Urban Development Miracle in China: An Explanation through the Lens of Unified Development Economics Theory

Ni Pengfei
National Academy of Economic Strategy, Chinese Academy of Social Sciences

(co-authored with Cao Qingfeng, Xu Haidong and Guo Jing)

Working Paper Series Vol. 2024-26

December 2024

The view expressed in this publication are those of the author(s) and do not necessarily reflect those of the Institute.

No part of this article may be used or reproduced in any manner whatsoever without written permission except in the case of brief quotations embodied in articles and reviews. For information, please write to the Institute.

Asian Growth Research Institute

The first author of this paper, Dr. Ni Pengfei, is a professor at the National Academy of Economic Strategy, Chinese Academy of Social Sciences. In August of 2023, he was invited as a Visiting Research Fellow to visit AGI.

This paper is a revised version of the one presented at an AGI seminar.

Urban Development Miracle in China: An Explanation through the Lens of Unified Development Economics Theory

Ni Pengfei, Cao Qingfeng, Xu Haidong, and Guo Jing

Abstract: The extraordinary urban development witnessed in China since the inception of economic reforms cannot be fully explained by insights or frameworks rooted in neoclassical economics. Building upon a review of pertinent literature, this paper introduces an innovative unified development economics framework, tailored to the context of China's urban ascension, and constructs the "3633" theoretical framework for China's unified urban development. Its underlying logic posits that institutional transformations during the reform era have fostered three agents – households, enterprises, and city governments – each with distinct demand-supply preferences, anticipated returns, and balance sheets, who harness six key elements (population, human capital, material capital, land, institutions, and technology) to drive their behavioral dynamic. These agents engage in three realms of activity – competition and collaboration, learning and innovation, production and consumption – leading to economic activities interweaving across sectors, space, and time. By adopting this framework, we systematically analyze the formation of economic agents during urban development since reform and opening-up, interaction mechanisms among economic agents for mutual needs, and the evolution of their capabilities, behaviors and assets underpinning urban development post-reform. Finally, through a spatiotemporal perspective, we present theoretical deductions in alignment with China’s urban reality, encompassing rapid growth and transitions of individual cities, the shift from homogeneous competition to specialized cooperation among cities, and staged acceleration of urbanization.
Keywords: Urban Development Theory, Unified Development Theory, Chinese Cities

I. Question: How to Explain China's Urban Development Miracle Since the Initiation of Reform and Opening-Up?

Since the implementation of economic reforms, Chinese cities have experienced a remarkable collective rise, transitioning through agricultural, industrial, and knowledge-based phases within four decades, marking a historic feat in urban evolution. The number and scale of cities have expanded rapidly; from 1978 to 2022, small towns multiplied approximately 8.8 times, and prefecture-level cities doubled. The urban system evolved from a single-centered, closed model in 1978 to a multi-centered, open network dominated by metropolitan areas today.

China's urbanization rate escalated from 17.92% in 1978 to 66.16% in 2023. Over the same period, the urban population swelled from 170 million to 930 million. A notable characteristic of this urbanization process has been the initially widening, but eventually narrowing, disparity between registered and permanent resident population urbanization rates. Concurrently, urban wealth witnessed a dramatic surge. The added value of non-agricultural industries in cities nationwide leaped from 0.27 trillion yuan in 1978 (compared to 0.035 trillion in 1952) to 112.17 trillion in 2018, marking a 315-fold

increase from 1978, and further to 121 trillion in 2022, representing a staggering 415-fold growth since 1978. The average urban economic growth rate hovered around 9.5%. The Engel's coefficient for urban households in China dropped significantly from 57.5% in 1978 to 27.7% in 2022, reflecting the nation's enhanced living standards.

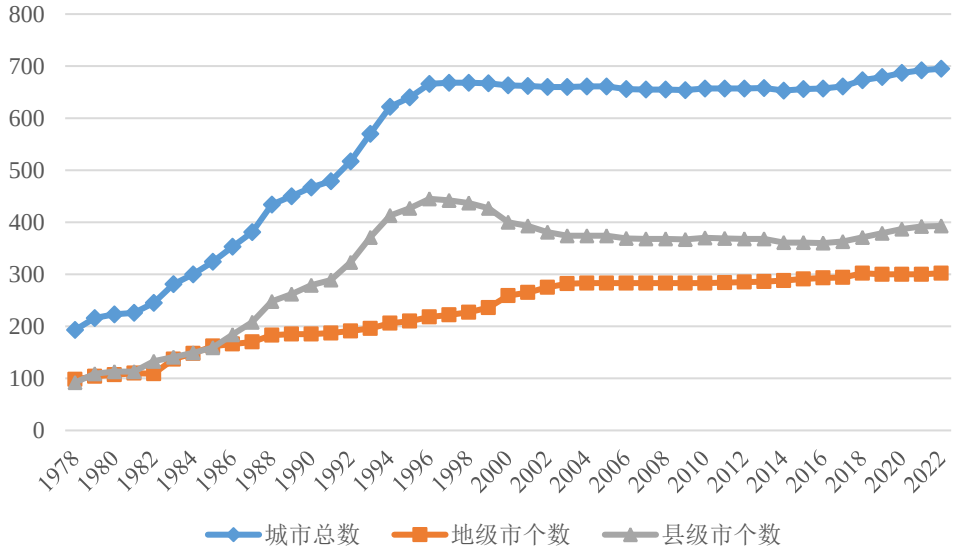

Figure 1: Changes in the Number of Chinese Cities Since the Initiation of Reform and Opening-Up

城市总数 Total Number of Cities

地级市里个数 Number of Prefecture-level Cities

县级市里个数 Number of County-level Cities

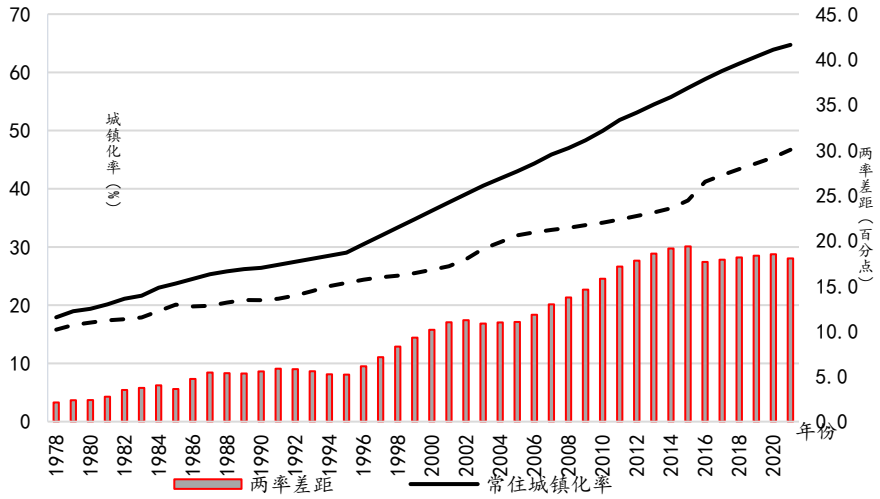

Figure 2: Changes in Urbanization Rate of China Since the Start of Reform and Opening-Up

城镇化率 Urbanization Rate

常住城镇化率 Permanent Resident Population Urbanization Rate
两率差距 Gap Between Two Rates
两率差距（百分点）Gap Between Two Rates (Percentage Points)
年份 Year

The collective rise of Chinese cities has not only crafted a vivid and unparalleled narrative, leaving behind distinct developmental footprints, but also accumulated a wealth of unique and valuable experience. In summary, four key points emerge: Government competition serves as a vital driving force behind the rapid development of Chinese cities; institutional innovation plays a decisive role in the high-speed economic growth of cities; participation in global division of labor acts as a significant power propelling China's urban ascension; and imbalanced yet concentrated non-agricultural activities constitute the cornerstone supporting rapid urban expansion.

The distinctive and precious lessons imbued with a strong local flavor, born out of China's urbanization, pose challenges to traditional economic theories while simultaneously furnishing new materials for theoretical innovations. They inspire systematic breakthroughs in urban development economics and call for practical advancements in the field. Yet, the prevailing neoclassical framework fails to offer a comprehensive explanation for China's urban miracle. Rooted in the exogenous assumption of institutions, it emphasizes the determining role of markets in both economic and urban development. However, the conspicuous fact is that China's market-oriented systems have undergone continuous reforms since the opening-up, necessitating a relaxation of the exogenous institutional assumption in the neoclassical framework. Moreover, as an indispensable agent in urbanization, the government's interactions with other economic agents like households and enterprises are pivotal to deciphering the city rising enigma. Given these constraints, comprehending China's urban miracle since the reform and opening-up requires a new theoretical structure. Hence, this paper endeavors to construct a theoretical framework for China's unified urban development based on indigenous unified development economics, incorporating institutional dynamics, the government, and other factors into a unified analytical framework, offering a more general perspective to elucidate the wonders of China's urban evolution since the reform era.

II. Literature Review

To construct a new theoretical framework for understanding China's urban development, it is imperative to revisit previous studies on economic development, China's economic progress, and the specific evolution of its cities. These theories span extensive historical depths and voluminous bodies of work, and thus, we will selectively summarize the most salient points.

(I) Theoretical Studies on Economic Development

Classical economics has conflated development with growth, with economists such as Smith, Malthus, and Ricardo emphasizing material factors, division of labor, and trade's role in economic development. During the neoclassical period, Marshall first proposed the concept of externalities in economic growth, while Schumpeter identified innovation as the engine of development, with entrepreneurs as its primary agents. Young (1928) renewed emphasis on the importance of specialization and expanding market size for growth. Early works by Harrod (1939) and Domar (1946), based on Keynesian short-run analysis, advanced a theory of dynamic growth emphasizing savings or

capital accumulation as the decisive variable. Solow (1956) attributed growth to increases in labor, capital, and productivity rises from technological advancement. Schultz (1960) argued that human capital accumulation through education is the source of social and economic growth and promotes income equality.

Development Economics has delved deeply into issues of developing countries' economic progress. Zhang Peigang (1949) was an early proponent of examining an agrarian country’s growth and structural transformation from an industrialization perspective. Lewis (1954) formulated the Dual Economy theory, highlighting that in a dual economy with unlimited labor supply, greater agricultural surplus, larger capital accumulation, and faster rural-urban migration lead to faster economic development. Hirschman's (1958) theory of unbalanced development argued that prioritizing resources in sectors with high 'linkage effects' would stimulate growth in others. Kuznets (1971) found that in developed countries, economic transitions involved a shift from agriculture to industry and then to services, with income gaps initially widening and later narrowing. The share of the secondary sector in GDP as well as labor force followed suit. Chenery (1960) saw economic growth and structural upgrading as intertwined, dividing economic development into six stages: traditional society, early industrialization, mid-industrialization, late-industrialization, post-industrialization, and modern society. Kaldor (1961), reflecting on a century of economic growth, outlined six stylized facts: stable growth in labor productivity and capital per capita, stable real interest rates, stable capital-output ratio, stable capital-labor shares in national income, and wide disparities in growth rates among fast-developing countries (ranging from 2% to 5%).

Modern economic growth theory universally emphasizes the role of knowledge and its accruing returns. Romer (1986, 1990) posited that the accumulation of knowledge drives technological change as the primary force for long-term economic growth, enhancing the scaling up of returns. Lucas (1988) contended that human capital could generate increasing returns to production, acting as the "engine" of economic growth, with countries rich in human capital experiencing sustained rapid growth. North and Thomas (1973) argued that innovations in institutional arrangements and their reduction of transaction costs were the determinants of economic growth, with property rights-related institutions being paramount; changes in institutions were triggered and driven by the definition and evolution of property rights, with governments making property structures more efficient for growth through institutional innovation. Becker and Murphy (1992) deemed that division of labor was primarily determined not by markets but rather by the costs and levels of social knowledge tied to specialization; it led to the scaling up of returns but also added coordination costs. Knowledge accumulation reduced coordination costs, enabling the ongoing evolution of division of labor and sustained economic growth; thus, human capital and technological progress were the sources of growth. Yang Xiaokai et al. (1999), based upon Smith's classical economics of division of labor, markets, and economic growth, introduced the dimension of transaction costs, proposing a clear framework where division of labor fostered market transactions and skill refinement, leading to increasing returns and economic growth. Lin Yifu (2012) in his New Structural Economics suggested that if an economy developed according to comparative advantage, capital would continually accumulate and industries upgrade; at every stage of development, beyond effective market mechanisms, a proactive role for the government was essential. Baumol (2002) viewed the combined force behind economic growth as systematic innovation within enterprises, competitive production of new products and processes, and collaborative innovation among

firms. Jones and Romer (2010) put forward six new stylized facts: market expansion, accelerated economic growth, variation in modern growth rates, higher income and total factor productivity differences (TFP), increased per-capita human capital, and stable relative wages, necessitating new frameworks analyzing these facts with creativity, human capital, and institutions.

Unified growth theories attempt to examine economic growth and transformation over extended periods. Marx (1859) offered a unified explanation for human development, using the interaction between productive forces and relations to elucidate social development and progress, implicitly containing his thoughts on long-term economic development. Rostow (1959) integrated historical phase analysis, sectoral, aggregate, psychological, and institutional methods, positing that economic development sequentially proceeded from a traditional society, preparation for takeoff, takeoff, maturity, to mass consumption, and beyond and that economic growth resulted from the continuous structural transformation and improving effects of industries. Becker et al. (1990), starting from human capital accumulation, assumed endogenous fertility and increasing returns on human capital, constructed a multiple equilibrium model. Within this, under Malthusian equilibrium, rapid population growth coincided with meager human capital accumulation and stagnant per capita output, whereas modern equilibrium witnessed growth in both human capital and per capita output, with the Industrial Revolution shifting Malthusian equilibrium to the modern one, a fortuitous technological change rather than endogenous transformation. Galor and Weil (1999, 2000), based on the intrinsic relationship between technological progress and demographic shifts, first developed a unified three-stage growth model compatible with economic growth, encompassing "Malthus Economic Stagnation", "Post-Malthus Economic Growth", and "Modern Continuous Economic Growth", providing a comprehensive dynamic analysis.

Despite the evolution of Western economics since Smith through Classical, Neoclassical, and more recent growth theories, which have established a vast and relatively complete disciplinary system, offering increasingly persuasive explanations for economic development and laying the groundwork for its theoretical progression, some interpretations remain unsatisfactory. To date, mainstream Western economics has yet to furnish a unified analytical framework to account for the comprehensive structural changes accompanying economic growth (Acemoglu, 2008). Specifically, it falls short in integrating institutions endogenously with other factors, omitting the role of government as an economic agent, and failing to incorporate the preferences, expectations, and multi-faceted, not entirely rational behaviors of economic agents. Thus, there remains substantial room for marginal improvement of Western economic development theories.

(II) Research on China's Economic Development

Domestic and international economists have proposed theoretical hypotheses or analytical models from various perspectives, offering diverse explanations and discussions regarding the miracle of China's high economic growth since the initiation of reforms.

Zhang Wuchang (2017) attributed China's economic transition and development to the opening-up of "inter-county competition". Zhang Jun (2003) advanced the proposition of "over-industrialization" in China's economic growth. Yuan Zhigang (2006) examined China's economic growth from the angles of institutions, structure, and welfare. Zhou Li'an (2007) introduced the "promotion tournament governance model" of local Chinese officials as an explanation for the economic growth miracle. Yao Yang (2009) argued that a neutral government, striving for the interests of all people rather than

specific groups, had determined the success of China's economic transition. Tao Ran (2010) identified changes in central-local relations and state-enterprise relationships as crucial reasons behind China's high-speed economic growth. Song et al. (2010) further theoretically explored the "Chinese-style growth". Lan Xiaohuan (2021) posited that the Chinese government, through deep involvement in industrialization and urbanization, had facilitated economic development, gradually established and refined market mechanisms, thus achieving an economic miracle in a manner distinct from developed nations' experiences.

Lin Yifu et al. (1999) utilized the framework of induced institutional change theory to explain China's economic miracle from the perspective of gradual reforms. Zhang Weiying (2010) underscored the monumental contribution of market-oriented reforms and the rise of Chinese entrepreneurs to the rapid economic growth. Zhou Qiren (2010) credited China's high-speed economic growth primarily to the transformation of its property rights system, resulting from a substantial reduction in economic institutional costs through reform and opening-up. Wu Jinglian (2012) asserted that the establishment of a market system that liberated productivity previously restrained by institutional constraints as the main driver of China's rapid growth. Jin Binyuan, Wang Jin, and Xu Chenggang (2014) argued that private enterprises, particularly emerging ones, rather than any violation of universal economic principles, determined China's stunning overall performance. Cai Fang (2013) regarded the release of demographic dividends through reform and opening-up as a key factor in promoting China's economic growth. Coase and Wang Ning (2013) considered the contract responsibility system, township and village enterprises, individual businesses, and special economic zones as the four most important "fringe forces" in China's market economy transition, collectively catalyzing China's "fringe revolution".

Liu He (2008) identified six key factors contributing to China's economic success: the consensus formed through reflection and learning, openness to the world and integration into the global industrial division and market system, steadfast commitment to market-oriented reforms, institutional strengths and political stability, numerous comparative advantages possessed by the nation, and the growing cultural foundation supporting its development. In addition to emphasizing the roles of investment, investment efficiency, capital formation, and improvements in labor productivity in China's high-speed economic growth, Zhang Jun (2013) also argued that the tax-sharing system altered the constraints and incentive mechanisms for local governments, transforming their vicious competition into a benign race for growth. This shift accelerated industrialization and capital accumulation in China, thereby facilitating its rapid economic expansion. Wei Sen (2015) attributed China's prolonged high economic growth to five factors: the country's market-oriented reforms, the full-throttle efforts of governments at all levels, the integration of China's economy and industries into the global arena, a low starting point for economic development prior to reforms, and the shrewd business acumen of the Chinese people.

Jiang Xiaojuan (2010) analyzed China's sustained high growth over three decades from the perspective of aggregate demand, proposing a dual-engine growth model for large nations. She examined the features and sustainability of this model across four dimensions: the advantages of being a large nation, openness, the advantages of the stage of development, and institutional strengths. Cai Fang (2010) extended the neoclassical growth model to explain the impact of the demographic dividend on economic growth, arguing that the "demographic bonus" magnified the contribution of capital to economic growth, enhanced labor quality, significantly improved resource allocation

efficiency, and hastened technological progress. Li Yang (2015) posited that a critical reason behind the Chinese miracle lay in the creation of an effective mechanism for mobilizing and allocating savings, with the increase in savings rates attributed to the explosive expansion of the financial system during the initial phase of reforms and the positive incentive mechanisms for residents, enterprises, and governments at all levels, representing the wisdom of China's gradual reform approach. Liu Shijin et al. (2018) argued from the standpoint that the structure of final goods was directly related to people's preference and income levels, demonstrating the path of China's long-term economic scale expansion and structural transformation. Shi Zhengfu (2013) introduced and applied a "three-dimensional market system" theoretical framework, analyzing how the healthy interaction between competitive local governments and enterprises granted Chinese firms and local governments extraordinary investment drive and unusual purchasing power in the international market, creating a miracle of extraordinary growth with unusually low volatility. Liu Shouying et al. (2022) argued that the government's strategy of leveraging China's unique land system to steer economic development enabled land to play varying roles in different stages of structural transformation and economic growth, which highlighted the significant role of land in China's economic miracle. Cai Fang (2013), using a coherent framework for economic growth, explored long-term development issues of the Chinese economy. He categorized economic growth into several types or phases including the Malthusian poverty trap, Lewis's dual economy development, the Lewis turning point, and the neoclassical growth. Simultaneously, he embedded China's economic development issues within the corresponding growth types and stages, conducting empirical analyses on major themes pertinent to each phase.

The aforementioned studies on China's economic development primarily focus on the macro-national level and mostly apply the mainstream neoclassical economic theories to explain the realities of China's transitional growth. They emphasize one or several key aspects influencing China's economic development but have yet to form a more general theoretical framework. Nonetheless, these literature serve as pivotal intellectual foundations for studying China's urban development.

(III) Studies on Modern Urban Development

Regarding the formation and evolution of modern cities, urbanization, and urban systems since the Industrial Revolution, scholars both domestically and internationally have conducted extensive analyses. In terms of urban morphological evolution, existing research posits that the typical progression from mono-centric cities to poly-centric metropolitan areas, then to urban clusters, subsequently to mega regions, and finally to urban networks, represents the general course of urban development (Friedman, 1995; Fang Chuanglin et al., 2005).

On the formation of cities, Marshall argued that the clustering of firms and populations was induced by externalities such as shared intermediate products, labor markets, and knowledge spillovers. Jacobs (1961) contended that any human settlement capable of successfully engaging in import substitution could evolve into a city. A city that perpetuated this process of substituting imports year after year underwent an explosive phase that sustained its economic dominance and continuously spawned new industries. Yang Xiaokai (1994) suggested that the key to city formation lay in specialized trade, with people aggregating in cities to reduce transaction costs for both production and living, leading to urban formations. Fujita et al. (2001) incorporated increasing returns and imperfect competition into urban economic analysis, utilizing these concepts to explain the emergence of cities and the urbanization process.

Regarding urban development, the New Urban Economics, initiated by Alonso (1964), Muth (1971), and Mills (1967), and further advanced by scholars such as Wheaton (1974), Brueckner (1983), and Fujita (1989), elucidates the transformational law of urban spatial structures and forms. Fujita and Ogawa's (1982) model of a closed multi-centered city depicts the process through which cities evolve from mono-centric to poly-centric configurations under varying transportation costs. Palivos and Wang (1996) introduced an endogenous optimal growth model for cities, deducing a path of economic equilibrium growth with constant population size, while highlighting that the equilibrium population size under decentralized decision-making was lower than the optimal level.

In examining the formation and evolution of urban systems, von Thunen's agricultural location theory, Weber's industrial location theory, Christaller's central place theory, and Losch's market location theory each contributes unique perspectives on the structuring and transformation of urban spatial systems. Zipf's (1949) observation confirmed that the population rank-size distribution in urban systems adhered to a Pareto distribution with an exponent of 1, known as Zipf's law, a finding theoretically substantiated by Gabaix (1999) and Benguigui and Blumenfeld-Lieberthal (2007). Ioannides (1994), González-Val et al. (2015), and Behrens et al. (2014) integrated central place theory into general equilibrium frameworks to study the city scale system. Arshad et al. (2018) contended that Zipf's law held when urban regions were accurately delineated and city systems were mature, indicating a nested relationship among multi-form urban entities.

Regarding urbanization and rural-urban relations, Lewis's (1954) urbanization model posits that under unlimited supply of rural surplus labor, urbanization undergoes a slow-fast-slow progression; the initially accentuating rural-urban dualism gradually transitions towards a unified economy in later stages. Jorgenson's (1967) dual economy theory underscores how the scale of agricultural surplus governs industrial expansion and labor migration, thereby shaping the scale and pace of urbanization. Harris and Todaro's (1970) expected income differential theory identifies disparities in rural-urban incomes, urban job prospects, and urban unemployment rates as pivotal drivers of rural-urban migration. Knox et al. (1995) asserted that urbanization was propelled by interacting social, economic, demographic, political, cultural, technological, and environmental transformations.

Overall, given the completion of urbanization in most developed Western economies, theories on urban development in the West have matured, comprehensively addressing single-city dynamics, urban systems, and the transition from rural-urban dualism. However, China's distinct and rapid urbanization trajectory since its reform and opening-up, coupled with its unique institutional transformations, presents characteristics not fully explained by existing theories rooted in Western urbanization experiences.

(IV) Research on the Development of Chinese Cities

Over the past four decades of reform and opening up, China has witnessed tremendous transformations in its cities, urban systems, and urbanization processes. Theoretical and empirical studies abound regarding the unique rise of Chinese cities.

Regarding the rapid growth of China's urban economy, Zhang Wuchang (2017) explained the inter-county competition through the concept of "contract expansion", suggesting that regions with contracted responsibilities became the main competitors. This intense competition led to the rational allocation of production factors such as land, thereby promoting rapid local and national economic growth. Zhang Weiying and Li Shuhe (1998) argued that the decentralized policy in the early 1980s led

to inter-regional competition, which in turn triggered the privatization of state-owned and collective enterprises, boosting the development of the private sector. Ke Shanzi (2009) found that the economic growth of provincial capitals and sub-provincial cities had a significant backwash effect on lower-level cities and counties, while the economic growth of lower-level cities and counties had a significant market area growth effect on the higher-level cities located in the market center. Cities and counties at the same level mutually reinforced each other in economy. Zhang Jun (2007) believed that under the “local government competition” system, governments at all levels and regions in China had become the largest “economic development corporations” in their respective levels and regions, competing to attract investment, emancipate their minds, innovate systems, and “develop the market economy", thus promoting local growth. Zhou Li’an (2017) suggested that competition among local governments may have multiple positive and negative consequences. Zhao Yanjing et al. (2014) argued that the nationalization of urban land and the collectivization of rural land had created conditions for the government to monopolize the primary land market. On this basis, the government financed infrastructure construction by transferring the right to use urban land, leading to the rapid rise of hundreds and thousands of cities. Liang Qi (2009) connected division of labor, agglomeration, and economic growth, explaining the impact of spatial agglomeration on economic growth. Liu Shijin et al. (2010) demonstrated that promoting the urbanization of rural migrant workers would drive China’s economy to achieve balanced growth at a higher level through channels such as narrowing the income gap between residents, increasing city size, and enhancing human capital accumulation. Ni Pengfei (2018) believed that institutional reform, non-agricultural agglomeration, global division of labor, and local competition had driven the high growth of Chinese cities. Deng Zhongliang and Zhang Keyun (2020) argued that the spatial differentiation of China’s urban economic growth originated from the matching mechanisms of factor structure and industrial correlation, city size and industrial structure, and market size and industry choice.

Regarding China's unique path of urbanization, Zhou Tianyong (2001) argued that the Todaro model did not align with the practices observed in China's dual structure transformation. Cai Fang and Du Yang (2003) highlighted that the patterns of city emergence and development during China's transition period diverged from both mature market economies and traditional planned economies, with market forces and resource redistribution both playing roles in urban development. Chen Bochong, Hao Shouyi, et al. (2004) developed a model of rural surplus labor urbanization decision-making under uncertainty, asserting that rapid urbanization was a result of joint government and market forces, and further market-oriented reforms and expanded openness would facilitate China's swift urbanization. Wang Guogang (2010) viewed urbanization as a pivotal force driving the transformation of China's economic development pattern. Gu Shengzu (2016) pointed out that uneven development between urbanization, industrialization, informatization, and agricultural modernization, unequal access to public services in cities, incomplete rights for migrant workers, and restrictions imposed by the household registration system had left a large number of rural migrants in a semi-urbanized state. Ni Pengfei et al. (2014) constructed a model of rural surplus labor transfer under open conditions, explaining China's peculiar urbanization path where urbanization lagged behind industrialization in the early stages of reform and opening-up (semi-urbanization), and surpassed industrialization in latter stages (full urbanization). Liu Ruiming and Shi Lei (2015) identified the "double dual structure" in China's economic transition as a significant cause for the lag in urbanization. Yu Huayi (2015) found

that rising urbanization rates led to larger local government scales. Lu Ming et al. (2018) observed that cities with better land rights protection in China's rapid urbanization had more efficient new city planning. Xie Zhenfa et al. (2019) emphasized the influence of tax revenue sharing on local governments' land allocation behavior. Lu Ming and Li Pengfei (2022) stressed the importance of coordinated development between urban and rural areas and among regions. Zhong Yuejun et al. (2024) proposed that China could advance structural transformation, promote economic growth, and enhance social welfare by adjusting the allocation of labor and land among cities.

Regarding the development of China's urban system, Fan Jianyong and Shao Ting (2011) found that excessively high housing prices exacerbated the flattening trend in China's urban hierarchy. Zhang Li et al. (2017) investigated the pull and hindering effects of housing prices on labor mobility in cities. Hu Jie et al. (2014) argued that many small cities and central towns lacked substantial industrial support and offered low levels of public services, rendering them unattractive. Wei Shouhua et al. (2020) suggested that China's urban size distribution was deviating from Zipf's Law, becoming increasingly irrational, with both large cities of high administrative ranks and small county-level cities experiencing rapid population growth, while medium-sized cities (prefecture-level cities) grew relatively slowly. Nevertheless, Liu Xuehua (2015), Lu Ming (2011) and Liang Qi et al. (2013) contended that China's urban system exhibited low concentration. Sun Sambai et al. (2014) demonstrated an inverted U-shaped relationship between city size and happiness. Chen Qiangyuan et al. (2016) discovered that the premium productivity of large Chinese cities resulted from agglomeration, selection, sorting, and competition effects. Wang Ruyu et al. (2019) identified a tiered structure of China's financial centers aligned with the urban hierarchy. Zhou Xiaobo and Ni Pengfei's (2018) study on the size distribution within and among urban clusters in China find the urban system trending towards convergence with Zipf's Law. Ni Pengfei (2019) argued that a multi-form nested urban system was the direction for China's future urbanization path, where cities of various forms had reasonable size ranges and all urban systems followed Zipf's Law, indicating a balanced and hierarchical urban structure.

Current research on China's urban development has meticulously examined, from diverse angles, the factors behind the rapid urban growth since the initiation of economic reform and opening-up, the features of China's distinctive urbanization pathway and its causal mechanisms, as well as the progression of its urban system's evolution. These studies, leveraging general theories of urbanization and urban development from the Western context, have illuminated that the particular institutional idiosyncrasies of China as a transitioning nation, its characteristics as a large country, and the intricate interplay among various agents and elements (including competition among local governments, population spatial mobility, and inter-city spatial spillover effects) are all vital factors influencing the development of Chinese cities, urbanization, and the urban system. Nevertheless, a cohesive theoretical framework that systematically explains the urban development in China since the onset of reform and opening-up remains to be constructed.

A review of the literature on economic development, China's economic development, urban development, and specifically the development of Chinese cities reveals that due to the unique nature of China's urbanization and urban development trajectory since the initiation of reform and opening-up, prevailing neoclassical frameworks for economic and urban development theories have notable limitations in explaining China's urban growth during this period. Existing studies on China's economic

and urban development tend to concentrate on selecting crucial dimensions of China's economic system, with their foundational theories largely grounded in the neoclassical paradigm of economic and urban development. While they offer profound insights into understanding the evolution of China's cities since the reforms, they have yet to coalesce into a unified logical framework, particularly one that integrates institutions, government roles, economic agents, their expectations, and preferences within the analysis. This paper endeavors to initiate from fundamental logic, employing novel analytical tools, to construct a more encompassing unified theoretical framework that incorporates institutional elements alongside various other factors, different economic agents, their expectations, preferences, and behaviors. The aim is to provide a comprehensive explanation for the miraculous rise of Chinese cities since the advent of reform and opening-up, thus bridging the gap in the literature by offering a holistic perspective that accounts for the complex interplay of institutions, government actions, and economic agents' rationalities within the distinct context of China's urban transformation.

III. The Hypothesis of Unified Development in Chinese Cities

Since reform and opening-up, the process of urban development in China has paralleled the nation's broader transformation from a traditional society into a modern one. Whether viewed through the lens of the inherent principles of traditional development economics or from the perspective of explaining economic growth in terms of scale expansion and structural change, theories that elucidate China's urban development over the past forty years rightfully constitute authentic theories of China's urban economic development. This paper endeavors to integrate the concept of unified development economics with the practical experiences of Chinese cities, terming this framework the hypothesis of unified development for Chinese cities. This approach aims to encapsulate the comprehensive and interconnected aspects of economic, social, and institutional changes that have collectively shaped China's urban landscape.

(I) The Framework of Unified Development Economics

Given the limitations of neoclassical economics in explaining economic development, this paper strives to establish a succinct analytical framework that endogenously integrates and accommodates the pivotal factors driving economic development, along with their reciprocal interactions. This framework aims to provide a unified explanation for micro-behaviors and macroeconomic shifts across diverse economies, hence it is termed the framework of unified development economics. Building upon this foundation, by incorporating the characteristics of Chinese urban development since the inception of reform and opening-up, we arrive at the hypothesis of unified development in Chinese cities. Within the framework of unified development economics, economic development is perceived as a multifaceted phenomenon encompassing the growth and enhancement in quality of population, material capital, technology, human capital, and institutions. It also includes changes in objectives and interactions among households, firms, and governments, as well as comprehensive shifts in industrial sectors, spatial distributions, and temporal dynamics. The core components[1] are summarized as follows:

[1] For a detailed discussion on Unified Development Economics, see: Ni Pengfei, Unified Development Economics — An Analysis of the Forces Driving Human Economic Development, published by Gezhi Publishing House, Shanghai Sanlian Bookstore Co.,Ltd, and Shanghai People's Publishing House (Modern Economics Series), (forthcoming).

(1) Analytical Tool. Cost-benefit analysis, exemplified by neoclassical economics, relies on precise measurement of costs and benefits and is primarily suited for analyzing resource allocation under assumptions of perfect rationality and complete information. However, it has clear limitations when examining complex interactions among economic agents under conditions of imperfect information and bounded rationality. Drawing inspiration from the theories and methodologies of physics and psychology regarding forces, this paper introduces and employs a new analytical tool — "force". In this context, the force driving economic development stems from the interaction of economic agents' desire preferences and anticipated returns, with assets (inclusive of both input factors and output products as assets) serving as points of action. It is composed of two elements: motivation and capability. Motivation is determined by the strength and structure of agents' preferences and expectations, while capability is determined by the scale and structure of their assets, with motivation and capability influencing each other to form a dynamic force. This force for economic development can be categorized in various ways: from the perspective of the reproduction process into productive (supply-coopetition), consumptive (demand-coopetition), exchange (supply-demand-coopetition), innovative-coopetition, and learning-coopetition forces; and from a spatial viewpoint into agglomerative, dispersive, attractive, and repulsive forces.

(2) Fundamental Assumptions. The theoretical framework of unified development economics rests on three basic premises: First, endogenous growth rooted in the innate imbalance of material distribution within and outside humans leads to ever-increasing demands. As incomes rise, current satisfaction breeds additional demands for more types and quantities of goods and services, driving economic agents to pursue maximized returns transcending time, space, and sectors. Second, knowledge violates the principle of conservation of mass-energy, meaning its production and conversion do not adhere to the law of conservation. As a product of human consciousness, knowledge does not dissipate upon use but possesses the potential for infinite growth. This attribute of knowledge dictates that as it is widely and repeatedly utilized, its average cost per unit of output decreases, manifesting in increasing marginal returns. Third, interactive economies of scale imply that the economic effect of any interaction between two or more agents exceeds the sum of their individual actions of the same scale. As the scope of interaction expands, agents experience increasing returns and enhanced capabilities. Furthermore, interactions across time and space generate spatial and temporal costs.

(3) The Fundamental Framework of "N533". A core distinction between unified development economics and traditional neoclassical economics lies in the formulation of the production function. Neoclassical economics, when defining the production function, solely considers the mapping relationship between inputs and outputs, overlooking the impact of economic agents and their behaviors. Consequently, its production function is essentially a black box, opaque to the intricacies of agent actions. Conversely, unified development economics underscores the role of economic agents' driving forces in the development process. It incorporates the considerations of agents and their behaviors into production, endogenizing agents' preferences and expectations. This approach effectively opens the black box of the neoclassical production function. The central tenet of unified development economics regarding economic development can be encapsulated by a triangular production function (depicted in Figure 3): Economic development constitutes a process where various factor assets are transformed into output assets as inputs. Simultaneously, different assets influence

agents' expectations and preferences, which, in turn, affect their driving forces and thereby govern their behaviors. These behaviors, then, have an impact on the transformation process from inputs to outputs. In essence, economic agents' preferences and expectations (their driving forces) are not only embedded within the production function but also play a decisive role in shaping it. This framework underscores a reciprocal relationship, where the very forces that are influenced by the production process also actively define its contours and dynamics.

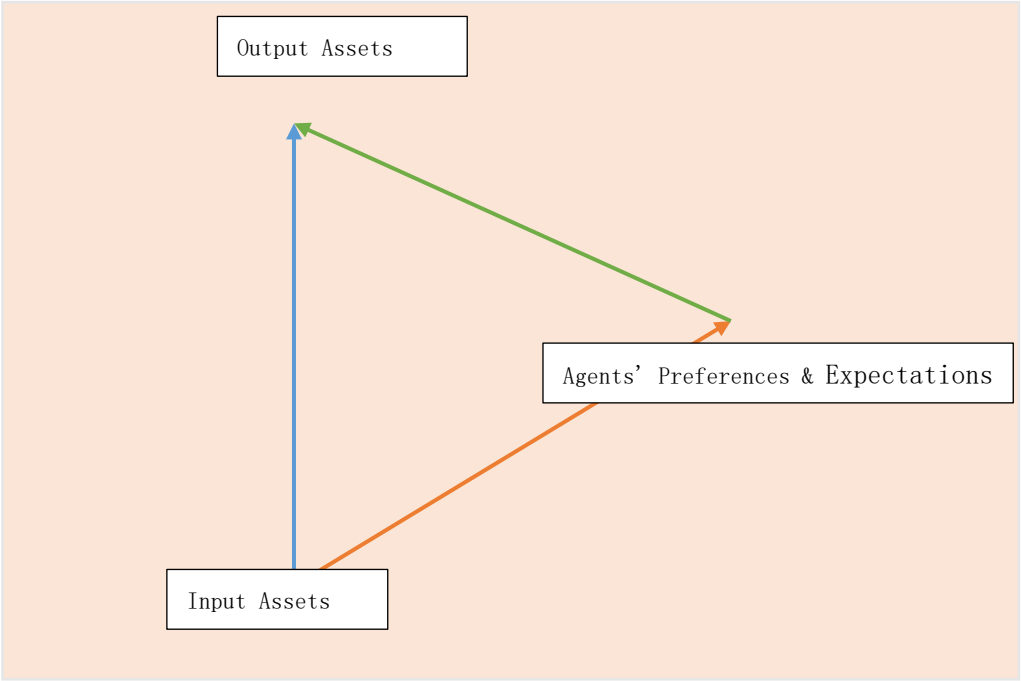

Figure 3: Triangular Production Function: The Core Framework of Unified Development Economics

Under the three fundamental assumptions of endogenous demand growth, non-conservation of knowledge in terms of mass-energy, and interactive economies of scale, this paper constructs the basic framework of unified development economics, referred to as "N533":

- N represents the various types of agents in the economic system, including suppliers or demanders of public or private assets, whether individuals or organizations. Here, N emphasizes the uncertainty in the variety of economic agents, each with their own preferences and expectations, in different development contexts. In a modern economic system, there are at least three types of agents involved: government, households, or enterprises.
- Five fundamental input elements for economic activities based on their nature: institutions, material capital, population, human capital, and technology. Moreover, both the inputs possessed by economic agents and their products are collectively referred to as the assets of these agents.
- Three tiers of behaviors encompass concrete behaviors, abstract behaviors, and interactive behaviors. We posit that economic behavior is a unification of these three tiers. Concrete

behavior involves the production, consumption, interaction, and service activities of tangible elements like material capital, population, human capital, technology, and institutions. Abstract behavior typically includes innovation, learning, and repetitive behaviors. Relational behavior refers to interactive behaviors between agents, such as competition and cooperation.

- Three distributions arise since any economic agent's assets and behaviors are distributed across certain sectors, spaces, and periods, forming three distributions: sectoral distribution of economic activities, spatial distribution, and temporal distribution. Based on this, interactions among N types of agents, 5 elements, 3 tiers of behaviors, and 3 distributions lead to endogenous changes within themselves, as well as growth in the quantity and variety of input factors and output products.

It is crucial to note that the unified development economics framework constructed herein does not entirely reject neoclassical economics. Instead, based on the new analytical tool of "forces", it establishes a fresh theoretical logic that not only verifies certain aspects of neoclassical economics but also traces back and revises the fundamental assumptions of the theoretical framework. By delving into the essential nature of knowledge in economic development and exploring new economic relationships, it achieves the endogenization and compatibility of major elements in economic development, enhancing our understanding of the dynamics of economic progress.

(II) Background of the Rise of Chinese Cities and Framework of Unified Urban Development

1. Background of the Rise of Chinese Cities

The characteristics of China's national conditions and their changes since the initiation of reform and opening-up can be outlined as follows:

First, China is a vast country with a large population and extensive diversity. With a colossal population and expansive territory, the nation boasts a wide range of natural conditions across regions, including variations in climate, hydrology, topography, and ecology, as well as significant disparities in social factors such as population density, income levels, human capital, and institutional differences. These features significantly determine the diversity and disparity in China's urbanization and urban development. The immense scale of the country fosters conditions for the initial concentration followed by dispersion of urban growth, dictating large populations and expansive spatial dimensions for Chinese cities, alongside higher population and economic densities. The vast discrepancies between regions predicate varying levels and structures of economic development among cities, fostering unique competitive and cooperative relationships among them, as well as a gradient difference and complementary division of labor in their economies.

Second, China is transitioning from a planned economy to a market economy. The market-oriented reforms initiated after 1978 aimed at establishing a socialist market economy, characterized by a dominant public ownership alongside various forms of ownership, the market playing a decisive role in resource allocation, the government optimizing its role in resource allocation, and a distribution system primarily based on work and remuneration alongside other forms. At the core of the reform was the shift from a planned to a market economy, a process during which the degree of marketization in China's commodity and factor markets, particularly in urban land markets and reforms to population migration and *hukou* (household registration) systems, significantly increased, facilitating

the rural-to-urban migration of population.

Third, China opened up to the world amidst a new wave of globalization. In line with the unified development economics framework established in this paper, the economic system is a dynamic system comprising multiple spatial locations and industries, with departments and regions interconnected. Since the advent of reform and opening-up, China has leveraged external factors and served global markets to impact urban development. On one hand, coinciding with the beginning of a new round of globalization, global industrial chains evolved from domestic segmentation to international division and eventually to global urban specialization, necessitating constant adjustments in the spatial organization of global production activities. On the other hand, transitioning from a closed to an open economy, China accelerated its pace of opening-up, adopting a strategy of "importing and exporting on a grand scale", and through participation in the global value chain, facilitated domestic urbanization.

Fourth, compared to developed nations, China is a late-developing giant. At the dawn of the reform era, China's economic development level was exceedingly low, with a per capita GNI of merely 190 US dollars in 1978, placing it in the World Bank's lowest income category. Then, being predominantly an agrarian nation, the country suffered from severe material scarcity. Despite abundant labor resources, labor productivity, particularly in agriculture, was exceedingly low. In industry, while preliminary industrialization had been achieved and a relatively complete industrial system established, technological levels were low, and capital accumulation through the agricultural-urban price scissors was sluggish. In terms of urbanization, at the beginning of the reforms in 1980, China's urbanization rate stood at only 19.4%, with just 193 cities and around 2,000 small towns. Thus, in its early reform period, China typified a late-developing giant nation.

Fifth, the world is undergoing the fourth technological revolution. Technological revolutions play a pivotal role in urban economic growth and transformation. Unlike the transformation paths of advanced nations from traditional to modern economies, China's urbanization coincides with the fourth technological revolution, integrating industrial, service, digital, and knowledge-based economies. The urban economic structure, whether in terms of factor composition, industrial structure, or demand structure, is rapidly evolving. Throughout the urbanization process post-reform, China, on one hand, has leveraged the advantages of backwardness offered by the fourth technological revolution to learn advanced technologies and practices from abroad at a lower cost, enabling technological catch-up. On the other hand, unburdened by historical constraints, China has been able to compete on par with developed countries, more effectively and swiftly adopting the latest fruits of the fourth revolution, such as informatization, digitization, and intelligentization, positioning itself on the forefront of this transformative wave.

2. Theoretical Framework for Unified Development in Chinese Cities

The unified development economics framework outlined above manifests differently across various temporal and spatial contexts. Specifically, applied to China's economic and urban development since the reform and opening-up, it is primarily influenced by broader national background characteristics. These characteristics transform the fundamental "N533" framework of unified development economics into a more specific "3633" framework when analyzing the development of Chinese cities, urban systems, and the urban-rural system since the reforms. This revised framework consists of three agents, six elements, three behaviors, and three couplings:

Three Agents: Government, enterprises, and households are the three principal agents. Since the reforms, households and enterprises have gradually emerged as independent economic entities. Acknowledging the significant role of the government in China's urban development, it is directly included as an economic agent in this framework, albeit with the proviso that government intervention in the economic field should not be excessive. Each agent possesses its own preferences, expectations, and assets. Hence, within the unified development economics framework, the N types of agents specifically refer to the government, enterprises, and households.

Six Elements: These include population, human capital, material capital, land capital, institutions, and technology as the six categories of assets. The combination of these six elements shapes the preferences and expectations of the three economic entities – government, enterprises, and households – and determines the formation and development of different economic agents. Notably, in contrast to the original five elements in unified development economics, given the pivotal role of land capital in China's urban development since the reforms, land capital is separated from material capital and treated as a distinct element.

Three Behaviors: In the context of Chinese urban development since the reforms, the concrete, abstract, and interactive behaviors in the unified development economics framework are manifested as production and consumption (concrete behavior), learning and innovation (abstract behavior), and competition and cooperation (interactive behavior) among economic agents.

Three Couplings: These refer to the departmental, spatial, and temporal distributions of different assets, economic agents, and their behaviors. Based on the initial spatial distribution of assets and a balance between interests and power dynamics, the assets and behaviors of any economic agent are distributed across specific sectors, spaces, and times, forming the economic sectoral structure, spatial structure, and temporal structure.

In summary, since the initiation of reform and opening-up, the interactions among the "3633" components in China's economic system have driven economic and urban development. Changes in institutional elements lead to the formation of the three main agents – the city government, enterprises, and households, each with their preferences and expectations. These agents utilize population, human capital, material capital, land capital, and institutional elements to engage in production and consumption, learning and innovation, and competition and cooperation. These activities, in turn, trigger changes in the departmental, spatial, and temporal distribution of economic activities. The interactions among economic agents, behaviors, and elements drive their endogenous changes, as well as the growth and structural evolution of outputs.

(III) Mechanisms for Agent Formation

From the perspective of unified development economics, the institutional change instigated by China's reform and opening-up in 1978 was also prompted by broader institutional competition on a global scale: specifically, in the post-war era, when market economies and planned economies were in contention, the drawbacks of planned economies became increasingly evident, propelling China to pioneer market-oriented economic institutional reforms. Since the inception of these reforms, China's institutional transformations have focused on two main aspects: domestically, implementing a series of market-oriented reforms to transition the economy from a planned to a socialist market economy; and externally, carrying out a series of liberalization measures to "attract foreign investment" and "go global", gradually participating in global industrial specialization and transforming the economic

system from closed to open. These critical reforms have enabled families, enterprises, and city governments to evolve into relatively autonomous decision-making entities with distinct rights and responsibilities and the capacity to allocate and create their assets.

1. Fiscal and Urban Land Reforms Enable City Governments as Independent Economic Entities with Capacity to Allocate Institutional and Land Capital

City governments act as primary agents in urban spatial governance. They provide public goods to resident households and private productive sectors, employ labor from households, and collect taxes from both households and the private sector. Fiscal and urban land reforms implemented since the reform and opening-up have transformed city governments into relatively independent stakeholders with interests. In terms of fiscal systems, pre-reform China operated under a unified revenue and expenditure system. In 1980, reforms moved towards decentralization from a "single-pot" to "individual-pot" financing system, and in 1988, various forms of fiscal contracting systems were introduced. The implementation of a "tax-sharing system" in 1994 marked a shift from "administrative decentralization" to "economic decentralization". As for land system reforms, following the clarification in 1982 that urban land was state-owned and rural land collectively owned, in 1986, the legal requisition of rural collective land by the government was established. In 1988, urban state-owned land use became payable, marking a partial marketization of land use rights. In 1993, it was determined that 95% of land grant proceeds would be under local authority, but the 1998 amendment to the Land Administration Law stipulated that "any unit or individual who needs to use land for construction must apply for the use of state-owned land according to law" and "the use rights of collectively owned land by peasants cannot be transferred or leased for non-agricultural construction", effectively preventing farmers from utilizing their land for industrialization and urbanization. This transitioned the government's role from a facilitator to a direct participant in urbanization. The 2003 reform introducing bidding, auctioning, and listing for the transfer of urban state-owned land use rights significantly enhanced the marketization of land use. These reforms in land and taxation have endowed city governments with the ability to allocate assets such as tax revenues and land capital, thereby boosting their incentives for urbanization.

2. Reforms in Rural Land and Population Systems Empower Households as Independent Economic Agents with Capacity for Human Capital Formation

Households consume both public and private goods while supplying labor, capital, or land to either the private or public sector. Reforms in rural land and population systems have facilitated the emergence of independent economic agents in both rural and urban households, leading to the formation of a competitive labor market. This has incentivized surplus rural labor, driven by their own best interests, to migrate from rural areas and the agricultural sector to non-agricultural sectors and regions with higher returns. Regarding rural land reforms, beginning in 1978 under government constraints, tacit approval, endorsement, and eventual promotion, farmers initiated the Household Contract Responsibility System through spontaneous exploration. By 1983, this system was comprehensively implemented across the vast countryside. By the end of that year, approximately 98% of farm households had adopted the household contract responsibility system, with contracted land for family operations accounting for around 97% of total cultivated land, thus separating ownership from usage rights. In 1994, the second round of land contracts began in most parts of China, and the 1998 amendment to the Land Administration Law extended the term of land contract operation rights to

thirty years. In 2003, laws were enacted to permit various forms of land transfer. From 2011 onwards, there was an initiative to confirm, register, and issue certificates for rural collective land ownership, household contract operation rights, essentially providing farmers with solid proof of their rights. Between 2014 and 2016, a "three rights separation" system for rural collective land ownership, household contract rights, and land management rights was piloted. In terms of population and labor market institutions, following the 1978 policy allowing educated youth to return to cities for a tripartite employment arrangement, the 1984 Central No.1 Document permitted rural residents to work and engage in businesses in small towns with their own food rations. In 1985, a labor contract-centered employment system was initiated, followed by the introduction of blue-stamped residence permits in 1992, encouragement of inter-provincial migration in 1993, and the adoption of uniform temporary residence and employment permit systems in 1995. By 1997, those settling in small towns were granted equal rights as local residents. Additionally, reforms in 1993 overhauled labor and personnel systems, achieving full contract-based employment by 1995, and from 1996 to 2003 surplus employees from state-owned enterprises were redeployed or reemployed, gradually refining the labor market. Consequently, reforms in rural land and population systems have facilitated the formation of households as economic entities, empowering them to manage and reproduce their human capital assets, thereby fueling the process of urbanization.

3. Corporate System Reforms and Opening-Up Make Enterprises Independent Economic Agents with the Capability to Develop Technological and Material Capital

Enterprises supply products to residents and the public sector, while procuring labor, capital, and land from households or the public sector. Since the reform and opening-up, the transformation of state-owned enterprises, the rise of township and village enterprises, and the influx of foreign firms have gradually established three categories of corporate entities in China: state-owned, private, and foreign-invested economies. Firstly, corporate reforms have promoted the formation of state-owned and private business entities. In the early 1980s, riding on the momentum of community and team enterprises, a wave of town-operated, village-operated, jointly-operated, and individually-operated township and village enterprises emerged. Through contract responsibility systems, they became economically autonomous units with "independent accounting, self-responsibility for profits and losses", "more work, more pay", and flexible staffing policies. Meanwhile, drawing lessons from the success of rural reforms, township and village enterprises, along with urban state-owned and collective enterprises, actively explored contractual and other decentralization reforms. Starting from the mid-1990s, through the restructuring of township and village enterprises and the encouragement of private enterprise development, market players with clear property rights and independent rights and obligations were formed, such as private and joint-stock enterprises. From 1993 to 2003, shareholding reforms and the establishment of modern corporate systems transformed urban state-owned and collective enterprises into responsible and rights-balanced joint-stock enterprises with operational autonomy. In parallel, from 1994 to 1997, state-owned specialized banks transitioned to commercial banks, and after 1997, large-scale state-owned commercial banks underwent shareholding reforms and established modern corporate systems. In 2003, the State-owned Assets Supervision and Administration Commission (SASAC) was officially established, advocating for modern property rights characterized by clarity of ownership, defined responsibilities, strict protection, and smooth transfer, leading to a gradual regularization of state-owned asset transfers and a tiered supervision system. In 2005, the "Old

36 Clauses" were introduced, allowing non-public capital to enter industries and fields not prohibited by laws and regulations. In 2010, the "New 36 Clauses" further liberalized the entry of private capital into all sectors of the national economy. Secondly, China's opening-up and integration into the global division of labor fostered the emergence and growth of foreign-invested enterprises. In the 1980s, through the establishment of four special economic zones, opening 14 coastal cities, developing the Pearl River Delta economic zone, and founding Hainan Province, China swiftly opened up coastal cities. Starting in 1990, the development of the Pudong New Area, along with the implementation of border, river, roadside, and inland opening-up strategies, rapidly resulted in a comprehensive opening-up of cities across the nation. In 2001, China's accession to the WTO fully integrated it into the global economy. Since 2013, free trade zones have been established in Shanghai and other cities. In 2018, the entire island of Hainan was designated as a free trade zone. The Belt and Road Initiative launched in 2015 initiated all-round, two-way openness. Driven by profit maximization, foreign-invested enterprises engaged in global division of labor, transferring some industrial segments to domestic cities, thereby accelerating urbanization. Therefore, the institutional reforms since the reform and opening-up have not only fostered the formation and growth of enterprises as independent economic entities but also empowered them with the capability to accumulate technological and material capital through innovation and investment.

(IV) Mechanisms of Interaction among Agents

In line with the fundamental framework of unified development economics, once economic agents endowed with distinct preferences and expectations are established, their behaviors start to exert mutual influence, giving rise to mechanisms of interaction among different agents. These interactions serve as the pivotal intermediate mechanisms influencing economic development. Specifically, since China's reform and opening-up, with city governments, households, and enterprises emerging as independent economic agents, these three entities have harnessed their respective assets to forge a unique, interdependent, and reciprocal mechanism of action, akin to a "hand-in-hand" partnership (depicted in Figure 4). This paper posits that this mechanism is the key explanatory factor behind the rapid ascendancy of Chinese cities since the initiation of reform and opening-up.

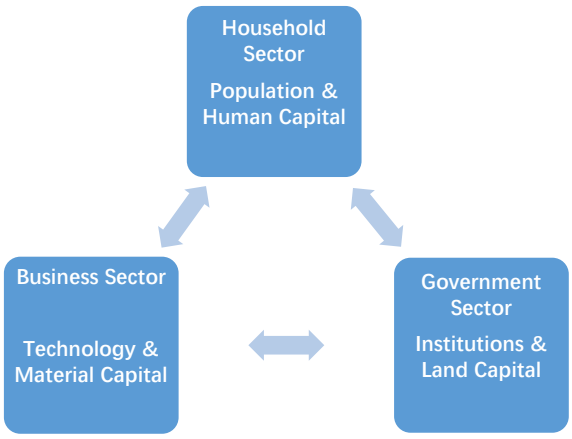

Figure 4: Illustration of Interaction Mechanisms among Agents

1. Interaction Mechanisms among Households, Enterprises, and City Governments

Rural households leverage their population and human capital assets by migrating to cities, where

they integrate with enterprises and city governments to engage in non-agricultural industries, fueling enterprise growth and urban ascension. The implementation of the Household Contract Responsibility System at the onset of the reforms increased agricultural output, resulting in a near-unlimited supply of surplus agricultural labor. Relaxation in population management systems facilitated the movement of rural households to urban centers, with labor forces gravitating toward non-agricultural industries based on prospects of maximizing returns. As the reforms deepened, rural and urban households expanded and upgraded their material and intellectual needs, driving the creation, imitation, and replication of material and knowledge products. By investing in human capital, they supplied labor and intellectual resources to enterprises or governments and, through savings, influenced the production and investment in these products.

2. Interaction Mechanisms among Enterprises, Households, and City Governments

Enterprises harness their technological and material capital assets to collaborate with households and city governments in urban settings for non-agricultural production activities, catering to both domestic and international markets. On one hand, enterprises cooperate with city governments to secure land, infrastructure, and public services. On the other hand, they combine with the rural surplus labor force to manufacture competitive products. Initially, the agricultural reforms unleashed a surge of surplus labor that powered the rise of township and village enterprises, while urban state-owned and collective enterprises transformed into relatively independent market entities. As openness expanded, China's comparative advantage in low labor costs attracted international industrial shifts, leading to a surge of foreign enterprises. Concurrently, market-oriented reforms facilitated the gradual formation and development of private enterprises. Leveraging international comparative advantages, Chinese enterprises primarily focused on manufacturing, learning, and competing, shaping urban development into a phase characterized by manufacturing, learning, and competition. However, incomplete institutional reforms and instances of unfair competition between state-owned enterprises or even the government and private firms hindered the creation, imitation, and replication of material and knowledge products.

3. Interaction Mechanisms Among City Governments, Households, and Enterprises

City governments leverage their institutional and land capital assets to collaborate with households and enterprises within urban environments, generating more products, services, and wealth. Through urban management, they attract businesses with low-priced industrial land and favorable policies, draw in migrating agricultural populations with affordable public services, and sell land at higher prices to urban dwellers, thereby boosting tax revenue and land value appreciation. This not only fosters industrial growth but also accelerates urban development and ascension. Furthermore, China's economic system dictates that city governments possess and control state assets such as land, with land use rights and revenues serving as crucial sources of fiscal income and tools for urban development financing, thereby endowing city governments with a unique role in urban progress. Acting as agents of urban spatial interests, Chinese city governments engage in land and urban management, participating in global or national competition and collaboration to attract labor, capital, technology, and enterprises. By levying taxes within their jurisdictions and providing public goods, they directly impact the roles of household and enterprise sectors in economic development and their competitive-cooperative relationships. Competition among city governments is a pivotal factor influencing China's urbanization.

In summary, market-oriented reforms since the inception of the reform and opening-up have engendered mutual needs and couplings among city governments, enterprises, and households, bringing together global capital, technology, and markets with an abundant supply of rural surplus labor, land, and business environments, thereby propelling the rapid development of Chinese cities.

(V) Agent Development Mechanisms

1. Evolution of Agent's Behavioral Dynamic

In line with the framework of unified development economics, the capabilities of economic agents are determined by the factor assets they can command. Since the initiation of reform and opening-up, the central government has actively promoted or tacitly endorsed local governments and the private sector to explore reforms and openness geared towards establishing a socialist market economic system. In this process, a multitude of factor assets essential to urban economic growth and transformation in China have emerged: an abundant supply of rural surplus labor, accumulating material and human capital, and massive inflows of foreign capital and technology. These factors have enabled households, various enterprises, and city governments to allocate and create corresponding factor assets, thus acquiring the capacity for economic development. Concurrently, as resource allocation shifted from being entirely planned to primarily market-driven, the government moved from direct administrative intervention in economy to predominantly indirect economic measures. This has allowed the factor assets invested by economic agents to be transformed into productive assets yielding returns, significantly enhancing the motivation of different economic entities to drive economic development.

As reform and opening-up deepen, the preferences and expectations of different economic agents as suppliers or demanders in product or factor markets are also undergoing evolution. Firstly, city governments, empowered with land ownership and revenue rights, have transitioned from pursuing economic growth at all costs to seeking economic balance, shifting focus from land exploitation to the provision of public goods as their asset portfolios evolve. Secondly, households, with rising per capita incomes and asset holdings, have shifted preferences from saving to home ownership, from a demographic production mindset (manifested in high population growth rates during the early stages of reform and opening-up) to investments in human capital, and from material consumption to knowledge-based consumption. Thirdly, in response to changes in their balance sheets, entrepreneurs have redirected their preferences and expectations from manufacturing to services and from tangible goods production to knowledge-intensive production.

2. Advancement of Agent Behaviors

During urbanization, the three agents — city governments, households, and enterprises — make distinctive choices regarding production and consumption, learning and innovation, as well as competition and cooperation, based on a calculation of benefits and costs. City governments engage in institutional innovations within their jurisdictions, provide public goods, and manage land and urban development to secure revenue and financing, while competing and collaborating with other cities for labor, talent, capital, and industries. Households migrate to urban non-agricultural sectors, supplying labor and human capital to enterprises and purchasing private goods from these enterprises. Reformed state-owned enterprises and emerging private and foreign-funded firms, operating in parallel competition, not only navigate their spatial locations through a cooperative and competitive dynamic with city governments but also compete and cooperate with domestic and international households for labor, selling their products in return.

Based on the comparative advantages derived from factors and markets, both domestically and internationally, the specific, abstract, and interactive behaviors of these agents are in constant evolution. Firstly, in terms of specific behaviors, this transformation manifests primarily in the changing patterns of production and consumption among different economic agents. Chinese enterprises have progressed through a sequence of production and service behaviors, starting with primary processing, advancing to light industry manufacturing, then heavy chemical manufacturing, transitioning into services, and ultimately specializing in knowledge-intensive services. Driven by government policies and other influential factors, Chinese households have adopted a "quality over quantity" approach to population growth. In terms of household consumption and investment, alongside continuous upgrades in material and intellectual consumption, there has been a dynamic shift in the mix of investments in education, savings, and housing. Meanwhile, Chinese city governments have been actively engaged in improving the business environment, providing public goods, and managing land resources. Secondly, in the realm of abstract behaviors, the shift is reflected in the evolving patterns of learning and innovation among these agents. The early and middle stages of reform and opening-up were characterized by imitation and learning, which later gave way to an increase in incremental innovation and original innovation as the economy matured. Consequently, the stock of China's material products, human capital, and technology assets surged, accelerating economic development. Thirdly, in relational behaviors, the transformation is evident in the changing dynamics of competition and collaboration among these agents. Initially, competition was primarily among domestic cities, with international cooperation playing a supplementary role. Over time, this shifted to a scenario where domestic cooperation took a secondary position to international competition. This dual strategy facilitated the inflow of foreign material and knowledge elements and the export of a myriad of products to overseas markets, and, domestically, fueled the competitive spirit among governments, enterprises, and households, spurring growth in material capital, knowledge, and demographic transitions.

The progression of these specific, abstract, and interactive behaviors among city governments, households, and enterprises has not only rapidly produced substantial material outputs but also fostered the creation of extensive knowledge products, such as technologies and human capital. It has concurrently catalyzed a swift demographic transformation, marked by population growth and increased life expectancy. Collectively, these advancements have shaped China's cities, urban systems, and urbanization processes to experience the rapid "S"-shaped growth, accompanied by swift rural-urban transitions. Of course, this rapid development has also entailed economic, social, and environmental changes, along with imbalances in growth and transformation within and between industries and societal strata.

3. Development of Agent Assets

Within the theoretical framework of unified development economics, the factor assets possessed by economic agents and the product assets generated from the reproduction of these factor assets (for example, material capital functioning as a factor asset in production, but becoming a product asset when reproduced) are in continuous development. Since the inception of reform and opening-up, changes in institutional factors and the interactive influences among different assets have collectively driven the evolution of the population, human capital, material capital, land capital, and technology (as factors and products) assets held by various agents. First, the population has shifted from relative abundance to relative scarcity. At the dawn of the reforms, China boasted an almost unlimited supply of

rural surplus labor. However, policies such as family planning, technological advancements, and changes in material capital (income) have led to a long-term low and rapidly declining population growth rate. The subsequent relative labor shortage has slowed economic growth and necessitated a pivot towards a higher-quality, more knowledge-driven economy. Second, the quality of human capital has seen a rapid uplift. The introduction of technology, corporate investment in human capital, large-scale public investment in basic and higher education by the government, substantial household investments in education, and the skill accumulation of a massive workforce through "learning by doing" have collectively expedited the enhancement of China's human capital. Third, material capital has witnessed a swift expansion. Accumulation of private sector material capital primarily stems from the pre-reform agricultural price scissors, resident savings, and foreign investment. In contrast, in the public sector, unlike in many other countries where city development is financed through taxes and infrastructure revenue, land finance and land-based financing have become crucial mechanisms for capital accumulation in Chinese cities. Fourth, the significance of land capital to urban development has steadily risen. Urban land in China is state-owned but controlled by local governments, which convert some rural collective land into urban state-owned construction land through requisition. They engage in urban management centered on land and other public elements, with competition among cities catalyzing rapid growth in public goods and other factors. Fifth, technological progress has been rapid. In the early stages of reform, technology spillovers from foreign investment and "learning by doing" drove technological advancements. However, as human capital and material capital have continuously grown, indigenous innovation has accelerated the pace of technological progress.

IV. Conclusions on the Unified Development of Chinese Cities

Both theoretically and practically, the formation and evolution of China's economic agents and their behaviors are manifested spatially through the development of (individual) typical cities, urban systems, and the rural-urban system. As a late-developing giant nation, the temporal and spatial actions of the three key economic agents — city governments, enterprises, and households — since the advent of reform and opening-up have led to a phased and distinctive evolutionary pattern in the development of typical cities, urban systems, and the rural-urban system.

(I) Development of Typical Cities: Rapid Growth Coupled with Swift Transformation

China's gradual institutional reforms since the initiation of reform and opening-up have sequentially propelled the development of (individual) typical cities, driven successively by rural households, foreign-funded enterprises, city governments, and urban households. This progression is characterized by a phased development from small towns to small and medium-sized cities, then to larger cities, and ultimately to city clusters and metropolitan areas.

1. Phase One: Rapid Growth Fueled by Rural Household Population Migration and the Rise of Small Towns

In the early years of reform and opening-up, reforms in rural land and population systems unleashed the potential of rural families. The redirection of agricultural surplus labor, a component of the population assets held by these households, into non-agricultural industries sparked high-speed economic growth and the development of small towns during the initial stages of reform. At the outset of industrialization and urbanization, the migration of rural surplus labor served as the primary engine

for economic development, enabling labor-intensive industries to initiate expansion and transformation. Starting from 1980, reforms in rural land and population systems facilitated the emergence of agricultural surpluses and surplus labor, which expanded demand for non-agricultural goods and provided labor for non-agricultural production. As rural surplus labor shifted to local township and village enterprises, the distribution of economic activities shifted, with these enterprises leveraging government support, surplus labor, and initially accumulated capital to establish businesses in small towns, focusing on light textile manufacturing and other labor-intensive sectors. Given the advantages of small-town enterprises in attracting and utilizing labor, the spatial distribution of economic activities also changed, manifesting in the rise of small towns across the country. In 1978, there were only 2,173 designated towns, mainly county seat towns and mining towns, which surged to 11,873 by 1989, marking a 4.5-fold increase. The number of township and village enterprises rose from 1.52 million in 1978 to 18.69 million in 1989, a growth of approximately 11.3 times.

2. Phase Two: High Growth Driven by Foreign Capital and the Expansion of Small and Medium-sized Cities

As China's opening-up deepened, foreign enterprises, acting as independent economic agents, increasingly influenced urban development through their investments in material capital, technology, and other elements. From 1990 onwards, building upon previous domestic capital accumulation, the inflow of foreign capital became a pivotal factor driving China's rapid economic growth. Domestic enterprises' economic preferences and behaviors also evolved, as they favored engaging in processing and manufacturing segments due to the significant profits gained from participating in global industrial chains led by foreign enterprises. This period saw a gradual shift in the industrial structure from labor-intensive to capital-intensive. With economic activities concentrating in special economic zones, high-tech development zones, and various customs-supervised areas, urbanization lagged behind industrialization. City governments intensified competition to attract foreign investment through the development of economic development zones, fostering the growth of numerous single-centered small and medium-sized cities.

3. Phase Three: Accelerated Growth Driven by City Government Land Management and the Rise of Large Cities

City governments in China, as substantial owners of land and relatively autonomous economic agents, wield the power to influence urban development through their manipulation of land capital, a capability further incentivized by the fiscal decentralization reforms. Following the second phase of industrialization and urbanization, Chinese cities had accumulated a certain level of material capital, technology, and human capital. However, instead of transitioning into a low-growth phase dominated by knowledge-intensive industries as per usual development patterns, China's path diverged. This deviation occurred partly because the earlier lag in urbanization behind industrialization created conditions for population urbanization in this phase, and partly because city governments, faced with a significant urban development opportunity, were motivated to sustain rapid growth and pursue greater gains. Thus, from 2000 onward, city governments exhibited a strong preference for utilizing land finance and land-based financing to manage and develop cities, alongside favoring state-owned enterprises in the development of heavy chemical manufacturing industries. This shift in economic activity spatially manifested in the proliferation of new urban districts and satellite cities, contributing to the formation and expansion of polycentric large cities.

4. Phase Four: High-Speed Growth Led by Urban Households' Advanced Human Capital and the Emergence of Metropolitan Areas and City Clusters

In this phase, the high-speed growth of Chinese cities is increasingly led by human capital elements, particularly advanced human capital, within urban households. Starting from 2010, with the onset of the Lewis Turning Point and the exhaustion of the migration of rural surplus labor, labor shortages began to drive up costs, leading to the migration of capital and low-end industries. At this juncture, advanced human capital within urban households emerged as a key driver of moderate economic growth. In the interplay among city governments, enterprises, and urban households, the variety of knowledge products produced in cities surged. The departmental distribution of economic activities evolved from a heavy chemical manufacturing-dominated structure to one focusing on material services and knowledge-based services. Spatially, the cityscape became more intricate, transitioning from large cities to interconnected metropolitan areas and city clusters.

The rapid growth and transformation of typical Chinese cities since the early days of reform and opening-up have also generated substantial local government debt and severe real estate bubbles, phenomena rooted in the phased nature of land and fiscal reforms. The 1994 fiscal decentralization reform left local governments with more responsibilities than financial resources and initially prohibited them from issuing municipal bonds (a restriction lifted for provincial governments and directly administered municipalities in 2014). To bridge the fiscal gap caused by infrastructure development during urbanization, city governments resorted to financing through local financing vehicles represented by urban investment companies, causing a rapid expansion of local government debt. Simultaneously, local governments heavily relied on land sales to compensate for fiscal shortfalls, solidifying the feature of land finance during urbanization. With city governments monopolizing the supply of construction land, they had a strong incentive to push up land prices, thereby fueling the formation of a real estate bubble.

(II) Urban System Development: Rapid Transition from Homogeneous Competition to Specialized Collaboration

In the early days of reform and opening-up, under the influence of planned economy and the stage of urbanization, China's urban system was excessively fragmented with underdeveloped major cities. Since the reforms, interactions among different economic agents in the formation and development of the urban system have experienced a transformation, evolving from homogeneous competition in the early reform period to specialized cooperation later on. This evolution has characterized the development of the urban system in the following phases:

1. First Phase: A Domestic Vertical Urban System Centered on Small Towns

At the dawn of reform and opening-up, the evolution of the urban system was primarily governed by the coupling of small towns with medium and large cities, dominated by the flow of labor (population) elements. Early opening-up efforts were concentrated in smaller coastal areas in eastern China. Amidst scarce resources and factors, inter-city competition for growth engines was inevitable. Small towns primarily relied on labor as their growth engine, supported by land and capital, producing agricultural and light industrial goods for sale to larger cities. Medium and large cities, on the other hand, depended on accumulated capital as their primary growth driver, complemented by labor and land, selling more sophisticated products and services to small towns and rural areas. Thus, the exchange of goods and services between cities fostered a reciprocal coupling among small towns and

medium and large cities in terms of labor, material capital, technology, and land capital. Dominated by labor as the primary coupling factor, with material capital and land as supplementary elements, most of the population gravitated toward local small towns, leading to their faster development compared to larger cities. As the hierarchical structure of medium and large cities remained unchanged, the urban system still exhibited clear hierarchical characteristics, forming a domestic vertical urban system centered on small towns.

2. Second Phase: An International Dual-Layered Urban System Centered on Coastal Cities

In the second phase, the coupling between coastal and inland cities, driven by the entry of foreign capital, led to further evolution of the urban system. As reforms progressed, the advantage of township and village enterprises driven by labor competition waned, and foreign capital emerged as a crucial growth engine. Leveraging their location advantage, coastal cities first harnessed foreign capital as their growth driver, while small inland towns continued to rely primarily on labor. Meanwhile, some inland medium and large cities, disadvantaged in attracting foreign capital, began to adopt land management as their main growth engine. In this process, labor and land resources from inland areas migrated to the east, supporting coastal cities in leveraging foreign capital for development. Conversely, the influx of labor income and fiscal transfer to the interior supported inland city governments in land management and the development of labor-intensive industries in small towns. Hence, a mutually dependent coupling formed between the growth engines of inland medium and large cities and those of coastal cities centered on foreign capital. In this phase, foreign capital dominated the coupling among cities as the primary driver of growth, with labor and land as supplements, enabling rapid development of coastal cities and giving rise to an international dual-layered urban system centered on export-oriented coastal cities.

3. Third Phase: An International and Domestic Dual-Layered Urban System Centered on Coastal Cities

In this phase, the evolution of the urban system was dominated by the coupling of competitive and cooperative behaviors among city governments based on land capital. First, after 2000, eastern coastal cities developed a dual growth engine led by foreign capital and land, complemented by highly-skilled talent. Secondly, the land-dominated growth engine became more prominent in inland medium and large cities, supported by foreign capital and labor, while in inland small towns, labor remained the primary driver, with land and foreign capital playing auxiliary roles. China's growth engine shifted towards land. To promote growth, city governments entered a phase of competition centered on land, from offering land incentives to adopting land finance strategies, alongside competing for talent, capital, and labor. This approach sustained high economic growth in cities, expanded municipal revenues, accelerated infrastructure construction, and transformed urban landscapes. However, it also engendered issues of high municipal debt, exorbitant property prices, and excessive infrastructure development, with high living costs and housing prices compelling some cities to pivot towards high-end elements like talent as their growth drivers. Spatially, the economic activities witnessed significant development in inland medium and large cities, leveraging their unique advantages in land competition, thus shaping an international and domestic dual-layered urban system with coastal cities at its core.

4. Fourth Phase: A Multi-Level Urban System Centered on Globalized Metropolitan Areas and City Clusters

During this phase, competition among cities over high-end human capital elements continued to

propel the evolution of the urban system. From 2010 onwards, land as a growth engine gradually diminished in importance, as land financing and fiscal reliance on land exhausted future growth potential, and high land prices and housing costs hindered the effectiveness of other growth drivers. Consequently, competition among cities during this phase primarily revolved around high-end human capital. Major cities with a competitive edge in high-end human capital were the first to transition to a growth model led by this factor, while medium-sized cities, although still primarily relying on land, integrated high-end human capital as a complementary growth driver. Inland small towns, lacking competitiveness in high-end human capital, persisted with labor as their primary driver, supported by foreign capital and land. Inter-city relations evolved from homogeneous competition to differentiated collaboration, with large cities enhancing their global competitiveness. As cities of varying sizes specialized, the urban system shifted from a hierarchical structure to a networked one. Overall, the spatial distribution of economic activities during this phase was marked by the rapid development of major cities, leading to a transformation of the urban system from being dominated by single-center large cities to multi-centered metropolitan areas and even nested systems centered on city clusters, reflecting a more diverse urban landscape.

Overall, since the beginning of reform and opening-up, interactions among cities in China's urban system have shifted from excessive competition in the early stages to excessive differentiation later on, a pattern shaped by the incremental nature of China's reform process. In the early years, the limited scope of reforms left cities with few options for different growth engines, resulting in homogenous competition. However, as reforms deepened, cities were able to choose growth strategies based on their comparative advantages and developmental stages, with some cities benefiting from first-mover advantages under incremental reforms, thereby exacerbating disparities among cities.

(III) Urban-Rural System Development: Rapid Urbanization with Phased Progress

At the outset of reform and opening-up, China was a mammoth nation with a pronounced dual urban-rural economic structure, characterized by a near-infinite supply of rural surplus labor. Over time, as the potential for rural labor migration dwindled, this dual structure gradually improved. Throughout different periods of reform and opening-up, variations in the dominant assets driving urbanization led to distinct phases in the development of China's rural-urban system. Nationally, before reaching a 50% urbanization rate, the focus was on the concentration of rural factors in cities, shifting the rural-urban relationship from a rural-dominated monolithic structure to a segregated dual system. Beyond 50% urbanization, there was a bidirectional flow of factors between rural and urban areas, with the relationship transitioning from dualistic to a city-dominated integration.

1. Phase One: Local Industry-Driven Urbanization with Minimal Rural-Urban Income Disparity

The rapid development of township and village enterprises, the main economic agents in the early days of reform and opening-up, made urbanization mainly driven by local assets. Prior to reforms, China's scarcity of material capital, limited knowledge capital, and rigid planned economy stifled agricultural productivity, resulting in minimal agricultural surpluses and non-agricultural goods, alongside a small and slow-growing urban population, space, and economy. Starting in the 1980s, early reforms unleashed a relative abundance of agricultural surpluses and unlocked the vast labor force in rural areas; concurrently, opening-up exposed China to larger international markets and advanced technologies, spurring local industrial development exemplified by township and village enterprises. In

this phase, as market-oriented reforms were in their infancy and labor and land were not yet allocated by market mechanisms, there was limited separation of population from land in rural areas and insufficient integration of population with land in urban areas, consequently keeping rural-urban disparities relatively minor.

2. Second Phase: Export-Oriented Industries Drive Urbanization, Widening Rural-Urban Gap

Since the 1990s, interactions in cities between the input factors brought by foreign firms — such as material capital and technology — and the population elements transferred through the movement of rural surplus labor, led to a phase of urbanization dominated by export-oriented industries. The combination of export-oriented industries with an almost limitless supply of rural surplus labor fueled industrialization and urbanization at a pace surpassing that of a closed economy. Simultaneously, the cost advantage provided by the unlimited supply of rural surplus labor in this phase hastened the pace of industrialization beyond urbanization, creating a mismatch in the spatial and sectoral distribution of economic activities, i.e., a discrepancy between industrial diversification away from agriculture and urbanization. City governments, lacking both motivation and capacity to provide adequate public services for the large-scale non-agricultural population migrating to cities, resulted in a rapid increase in the floating population urbanization rate, while the registered urban population growth remained sluggish. During this phase, as rural populations continually moved to non-agricultural sectors in cities, rural industries experienced cyclical shrinkage and a lag in transformation, exacerbating the rural-urban divide and widening the gap between cities.

3. Third Phase: Land and Infrastructure-Led Urbanization, Further Widening the Rural-Urban Divide

Triggered by reforms in urban land and fiscal systems, which energized local governments to stimulate economic development within their jurisdictions, the third phase of urbanization was dominated by land infrastructure development. Since 2000, city governments have promoted rapid urbanization through land management and infrastructure projects. In the early stages of this phase, as the output of non-agricultural sectors expanded rapidly, drawing rural household populations to non-agricultural sectors, city governments accelerated the construction of new urban districts to attract industries and populations. Urban areas rapidly expanded, non-agricultural employment surged, but this rapid growth came at the cost of ecological damage and other negative impacts on the urban-rural environment. Concurrently, with national policies aimed at protecting arable land and restricting urban sprawl taking effect, urbanization driven by land and infrastructure projects led to escalating land and housing costs, which in turn slowed down the pace of industrial development and hastened the shift towards service sectors, limiting population settlement and job opportunities in cities. Consequently, the rural-urban divide was further exacerbated during this phase.

4. Fourth Phase: Population-dominated Urbanization, Narrowing the Rural-Urban Gap

After 2010, with the urbanization rate surpassing 50%, China gradually entered a phase of urbanization dominated by population factors, where people increasingly prefer to work and reside in the same city. During the initial stages of urbanization (when the urbanization rate was below 50%), households tended to separate spatially, with young and able-bodied workers migrating to cities while the elderly, children, and women stayed behind in rural areas for care and support. Additionally, limited investment in human capital by both public and private sectors in rural areas constrained the growth of

rural human capital. As the urbanization rate exceeded 50%, rising wages enabled the urban resident population to afford living in cities, and city governments, motivated to attract residents and talents, became capable and willing to provide public services. This led to a shift in household preferences towards residing in the cities where they worked, accelerating the urbanization of registered population, and decreasing the proportion of non-registered permanent residents in cities, gradually realizing complete urbanization. During this phase, the spatial and sectoral distribution of economic activities became more harmonious, with population flow transforming from a unidirectional rural-to-urban pattern observed in the early stages of urbanization to a bidirectional exchange between urban and rural areas. Industrialization and urbanization synchronized, and rural human capital levels rose swiftly, enabling non-agricultural industries to contribute back to agriculture. Consequently, the rural-urban divide progressively narrowed.

V. Theoretical Innovation and Outlook

(I) Theoretical Innovations

The theoretical innovations of this paper primarily encompass two aspects:

First, it independently constructs the fundamental framework of unified development economics under the label "N533". The originality of this theoretical framework compared to existing theories of economic development lies in treating the agents, behaviors, factors influencing economic development, and their interactions as endogenous variables, forming an endogenously evolving dynamic system. This framework underscores the driving force of economic agents in economic development, offering a comprehensive tool for explaining and forecasting economic growth and structural transformation through power and interest analyses. Moreover, this theoretical framework is broadly applicable and generalizable, encompassing a wide range of economic phenomena, including long-term and short-term growth, transitions, expansion, and involution, as well as economic dynamics across various levels from global to national, regional, and urban. It not only focuses on the accumulation of material wealth but also delves into the intricate patterns of knowledge accumulation and population growth. Thus, unified development economics can provide deeper insights into economic growth and transformation, elucidating the underlying logic behind various economic phenomena, representing a significant advancement over current theories of economic development.

Second, building upon the innovation-based unified development economics "N533" framework and against the backdrop of China's urban ascendance, this paper constructs the "3633" theory framework for China's unified urban development, providing an explanation for the miracle of China's urban development since the initiation of reform and opening-up. The core innovative logic of the "3633" theory framework for China's unified urban development is as follows: Since the start of the reforms, competition in the external environment has stimulated changes in institutional elements, giving rise to three major economic agents – households, enterprises, and city governments – each with relatively independent preferences, expectations, and assets, and their respective motivations. These agents leverage six key elements – population, human capital, ,material capital, land capital, institutions, and technology – to form a competitive and collaborative dynamic force, engaging in triple behaviors of production and consumption, learning and innovation, and competition and cooperation. This process leads to the coupling and recycling of industries between urban and rural areas, within

cities, and among cities.

Compared to existing research grounded in the framework of neoclassical economics, the innovation of the theoretical framework constructed in this paper lies in: Firstly, employing the novel analytical tool of "forces" to clarify the formation, dynamic changes in motivation, and interaction mechanisms of the three economic agents – government, enterprises, and households – thereby revealing the rotation process and dynamic evolution of different forces in China's urban development since the reforms. Secondly, incorporating institutional elements into the analytical framework emphasizes the endogenous changes in agents' preferences and expectations, clearly explicating the interactions and dynamic evolution between institutional elements and other factors, thus enhancing the adaptability of the theoretical framework.

(II) Research Outlook

The theory framework for China's unified urban development proposed in this study is currently at the hypothesis stage, leaving ample room for expansion:

Theoretical Expansion and Deepening: A complete and reliable scientific theory should be a rigorous logical system composed of concepts, judgments, and hypotheses. While the logical system of the current hypotheses is relatively clear, the overall expression remains preliminary and crude, necessitating further refinement and depth.

Establishment of Rigorous Mathematical Models: A complete and reliable scientific theory requires a foundation built on rigorous mathematical models and deductive reasoning. The future plan includes constructing a heterogeneous agent endogenous growth model with spatial dimensions, internalizing key variables such as institutions, preferences, and expectations for the government, enterprise, and resident sectors, integrating "force" analysis throughout.

Empirical Verification: Currently, the theory is based on descriptive characteristics and empirical arguments. To become a complete and reliable scientific theory, it requires rigorous empirical testing from multiple angles and perspectives using advanced methodologies and detailed data.

Practical Application: In the future, the theory framework for China's unified urban development needs to be widely applied at various spatial levels (national, regional, and urban), across different industrial sectors, and in various aspects of factor-product and agent behaviors to explain past empirical observations and predict future developments. This will enrich our understanding and enhance predictive capabilities for the complex dynamics of urbanization and economic transformation in China.

References:

[1] Cai Fang. "Demographic Transition, Demographic Dividend, and Lewis Turning Point in China", *Economic Research Journal*, No. 04, 2010.

[2] Cai Fang. "Understanding the Past, Present, and Future of China's Economic Development: Based on a Unified Framework of Growth Theories", *Economic Research Journal*, No. 11, 2013.

[3] Cai Fang. "How Can Chinese Economy Achieve the Transition toward Total Factor Productivity Growth?" *Social Sciences in China*, No. 01, 2013.

[4] Cai Fang and Du Yang. "Urban Expansion in Transitional China: Hierarchy of City, Financing Capacity and Migration Policy", *Economic Research Journal*, No. 06, 2003.

[5] Chen Bochong, Hao Shouyi and Yang Xingxian. "The Dynamic Mechanism of the Rapid Development of Urbanization in

China", *Acta Geographica Sinica*, No. 06, 2004.

[6] Chen Qiangyuan, Qian Xuefeng, and Li Jingzi. "The Firm's Productivity Premium Puzzle of China's Big Cities", *Economic Research Journal*, No. 03, 2016.

[7] Deng Zhongliang and Zhang Keyun. "Why Does Spatial Differentiation in China's Economic Growth Exist? — An Explanation from the Perspective of Spatial Economics", *Economic Research Journal*, No. 04, 2020.

[8] Fan Jianyong and Shao Ting. "Housing Price, Location of Diversified Products and Urban System", *Economic Research Journal*, No. 02, 2011.

[9] Fang Chuanglin, Song Jitao, Zhang Qiang and Li Ming. "The Formation, Development and Spatial Heterogeneity Patterns for the Structures System of Urban Agglomerations in China", *Acta Geographica Sinica*, No. 05, 2005.

[10] Gu Shengzu. "Current Urbanization Should Realize Six Major Transformations", *Henan Social Sciences*, No. 09, 2016.

[11] Hu Jie, Li Qingyun and Wei Yanqiu. "Research on the Problem and Evolution Dynamic of New Style Urbanization in China: A Survey", *Urban Development Studies*, No. 01, 2014.

[12] Jiang Xiaojuan. "Big Powers' Growth Model in Double Engines: The Internal and External Demands in China's Economic Growth", *Management World*, No. 06, 2010.

[13] Jin Bingchuan, Wang Jin, and Xu Chenggang. "Private Sector as the Driving Force of Economic Development: Firm-level Evidence from Major Transition Economies", *China Journal of Economics*, No. 03, 2014.

[14] Ke Shanzi. "Spread-backwash and Market Area Effects of Urban and Regional Growth in China", *Economic Research Journal*, No. 08, 2009.

[15] Coase, Wang Ning. *Transforming China: The Road to Market Economy in China* [M]. Beijing: CITIC Press Group, 2013.

[16] Lan Xiaohuan. *The Chinese Government and Economic Development* [M]. Shanghai: Shanghai People's Publishing House, 2021.

[17] Li Yang. *Creating a Reliable Funding Mechanism for Economic Development* [M]//Why Is the Chinese Economy Working Well? Beijing: Economic Press China, 2015.

[18] Li Yang and Yin Jianfeng. *High Saving Rate, High Investment Rate and Chinese Economic Growth During Labor Transition*, *Economic Research Journal*, No. 02, 2005.

[19] Liang Qi. *Division of Labor, Agglomeration, and Growth* [M]. Beijing: Commercial Press, 2009.

[20] Liang Qi, Chen Qiangyuan and Wang Ruyu. "Household Registration Reform, Labor Mobility and Optimization of the Urban Hierarchy", *Social Sciences in China*, No. 12, 2013.

[21] Lin Yifu. "New Structural Economics and China's Road to Development", *China Market*, No. 50, 2012.

[22] Lin Yifu, Cai Fang and Li Zhou. *The China Miracle: Development Strategy and Economic Reform* [M]. Shanghai: Gezhi Publishing House, 1999.

[23] Liu He. *The Growth Miracle without an End* [M]// Fifty Chinese Economists Talk about Thirty Years, Shanghai: Gezhi Publishing House, 2008.

[24] Liu Ruiming and Shi Lei. "The Ownership Basement of China's Under Urbanization: Theory and Evidence", *Economic Research Journal*, No. 04, 2015.

[25] Liu Shijin, Chen Changsheng, Xu Zhaoyuan and Cui Xiaoyong. "The Impact of Migrant Workers' Urban Integration on Boosting Domestic Demand and Economic Growth", *Economic Research Journal*, No. 06, 2010.

[26] Liu Shijin, Wang Zihao, Cai Juntao, and Qian Shengcun. "2035: The Potential, Structure and Path of China's Economic Growth", *Management World*, No. 07, 2018.

[27] Liu Shouying, Wang Zhifeng, Zhang Weifan and Xiong Xuefeng. "The Exhaustion of the 'Land-Fueled Development' Model: An Empirical Study Based on Threshold Regression Models", *Management World*, No. 06, 2020.

[28] Liu Xuehua., Zhang Xueliang and Li Lu. "The Size Distribution of Cities in China: Stylized Facts and Experience

Demonstration", *Journal of Finance and Economics*, No. 11, 2015.

[29] Lu Ming, Chang Chen, and Wang Danli. "Institution and City: How Traditional Land Property Rights Protection Enhances the Efficiency of New Town Construction", *Economic Research Journal*, No. 06, 2018.

[30] Lu Ming and Li Pengfei. "Coordinated Urban-rural and Regional Development", *Economic Research Journal*, No. 08, 2022.

[31] Lu Ming, Xiang Kuanhu and Chen Zhao. "China's Urbanization and Urban System Restructuring: A Literature-based Review", *The Journal of World Economy*, No. 06, 2011.

[32] Karl Marx, Engels. *The Complete Works of Marx and Engels, Volume 13* [M]. Beijing: People's Publishing House, 1962.

[33] Ni Pengfei. "Three Factors Driving the Rise of China's Cities" [N]. *Guangming Daily*, 2018.

[34] Ni Pengfei. "A Multi-layered Nested City System Is the New Direction of China's Urbanization Path" [N]. *Economic Daily*, 2020.

[35] Ni Pengfei, Yan Yingen, and Zhang Anquan. "The Enigma of Under-Urbanization: An Explanation Based on International Trade", *Social Science in China*, No. 07, 2014.

[36] Shi Zhengfu. *Extraordinary Growth: China's Economy 1979-2049* [M]. Shanghai: Shanghai People's Publishing House, 2013.

[37] Sun Sanbai, Huang Wei, Hong Junjie, and Wang Chunhua. "City Size, Happiness and Spatial Optimization of Migration", *Economic Research Journal*, No. 01, 2014.

[38] Tao Ran, Su Fubing, Lu Xi and Zhu Yuming. "Can Economic Growth Bring about Upgrade?" *Management World*, No. 12, 2010.

[39] Wang Guogang. "Urbanization: Core of China Economic Development Mode Transition", *Economic Research Journal*, No. 12, 2010.

[40] Wang Ruyu, Wang Zhigao, Liang Qi, and Chen Jianlong. "Financial Agglomeration and Urban Hierarchy", *Economic Research Journal*, No. 11, 2019.

[41] Wei Sen. "Rethinking about the Reasons for China's High Economic Growth", *Exploration and Free Views*, No. 01, 2015.

[42] Wei Shouhua, Yang Yang and Chen Longlong. "City Administrative Hierarchy, Differential Growth of City Size and Evolution of Urban System in China", *China Industrial Economics*, No. 07, 2020.

[43] Wu Jinglian. "To Transform China's Model of Economy Development and Pursue Market-oriented Reform", *Journal of Beijing Normal University (Social Science Edition)*, No. 05, 2012.

[44] Xie Zhenfa, Zhu Kairong, and Li Pei. "Tax Sharing, Fiscal Incentives and Urban Land Allocation", *Economic Research Journal*, No. 10, 2019.

[45] Yang Xiaokai. *Specialization and Economic Organization: An Analytical Framework for Neoclassical Microeconomics* [M]. North-Holland Publishing Company, 1994.

[46] Yang Xiaokai, Huang Youguang, and Zhang Yugang. *Specialization and Economic Organization* [M]. Economic Science Press, 1999.

[47] Yao Yang. *Disinterested Government: An Explanation of Success in Transitional Chinese Economy*, *Economic Review*, No. 03, 2009.

[48] Yu Huayi. "Urbanization, Megapolization and Local Government Size in China", *Economic Research Journal*, No. 10, 2015.

[49] Yuan, Zhigang. *China's Economic Growth: Institutions, Structure, and Welfare* [M]. Shanghai: Fudan University Press, 2006.

[50] Zhang Jun. "Capital Formation, Industrialization and Economic Growth: Understanding China's Economic Reform", *Economic Research Journal*, No. 06, 2002.

[51] Zhang Jun. "Decentralization and Growth: China Context", *China Economic Quarterly*, No. 01, 2008.

[52] Zhang Jun. "The Tax Sharing System Is Right", *Business Weekly*, No. 17, 2013.

[53] Zhang Jun and Gao Yuan. "Official Tenure, Relocation Exchanges and Economic Growth: Evidence from Provincial Experiences", *Economic Research Journal*, No. 11, 2007.

[54] Zhang Li, He Jing, and Ma Runhong. "How Housing Price Affects Labor Migration?" *Economic Research Journal*, No. 08, 2017.

[55] Zhang Weiying. "Entrepreneurship and the Growth of Chinese Entrepreneurs", *Economic Affairs*, No. 02, 2010.

[56] Zhang Weiying and Li Shuhe. "Inter-regional Competition and Privatization of State-owned Enterprises in China", *Economic Research Journal*, No. 12, 1998.

[57] Zhang Wuchang. *China's Economic System* [M]. Beijing: CITIC Press, 2017.

[58] Zhao Yanjing. "Land Finance: History, Logic, and Choices", *Urban Development Studies*, No. 01, 2014.

[59] Zhong Yuejun, Xi Xican and Lu Ming: "Inter-city Factor Reallocation: Structural Transformation and Growth in a Spatial General Equilibrium Analysis", *Economic Research Journal*, No. 02, 2024.

[60] Zhou Li'an. "Governing China's Local Officials: An Analysis of Promotion Tournament Model", *Economic Research Journal*, No. 07, 2007.

[61] Zhou Li'an. *Chinese Government in Transition: Official Incentives and Governance* [M]. Shanghai: Gezhi Publishing House, 2008.

[62] Zhou Qiren. "Institutional Change Drives Economic Growth", *New Economy Weekly*, No. 05, 2010.

[63] Zhou Tianyong. "The Defect of Todaro Model and Its Adverse Policy Implication", *Economic Research Journal*, No. 03, 2001.

[64] Zhou Xiaobo and Ni Pengfei. "The Size Distribution Structure of Urban Agglomeration System and Its Effect on Economic Growth", *Social Science Research*, No. 02, 2018.

[65] Acemoglu, D. Introduction to Modern Economic Growth [M]. Princeton university press, 2008.

[66] Alonso, W. Location and Land Use: Toward a General Theory of Land Rent [M]. Harvard university press, 1964.

[67] Arshad, S., S. Hu and B. N. Ashraf, "Zipf's Law and City Size Distribution: A Survey of the Literature and Future Research Agenda", *Physica A: Statistical mechanics and its applications*, 2018, 492, pp.75-92.

[68] Baumol, W. J. The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism [M]. The Free-Market Innovation Machine. Princeton university press. 2002.

[69] Becker, G. and K. Murphy, "The Division of Labor, Coordination Costs, and Knowledge", *Quarterly Journal of Economics*, 1992, 107 (4), pp.1137-1160.

[70] Becker, G. S., K. M. Murphy and R. Tamura, "Human Capital, Fertility, and Economic Growth", *Journal of Political Economy*, 1990, 98 (5, Part 2), pp. S12-S37.

[71] Behrens, K., G. Duranton and F. Robert-Nicoud, "Productive Cities: Sorting, Selection, and Agglomeration", *Journal of Political Economy*, 2014, 122(3), pp. 507-553.

[72] Benguigui, L. and E. Blumenfeld-Lieberthal, "A Dynamic Model for City Size Distribution Beyond Zipf's Law", *Physica A: Statistical Mechanics and its Applications*, 2007, 384 (2), pp. 613-627.

[73] Brueckner, J. K., "Property Value Maximization and Public Sector Efficiency", *Journal of Urban Economics*, 1983, 14 (1), pp.1-15.

[74] Chenery, H., "Patterns of Industrial Growth", *American Economic Review*, 1960, 50, pp. 624.

[75] Chenery, H. B. "The Structuralist Approach to Development Policy", *American Economic Review*, 1975, 65 (2), pp. 310-316.

[76] Domar, E. D., "Capital Expansion, Rate of Growth, and Employment", *Econometrica*, 1946, 14 (2), pp.137.

[77] Friedman, J., "Global System, Globalization and the Parameters of Modernity", *Global modernities*, 1995, pp. 69-90.

[78] Fujita, M., "Urban Economic Theory", *Cambridge Books*, 1989,

[79] Fujita, M., P. R. Krugman and A. Venables. *The Spatial Economy: Cities, Regions, and International Trade* [M]. MIT press, 2001.

[80] Fujita, M. and H. Ogawa, "Multiple Equilibria and Structural Transition of Non-Monocentric Urban Configurations", *Regional Science and Urban Economics*, 1982, 12 (2), pp.161-196.

[81] Gabaix, X., "Zipf's Law for Cities: An Explanation", *Quarterly Journal of Economics*, 1999, pp. 739-767.

[82] Galor, O. and D. N. Weil, "From Malthusian Stagnation to Modern Growth", *American Economic Review*, 1999, 89 (2), pp.150-154.

[83] Galor, O. and D. N. Weil, "Population, Technology, and Growth: From Malthusian Stagnation to the Demographic Transition and Beyond", *American Economic Review*, 2000, pp.806-828.

[84] González-Val, R., A. Ramos, F. Sanz-Gracia and M. Vera-Cabello, "Size Distributions for All Cities: Which One Is Best?", *Papers in Regional Science*, 2015, 94 (1), pp. 177-197.

[85] Harris, J. R. and M. P. Todaro, "Migration, Unemployment & Development: A Two-Sector Analysis", *American Economic Review*, 1970, 60 (1), pp.126-142.

[86] Harrod, R. F., "An Essay in Dynamic Theory", *Economic Journal*, 1939, 49 (193), pp.14.

[87] Hirschman, A. *The Strategy of Economic Development* [M]. New Haven: Yale University Press, 1958.

[88] Ioannides, Y. M., "Product Differentiation and Economic Growth in a System of Cities", *Regional Science and Urban Economics*, 1994, 24 (4), pp.461-484.

[89] Jacobs J., *The Death and Life of Great American Cities* [M]. New York: Vintage, 1961.

[90] Jones, C. I. and P. M. Romer, "The New Kaldor Facts: Ideas, Institutions, Population, and Human Capital", *American Economic Journal: Macroeconomics*, 2010, 2 (1), pp. 224-245.

[91] Jorgenson, D. W., "Surplus Agricultural Labour and the Development of a Dual Economy", *Oxford economic papers*, 1967, 19 (3), pp. 288-312.

[92] Kaldor, N. Capital Accumulation and Economic Growth; proceedings of the theory of capital: proceedings of a conference held by the International Economic Association, F, 1961 [C]. Springer.

[93] Knox, P. L., P. J. Taylor and P. J. Taylor. World Cities in a World-System [M]. Cambridge university press, 1995.

[94] Kuznets, S. Economic Growth of Nations: Total Output and Production Structure [M]. Harvard University Press, 1971.

[95] Lewis, A., "Economic Development with Unlimited Supplies of Labour", *Manchester School of Economic and Social Studies*, 1954, 22, pp.139-191.

[96] Lucas Jr, R. E., "On the Mechanics of Economic Development", *Journal of Monetary Economics*, 1988, 22(1), pp.3-42.

[97] Mills, E. S., "An Aggregative Model of Resource Allocation in a Metropolitan Area", *American Economic Review*, 1967, 57 (2), pp.197-210.

[98] Muth, R. F., "The Derived Demand for Urban Residential Land", *Urban studies*, 1971, 8 (3), pp.243-254.

[99] North, D. C. and R. P. Thomas. The Rise of the Western World: A New Economic History [M]. Cambridge University Press, 1973.

[100] Palivos, T. and P. Wang, "Spatial Agglomeration and Endogenous Growth", *Regional Science and Urban Economics*, 1996, 26 (6), pp. 645-669.

[101] Ramos, A. and F. Sanz-Gracia, "Us City Size Distribution Revisited: Theory and Empirical Evidence", 2015,

[102] Romer, P., "Increasing Returns and Long-Run Growth", *Journal of Political Economy*, 1986, 94, pp.1,002-1,037.

[103] Romer, P., "Endogenous Technological Change", *Journal of Political Economy*, 1990,

[104] Rostow, W., "The Stages of Economic Growth", *Economic History Review*, 1959, 12 (1), pp.1-16.

[105] Schultz, T. W., "Capital Formation by Education", *Journal of Political Economy*, 1960, pp.571-583.

[106] Solow, R. M., "A Contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, 1956, 70 (1), pp. 65-94.

[107] Song, Z., K. Storesletten and F. Zilibotti, "Growing Like China", *American Economic Review*, 2011, 101, pp. 196-233.

[108] Wheaton, W. C., "A Comparative Static Analysis of Urban Spatial Structure", *Journal of Economic Theory*, 1974, 9 (2), pp. 223-237.

[109] Youno, A. A., "Increasing Returns and Economic Progress", *Economic Journal*, 1928, 38 (152), pp. 527-542.

[110] Zhang, P. Agriculture and Industrialization: The Adjustments That Take Place as an Agricultural Country Is Industrialized [M]. Cambridge, Harvard U, 1949.

[111] Zipf, G. K. *Human Behaviour and the Principle of Least Effort* [M]. Reading: Addison-Wesley, 1949.