediate class conflicts in the age of industrialization, the contemporary state should intervene in AI development to prevent technological power from being monopolized and to ensure that technological progress accords with the public interest.
- **Promotion of substantive equality:** Stein’s social state seeks not merely formal legal equality but substantive equality of opportunity for development. In the AI era, the administrative state should ensure equitable access to and benefits from AI technologies, preventing digital divides from generating new forms of social stratification. Measures include promoting AI literacy, ensuring algorithmic fairness, and preventing AI-based discrimination.

- Protection of personal development and autonomy: Stein maintained that the purpose of the state is to enable each individual to freely develop his or her personality. While AI can enhance efficiency, it must not alienate human beings or violate human dignity. Administrative states should ensure that AI applications respect human autonomy, protect personal data and informational self-determination, and prevent algorithmic control from displacing free choice.
- Prevention of social fragmentation: Stein stressed that the state must prevent the escalation of social conflicts. AI may exacerbate wealth inequality, labor market polarization, and social exclusion, thereby increasing the risk of social fragmentation. Administrative states should adopt social policies—such as labor market transition assistance and adjustments to social security systems—to mitigate the negative impacts of AI.

B. Preventive Governance Architecture

Consistent with Stein's emphasis on state activism, AI risk governance should adopt the precautionary principle and establish forward-looking mechanisms:

- Technology assessment systems: Governments should create mandatory AI impact assessment schemes that require comprehensive evaluation of high-risk AI systems prior to deployment, including technical reliability, social impact, and ethical risks. These assessments should involve multiple stakeholders and encompass not only technical review but also social and ethical scrutiny (Reisman et al., 2018).
- Regulatory sandboxes: For innovative AI applications, regulators may establish sandboxes that allow controlled experimentation in limited settings and close observation of potential risks before large-scale deployment. This approach encourages innovation while enabling early detection of problems.
- Continuous monitoring: Post-deployment monitoring systems should track the real-world performance and social impact of AI systems. Because AI systems continuously learn and evolve, ex ante assessments alone cannot ensure long-term safety; dynamic oversight is indispensable.
- Prohibitions and restrictions: Certain AI applications that pose particularly high risks or infringe fundamental rights should be explicitly prohibited or tightly restricted, such as social credit scoring systems, large-scale biometric surveillance, and subliminal manipulation techniques (European Commission, 2021).

C. Cross-Sectoral Collaborative Governance

Given the complexity of AI, governance must be based on cross-sectoral collaboration:

- **Interdepartmental coordination:** Governments should establish cross-ministerial coordination mechanisms on AI governance to integrate expertise and resources from different policy areas. Policymakers may consider creating dedicated AI regulatory bodies responsible for overall policy planning, standard-setting, and enforcement, thereby avoiding fragmented or overlapping regulation.
- **Public-private partnerships:** Enterprises should be encouraged to participate in governance processes and assume social responsibility in AI development. Administrations can employ soft regulatory tools—such as certification schemes and codes of conduct—to guide corporate behavior and promote co-regulation (Coglianese & Mendelson, 2010).
- **Academic and civil society participation:** Platforms for stakeholder engagement should involve academic experts, civil society organizations, and affected communities in AI governance. Instruments such as public consultations, hearings, and citizen deliberation can enhance the democratic legitimacy and social responsiveness of governance.
- **International cooperation:** Since AI risks are transnational, states must cooperate internationally in developing AI ethics guidelines, sharing information, and coordinating technical standards. Such cooperation helps prevent a regulatory “race to the bottom” in which jurisdictions compete to loosen standards to attract investment.

D. Capacity Building and Institutional Adaptation

The administrative state must strengthen its own capacities to meet AI governance challenges:

- **Professional training:** Governments should recruit and cultivate public servants with expertise in AI and data science, thereby enhancing the technical competence of administrative agencies. Exchange programs with academia and industry can help bring cutting-edge knowledge into the public sector.
- **Organizational culture transformation:** Traditional bureaucratic culture emphasizes hierarchy and procedural correctness. To respond to rapidly changing technologies, administrative organizations must become more flexible and responsive. Cross-sectoral collaboration, tolerance for experimentation, and a culture of learning and adaptation should be encouraged.
- **Innovation in legal instruments:** New legal tools must be developed beyond traditional

command-and-control regulation. Principle-based regulation, soft law instruments, and co-regulation can help balance legal certainty with regulatory flexibility (Yeung, 2018).

- Technical tools for algorithmic governance: Regulators should employ technical instruments to govern technology, such as AI auditing tools, algorithmic transparency techniques, and explainable AI methods, in order to make oversight more efficient and accurate.

E. Social Justice and Inclusive Development

In line with Stein's concern for social justice, AI governance should promote inclusive development:

- Ensuring algorithmic fairness: Legal requirements and review mechanisms should be created to safeguard algorithmic fairness and prevent discriminatory outcomes. High-risk AI systems should be subject to fairness testing to demonstrate that they do not impose unjust burdens on particular groups (Barocas & Selbst, 2016).
- Protecting digital rights: Core digital rights should be guaranteed, including data protection and informational self-determination, the right to an explanation of algorithmic decisions, and the right to object to purely automated decisions. The European Union's General Data Protection Regulation (GDPR), for instance, grants individuals the right to contest certain automated decisions that significantly affect them.
- Enhancing AI literacy: AI education initiatives should improve public understanding of AI principles, impacts, and risks, thereby strengthening digital citizenship. Such literacy is a prerequisite for realizing the free development of personality emphasized by Stein.
- Labor market and social security reforms: To address the impact of AI on employment, states should establish mechanisms for labor market transitions, lifelong learning systems, and adjustments to social safety nets, enabling workers to adapt to technological change and share in the benefits of technological progress.
- Inclusive innovation policies: AI innovation policies should ensure that small and medium-sized enterprises and disadvantaged groups can participate in and benefit from AI development. Rather than remaining a game dominated by large technology companies, AI should become a driving force for overall social progress.

VI. CONCLUSION AND RECOMMENDATIONS

A. Research Findings

Building on Lorenz von Stein's theory of the state, this article has explored the role and challenges of the administrative state in AI risk governance. The main findings are as follows.

First, Stein's theory of the social state provides a crucial normative foundation for AI risk governance. He emphasized that the state must transcend the passive night-watchman role and actively mediate social contradictions so as to promote the free development of all members of society. This insight is highly relevant for contemporary AI governance: in the face of AI-driven social inequality, power concentration, and human rights violations, the administrative state must not simply defer to market forces but must intervene proactively to ensure that technological development aligns with the public interest and social justice.

Second, AI risks exhibit structural features of complexity, systemic impact, and cross-sectoral reach. These risks are not mere technical issues; they involve social justice, democratic governance, and the protection of fundamental rights. Algorithmic bias can reproduce and amplify social discrimination; data monopolies can concentrate power; and automated decision-making can undermine individual autonomy. At root, these risks reflect transformations in power relations and must be understood through the lenses of political economy and social structure.

Third, traditional modes of administrative governance display multiple limitations when confronting AI risks. Command-and-control regulation is too rigid; ex post regulation is too reactive; departmental fragmentation leads to governance silos; and state-centric approaches neglect the participation of diverse stakeholders. Administrative authorities simultaneously face structural challenges, including knowledge gaps, lagging governance processes, ambiguous jurisdiction, questions of democratic legitimacy, and resource constraints.

Fourth, an AI risk governance framework inspired by Stein's theory must embody new forms of governance. Such a framework should incorporate preventive mechanisms (technology assessment, sandboxes, continuous monitoring), collaborative mechanisms (interdepartmental coordination, public-private partnerships, multi-stakeholder participation, international cooperation), capacity building (professional training, organizational reform, innovative legal tools), and social justice safeguards (algorithmic fairness, digital rights, AI literacy, labor and social security reforms).

Fifth, effective AI governance requires balancing multiple values: expertise and democracy,

innovation and safety, efficiency and fairness, and state authority and individual freedom. To strike these balances, administrative states must cultivate sophisticated judgment and dynamic adaptive capacities.

B. Theoretical Contributions and Practical Implications

Theoretically, this study contributes by applying Stein's nineteenth-century theory of the state to the twenty-first-century issue of AI governance, thereby revealing the contemporary significance of a classical framework. Stein's analysis of social contradictions in the age of industrialization parallels the challenges raised by the current AI revolution. His concept of the social state, his emphasis on the dynamism of administrative power, and his commitment to substantive equality all provide a normative basis for contemporary AI governance.

This study also highlights the importance of interdisciplinary integration. AI governance is not merely a technical problem; it is a multifaceted challenge that spans law, politics, ethics, and sociology. Scholars and policymakers must transcend disciplinary boundaries and adopt a holistic perspective in understanding and regulating AI.

Practically, the governance framework proposed here offers valuable guidance for policymakers. As states around the world construct their AI governance regimes—such as the EU's AI Act, the United States' emerging AI rights frameworks, and algorithmic regulation in other jurisdictions—the analysis suggests that effective governance cannot be confined to technical or sectoral rules. It must also be guided by the social state ideal to ensure that AI development serves human well-being and social progress.

C. Research Limitations and Future Directions

This study has several limitations.

First, significant temporal and contextual differences separate Stein's theory, formulated in nineteenth-century Europe, from contemporary societies. Historical circumstances, technological conditions, and political institutions have changed dramatically. Any application of his theory to the present must proceed through careful translation to avoid simplistic analogies.

Second, this article is primarily normative and theoretical in orientation, focusing on how administrative states ought to govern AI risks rather than on empirical patterns of governance. Future research could employ case studies and comparative methods to investigate how different jurisdictions actually implement AI governance and what outcomes they achieve.

Third, due to limitations of scope, this article discusses AI technologies only at a general level.

Future studies could conduct in-depth analyses of specific AI application domains—such as autonomous vehicles, medical AI, or AI in judicial decision-making—to explore sector-specific risks and regulatory needs.

Fourth, this article focuses primarily on governance at the level of nation-states and addresses global governance only briefly. In an era of globalization, international coordination is crucial for effective AI governance and deserves further exploration.

Future research may proceed along several directions:

- Empirical research: Fieldwork, interviews, and archival analysis could provide a more detailed understanding of how administrative agencies govern AI risks in practice, the obstacles they face, and the strategies they adopt.
- Comparative studies: Comparative investigations of different national AI governance models—such as rights-based approaches in the EU, innovation-centered strategies in the United States, or more state-led frameworks elsewhere—could reveal how political institutions, legal cultures, and industrial structures shape regulatory choices.
- Sectoral studies: Domain-specific research on generative AI, autonomous weapons, recommender systems, or biometric identification could clarify distinct risk profiles and governance requirements.
- Global governance: Future work could analyze the role of international organizations such as the United Nations and the OECD in formulating AI ethics guidelines and examine the mechanisms and challenges of global AI governance.
- Critical perspectives: Drawing on critical theory, scholars might scrutinize AI governance discourse itself, warning against the risk that governance could become a tool of existing power structures, and exploring how genuine democratic participation and social justice can be realized.

D. Policy Recommendations

Based on the findings of this study, the following policy recommendations are proposed for AI risk governance in Taiwan:

- Establish a dedicated AI governance body: Integrate cross-ministerial resources and create a specialized institution responsible for coordinating AI policy planning, standard-setting, risk assessment, and regulatory enforcement, thereby avoiding fragmented governance and regulatory gaps.
- Enact a basic AI law: Drawing on the EU AI Act, Taiwan should adopt a basic AI statute

establishing a risk-based regulatory framework, including tiered management of AI risks, mandatory assessment and certification of high-risk AI systems, requirements for algorithmic transparency, and the protection of individual rights.

- Strengthen administrative capacity: Invest in building the AI-related professional capabilities of administrative agencies, including personnel training, development of technical tools, and cooperation with academia and industry, in order to enhance regulatory effectiveness.
- Promote multi-stakeholder participation: Create mechanisms for citizen and stakeholder engagement in AI governance, such as citizen deliberation, stakeholder consultation, and transparent decision-making procedures, thereby enhancing democratic legitimacy.
- Emphasize social impact assessment: AI governance should not focus solely on technical safety but also evaluate impacts on employment, equality, and social cohesion. Social impact assessments should be institutionalized, and appropriate compensatory and support measures should be developed.
- Align with international norms: Actively participate in the formulation of international AI ethics guidelines and technical standards, ensuring that domestic regulations are compatible with global norms and thereby avoiding both regulatory arbitrage and excessively restrictive rules that impede innovation.
- Promote inclusive AI development: While supporting AI industries, the state should advance digital inclusion policies, including AI literacy education, assistance for small and medium-sized enterprises in adopting AI, and labor transition programs, so that the benefits of AI are widely shared.
- Establish AI ethics review mechanisms: AI projects undertaken by government agencies or funded with public resources should be subject to ethics review to ensure alignment with the public interest and the protection of human rights.

E. Concluding Remarks

Artificial intelligence is among the most transformative technological forces of our time, offering tremendous opportunities while simultaneously generating profound risks. How to govern AI is a question that will shape the future trajectory of human societies. The social state ideal articulated by Lorenz von Stein more than a century and a half ago continues to offer important guidance: the state should not be a mere bystander to technological development or a mere night-watchman of markets, but an active representative of the interests of society as a

whole, intervening to ensure that technological progress serves the freedom and well-being of all.

In the age of AI, the administrative state faces unprecedented challenges. The complexity of technologies, the rapidity of change, and the depth of social impact all test the state's capacity for governance. Traditional regulatory models are no longer adequate; new governance architectures are required—preventive rather than purely reactive, collaborative rather than purely command-based, dynamic rather than static, and inclusive rather than exclusionary.

Meeting these challenges demands far-reaching reforms within the administrative state: strengthening professional expertise, transforming organizational cultures, innovating governance instruments, and broadening democratic participation. It also requires concerted efforts from all sectors of society: enterprises must assume social responsibility, academic institutions must provide expert support, civil society must engage in oversight and deliberation, and the international community must seek cooperative solutions.

The ultimate purpose of AI governance is not regulation for its own sake but, in Stein's terms, the promotion of the free development of every member of society and the realization of human dignity and social progress. In an era of rapid technological change, this classical humanistic ideal becomes all the more precious and calls for our wisdom and courage to put it into practice.

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