

Affordable or unaffordable? A Preliminary study of a reasonable social housing rental price range in Taipei City

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Abstract

The central government in Taiwan enacted the Housing Act in 2011, in which social housing was firstly well-defined in the housing policy history. In the Article 3, social housing built by the government or private sector with subsidies from the government that is primarily rented. Hence, each local government is required to develop the pricing model based on the housing demand. However, Taipei City for instance, the average rental price of social housing is unified by 30% off market price and apply to any income levels households. It is questionable of whether certain standard could really meet the affordability of the disadvantaged groups. The past researches were mostly concentrated on the quantity and the distribution of social housing provision. There are few studies discussing about the rent setting system, which is probing whether the pricing is actually affordable or not.

Therefore, this paper intends to examine that the social housing in Taipei City was unaffordable no matter in the past or now by using rent-to-income ratio. Furthermore, this research will review the target group, rent setting and providing mechanism in different countries. Through the case studies, Taipei City can learn the practice of other countries, and improve the problem of unaffordable social housing. According to above, this paper would practice one rent setting system of the countries, which is considered by similar economic and society structure to Taipei City, as a preliminary study of reasonable social housing rental price.

1 Background

In order to solve the housing problem, most states protect people's housing rights, which seen as basic human rights through the enactment of legislation. However, in Taiwan, housing rights is not a constitutional right (constitutional interpretation no. 558). Until the Housing Act was passed in 2011, housing rights was accepted as a basic human right, which entitled people to improvements in the quality of housing, and thus allows all citizens to enjoy suitable housing and a dignified living environment.

Although awareness of housing policy counselling subjects has become more and more common, it is still impossible to provide housing rights, which are aimed at helping all citizens enjoy suitable housing, especially the economically disadvantaged. In addition to the small amount of social housing available, the other reason this policy is not valid is because the policy does not consider the affordability of housing in the case of those who are disadvantaged.

In the Cold War (1950s), Taiwan was subsumed into the anti-communist policy that was led by the United States. At the time, the society and economy of Taiwan was unstable, and the government was unable to solve existing problems. One of the reasons for this was that almost 85% of the government budget had to be used for military expenditures, and only 15% of the budget could be used on housing supply, education, public infrastructure, and so on. The only way to solve the problem was to use the United States plan to provide loans, which was entitled the Construction of Public Housing Lending Regulations (1957-1975), to stimulate the housing market and promote economic development (Mii, F. K., 1988). At that time, the social housing (also meaning public housing in Taiwan) policy in Taiwan was a contingency system aimed at accommodating a large number of post-war immigrants and homeless citizens.

In the 1960 s, Taiwan for the first time successfully entered a period of international trade and economic development was based mainly on external trade, which kept the domestic economy growing and the national income increasing. Due to the growing economy, the housing filtering process improved the national ability to enter the housing market and solve the housing problems existing at that time.

However, in the early 1970 s, as a result of the global economic downturn and stagflation, stagnation made the housing supply system inoperable. Upper middle class household incomes could not keep up with housing prices, and the low-income households could not afford basic living needs. In response to the situation, the government enacted the Public Housing Act in 1975, which was an attempt to build a large number of public housing projects to protect the housing rights of the disadvantaged (Mii, F. K., 1988).

According to Article 16 in the Public Housing Act, the public housing price was set in reference to the market price of nearby properties with specific deductions. In this period, public housing prices were lower than general housing prices, but there was still a gap between public housing prices and the affordability of housing for low-income households. According to the population based on a housing survey, vacant public housing stock rose to 820,000 units, which highlighted the problem of unaffordability (Executive Yuan, 1994). As a result, the housing policy involved the consumption of a large amount of public housing stocks, and private investment was not encouraged in the construction of public housing after 2000 (Lin, W. I., 2003).

After the Housing Act was announced in 2011, the government began to supply social housing that was primarily rental housing, which was built by either the government or the private sector with subsidies from the government. In the draft of the Regulation on Lease of Social Housing in Taipei, the rents for social housing were to be set in reference to the market price of nearby properties with specific deductions just like the price setting for public housing. Due to the increasing housing prices in Taipei, rent, which was deducted from the market price, was limited to protect the housing rights of low-income households.

2 Literature review

2.1 Social housing in Taipei City

In order to meet the housing needs of low-income households and to make housing affordable to citizens, after the Housing Act passed in 2011, the administration in Taipei City began to promote acquiring a house by leasing rather than buying. The government combined the resources from the government and private sector to increase the supply of social housing; on the other hand, the government improved the affordability of housing for low-income households through providing subsidies to them.

Government properties are the key to driving the modes of supply of social housing in Taipei City, including construction directly by the government, reconstruction or renovation of a public building, and coordination with urban renewal (Department of Urban Development, 2012).

The operation of social housing involves the government retaining ownership of the land and buildings, where applicants for social housing can enjoy use rights during the period of the lease. To maintain quality of living, the government entrusted the private sector to with the management of maintenance of these properties. The Taipei City government established a housing fund to ensure that the operation was successful, which involved the use of subsidies from the central government and social housing revenue as the funding sources.

In order to protect the housing rights of low-income households, the applicant qualifications set a limit to age, household composition, household income, and so on. On the other hand, the rents were set according to the local rent standards, with the social housing rent being set at usually 30% less than the market rent (Liu, H. S., 2014).

Table 1 Taipei City social housing statistic

Social housing Program	Dalongdong	Dunhuang	Hsingtien Temple	Wanlong	Jingwen	Yongping
Households	110	3	30	41	39	51
Average living area (m ²)	137.09	109.09	42.98	70.18	111.83	155.37
Applicant qualification	Household income at the first and second quintiles: annual income under 1,190,000 NT dollars → monthly income under 99,167 NT dollars					
Average rent	16,600	21,900	12,150	14,785	19,375	12,050
Social housing Program	Longshan Temple Station	Gangqian Station		Taipei Bridge Station	Xindian Depot Station	
Households	11	14		327	218	
Average living area (m ²)	80.10	39.67		49.59	42.98	
Applicant qualification	Household income at the first and second quintiles: annual income under 1,190,000 NT dollars → monthly income under 99,167 NT dollars					
Average rent	23,100	24,600		20,300	18,000	

Source: Social Housing Advocacy Consortium (2015)

According to the Taipei City Family Income and Expenditure per Household Survey conducted in 2013 (Table 2), qualified applicants accounted for 38.48% of all households in Taipei City whose monthly income ceiling was 100,000 NT dollars. While the household income was in a range between 67 to 75 thousand NT dollars per month, the affordable resident expenditure was under 22.5 thousand NT dollars, which is lower than the 30% rent-to-income ratio. Although these households were qualified to apply for social housing, they may not have been able to afford it, such as the social housing at Longshan Temple Station and Gangqian Station. These kinds of households, who qualified to apply for social housing without the ability to afford it, accounted for 28.11% of all households in Taipei City; on the contrary, the households who both qualified and could afford the housing made up only 10.37% of all households in Taipei City.

Table 2 Taipei City Family Income and Expenditure per Household Survey

annual income (thousand NT dollars)	monthly income (thousand NT dollars)	households	percentage	Accumulated Ratings
0 - 500	0 - 420	41,847	4.10%	4.10%
500-600	420-500	27,071	2.65%	6.75%
600-700	500-580	43,441	4.25%	11.00%
700-800	580-670	48,625	4.76%	15.76%
800-900	670-750	64,355	6.30%	22.06%
900-1,000	750-830	61,795	6.05%	28.11%
1,000-1,100	830-920	53,628	5.25%	33.36%
1,100-1,200	920-1000	52,272	5.12%	38.48%
1,200-1,300	1000-1080	59,718	5.85%	44.33%
1,300-1,400	1080-1170	55,493	5.43%	49.76%
2,800-3,000	233-250	20,353	1.99%	91.61%
3,000-4,000	250-333	55,678	5.45%	97.06%
Over 4,000	Over 333	30,009	2.94%	100.00%
Total		1,021,434	100.00%	---

Resource: Taipei City government DGBAS (2013)

According to the Health and Welfare Department of the Taipei City government, middle-income and low-income households are identified by the monthly income per person, which is 19,461 NT dollars and 14,794 NT dollars, respectively. By using these values to multiply by the average number of household members (3.21), lower-middle-income households can be identified by a household monthly income of under 67 thousand NT dollars. Thus, the household monthly disposable income can be calculated as 20,100 NT dollars, which is lower than some social housing rental fees. Therefore, unaffordable social housing is a concrete actuality in Taipei City.

2.2 Case Study

According to the preceding discussion, the major reason that social housing is unaffordable is that the rent is set based on the peripheral market price rather than the affordability of the applicants. Therefore, this research is an attempt to use experiences, including the use of target groups and the rental systems of other countries whose social housing development background and supply are dealt with in a manner similar to those in Taiwan.

Governmental participation in social housing can be divided into 4 types according to different supply modes and the degree of involvement. The first type is absolutism, where the housing supply relies entirely on the government such as is the case in some communist countries. The second type of social housing supply is mainly provided from the government such as is the case in Singapore. The third type of supply mode is similar to a public private partnership in which the government shares the burden with the private sector; for instance, in the Netherlands and Japan. The last one is a mode inducing the private sector to participate in the social housing supply through urban planning, housing standards, and the encouragement of development that is controlled by the government, for example, the United States (Chang, C. O., 1990).

By integrating the operation of social housing in Taipei as discussed in Section 2.1 with the classification used by Chang (1990), the supply mode, including the provider, the supply method, and the management of social housing are the third type, which is approximately the same as that used in the Netherlands and Japan. On the other hand, the funding and provision of social housing in Taipei tends to be the fourth type and are similar to the mechanism in the United States. Therefore,

the following table provides an analysis of these three cases for supply operation, target group and rent setting for social housing.

Table 3 The form of governmental participation in social housing in

Taipei City			
Target group	Social housing provider	Land provider	Funding
lower-middle-income households	Local government Private sector	government property (local government)	Housing funding (local government)
Supply modes	Property	Management	Rent setting
1. Build directly by government 2. Participate in urban renewal	Local government owns the ownership. The applicants own the use right.	Private sector	30% off the market rent

2.2.1 The Netherlands

After the Housing Act passed in 1901, the government paid a great deal of attention to formal housing associations (HAs) which had the authorization to privatize, and entitled the HAs to funding and basic rights. Social housing was supplied by the cooperation of the government and the institutions for which the government was responsible for providing financial support, including subsidies, long-term low-interest loans, or providing cheap land for building sites, and the HAs took charge of the construction.

Because of housing shortages and the fact that a lot of houses had to be renovated or rebuilt after the Second World War, extensive construction of rental housing was promoted, and the rent was set at a lower price to provide social housing to all citizens with housing needs during the 1950s. To maintain the lower rent, the government regulated the setting of rents and loans, which made the supply-demand relation between the HAs and the tenants more dependent on the government. As a result, the subsidy burden on the government became higher in the late 1980s (J. van der Veer, D. Schuiling, 2011)

In the national policy report *Housing in the 1990s*, a regime shift, in which social housing and subsidies changed from including all citizens to only low-income households, social housing was announced, which has now been implemented for years. In response to the change, the HAs had to transform into financially independent self-financed social enterprises.

The new cabinet after the 2010 election suggested a gradual increase in the limit on the social housing applicant qualifications. The suggestion was enacted in the new regulation announced in 2011, and the most important measure was that 90% of all new lettings of social housing had to be allocated to households whose income was below the annual income standard at the time. The rent of all rental housing including social housing was set by a governmental rent point system. The system scores the housing points using a scale, location, structure, form, furnishings and so on. A higher score indicates better housing conditions which are allowed to charge a higher rent. The minimum score is 40 points, corresponding to an annual minimum rent of 19,466, and the marginal price is point.

2.2.2 Japan

After the Second World War, the Japan government started to improve housing quality for low-income households. Thus, the government established the Government Housing Loan Corporation for the purpose of providing low-interest loans starting in 1950. The next year, the government enacted the Public Housing Act. In 1955, the government empowered the Japanese Housing

Corporation to manage construction and planning. These acts and corporations are the three pillars of the Japanese public housing system (Liu, D. W., 2007).

In the early 1990s, Japan experienced a severe financial crisis, which was a turning point in its housing policy. The Prime Minister, Hashimoto, raised the need to curtail public spending in 1997; therefore, the private sector took the initiative to promote a public-private partnership, and enacted the PFI Act in 1999. Since the PFI Act passed, social housing activities have integrated public assets and private funds; that is to say, while the private sector builds and owns the social housing, the management and contracts are controlled by the government.

The Public Housing Act mandated that social housing be provided by the local government and housing corporations. The central government was only responsible for providing capital subsidies, which were separated into two kinds of subsidies. One included the construction or acquisition costs, and the other type of subsidy was for the landlords to subsidize the difference between the rent benchmark price and the market price.

The operational mode of Japanese social housing is determined by the local government, who manages the social housing allocation procedures, including the announcements, acceptance of applications, qualification assessments, rent setting, and so on (Mao, S. J., 2010). In addition to the household income level, there are more factors to be considered in the rent setting system, such as the family composition and the characteristics of the housing in different locations (Maruyama, G., 2013). The formula for setting the rent is shown below.

Rent = The rent benchmark price Urban land price coefficient
Area and scale coefficient The life time coefficient Convenience coefficient

The target group for social housing is households whose income is under the first quartile (25%) of all households, and the monthly income is under 200,000 yen. The rent benchmark price is set by 70% off the monthly income. The urban land price coefficient is set by the land price index variation, which reflects the urban land price fluctuations. The area and scale coefficient is the ratio of living area to the standard housing area per household. The life time coefficient considers the depreciation and age of housing, which is different from the building composition and materials. Lastly, the convenience coefficient reflects the influence on pricing from location, transportation, and surrounding facilities.

2.2.3 The United States

Affordable housing programs in the United States are carried out through a partnership among the federal government, local housing associations and private property owners.

During the Great Depression, the Housing Act of 1937 allowed the state governments to establish local public housing authorities (PHAs) as a provider of social housing to promote more employment opportunities and satisfy the housing needs of low-income households. In the Second World War period, the housing issue was not taken seriously until the war was over, and housing demand was inflating. To solve the problem, the Housing Act of 1949 was passed and revived the social housing program.

The government turned the concept of eliminating urban poverty using social housing into a living purpose-driven program which was aimed at improving the housing quality of the lower-middle class and reducing urban recession (Huang, Y. M., 2013). With this in mind, the federal government handed over the responsibility of the social housing program to the US Department of Housing and Urban Development (HUD) in 1965.

However, members of the US Congress and the Nixon Administration amended the Housing Act of 1937, creating a new Section 8 Housing Assistance Program, which is responsible for providing affordable housing for households whose income is under the local median income, to replace Section 23.

J. Gresley (2011) pointed out that Section 8 makes use of a private market investment and ownership structure. Two of the important programs in Section 8 are the Housing Choice Voucher (HCV) program and the Project Based Section 8 program, which are coupled with HUD mortg

In the HCV program, social housing applicants have to examine the qualifications according to their household income and then set a part of their income as rent (usually 30-40% of their total income). The difference between 30% of the household income and the fair market rent announced annually by HUD decide the value of the HCV. The households pay their rent directly to the owner, while the housing associations make a payment to the owner monthly which covers the difference between the household rent and the fair market rent.

The Project-Based Section 8 program allows HUD to set secured credit for developers, who can get a low-interest loan from banks and reduce the cost of construction to provide housing within a lower rent range. The operational mode of the Project-Based Section 8 program is similar to that of the HCV program, which sets 30% of the household income as the social housing rent, and the difference between the social housing rent and the fair market rent is covered by HUD.

As the subsidy standard, the fair market rent is usually set at the 40% quantile of the market rent. The fair market rent, which can be impacted by the scale, quality, location, age, and the furnishings of the house, is adjusted in accordance with the annual Consumer Price Index.

2.2.4 Summary

According to the cases from different countries, housing associations in the Netherlands are the main planners, providers and operating units for social housing. Cooperation between local governments and corporations is the key to operating the social housing system. The federal HUD in the United States guides the supply of social housing with abundant funding through both market mechanisms and subsidies.

Table 4 Case study in the Netherland, Japan, and the United St

Countries	The Netherland	Japan	The United States	Taiwan
Target group	lower-middle-income households	the household income under 25% of all citizens	the household income under 50% of all citizens	lower-middle-income households
Social housing provider	HAs	local government private sector	associations and developers	local government Private sector
Land provider	government	government property and private land	associations and developers	local government
Funding	HAs government	central government	federal HUD	local government
Supply modes	HAs	1. build by government or corporations 2. PFI	associations and developers	1. build directly by government 2. participate in urban renewal
Property rights	rent from HAs	rent from the local government or corporations	rent from the house owner	rent from the government
Management	HAs	corporations and private sector	house owner	private sector
Rent setting	rent point system	The formula (1)	1. 30% of the income 2. Fair market rent	30% off the market rent

Relative to Taiwan, there are neither social entrepreneurs as large as the housing associations in the Netherlands, which are able to assume the supply of social housing independently, nor is there a public sector as rich and influential as HUD is in the United States. As a result, the most similar case to Taiwan is the Japanese social housing system including a societal structure, provider and operational mode. Because the system of social housing rent setting is unfinished in Taipei City, this article is an attempt to use the rent setting formula and coefficients in Japan to assess the affordable rent price range in Taipei City as a preliminary study.

3 Empirical research

3.1 Research Design

In this paper, Taipei City is taken as the research field, and the household income and expenditure survey conducted in 2013 is used to discuss the low-income household affordable rent range for the

2 social housing programs under construction, which are the Dongming and Xinglong social housing programs.

First, parameters are set, including income grading, the urban land price coefficient, area and scale coefficients, and the convenience coefficient. Income grading is used to ensure the applicant qualifications for social housing, for instance, the households in Japan whose income level is less than 25% of all citizens. The urban land price coefficient is used to react to the urban land price fluctuations and is set by the Land Price Index from each region. The area and scale coefficients refer to the concept of standard household housing areas from the social housing in Japan. The lifetime coefficient refers to building depreciation and differences among structures. Because the social housing in Taiwan has been developed recently, take a social housing program founded in 2011 in Taipei City for example, the life time coefficient would be 0.996. The convenience coefficient is mainly used to react to the impact of location and building characteristics. After setting the parameters, the affordable rent is calculated using the coefficients and the rent benchmark price.

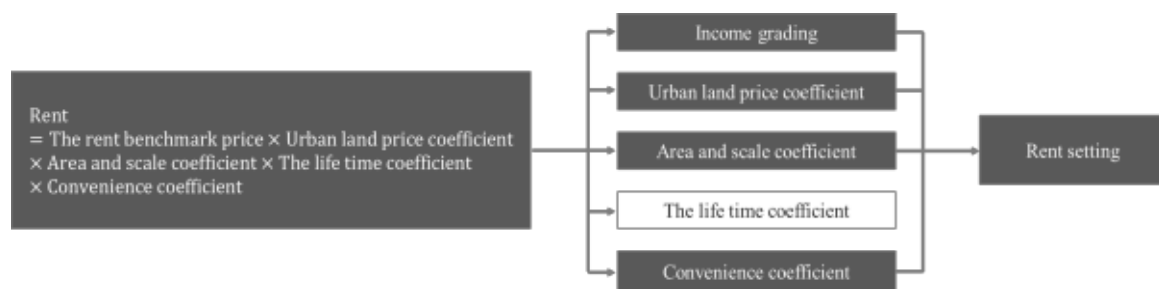


Figure 1 Research lifetime

3.2 Research Procedure

3.2.1 Income grading

The applicant qualifications for social housing in Japan include households whose income level is less than 25% of all citizens and a limit on monthly household income is set at 200,000 yen; 70% off the household monthly income is set as the rent benchmark price.

According to the household income and expenditure survey in 2013 in Taipei City, the monthly disposable income is divided into five equal parts. The target groups for social housing in Taipei City are in the first and second quintiles, namely the households whose monthly income is under 78,061 NT dollars, and the rent benchmark price is under 23,418 NT dollars.

Table 5 The household income and expenditure survey

Quintile	1st (0-20%)	2nd (20-40%)	3rd (40-60%)	4th (60-80%)	5th (80-100%)
Average annual income	572,682	936,732	1,315,989	1,800,832	3,100,837
Average monthly income	47,724	78,061	109,666	150,069	258,403
rent benchmark price	14,317	23,418	32,900	45,021	77,521

Resource: Taipei City government DGBAS (2013)

3.2.2 Urban land price coefficient

The urban land price coefficient is intended to react to urban land price fluctuations and is set according to the land price index from each region. The larger the city, the higher the coefficient. The value is announced yearly by the Ministry of Land, Infrastructure, Transport and Tourism

(MLIT) in Japan. Due to the narrow range of land price changes after 1996, the coefficient is in an area within 0.7-1.7.

Relatively, the measurement of the coefficient in Taipei refers to the fluctuation rate of the land price index. The higher the fluctuation rate is, the more concentrated the development is. According to Table 6, the urban land price coefficient in Taipei City is 1.0406.

Table 6 The fluctuation rate of land price index in 5 municipalities

	Taiwan	Taipei City	New Taipei City	Taichung city	Tainan City	Kaohsiung city
2014	110.38	108.84	116.72	112.45	107.85	111.71
2013	105.79	104.59	108.55	110.00	104.36	105.51
fluctuation rate	1.0434	1.0406	1.0753	1.0223	1.0334	1.0588

Resource: Taipei City government DGBAS (2013)

3.2.3 Area and scale coefficient

The area and scale coefficient is assessed by the ratio of living area to the standard housing area per household, which is 70 m² as announced by the Public Housing Enforcement Order in 2006.

Due to the high urban density, the expensive land prices, and the similar forms of housing, the standard housing area uses the average living area of an apartment or studio apartment per household. According to the residential and real estate statistics in 2013 in Taipei, the standard housing areas for apartments and studio apartments are 96.41m² and 41.30m², respectively.

In order to respond to the applicant's family composition, there are four different social housing provided in Taipei. Therefore, as Table 7 shows, there are 4 coefficients in each case of social housing in Taipei.

Table 7 The 2 developing programs of social housing in Taipei City

Room type	Dongming social housing				Xinglong social housing			
	Apartment			Studio apartment	Apartment			Studio apartment
No. of Rooms	1	2	3		1	2	3	
Living area (m ²) (A)	36.36	56.20	76.03	29.75	41.32	54.55	69.42	26.45
Standard housing area (m ²) (B)	96.41			41.30	96.41			41.30
Coefficient (A) (B)	0.38	0.58	0.79	0.72	0.43	0.57	0.72	0.64

Resource: Taipei City government DGBAS (2013)

3.2.4 Convenience coefficient

The convenience coefficient is intended to mainly react to the impact of location and the building characteristics, which is different from transportation convenience, peripheral facilities, furnishings in the building, and so on. The relation between the factors can be formulated as:

$$\text{Convenience coefficient} = \frac{\text{site condition}}{\text{Urban land price coefficient}} \times \text{furnishings condition} \quad (2)$$

The site condition in Japan is the ratio of the social housing asset price to the surrounding real estate asset ceiling, which can be formulated as:

$$\log_0 \frac{\text{social housing asset price}}{\text{surrounding real estate asset ceiling}} \quad (3)$$

Two cases in Taipei City that are under construction are used for assessment, and the site condition value is shown in Table 8.

Table 8 The convenience coefficients of the 2 program

Program	Social housing asset price (NT dollars) (A)	Surrounding real estate asset ceiling (NT dollars) (B)	()	()	Site condition
Dongming	3,421,052	44,500,000	6.5341597	7.6483600	1.1705193
Xinglong	10,909,090	31,500,000	7.0377885	7.4983106	1.0654356

The furnishings condition in Japan is similar to the rent setting scoring system in the Netherlands. In Japan, the furnishings condition is used to check whether the provider supplies the basic furnishings or not. Contrary to Japan, both of the cases in Taipei City provide bedding, sink and other basic furniture to allow people to easily move in. Therefore, the rent setting in Taipei City eliminates the furnishings condition.

3.2.5 Summary

To integrate all of the coefficients and bring the different household income levels into consideration, the formula for the rent setting system is shown below.

$$\text{Affordable rent} = \frac{\text{The rent benchmark price} \times \text{Urban land price coefficient}}{\text{Area and scale coefficient} \times \text{Convenience coefficient}} \quad (4)$$

In response to the four types of rooms for Donming and Xinglong social housing, and the two levels of household income, we can obtain 16 affordable rent prices calculated from the formula.

Because Donming and Xinglong social housing is still under construction, the government only indicates that the rent is unified by 30% off the market price. According to the surrounding housing rent through transactions from the period 2011-2014, the average rent of the housing nearby Donming social housing is 19,250 NT dollars per month, which means that the Donming social housing rent could be 13,475 NT dollars per month. On the other hand, the average rent of the housing nearby the Xinglong social housing is 45,000 NT dollars per month; that is, Xinglong social housing rent could be 31,500 NT dollars per month.

In one respect, some of the affordable rents are higher than 30% off market price, which means the government can set a lower price as the social housing rent. In addition, when the affordable rent is lower than the reductive market price, the government should provide subsidies from housing funding in Taipei City to cover the difference or cut the social housing rent to meet the affordability of the applicant.

Table 9 The coefficients and affordable rent range in Taipei City

	Income level	Room type	rent benchmark price	Urban land price coefficient	area and scale coefficient	Convenience coefficient	Affordable rent	
Dongming social housing	1st quintile (0-20%)	Studio apartment	14,317 NT dollars	1.0406	0.72	0.854322	9,164	
		Apartment			1 room		0.38	4,837
					2 room		0.58	7,382
					3 room		0.79	10,055
	2nd quintile (20-40%)	Studio apartment	23,418 NT dollars		0.72		14,990	
		Apartment			1 room		0.38	7,911
					2 room		0.58	12,075
					3 room		0.79	16,447
Xinglong social housing	1st quintile (0-20%)	Studio apartment	14,317 NT dollars	0.64	0.938583	8,949		
		Apartment		1 room		0.43	6,013	
				2 room		0.57	7,971	
				3 room		0.72	10,068	
	2nd quintile (20-40%)	Studio apartment	23,418 NT dollars	0.64		14,638		
		Apartment		1 room		0.43	9,835	
				2 room		0.57	13,037	
				3 room		0.72	16,468	

4 Conclusion

Through the calculation, the social housing rent can be turned into a quantification formula, which considers not only household income level, but also residential location, convenience and other factors affecting the rent. Compared to the deduction from the market price, the rent calculated from the formula is more able to prove that it is affordable.

However, the formula in this research is still rough and limited to data acquisition; for instance, income grading. The income grading should be subdivided into more levels, and household monthly income per person instead of average monthly household income should be used to take household structure into consideration.

To maintain affordable rent, the rent setting formula is not adequate. There also needs to be subsidies from the government to keep social housing management operating. Taking the United States as an example, one of the methods used to achieve affordable social housing has been to cover the difference between the rent and market value rent for the landlords.

In conclusion, to make social housing in Taipei more and more affordable, besides bringing refinement to the formula, the related policies and mechanisms should be collaborated on.

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