

Determinant Factors and Influence of Job-housing Imbalance in East Asian Context

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Abstract: In recent years, the imbalance of job-housing in metropolitan areas has intensified, raising hot discussion on job-housing spatial relationship and employment accessibility in related fields. This article aimed to classify the reasons, impact and the corresponding solution of job-housing imbalance by reviewing the formation and development process of this concept and analyzing the cases from 3 countries in East Asia. The article concludes that job-housing imbalance is related to urban sprawl and decentralization, with issues from the planning, industrial, and individual levels. The impact of job-housing imbalance is illustrated in limited travel choice, social segregation, low quality of life and pressure on the urban environment. Solutions that have been taken so far can be classified into ameliorating job-housing spatial mismatch and providing more travel choices.

Keywords: Jobs-Housing Balance; East Asia; Suburbanization; New Town

1.Introduction

Jobs and housing are the two essential elements that constitute urban land use. The spatial relationship between the two determines the characteristics and efficiency of urban transportation to a large extent. However, along with counter-urbanization, the problem of separation of working and living has become more and more serious. Therefore, arranging the land for working and living has become an essential topic in urban planning. "Jobs-Housing Balance" is an ideal model of the relationship between employment and residential space. It is a planning concept gradually formed by Western planners in the process of fighting against "urban diseases" ^[1].

This paper first expounds the definition and measurement of job-housing balance, and then introduces the development process of this concept. Then analyses the condition of job-housing imbalance in 3 countries in East Asia, and further analyses the reasons behind it. Finally summarizes the impacts and the corresponding strategies to improve this issue.

2.Defining Job-housing Balance

2.1 Definition of Job-housing Balance

The basic meaning of job-housing balance refers to the fact that within a given geographical area, the number of laborers in the residents and the number of jobs is roughly equal, and most residents can work nearby; In terms of mode of commute transportation, ideal model of job-housing balance advocated to walk, take bicycles or other non-motorized vehicle. When necessarily using motorized vehicle, the travel distance and time are recommended within a relative short range. This ideal model will benefit to reduce the use of motor vehicles, primarily cars, thereby reducing traffic congestion and air pollution ^[2, 3].

However, even if the planners achieve a balance in the layout of land use, the final market allocation may only

achieve a balance between job and housing for some residents and not for the other. How to judge whether it is balanced in practice needs to be measured.

2.2 Measuring Job-housing Balance

The measurement includes two aspects. One refers to whether the number of jobs and the number of housing units in a particular geographical area are equal. The measurement generally uses the job-housing ratio: the ratio of the number of jobs to the number of households in a given geographic area. When the ratio is between 0.8 and 1.2, the area is considered to be balanced ^[2, 4]; the second refers to the proportion of the number of workers who live and work within a given geographical area and is called a self-contained measurement, using the "independence index" proposed by Thomas, it is the ratio of the number of people who live and work in a given area to the number of people who go to work outside. The higher the ratio is, the better the community's self-sufficiency ^[5, 6].

3. International Cases in East Asia

3.1 Hong Kong

Generally, Hong Kong's new towns were developed primarily as a mean to alleviate the overcrowding conditions of established urban areas ^[7]. Although the three generations of new towns in Hong Kong are designed with "self-containment" as the design principle, it is confirmed that there is inadequate provision of jobs and schools in new towns resulting in widespread cross-district commuting between new towns and old-established urban areas ^[8] through the latest census in 2016, job opportunities of the metropolitan area and New Territories are unevenly distributed: the population of the New Territories accounts for about 40% of Hong Kong, but it only provides less than 25% of job opportunities.

In terms of reasons of job-housing imbalance in New Town, the lack of supporting public facilities, especially in the early stage of the development, discouraged offices from moving to new towns. Secondly, the decline of Hong Kong's industries and the relocation of factories to the mainland have lost many job opportunities. Thirdly, in the construction phases, some of the new towns did not attract enough private housing. Therefore, developers believe that there is not adequate potential vitality of the local economy. It fails to attract developers to build enough offices and factories so that people are forced to commute across districts ^[8].

As a result, compared with urban areas, new towns have a more severe separation of job and housing with longer commutes, higher costs, and fewer people employed locally ^[9]. Among existing new towns, older and more mature new towns (Shatin, Tuen Mun, etc.) are slightly better. More people are employed locally, the mobility index is lower, and the relocation rate within five years. The primary benefits of these new towns are closer to the metropolitan area and have substantial industrial base or may have a long history of development.

On the other hand, newer new towns have a worse condition in terms of job-housing balance (Tin Shui Wai, Tseung Kwan O, etc.), with longer commuting duration and higher costs, fewer people working in the same district. Moreover, moving to these areas is strongly related to cross-region commuting but lower living costs ^[8].

It is proved that the Job-housing Imbalance of new towns has strongly impacted local commuters' lives. Firstly, work accessibility strongly affects commuting time and ticket price ^[9]. Secondly, long commuting could discourage non-commuter duration, especially for public transportation users, which may harm the work-life balance and affect quality of life ^[9]. Thirdly, in the context of Hong Kong, the trend of single transportation of relying too much on public transportation makes it poor people who cannot afford travelling costs more difficult to find job opportunities in the wider community, hence it caused increasing unemployment and caused severe social segregation ^[10].

To improve the current condition, Transportation Support Scheme (TSS) in 2007 was created, aiming to provide transportation subsidies to job seekers and low-income employees in four remote areas to encourage cross-regional employment. The results proved to reduce the unemployment rate and increase the proportion of commuting across

districts ^[11].

3.2 Mainland China

In terms of Mainland China, the job-housing imbalance caused by urban sprawl is widespread in the major cities. The reasons for this phenomenon are not the same as other countries, as institutional factors profoundly impact it. After the Chinese reform and opening up, the workers' housing system under the planned economy and the layout of close job and housing gradually disintegrated, which has led to a significant increase in the selectivity and mobility of where residents live and where they are employed ^[12]. The reform of land marketization made the manufacturing companies move to the suburbs. These reforms have led to a rapid expansion of cities' scale, but the major residential areas are still in the central city, leading to the imbalance of living and job ^[12]. Moreover, this situation is one reason for high transport demand and transport costs for urban economic development ^[13] and traffic congestion and environmental problems.

Beijing could be a typical example. From the city centre to the outer rings, the imbalance of jobs and housing becomes more serious ^[14]. There are two main reasons for this condition. At the level of urban planning, the move out of the industry factories and the financial and office works concentrated in the centre city has led to increased residents' commuting distance and time ^[12]. On the other hand, on a personal level, due to the high housing prices in the central area, commercial houses residents actively choose long-distance commutes to improve their living conditions. While the residents of security housing, which are usually located in the suburbs, have fewer options for work and have to commute long distances ^[15]. To deal with the imbalance, the government has proposed to create the sub-centre, the Beijing Municipal Administrative Center to undertake the evacuation of the central city population ^[16].

3.3 South Korea

In South Korea, job-housing imbalance mainly related to the following two factors. The first one is the contradictory urban planning policies of greenbelt policy and "leap-frog" new towns development. Greenbelt policies were adopted in different cities in South Korea. For Seoul, the primary targets of Korea's greenbelt policy were to slow down the population and industrial concentration and prevent sprawl in the Capital. So, to jump over the greenbelt, new towns around Seoul have been developed 20–28 km away from the central area of Seoul. However, residents in new towns still choose to work in Seoul because these new towns mainly provide housing but lack employment and public service facilities, resulting in a longer commute route and time to Seoul because of the greenbelt. Therefore, the greenbelt policies and "leap-frog" new town development have led to a severe discontinuity of population and employment density gradients, creating a severe job–housing imbalance ^[17]. Another critical reason for job-housing imbalance is firms and residents' choice of their location of industry, jobs and housing. Companies want to stay in the city centre because they are afraid of losing the industrial aggregation effect if they move out of the centre ^[17]. The separation of work and residence for residents and families is individual decisions made by them after comprehensively considering job opportunities in the centre and lower housing prices in the suburbs ^[18].

The job-housing imbalance has affected urban development and residents' lives in South Korea. "Leap-frog" urban sprawl leads to waste of resources ^[17]. Also, restrictions on land development have exacerbated social inequities and high residential prices resulting in the living separation of rich and poor ^[19]. To solve the job-housing imbalance, the Seoul Metropolitan Master Plan planned to release part of the greenbelt to accommodate future urban growth ^[17].

3.4 Japan

As for Japan, continuously polarized mega-cities, non-independent new towns and fast-developing rail transportation system are the main reasons for job-housing imbalance. On the one hand, Tokyo is still in further polarization and has the most substantial power to attract people to work here ^[20]. However, on the other hand, Tokyo's new towns have not become a relatively independent area that can evacuate the functions of the central city but has formed commuter towns to accommodate the external population gathered in Tokyo, resulting in the extension of residential land and the overall expansion of urban land ^[21]. Also, development of the rail public transportation system

and its technology in Japan has made it possible to form the over-expansion of central cities, which finally caused long commuting distance and time.

In Japan, the job-housing imbalance has led to traffic noise and exhaust pollution, high land prices in central urban areas and commuters' mental health problems caused by long commuting time and crowded commuting environment ^[22]. The Japanese government has also taken measures to alleviate the problems caused by severe job-housing imbalance. Since the 1960s, Tokyo planned to relocate enterprises and R&D institutions in the central area to different around new towns, hoping to form sub-central cities.

4. Discussion

4.1 Reasons of job-housing imbalance

Generally speaking, the separation of housing and job originates from the following two urban forms. The first is decentralization. For example, the governments build new towns or built large security housing project in the suburbs to accommodate rapidly growing populations but ignore the allocation of jobs. Another case is to set up green belts to prevent urban sprawl, but they exacerbate the divide between cities and suburbs. The second type is urban sprawl, which may come from industrial spillover which often requires support from robust transport systems.

4.2 Impacts of job-housing imbalance

In conclusion, the impacts of job-housing imbalance mainly included four aspects (Table 1). Firstly, long commuting distance limited people's travel choice. Secondly, the job-housing imbalance leads to low employment accessibility of low-income groups, high cost of transportation, unaffordable high housing price in the central area, which exacerbated social segregation. Thirdly, less disposable time and mental health problems caused by long commuting time affected quality of life.

Finally, it also increased pressure on the urban environment, such as air pollution and waste resources.

Table 1 Impacts of Job-Housing imbalance

Type	Content
Limited travel choice	People in Hong Kong and Japan relying too much on public transportation
Social segregation	The gap between the rich and the poor in society has widened because the employment accessibility of low-income groups has entered a vicious circle.
	The poor cannot afford the high cost of transport, which increases unemployment.
	Leading to higher land price in the central area
	Separation of the living area of rich and poor
Affect Quality of Life	People waste time on commuting, have less disposable time and lower quality of life.
	Long commuting time causes mental health problems.
Increase pressure on the urban environment	More traffic congestion and traffic noise
	"leap-frog" urban sprawl leads to waste of resources
	Leading to exhaust pollution

Strategies to improve job-housing imbalance could be concluded into two aspects as to reduce Job-housing spatial mismatch and to improve the freedom and time of travel choices (Table 4).

In terms of improving Job-housing spatial mismatch, new growth areas closer to the CBD are more likely to capture the spillover jobs from the congested CBD. They are potentially competitive if favourable regional job policies can be actively implemented by the government ^[23]. Meanwhile, suburban job clusters are concentrated decentralization and reduce their dependency on the urban core. It could also be better to adopt alternative work schedules in specific industries to relieve commute burdens ^[9]. Last but not least, the government could provide affordable housing in a location closer to the job-centre or housing subsidies to people buy/rent house near their jobs.

Likewise, improving the freedom and time of travel choices contributes to job-housing balance as well. In short term, it is necessary to equipped with better public transportation infrastructure near the new construction area. In the long term, the ideal solution is to improve the comprehensive transportation system and provide various options and provide commuting and transportation subsidies, improving the affordability of commute.

Table 2 Strategies for Improving Job-housing Balance

Type	Content	
Reduce Job-housing spatially mismatch	Job decentralization	New growth areas closer to the CBD are more likely to capture the spillover jobs from the congested CBD and are potentially competitive if the government can actively implement favourable regional job policies. (Loo & Chow, 2011)
		Suburban job clusters are concentrated decentralization and reduce their dependency on the urban core.
		Adopt alternative work schedules (e.g., telecommuting, flexible work hours) in specific industries to relieve commute burdens (He et al., 2020)
	Provide affordable housing in a location closer to the jobcentre (PRH etc.)	
	Provide housing subsidies to people buy/rent house near their jobs	
Improve the freedom and time of travel choices	Equipped with better public transportation infrastructure near the new construction area	
	Improve the comprehensive transportation system and provide a variety of options (cycling, walking, etc.)	
	Provide commuting and transportation subsidies, improve affordability	

5.Conclusion

This article aimed to classify the reasons, impact and the corresponding solution of job-housing imbalance by reviewing the formation and development process of this concept and analyzing the cases from 3 countries in East Asia. This study results filled in the gaps of previous studies on the lack of comparison and summary on job-housing imbalance in different countries.

This article suggested that from the perspective of urban form, the job-housing imbalance is related to urban expansion and urban decentralization. The causes come from the planning level, the industry level and the individual level. The impact is reflected in travel choice, social segregation, low quality of life and pressure on the urban environment. The solutions that have been taken so far can be divided into ameliorating the mismatch between employment and housing space and providing more travel options.

However, this paper only involves cities from three countries in East Asia, and future studies can summarize the

situation of more countries and regions. Present studies on job-housing balance are usually conducted in cities, and there is a lack of summary at the national level. Research on the causes of job-housing balance in some regions lacks consideration of individual subjective will, which need further studies to explore.

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