Study on Cross-regional Allocation of Construction Land in Beijing-Tianjin-Hebei Region based on Differentiation

Shuqin Zhao\textsuperscript{1,}\textsuperscript{*}, Guoyan Wang and Hongfei An\textsuperscript{1}

\textsuperscript{1}Hebei GEO University, Huai’an East Road, Shijiazhuang, China
shuqinzhaoo999@163.com

Abstract. Shanghai and Beijing are two leading cities no matter in proportion of urban construction land, ability of attracting funds or in population concentration. In contrast, Hebei province is not comparable to the two cities in such three areas, but has higher planning potential of total city and rural construction land and higher potential of farmland transference. The cross-regional paid circulation of construction land is not only effective in overcoming utilization loss of construction land, land shortage of megacities and big cities, city economic competitiveness decline, but also an inevitable choice to attract capital and manpower from Beijing and Tianjing and enhance Beijing-Tianjin-Hebei Region cooperative development, providing reference for Xiong’an New Area development in construction land allocation.

1. Introduction
At present, supply-side structural reform has become a important strategy of the Communist Party of China and the State Council. The Fifth Plenary Session of the 18th CPC Central Committee clearly proposed to optimize allocation of land elements, create new supply and promote the development of new industries. Whether land supply side reform can provide driving force for overall supply-side structural reform has become a research focus. The city economic competitiveness decline caused by low supply rigidity of construction land, low supply ratio of residential land for megacity, low plot ratio and cross-regional circulation of construction-prohibited land. The voice for current land supply system reform, especially construction land allocation system reform, has always been there\textsuperscript{1}. The attempt of cross-regional paid circulation of Beijing-Tianjin-Hebei construction land is of positive significance for Beijing-Tianjin-Hebei coordinated development and of reference significance for Xiong’an New Area construction in land allocation.

2. Comparison of land element allocation among China three cities groups
2.1. Comparison of Construction Land Construction
Table 1 shows Land Utilization Overall Planning (2006-2020) data on the administrative land area, agricultural land area, cultivated area, construction land area, land area for urban and rural construction, urban residential land area of Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Guangdong prescribed on web portal of Ministry of Land and Resources (Ministry of Land and Resources of the People’s Republic of China). Urban construction land area data and Shanghai construction land area data are derived from Chinese City Statistical Yearbook (2016) (Urban Social Economic Bureau of State Statistics Bureau). The value of Beijing-Tianjin-Hebei Region is the sum of values of Beijing, Tianjing and Hebei; the value of Yangtze River Delta is the sum of values of Shanghai, Jiangsu and Zhejiang, and value of Pearl River Delta is equal to the value of Guangdong.
Table 1. Land use planning data of three major areas

| Region                        | To 2020 | Administrative land area | Agricultural land area | Construction land area |
|-------------------------------|---------|--------------------------|------------------------|------------------------|
|                               |         |                          | Cultivated area (ten thousand mu) | Land area for urban and rural construction |
| Shanghai                      |         | 8239                     | 3875                   | 2981                   | 2600 |
| Jiangsu                       |         | 106743                   | 67750                  | 20615                  | 15601 |
| Zhejiang                      |         | 105397                   | 86363                  | 11326                  | 7980 |
| Yangtze River Delta           |         | **220380**               | **157988**             | **34922**              | **26181** |
| Guangdong                     |         | 179757                   | 149971                 | 20060                  | 15230 |
| Pearl River Delta             |         | **179757**               | **149971**             | **20060**              | **15230** |
| Beijing                       |         | 16410.54                 | 11960                  | 3817                   | 2700 |
| Tianjing                      |         | 11917.32                 | 7073                   | 4034                   | 2500 |
| Hebei                         |         | 188434                   | 142531                 | 19113                  | 14980 |
| Beijing-Tianjin-Hebei Region  |         | **216762**               | **161564**             | **26964**              | **20180** |

As can be seen in Figure 1, Yangtze River Delta has the largest land area for urban and rural construction, followed by Beijing-Tianjin-Hebei Region and then Pearl River Delta. However, in terms of ratio between rural residential land area and total land area for urban and rural construction, Beijing-Tianjin-Hebei Region has the highest value, followed by Yangtze River Delta and then Pearl River Delta.

As shown in Figure 2, Jiangsu has the largest total land area for urban and rural construction, followed by Guangdong and then Hebei, and Tianjing ranks in last position. However, from the aspect of ratio between rural residential land area and total land area for urban and rural construction, Hebei is the highest, followed by Jiangsu, and Shanghai ranks the bottom.

Figure 1. Comparison of construction land scale and structure among three major areas.
On one hand, the results indicate different areas have different construction land structure. For example, Yangtze River Delta has the largest land area for urban and rural construction, Beijing-Tianjin-Hebei Region has the largest proportion of rural residential land area, and Pearl River Delta has the lowest proportion of rural residential land in rural collective construction land. Among the three major areas, the construction land scales per household or per resident are different, i.e. the land wealth per household or per resident are different. This may be due to large construction land of Yangtze River Delta and Pearl River Delta in history or the farmland transference in recent years. On the other hand, the results also indicate Beijing-Tianjin-Hebei Region has larger planning potential of urban and rural construction land, and enjoys larger development space than Yangtze River Delta and Pearl River Delta.

2.2. Comparison of Potential for Farmland Transference Among Three Areas
As shown in Figure 3, Pearl River Delta has the largest ratio of agricultural land area to administrative land area, while the lowest ratio of cultivated land to agricultural land area, showing a large potential of farmland transference. Compared with Yangtze River Delta, Beijing-Tianjin-Hebei Region has higher ratio of agricultural land area, but a lower ratio of cultivated land, which indicates that farmland transference potential of Beijing-Tianjin-Hebei Region is higher.

As shown in Figure 4, Guangdong has the highest ratio of agricultural land area, followed by Zhejiang and Hebei; from the aspect of the ratio of cultivated land, Jiangsu has ranks the first, Tianjing ranks the second, Hebei ranks the third, Guangdong is higher than Beijing; Guangdong has the highest potential of farmland transference, followed by Zhejiang and then Hebei, wherein Tianjian has the lowest potential. It should be noted that the larger the potential of farmland transference is, the larger the support of land can provide for future development.
3. Comparison of capital and population gathering situation of China three major areas

3.1. Comparison of Capital and Capital Allocation Situation of China Three Major Areas

Table 2 shows the 2016 year-end balance of deposits (domestic and foreign currency) in all financing institutions (including foreign capital), 2016 year-end balance of loans (domestic and foreign currency) in all financing institutions (including foreign capital), 2016 household balance of deposits (RMB) over province (city), 2016 balance of deposits (RMB) of non-financial business over province (city), and deposit per capita (RMB). There data are collected from 2016 National Economic and Social Development Bulletin on web portal of National Bureau of Statistics of the People’s Republic of China (National Bureau of Statistics of the People’s).

| Region            | 2016 | Balance of deposit of all financing institutions | Balance of loan of all financing institutions | Deposit per capita (yuan) |
|-------------------|------|-----------------------------------------------|---------------------------------------------|--------------------------|
|                   |      | Households deposit | Non-financial business deposit |                                      |                          |
| Shanghai          | 110510.96 | 25112.99 | 45105.14 | 59982.2 | 87720.02 |
| Jiangsu           | 121106.6 | 439005 | 452779 | 91107.6 | 42915.60 |
| Zhejiang          | 99530 | 38775 | 34562 | 81805 | 53402.11 |
| Yangtze River Delta | 331147.6 | 502892.99 | 532446.14 | 232894.8 | - |
| Guangdong         | 179829.19 | 59768.75 | 63509.89 | 110928.41 | 47574.48 |
| Beijing           | 179829.2 | 59768.75 | 63509.89 | 110928.4 | - |
| Tianjing          | 138408.9 | 28012 | 50998.3 | 63739.4 | 112292.42 |
| Hebei              | 30067.03 | - | - | 28754.04 | 52273.79 |
| Beijing-Tianjin-Hebei Region | 55513.3 | 32710.9 | - | 37352.2 | 31941.56 |
| Beijing-Tianjin-Hebei Region | 223989.2 | - | - | 129845.6 | - |
As shown in Figure 5, Guangdong ranks the first in both deposit and loan of all financial institutions, Beijing ranks the second in deposit of all financial institution. Jiangsu and Zhejiang ranks the second in loan of all financial institution. Jiaosu Jiangsu ranks the first in both household deposit and non-financial business deposit. All these results indicate the areas mentioned above have strong money-making ability, while Tianjing and Hebei have lower money-making ability.

As shown in Figure 6, the three major areas have different money-making abilities, wherein Yangtze River Delta has higher money-making ability than Beijing-Tianjin-Hebei Region. There is also a large internal differentiation of money-making ability, for instance, Beijing has the largest per capita deposit, followed by Shanghai, and Hebei ranks the bottom. The internal differentiation of Beijing-Tianjin-Hebei Region is larger than that of Yangtze River Delta, and Beijing has a strong siphonage of capital from Tianjing and Hebei.

3.2. Comparison of Population Aggregation Degree Among Three Major Areas

Table 3 shows the population aggregation degree consisting of “proportion of urban population” and “population density” [2], which is calculated based on data in Chinese City Statistical Yearbook (2016). Population aggregation degree=a×proportion of urban population +β×population density (wherein the weight of a and β are both set to 0.5, a+β=1). First, the proportion of urban population and population density are respectively subjected to N (0,1) statistical standardization processing: proportion of urban population=(proportion of urban population−mean value)/standard deviation, population density=(population density-mean value)/standard deviation, obtaining population aggregation degree. Secondly, the obtained population aggregation degree is subjected to differential treatment: population aggregation degree=(population aggregation degree-minimal value)/(maximum value-minimal value)×100. It can be seen from Table.3 that Shanghai has the largest population aggregation degree, followed by Beijing, and Hebei ranks the bottom.
Table 3. Regional population aggregation index and its location

| Province | Proportion of urban population (%) | Population density (people/km²) | N(0,1) statistical standardization | Population aggregation degree |
|----------|-----------------------------------|-------------------------------|-----------------------------------|------------------------------|
|          |                                   |                               | Urban proportion                  | Exponential value            | Standardization (%) | Rank |
| Beijing  | 86.51                             | 812.50                        | 1.18                              | -0.08                        | 0.55               | 56.7  | 2    |
| Tianjin  | 82.64                             | 853.12                        | 0.82                              | -0.02                        | 0.40               | 51.8  | 3    |
| Hebei    | 57.33                             | 406.77                        | -1.48                             | -0.76                        | -1.12              | 0.00  | 7    |
| Jiangsu  | 66.52                             | 728.97                        | -0.64                             | -0.22                        | -0.43              | 23.30 | 4    |
| Shanghai | 87.60                             | 2275.67                       | 1.28                              | 2.36                         | 1.82               | 100.00| 1    |
| Zhejiang | 65.80                             | 466.49                        | -0.71                             | -0.66                        | -0.69              | 14.80 | 6    |
| Guangdong| 68.71                             | 500.36                        | -0.44                             | -0.61                        | -0.53              | 20.20 | 5    |

It can be concluded that on one hand, Beijing and Shanghai are two leading cities no matter in urban construction land proportion, ability of attracting funds and population aggregation degree, while Hebei ranks lower in these three indexes. On the other hand, the land reserve for future development of Beijing and Shanghai are limited, while Hebei has great potential of land support for its future development, as long as the corresponding capital and population resources are matched, Hebei can gain a great future development.

Beijing ranks the top in ability of attracting fund and population aggregation degree, similarly Tianjing does a great job in these two aspect, while Hebei is less superior although it has the largest potential of land utilization. The cross-regional paid circulation of construction land is an inevitable choice to attract capital and human resource from Tianjing and Beijing and promote harmonic cooperative development of Beijing-Tianjin-Hebei Region, providing reference for millennium engineering project of Hebei Xiongan New Area.

4. The cross-regional paid land allocation path and strategy for Beijing-Tianjin-Hebei Region

4.1. China Land Circulation of Construction Land and Characteristics

According to Article 10 of China’s Constitution “Land in the cities is owned by the state. Land in rural areas and suburban areas of cities excluding those belonging to the state prescribed by law belongs to collective ownership; house sites and privately farmed plots of cropland and hilly land are also owned by collectives.” According to current laws and regulations, the ownership of China construction land can be divided into state-ownership and collective ownership. Collective construction land can be further decomposed into house site, collective public construction land (street, school land, etc) and collective commercial construction land (village-run business and country-run business).

Since the release of “Temporary Regulations on the Assignment and Transfer of the Right to the Use of State-owned Land in the People’s Republic of China” (State Council decree no.55) in May 1990, the circulation of urban construction land has been permitted. However, the circulation of rural collective construction land has successively experienced three stages: circulation of collective commercial construction land in “establishment and alteration of property right of township and village enterprises”, circulation of rural collective construction land in “new rural construction and centralized residence of village people or rural land management project”, and paid voluntary withdrawal or transfer of house site “within the collective economic organization”.

As prescribed in Article 63 of “The Land Administration Law of the People’s Republic of China”, “the right of use of land owned by peasants shall not be transferred, transferred or leased for non-agricultural construction; however, enterprises that conform to the overall planning of land use and acquire land for construction in accordance with the law shall be exempted from the transfer of land use right according to law due to bankruptcy or merger”. The collective commercial construction land in this stage can only be passively transferred.
Under the “new rural construction and villagers’ centralized residence or rural land renovation project”, the circulation of rural collective construction land has been permitted since “the Issue of a Pilot Management Method for the Increase and Reduction of Urban and Rural Construction Land”, of which the purpose is to cover the gap of urban construction land index. The concrete operation is to transfer idle and inefficient collective commercial construction land into urban construction land via collective construction land saving in new rural construction renovation project, or via collective construction land saving in centralized residence renovation project for villagers, or via collective construction land by demolition and reconstruction of via house sites.

According to “The CPC Central Committee’s Decision on Comprehensively Deepening Reform of Several Major Issues” agreed on the Third Plenary Session of the 18th CPC Central Committee and “The Decision of Standing Committee of the National People’s Congress on Authorizing the State Council’s to Temporarily Adjust and Implement Relative Legal Regulations for Beijing Daxing District and Other 33 Pilot Counties (Cities, Districts)” settled on the 13th meeting of the standing committee of the 12th National People’s Congress in 2015 (The Decision of Standing Committee of the National People’s Congress on Authorizing the State Council’s to Temporarily Adjust and Implement Relative Legal Regulations for Beijing Daxing District and Other 33 Pilot Counties (Cities, Districts)), the proposal of “allowing the sale, leasing and demutualization of right to use of rural collective business construction land, and implementing equal share equal right equal price as with right to use of state-owned construction land” has been clearly approved. This indicates rural collective commercial construction land can not only be circulated, but also in equal price and equal share.

In 2014, “China New Urbanization Plan (2014-2020)” proposed to implement connecting policy of increasing urban construction land scale and attracting migration rural population to settle down. On the Fifth Plenary Session of the 18th CPC Central Committee, the work conference on central urbanization proposed reform task – “Press Conference on Suggestion of Implementation on Establishing Hooking Mechanism between Increase Scale of Urban Construction Land and Settlement Number of Migration Rural Population”. In 2016, the 13th five-year plan of the state lay further emphasis on accelerating the citizenization of migration rural population and on establishing connecting mechanism between increasing urban construction land scale and attracting migration rural population to settle down. In the end of 2016, ministry of land, housing, public security and environmental protection expressed that “allowing rural migrant residents to voluntarily have paid withdrawal or transfer of house sites within their own collective economic organizations based on requirements of rural residence land system pilot reform” in “The Opinions on The Implementation of Connecting Policy of Increasing Urban Construction Land Scale and Attracting Migration Rural Population to Settle Down” (Ministry of Land and Resources of the People’s Republic of China). This basically opens the path of circulation for house sites.

Currently, a new pattern has formed on the circulation of China land usage right, i.e. “newly-added construction land is provided by annual plan of land utilization, urban and rural construction land is comprehensively planned as a whole, the use right of urban and collective construction land is circulated within province, and house site is circulated following migration rural population”. System problems such as the city economic competitiveness decline caused by low supply rigidity of construction land, low supply ratio of residential land for megacity, low plot ratio and cross-regional circulation of construction-prohibited land have also been concerned.

4.2. Cross-regional Paid Land Allocation Strategy for Beijing-Tianjin-Hebei Region

Under the premise of abiding by the land-use regulation system, provincial overall plan of land utilization and annual plan for land use index, firstly, the newly-added construction land of Beijing-Tianjin-Hebei Region is allowed to be sold on cross-regional market, and cross-regional requisition-compensation balance of cultivated land is allowed; secondly, realize market-oriented planning of cross-regional increase and reduction of inventory urban construction land; thirdly, realize cross-regional circulation of household collective construction land; fourthly, allow cross-regional ecological renovation of inventory ecological land without changing ownership. In all, realize manpower land-use through cross-regional paid planning of land use right.
According to “World Development Report 2009” announced by World Bank, nearly half of world’s economic activities happen on 1.5% of land area. Beijing-Tianjin-Hebei Region, Yangtze River Delta and Pearl River Delta are three major economic area of China, wherein Yangtze River Delta has become one of 6 world’s big city groups, but still lag behind New York City agglomeration and Tokyo urban agglomeration. The paid overall utilization of land resource, assets and capital can not only improve the economic aggregation and balanced development of Beijing-Tianjin-Hebei Region, but also contribute to the environmental protection and management of Beijing-Tianjin-Hebei Region. Although the circulation of inventory urban construction land that conform to land use control has always been permitted within provincial domain, due to limited number of suppliers and demanders, the inventory land capital at “redundant area” of various cities are mainly digested by real estate development, which leads to a small trading volume of urban industry land and provides insufficient driving force industry transformation and upgrading of cities in “lack of fund”. Allowing cross-regional paid circulation of construction land in Beijing-Tianjin-Hebei Region not only provides time-space matching channel for industrial land demand and land supply, but also provides new blood for new economic growth point of redundant cities, which is a win-win strategy.

5. Conclusions and suggestion
Currently, supply-side structural reform has become an important strategy of the Communist Party of China and the State Council. Land system, as one of the most basic economic systems, plays an vital role in supply-side structural reform, regarded as basic platform, core content and key point of whole supply-side structural reform. Giving play to the decisive role of market in resource allocation has long been a major policy view since the 18th CPC National Congress. Allowing cross-regional trade and planning of newly added and inventory construction land and allowing cross-regional “requisition-compensation balance” of cultivated land are innovation points of land supply side reform. On one hand, peasants who have long been lived and worked in cities are allowed to transfer their house-site construction land at original country-side to the cities they work, serving as construction land for urban expansion, while the agricultural land inventory at their original countryside is increased via restoring cultivation of house-site. On the other hand, allowing cross-regional circulation of inventory construction land can activate the flexed land capital, injecting blood into the new industry. It is of positive significance for promoting the coordinated development of Beijing-Tianjin-Hebei Region through the supply of land element supply, land asset price and land financial market transmission mechanism under the new normal, and promoting the linkage reform of capital and household registration through cross-regional allocation of construction land.

6. References
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