

# FACTORS THAT DRIVE RESIDENTIAL REAL ESTATE BUBBLES: PROSPECT FOR BUBBLES WITHIN THE NATIONAL CAPITAL REGION (NCR)



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SGRA 17<sup>th</sup> Sustainable Shared Growth Seminar  
February 11, 2014  
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# Outline:



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- ∞ Main Questions to Answer and Scope
- ∞ Summary of Related Studies' Relevant Info
- ∞ The Framework and Methods
- ∞ Results
- ∞ Conclusion, Policy Recommendation and Further Study Recommendation
- ∞ BONUS part



# Background of the Study



- ❧ Renewed Importance of Asset Bubble Study due to U.S. 2007 Housing Bubble
- ❧ The challenge on determining what influences bubble emergence
- ❧ No conventional/standard tools to be used in analyzing and detecting bubbles; The recommendation of at least two methods (Kubicova and Komarek, 2011)
- ❧ Outsiders have warned for another housing bubble experience (in particular H2 of 2012).
- ❧ If housing bubble has emerged, the economic growth momentum, which started in 2012, could have been unsustainable.

# Main Questions to Answer and Scope:



## Main Questions:

- 1.) How can one detect housing price bubble growth?
- 2.) What are the fundamental factors that drive housing price bubble within NCR?
- 3.) Are there specific periods when housing bubbles emerged in the past (2000 to 2012) that are significantly driven by sentiment?

## Scope

- High-end segment of Real Estate properties
- Within NCR; Makati, Rockwell, Bonifacio Global City, and Ortigas
- Prices and Rent quarterly data utilized are from 2000 to 2012

In this study, the fundamental factors refer to Residential Real Estate Loan growth, de-seasonalized GDP per capita, M2 or money supply year-on-year (y-o-y) growth rate, 91-day Treasury Bill growth rate, Real Estate Companies Stock Price index level, Foreign Exchange rate, and unemployment rate in NCR.

# Summary of Related Studies Relevant Info:



- ❧ A bubble is the deviation of an asset price from its fundamental value (Scherbina, 2013)
- ❧ Boom and Bust vs. Bubble and Burst
- ❧ Bubble emergence is due to both fundamental and sentiment (psychological) factors
- ❧ Bubble stages: Birth of the Bubble, Sustenance of the Bubble, Bursting of Bubble, and Aftermath (Damodaran, 2004).
- ❧ Factors that drive housing bubbles: Money Supply, GDP per capita, Capital Inflow (FX), Stock Market on properties, Unemployment, Optimism, lack of higher-order mutual knowledge, short-sale constraint, etc.
- ❧ Fundamental factors refer to macro/micro-economic or financial variables, while sentiment as a factor pertains to belief in future cash-flow/return usually known as euphoria/ overly optimistic outlook.



## Summary of Related Studies' Relevant Info:



- œ Country experience: U.S., Japan, Thailand, Spain and Philippines

Highlighted Similar Experience Among them:

→ Euphoria

→ Credit growth (increasing), awash with liquidity

- œ On Asset Bubble Detection: Many, but none is used as the standard one.

# The Framework



# Methods:




## ∞ OLS Regression (Multi-Variables)

**Step 1:**  $\Delta B_t = \Delta P_t - \Delta P_t^f$

**Step 2:** Regression of the Bubble component to the fundamental factors:

$$\Delta B_t = a + \beta_1 M2gr_{(n)} + \beta_2 Stockprices_{(n)} + \beta_3 GDPper\_capita\_sa_{(n)} + \beta_4 91Tbill\_rate_{(n)} + \beta_5 FX_{(n)} + \beta_6 RRE\_loan_{(n)} + \beta_7 NCR\_unemp + u$$

 **sentiment**

*(This method is used to know the relationship of the relevant fundamental factors to the bubble component)*



# Methods:



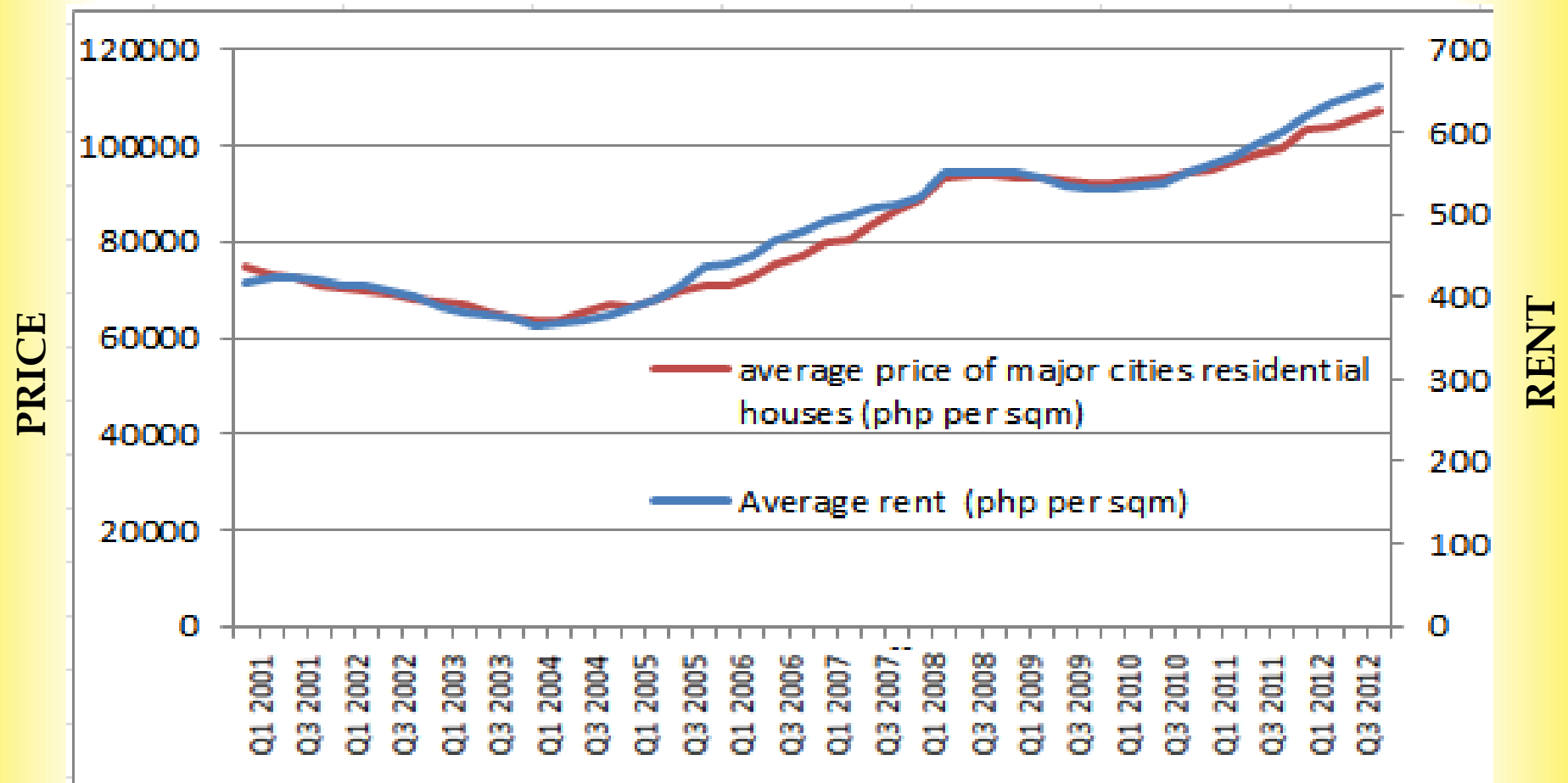
⌘ Taipalus ADF Method:

$$\Delta Y_t = \alpha + \beta t + \gamma Y_{t-1} + \delta_i \Sigma \Delta Y_{t-1} + e_t$$

if  $\gamma \geq 0$ , then the sample manifest non-stationarity  
which indicates bubble existence

*(This method is used to detect the periods on which there  
was/were sentiment-driven bubbles)*

## Historical Average Price and Rent



Efficient Market Hypothesis (EMH) tells us that if Price is not equal to the fundamental value (rent), then there is/are bubble/s.

# Results: Bubble Growth

Period	BUBBLE growth	Period	BUBBLE growth	Period	BUBBLE growth
2001 Q1	1.8%	2005 Q1	-1.4%	2009 Q1	0.4%
Q2	-2.4%	Q2	-1.7%	Q2	1.1%
Q3	-3.8%	Q3	-4.7%	Q3	1.7%
Q4	-6.2%	Q4	-9.0%	Q4	1.7%
2002 Q1	-5.0%	2006 Q1	-7.0%	2010 Q1	1.7%
Q2	-2.3%	Q2	-6.1%	Q2	1.1%
Q3	-1.1%	Q3	-5.6%	Q3	0.6%
Q4	0.5%	Q4	-1.5%	Q4	-1.2%
2003 Q1	2.3%	2007 Q1	0.5%	2011 Q1	-2.4%
Q2	3.6%	Q2	-0.2%	Q2	-2.9%
Q3	1.9%	Q3	3.0%	Q3	-4.6%
Q4	1.5%	Q4	5.7%	Q4	-3.5%
2004 Q1	0.2%	2008 Q1	4.6%	2012 Q1	-1.9%
Q2	-1.4%	Q2	5.9%	Q2	-3.9%
Q3	1.4%	Q3	3.7%	Q3	-2.2%
Q4	2.5%	Q4	0.6%	Q4	-1.3%

In most past quarters, there is undervaluation within NCR as evident to the negative deviation of price from the rent growths.

# Results: OLS Regression

Dependent variable:	Bubble Growth	
Independent Variables:	Coefficient	t-statistics
Foreign Exchange Rate (Capital Flow) (-1)	-0.005801	-3.02
Treasury-Bill 91 day (-4)	-0.010383	-4.44
NCR Unemployment Rate (+4)	-0.560699	-2.36
GDP per capita (-5)	0.000004	1.8
Money Supply (M2 Growth Rate) (3)	0.029946	3.07
Real Estate Loan Growth Rate (-3)	0.035888	3.14
Stock Market (RE) index	0.000044	2.06

R-squared	0.4623
Prob(F-statistic)	0.005458

→ Low R-squared tells us that the fundamental factors do not explain most of the bubble growth fluctuations which makes u, the error-term representing sentiment, as dominant and more influential.

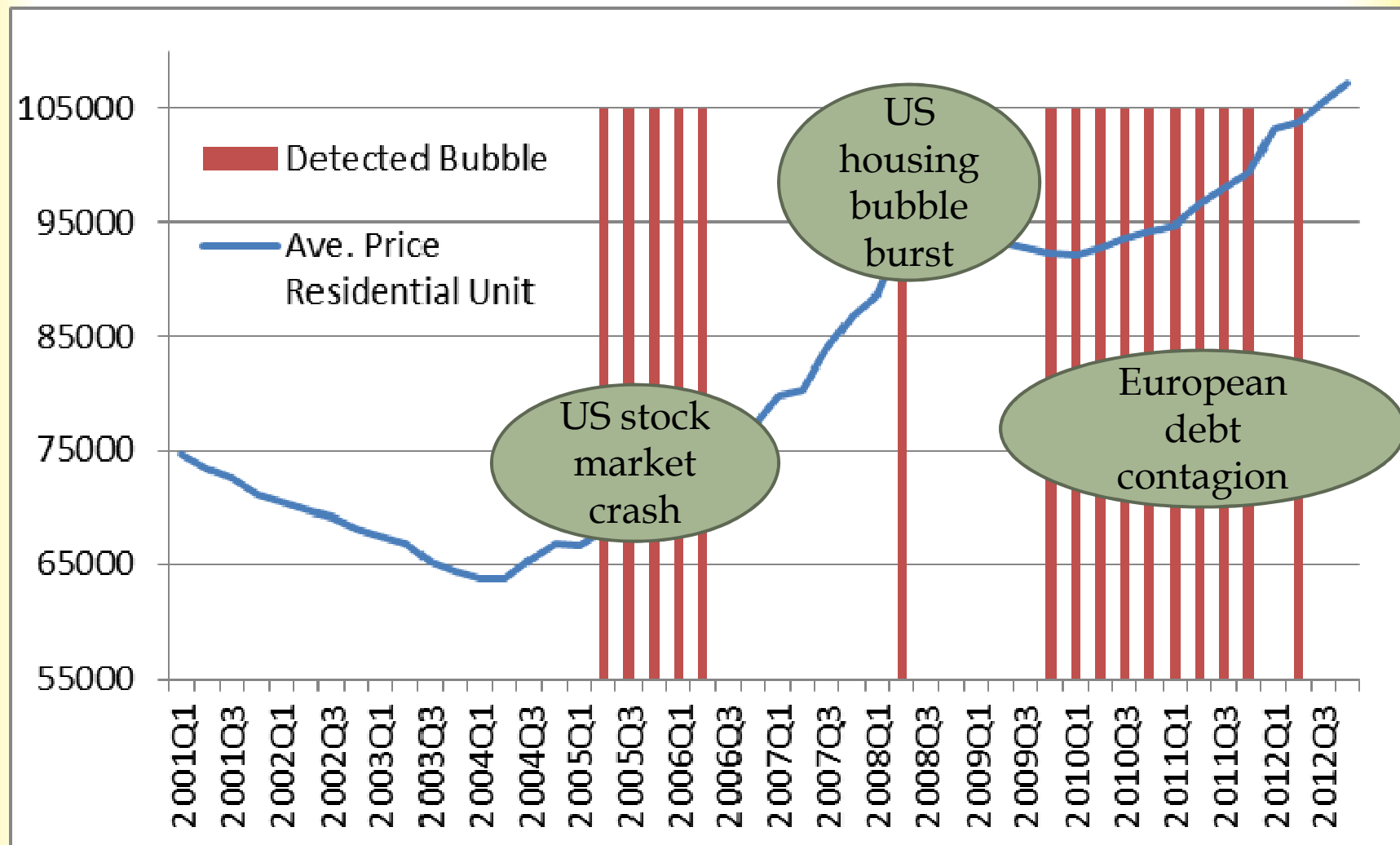
Foreseen unemployment rate, Money Supply, and RE Credit Growth are the significant and, at the same time, have strong impact, in terms of magnitude, to the bubble growth

# Results: Taipalus ADF (2012) Method

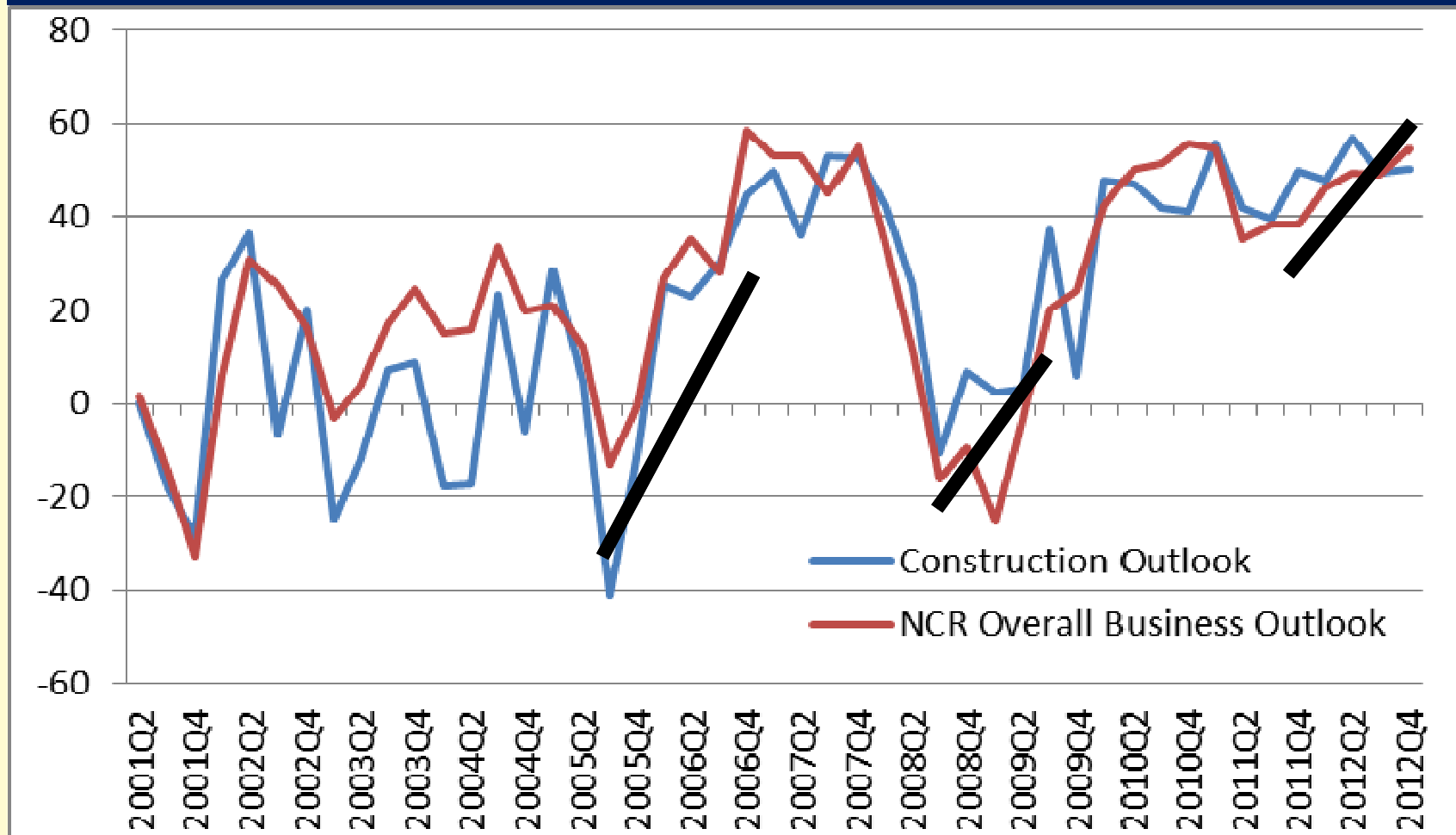
Bubble Period	$\gamma$ value
Q3 2005	0.2693
Q4 2005	0.2832
Q1 2006	0.3203
Q2 2006	0.3985
Q2 2008	0.1075
Q4 2009	0.0661
Q1 2010	0.1394
Q2 2010	0.2668
Q3 2010	0.2035
Q4 2010	0.3495
Q1 2011	0.4638
Q2 2011	0.3764
Q3 2011	0.3650
Q4 2011	0.2677
<b>Q2 2012</b>	<b>0.8939</b>

Only Q2 of 2012 has a relatively high magnitude gamma which indicates that the bubble detected is quite a threat

# Results: Taipalus ADF (2012) Method



## BSP's Quarterly Business Expectation Survey on Construction Outlook and NCR Overall Business Confidence (2001-2012)



**The Detected Bubble Period Coincide with the Uptick and Optimistic Construction Outlook and NCR Overall Business**



## Conclusion, Policy Recommendation and Further Study Recommendation

### Conclusion:

1.) To detect an asset (housing) bubble, there must be a clear definition of what an asset bubble is. In the study it is defined, similar to most recent bubble studies, as the deviation of asset price from its fundamental value.

2.) The seven fundamental factors are related to the housing bubble:

Negative relation (-): FX, Treasury Bill 91-day, NCR unemployment rate.

Positive relation (+): GDP per capita, Money Supply, RE Loan/Credit, RE Stock Price Index

The *u-term* which represents the sentiment as a factor is seen to explain the bubble growth movement better

3.) There are specific quarters in which PH experienced housing bubble due to sentiment, the highest was last Q2 2012.

## Policy Recommendations:

- 1.) Government Officials, who handles economic stability, should be cautious on the drastic movement of the following factors: unemployment, credit growth, and money supply; these three points to stricter capital control/contractionary policy.
- 2.) Since sentiment is the main driver of bubble, as also based historically, the government must curb the investment to luxury units. In 2008, government put a 20% cap on real estate lending which can be said as preemptive of possible speculation.
- 3.) A historical record of fundamental value can be utilized to monitor asset bubble. This can be possible if certain government department can make a price index for real estate properties.

### **Further Study Recommendations:**

- 1.) One of the limitation of the study is on data. Very few historical data on price and rent in the PH. With more and longer historical data, the study will have more precise estimate of coefficients/magnitude impact to the bubble growth.
- 2.) The use of more methods as possible.
- 3.) Add qualitative method such as interview with real estate managers and analysts.
- 4.) Study the “bubble thy neighbor” phenomenon in the case of the Philippines and U.S.
- 5.) The utilization of other valuation method in getting the fundamental value.

## BONUS part

*Will there be or is there a bubble in the high-end segment of the real estate/property market?*

- In the high-end segment, there is a bubble seen in Q2 2012 (as based in the study).
- Is this threat significant?
- NO
- Since the market share for the high-end is just about 3-5% in the total market share in the PH real estate market.
- The construction boom in NCR caters the middle income class and below families. That segment has about an estimate of 3-4 M housing backlog. This was even seen to grow at 5.8 M in 2016 (Housing and Urban Development Coordinating Council (HUDCC))
- Moreover, in case there's a housing bubble, BSP has tightened capital flow(in/out) and now has more reserve to resolve financial paralysis.

Maraming salamat po  
Thank you very much  
Arigatou gozaimasu