

# Does exchange rate and housing price in city nearby matters? An empirical study in Hong Kong

Author: Rita Yi Man Li, Kung Chun Wah, Tony Beiqi Tang

# 1. Introduction

- ▶ Hong Kong's economy was frustrated by price collapse in 1997 due to the decline of housing prices (HKMA, 2011).
- ▶ This reflects the importance of maintaining growth in the real estate market.
- ▶ Currently, housing prices are surging to a high level as in 1997.
- ▶ The reasons behind is due to the intense speculative activities and influx of cash flow from China due to RMB appreciation.
- ▶ Our objective is to analyze the relationship between exchange rate, housing price of nearby cities to the housing price in Hong Kong.

## 2. Literature review

- ▶ Previous research on housing price
  - a) Li (2009) studied the relationship between climate and housing price in Hong Kong and found that there were a significant negative relationship between property price and temperature.
  - b) Ando, Dahlberg, and Engström (2017) did a research of the relationship between nuclear disaster (Fukushima disaster) and housing price in Sweden.

## 2. Literature review

- ▶ Exchange rate and housing price
  - a) Ohno and Shimizu (2015) indicated that an arrangement to restrain the fluctuation of the exchange rate and capital controls had the potential to raise the housing price in Asia.
  - b) L. Wang and Wang (2017) pointed out that there was a significant positive relationship between RMB exchange rate and housing price in China.
  - c) Yang and Zhiqiang (2012) applied VAR test to examine the relationship between RMB real effective exchange rate and real estate price in China. They found that in the short-run, the increase of housing price would lead to the depression of RMB exchange rate

## 2. Literature review

- ▶ Factors that affect the housing price
  - a) Li and Li (2012) realized that there was a relationship between interest rate and housing price that the extraordinarily low interest rates would accelerate the rise in housing price.
  - b) Fereidouni (2010) indicated that in Iran, the oil price, construction costs and the credit to the private sector had positive affect on the housing price.
  - c) Vogiazas and Alexiou (2017) pointed out that factors as real gross domestic product, bank credit, and real effective exchange rate would affect the housing price.

## 3. Research method

- Ordinary Least Squares (OLS)
  - a) OLS is a type of regression estimation.
  - b) OLS tries to describe the relationship between two variables with a line.
  - c) OLS is a statistical technique which attempts to find the function which most closely approximates the data (a "best fit").

## 3. Research method

- ▶ Hetero-scedasticity

- a) If there are sub-populations that have different variabilities from others.
- b) Here "variability" could be quantified by the variance or any other measure of statistical dispersion.
- c) Thus heteroscedasticity is the absence of homoscedasticity.

## 3. Research method

### ► Cubic Spline Interpolation Approach

- a) We adopt Cubic Spline Interpolation approach is to convert the quarterly data to monthly data.
- b) This mathematical approach gets an interpolation formula that is continuous in both 1st and 2nd derivatives, both within the intervals and at the interpolating nodes.
- c) The set of splines, which touch at the nodes, therefore form a continuous curve.

## 4. Description of data and variables

- ▶ The overview property market of North District, Hong Kong
- a) Hong Kong is a high density city compared with other developed cities. Seven million citizens live in total area of about  $1,092 \text{ km}^2$  (in 2015).
- b) After the financial crisis, the US exchange rate dropped. As Hong Kong dollar is linked with USD, the exchange rate of HKD depreciated.

## 4. Description of data and variables

- ▶ The overview property market of North District, Hong Kong
- c) The dependent variable we choose are the transaction of some private properties in North District from April, 2009 to December, 2014.
- d) The reason of choosing this start point is that the first QE in US was started as March of 2009. So this structure break should be considered in our paper.

## 4. Description of data and variables

- ▶ Four selected explainable variable are included
  - a) Gross Domestic Product
  - b) Shen Zhen CCL
  - c) Capital and Financial Accounts (CFA)
  - d) Size of property

## 4. Description of data and variables

- Gross Domestic Product (GDP)
  - a) This independent variable mainly describes the national income of Hong Kong people.
  - b) If the population in Hong Kong is assumed as constant, rising the value of GDP means the average money income of all Hong Kong people is still increased as well.
  - c) This article would like to predict that GDP does not affect property price, as the increasing rate of property value in Northern District is definitely quicker than household's income.

## 4. Description of data and variables

- ▶ Shen Zhen CCL
  - a) Shen Zhen is one of the nearest city by Hong Kong. The domestic asset market would have a momentum to foreign countries.
  - b) Both Hong Kong and Shen Zhen are measured by the Centa-City Index (CCL) for secondary private residential property price, but property market.
  - c) CCL a monthly index based on all transaction records as registered with the Land Registry to reflect property price movements in previous months.

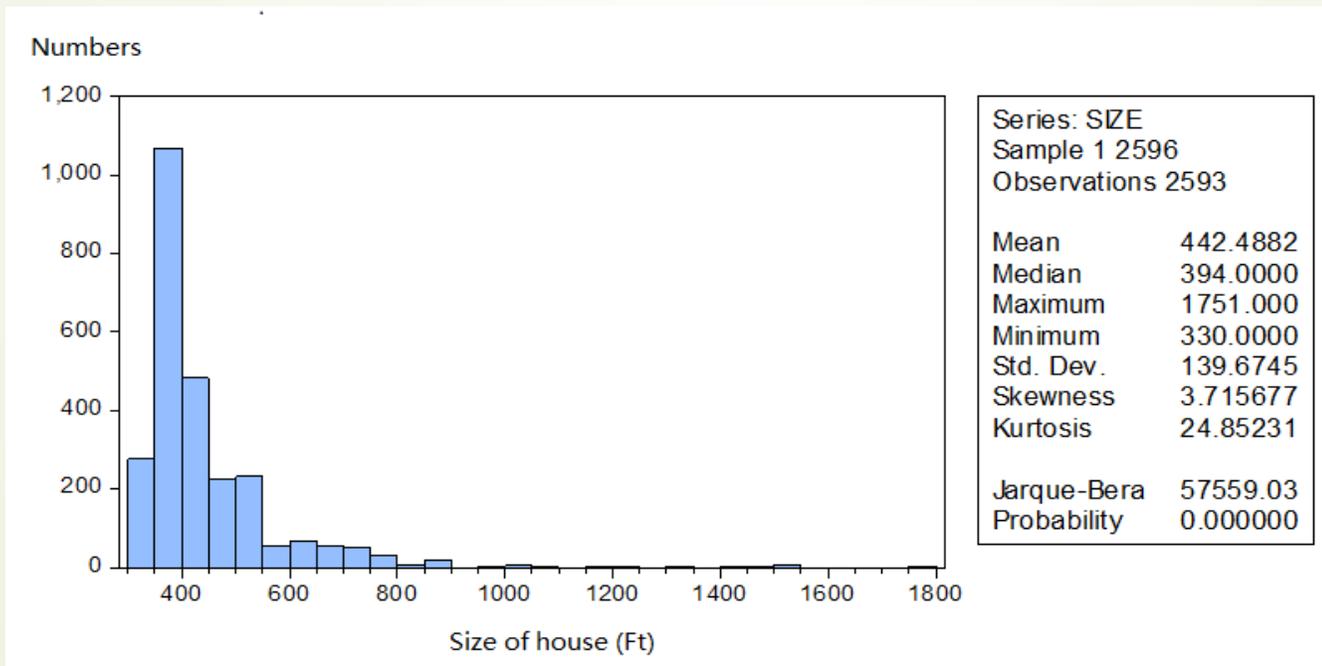
## 4. Description of data and variables

- ▶ Capital and Financial Accounts (CFA)
  1. The capital account relates to dealings includes different things
  2. Because Hong Kong is the international financial center and allow free capital flow, capital and financial account has large amount in balance of payment. This account would significantly affect the economy of Hong Kong.

	<b>Capital and Financial Accounts (CFA)</b>
1.	The transfer of ownership on fixed assets
2.	Debt forgiveness
3.	The transfer of funds received to the sale or acquisition of fixed assets
4.	Gift and inheritance taxes
5.	Death levies
6.	Patents
7.	Copyrights
8.	Royalties and uninsured damage to fixed assets

## 4. Description of data and variables

- Size of property
- Description of the general size in Northern District



- The mass of the housing units is concentrated on the smaller size.
- We can draw a conclusion that most housing estates are small size in Northern district.

## 5. Research Finding

- Regression model & null and alternative Hypothesis
- a) Every independent variables are changed as log value because it can show the percentage change of them month by month.
- b) That means 1% changing of explainable variables would affect the actual value of dependent.

## 5. Research Finding

► Equation:

$$\log(\text{values}) = \beta_0 + \beta_1 \log(\text{Ex}_{HKD/RMB}) + \beta_2 \log(\text{GDP}) + \beta_3 \log(\text{CCL}_{SZ}) + \beta_4 \log(\text{CFA}) + \beta_5 \log(\text{Size}) + \epsilon_t$$

► Where

- a) Value= Property transaction value in Secondary market
- b) Ex= Exchange rate with Hong Kong dollar against 1 RMB
- c) GDP= Gross domestic Product in Hong Kong
- d) CCL= Centa-City Index of Shen Zhen
- e) CFA= Capital and Financial accounts in Hong Kong
- f) Size= Unit's size

## 5. Research Finding

- ▶ OLS estimation table (E-views)

<b>Dependent Variable: VALUE</b>				
<b>Method: Least Squares</b>				
<b>Sample: 12596</b>				
<b>Included observations: 2592</b>				
<b>White heteroscedasticity-consistent standard errors &amp; covariance</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
<b>C</b>	-3618.492	354.8166	-10.19820	0.0000
<b>LOG(CFA)</b>	-11.54701	3.837320	-3.009133	0.0026*
<b>LOG(HK_GDP)</b>	38.50562	26.81495	1.435976	0.1511
<b>LOG(RMB)</b>	973.2393	45.18834	21.53740	0.0000*
<b>*LOG(SHEN_ZHEN_CCL)</b>	140.2384	14.67311	9.557510	0.0000*
<b>LOG(SIZE)</b>	418.0827	11.96846	34.93205	0.0000*
<b>R-squared</b>	0.829334	<b>Mean dependent var</b>	259.8067	
<b>Adjusted R-squared</b>	0.829004	<b>S.D. dependent var</b>	127.5121	
<b>S.E. of regression</b>	52.72830	<b>Akaike info criterion</b>	10.77049	
<b>Sum squared resid</b>	7189787.	<b>Schwarz criterion</b>	10.78406	
<b>F-statistic</b>	2513.288	<b>Durbin-Watson stat</b>	1.848365	

## 5. Research Finding

### ► Result

- a) Chinese capital and Hong Kong property market in Northern Market is highly related with as the p-value of the variables is less than 0.05.
- b) The coefficient of exchange rate is 973.23, which means 1% increasing at RMB against Hong Kong dollar would induce \$973 of property value.
- c) The coefficient of capital and financial accounts (-11.54701) has a negative effect on the property value. In this period, capital flow rising is negatively correlated with housing value.

## 6. Conclusion

- a) Foreign exchange rate can affect the domestic property market.
- b) Chinese financial capital negatively affects the property price in Hong Kong
- c) Exchange rate of RMB affects property value at the highest numbers, where implies that it has been one of the most important factors to push the property value in the Northern District since 2009.

End