

## DETERMINANTS OF HOUSING CONSUMPTION AND RESIDENTIAL CROWDING IN HONG KONG

Wadu Mesthrige Jayantha

*Dept. of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong,  
bsmjwadu@polyu.edu.hk*

Eddie C. M. Hui

*Dept. of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong,  
bscmhui@polyu.edu.hk*

### Abstract

The goal of this paper is to examine the dynamics of housing consumption and residential crowding in Hong Kong over the last two and half decades. The study introduces a new factor, land supply to the model of housing consumption and residential crowding along with other standard variables. Empirical results provide strong evidence that the introduced new factor, land supply, exert significant influence on housing consumption and crowding. Findings suggest that current land supply policy should be changed aggressively, away from the current ‘high land price’ policy towards comprehensive developments in outer urban areas in order to improve housing consumption for all strata of the population. It is still clear, however, that market factors are also playing a significant role in shaping housing consumption. This study adds knowledge to previous works as it analyzes changing nature of dynamics of residential crowding and underlying causes of housing consumption and crowding over the years rather than in a particular point in time. And this is the first of its kind in Hong Kong.

**Keywords:** Housing consumption, residential crowding, Hong Kong

### 1 Introduction

Residential crowding seems to be a norm rather than being exceptional in Hong Kong. Even much more evident is the overcrowding phenomenon in the private housing units, with several households sharing one small unit (Ho and Wong, 2009). For instance, floor space consumption by most of the households in Hong Kong is far shorter than they need. The average floor-space per person *SPP* (hereinafter *SPP*) is significantly low in Hong Kong – much smaller than that in developed countries (see **Table 1**). Even by modern standards, the average Hong Kong people lives in a much smaller space than in comparable cities across the world. The average area of 15.6m<sup>2</sup> per person in Hong Kong was lower than the minimum space standards of 21m<sup>2</sup> and 18m<sup>2</sup> per person in the UK and Japan, respectively (Hui *et al.*, 2004). According to the US Census Bureau, the *SPP* in the USA is 66.3 m<sup>2</sup> 1999 (Huang, 2003) – almost four times that of Hong Kong. On the other hand, the average size of housing unit is also very small with an average of 40-45 m<sup>2</sup> (**Figure 1**) and a large proportion of units are old and aging rapidly. This gives an indication of residential crowding and quality of housing in Hong Kong. As high density

dwelling units with high ground densities in Hong Kong is an extremely serious problem, this issue warrants serious attention for the government, society and academics.

Yet research on housing consumption and residential crowding in Hong Kong has been quite limited. This important gap in the literature – examination of housing consumption and residential crowding in Hong Kong - has largely gone uninvestigated for some reasons. The main goal of the present study is to **(a)** evaluate levels of housing consumption and residential crowding; and **(b)** to explore significant determinants of housing consumption and residential crowding in Hong Kong, and suggest an explanation for their underlying dynamics. To our knowledge, this study is the first of its kind in Hong Kong to fill this gap.

**Tab. 1** Housing conditions across various cities/countries

	Hong Kong <sup>(a)</sup>	Japan <sup>(c)</sup>	Singapore <sup>(b)</sup>	US <sup>(b)</sup>	UK <sup>(b)</sup>	Denmark <sup>(b)</sup>	Sweden <sup>(b)</sup>
Average floor space per person	14 m <sup>2</sup>	31 m <sup>2</sup>	20 m <sup>2</sup>	67 m <sup>2</sup>	35 m <sup>2</sup>	52 m <sup>2</sup>	43 m <sup>2</sup>
Average floor space per dwelling	45 m <sup>2</sup>	95 m <sup>2</sup> <sup>(d)</sup>	----	174 m <sup>2</sup>	85 m <sup>2</sup>	109 m <sup>2</sup>	90 m <sup>2</sup>
Average persons per dwelling	3.0	2.7 <sup>(d)</sup>	----	2.6	2.4	2.1	2.1

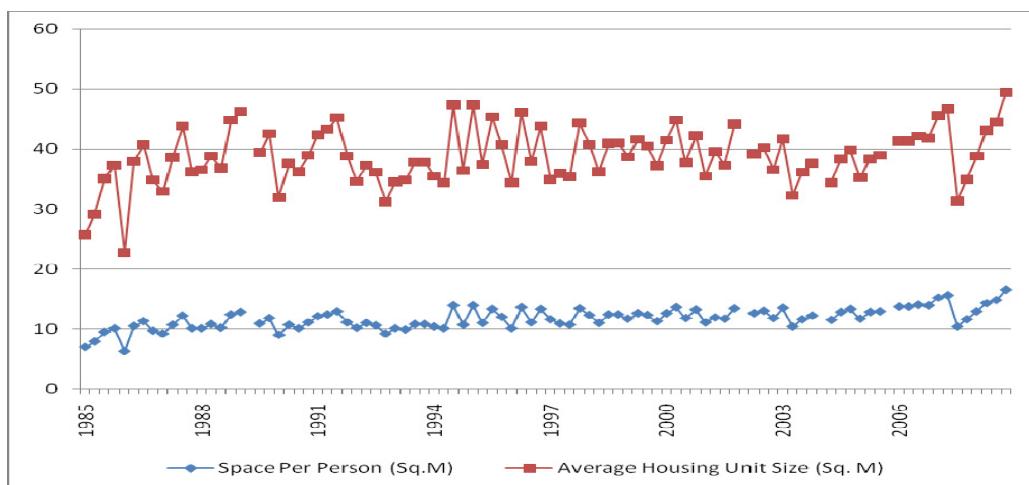
Sources: <sup>(a)</sup> Hui *et al.*, (2004)

<sup>(b)</sup> Extracted from Rector (2007)

<sup>(c)</sup> Extracted from Research & Library Services Division, Hong Kong Legislative Council Secretariat (1999)

<sup>(d)</sup> Organization for Housing Warranty, Japan (2005)

Note: Survey years are different across the countries



Note: Usable floor area has been considered

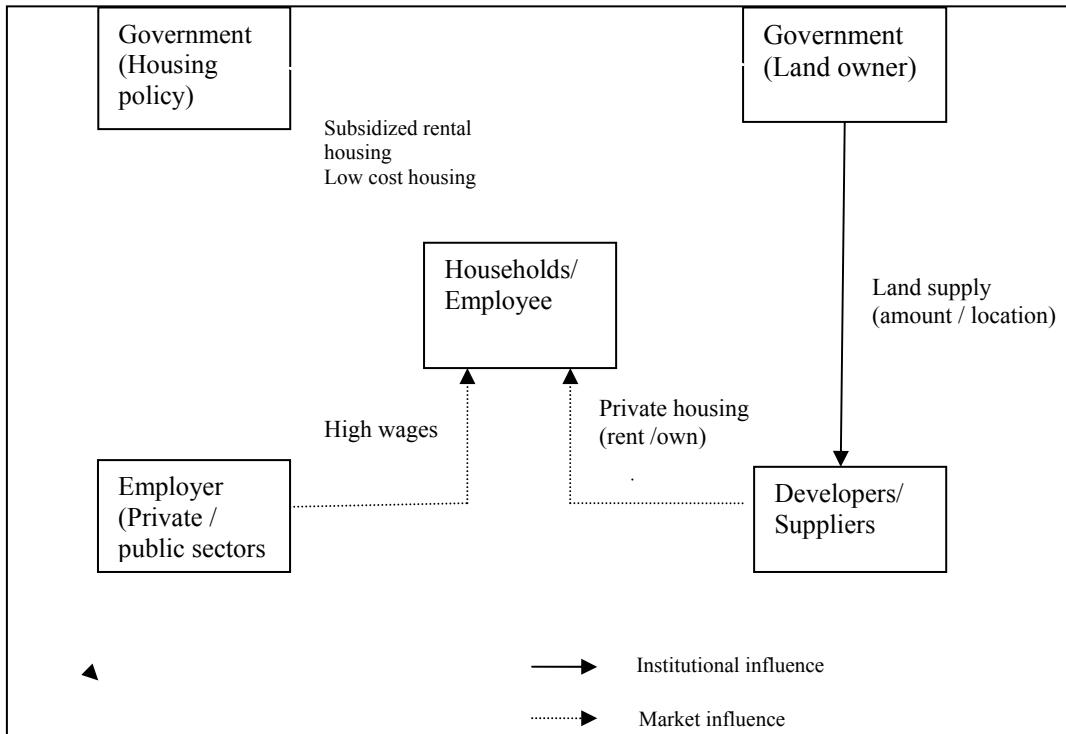
Source: Compiled from *Monthly Statistics (various issues)*, Buildings Department; and *Monthly Digest of Statistics*, Census and Statistics Department

**Fig. 1** Average Housing Unit Size and Average Space per Person

## 2 Determinants of Housing Consumption and Residential Crowding

Even though Hong Kong is considered one of the freest economies in the world, the government plays a significant role in the housing market (Ho and Wong, 2009). The government is involved in housing market in two dimensions: *first*, as the sole owner of

land, government decides when, where and how much new land will be released to the housing market (see **Figure 2**); *second*, it provides some public housing. Therefore, in addition to housing market factors and household characteristics (Clark *et al.*, 1994; Deurloo *et al.*, 1994), institutional influence on housing consumption is also important in Hong Kong. Thus, we hypothesize that although housing consumption and residential crowding in Hong Kong is controlled by market and demographic related factors; institutional factors also play an important role (these factors are shown in **Figure 3**).

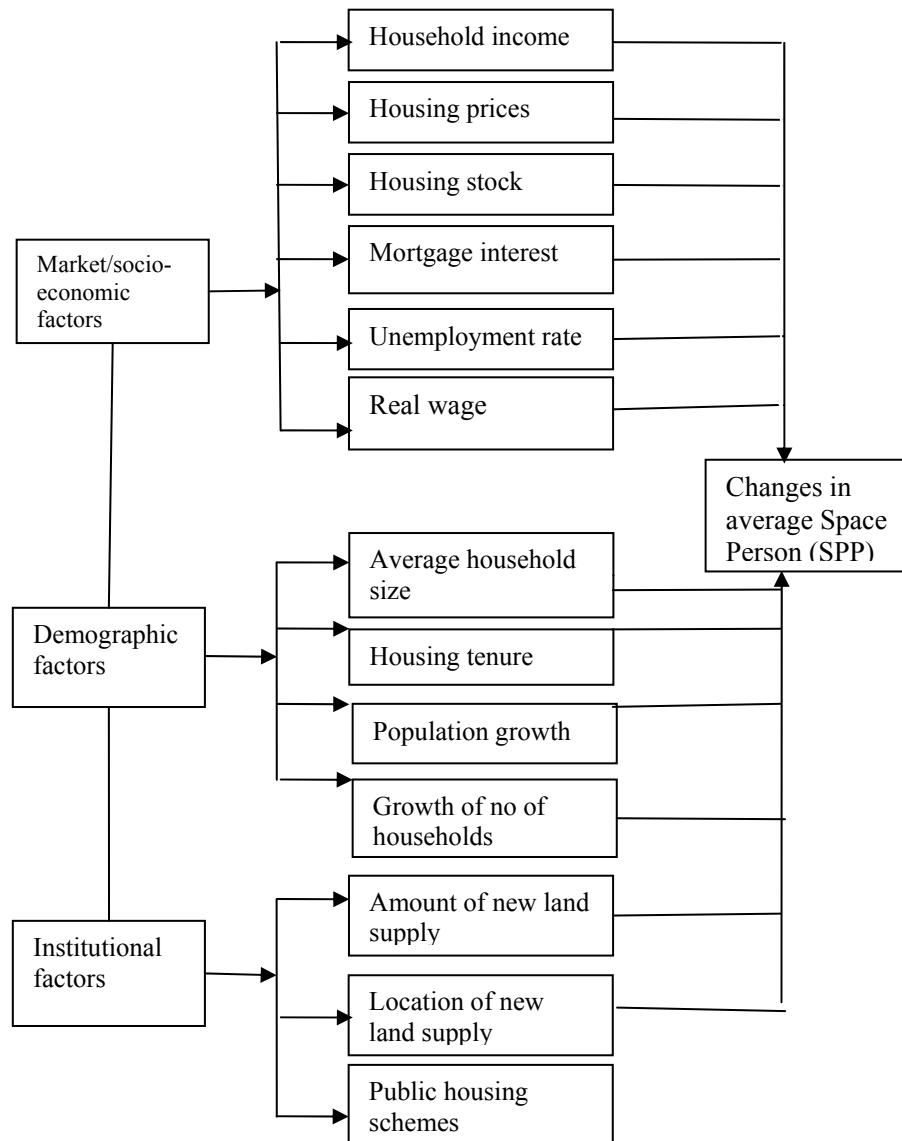


**Fig. 2** Government influence on Housing Consumption - Hong Kong Economy

### 3 Empirical Analysis

#### 3.1 Variables and Data Description

Housing consumption and residential crowding in the study are measured by the amount of living space a household occupies ( $m^2$ ), the amount of space per person ( $m^2$ ) and an indicator of space stress, i.e. ‘space per person stress’. ‘Space per person stress’ is measured by the deviation from the mean value of space per person. If actual space usage is greater than the average space usage, it is an over consumption situation. A negative space-stress value indicates that household members do not have adequate living space – *i.e.* under consumption. On the other hand, a positive space-stress value indicates that household members use space more than what they need – *i.e.* over consumption. The study employs quarterly data from 1985:1 to 2008:4. Three different sets of explanatory variables: market, demographic and institutional, are used in the empirical analysis (see **Figure 3**).



**Fig. 3** Flow Diagram of Determinants of Housing Consumption and Crowding

### 3.2 Multivariate regression models

A multivariate regression analysis is carried out to reaffirm the results obtained from correlation and univariate regression analyses<sup>1</sup>, and also to identify significant determinants of housing consumption and crowding. Findings of this analysis are reported in **Table 3**.

<sup>1</sup> Results are not reported in the paper due to space limitation, available upon request.

**Tab. 3** Housing consumption and crowding: Multivariate regression analysis:

	Model 1 Space per person (m <sup>2</sup> ) (SPP)	Model 2 Average housing unit size (m <sup>2</sup> )(AHU)	Model 3 Space stress (SPSTRESS)
<b>Market factors</b>			
Household income (LHY)	0.404*	0.434*	3.626**
Housing price (LHP <sub>t-1</sub> )	-0.192*	-0.169**	-1.439
Unemployment rate (LUNM <sub>t-1</sub> )	-0.380	-0.043	-0.529
Real wage (LRW)	-0.215	-0.221	-----
Housing stock (LHS)	-0.023	-0.185**	-2.110**
<b>Household characteristics</b>			
Average household size (LAHS)	-1.013**	-----	-9.341
Population growth (POG)	-----	0.039	0.441
Growth of number of Housing tenure (LHOR)	-----	0.827*	8.591**
<b>Institutional factors</b>			
Land supply – the amount (LLS <sub>t-1</sub> )	-0.043*	-0.034*	-0.418*
Land supply – the Location			
- Dummy variable (LLS1 <sub>t-5</sub> )	-0.039**	-0.041*	-0.439**
- Proportion (LLS2 <sub>t-5</sub> )	0.022*	0.024*	0.227*
Constant	2.572*	1.527**	-10.138
Number of observations	88	88	88
R-square	0.461	0.259	0.478
D.W- statistic	2.036	1.912	1.909
F-statistic	7.518	2.724	7.132

Notes: all variables are in natural logarithms form, except for population growth. The symbol \* indicates correlation coefficient significant at the 0.05 level and \*\* indicates significant at the 0.10 level.

The land supply variable is found to be highly significant, with a negative sign. This negative sign indicates that land supply policy has not assisted in improving housing consumption because land supply over the last decade has been mainly concentrated in inner city areas. The land supply in inner city areas do not help to uplift housing consumption as urban houses are not affordable for many people. As land supply increases in cities, housing consumption on average declines in terms of SPP simply because many people cannot afford larger houses in cities; and thus it forces more than one household to live in one small unit. This finding is consistent with the current ‘high land price’ policy which favours increasing land supply through massive reclamation rather than through comprehensive developments in outer urban areas.

As shown in models 1 and 2, among market factors, household income, housing price and stock of housing influence housing consumption significantly. Among these, households with larger income seem to be the most significant determinant of housing consumption. Interestingly, both SPP and AHU models yield almost the same magnitude of coefficients (0.404 and 0.434, respectively). Housing price is also found to be significant and also exhibits the expected negative sign, unlike in previous univariate cases.

Among demographic factors, housing tenure and average household size exert a strong influence on housing consumption and residential crowding. Ownerships have

strong positive effects on amount of living space households have, with a one percentage point change in ownership causing a 0.8 percentage point change in housing consumption. In summary, it is clear that the housing consumption and residential crowding in Hong Kong are determined not only by market and demographic factors, but also institutional factors. Although household income, household size, housing tenure and housing price have strong effects, institutional factors, especially location of land supply is found to be extremely important on housing consumption and crowding. It is also interesting to note that magnitudes of the coefficients for location of land supply in both models 1 and 2 are quite similar, which also indicates the importance of location of land supply on housing consumption. It should also be noted that housing consumption in the current period is influenced by the land supply in previous periods, in our analyses it was found last 5<sup>th</sup> quarter. This is to be expected as there is an inherent time lag between the decision to start a project and the completion.

## 4 Conclusion and Discussion

Findings suggest that current land supply policy should be changed aggressively, away from the current ‘high land price’ policy towards comprehensive developments in outer urban areas in order to improve housing consumption for all strata of the population. The government should relax its restrictive land supply policy by making use of the abundant non-built up land in Hong Kong if we are to achieve the objective of affordable housing and a better living environment for low and middle income people. One of the major options available to address residential crowding issue is to push people to outer urban areas, with some sensible town planning, such as the New Territories and some other places where there are still lots of unutilized lands available. This can only be done by the government authorities as the sole owner of land. Thus, the institutional influence on housing consumption in Hong Kong will be as important as ever before.

## References

- [1] Clark WAV, Deurloo M C, Dieleman F M, 1994, “Tenure Changes in the Context of Micro-level Family and Macro-level Economics Shifts” *Urban Studies* **31** (1) 137-154
- [2] Deurloo M C, Clark WAV, Dieleman F M, 1994, “The Move to Housing Ownership in Temporal and Regional Contexts” *Environment and Planning A* **26** 1659-70
- [3] Deurloo M C, Dieleman F M, Clark WAV, 1987, “Tenure Choice in Dutch Housing Market” *Environment and Planning A* **19** 763-781
- [4] Ho L S, Wong G, 2009, “The First Step on the Housing Ladder: A Natural Experiment in Hong Kong” *Journal of Housing Economics* **18** 59-67
- [5] Huang Y, 2003a, “A Room of One’s Own: Housing Consumption and Residential Crowding in Transitional Urban China” *Environment and Planning A* **35** 591-614
- [6] Huang Y, 2003b, “Renters’ Housing Behavior in Transitional Urban China” *Housing Studies* **18**(1) 103-126

- [7] Hui E, Lam M, Ho V, 2004, “Land Use Policy and Patterns in Hong Kong”, *ENHK Conference*, Cambridge, 2-6 July
- [8] Lands Department (various years) *Land Sales Records*, HKSAR, Printing Department, Hong Kong
- [9] Rector R, 2007, *How Poor are America's Poor? Examining the 'Plague' of Poverty in America*, Executive Summary Backgrounder, The Heritage Foundation, The Domestic Policy Studies Department, Washington DC
- [10] *The Standard* 2009, “Flats Price Fury to Hit the Streets”, (by Lau, N. and Phila, S), 19 October, page 6
- [11] UN Department of Economic and Social Affairs, 2005, *Promoting Sustainable Human Settlement Development*, Chapter 7,  
<http://www.un.org/esa/sustdev/natinfo/indicators/indisd/english/chapt7e.htm>