



Land assembly for urban development in Taipei City with particular reference to old neighborhoods

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ARTICLE INFO

Keywords:

Land assembly
Tragedy of the anticommons
Gini coefficient
Urban development
Taipei City

ABSTRACT

Taipei, the capital city of Taiwan, has suffered a scarcity of land supply. The size of residential development sites over the past 20 years falls in the range of 500 and 700 square meters. Furthermore, the size of development sites varies widely depending on the sites' locations within the city. Given that the size of a development site is a rational economic decision, this study sets out to unveil the determinants. Residential development projects completed between 1994 and 2015 are examined by regression analysis. Results show that residential development sites tend to be larger along a major road and smaller when they are closer to a metro station. Also, residential development sites are likely to be smaller when they are located in areas where ownership of land is relatively fragmented. Finally, a larger residential development site often results from the assembly of several smaller sites. We further selected one of the oldest neighborhoods in Taipei City, the Wan-Hua Station areas for a case study. Analysis of the reliable data sets of land title registration and building use permits between 1970 and 1988 indicates that a significant amount of time and resources has been expended for land assembly activities. That is to say, small sites and fragmented land ownership are among the primary contributing factors to the inert supply of housing. Nevertheless, there does not seem to be an apparent solution to the land assembly problems.

1. Introduction

Taipei, at the end of 2017, accommodated 2,683,257 inhabitants among approximately 1.05 million households over an area of 271.8 km², leading to a density of 9872 inhabitants per km². One of the present challenges faced by Taipei City is its skyrocketing housing prices. The Sin-Yi Realty price index for housing has risen from 163.46 in 2008 to 267.73 in 2017. (Sin-Yi Realty <http://www.sinyi.com.tw>) However, the housing stock over the same timeframe has increased by 62,645 units, which only accounts for approximately 6.6% of the total stock. (Real Estate Information Platform, Ministry of the Interior <https://pip.moi.gov.tw/V2/Default.aspx>)

There are a variety of reasons concerning both demand and supply that contribute to rising housing prices. The majority of previous studies paid the most attention to demand-side factors, and those pertaining to the supply-side have been largely ignored. Glaeser and Ward (2009) observe a rapid increase in housing price and at the same time an inert supply of new housing in the Greater Boston area. Therefore, they suggest stringent land use regulations as the major institutional contributing factor. A similar conclusion was found in Glaeser and

Gyourko (2005), which also involved a city context. In fact, decades ago, this line of argument was proposed on a national level in the United Kingdom (Evans, 1991).

Unlike the case in Greater Boston, the Taipei City Government has never been particularly anti-development. On the contrary, government-led land development schemes, such as land readjustment and urban renewal, among others, are always a major driver to facilitate urban development or redevelopment. It is however noted in Lin (2014) that small and fragmented land parcels are largely responsible for the slow redevelopment in Taipei. As of 2015, the size of individual privately-owned land parcels in the city is on average 441.47 m². The land parcels in Neihu district, with an average size of 1152 m², are the largest among the 12 districts in the city. Neihu is on the more recently developed eastern part of the city, where numerous large-scale land development projects were implemented by the government. In contrast, land parcels in Datong and Wanhua districts, on the early developed western part of the city, are only on average 88m² and 91m², respectively (Dept. of Land Administration, Taipei City Government). This evidence appears to suggest that how land parcels are re-configured, either assembled or partitioned over time, is essential to the

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consequent housing supply and price, and also to the pattern of urban development.

2. Land assembly and its possible consequences

What distinguishes land from other production factors is its fixed location and fairly slow adaptation to outer changes. When land is developed or redeveloped, developers must consider how lot size and configuration affect value as well as how they affect costs so as to maximize profit (Colwell and Scheu, 1989). When no plots on the market fit the required size of profit maximization, the rebundling or reconfiguration of rights over plots is necessary. In a market dominated by small plots, land assembly is prevalent. Land assembly refers to the process of assembly of multiple individually-owned parcels into one larger, single-owned parcel (Brooks and Lutz, 2016). Shoup (2008) likened the many small parcels of land with different owners involved in a development project to the anticommons problem of cooperation and coordination. Heller (1998) stated that the tragedy of anticommons can occur when too many individuals have exclusive rights of a scarce resource. The tragedy is that rational individuals, acting separately, may collectively waste the resource by under-consuming it compared with a social optimum. Buchanan and Yoon (2000) also suggested that anticommons will lead to potential economic devaluation, ultimately leading to resource under-utilization. In the anticommons, persons may, by reducing inputs to the common facility via price, reduce the rent available to others who also exercise potential exclusion rights. The authors proposed that the tragedies of commons and anticommons are symmetric, and their size of opportunity loss is an increasing function of the number of persons assigned simultaneous rights.

If subdividing land into smaller parcels and assembling it into larger parcels were free of costs, the price of land per unit of area would not depend on the size of a site. However, with significant costs involved in land assembly, Colwell and Munneke (1999) found a higher price per square foot for residential land in the city center of Cook County, Illinois. Tabuchi (1996) and Lin and Evans (2000) reached the same conclusion that land price per unit of area increases with plot size in Osaka, Japan and Taipei, Taiwan. It is noted that the areas examined in the two cities are not confined only to the city center; the finding is a city-wide phenomenon. Lin (2005) provided a detailed account of how parcels are assembled in a land readjustment project at the outskirts of Taipei. Developers not only purchased contiguous parcels, but they also bought the parcels auctioned by the government which were next to parcels they already owned. Because many parcels are jointly owned, developers frequently purchase all the shares of a parcel at the same time to secure sole ownership. Furthermore, parcels did not appear to be selected for development randomly. Developers tended to favor larger parcels with fewer joint-owners over smaller parcels with many joint-owners.

Cunningham (2013) studied the sales prices of properties transacted between 1991 and 2007 in Seattle, Washington, USA. During that time period, the city experienced a rapid increase in land prices. A total of 92 instances of land assemblage were identified in which 151 parcels were sold 214 times within 3 years prior to redevelopment. Land bought in the process of a successful assembly commanded a price premium of 18 percent. Brooks and Lutz (2016) examined the land assembly in Los Angeles and found that assembly land sells at a 15–40 percent premium relative to non-assembly land. Furthermore, a 10 percent increase in the size of a parcel increases the probability of it being assembled at some point in the future by 0.1 percent. In the most recent study, Lindenthal et al. (2017) examine land assembly in Amsterdam over a period of 183 years. It is found that small lots and lots with suboptimal shapes are more likely to get redeveloped. In addition, social ties by sharing a joint religion or profession between owners increase the odds of land redevelopment.

To put land assembly in a wider policy context, Heller (1998) ascribed the slow reconstruction of Kobe after its catastrophic earthquake

in 1995 to the blockage of some land owners. The prevalence of overly small land parcels were said to be created by the land laws enacted after World War II. Sim et al. (2002) offered the experience of how Singapore averted the tragedy of the anticommons. Before the introduction of the Land Titles (Strata) Act of 1999, all owners in the estate or building had to agree for an en bloc sale to go through. Naturally, the 100% consent requirement was fairly difficult to achieve. It also posed problems in redeveloping land to cater to the housing needs of a dense population. The new 1999 Act replaced the unanimous rule with a majority rule in which a respective 90% and 80% of owners need to agree to the en bloc sale for a development project that is less than and more than 10 years old, respectively. In the case of the Kim Lin Mansion project, which was blocked by three owners, the Act resolved the objection and helped release 88 million dollars to be shared by the owners. Despite possible controversy over minority protection and attenuation of property rights, the authors argued that the availability of private housing for the majority should take precedence in land-scarce Singapore. Zhu (2012) examined the urban development of Ho Chi Minh City, Vietnam. Zhu argued that the city's current unsustainable form of development primarily stems from fragmented land holdings in a densely populated area. A typical plot of allocated housing land in the city is a 30–50 square meter rectangle, 3.5–4.5 meters wide and 10–15 meters long. The constraint of a very small building site, coupled with the preference to self-build, led to the prevalence of 1- or 2-story low rises with site coverage as high as 80–90%.

The concern involved with the failure of land assembly is that a value-enhancing activity that could leave every party better off than the status quo will fail to occur as a result of strategic holdout behavior and other transaction costs. In other words, the market produces too little land assembly. In consequence, some parcels are misallocated to sub-optimally dense uses (Brooks and Lutz, 2016). Where rights over land are fragmented, land tends to be underused in the sense that if it were assembled for redevelopment, it would be worth more than enough to fully compensate all the original owners for giving up their property (Shoup, 2008). In other words, the anticommons tragedy is plausible only when good substitutes are rare or absent. When no good substitutes are available in land assembly, the structure of bargaining among players is in spirit similar to the bilateral monopoly (Cohen, 1991). From the efficiency perspective, the difficulties associated with assembling small parcels into a large one also hinder the materialization of the economies of scale in production.

Review of past studies on land assembly suggests that assembly of numerous contiguous parcels is commonplace in cities, particularly in old neighborhoods where redevelopment is in great demand. Although small and large landowners are mentioned in passing in many studies, they are often not rigorously defined. If a small land owner is defined as one whose parcel is too small in itself for an economically viable development, land market in Taipei would be overwhelmingly dominated by small land owners. In this regard, supply of land for those small land owners is an all-or-nothing decision (Evans, 1986). Small land owners would either sell all their land or not sell at all. Prevalence of small land owners will greatly direct market outcome towards one in which large-scale development is difficult to take place.

All in all, if the arguments of land assembly and anticommons are valid, assembly of small parcels into a larger and developable one will be difficult. In other words, one shall observe that larger development sites tend to be ones resulting from assembly of smaller ones. Also, the size of developed parcels tends to be larger than that of undeveloped ones. Finally, the assembly activity tends to have taken years, likely through a series of acquisition of small sites. In order to empirically examine the predicted phenomenon, we first look at the new residential development sites across Taipei City to identify the rationale behind determining the sizes of development sites. This macro-city-wide study is followed by a micro-neighborhood study. We select one of the oldest neighborhoods in the city to detail the process of land reconfiguration and its relation to later development. It is hoped that additional

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