

## **“Easy Credit and Real Estate Bubble in Dhaka, Bangladesh- The Nexus and Policy Implications for Bangladesh Bank”**

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*The existing literature on Real Estate bubble mostly agrees that such bubble can be attributed to the influx of housing loans and more specifically the presence of cheap lending in the economy. This paper aims at analyzing the effects of easy credit on the bubble formation in the Real Estate sector of Bangladesh in accordance with the statistical data from 1990-2010. A thorough examination of the bubble formation has been presented through graphical analysis based on housing related ratios and an empirical investigation has been conducted using a regression analysis based on Ordinary Least Squares approach. The results provide strong empirical support to the notion that prevalence of easy credit did indeed fuel the price bubble in the sector under analysis. Moreover, the policy guidelines, both monetary policy and macro-prudential regulations, have been discussed which could be adopted by Bangladesh Bank, the central bank of the country, in order to effectively contain the Real Estate bubble and minimize the risk of a financial mismanagement.*

### **1. Introduction**

The notable socio-economic progress and accelerated urbanization in Dhaka city, the capital of Bangladesh, has provided the impetus for an ever increasing demand for housing by its dwellers. For the last two decades, from 1990-2010, the demand for better and sophisticated housing, more specifically the demand for apartments and flats have witnessed phenomenal increase. The aspiration and the status symbol of owning an apartment, the profitability aspect on part of the Real Estate companies, population pressure and other various factors have led to a rapid expansion of the Real Estate industry. This major expansion has brought about many benefits in terms of providing housing for the increasing population, creating employment, providing revenues to the government and other positive external benefits to its linkage industries. However, such an expansion has been characterized by a bubble in this sector in terms of the apartment price that has prevailed over this time span. One of the fundamental factors that have contributed to this price bubble has been the influence and the prevalence of easy credit from the financial sectors of the country to the apartment owners. Financial liberalizations, excessive lending with low interest rates and convenient terms and conditions on housing & mortgage loans did in fact allow individuals to opt for apartment purchases. This phenomenon has fuelled the apartment prices by a high magnitude and the prices have gone quite beyond the purchasing capability of the middle and low income group. According to a paper titled ‘A comprehensive study on the Real Estate sector of Bangladesh’, it was found out that 80% of almost 700 households surveyed in the Dhaka city in their research have declared bank loan as a major source of fund for apartment purchase. It is to be noted that the average apartment prices in terms of per square feet prices in different areas in the decade from 2000-2010 have seen the biggest jump, increasing almost at an average of 280%.

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The underlying motivation for this research lies in the fact that there is a dearth of empirical researches currently existing on this sector and the price bubble associated with it. Given the magnitude and growth of this sector and its possible economic implications, this paper delved into filling this gap and investigating this matter by providing a more in depth view through a combination of graphical aid, qualitative analysis and empirical examination. The results obtained have added new dimensions to the understanding the dynamics of this price bubble in the Real Estate sector. The research findings have shown that some of the variables which mostly prove to be significant in the current literature have been proved otherwise in the analysis framework this paper conforms to. This indeed provided a different result from what is usually expected. As for the significance of the study, both the analysis of housing related ratios and econometric investigation have shown and confirmed the research hypotheses that this research intends to investigate. Hence, from this study it has been clear that easy credit in fact influenced and caused the price bubble.

It is to be noted that the geographic scope of this study is confined within 17 areas of the Dhaka city. And the data sources for this research include Bangladesh Bank, Bangladesh Bureau of Statistics, Newspapers and online articles. As for the arrangement of the paper, section 2 provides a review on the existing literature on the Real Estate bubble and its relation with easy credit. Section 3 covers graphical representations and analysis pertaining to housing related ratios. Section 4 delves into the empirical investigation and results and section 5 and section 6 provide policy recommendations and conclusion respectively.

## 2. Literature Review

### 2.1 Real Estate Bubble: A Theoretical Introspection

A Real Estate bubble is the manifestation of an economic bubble occurring in the Real Estate market where the value of properties such as housing is characterized by drastic increases in its value which reach an unsustainable level and then suddenly implodes. More specifically, a bubble is defined simply as any substantial upward price movement over an extended range that suddenly implodes (Evanoff et al, 2013). It is a process of continual price rising detached from real value and the excess of sales over moderate price dictated by the market (Ning and Hoon , 2012). If the bubble inflates at a very rapid rate and turns into a bubble of a very high magnitude, it calls for special attention for the policymakers and the government alike as the prices of housing is at a high deviation from its intrinsic values and calls for price correction through market mechanism and other forms of regulatory measures, both fiscal and monetary. Krainer (2003), for example, says that a housing bubble occurs when the ratio of house prices to rent trends above its long-run average. Asset bubbles are usually if not always associated with an expansion of money and credit.

From the analysis of discourse of the Austrian economics and Post-Keynesian economics, real estate bubbles are seen as an example of credit bubbles because property owners generally use borrowed money to purchase property, in the form of mortgages. These are then argued to cause financial and hence economic crises. The conceptual issues regarding asset price bubbles and more specifically real estate bubble has emerged as a very significant issue in the economic literature especially after the Global Financial Crisis of 2007-2008. The IMF evidence documents that equity and housing bubbles occur relatively often where equity crashes occurred on average every

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decade and housing crashes about once every 20 years. Housing price busts are less frequent, but last nearly twice as long and lead to output losses that are twice as large (IMF World Economic Outlook, 2003). Moreover, it is very difficult to identify unsustainable asset price booms in a timely matter, as it will be very hard to determine whether for instance a house price increase is warranted by its fundamentals or rather based on misplaced expectations (Greenspan, 2002).

Taking into consideration the effects of the Real Estate Bubble and its detrimental consequences on the overall economy, a number of measures have been developed over the years to assess whether bubble exists or not in the Real Estate Market. According to Ren and Wang (2008), the indices “housing price-to-income ratio”, “housing price growth rate-to-GDP growth rate ratio”, “real estate investment growth rate-to-GDP growth rate ratio”. Other measures include, “housing debt to income ratio” or “debt-service ratio”.

The next section discusses about some of the major Real Estate Bubbles that have been observed in some of the major industrialized economies.

### 2.2 Real Estate Bubble Worldwide

In this section, the occurrence of some major real estate bubbles across the globe have been highlighted and how the access to cheap credit in the form of Mortgage loans and low interest rates have influenced the formation of such bubbles in these economies have been discussed.

The **United States housing bubble** has been one of the most predominant reasons for the greatest financial and economic collapse of the century, the “Global Financial Crisis 2007-2008”. Housing prices peaked in early 2006, started to decline in 2006 and 2007, and reached new lows in 2012 (Shiller Home Price Indices, n.d.). According to Jeff (2009), “The credit crisis resulting from the bursting of the housing bubble is — according to “general consensus”— “the primary cause” of the 2007–2009 recessions in the United States”. Moreover, Bernanke (2010) noted that “The most rapid price gains were in 2004 and 2005, when the annual rate of house price appreciation was between 15 and 17 percent and hence the timing of the housing bubble does not rule out some contribution from monetary policy in the sense of accessibility of easy credit throughout the economy”. According to Merriam (2009), “Cheap money was brought to us in the first instance by the dot.com crash in 2000 and the Federal Reserve cutting its short-term rates to the lowest ever, down to 1% from 6.5%, to overcome the 2000-2001 recessions and such interest policy paved the way for cheap credit investment in the Housing market in the U.S.”

The **Chinese property bubble (2005-2011)** was a real estate bubble in residential commercial real estate in the People's Republic of China. The bubble started deflating in late 2011 when housing prices began to fall following policies responding to complaints that members of the middle-class were unable to afford homes in large cities (Keith, 2012). Some of the possible contributors of the rising home prices included low interest rates and increased bank lending beginning in 2003 under Wen Jiabao which allowed cheap credit for the construction and purchase of property while making competing debt investments less appealing (Dexter and Xinhua, 2010). According to Shenglan (2009), “There were high price-to-income ratios for real estate, such as in Beijing where the ratio is 27 to 1 years, five times the international average (27 to 1 is based on a double income household so 54 to 1 for a single income household of roughly 6,500USD/yr) and high

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price-to-rent ratios for real estate, such as in Beijing where the ratio is 500:1 months compared to the global ratio of 300:1 months". A new nationwide real estate sales tax was introduced in China in late 2009 as a measure to curb speculative investing (Jamil, 2009). Moreover, a mortgage discount for first-time property buyers which had offered fixed, 5% 20-year mortgages at just above 4% was also being eliminated easy credit was influencing the real estate bubble formation.

The **Japanese asset price bubble** was an economic bubble in Japan from 1986 to 1991, in which real estate prices were greatly inflated. So much money readily available for investment, combined with financial deregulation, and monetary easing implemented by the Bank of Japan in late 1980s resulted in aggressive speculation particularly in the real estate market and this continued to be a problem for several years to come, and as late as 1997, banks were still making loans that had a low probability of being repaid.

The **Spanish property bubble** refers to the massive growth of real estate prices observed, in various stages, from 1985 up to 2008 in Spain. According to the reports of the Bank of Spain, between 1976 and 2003 the price of housing in Spain has doubled in real terms, which means, in nominal terms, a multiplication by 16. According to the Bank of Spain, from the period of 1997—2006, the price of housing in Spain had risen about 150% in nominal terms, equivalent to 100% growth in real terms. One of the main contributors of this situation has been the growth of household debt. In 1986 debt represented a 34% of disposable income, in 1997 it rose to 52%, and in 2005 it came to 105%. From 1990 to 2004, the average length of mortgages increased from 12 to 25 years.

### 2.3 Cheap Credit & Real Estate Bubble: Connecting the Dots

Empirical evidence indeed shows a close correlation between house prices and mortgage credit growth and interest rates. According to the IMF 2011 report, it was found that for OECD countries, a 10 percent increase in household credit on average is associated with a 6 percent increase in house prices. In the September 2004 World Economic Outlook, IMF economists identified a number of global factors that contributed to the boom, among which interest rates and bank credit emerged as significant factors. In the IMF's 2008 World Economic Outlook, declining real interest rates has been identified as a major driver of global house price increases during the 2000s.

Claessens et al (2010) moreover found that within countries, cycles in credit and house prices appear to be the most highly synchronized. Also the recent housing boom of U.S. coincided with a period of very rapid credit growth, sometimes referred to as the global credit boom (Hume and Sentance, 2009). Moreover, Andrews (2010) and Andrews, Caldera Sánchez and Johansson (2011) show that in 18 OECD countries, financial innovation has increased real house prices directly by 30% on average since 1980. All in all, there is convincing evidence that financial innovation has affected house prices, both through time and across countries.

As argued by White (2008), the dramatic fall in interest rates from 2001 by Fed created a demand bubble that was drawn disproportionately into real estate and the Real-estate loans at commercial banks grew at a 12.26 percent compound annual rate during the period from the mid-point of 2003 to the midpoint of 2007. This Fed-fueled low interest rates and growth of mortgage credit pushed up the demand for and prices of existing houses, and encouraged the construction of new housing on undeveloped land. Kaminsky and Reinhart (1999) studied a wide range of crises in 20 countries including

5 industrial and 15 emerging ones. A common precursor to most of the crises considered is financial liberalization and significant credit expansion.

Deng et al. (2005) found that the availability of home mortgages contributes to the increasing demand of residential properties. Moreover, Zhang and Sun (2006) found that driving forces of China's current property boom include lower real lending rates and easier access to property loans. Liang and Cao (2007) found unilateral Granger causality from bank lending to property price. These studies indicate that bank loan and interest rate are significant factors affecting property market dynamics. Moreover, Pages and Maza (2003) noted that "The relaxation of credit constraints, evidenced by growth in housing loans and declines in nominal mortgage rates, account for a substantial portion of house-price growth in Spain from 1976 to 2002". Excess bank lending led to property booms, as evidenced by cross-country studies (Davis and Zhu, 2004). Zhang and Sun (2006) found that 1 per cent increase in the proportion of property loan to total bank loan would give rise to 21.3 per cent growth in property investment. As found out by Zhang et al. (2010) that monetary expansions and bank loans among other factors remained the driving factors of housing prices escalation. During recent decades, unsustainable increases in asset prices have been associated on a number of occasions with botched financial liberalization, in both emerging-market and industrialized countries (Bernanke, 2010).

In this paper, effort has been made to expand the literature on Real Estate bubble by working on improved and modified OLS model and complementing its result by analysis of housing related ratios in the context of Real Estate sector of Dhaka city. It is to be mentioned that the past studies as mentioned above did not address or mention the problem of the price bubble in this specific context. Moreover, the lack of dynamic studies currently existing for this specific circumstance has been significantly addressed in this research. Hence, this paper brings in new knowledge and line of thought into our understanding of the price dynamics of this sector under consideration.

### **3. Real Estate of Bangladesh: The Scenario**

#### **3.1 General Overview**

Bangladesh, like many other developing countries faces an acute shortage of affordable housing both in the urban and rural areas (Sarker, 2011). Moreover, housing affordability is being eroded by poor land administration policies, which have resulted in very high land prices that make urban housing prohibitive for lower-income groups; and in infrastructure that is inadequate for expansion into urban and rural areas. In Bangladesh 25% of the population now live in urban areas; this proportion will be 34% by the year 2015 (Strengthening the Role of Private Sector Housing in Bangladesh Economy: The Policy Challenges, 2003).

In the last four decades private developers have supplied more than 100,000 units of apartments to the nation and will be supplying 25000 more units in the next three years (Sheltech, 2011). Experts opine that, Bangladesh will encounter high levels of urbanization by 2015 and by that time Dhaka will need to house about twenty million people to become the fifth largest city in the world. Over the past decade Dhaka has had the highest population growth rate of any major city in the world. Natural growth of population and huge migration every year due to many push and pull factors raised the growth rate to about 7 percent. Due to various factors, including the

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absence of an urbanization policy or a human settlement policy, urban growth and urban development in Bangladesh is basically Dhaka oriented (Rahman, 2001). People from all socio-economic backgrounds in Dhaka face housing problem of one type or another. The low-income families are in need of low cost flats or plots and the middle and upper income families are complaining that the cost of a decent plot or a decent flat is going beyond their means (Rahman, 2001).

The average price of a flat/apartment has witnessed its biggest jump in the decade 2000-2010, especially rising at an exponential rate from year 2006. According to one of the REHAB's President, "The apartment prices in some of the major posh of Dhaka city such as Gulshan, Baridhara, Banani and Dhanmondi have shot up to the range of Tk12, 000 to TK 20,000 per square feet which equal the per square feet prices in Mumbai which is considered as one of the expensive cities in the world in terms of housing costs". It is to be noted that the occurrence of such an inflated price is quite highly attributed to the upward increase in credit growth, i.e. increased sanctioning of home loans from the banking sector, including both Private Commercial Banks and State Commercial Banks, to the apartment owners. Rahman (2010) pointed out that in terms of housing/apartment loans disbursements, private banks led the tally with Tk. 7,490 crore outstanding loans to the housing sector as on June 30, 2009, against just Tk. 3,510 crore three years ago. Moreover, private banks' lending to the sector increased by over 113 percent in the three years to fiscal 2009 and the banks' outstanding home loans have doubled to Tk. 12,360 crore in fiscal 2009 from Tk. 6,400 crore in fiscal 2006 (Rahman,2010). Bangladesh Bank (BB) statistics show that housing loans reached Tk.18, 180 crore at the end of fiscal 2009 from Tk.10, 090 crore in fiscal 2006, a massive 80 percent rise. Taking into consideration the overheating of the Real Estate Market, Bangladesh Bank (BB) in 2009 cautioned all concerned of a damaging consequence in the country's overheated real estate sector and admitted that a large chunk of credit meant for industries and small and medium enterprises (SMEs) have been diverted to the capital market and the real estate market (Bangladesh Directory, 2009). Salehuddin Ahmed, the governor of BB, opined that the Bubble like pressure on the Real Estate sector is induced by high credit growth in the banking sector. Despite BB's limited role in the property market, the banks have been cautioned about not to extend loans to this sector so as to rein in the skyrocketing prices.

### 3.2 Analyzing the Bubble

Before we analyze the bubble based on the index methods, we will investigate and look at some of the traits of the Real Estate sector from 1990-2010. First we shall examine the apartment price index which has been constructed for the period 1990-2010. Then we shall inspect the apartment price growth rate in light of the growth of housing Loans Disbursed to and housing loan accounts opened by apartment buyers and finally we will analyze the profit bubble that existed in this sector from 2000-2010.

#### 3.2.1 Apartment Price Index Analysis

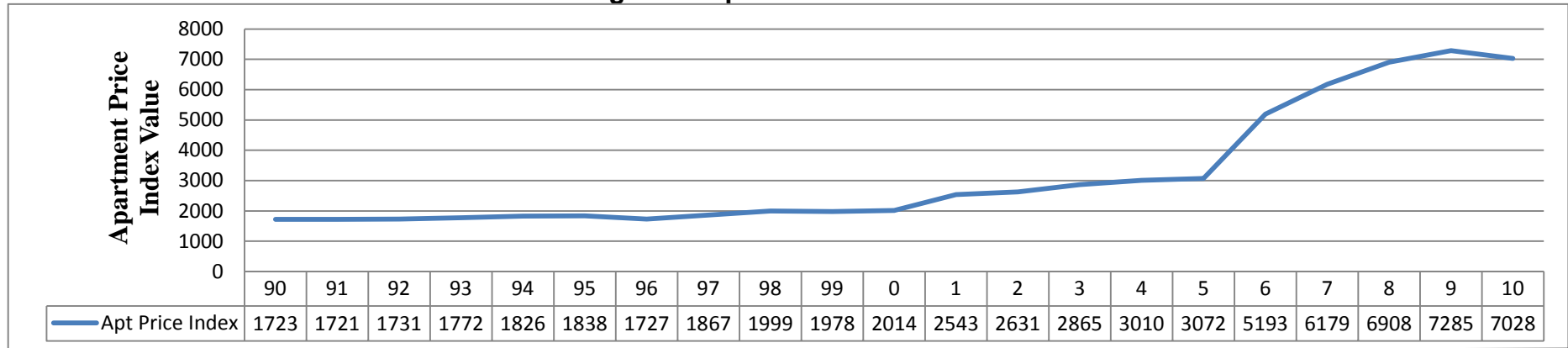
The following figure 1 shows the apartment price index of Dhaka city over a 20 year period from 1990-2010. The index has been calculated on the basis of additive weighted method. From the graph it can be seen that the apartment price index remained very stable and smooth with very minor changes for the decade 1990-2000. The overall sales volume and apartment price changes were very insignificant during this period which explains the very linear nature of the index curve. From year

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2000 onwards, the total apartment price index scenario took a paradigm shift. For the first 5 years, the index went up by 1000 points. And from 2006-2009, the index witnessed an exponential rise in index value and crossed 7000 points before experiencing a slight dip in the year 2010. It is safe to presume the fact that from year 2000 onwards, the Real Estate sector began to experience a bubble from the demand side and the full presence of the apartment price bubble was prevalent and very well reflected in the period 2006-2009. It is to be noted that the banking sector itself witnessed more rapid and aggressive expansion in the decade 2000-2010 than its previous decade. With more banks, both local and international, actively present in the banking sector in the latter decade, brought many financial innovations where housing loans being one of the more important financial products for banks. With mortgage rates between 16%-18% subject to adjustments for most Private and State Commercial Banks and with convenient monthly loan installments, covering almost 70% of the property (apartment) value, home loans have turned out to be a lucrative product for banks and an easy source of finance for apartment buyers. Such a situation led to an influx of mortgage loans with attractive interest. This surge in cheap credit fueled the apartment price in the latter decade explaining the very exponential nature of the index curve.

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## Figure 1: Apartment Price Index



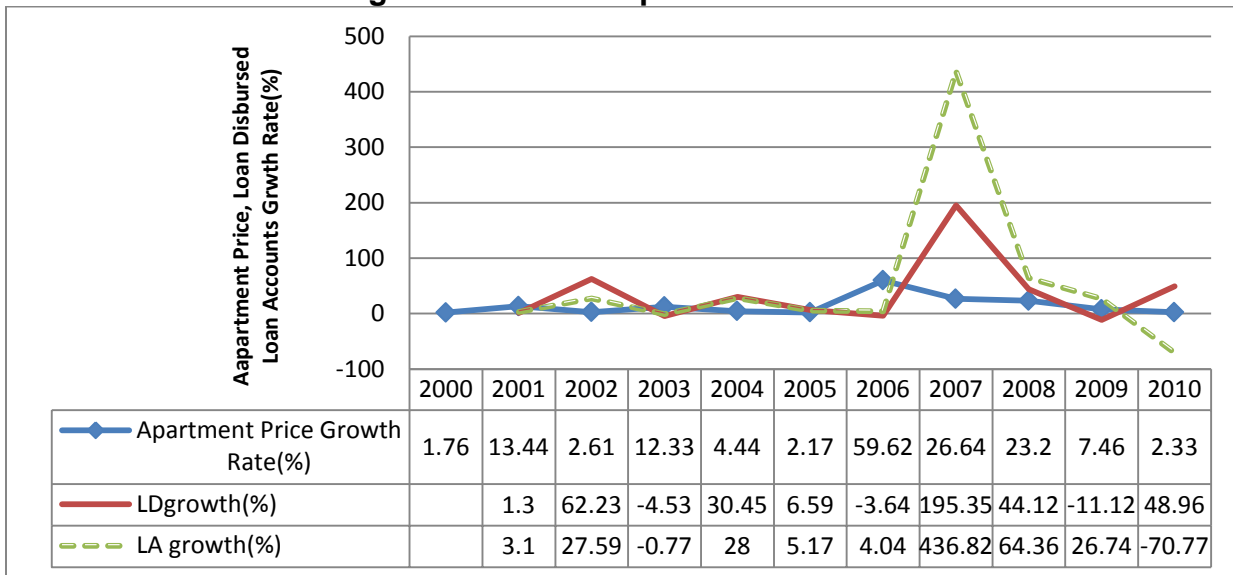
Source: Author's own calculation. Base Year: 1988-89. Base Year Index Value: 1700.



### 3.2.2 Credit Growth and Apartment Price Growth: The Nexus

The Fig 2 represents the growth rate of apartment prices, the growth rate of home loans disbursed (LD) by banks, both Private and State Commercial Banks, to the apartment buyers and the growth rate of the home loan accounts(LA) opened in the banking sector for flat purchase for the period 2000-2010. It can be observed that from the beginning of the year 2000 till the beginning of year 2005, the apartment price growth rate did not witness very significant jump and did not respond quickly and uniformly to changes in growth rate of LD and LA. However, from 2006 till 2009, the apartment price growth was sensitive and moved in the same direction as the LD and LA. And the apartment price growth made a substantial upward movement during this specific period compared to the other periods under our analysis. This shows that apartment price growth had a significant correlation with growth of LD and LA implying the relation between apartment price increase and cheap credit to apartment buyers as indicated by LD and LA growth.

**Figure 2: Credit & Apartment Price Growth**

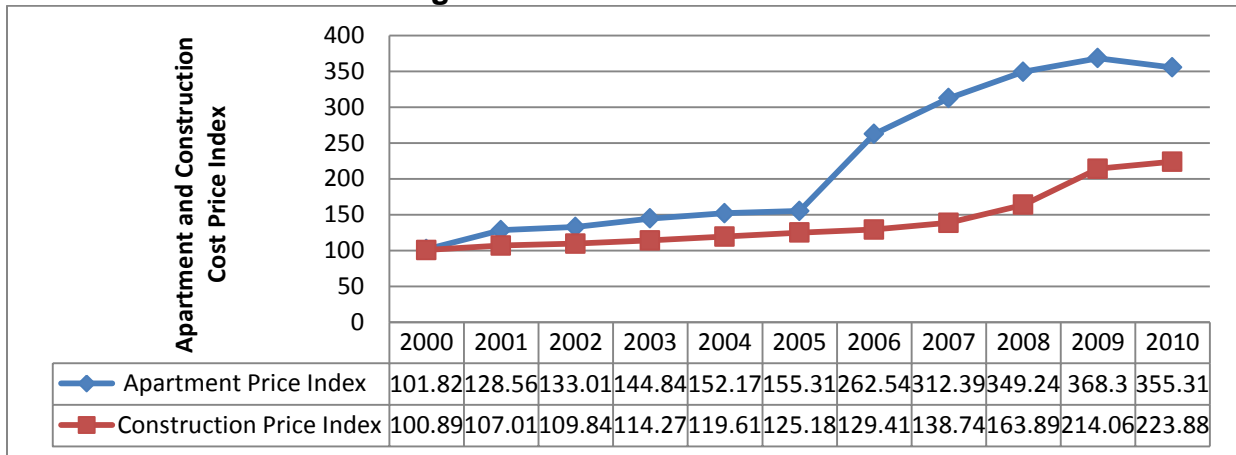


Source: Author's own calculation.

### 3.2.3 Profit Bubble

The following diagram indicated by Fig 3 shows the profit bubble that existed in the Real Estate sector over the period 2000- 2010. The blue line represents the Apartment Price Index while the red line represents the Cost Construction Index of houses. Both of these indexes show an upward trend, the apartment index rising mainly due to overly inflated price and construction cost index increasing due to rise in construction materials such as rods, bricks, cements etc. From year 2000 till 2006, the difference between these two indexes was not significantly high. However, from year 2006 till 2010, the difference turned out to be very large as can be observed from the diagram implying the existence of a profit bubble where the apartment prices were largely higher and inflated compared to the construction cost. This result is very consistent with the result of the "Housing Price to Income ratio" where it also showed a highly upward increase of the ratio value from 2006 to 2010.

Figure 3: Profit Bubble Trend



Source: Author's own calculation and Bangladesh Bureau of Statistics.

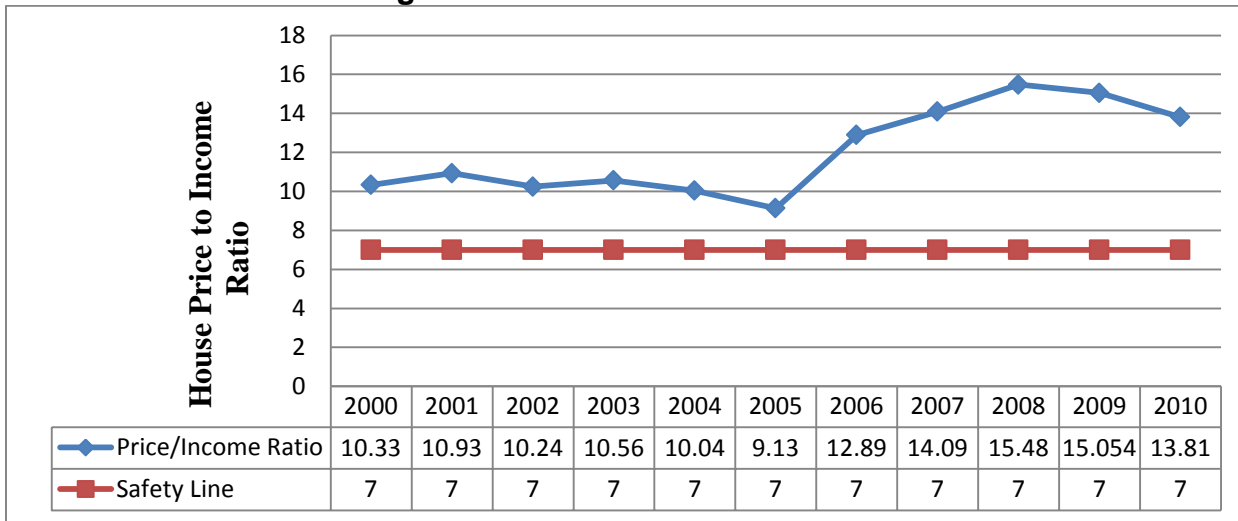
### 3.3 Measurement of Real Estate Bubbles: The Indices Methods

According to Ren and Wang (2008), the indices “housing price-to-income ratio”, “housing price growth rate-to-GDP growth rate ratio”, “real estate investment growth rate-to- GDP growth rate ratio”, can well reflect the real estate bubble level. Thus, this section will analyze the three indices respectively basing on the real situation of Dhaka Real Estate market from the year 2000 to 2010, measuring the changing situation of housing bubble and the 10-year average bubble level by examining the change of index values around the safety.

#### 3.3.1 Housing Price-to-Income Ratio

The “housing price-to-income ratio” shows the payment capacity of a family/individual when it comes to acquiring an apartment or flat. Higher housing price-to-income ratio means lower payable capacity. When the ratio increases continuously, the level of the needs of speculation in housing market become higher, causing a possibility of housing bubble forming. Internationally, the safety value of housing price-to-income ratio in developing countries is “7”. Fig.4 shows the housing price-to-income ratio of Dhaka city from the year 2000 to 2010. It is very clear from the curve that this ratio has remained above the safety for all the periods under consideration and making a very big jump from 2006 till 2009. The ratio on an average remained above 10 for all the periods signifying a high divergence between apartment prices and disposable income growth. Moreover, it can be presumed that the payment capacities of the families in Dhaka city have been weak throughout all these 10 years, and hence can be concluded that the apartment prices were not rational and highly overpriced and inflated and thus the real estate bubble existed in the market.

Figure 4: House- Price to Income Ratio

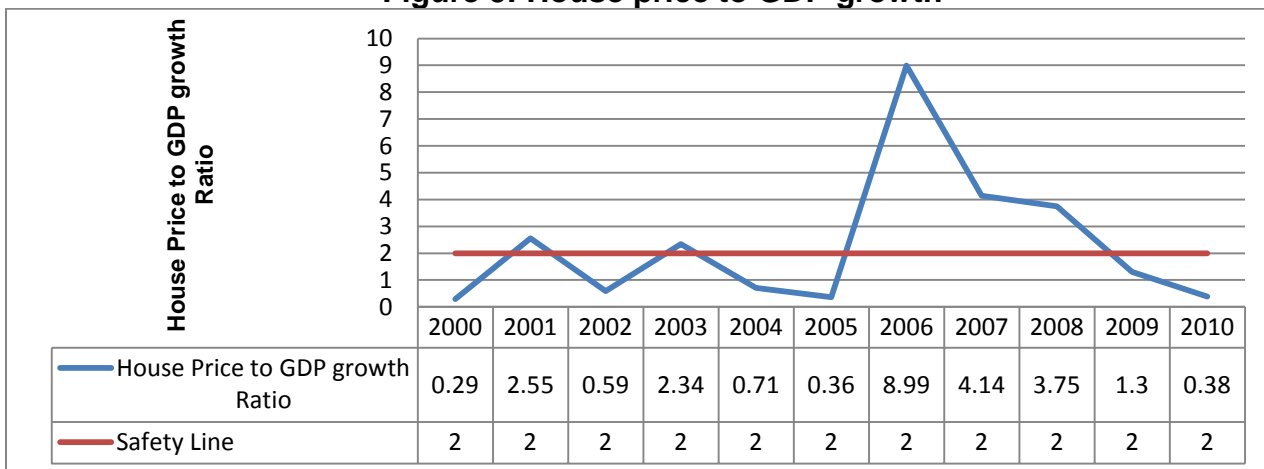


Source: Author's own calculation.

### 3.3.2 Housing Price Growth Rate-to-GDP Growth Rate Ratio

This ratio mainly shows the expansion level of housing bubble and can be usually used to examine the bubble level. Internationally, the safety value of the index has no strict standard. Generally, when the housing price increases 2 times more than the GDP growth rate, the housing price seems to be not reasonable due to the existence of housing bubble. As shown in Fig. 5, in the retrospect of this ratio, Dhaka city has basically kept a healthy economy development represented by the fact that the ratio remained under the safety line for most of the periods. However, from year 2006 to 2009, the ratio value of Dhaka city was way beyond the safety line, implying the existence of bubble during this time as the apartment price growth rate outpaced the GDP growth ratio by a large margin.

Figure 5: House price to GDP growth



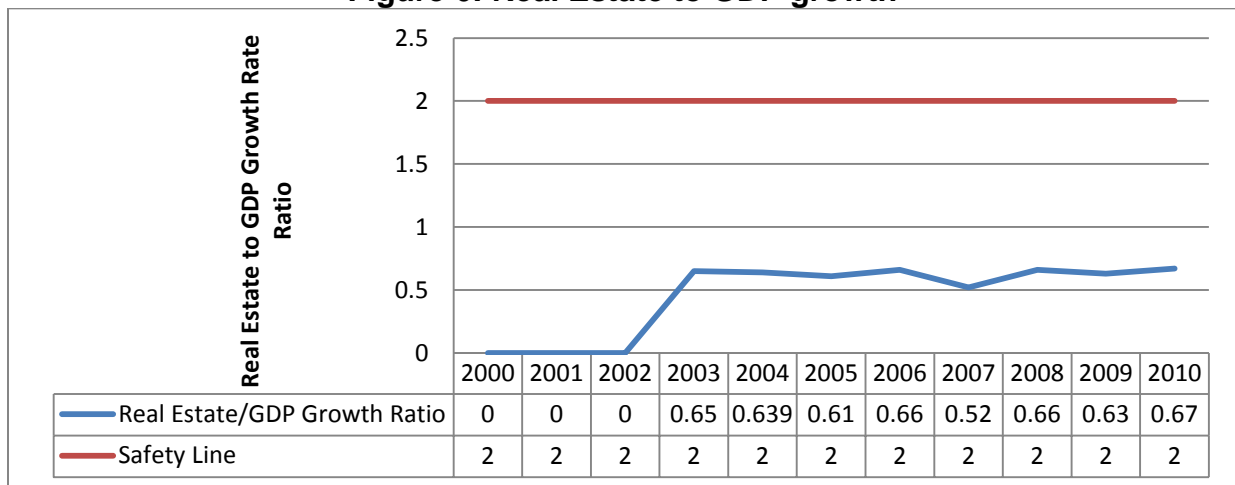
Source: Author's own calculation

### 3.3.3 Real Estate Investment Growth Rate-to-GDP Growth Rate Ratio

Real Estate investment is able to reflect the supply-demand relationship of housing market. If the investment increases rapidly, the demands of housing speculation will be also increased. Thus, it is the basic index that examines whether the investment structure in various fields of national economy is rational or not and whether the expansion of housing investment exceeds the rational standard or not. Generally, only if the ratio value is less than 2, the real estate investment growth rate is in a healthy situation.

From Fig.6 we can see that from year 2000 to 2010, the real estate investment growth of Dhaka is generally in a normal condition and is very much below the safety line. Due to the non-existence of data for Real Estate growth rate for the year 2000-2003, the growth rate is shown to be zero. And as for the rest of the period, the ratio value has remained very low and below the safety line. This shows that Real Estate growth rate has remained consistent very much in line with the GDP growth rate. Hence, in the light of this ratio analysis, there was not any presence of real estate bubble during the period under analysis.

**Figure 6: Real Estate to GDP growth**



Source: Author's own calculation

## 4. Empirical study of the Real Estate Bubble: A Regression Analysis

### 4.1 Real Estate Bubble Examination: The Ordinary Least Squares Approach

In this section we will make use of Econometric analysis through use of regression technique to find out how much of the variance of the apartment prices in Dhaka city can be explained by the independent variables used in the model. We have included 5 independent variables including financial and macroeconomic variables. Yearly data from 2000-2010 have been used for both the dependent variable and the independent variables to perform the regression based on Ordinary Least Squares (OLS) method. Like previous researches and empirical investigation method carried out by other researchers and institutions in this field of study, a similar OLS estimation has been employed here. The linear model developed for the analysis closely follows that of Ning and Hoon (2012) and a report in World Economic

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Outlook by IMF in 2004. To make the model more relevant for the local context of Real Estate in Dhaka city, the model has been improved and modified by the inclusion of new variables such as *LoanDis* and *LoanA/C* as a means of strengthening the theoretical framework to understand the significance factors influencing the housing price bubble.

The Regression Model is specified as below:

$$\% \Delta(P) = \beta_0 + \beta_1 \text{LoanDis} + \beta_2 \text{LoanA/C} + \beta_3 \text{Reallnc} + \beta_4 \text{Interest} + \beta_5 \text{Credit} + \varepsilon$$

Where,

*%Δ(P)*: Price growth of Apartments

*LoanDis*: The amount of Loans disbursed by the banks, including both private and state commercial banks to the apartment buyers

*LoanA/C*: The number of housing loan accounts opened in the private and state commercial banks by apartment buyers.

*Interest*: The percentage charged by the Banks to its loan clients

*Reallnc*: Measures the Real Income growth of the economy

*Credit*: It refers to the private sector credit growth

The following regression results have been derived through the operation of OLS technique. The results are given below.

**Table 1: Model Summary**

R-square	Adjusted R-square	Std. Error	DW Statistic	F statistic	Sig.
.950	.901	748.379	1.934	19.518	0.003

Table 1 above is a representation of the model summary implying the overall fit and goodness of the model developed for the analysis. It includes elements important parameters like the Adjusted R-square, Std. Error, DW Statistic, F statistic and its significance level.

The table 2 below provides the information on the significance of the individual beta coefficients used in the regression model. The t-statistic and P-value for all the independent variables are given below to assess which variables have significance in the model and are highly correlated with the dependent variable.

**Table 2: Significance of the independent variables**

Variable	Standardized Coefficient	t-statistic	P-value
LoanDis	0.70	3.276	0.0221
Loan A/C	0.266	1.457	0.2049
Reallnc	0.042	-0.061	0.9533
Interest	-0.007	0.269	0.7985
Credit	0.075	0.623	0.5589

#### **4.1.1 Result Interpretation**

From the results obtained we can conclude that the goodness of fit of the model is very high as indicated by adjusted square of 0.901 which implies that 90.1% of the variation of the dependent variable  $\% \Delta(P)$  i.e. percentage change in Apartment prices, can be explained by the changes in the independent variables used in the regression model. Hence, the error term of the equation captured by  $\epsilon$  is very insignificant with only 10% loss of information and the independent variables have been very effective in explaining most of the variation of the dependent variable. Moreover, the value of the DW statistic and F-statistic show that the model does not suffer from significant autocorrelation problem and the values of the coefficients are statistically significant.

From our OLS estimation, the following regression model has been established and it is specified as below:

$$\% \Delta(P) = 1019.44513037 + 0.700\text{LoanDis} + 0.266\text{LoanA/C} + 0.042\text{Reallnc} - 0.007\text{Interest} + 0.075\text{Credit}$$

Now we will analyze the significance of the independent variables used in the model based on our results presented in table 2.

The only significant variable in the model is “LoanDis” satisfying both the criteria of t-statistic and P-value. A coefficient of 0.70 for this variable implies that an additional increment in the amount of Loan disbursed for purchase of apartments would induce a increase of apartment prices by ‘0.70’ unit/taka. This implies that this variable has strong correlation with  $\% \Delta(P)$  i.e.

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growth of apartment prices and hence has significant explanatory power in explaining the changes in apartment prices for the period under consideration.

The independent variables LoanA/C, Credit, Interest and Reallnc have proved to be statistically insignificant with all their P-Values in excess of “0.05” and t-statistic of values less than “2”. Hence, from this we can conclude that these particular variables have proved to be statistically insignificant in the model and thus have weak explanatory power in explaining the changes in apartment prices over the period under our analysis.

The result from the empirical investigation does conform to our research hypotheses that the apartment price bubble can be linked with influx of housing loan as indicated by the statistically significant variable ‘LoanDis’. This result does lend support to the other empirical analysis and claims related to the credit induced real estate housing boom as found in Deng et al. (2005); Davis and Zhu (2004); Zhang and Sun (2006); Zhang et al. (2010); Kaminsky and Reinhart (1999); White (2008); Cao (2007) and Zhang and Sun (2006).

The result found from this analysis is new from the perspectives of the context this research is based on and hence adds a new dimension to the existing literature. A very interesting matter to note is that important variables like the ‘Interest’ and ‘Reallnc’ were not influential factors in assessing housing bubble. This is a very different result as both these factors are significant in explaining the borrowing power of apartment buyers. This may probably signify that when it comes to the decision of flat purchases in Dhaka city, other underlying factors like LTV ratios and convenient payment terms and conditions of housing loans are relatively more important than the prices of house loans (i.e. interest) and real income of the buyers.

## **5. Monetary Policy & Macro Prudential Regulation: Policy Approach for Bangladesh Bank**

### **5.1 Policy Options: An Analysis**

How will Bangladesh Bank (BB), the central bank of the country, with the objective of maintaining a stable inflation and promoting high output take into consideration the apartment prices and credit growth, is a question that precludes any simple answer in the economic doctrine. Many financial crises in the past decades have been the result of Real Estate Bubble and hence it is of prime importance for the central bank to be able to take precautionary measures in order to prevent the bubble. Borio and Lowe (2002) opined that in low inflation environments, monetary policy may be an appropriate and effective tool to minimize asset bubbles and to preserve financial and monetary stability. Assenmacher-Wesche and Gerlach (2008, 2010) have argued that it is extremely costly in terms of reductions in GDP to use monetary policy to deal with real estate bubbles. According to a research undertaken by them and conducted on 17 OECD countries, it was found that offsetting a 15% rise in property values would require real GDP to be depressed by 5%. Moreover, the implementation of tight monetary policy to rein in property bubbles may take a long time to come into full effect due to time lags and upward movements in interest rates may hold damaging implications for investment climate in the economy. Therefore, in

summary, while raising interest rates to minimize a Real Estate bubble may be a good option given that the economy is in a stable economic condition, the inclusion of Macro Prudential regulations alongside monetary policy would be more effective in containing the Bubble than relying on Monetary policy alone. The term macro-prudential regulation characterizes the approach to financial regulation aimed to mitigate the risk of the financial system as a whole (or "systemic risk"). From the policy perspectives of Bangladesh Bank, a mixture of monetary policy and macro-prudential regulation will be effective to check in the property price bubble in the Real Estate sector since Bangladesh Bank does not have direct intervention in the Real Estate sector. The policy guidelines should be like one where there is reciprocity and uniform coordination between the policy enforcement by BB and the government.

The following section discusses and points out a number of policies, both Monetary and macro-prudential, that might be adopted and enforced by the respective authority to promote stability and a healthy growth of the Real Estate market over time.

### **5.2 Policy Recommendations: Pathways for Bangladesh Bank**

This section discusses the possible policy actions that Bangladesh Bank with the inclusion of macro prudential regulations might take so as to control and curtail the overheating of the property price bubble. The policy recommendations are provided below.

#### ***Monetary Policy Approach***

- Bangladesh Bank can enforce regulatory laws on the housing loan schemes of the banks, especially the private commercial banks for a mandatory increase in cap on the interest charged on such loans. Currently, the mortgage/housing loans on an average range between 11-18%. Enforcing a higher cap on it to let's say, 20% to 25%, would increase the debt servicing cost of taking out housing loans. This may reduce the amount of housing loans taken by apartment buyers from the banking sector. This will push down the number of apartments bought by loans which is currently the major source of financing for flat purchases. Thus, overall, this will depress the demand for apartments and cool down the overheating of price bubbles.
- Bangladesh Bank can also make a special fund through which it will finance the construction of large housing projects and hence develop satellite towns in the adjacent municipalities of Dhaka city such as Gazipur and Savar where there are a lot of empty government lands. Back in 2007, BB created a Tk.300 crore fund disbursed through the commercial banks to finance flat purchase of the low and middle income people where the loan scheme had a very low interest of 10% compared to the market rate of 15%-18% at that time. In 2009, a government minister stated that the government is planning to develop four satellite towns accommodating a total of 100,000 flats (Karim, 2009). Hence, if BB can finance the development of such residential towns on a larger scale in collaboration with the government then the problem of affording flats due to high price shall be solved as the prices of apartments under these housing projects will substantially be lower compared to the private real estate. Overall, this will to a large extent solve the problem of housing for most middle



and low income families who have difficulty purchasing apartments in Dhaka city or even renting out one. Hence, this shall lower down the dependence on apartments in Dhaka city and thus prevent the overheating of apartment prices that has prevailed for long.

### ***Macro-Prudential Regulations***

- Mandatory reductions in Loan to Value (LTV) ratios- Currently, under the private bank's housing loan scheme, 70% of the value of the property is being covered by the housing loan and only 30% has to be self financed. If this LTV is reduced by a substantial percentage, for example 40%, then the self financing part will rise up to 60% of the property value. This as a whole will affect the demand for housing/mortgage loans as the cost of self financing is increasing. This may act as a negative shock and push down the demand for housing loans and thus the credit fueled demand for apartments will witness a substantial reduction thus pushing down the overly inflated apartment prices.
- Increases in annual real estate taxes- This measure will ensure that increase in apartment price will be complimented by higher annual real estate taxes. Thus, in time of a price bubble, the corresponding increase in taxes will make owning real estate less attractive thus pushing down the ownership of apartments and thus affecting apartment price levels.
- Elimination of tax deductibility of interest- Such elimination would mean that apartment buyers are not getting any tax relief on their income despite paying interest on their house loans. This may help to rein in property prices as this benefit of tax deductibility is being taken away and hence apartment owners will have to bear the full cost of tax alongside servicing of debt thus discouraging them into purchasing flats.
- Direct restrictions on real estate lending- This may be the most direct approach in reducing the risk of property price bubble. Such restrictions would deter the flow of credit from the banking sector to the real estate and thus pushing down the demand for apartments on a significantly high level. This will be able to contain the overheating of apartment price bubble.

## **6. Conclusion**

So far, from our analysis of the Real Estate market scenario in Dhaka city, we have gained valuable insights into the nexus between cheap credit and the apartment price bubble. From regression analysis and graphs, we can conclude that the influx of mortgage/housing loans complimented with underlying factors like manageable interest rate, attractive LTV ratio and convenient payment terms and conditions have contributed significantly to the overheating of this price bubble during the period 2000-2010. The results in this paper have added new dimensions to our current state of knowledge and showed how certain financial and macroeconomic parameters may behave differently or similarly when placed in a different scenario and economic condition. It tried to address and provide an empirical justification on credit induced housing boom in a context on which little or no researches exist. The significance of this paper is that it opened up new avenues for policy makers and researchers alike to pursue further study into this phenomenon. It is to be noted that this paper did fall

short on some aspects such as data inadequacy of variables, small sample size, non-cooperation of real estate companies in disclosing relevant information and usage of variables as proxy of another. There is further scope of research in this particular sector. If the following problems and inadequacies can be overcome, a more dynamic investigation can be carried out in examining the research hypothesis that this paper is based on.

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