Research on the Establishment of Supply Mechanism of New-type Urbanization Construction System

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Abstract. The supply mechanism in new-type urbanization construction system is regarded as a system from systematic and scientific perspective. First, the connotation model of new-type urbanization supply mechanism is established by the point of view of system science, and then the present situation, problems and reasons of new-type urbanization supply are systematically analyzed from five subsystems: manpower supply, land planning, capital accumulation, industry development and technology promotion. And next, the system dynamics tools are utilized to analyze the causal relationship among elements of subsystems. Finally, the countermeasures and suggestions for the construction mechanism of improving manpower supply, managing land planning, broadening finance channels, boosting industrial development and accelerating innovation drive are proposed on basis of the problems in subsystems and the relationship among elements.

1. Supply Status and Connotation Structure Model of New-type Urbanization Construction System

Since the 16th Congress proposed to gradually raise the urbanization level, the urbanization has been steadily developed and the number of migrant workers has increased. The statistical data published by State Statistical Bureau (Table 1) indicates that the population base living in cities and towns is large and shows an upward trend every year. The number of urban resident population in 2017 accounted for 58.52% of total population of country and was 1.17% higher than that in 2016 according to the data released by State Statistical Bureau. In this context, the demands for manpower, land, capital, industry and technology also increase. The new-type urbanization is the main force to expand domestic demand in China. However, the traditional urbanization pursues "quantity" over quality, and excessive assistance of urbanization causes the imbalance of supply structure. On November 10, 2015, the 11th Conference of Central Financial Leadership Group proposed to carry out the structural reform of supply side. Therefore, it is an urgent task for decision makers that how to adjust the supply structure of urbanization. It need utilize systematic and scientific theories to combine the guiding ideology of structural reform for supply side, study the supply connotation system of new-type urbanization construction system from a systematic view, and study the countermeasures for management and control from the perspective of mechanism.
### Table 1. Urbanization Rate in China during 2005-2017

| Year | Total population at the end of the year (ten thousand people) | The urban population at the end of the year (ten Thousand people) | The proportion of urban residents (%) |
|------|---------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------|
| 2002 | 128453                                                        | 50212                                                           | 39.09%                               |
| 2003 | 129227                                                        | 52376                                                           | 40.53%                               |
| 2004 | 129988                                                        | 54283                                                           | 41.76%                               |
| 2005 | 130567                                                        | 56212                                                           | 42.99%                               |
| 2006 | 131448                                                        | 58288                                                           | 44.34%                               |
| 2007 | 132129                                                        | 60633                                                           | 45.89%                               |
| 2008 | 132802                                                        | 62403                                                           | 46.99%                               |
| 2009 | 133450                                                        | 64512                                                           | 48.34%                               |
| 2010 | 134091                                                        | 66978                                                           | 49.95%                               |
| 2011 | 134735                                                        | 69079                                                           | 51.27%                               |
| 2012 | 135404                                                        | 71182                                                           | 52.57%                               |
| 2013 | 136072                                                        | 73111                                                           | 53.70%                               |
| 2014 | 136782                                                        | 74916                                                           | 54.77%                               |
| 2015 | 137462                                                        | 77116                                                           | 56.10%                               |
| 2016 | 138271                                                        | 79298                                                           | 57.35%                               |
| 2017 | 139008                                                        | 81347                                                           | 58.52%                               |

It has accumulated a lot of experiences both at home and abroad in respect of researches on supply and management mechanism. In the overseas analysis on supply elements, Adam Smith believed that the significant factors in economic development were supply-side factors such as labor and capital, etc [1]. In terms of the study on supply, Simon Fildes (1986) of "School of Mild Supply" analyzed that the level of fiscal deficit would have a certain impact on capital formation and inflation based on the "Feldstein curve"[2]. On the solution to supply issue, in 1980s, the president of the United States, Reagan proposed policies based on Theory of Supply School, such as tax abatement, government expenditure reduction and monetary deflation, etc [1]. On the analysis of supply elements in China, Liu Zhibiao (2016) believed that the supply elements were composed of four aspects: labor force, technological innovation, and capital and system innovation [3]. In regard to research on supply issue, Gu Shengzu, et al. (2012) pointed out that urbanization excessively relied on the driving of "land dividend" and "demographic dividend"[4]. On the solution to supply issue, Fang Huizhen et al. (2016) put forward that carrying forward the supply side reform of "human, land and money" was the key to promoting new-type urbanization[5]. These achievements exert a certain reference function in the research on management and control of new-type urbanization supply, but they are relatively fragmented. This paper hopes to provide ideological methods and construction mechanism for the clarity of supply structure and construction of management mechanism of new-type urbanization construction system through the study.

This paper holds that the supply mechanism of new-type urbanization construction system includes manpower supply, land planning, capital accumulation, industry development and technology promotion, and then puts forward its connotation system as shown in Fig. 1.
2. Supply Difficulties and Systematic Analysis of New-type Urbanization Construction System

2.1. Imbalance of Manpower Supply

The first imbalance of manpower is among the quality. In the subsystem of human resources, every migrant worker is the subject. On one hand, the professional quality of subjects is not balanced. There has always been a problem of uncoordinated education resources of urban and rural areas in China. This problem directly affects the educational level of rural labor force. In 2015, 84.4% of rural labor force in China was only in junior high school level or below that. Although this proportion has decreased in recent years, people with low educational background still account for majority. This phenomenon affects the supply quantity of talents in innovative industries, which is one of the reasons for transformation of traditional industries. On the other hand, the ideological quality of subjects is not balanced, including their breadth of thinking, personal accomplishment and self-promotion consciousness, etc. The migrant workers lack personal promotion consciousness. The resistance of personal promotion mainly comes from themselves and the omission of enterprise; and lack of personal promotion consciousness and training funds, low learning efficiency are the internal factors that affect the improvement of ideological quality. Some enterprises or units of subjects do not take an active attitude towards employee training, the lack of training input and rigid constraint on employers are the external factors that affect the improvement of ideological quality. Some enterprises or units of subjects do not take an active attitude towards employee training, the lack of training input and rigid constraint on employers are the external factors that affect the improvement of ideological quality. The second imbalance is about the distribution of manpower structure. This is mainly reflected in the surplus of some professions and the uneven distribution of human resources in different regions. On the one hand, talents scramble for popular specialties, resulting in oversupply of some professional talents. On the other hand, more than 80% of our country’s talents are gathered in economically-developed southeast coastal areas, and the high-end talents are short in Midwest, which further affects the balance of China’s economic development. The third factor is the large difference in level of management personnel. The main
difference lies in the management quality and specific management behavior. Firstly, the management personnel's cultural foundation, moral cultivation and ideology directly affect their management quality. Secondly, the inertial mode of government in economic development is to invest in general production factors such as labor, land and resources, etc., however, the proportion of talents and technology elements is low, and the attention to talent training is insufficient.

2.2. Unreasonable Use and Planning of Land

First of all, there are large numbers of people but little space to spare in China, land planning is greatly restricted by national conditions. According to statistics, by the end of 2016, total population reached 1.38271 billion in China. In context of rising population and limited land area, the per capita agricultural acreage and the per capita land area are 30% of world's per capita level. Secondly, the land use situation is not satisfactory, and the agricultural land is threatened by encroachment. On the one hand, it is the individual embezzlement. As for residential land, many migrant workers will choose to return to their hometown and build houses due to high housing prices in urban area. Since the housing regulations in some districts are not systematically formulated, there will be some acts of lacking planning and private land-occupation, etc. When building houses, which is not conducive to development of urbanization. On the other hand, it is the behavior of regional transformation. As for industrial land, some areas blindly plan and transform the cultivated land into industrial land and implement "running city" in order to speed up the process of urbanization. Relying on land consumption to promote urbanization can only produce short-term effects, which is not conducive to long-term development. GDP per km² of land in the US, i.e. the land economy density, is about 4-5 times that of our country. The economic growth utility brought by surface expansion of urban land is not large. Finally, the low level of land regulation leads to unreasonable supply and distribution. At present, the real estate industry in China presents a contradiction: overstock of real estate and shortage of supply in some areas. On the one hand, the surplus of real estate is serious in process of urbanization. The commercial housing sales area of China in 2015 was 1.28 billion m²; the area for sale was 720 million m², and out-inventory time of commercial housing was 6.3 years. The use rate of residence in second or third-class cities is not high [6]. On the other hand, the migrant workers' demands for urban housing are not satisfied. After the urban development, a large number of employment opportunities provided has attracted many people to enter the cities, the population density constantly increases and the demand for housing rises, which is one of the important reasons for the rising of house prices.

2.3. Non-standard Capital Accumulation

Firstly, the financial situation of local governments is constrained by GDP, financial self-sufficiency rate and financial independence, etc. The supply capacity of funds is limited and the capital gap cannot be avoided. At present, the real estate in some areas demands too much capital, which far exceeding the ability of local governments in supply investment. Secondly, the economic situation of residents is not ideal. Although the per capita disposable income of Chinese residents in 2016 was 23,821 Yuan with actual growth of 6.3%, the Gink coefficient was 0.465 and still in stage > 0.4, the income gap was large. Thirdly, the financing channels and capabilities are unstable; and it is difficult for long-term financial modes to sustain. On the one hand, the nation has carried out the financing by aid of land leasing and land mortgage, etc. for quite some time, which provides a certain impetus for the development of urbanization. However, this way will increase the difficulty of land management and raise the population living cost of urbanization. On the other hand, the traditional economic growth model of country depends on the "three carriages" of investment, consumption and export on demand side, especially over-depends on investment. However, the increase in investment will cause the rise in capital supply price and cost, which will further lead to a decrease in the expected revenue on investment. Moreover, the increase in investment will increase the output of commodities and affect their market prices. Therefore, excessive investment can only improve short-term efficiency but cannot guarantee the stability of capital supply capability. At the same time, the risk of attracting capital and financing aggravates, and the social leverage ratio is high. By the end of 2015, China's aggregate liability was
168.48 trillion Yuan, and the whole social leverage ratio was 249%. Although it is still in the controllable range, the rising trend in recent years still needs attention. The high leverage ratio is not conducive to the development of enterprises. Too much debt burden will cause much of company's cash flow to be used for repaying capital with interest, lack of funds to maintain the production, or even cause insolvent and business failures.

2.4. Industrial Development Lacks Overall Planning Guidance
First of all, it is unreasonable industry positioning. On the one side, some cities with superior geographical conditions only pursue the industry with rapid economic benefits such as the development of real estate but neglect the local geographical environment and population demands, which makes the key development industries not suitable for local environment and cannot play the local advantages, and eventually causes the "empty city" and "deserted city" phenomenon. On the other side, the leading industries are laced. In China, the lack of leading industries is one of the important reasons for the irrational industrial structure in less-developed areas. Economic development is relatively slow due to lack of the boosting role of leading industries. The driving force of leading industries on regional economy can be directly reflected in Guangzhou Tianhe Technology Park, Shanghai Pudong New Area and Wuhan East-Lake High-Tech Zone. Moreover, the unbalance in industrial structure is also impact a lot. At first, the weakness in agricultural foundation, low level of industry and lagging development of the service industry has always been the problem of Chinese industry structure. At present, the nation has made great efforts to develop the tertiary industry. According to statistics, the proportion of added value of China's tertiary industry in 2016 was 51.6%, while the proportion of added value of the primary industry and secondary industry was only 8.6% and 39.8%, and the real industry went downhill. Although the development of tertiary industry can effectively promote the development of state economy, this development needs to be established on a diversified and rationalized industrial transfer mode. Our country has a large population and the productivity issue still exists. Blind pursuit of increase in proportion of tertiary industry and the neglect of supply of high-quality productivity will result in serious imbalance of industrial structure and bring greater social contradictions. In addition, China's modes of long-term economic growth are focused on expanding industrial scale and increasing the total industrial output. This mode brings about the increase in proportion of industries with high energy-consumption, high emission and low added value, while industries with high added value and high technology content occupy a relatively low proportion. Enterprises with low technological content have large demands for labor, need high investment and have great impact on the ecological environment. Finally, the industries in the backward areas have relatively low intensification degree, which also increases the affordability of ecological environment and reduces the utilization rate of resources.

2.5. Slow Promotion Process of Technology
For one thing, the efficiency of technology introduction is relatively low. The main way to promote technological progress in China is technology introduction. Over reliance on technology introduction has led technological progress to be trapped in a high input & low-level cycle of "backward, introduction, re-backward and reintroduction"[7]. At the same time, there is a large gap in the ratio of expenditure on technology introduction funds and digestion & absorption with developed countries; and the proportion of technology introduction and technology application is not coordinated. For another thing, the prescription of technological innovation is not great. There is a gap between the input and conversion rate of technology with the economic development demands of urbanization. According to the data of "National Statistical Bulletin on Investment in Science & Technology in 2016", the input intensity of R & D funds in China in 2016 was 2.11%, while this ratio in major innovative countries such as the US, Germany and Japan reached 2.74%, 2.84% and 3.59% in 2014. In contrast, our country's technology input is not sufficient. Moreover, the transformation of technological innovation input into production technology progress requires a longer cycle. And it is difficult for the technology based on market R & D to keep pace with market changes in transformation, which will eventually weaken the expected utility of technology. Lastly, the management of scientific and technological evaluation is not favorable. The
construction and implementation of scientific and technological system in China need to be improved; the innovation incentive system and technological evaluation system are lacked, there are also some problems such as the unfulfilled scientific and technical structural reform of "Law for Promotion of Scientific and Technological Achievements".

3. Causality Analysis on Elements in Supply Mechanism of New-type Urbanization Construction System

On basis of defining the elements in supply mechanism model of new-type urbanization construction system, this paper analyzes the relationship among elements in this model and represent the relationship among variables by causality chain; of which "+" and "-" in the causality chain represent positive and negative feedback respectively, i.e. "+" indicates that the rise of one variable will drive the other variable to rise synchronously, "-" indicates that the rise of one variable will lead to the decline of another variable.

This paper conducts a causality analysis on the five subsystems of supply mechanism of new-type urbanization construction system: manpower supply, land planning, capital accumulation, industrial development and technology promotion.

Its causality diagram is as follows:

Figure 2. Causality diagram of manpower supply

Figure 3. Causality diagram of land planning

Figure 4. Causality diagram of capital accumulation

Figure 5. Causality diagram of industrial development
Figure 6. Causality diagram of technology promotion

Through the analysis on relationship among elements, it can be intuitively learned from the relationship diagram that elements affecting the quality of supply are numerous and have certain hierarchy. The elements that have a direct impact on the quality of supply are five essential factors: the quality of manpower supply, the rationality of land planning, the efficiency of capital accumulation, the development of industry and the promotion of technology. At the same time, there are also elements such as the level of management personnel, the balance of human resources, the encroachment area of agricultural land, the surplus extent of real estate, the financing channels, the real economy, the reasonable degree of industrial positioning, the degree of industrial orientation, the digestibility degree of technology introduction and technical input. The analysis on causality among elements can provide macro structural design and micro countermeasures for establishing supply mechanism.

4. Supply Mechanism and Management Countermeasures of New-type Urbanization Construction System

4.1. Tend to Purposiveness and Self-organization, Improve the Manpower Supply

The core purpose of new-type urbanization construction system is to promote the development based on "human". Human development is related to both external supply and self-organization. Firstly, start with the improvement of manpower quality, increase investment in population training, encourage innovation and set up a variety of training courses as much as possible on premise of understanding the demands. Then, increase the intensity of publicity and training in forms of social media, field visits and publicizing meetings so as to encourage migrant workers to participate in training and improve the quality of urban resident population. Migrant workers also need to enhance their independent promotion awareness. They can understand the improvement means of self-skills and identify the demands for work through the network or enterprise, etc. and then accept suitable training for their own development so as to improve work skills and enable themselves to gain more job selections. After that, strengthen guidance education for enterprises and encourage enterprises to increase staff training through rewards and punishments mechanism. Secondly, adjust the distribution of manpower structure. On the one hand, it is necessary to accelerate the pace of coordination with colleges and universities in view of current situation of talent supply contradiction, and strengthen the guidance of professional choice in combination with talent demands of market in order to cultivate practical and high-tech talents. On the other hand, as for the uneven distribution of talents, it can adopt positive guidance strategies of providing
subsidized housing and strengthening the training in regions lack of talents so as to shorten the talent distribution gap between different regions. Thirdly, standardize the selection mechanism of management personnel, improve their entry threshold and take optimal selection as goal to ensure their management quality. At the same time, establish supervision mechanism, strictly regulate management behavior and raise the attention to talent cultivation.

4.2. Improve Aggregation and Synergy, Manage the Land Planning

Rationally manage and plan the land, defect the land redline, pay attention to land use, focus on the aggregation, coordinate the relationship between demand and supply of housing with land expansion and economic development. First, it must hold 1.8 billion mu of farmland under the basic national conditions of greater degree of land constraint. On basis of returning the grain plots to forestry, formulate supervision and guarantee policy to prevent farmers from cultivating the returning farmland so as to guarantee the nature of farmland and improve masses' confidence of keeping the farmland. Secondly, it must maintain the consistency of land urbanization and population urbanization. The practice of setting up supervision departments and diversified assessment systems has restricted local government's behavior of blindly exploiting land resources for economic development. While paying attention to the planning and use of urban land, it is necessary to grasp the land use in rural areas, make rational planning and improve the problems such as low efficiency of current land use so as to make a paving for urbanization. Finally, exert the regulation function of land and coordinate the relationship between housing supply and demand. As for exuberant housing demands, it can adopt a positive policy for those who have a certain material foundation and could buy houses so as to encourage the residence purchase. It can take the stability policy for those without purchase ability to guide the rental housing. For low-income group who cannot afford to rent houses, adopt the security policy to provide Public Renting Houses or Cheap Renting Houses. In respect of the surplus of real estate, the current inventory shall be digested through certain preferential policies. In addition, the cities with high housing vacancy rate shall be clearly defined through data analysis, and certain restrictions shall be taken on the development of real estate industry in this city to prevent the continuous accumulation of inventory.

4.3. Grasp the Integrity and Stability, Broaden the Financing Channels

Broaden the capital accumulation channels and grasp the reliability of investment & financing mechanism from the holistic perspective. First of all, the financial resources of local governments can be raised through tax adjustment and other channels so as to improve the ability of capital supply and reform the investment & financing mechanism. At the same time, establish a multi-fund guarantee mechanism for urbanization. In order to improve capital's stability in process of urbanization, it can perfect the tax policy, issue the construction bonds and set up the departments that supervise the capital state of local government. Next, reduce the income gap between residents, which can adjust the exorbitant income through tax policy, reduce farmers' burden and improve residents' economic situation by aid of tax incentives and compensation policies. After that, broaden investment & financing channels. It needs to grasp the reliability of financing channels and reduce the acts of using land for financing from a holistic perspective. Through streamlining administration and delegating power to the lower levels, increasing investment & financing channels, absorbing social capital, such as provision of public services, it can draw lessons from foreign experiences, adopt the form of cooperation between government capital and social capital, and provide public services in all or part of social capital. By performance evaluation, the government gives social capital certain benefits so as to enhance social participation in public services and reduce the pressure of government in capital. At the same time, it is necessary to increase the leverage degree. The top priority of task is the enterprise's deleveraging. At present, the overcapacity enterprises in Chinese market are mainly the state-owned enterprises in traditional competitive industries. The government should clear the goal of deleveraging and eliminate the "zombie enterprises". Enterprises with high leverage ratio can reduce this ratio by listing and issuing shares or negotiating with banks for transferring debt to stock, etc.
4.4. Pay Attention to Dynamics and Hierarchy, Boost the Development of Industry
Grasp the hierarchy of different regions, rationally plan the industrial layout and dynamically adjust the industrial structure. On the one hand, increase the investment of talents and funds in areas with backward economic development, analyse the reasonable degree of local industry positioning, formulate scientific industrial positioning plan, carry out appropriate subsidies and boost the backward areas to develop key industries in combination with local advantages. At the same time, make clear the importance of the leading industry for urban development, learn from the experiences of areas with leading industries at home and abroad, clarify the resources in region, carry out the resource integration and form the leading industries with local characteristics. On the other hand, adjust the industrial structure. In the first instance, the tertiary industry should be developed on basis of ensuring the sufficient supply of productivity if it wants to adjust industrial structure in a diversified and rationalized industrial transfer model and to squarely face current productivity problem in our country. In the next place, the government shall formulate relevant regulations to reduce the "three-high" enterprises with high consumption, high pollution and high emission. And enterprises are supposed to strictly follow the national regulations on emission restriction, increase the investment in technology, reduce resource loss by introducing new technology or developing green industry to increase enterprise's additional value, reduce the excessive demands for labor force and cut down the proportion of pollutant emission.

4.5. Maintain Openness and Environmental Adaptability, Speed up Innovation Driving
Grasp the openness of technology introduction and improve the adaptability of innovation technology. Firstly, change the inherent thinking of technology introduction. On the one hand, reduce the dependence degree of technology introduction to improve the innovation autonomy of Chinese enterprises. The talent training can be enhanced and independent innovation ability can be improved by strengthening the cooperation between government, enterprises and universities, combining the "industry-university-research" mode. On the other hand, increase the technology introduction for investment digestion and absorption. The core of technology introduction should be transferred from "introduction" to "digestion and absorption", internalize the foreign technology and narrow the gap between technology introduction with technology application. Secondly, increase the input in technological innovation in order to shorten the gap with developed countries. Pay attention to talents training and change the "large but not strong" status of our scientific research personnel so as to shorten the cycle of technological transformation and seamlessly link the technology application with current demands of market. At the same time, coordinate the relationship between R & D direction of scientific research team and the technology needed by enterprises in actual production, and do well in linking the two parties. Thirdly, improve the construction of technical mechanism system. At first, enhance its hierarchy and expand the vertical and horizontal Omni-directional coverage of system. In addition, set up supervision & evaluation system; supervise and evaluate the degree of implementation, and test the implementation effect through sampling survey and other modes. Moreover, establish the corresponding incentive system to promote the activity of "mass entrepreneurship and innovation".

5. Conclusion
The optimal control for supply issue of new-type urbanization construction system is a complex system engineering. From the perspective of systematic theory, this paper analyses the supply status, constructs a connotations model of supply mechanism aiming at clarifying the idea of supply issue, and then comprehensively analyses the problems and causes, as well as the relationship among elements by system dynamics. Finally, the countermeasures for management and control of supply issue of new-type urbanization construction system are put forward in the hope of providing a way of thinking for research on supply of new-type urbanization.

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