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Wang Wen

Chongyang Institute for Financial Studies, Renmin University of China (Beijing, PRC)

Dun Zhigang

Chongyang Institute for Financial Studies, Renmin University of China (Beijing, PRC)

THE THEORETICAL CORE, LOGICAL EXPLICATION, AND PRACTICAL INNOVATION OF NOONOMY FROM THE PERSPECTIVE OF CHINESE MODERNIZATION

Abstract: The 2026 Government Work Report forward-lookingly proposes to “build a new form of intelligent economy” for the first time, a major strategic proposition that demonstrates profound logical alignment with the theory of noonomy. This theory advocates a paradigm shift from “economic rationality” to “cultural rationality”, aiming to liberate humanity from traditional material production and providing a visionary framework for deconstructing social formations in the post-industrial era. Taking a macro perspective, this paper systematically analyzes the internal logical isomorphism between noonomy and the path of Chinese modernization. The study reveals that China’s holistic innovation-driven strategy, the theory of new quality productive forces, the system of high-level scientific and technological self-reliance, and the people-centered development philosophy resonate deeply with the core tenets of noonomy, including knowledge-led productive forces, the automation of the technosphere, and the cultural shift in needs. China’s scaled and institutionalized practices in areas such as intelligent manufacturing, super digital infrastructure, the allocation of national strategic scientific and technological forces, and the cultural creative economy not only provide an irreplaceable, grand testing ground for noonomy but also, relying on the institutional advantages of the “new whole-nation system,” greatly enrich and transcend its original theoretical presuppositions in the practical dimension. Based on this, the paper systematically proposes practical pathways: constructing an underlying institutional system adaptable to noonomy, strengthening breakthroughs in disruptive technologies, reshaping the human capital landscape of an intelligent society, promoting the intelligent and cultural transformation of social governance, and deepening Sino-Russian theoretical and practical cooperation. This research aims to provide solid academic backing and strategic support for China to lead the new paradigm of global intelligent civilization during the 15th Five-Year Plan period and into the longer-term future.

Keywords: new form of intelligent economy; noonomy; Chinese modernization; new quality productive forces.

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王文

中国人民大学重阳金融研究院 (中国, 北京)

敦志刚

中国人民大学重阳金融研究院 (中国, 北京)

从中国式现代化的视角看智慧型经济的理论核心、逻辑分析和创新实践

摘要: 在中国2026年政府工作报告中, 首次前瞻性地提出了打造智能经济新形态的任务。这一重大战略提议与智慧型经济理论具有深刻的逻辑共鸣。智慧型经济理论主张从“经济理性”向“文化理性”转变, 使人类从物质生产中脱离出来, 这为理解后工业时代的社会形态提供了远景框架。本文从宏观层面系统分析了智慧型经济理论与中国式现代化轨迹之间的内在逻辑同构性。研究表明, 中国的全面创新发展战略、新质生产力理论、实现高水平科技自主的方针以及以人为本的发展理念, 与智慧型经济理论的核心观点, 包括知识生产力、技术圈自主化以及需求结构的文化转变, 深度共鸣。中国在知识生产、全球数字基础设施、国家战略科技力量布局以及文化创意经济等领域的大规模制度化实践, 不仅构成了检验智慧型经济理论不可或缺的实践空间, 而且依托于新的全国性资源动员体系所具备的制度优势, 在实践层面显著丰富并超越了该理论的最初前提。在此基础上, 本文提出了以下行动方向: 建立与智慧型经济相兼容的基础制度体系, 加强突破性技术研究, 重构知识型社会的人力资本结构, 推进社会治理的智能化并提高其文化水准, 以及深化中俄在理论与实践层面的合作。本研究旨在构建坚实的科学和战略基础, 以助力中国在“十五五”期间及更长远未来的发展, 引领世界迈向智慧文明的新格局。

关键词: 智能经济新形态、智慧型经济、中国式现代化、新质生产力。

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I. Introduction

The 2026 Government Report of the People's Republic of China for the first time forward-lookingly articulated the goal of “shaping a new form of intelligent economy,” marking a decisive step for intelligent technologies in reshaping the underlying logic and macrostructure of the Chinese economy. As a next-generation economic paradigm, this new form of intelligent economy relies on artificial intelligence as its primary driver, data as its key enabler, and total intellectualization as its fundamental characteristic. Essentially, it expresses the inevitable transition of the AI+ initiative from localized technological empowerment to a systemic restructuring of ecosystems. Its content encompasses three dimensions: the industrialization of intelligent technologies, the intellectualization of real economy, and the systemic establishment of an intelligent ecosystem. At its core, it entails a comprehensive reconstruction of the processes of production, distribution, exchange, and consumption using artificial intelligence. This strategic approach is consistent with the systemic planning enshrined in the Proposals for the Formulation of the Fifteenth Five-Year Plan for National Economic and Social Development, adopted by the Fourth Plenary Session of the 20th Central Committee of the Communist Party of China, which emphasizes the development of new productive forces and high-level scientific and technological self-sufficiency. The macropolitical trajectory clearly demonstrates that China's development model is undergoing a

profound transition from reliance on factors of production and investment to inclusive, innovative growth. This development logic driven by innovation and high technology is highly consistent at a deep theoretical level with noonomy which is described by advanced economic thought through knowledge dominance and an intellectual driver.

Understanding the distant horizons of a new form of intelligent economy requires a deep analysis of the theoretical core of noonomy [Bodrunov, 2023]. The theory of noonomy, proposed by Russian economist Sergey Bodrunov, provides an insightful analytical framework for understanding how the modern science and technology revolution is reshaping social forms. Today, the sixth technological paradigm based on the convergence of NBIC technologies (nano-, bio-, information, and cognitive) is driving humanity toward a historic transition from traditional industrial civilization to a new intellectual civilization. Noonomy creatively inherits and develops Marx's idea of the transition from the "realm of necessity" to the "realm of freedom," convincingly demonstrating that under conditions of highly intellectualized and automated productive forces, the underlying logic of economic life radically changes: traditional "economic rationality" gives way to "cultural reasonableness," where "reason" (noos) guides and redefines "law" (nomos). In such a system, the accumulation of material wealth ceases to be the ultimate goal, and humans are gradually freed from arduous material labor and transition to activities centered on the creation of knowledge, cultural value, and mental needs. Therefore, noonomy acts not only as a projection of the economic form emerging from highly developed intellectual technologies, but also as a crucial value orientation guiding the movement of the new form of intelligent economy away from dependence on things and toward the comprehensive liberation of man.

Despite the epochal significance of this civilizational shift, academic literature has already accumulated a significant body of work on such subject areas as new quality productive forces and innovative development. However, the profound qualitative connection between the promising theory of noonomy and the establishment of a new form of intelligent economy in the context of Chinese-style modernization has yet to receive systematic theoretical exploration and logical analysis. Existing research has not yet clarified the extent to which the theory of noonomy can accurately explain China's development trajectory, nor has it demonstrated how advanced Chinese practice in creating a new form of intelligent economy tests, enriches, and even surpasses the theory's assumptions at the micro and macro levels. For this reason, an in-depth study of noonomy is of indispensable academic and practical value for accurately assessing and advancing the qualitative development of this new form of knowledge-based (intelligent) economy. This paper, drawing on the broad perspective of Chinese-style modernization, systematically uncovers the theoretical core and operating logic of noonomy, identifying its internal intersections with China's innovation strategy. This fills a theoretical gap and provides a scientific foundation for developing a Chinese strategy for the development of a new, future-oriented intelligent economy.

II. Theoretical Content, Philosophical Foundations, Structural Logic and Mechanism of Functioning of Noonomy

Noonomy as a theoretical framework describing the shape of post-industrial civilization is not limited to adjusting the existing economic model. It is a profound paradigm shift. This concept is rooted in the dialectical inheritance of classical Marxism and in a careful understanding of the trends of contemporary scientific and technological evolution. On this foundation, a new logic of social order is constructed, where knowledge, rather than capital, is the centrepiece.

2.1. Conceptual Definition of Noonomy and its Methodological Framework

The term “noonomy” is formed by combining the Greek words *noos* (“wisdom,” “reason”) and *nomos* (“rule,” “law”) and denotes a new social form where human reason is central. Bodrunov combines these roots to emphasize that he is talking about a mode of social organization based on the “laws of reason” and contrasts it with traditional “economics” which is subordinate to the “laws of environment,” that is, resource scarcity and competition. Consequently, the essence of noonomy consists of a “non-economic method of satisfying reasonable needs.” Its logic is no longer oriented toward maximizing material wealth, but is built on standards of reasonableness established by the progress of knowledge and cultural development. In noonomy, knowledge and creative work are the primary resources; value creation ceases to depend primarily on material consumption and capital investment and increasingly relies on the production and application of new knowledge, and the unlocking of human creative potential. At the center is a non-economic way of production and life, focused on knowledge, creativity, and cultural needs. The theoretical premise is as follows: when a technical system can autonomously perform material production, humans will withdraw from the domain of physical labor and focus their energies on creative and intellectual activity, resulting in the emergence of a new social order shaped around the supply of knowledge and the demand for culture. The theory’s methodological framework is built on research into trends in modern science and technology and the social changes they have engendered. Through an analysis of interrelations between technology, society, and humans, it provides a model and causal chain for the transition to a new social structure.

2.2. Bodrunov’s Theoretical Contribution to Noonomy

Bodrunov’s main contribution to the theory of noonomy can be summarized in three propositions. First, he proposed a normative framework for the transition to a “post-economic” civilization. Bodrunov interprets noonomy as an institutional order where social development is guided by “reason” and “cultural reasonableness.” The economic system ceases to regard profit maximization as the ultimate goal and transitions to a humanistic social order focused on human development, creative self-actualization, and public welfare. Secondly, through the transitional mechanism “NIS.2 → noonomy,” he explains the leap in social form under the influence of technological revolution. Bodrunov describes the structural path from the New Industrial Society of the second generation (NIS.2) [Bodrunov, 2025] to noonomy and demonstrates how the convergence of NBIC(S) technologies through automation, intellectualization, and enhanced knowledge intensity restructures the production system: material production recedes into the background, and human labor shifts from direct manufacturing to goal-setting, creative activity, and social interaction. This mechanism correlates with the logic of technological impact through task substitution and creation: the “substitution effect” due to automation and the “redistribution effect” through the emergence of new tasks jointly determine the historical turning point in the form of labor. Third, Bodrunov links technological cycles and institutional choices with the program of practical transformation. In the theory of noonomy, a technological revolution refers to a long-term structural change, when institutional supply, public investment, and social mechanisms must translate technological dividends into a trajectory of universal development. This is reminiscent of approaches that link technological revolutions, financial structures, and “golden eras” through coordinated governance.

2.3. Philosophical and Civilizational Foundations of Noonomy

The theory of noonomy inherits Marx's reflections on the ultimate goal of social development. In *Capital* and other works, Marx anticipated the point when, with a high level of development of productive forces, humanity would transcend the "realm of necessity" and enter the "realm of freedom," where "the realm of freedom actually begins only where labour which is determined by necessity and mundane considerations ceases." In such a state, human activity itself becomes a goal, not a means of survival. Noonomy offers a contemporary interpretation of this "realm of freedom" and attempts to answer the question of how social structure should be restructured after digital and intellectual technologies completely transform the mode of production and make human liberation a reality. When intelligent technologies provide a colossal abundance of material goods and production with near-zero marginal costs, social relations cease to be built around material appropriation and become oriented toward human development. Furthermore, the theory assimilates the ideas of the noosphere from Teilhard de Chardin and Vladimir Vernadsky. Already in the first half of the 20th century, Vernadsky and his contemporaries believed that human reason was becoming a decisive force reshaping the Earth, and that society was entering the era of the noosphere, where nature is organized by thought. Noonomy develops this line and asserts that human reason must not only transform nature but also direct and control the technosphere created by technology, subordinating it to human cultural and intellectual goals rather than the blind expansion of material growth. Consequently, noonomy is a project for a civilizational form whose inner core is the cultural and intellectual values of humanity, and whose economic development is subordinated to the enrichment and rise of human inner world, rather than the endless race for consumption.

2.4. Technology Driven Transition of Social Form: From the New Industrial Society (NIS.2) to Noonomy

The theory of noonomy views modern society as an intermediate stage in the transition from the New Industrial Society of the Second Generation (NIS.2) to the civilization of reason. NIS.2 denotes a new industrial stage marked by knowledge-intensive production: the production process here relies heavily on scientific knowledge and information technology, and the volume of knowledge contained in a single unit of output increases dramatically. At the NIS.2 stage, knowledge already displaces traditional factors and becomes the primary source of growth, and the role of humans changes: they cease to be an appendage of the machine and become observers and managers of the process. The goal of this stage is the dialectical dismantling of the late-industrial system and post-industrial trends.

However, noonomy goes beyond NIS.2. Its ideal state implies a "dual system": on the one hand, a highly autonomous technical system based on NBICS technologies (nano-, bio-, information, cognitive, and social technologies) assumes the bulk of material production functions; the sixth technological paradigm built on the integration of NBICS has already created sufficient conditions for the transition to intelligently organized production. On the other hand, a "social system" formed by people sets value goals and formulates creative ideas that guide the technical system's operations. As the convergence of NBICS deepens, the autonomy of the technical system within the sixth technological paradigm grows, and production's dependence on direct human labor significantly decreases. Noonomy anticipates a turning point at which knowledge-intensive automated production fully matures, and social form finally shifts from industrial logic to the logic of reason: development is no longer built around material output and shifts its focus to the

generation and supply of knowledge, signifying a radical shift from an industrial civilization to a civilization of reason. The key sign of this transition is the final separation of the technosphere from human society, when the production process reaches a level of automation that requires almost no human intervention. Then, society's primary concern will no longer be the industrial engineering, but the acquisition of absolute, or universal, knowledge, marking the full entry into the era of noonomy.

2.5. Basic Characteristics of Noonomy and the Logic of its Functioning

Noonomy, as a form of future civilization, has features and logic that differ sharply from the traditional economic paradigm:

Firstly, the dematerialization of production occurs. The scale of material production and its relative importance in socio-economic life are declining, while knowledge, information, creativity, and other "intangible products" are gaining a dominant position. Scientific and technological progress makes automated "unmanned production" possible; humans are no longer directly involved in the production of most material goods, and the supply of goods is automatically provided by the technical system at significantly lower costs and resource consumption. As a result, material wealth ceases to be scarce, and economic growth is no longer measured by the volume of material output.

Secondly, labor loses its economic form. After humans exit the domain of direct material production, classical "paid labor" ceases to be the foundation of social order. Labor increasingly takes the form of creative, research, and caring activity, rather than a means of earning a living. The line between work and life is gradually blurring, and "work" is no longer perceived as an obligation imposed by economic necessity, but rather as a free choice for self-actualization. Consequently, traditional production relations based on employment and compensation are weakening, and connections between people are increasingly being built through cooperative communities and innovative networks.

Third, a decapitalization of relationships is taking place. As material scarcity eases, ownership loses its central place in social relations. Resource distribution models based on the principle of "use without owning" are becoming widespread, collaborative consumption and the rental economy are booming, and ownership is becoming separated from the right to use. Wealth ownership ceases to be the primary source of social status, and redistribution mechanisms increasingly focus on shared use and universal access. Economic relations among members of society become less rigid and less defined. At the same time, market competition diminishes, and cooperation and sharing take the place of the new value orientation.

Fourth, human needs acquire a cultural nature. In noonomy, the structure of needs shifts from the material to the cultural. When basic material needs are sufficiently satisfied, the main contradiction becomes the desire for quality of life and intellectual development. Education, art, entertainment, and philosophical inquiry, responding to the needs of intellectual civilization, are becoming the center of economic activity. Consumption is no longer considered the ultimate goal of growth, but rather a means of self-discovery and progress toward the good life. The system of public evaluation is also shifting from narrowly economic indicators to those that take into account cultural level and creative contribution. The Human Development Index, national innovation indices, and cultural development indices are proposed as the primary criteria for social progress, replacing GDP growth rates.

Ultimately, noonomy is disrupting the economic paradigm of the industrial era and rebuilding production relations and the system of social values based on knowledge and wisdom. The logic of its operation is expressed in a dual drive: automated production in the technical system plus cultural goal-setting in the social system. On the one hand, the highly intelligent technical system operates efficiently in the background, continuously producing goods and services that satisfy human needs. On the other hand, human society, through democratic participation and cultural leadership, determines the area and goals of technology application, ensuring that scientific and technological progress contributes to the comprehensive development of humanity rather than becomes a force against it.

III. International Effects of the Theory of Noonomy and its Points of Intersection with China's Development Strategy

3.1. Effect of the Theory of Noonomy

Bodrunov's proposed noonomy is not only a theoretical blueprint for a future social form but is also gradually evolving into an analytical framework linking technological advancement, institutional choice, and the redefinition of development goals. As such, it significantly influences both the international development agenda and the strategic narrative of Chinese-style modernization.

3.1.1. At the international level, the theory advances the research agenda of "technological revolution – civilizational transformation," shifting the discussion from internal debates within economics to the realm of interdisciplinary paradigm shift. Bodrunov defines noonomy as "a non-economic way of production and distribution." The key effect is that digitalization, cognition, and the revision of social value goals are linked into a single framework. From this perspective, technological progress ceases to be treated solely as a problem of productivity and is included in the explanation of the transition of social form, stimulating political economy, science and technology studies, and development studies to engage in a dialogue around the chain of "relative autonomy of the technical system - setting human goals - return of cultural reasonableness." At the same time, the "NIS.2 -> noonomy" stage-by-stage formula establishes a clear logic for the transition from intellectualization and the growth of knowledge-intensity in the industrial system to the institutional reconstruction of society, offering the international academic community a verifiable meso-level narrative and strengthening the practical applicability of noonomy as an integral theory of "technology-institutions-values."

3.1.2. At the theoretical level, noonomy provides a normative guideline for the "guiding management of innovation" and reframes the legitimation logic of industrial policy and technology-driven governance. The most significant impact on international political debate is that the choice of innovation area is no longer viewed as a simple tool for industry competition and is elevated to the level of a choice of civilizational goals. Based on public welfare, comprehensive human development, and social reproducibility, the role of the state in technological diffusion, the provision of public goods, and institutional innovation is being redefined. This approach is consistent with the logic of mission-oriented innovation policy, where governance is built around setting direction and co-creating markets. When a technological revolution enters a phase of high uncertainty, strong externalities, and profound path dependence, policy cannot limit itself to "market repair"; it requires shaping the technological-industrial trajectory through objectives, coordinated investments, and institutional supply. Furthermore, noonomy emphasizes that auto-

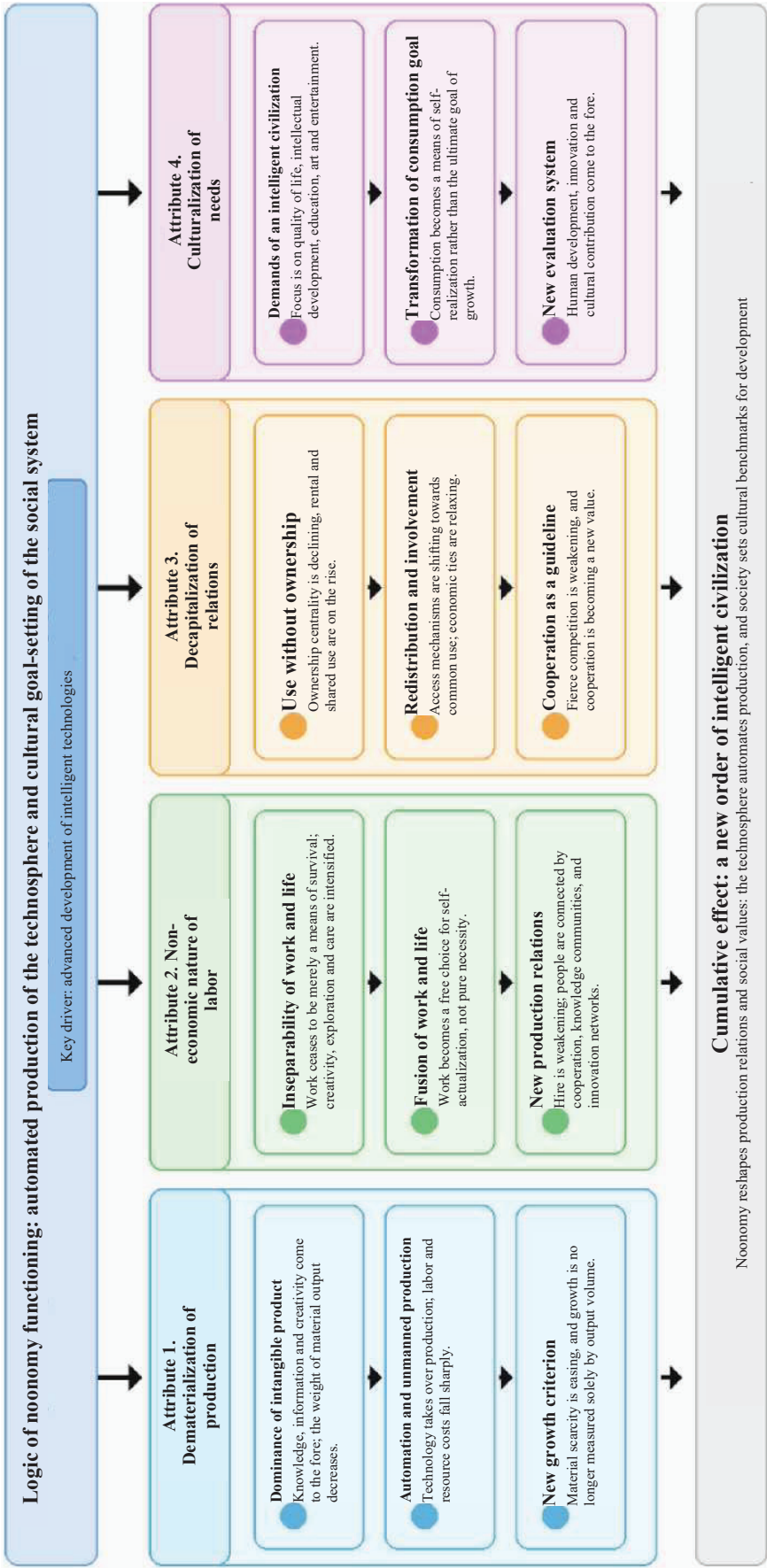


Fig. 1. Basic Characteristics and Logic of Noonomy Functioning

mation and intellectualization fundamentally revise the structure of labor, thus directly resonating with the classic “substitution effect – redistribution effect through new tasks” model and providing a mechanism for discussing how to transform the technological dividend into a social one.

3.1.3. In the Chinese context, noonomy provides a theoretical mirror for the strategic nexus of “innovation driver, new quality productive forces, and scientific and technological self-sufficiency” and, in the face of increasing external constraints, strengthens the integration of discourse. Its impact in the Chinese context is primarily manifested as conceptual isomorphism: propositions on knowledge dominance, intellectual drivers, and a value shift closely align with the Chinese political emphasis of the new stage, which is enhancing attention to scientific and technological self-sufficiency, advanced manufacturing, and strategic new industries. Against the backdrop of tightening external technological constraints, the weight of “technological self-sufficiency” has noticeably increased in China’s political and public discourse, creating fertile ground for the adoption of noonomic propositions such as the autonomy of the technological system, institutional guarantees, and the redefinition of social goals. More importantly, China’s institutional mobilization capacity and its global marketplace constitute an observable “institutional experimentation space” for noonomy: the construction of national strategic scientific and technological forces, coordinated attacks on bottlenecks in production chains, and the public nature of digital infrastructure provide a solid empirical foundation for the discussion of the transition from a normative vision to an achievable trajectory, while simultaneously creating Chinese “mechanistic evidence” for the international dissemination of noonomy.

3.2. Intersection of Noonomy with China’s Development Strategy

In recent years, the Chinese academic and expert community has begun systematically introducing the concept of “noonomy,” incorporating it into the research agenda of Chinese-style modernization and new productive forces through translations, publications, and discussions. The Chongyang Institute for Financial Studies at Renmin University of China, drawing on its capabilities for agenda-setting and international academic communication, has promoted Chinese translations of Russian economist Sergsy Bodrunov’s works titled Noonomy [Bodrunov, 2023] and Strategizing Societal Transformation: Knowledge, Technologies, and Noonomy [Bodrunov, Kvint, 2025] in China. Thanks to this, noonomy has gone beyond mere familiarity with the concept and become a discussed theoretical framework and policy language. This advancement not only increased the term’s visibility within the country but also created an important theoretical foundation for linking it with themes of innovative development, new productive forces, scientific and technological self-sufficiency, and Chinese-style modernization.

3.3. Innovative Development Strategy and the Noonomic Idea of “Knowledge-Dominant Production”

At the core of the theory of noonomy is the assertion of the absolute dominance of knowledge in the system of productive forces. This is fully consistent with Xi Jinping’s thesis that “innovation is the primary driving force of development,” which marked a fundamental shift in the Chinese model from factor-driven growth to growth based on knowledge and innovation. This strategic idea is fundamentally consistent with the noonomic proposition that knowledge determines the consumer characteristics and technical parameters of a product, and that knowledge is the most significant factor in advancing scientific and technological progress. Signifi-

cantly, China has not limited itself to recognizing innovations in the ideological domain, but has created a powerful practical vehicle for its knowledge-dominated productive force through institutional decisions such as “improving the new national resource mobilization system” and strengthening national strategic scientific and technological capabilities. State-owned key laboratories, major scientific and technological infrastructures, high-level research universities, and technological leaders in industry collectively form China’s system of national strategic scientific and technological forces, whose mission is to organize and systematize knowledge creation and breakthroughs in response to national strategic needs. This strategy driven by state will and focused on the primary sources of innovation is the fundamental effort crucial for noonomy to move from theory to reality. From a noonomy perspective, knowledge will become the primary factor of production in the future, and growth will be based on innovation and the dissemination of knowledge. China is moving in this direction: the share of R&D expenditure in GDP has already approached 2.7 percent, exceeding the EU average and approaching the OECD average; the accumulated number of active patents for inventions and the publication of academic papers are leading worldwide. All this demonstrates that China is creating a new engine of development, one in which knowledge-based innovation has a key place, thereby aligning with the noonomic thesis on the critical role of knowledge-based productive force. Furthermore, China is consciously cultivating an innovation culture and improving its innovation ecosystem, encouraging mass entrepreneurship and innovation, and building synergies between human resources, research, and industry, which also aligns with the noonomic imperative to make knowledge the primary driver of economic activity.

3.4. Development of New Quality Productive Forces and Correspondence to the Noonomic “Transition of the Technological System”

The emergence of noonomy is supported by new technological systems and is understood as a key transition from a resource-based economy to a knowledge-based economy. In 2023, Xi Jinping proposed the original concept of “new quality productive forces,” thus signaling a qualitative shift in the development of modern productive forces. New quality productive forces are born from revolutionary technological breakthroughs, innovative configurations of production factors, and profound industrial modernization. They are distinguished by their innovative nature, their key characteristic is high quality, and their essence is equivalent to advanced productive force. This understanding closely corresponds to the noonomic description of the transition from traditional industrial society to the New Industrial Society of the second-generation (NIS.2). At the center of NIS.2 is knowledge-intensive material production where the information component is growing, the share of the material component is declining, and the production process is becoming more flexible and intelligent. At the same time, proposals for the Fifteenth Five-Year Plan call for “developing new quality productive forces” and “continuously generating new quality productive forces,” thereby elevating them to an even more prominent strategic position. Essentially, we are talking about a new generation of technological systems centered on digital and green technologies. Today, China is intensively promoting the development of cutting-edge technologies, including artificial intelligence, quantum information, the Internet of Things, and biotechnology. It is implementing a “new infrastructure” program and is building 5G networks, industrial internet, data centers, and artificial intelligence platforms on a large scale. All of this directly aligns with the noonomic proposition that the

convergence of NBIC(S) technologies serves as the driving force behind the transformation of social form. Noonomy specifically emphasizes that it is NBIC(S) convergence that triggers a shift in the production paradigm. China's technological leapfrogging practices are at the forefront of the world in many ways: by the end of 2025, the country had built over 1.15 million 5G base stations, exceeding 70 percent of the global total and forming the largest and most technologically advanced independent 5G network; the BeiDou satellite navigation system has been fully operational, creating an autonomous spatial information technology system; and projects such as Eastern Data, Western Computing have been launched to optimize the nationwide distribution of computing and information resources. These measures lay the foundation for the technological transition and allow China to enter the NIS.2 stage of the new industrial society, where knowledge-intensiveness and intelligent drivers dominate, ahead of other countries. In this vein, new quality productive forces serve as a precise Chinese definition of the form of productive forces at the NIS.2 stage and as a practical benchmark. Vigorous development of strategic new industries and industries of the future aims to build a technosphere infrastructure that supports the next-generation social form and creates a solid material and technical foundation for a more advanced transition to noonomy.

3.5. Creating an Independent Innovation System and Aligning it with the Noonomic Emphasis on "Technological Self-Sufficiency"

The theory of noonomy suggests that as technology develops, a relatively autonomous technosphere will emerge, capable of operating in a self-sufficient mode, while human society will withdraw from direct production and assume the role of observer and manager. The relative autonomy of such a technosphere requires that its core technologies and key systems be independent and manageable. This thesis is entirely consistent with China's strategy of high-level scientific and technological self-sufficiency. In this regard, China's construction of a system of independent innovation is entirely consistent with the idea of noonomy. Faced with international technological blockades and supply chain security challenges, China is consistently pursuing independent innovation, implementing breakthrough projects in key technologies such as advanced chips, industrial software, aircraft engines, and new materials. Xi Jinping has repeatedly emphasized that critical technologies are a powerful tool of the state and must be strongly controlled by the country: "Key core technologies cannot be begged for, bought, or given as a gift"; "In innovation, one should not question the origin; the main thing is contribution to the country." Noonomy demands that crucial technologies be under independent national control and serve the well-being of the people, without placing the country in a dependent position. Today, China has fully mastered 5G, high-speed rail, nuclear energy, and space technologies; landmark achievements, such as the Tianwen Mars mission and the Jiuzhang quantum computer prototype, are continually emerging. Efforts to complement, strengthen, and extend value chains in key areas - from advanced chips and operating systems to industrial software and bio-breeding - objectively create the foundation for the establishment of an independent, comprehensive, and sustainable "Chinese technosphere." All this represents China's determination and tangible achievements in building an autonomous and controlled innovation system and largely aligns with the noonomic requirement of "technological self-sufficiency." As further breakthroughs are made in bottlenecks, China's system of independent innovation will provide noonomy with a powerful and independent technological underpinning.

3.6. Building Digital China and its Correspondence to Noonomic “Cognitive Production”

In noonomy, the production mode is described as “cognitive production” where automated production and intelligent decision-making are enabled by systems based on artificial intelligence and big data. The Digital China and intelligent society projects being promoted in China are an essential practice in moving toward this type of production. On the one hand, the country has already created the world’s largest digital infrastructure which is technologically advanced: 5G networks, data centers, and computing networks serve as the physical medium for generating, transferring, and processing massive amounts of data. During the Fourteenth Five-Year Plan, the scale and quality of cyberspace industries continued to grow, and the added value of core digital industries in GDP increased from 7.8 to 10.4 percent. In 2024, China’s total data output increased by 25 percent year-on-year, and the number of 5G base stations reached 4.251 million. The country is intensively leveraging big data and cloud computing to strengthen governance; digital government and smart cities are being developed nationwide, with scenarios such as urban think tanks, autonomous driving, and intelligent medicine gradually being implemented. These facts demonstrate that China has already made significant progress in the cognitiveization of production and governance and is moving along a path that is highly consistent with the vision of noonomy. At the same time, China is extensively exploring reforms to the market allocation of data factors, establishing data as a new factor of production alongside land, labor, capital, and technology, and building institutions for data ownership, circulation, trade, and security. These practices are fully consistent with the noonomic understanding of the central role of information and cognitive technologies in future production and represent a major social experiment in transforming “knowledge management” into a real productive force.

3.7. Value Orientation of Chinese-Style Modernization and its Consonance with Noonomic “Cultural Reasonableness”

Noonomy strives for cultural reasonableness that transcends materialism, focuses on the all-round development of the individual and the common good, and emphasizes the need to “abandon social distinctions related to wealth and channel competition into the realm of intellectual development and self-improvement” to ultimately ensure comprehensive human development. This value system directly aligns with the orientation of Chinese-style modernization. Chinese modernization is defined as a modernization of shared prosperity for all people, a modernization of the coordinated development of material and intellectual civilization, and a modernization of the harmonious coexistence of man and nature. In all these wordings, utilitarianism focused solely on GDP is overcome, and cultural reasonableness is clearly evident. At its core, this approach transcends the Western capital-centered model of modernization and establishes human-centered development as its foundation. Both the policy of shared prosperity, aimed at reducing disparities between city and countryside, regions and income groups, and the development of an advanced socialist culture to meet the growing intellectual and cultural needs of the people, and the integration of ecological civilization into the entire process of socioeconomic development, testify to the overcoming of a narrow focus on economic growth. Noonomy, in turn, calls for the goal of satisfying “growth needs,” including individual development, cultural creativity, and social care. This value aspiration centered on human well-being, social justice, and the longevity of civilization is intrinsically consonant with noonomic “non-economic” goals and “cultural reasonableness,” and together point to a more human-centered and harmonious form of future society.

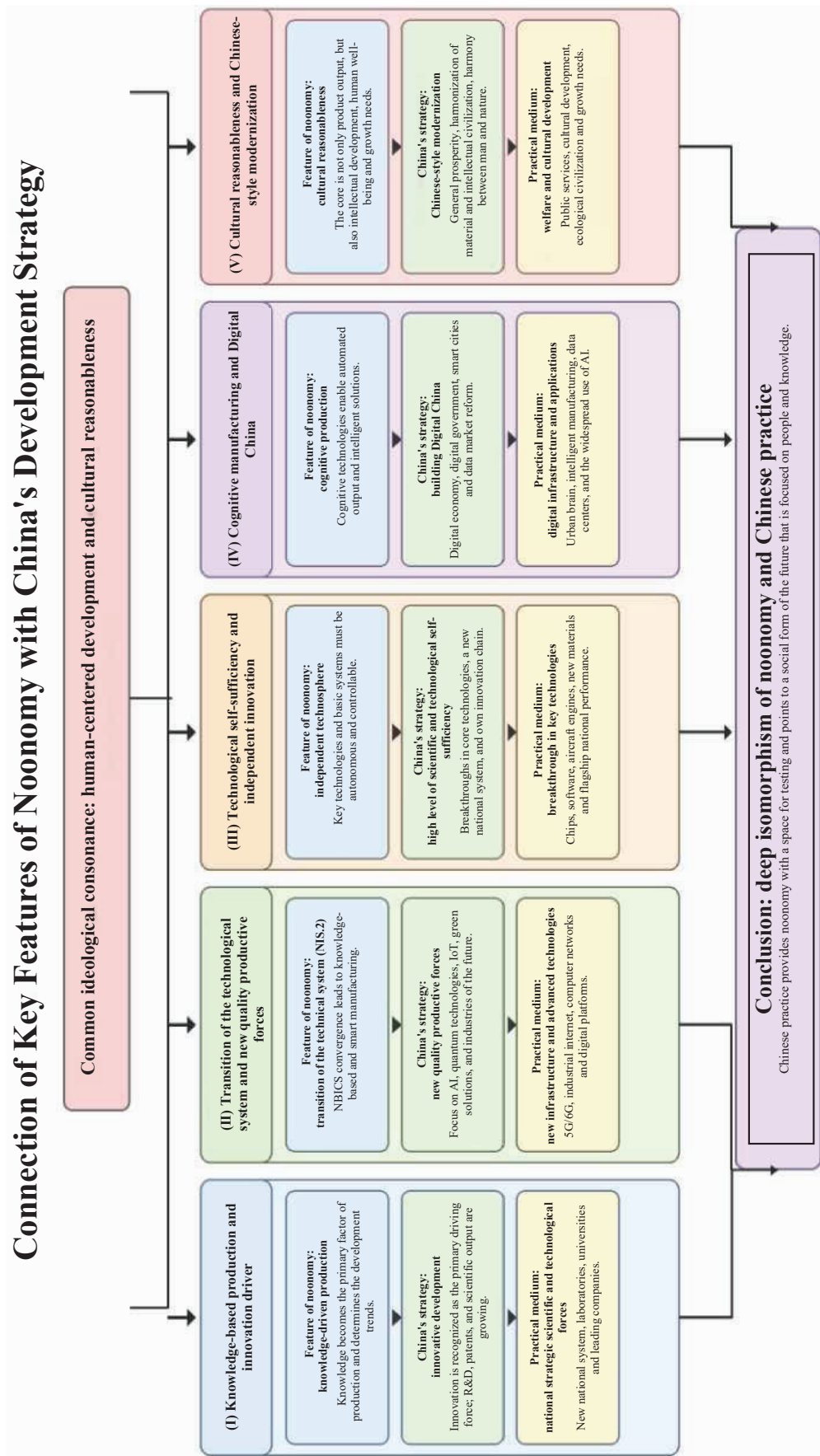


Fig. 2. Relationship between Noonomy and China's Development Strategy

IV. How Chinese Practical Innovations Enrich and Transcend the Theory of Noonomy

China is not only a “verifier” of noonomy, but also a participant in its further theoretical evolution.

4.1. Chinese Way of Smart Manufacturing: A Large-Scale Practice Going Beyond Industry 4.0

The theory of noonomy predicts that at the NIS.2 stage, production will shift toward knowledge-intensiveness, and humans will transform from machine appendages into process supervisors. China’s practice of smart manufacturing, with its astonishing scale and pace, has transformed this theoretical assumption into a major reality. By 2024, the penetration rate of digital R&D and design tools among industrial enterprises above the established scale reached 84.1 percent, and the numerical control rate for key production operations reached 66.4 percent. This is no longer a matter of localized automation of individual enterprises, but rather a holistic advancement of the entire industrial system. From “unmanned factories” and “dark factories” to flexible manufacturing and digital twins, technologies once considered cutting-edge concepts have been widely adopted in China based on a vast manufacturing system. Unlike developed Western countries, where isolated demonstration projects often predominate, China’s smart manufacturing approach is marked by its reliance on a national system and mass replication. In the area of industrial robotics, during the Fourteenth Five-Year Plan period, China supported 46 cities in pilot projects for new technological transformation, built over 230 high-end smart factories and 1,260 5G factories, and the share of new industrial robot installations exceeded 50 percent of the global total, exceeding the combined total of the United States and Europe. The widespread adoption of robots has dramatically reduced the number of workers on assembly lines, and direct labor costs at many enterprises have been reduced by more than half over the past ten years. This large-scale and systemic practice of smart manufacturing is already moving beyond the initial Industry 4.0 model, accelerating technological iteration and cost reduction, and also preliminarily identifying the contours of a production system where dependence on labor is reduced in a noonomic sense. The Chinese experience demonstrates that in the global economy, strategically directed state-led industrial intellectualization can create a unique systemic advantage that goes beyond the German Industry 4.0 model.

4.2. Building a Global Digital Infrastructure as a Foundation for Noonomy

Establishment of noonomy is only possible with a robust information infrastructure and massive data resources. The global digital infrastructure that China has been purposefully building in recent years is already at the forefront of the world and creates a head start for the future knowledge economy. First, in the communications network sector, China has built the world’s largest fiber-optic and mobile networks, with the number of 5G mobile users exceeding 1.1 billion and 230 million households enjoying fixed broadband access with speeds of 1 Gbps or higher. High-speed and ubiquitous connectivity forms the digital backbone for the intelligent transformation of all industries. Secondly, in the area of spatial information and navigation, China’s BeiDou satellite system is operational globally. Construction of a high-precision Earth observation system has essentially been completed, and autonomous satellite communications capabilities have been significantly enhanced. This is creating an independent and controllable spatiotemporal information foundation for the era of knowledge economy. Third, in the area of computing and data infrastructure, China has launched the Eastern Data, Western Computing program, building national data center clusters in the West and locating supercomputer and cloud centers in the

East, resulting in the creation of an integrated all-China computing network. Its function is comparable to that of a “digital highway” and “central processor” for the society of the future. This state-organized and massively scaled digital public infrastructure exceeds the capabilities of any single market actor in terms of scope and depth. It not only supports the current development of the digital economy but also creates the physical and logical preconditions for cognitive production and the autonomous functioning of the technosphere in noonomy. Here, China’s practice provides a significant complement to theory. As these infrastructures continue to improve, China may be the first to acquire the “neural network” and “digital ground” sufficient to support a knowledge-based economy, thereby acquiring a key prerequisite for its early implementation.

4.3. Sharing Economy and Platform Innovation: A Physical Form of the Noonomic Principle of “Use Over Ownership”

The features of noonomy, which weaken physical ownership and emphasize sharing and co-operation, have been clearly evident in the rapid development of China’s sharing economy. Over the past decade, China has become the world’s largest sharing economy market. From bike- and car-sharing to office space and manufacturing equipment, China is at the forefront of both scale and model innovation. This economic model where the right of use displaces ownership dramatically improves the efficiency of resource allocation, lowers the barrier to participation for individuals, and effectively erodes traditional notions of ownership. Chinese consumers have embraced the “use without owning” model en masse and developed corresponding consumption habits. According to the source, the volume of transactions in the Chinese sharing market reached RMB 4.46 trillion in 2024, is expected to exceed RMB 5 trillion in 2025, and could reach RMB 8.5 trillion by 2030, with a compound annual growth rate of over 10 percent. For example, the proliferation of bike sharing has transformed the way hundreds of millions of people travel, allowing them to ride without owning a bike; online car-hailing platforms have dramatically increased the utilization rate of private cars, making owning a car no longer a prerequisite for mobility; and new formats such as co-working spaces and power bank rentals continue to emerge, maximizing resource utilization. At its core, the sharing economy, through modern information platforms, quickly matches unused resources with demand, enabling demand-based allocation and cyclical use. This process is entirely consistent with the noonomic trend of diffusion of ownership, where the desire to appropriate property weakens and attention to consumer value increases. At the same time, the development of digital platforms is giving rise to a multitude of cooperative innovation models - from open-source communities and crowdsourced design to public crowdfunding, which is experiencing rapid growth in the Chinese internet ecosystem and represents the shift in economic relations from competition to cooperation. The rise of platform economy powered by algorithms and data enables precise and efficient matching of supply and demand and shortens the chain between producer and consumer, which is highly consistent with the noonomic notion of directly linking the customer’s needs with the producer’s product or service.

4.4. System of National Strategic Scientific and Technological Forces: Institutional Transcendence of the Theory of Noonomy

Noonomy emphasizes the leading role of reason and primarily describes the society of the future from a technological and value perspective. However, it does not provide a clear national path for how to organize and effectively produce and apply this “reasonableness,” especially in

an environment of fierce international competition. China's "new national resource mobilization system" and the system of national strategic scientific and technological forces provide a powerful institutional response. This system combines the political advantage of concentrating efforts on major tasks with the fundamental role of the market in the efficient allocation of resources, creating a unique model of innovation governance. Like the American "deep developmental state," it is capable of channeling breakthrough innovations through defense, energy, and other channels, while simultaneously leveraging the advantages of the socialist system for systemic national planning and resource coordination, focusing efforts on overcoming technological bottlenecks. From manned spaceflight and Beidou navigation to the C919 passenger aircraft, a series of major scientific and technological achievements clearly demonstrate the effectiveness of this system. In other words, the Chinese institution of national science and technology offers a much more realistic path to the implementation of the noonomic vision: through government action, social conditions favorable to the emergence of a knowledge economy are created, and issues that the market cannot resolve spontaneously are integrated into strategic planning and public policy, thereby dramatically reducing the risks and costs of transition. This advanced practical dimension serves as a significant complement to and expansion of the theory of noonomy.

4.5. Rise of Cultural Consumption and the Creative Economy: Early Signs of Key Features of Noonomy

The ultimate form of noonomy envisions humanity liberated from the pressures of material production and focusing its energies on science, culture, art, and other creative endeavors. In modern China, this trend is represented by rapid growth of cultural consumption and creative industries. In the first three quarters of 2025, the country's residents' expenditure on education, culture, and entertainment reached RMB 2,531 per capita, an increase of 10.3 percent year-on-year, and its share of per capita consumer expenditure was 11.7 percent. The digital content industry has demonstrated even more explosive growth: by the end of 2024, the audience of Chinese online literature reached 575 million people, the number of authors exceeded 30 million, the total number of works exceeded 41.65 million, and 2 million new works were added during the year. In 2025, the actual sales revenue of Chinese independently developed games in overseas markets amounted to US\$ 20.455 billion, an increase of 10.23 percent, and exceeded the RMB 100 billion mark for the sixth consecutive year. All these phenomena indicate that Chinese society is shifting from material consumption to cultural consumption, and the aesthetic, creative, and intellectual needs of the masses are becoming a significant source of economic activity. The growth of creative economy is generating a large amount of "creative labor": for example, over 10 million content creators are active on major online platforms, unlocking their potential and generating income through short videos, streaming, and literary creation. The number of people employed in the cultural and creative industries is rapidly growing and already exceeds 10 percent of employment in a number of large cities. All these trends align well with the noonomic vision of a society where creative labor is the centerpiece.

V. Designing a Chinese Trajectory toward Noonomy

Looking ahead to the Fifteenth Five-Year Plan and beyond, China must intensively integrate noonomy into high-level national strategic planning and systematically build institutions, technologies, and a human capital system that will support the next-generation civilization and enable the country to lead the global transition to intelligent civilization.

5.1. Development of an Institutional System Supporting Noonomy

China should proactively develop a national roadmap for the development of noonomy and incorporate it into its medium- and long-term strategic planning. First, the nationwide strategic planning system must be improved. It would be appropriate to enshrine noonomy as a strategic vision for the country's long-term development, define a clear roadmap and milestones, integrate its fundamental ideas into the Fifteenth and subsequent Five-Year Plans, and align policies in science and technology, industry, education, and culture. Secondly, it is necessary to accelerate the creation of new factor markets consistent with noonomy. This is not just about improving technology and labor markets, but, above all, about building a data market, a market for algorithms, and a system of public computing services. We must accelerate the establishment of basic institutions for data ownership, circulation, income distribution, and secure governance, so that the main factor of production - data - can safely and efficiently circulate and distribute, institutionally supporting "cognitive production." Third, it is necessary to deepen the reform of the science and technology governance system. This requires "eliminating all ideological and institutional barriers that hinder innovative development," improving the trust-based management system for research funding, building a multi-element assessment based on innovative value, potential, and contribution, and granting researchers greater autonomy, thereby creating a free and inclusive environment for original, basic innovation. Fourth, the creation of a market for algorithms and computing power should be explored. The government can act as a facilitator, encouraging companies and research organizations to publish "open lists" of algorithms and create mechanisms for their shared use and trading. At the same time, the opening of national computing infrastructure to the public should be accelerated, and rules for the distribution and paid use of computing resources on demand should be developed, preventing monopolization and waste. Additionally, the legal framework for data and privacy protection must be improved.

5.2. Strengthening Fundamental Research and Breakthroughs in Disruptive Technologies

China needs to pursue a more forward-looking science and technology strategy and increase investment in basic research and disruptive innovation. First, it should implement a national next-generation technology strategy and support long-term and sustainable investment in NBICS convergence. In areas such as quantum information, neuromorphic intelligence, synthetic biology, and future energy, which are capable of generating paradigm shifts, a series of strategic and reserve research projects must be launched in advance. Secondly, a "system for the preliminary development of future technologies" must be established. It would be useful to borrow from the experience of organizations like DARPA and create specialized institutes that will proactively assess and deploy breakthrough technologies that could have a decisive impact in 10-20 years, supporting risky and unorthodox exploratory research and helping to take a proactive position in the future technology race. Third, we need to strengthen the capacity of national strategic scientific and technological forces for collaborative breakthroughs. Relying on state laboratories as a core, we must combine the strengths of universities, research institutes, and leading companies, creating interdisciplinary and cross-industry innovation alliances aimed at overcoming bottlenecks and developing the industries of the future, in order to navigate the path from fundamental science to industrial application across the "valley of death."

5.3. Building a Human Capital System for a Knowledge Society

To transform China's human resource advantage into a knowledge-based economy, a profound transformation of education and training is required. First, comprehensive reform of the education system must be advanced and a new approach to education - one that emphasizes interdisciplinary learning, creativity, and intellectualism - must be established. Traditional disciplinary barriers should be broken down, interdisciplinary approaches actively developed, and research-based and project-based learning encouraged. Artificial intelligence and data science should become the core of general education, developing students' ability to collaborate innovatively with intelligent technologies. Secondly, a future-oriented system for training creative and managerial personnel must be developed. On the one hand, we must accelerate the training of researchers essential for national innovative development, creating a group of strategic scientists and outstanding innovators capable of achieving leading scientific positions globally. On the other hand, we must cultivate a large group of comprehensive technology management professionals with an understanding of technology, law, ethics, and society to address the complex challenges arising from artificial intelligence, genome editing, and other emerging technologies. Third, it is necessary to create a public system to support lifelong learning and universal creativity. Digital technologies should be used to build open and flexible lifelong learning platforms that provide all members of society with the opportunity to regularly update their knowledge and skills. At the same time, policy measures and platform support should encourage public participation in content creation, open-source communities, and social innovation, making creativity a universally accessible way of life. Fourth, it would be useful to implement dedicated programs to support creative talent, identifying and funding young people with outstanding potential in artistic design, cultural creativity, and fundamental science, providing them with long-term support and space for free exploration and bold innovation.

5.4. Promoting the Intellectualization and Culturalization of Public Governance

The transition must be advanced simultaneously in two areas: intellectualization and culturalization. First, we must vigorously develop intelligent governance. We must accelerate the construction of smart cities and intelligent public services, leveraging the Internet of Things, big data, and artificial intelligence to improve the efficiency and human-centeredness of city administration, transportation, healthcare, and education. Public administration must move from experience to data, achieving greater accuracy and scientific validity. For example, through the shared use of government data and algorithmic analysis, it is possible to promptly detect changes in public needs and adjust policies; decision support systems based on artificial intelligence can strengthen the ability to respond to complex public safety and public health issues. Secondly, the idea of "cultural management" should be disseminated. In the social sector, greater reliance should be placed on cultural area, value consensus, and dialogue mechanisms, gradually replacing rigid and directive methods. When setting management goals, it is necessary to move away from an excessive focus on economic performance and to take greater account of the comprehensive development of the individual and the quality of intellectual life. Community self-governance, the participation of public organizations, and civic volunteerism should be encouraged to build a multi-actor cooperative governance structure. The ultimate goal is to move from mere "control" to "smart ordering," whereby the very efforts of society become a process of embodying cultural reasonableness and collective wisdom.

5.5. Intensification of Chinese-Russian Cooperation in the Theory and Practice of Noonomy

Russia has accumulated extensive experience in researching the knowledge economy, and China serves as a practical testing ground for the future intelligent civilization. Therefore, the two countries have broad prospects for cooperation in this area. First, we need to strengthen joint theoretical research. Through joint projects and conferences, Chinese and Russian scholars can engage in an in-depth dialogue on the theoretical model of noonomy, its implementation paths, and its social implications. The combination of China's experience accumulating data from social experiments and the Russian philosophical tradition could lead to the development of a more mature economic theory. Secondly, a Chinese-Russian cooperation platform should be established on issues related to the civilization of the future. An initiative could be put forward to establish a Chinese-Russian Research Center for the Development of Intelligent Civilization, regularly publishing analytical reports on the intellectual economy, and providing expert support to the governments of both countries. As part of scientific and technological cooperation within the Belt and Road Initiative, it would be useful to expand the range of topics related to noonomy and jointly discuss technological governance, digital sovereignty, and cultural diversity. Third, it's worth promoting pilot projects for practical cooperation. China and Russia could select suitable industrial parks or cities and launch joint experiments, such as establishing a Chinese-Russian digital industry demonstration database or a joint smart manufacturing factory, pooling their capital and technological advantages and testing real-world noonomy scenarios. The two countries could also advance discussions on intelligent civilization within the UN, BRICS, and other multilateral forums, jointly addressing global issues such as AI governance and the digital divide, and giving new meaning to the concept of a community with a shared future for mankind.

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Information about the author

Wang Wen

Dean of Chongyang Institute for Financial Studies (RDCY), Dean of School of Global Leadership at Renmin University of China (RUC), Professor
E-mail: wangwen2013@rus.edu.cn

Dun Zhigang

Senior Research Fellow at the Chongyang Institute for Financial Studies (RDCY) at Renmin University of China (RUC), Global Governance Analyst
E-mail: wangwen2013@rus.edu.cn