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Master in Real Estate Management  
Real Estate Development and Financial Services

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## **Business and Real Estate Cycles The Kuala Lumpur Office Market**

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## Master of Science thesis

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Keywords : Cycles, Real Estate Cycle, Business Cycle, Demand, Supply, Absorption, GDP, Kuala Lumpur

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### Abstract

**Purpose-** The purpose of this paper is to apply the concept of business cycle and real estate cycle in term of their characteristics, period and sequence of the cycle to the Kuala Lumpur's office market.

**Design/methodology/approach-** The paper is based on previous literature review, facts, reports, and data in arriving at the conclusion of the study.

**Findings-** This paper revealed the characteristics, period and sequence between business and real estate cycles to Kuala Lumpur's office market.

**Research limitation/ Implications-** The framework and flows of this paper act as an introduction for the paper. Lacks of literature and attention on the business and real estate cycles in Kuala Lumpur's have created difficulties to gains information and data on this paper.

**Practical implications-** This paper is important for the students, government and policy maker in order to further a research and develop a foundation for business and real estate cycles in Kuala Lumpur.

**Keywords-** Real Estate Cycle, Business Cycle, Demand, Supply, Absorption, GDP, Kuala Lumpur

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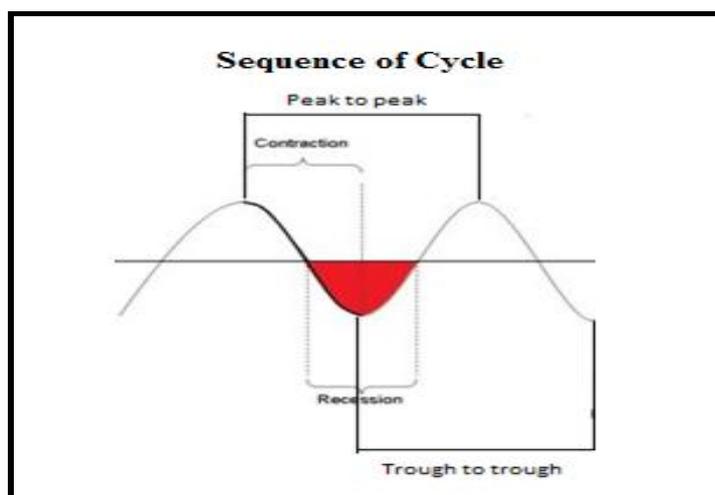
## 1. INTRODUCTION

### *1.1 Background*

Real estate and business cycle correlate to each other in a way that both of the cycles are fundamental to each other. In other words, real estate and business cycles move in a circular motion that leads to the upswing and downturn of each cycle. Every sequence of this cycle will lead to one and another. For an example, an upswing in real estate cycle will lead to an upswing in the business cycle and vice versa.

The real estate cycle consists of several stages from acquisition of land, feasibility study, planning, construction, selling, management and refurbishment. This process will then contribute to development of the ups and down of the real estate cycle. However, as similar to other cycle, the real estate cycle also fluctuates according to the economic condition of the country.

In the meantime, the business cycle is mainly driven by holistic measures of endogenous and exogenous factors of the world and domestic economy. Burns and Mitchell (1946) noted that business cycle is a repetition of the nation's aggregate economy activities that consist of expansion, peak, contraction and recession. The positive sequence is running from trough to trough and the negative sequence is from peak to peak as illustrated in figure 1 below.



**Figure 1:** Sequence of cycle

A few characteristics have been found in determining the relationship between these cycles. They are period of occurrence and sequence of the cycle. These contribute to the physical fundamentals of the cycle. The length of every cycle for instance, was found to be non identical between cycles. There were some with a long time period while the others with medium or short time period. While for sequence of the cycle, co-existence may occur between both cycles as a result of tight reliance between the cycles. (See Renaud (2003), Wheaton (1999) and Kaiser (1997)).

As noted in Renaud (2003), the macroeconomic higher dependency to real estate has makes the economy vulnerable and has a higher potential to face economic crisis. This has been witnessed by the occurrence of Asia financial crisis in 1997. The causes of the crisis initially have been acknowledged to be lack of high caliber banking system, weak stock exchange, fringe attitude and various other causes (Mera and Renaud, 2000). At that time countries like Hong Kong, Taiwan, South Korea, Malaysia, Thailand and Indonesia were hit by a strong demand of real estate as a result of rapid urbanization.

In addition, the immature banking control at that moment had led to higher dependency on real estate and caused the economy to soar. Furthermore, large part of these countries had high real estate to GNP ratio which exposed them to the risk of imbalanced distribution. As a result, only some of the countries that were able to tighten their banking system had managed to survive while some faced smaller impact. Another prime example of close connection between real estate and economics can be witnessed in the recent global financial crisis that was caused by the failure of the banking and investment players to detect the problem earlier.

This study will discuss the real estate cycle and business cycle relationship in terms of their phases, period of occurrence and sequence. Moreover, the study will be centered on the real estate cycle and business cycle in Kuala Lumpur.

### ***1.2 Aim***

Real estate and business cycles have been a big issues discussed globally. It has demonstrated a tremendous effect on world's economy. In the recent global financial crisis, which started with a subprime market in real estate, has led to a financial crisis that first shook United States, followed by Europe before spreading to the rest of the world. This phenomenon has

triggered my desire to explore the performance of real estate and business cycle in Kuala Lumpur. The study will act as an introduction to the real estate and business cycles in Kuala Lumpur. It will touch on the characteristics of the cycles, period of the cycles, and their relationship. The paper will also cover the range between real estate absorption in existing purpose built office and growth of gross domestic product pattern in Kuala Lumpur from 1985 to 2010. It tries to capture the trends and patterns in real estate cycles in order to identify the relationship between these two cycles.

### ***1.3 Research Question***

This study aims to look deeper on the study done by Zailan(2009) through her presentation during the 16<sup>th</sup> Asean Valuers Association (AVA) seminar on the performance of Malaysia's property market amid the global economic crisis. This study will look into the relationship between real estate cycle and business cycle which is very much interdependent on each other. In order to shed light on the research question, this paper will look into sub-questions such as:

- Characteristic of the cycles  
Does the cycle move in a cyclical pattern?
- Phases of the cycles  
Do phases such as expansion, peak, contraction and trough occur in the cycle?
- Period of the cycles.  
How long does the cycle last?
- Sequence of the cycles  
Which cycle moves first?

### ***1.4 Limitations***

This paper seeks to establish the relationship between real estate with economic condition in Kuala Lumpur. It uses previous literature as theories and guideline as the foundation of its research question and methodologies. The indicator for real estate such as absorption, and for economic condition such as gross domestic product (GDP), are considered as straight forward, however hard to interpret as it is used analytically rather than empirical. Lack of literature, data and attention on the Kuala Lumpur's real estate cycle and business cycle will also create difficulties in reaching a transparent and unbiased conclusion. Thus, the

framework of this study will only used as an introduction for real estate and economic condition in Kuala Lumpur within the previous three decade.

### *1.5 Disposition*

The paper is divided into six divisions. Firstly, it starts with introduction of the paper, followed by methodological considerations that will be used in the research. Secondly, the paper looks at the various theories used to explain the relationship between real estate and business cycle. It continues with background information on Kuala Lumpur's economic development and its real estate environment to shed some light on the Kuala Lumpur business and real estate arena. Later, data on GDP and absorption will be collected and tabulated in a graph. Last but not least, conclusion and further studies will be suggested in the final part of this paper.

### *1.6 Methodology*

#### *1.6.1 Theoretical Basis*

This study uses several theories from previous authors regarding the relationship between real estate and business cycle as its methodology. Previous studies on real estate cycle had a long swing and data was typically gathered in large time zone. Several previous studies exhibited the usage of broad time horizon in distinguishing real estate and economic cycle. For example, Kaiser (1997) used historical annual return from 1923 to 1985 to determine every single real estate cycles while Tsatsaronis (2004) adopted data dated since 1973 to 2003 and from 17 industrial countries. Beyond that, Zailan (2009) used an annual real estate transactions data and country's GDP for the real estate and economic cycle respectively.

#### *1.6.2 Choice of Method to Use*

This study will use similar volume of data used in previous literature. It will use absorption rate obtained from percentage of spaces for existing purpose built office real estate. Zailan (2009) determined absorption as the amount of changes in occupancy to the vacancy rate, which derives from the equation of:

$$\text{Absorption Rate} = \frac{\text{Occupied Space (t)} - \text{Occupied Space (t-1)}}{\text{Existing Stock (t)} - \text{Occupied Space (t-1)}} \times 100$$

A comprehensive GDP for these years will be used in determining economic cycles. The GDP is obtained from the World Bank, and assumed as the GDP of Kuala Lumpur as GDP is a component of macroeconomics that measures the economy as a whole<sup>1</sup>. This data will then be analyzed statistically according to previous study done by Zailan (2009). However, this study will differ in term of data gathered and analysis as it plots the relationship between real estate cycle and business cycle in a single graph.

### *1.6.3 Choice of Data Source*

The research data are selected from Malaysia's Statistical Department, Treasury Department through Ministry of Finance (MOF), Central Bank (BNM), National Property Information Centre (NAPIC) under the arm of Valuation and Property Services Department (VPSD). Other reliable third party sources such as World Bank, CIA World Factbook, and International Monetary Fund (IMF) data are used in order to come out with a concrete study.

The data were taken from secondary sources and have been transformed into facts and figures. Data on GDP was gathered from the World Bank. While data for office supply and absorption were taken from National Property Information Centre (NAPIC). Other information related to Kuala Lumpur is congregated by the local authority of Kuala Lumpur City Hall (DBKL), Malaysia Central Bank or Bank Negara Malaysia (BNM) and Statistical Department.

This study is non-respondent study therefore no interview or any feedback has been made throughout of the study. In order to retain authenticity of this study, the sources are congregated based upon its reliability and most of the information come from official sources.

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<sup>1</sup> Refer to <http://www.investopedia.com/articles/02/120402.asp#axzz1iFTvdMvA>

## 2. LITERATURE REVIEWS

The literature review will be the theoretical basis of this study. It will first explained definition of cycle, before coming into the core part of the study, that is business and real estate cycle. In these parts, characteristics and phases of the cycles, period, sequence and the cycles indicator will be explored. Then, relationship between real estate and business cycle will be explained. Lastly, a hypothesis will be established in the summary of this literature review.

### *2.1 Fundamentals of cycle*

#### *2.1.1 Definition*

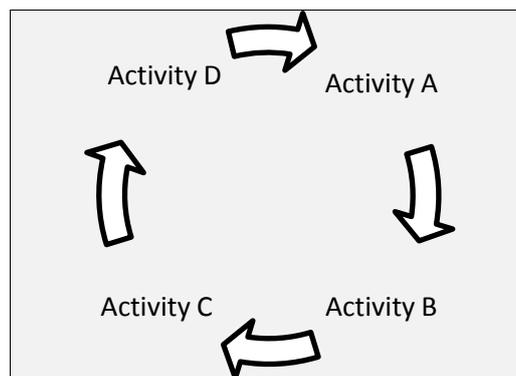
To understand thoroughly about real estate and business cycle one need to be acquainted with the definition of cycle. According to Oxford Online Dictionary<sup>2</sup>, cycle can be defined as:

*“A series of events that are regularly repeated in the same order”* and also

*“A period of time taken to complete a cycle of events”*.

Another definition of cycle by the Cambridge Dictionary Online<sup>3</sup> defines:

*“A group of events which happen in a particular order, one following the other, and which are often repeated”*.



**Figure 2:** Illustration of a cycle

The word cycle can be synonymise with the words of phase, sequence, series, rotation, repetition or round are all symbolizing the act of moving wheels that rotate up and as in figure

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<sup>2</sup> Retrieved on 27 September 2011, [www.oxforddictionaries.com](http://www.oxforddictionaries.com)

<sup>3</sup> Retrieved on 27 September 2011, [www.dictionary.cambridge.org](http://www.dictionary.cambridge.org)

2 above. In general, we can assume that cycle is a recurrent set of identical series that has beginning and end.

Phyr, Roulac and Born (1999) in describing relevancy of cycles have come up with the nature of cycles which exist everywhere and were interdependent. They relate this nature to being related to everything we live in from the solar to earth system and their physical changes which effect human behavior and economic activity. So, it is logical that real estate and economics is also cyclical.

## *2.2 Business Cycle*

### *2.2.1 Characteristics of Cycle*

There are four phases in business cycle. Fanning (2007) categorised business cycle into expansion, slow down, peak and downturn, contraction and slow contraction and upturn. This cycle is described in the context of production, employment and incomes that will later draws the upswing and downturn of the business cycle. These can be explained as below:

i. Expansion

During this period, economic is in upswing, growth in production and employment can be seen. At this period, price of consumer goods will increase but parallel with the growth in incomes.

ii. Slowdown, peak, and downturn

Economy continues growing reaching full employment. At this moment, rate of inflation increases more than consumer incomes, and slows the economy. This phenomena slowly reaching peak of the economy sets itself up for contraction.

iii. Contraction

A decline in employment, production, and income will be experienced in this period. Prices show stabilization and deflation. At this moment, the economy falls sharply.

iv. Slowed, contraction, trough, and upturn

Once the economy falls, it tries to stabilize rates of employment slowing it down, stabilizes unemployment, reaching trough point, and then set it to expand again.

### *2.2.2 Period of the Cycles*

Previous study by Zailan (2009) has gathered GDP as business cycle indicator from year 2000 to 2009. This period intended to resemble Malaysia's economy after the Asian Economic Crisis of 1997 and through the recent global financial crisis in 2008. Furthermore, numbers of studies have been done in early the 1900s by economist in essence to determined period of business cycles. Economists such as Burns and Mitchell (1946) have analyzed nine different phases of the business cycle from the period of late 1890s until 1940. But, the period of time taken in determining the business cycle is quite vague.

Filardo (1994) found that period of business cycles varies across time. He included Hamilton (1989) whom suggested that timing and duration phases of business cycle are dependent on National Bureau of Economic Research (NBER) contractions and expansions, compared to the business cycle behavior itself. But none could find a better solution as economic behavior is unpredictable.

As business cycle and real estate cycle have an inevitable relationship, Phyr, Roulac and Born (1999), have identified period of business cycle is to be determine through the relevance of real estate investment performance. While for a study done by Grebler and Burns (1982) had found that peak in GNP lead to eleven month peak in construction cycle. Furthermore, studies done by several authors such as Witten (1987), Rodino (1987) and Apgar (1986) suggested the consideration of exogenous factors such as time acquisition when market is soft and disposition when market is tight to come out with the period of the cycles.

### *2.2.3 Sequence of the Cycles*

In an article written by Zailan (2009), she has studied sequence of business and real estate cycle for eight consecutive years. She had used data on Malaysia's GDP rate and property transaction from year 2000 to 2008. Those data were presented in graph to illustrate fluctuation movement of both cycles in series of activities throughout these eight years until the recent global recession in 2008. The sequence of cycles in most of the time is varied between each study.

#### ***2.2.4 Business Cycle Indicators***

Basically, business cycle indicator is a statistics of past and present economy. This statistics later will be used to generate future prediction of economy performance. Thus, knowing these indicators is important for further understanding of business cycle.

Stock and Watson (1998) had done an examination of economic cycle indicators through 71 economic time series in 8 broad categories of sectoral employment. They had studied every detail in the sectoral economy components before transforming it into logarithm and change it to percentage at an annual rate. Those percentages were later used to determine the nation's economic cycle. The components of his 8 categories sectoral employment were National Income and Product Account, aggregate employment, productivity and capacity utilization, prices and wages, asset prices, monetary aggregates, miscellaneous leading indicators and international output

Nevertheless, most common studies have employed real gross domestic growth (GDP) as the main indicator to business cycle. Classics studies of business cycle by Burns and Mitchell (1946) and other economist such as Harvey and Jaeger (1993), Hess and Iwata (1997), Pagan (1997) Male (2011) had applied GDP to determined aggregate macroeconomics in their time series data. As an aggregate measure, GDP is a comprehensive report on total production for a country for a period of time which is discounted with base year to distinguished current present value of the real growth.

#### ***2.2.5 Importance of Demand and Supply in Business Cycle***

Demand and supply play an important role in the business cycle. They are fundamental factors that lead to construction of GDP components. A stable economy in a country for instance, may increase demand of goods and services, while at a meantime may also increase supply of these goods and services. This will lead to the prosperity of one's economy. However, if the opposite is happening, one's economy may be doomed leading to a trough period of the downturn business cycle.

A business cycle draws attention to importance of demand and supply in development of its cycle. In order to gained and control an economy of one's country, demand and supply should be monitored continuously to enhance its growth. Other factors are also important in

constructing GDP component, however, demand and supply is the most fundamental as it is considered as the ignition of every action.

### *2.3 Real Estate Cycle*

While in real estate cycle, the literature review will be explained in same context as in business cycle, such as characteristics, period, indicators and importance of demand and supply in the cycle.

#### *2.3.1 Real Estate Cycle Characteristics*

Characteristics of real estate cycle are demonstrated in a study conducted by Fanning (2007) and Wheaton (1999). Wheaton (1999) had introduced a Stock Flow model to defined real estate cycle by sectioning cycles and proved the existence of these phases in real estate. In this model, he showed that there is strong existence of demand in a given stock of real estate. This demand relates to general economic condition such as increase in gross domestic product (GDP) and employment rate, that later leads to increased real estate price and production. In the short run, constant supply of real estate would stabilize the price as demand meets supply. However, this situation is only for the short run as in the long run demand would be lower as a result of real estate oversupply that contributes to price plunge and raise vacancy. Thus, every transition in economic behavior certainly has an influence on the cycle of real estate.

In a literature made by Fanning (2007) described real estate cycle with occupancy, absorption rates, prices, construction and development activity. This real estate cycle is divided into four stages:

- i. Recovery

The recovery period is the moment where the cycle is having a slow contraction, trough and upturn. At this moment the real estate notably experiencing decrease in vacancy rate, low rental growth and lesser absorption rate as in the expansion period. Unstable economy makes an impact on the employment rate and effects the real estate where construction and development bottoming out, reaching its trough. However, these enable the absorption to stabilise and occupancy rates rise again.

ii. Expansion

During this period, occupancy and absorption rates is said to increase to its highest and reached its peak. The employment rate also increases and reach optimum occupancy rate thus simultaneously increasing the demand for real estate. As a result, prices on real estate bubble, and construction accelerating its pace.

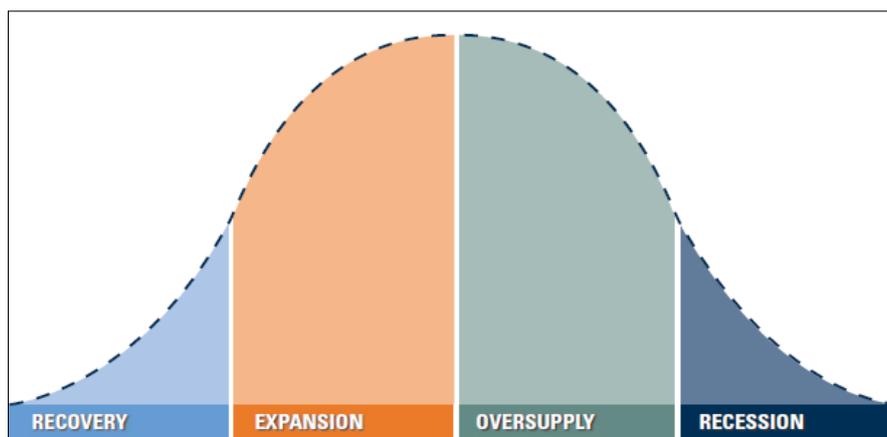
iii. Oversupply

In this period, the cycle is in peak position. Once prices in real estate booming, less people will spend on real estate. Absorption will increase with a slow path, reaching its peak, and decline. The employment rate starts to mellow down and causes the demand of real estate to slowly decrease.

iv. Recession

Recession or contraction is a period where real estate starts declining, low absorption rates and decrease in occupancy rates. Like a bubble, prices of real estate burst, and fallout of prices are experienced. The economic recession brings effect on employment rate as employment is low, demand for real estate low. Hence, the real estate construction and development fall to bottom.

Figure 3, shows the illustration of each period in real estate cycle that demonstrates on how every period in the cycle creates impact on each other.



**Figure 3:** Real estate cycle

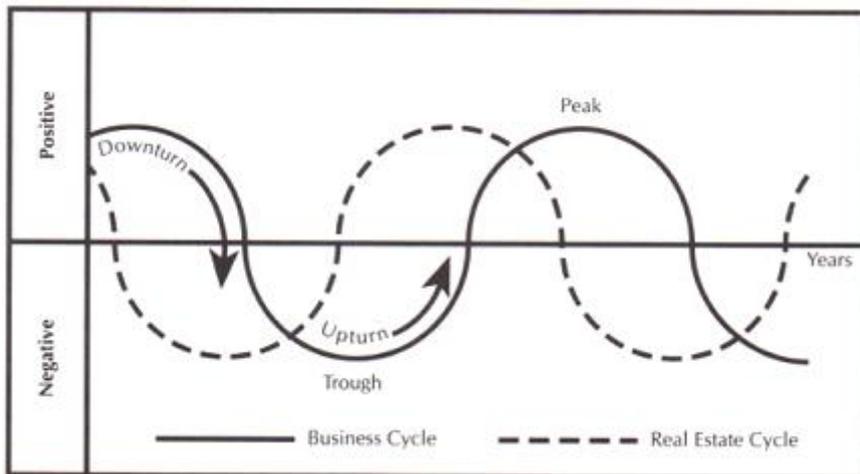
*Source: [www.tcofficespace.com/realestatetips.aspx](http://www.tcofficespace.com/realestatetips.aspx)*

### 2.3.2 Period of the Cycles

According to Wheaton (1987) a recurrent ten-twelve year cycle of real estate does exist in the national office market. While Mueller (2002) has included Witten (1987) and Brown (1984) on period of real estate cycle as being unique, more time or longer length of time is needed to have a better understanding of the cycle movement respectively. Yet, there is still no uniform measurement available in addressing this matter.

### 2.3.3 Sequence of the Cycles

There are three different opinions on real estate cycle found, such as moving in advance, tailed and constant with economic cycle. As stated by Fanning (2007) real estate cycle is depending on business cycle, however it reacts in advance. He proposes his idea that real estate activities act in advance in accommodating demand for properties in the short run. In return, it creates economic activities through loans and mortgages. This is part of fundamentals of the economic cycle. Figure 4 exhibits the sequence of business cycle decline later after real estate cycle and real estate move in advance before it follow by business cycle.



**Figure 4:** Real estate and business cycle  
*Source: Fanning (2007)*

Meanwhile, significant studies showing real estate cycle mutually exist ahead before economic cycle is also covered by previous studies. Mueller (2002) claimed that the connection between real estate cycle and business cycle is tight but it usually tailed after the

business cycle. Evidence he has made up showing real estate supplies could not fulfill the current demand while at different time it has become oversupply when demand is low. He has also has considered real estate cycles to be a ‘mirror reflection’ of the economy. However, they may differ by the influences of different set of time, locations and other dependents.

#### *2.3.4 Real Estate Cycle Indicators*

There are eight factors such as vacancy rates, absorption, occupancy rates, time lag, types of properties, property present value, government intervention and GDP should be considered in both of the cycles. These variables will later help in shaping cycle of real estate and business cycle in this study.

Wheaton (1987), discussed the importance of vacancy rate in determining the cyclic behavior of the national office market. It was found to act as an indicator to supply and demand of property as well as for rent and price adjustment in real estate markets. He also found a direct linkage between business and real estate cycle through recession forecast which seen up and down of economic relation with absorption and vacancy rates.

While in terms of valuation context, Born and Pyhrr (1994) has stressed the importance of real estate cycle and market condition in producing a meaningful and a clear reflect on the property present value estimates. This study shows a significant relationship between real estate and business cycle in providing strategic decisions, taking into account peak and trough economic cycles and occupancy rates of the property.

Mueller (2002) in forecasting the next real estate cycle performance has mentioned importance of time lags in determining real estate cycle as demand and supply of properties takes more time to complement each other. This is due to the nature of properties itself plus tedious procedures associates to complete development of the properties themselves. So, considering the time lags in demand and supply of properties may control space production, at the same time help to lessen volatility of real estate, besides the effect of economic cycles.

Types of variable choose also play important role in shaping the cycles. General perception of real estate or economic cycle that usually move with the same pattern may contrast depends on the type of real estate itself. Wheaton (1999), discussed that the idea of

consistent volatility of real estate cycle is not completely accurate. It depends on types of real estate. From his study on 54 largest metropolitans in Unites States, he has found out that retail and office properties are more prone to inconsistent changes in real estate cycle.

Factors affecting real estate and economic performance such as using absorption, government intervention and GDP as its indicator have been pointed in Zailan (2009). The paper questioned the relationship between real estate indicators, GDP growth and government measures during global economic meltdown. It was found that, despite of global economic uncertainties, government measures and initiatives promote a healthy property economics. However, property market performance is undoubtedly affected by the crisis through a slight drop in property transaction value, and a slower demand and supply situation.

### *2.3.5 Importance of Demand and Supply in Real Estate Cycle*

A study by Kaiser (1997) showed that excessive supply of residential properties, which is greater than demand at that time, had caused inflation and negative returns to real estate cycle. Historically, the period of late 1920 to 1930 has showed a tremendous effect of imbalance demand and supply of real estate to the economics as a whole. He discovered several boom/bust periods in his study from the early 1920s to 1980s toward analyzing how price were less volatile and became more stable when it was in a long economic cycle. This study is essential to know the relationships of economic behavior at that time that could change the real estate cycle.

Mueller (2002) in explaining physical cycles of real estate had draw attention to importance of demand and supply in real estate and business cycle. As mentioned earlier, besides than economic cycles, demand and supply are important in determining volatility of real estate. Failure to monitor demand and supply of real estate may direct to oversupply of properties. Besides, it will also affect the economic performance and its capital market investment, as construction projects needed to be stopped, and downgraded of REITs stock, for instance.

## *2.4 Relationship between Real Estate and Business Cycle*

First of all, relationship between real estate and business cycle is described in a simplest way by Fisher (2008). He dictated business cycle and real estate is much related to each other. As for instance, in his book mentioned that real estate cycle is important in order to forecast the economy. Number of units being erected for an example, may be an indicator to the business cycle itself.

Geraci (1996) validates this through his book by stating that real estate cycle has a vital effect in enhancing the business market. As an example, in the years after World War II (1946-1966), when the economy needs to be stimulated, capital will be injected to real estate industry. At that point, real estate market helps reviving the economy through distribution of loans and mortgages, and also by providing job opportunities through construction area from foundation to the interior appliances of development.

Geraci (1996) in explaining relationship between business and real estate also pointed out that they have a cyclical movement as they move together through inflation and recession. These have been explained through government intervention in aiding the economic, using real estate as it tools to control simultaneous up and down of economic performance.

## *2.5 Summary*

Based from the literature reviews done previously, it has created a guideline to determine real estate and business cycle in Kuala Lumpur. The literatures also covered several characteristic of the cycles such as relationship, phases, period, and sequence of the cycle. It has also collect information from previous study on how to determine real estate and business cycle for this study. Moreover, the existence force of demand and supply must notably recognize as it was able to maneuvered direction of the cycle as example to previous connection of demand and supply to boom and bust period.

These literatures will also act as a hypothesis to the study. In order to answer the research question, the previous literature has found that:

- There was a great relationship between real estate and business cycle.
- They were moving in a cyclical pattern which consists of expansion, peak, contraction and trough.

- There were inconsistent of theories on period of the cycles.
- There were inconsistent of sequence of the cycles. Some were suggested that real estate move in advanced, and vice versa.

### 3. OVERVIEW ON BUSINESS CYCLE

#### *3.1 Definition & General Economic Overview*

A business cycle usually measures economic outlook in a certain country. It consists of three most vital variables such as output, unemployment rate and inflation rate. Output measures level of production of the economy. It is typically determine by GDP. GDP may give a perspective on size of an economy of a country, while GDP per capita provides average standard of living of the country, whereas GDP growth tells the performance of the economy from year to year. As this study tries to find out economic performance in Kuala Lumpur, GDP growth will be used to analyze the business cycle. The following, will bring more insight on the overview of business cycle.

Economic outlook in general have shown its dark days since the collapse of American financial in mid 2007. However, amidst of the crisis, world economy have grew rapidly for the past two decades. It has contributed to good performance of world's output before the crisis arrived (Blanchard,et.al, 2010). The following will show and give more insights view of the economic outlook globally before coming into Kuala Lumpur's economy.

#### *3.2 Economic Overview in United States*

The global economy view would not be complete without an overview the economic giant, the United States. Since the Great Depression in the 1930s, the economy of USA has very much prospered as other European counterparts. The GDP growth has been moored around 3%-4.5% and GDP per capita has grew steadily for the past few decades (World Bank, 2010). Nonetheless, in 2008 it has slowed down after severe subprime market recession triggered in the middle of 2007.

Besides than problem of subprime mortgage market, there are other four major reasons that are believed to have triggered the recent economy meltdown, which are: increase in oil prices, fall in housing prices, fall of stock market, and restriction of credit. (Blanchard, et.al, 2010).

The increase in oil prices has raised inflation to and cost of commodities in global markets. Fall in real estate price and stock market has lessened household wealth. These has

been worsened by credit restriction by federal reserves to tighten the capital market and made it harder to access credit.

Another reason that contributed to US economic crisis is its imbalance of trade deficit. Its import has exceeded export enormously, that lead to borrowing from the rest of the world to cover up the trade deficit. This phenomenon is a mirror image to what has happened to the Asian countries in the late 1990s. United States average output growth rates for the previous two decades can be seen in Table 1.

**Table 1:** Output growth rate for United States since 1991

Output Growth Rate	
1991 - 2000	2001 – 2010
3.3	1.6

*Source: World Bank*

**3.3 Economic Overview in Southeast Asia**

In the late1990s Southeast Asia<sup>4</sup> has been affected to the Asian crisis. Many have suffered during this crisis. It happened due to large borrowing made by Thailand and Indonesia from the rest of the world when suddenly the rest of the world changed their mind, and stopped lending to Asia, (Blanchard et.al, 2010). However, the precise causes of the crisis remain debatable. But the good part is it turned most of the countries to be more transparent, and improved banking institution. Although some country went much further than the others.

During the last decade, Southeast Asia has learned its lessons and started to move on. Nonetheless, in the context of the USA economic crisis, Southeast Asia has not been excluded from being affected by it. Some parts of Southeast Asian countries average output growth rates for the previous two decades can be seen in Table 2.

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<sup>4</sup> Southeast Asian in this context are countries consist of Singapore, Indonesia, Malaysia and Thailand

**Table 2:** Output growth rate for Southeast Asia countries since 1991

Output Growth Rate		
	1991 - 2000	2001 - 2010
<b>Indonesia</b>	7.2	5.3
<b>Singapore</b>	7.5	6.0
<b>Thailand</b>	7.0	5.1

*Source: World Bank*

### ***3.4 Economic Overview in Malaysia***

Malaysia's economic development is towards a multi sector economy. Started from a producer of raw materials, agriculture produced a large proportion of national's commodity with oil palm and rubber being the main export commodities along with timber and cocoa. In early 1980's, in correspondent to the government industrial shift, the economy landscape had changed into manufacturing and heavy industry. The service sector also has developed to become one of the main components of economic in Malaysia, especially in recent years.

It has developed into a free market economy. Singapore, China, Japan and United States are amongst Malaysia's trading partners with main export in manufacturing of electronic components, petroleum, liquefied natural gas, palm oil, and rubber. Government has moved up value-added production chain by attracting investment in Islamic finance, high technology industries, biotechnology and services.<sup>5</sup>

Malaysia economic development has prospered in the 1990s. However, it has collapsed in late 1990s due to the Asian crisis. Malaysia has acted independently without accepting helps from international monetary fund. It has taken measures to boost its domestic demand while reduced economy's dependence on exports.

While in early 2000s, once again, Malaysia has fell into economic crisis, and recently it has not been excluded from the global crisis in the late 2000s. Malaysia average output growth rates for the previous two decades can be seen in Table 3.

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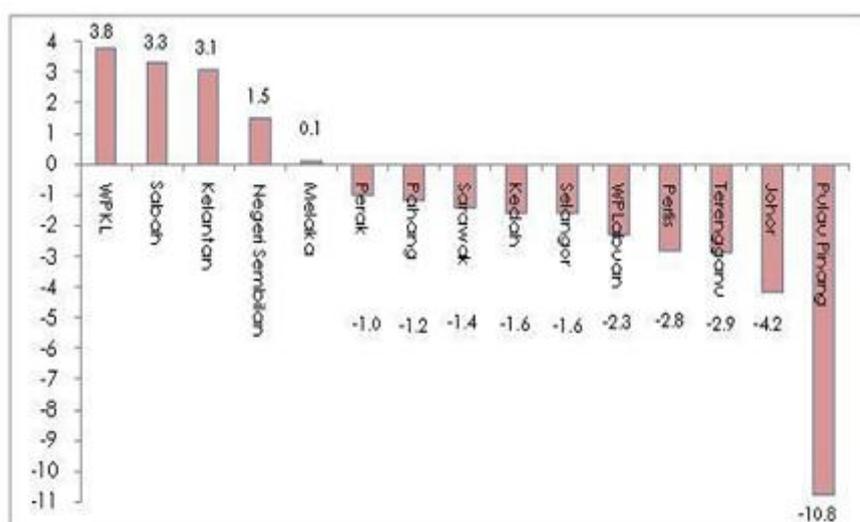
<sup>5</sup> CIA The World Factbook on Malaysia economy, retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/my.html> on July 18, 2011.

**Table 3:** Output growth rate for Malaysia since 1991

Output Growth Rate	
1991 - 2000	2001 – 2010
9.1	5.6

*Source: World Bank*

Kuala Lumpur is a capital city of Malaysia. It has contributed the most to Malaysia's economic development compare to other cities (refer to WPKL in Figure 5 below). In developing country economy vision, Kuala Lumpur is positioned to achieve a vision in turning Kuala Lumpur into a world class city in the year 2020. Being a capital city of Malaysia has made Kuala Lumpur economic activities and development moves in accordance with Malaysia's economy vision and mission.



**Figure 5:** GDP growth (%) by the state at constant 2000 prices in 2009  
*Source: Statistics Malaysia.*

## 4. REAL ESTATE IN KUALA LUMPUR

### *4.1 Development of Real Estate in Kuala Lumpur*

Real estate in Kuala Lumpur has continuously being developed into a modern city. The development has taken place since it became the federal city of Malaysia in early 1960's. However, significance development of the city only came in early 1990's where impact of industrialisation of the nation economic has become fruitful. The robustness of its economy has made Kuala Lumpur as an attractive place to live and operate business (Mera and Renaud, 2000).

The price of land is comparatively low compared to other neighbouring Asian cities. As a result, this has creates strong demand for real estate in Kuala Lumpur and areas close to the city. A great number of new developments have grown along the city lines and greater Kuala Lumpur areas. The greater areas then have been sprawled into nuclear cities around Kuala Lumpur which is known as Klang Valley. The demand of real estate in these areas is increasing consistently every year that has accumulated to short supply of real estate and thus increases the price.

Meanwhile, the robustness of economic is not just bringing different dimension to real estate market but also to the financial market. Despite continuous demand on real estate, financial market has become more liberalised and exposed to the risk of financial crisis. The periodic crisis is often followed by real estate price bubble. As cited in Allen and Gale (1999), historically the financial crisis that has happened in large cities was formed by the liberalisation of their financial market. In addition, the liberalisation of financial market has increased the lending rate thus increase the price of real estate. These further contributed to price collapse and initiated real estate bubble.

Furthermore, in evidence to Renaud (2003), the main cause of the Asian financial crisis in 1997 was evidence of weakness of the financial institution. Banking liberalisation opens more potential in term of foreign direct investment and greater capital inflow, but the banking liberalisation has also resulted in some negative impacts. The bank lending is much more relaxed and low interest rate. Furthermore, this capital regime that has caused much to the non-performing loan. This has backfired on the financial institution at that time and caused

the financial turmoil. In order to overcome the problems, the central bank has raised the interest rates which later exposed more problems to the real estate industry.

Identical to other large cities, Kuala Lumpur has also experienced boom bust period of real estate in late 1990s. The bust period of real estate cycle in Kuala Lumpur has strong connection to Asia financial crisis in 1997. Prior to the crisis, Kuala Lumpur has rapidly developed into urban area as part of its urbanization process with record high demand of real estate. The financial liberalisation has increased lending rates thus increased the real estate price. At the time when Malaysia been hit by the Asian financial crisis 1997, the real estate bubble in Kuala Lumpur has finally burst. The real estate was adversely impacted by the crisis and took a long time to recover.

Moreover, the financial crisis and liberalisation of financial market are not the only causes of real estate bubble at that moment but other factors such as speculation have also contributed to bubble in Kuala Lumpur. The ability to acquire multiple real estates and with a less strict regulation increased the price of real estate in Kuala Lumpur. This led to oversupply and lowered the occupancy rate. Besides, the scarcity of lands in city centre and increase cost of raw materials also caused the burst of real estate bubble in Kuala Lumpur.

#### *4.2 Kuala Lumpur's Real Estate*

In Malaysia real estate sector is controlled by several authorities and ministries. Every parcel of lands is bind to National Land Code and under the authorisation of state government. On preliminary stages of development, Town and Planning unit is responsible for development process. There are seventeen stages of application process for development in Malaysia from layout plan until issuance of certificate of completion and compliance<sup>6</sup>. After completion of development, data on the properties is recorded by the National Property Information Centre (NAPIC) which is regulated under Valuation and Property Services Department (VPSD).

NAPIC was established in 1999 with the objective to supply precise, complete and timely information on demand and supply of property in the country to all parties involved in real estate industry. There are six sector<sup>7</sup> of real estate recorded within NAPIC. According to

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<sup>6</sup> Perbadanan Putrajaya One Stop Centre information on development guidelines, retrieved from [http://www.ppj.gov.my/portal/page?\\_pageid=311,1&\\_dad=portal&\\_schema=PORTAL#1436](http://www.ppj.gov.my/portal/page?_pageid=311,1&_dad=portal&_schema=PORTAL#1436) on July 18, 2011.

<sup>7</sup> Volume and Value of Property Transaction by Sub-sector year 2001-2010, retrieved from [http://www.jpjh.gov.my/V1/pdf/StatsNAPIC\\_7\\_Subsektor\\_2010.pdf](http://www.jpjh.gov.my/V1/pdf/StatsNAPIC_7_Subsektor_2010.pdf) on July 18, 2011.

the volume of property transacted from year 2001 to 2010, residential recorded the highest transaction sectors above others sectors followed by agricultural, commercial, development land, industrial, and others sector respectively.

NAPIC which comes under the arm of VPSD is appointed by MOF as one of fourteen agencies to manage the real estate sector. These fourteen revenue oriented agencies including VPSD and other agencies such as Inland Revenue, Customs and Central Bank to name a few are directly controlled by MOF. The objective of MOF is to control nation's income and economic development as well as conscientious to delegate nation's wealth distribution equally to the nation.

Real estate contributes some proportion of income to nation's economics. According to Ministry of Finance (MOF) <sup>8</sup> real estate services contributed 5.5% of GDP percentage and real estate construction added 3.3% more to GDP in year 2010 alone. This shows a positive sign in real estate sector in Malaysia with a consistent growth recorded since 2001 to 2010. Achievement of real estate sector shows significance growth in economic development. The real estate transaction shows progressive and consistent increase every year since 2001 to 2010. Only in 2005 and 2009 some slight drop of volume of transaction has occurred but it is not significant and transactions remain bullish as real estate keep increasing after drop in previous year.

Kuala Lumpur has added up huge percentage to the country's real estate sector. It has yielded 40.93% for purpose built office, 20.19% for shopping complex, 18.57% for hotel room, 9.38% for residential, 8.66% for hotel, 6.22% for shop, and 5.51% for industry. These percentages have put Kuala Lumpur to the top 6 for most of real estate supply in Malaysia. As an example, out of 16 states, it has recorded the first place for purpose built office and hotel room, second on shopping complex, third on residential, fifth on hotel and industry, and sixth on shop<sup>9</sup>.

Being a matured city has seen Kuala Lumpur as pioneer to most of Malaysia's real estate sector. It has raised its name through development of Malaysia's landmark, such as Kuala Lumpur's Petronas twin tower, Kuala Lumpur tower, several mega shopping malls, and entertainment areas in its territory. These developments have not only contributed to country's

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<sup>8</sup> MOF publication on GDP by kind of economic activity at constant year 2000 price.

<sup>9</sup> Summary of Existing Stock for Residential, Commercial, Leisure and Industrial property Sub-sector as at Q1-Q4 2010

economy, it also turned Kuala Lumpur real estate as the number one choice in real estate investment.

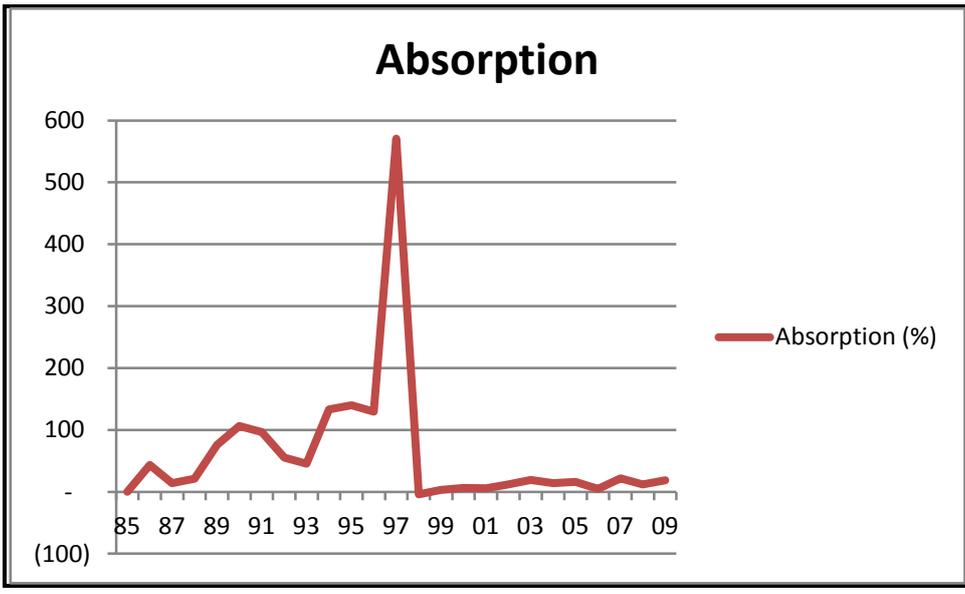
**5. EMPIRI**

In this section, data on the real estate cycle and business cycle will be tabulated and graphed into absorption and GDP. Absorption data is determined according to Zailan (2009):

$$\text{Absorption Rate} = \frac{\text{Occupied Space (t)} - \text{Occupied Space (t-1)}}{\text{Existing Stock (t)} - \text{Occupied Space (t-1)}} \times 100$$

Meanwhile GDP is derived from the annual GDP growth provided by World Bank and assumed to be the GDP of Kuala Lumpur.<sup>10</sup>The data will be divided into three categories; first it will be plotted in a single graph respectively to illustrate the characteristics of the cycle. It will be interpreted and explained according to the issues and market reports respectively. Later, the graphs will be plotted on a 10 year basis to compare their period of cycles. Last but not least, both of the data will be plotted in a single chart to show the relationship between these cycles.

*5.1 Characteristics of Real Estate Cycle*



**Figure 6:** Kuala Lumpur existing office built absorption rates

The characteristics of this cycle are shown through peak to peak and trough to trough of the graph. The movement of cycle from peak to peak indicates negative cycle and trough to trough showed a full cycle in positive cycle. A negative cycle is showed between 1986 to 1990, 1990 and 1995, 1995 and 1997, 1997 and 2003, 2003 and 2007, 2007 and 2009. While

<sup>10</sup> Refer to Appendix 1, 2 and 3.

a positive cycle is showed between 1987 and 1992, 1992 and 1996, 1996 and 1998, 1998 and 2006, 2006 and 2008.

Kuala Lumpur's real estate cycle is represented through office space absorption between the years 1985-2009. The absorption market shows series of inconsistent swings in the real estate sector. It starts with contraction in 1986 and gradually shaping into cyclical movement in the late 1980's until the early 1990's.

In the 1990's, real estate absorption showed a significant growth and fall. 1997 itself recorded a sudden growth that reached its peak with five times absorption than before. The significant growth was spurred by bubbles and speculation which loosened up banking regulation on lending rates. However, the growth did not stay for long. A year later, absorption bottomed down, reaching -4% of absorption. The fallout was marked by the softening of the market and poor absorption. Many tenants chose to relocated, even ceased operation to reduce costs.<sup>11</sup>

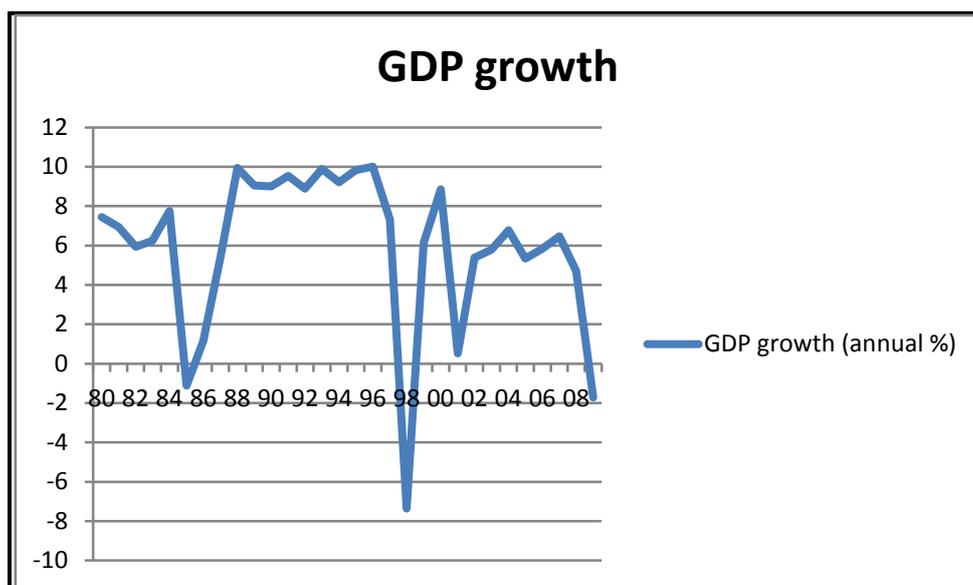
Experiencing a sudden boom and bust period of absorption has made government take initiatives to freeze new office development in Kuala Lumpur starting the year 1999.<sup>12</sup> However, new supply is limited to certain areas in Kuala Lumpur. The absorption showed a gradual movement within 2000's, keeping an average below 20% of absorption.

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<sup>11</sup> Rahim&Co on Kuala Lumpur office market review, retrieved from <http://www.rahim-co.com/art3.htm> on August 17, 2011.

<sup>12</sup> CH Williams Talhar & Wong on 2006 market outlook, retrieved from <http://www.wtw.com.my/2005/images/stories/pmr/kl/PropertyMarket2006.pdf> on August 18, 2011

## 5.2 Characteristics of Business Cycle



**Figure 7:** Malaysia's annual GDP growth  
*Source: World Bank*

Characteristics of business cycle are also determined through the period of contraction, trough, expansion and peak. These were illustrated through the positive and negative of the graph above. The negative cycles were illustrated between 1984 and 1988, 1988 and 1991, 1991 and 1993, 1993 and 1995, 1995 and 2000, 2000 and 2002, 2002 and 2004, 2004 and 2006. While for positive cycles, they were illustrated between 1982 and 1985, 1985 and 1989, 1989 and 1992, 1992 and 1994, 1994 and 1998, 1998 and 2001, 2001 and 2005, 2005 and 2009.

The figures above shows a series of ups and downs in Kuala Lumpur business cycles. GDP growth from the year 1980-2009 was recorded to explain performance of the cycle. In the early 1980's the GDP growth grew quiet competitively with recorded GDP of 7% growth in 1980 before started to fell sharply in 1986 to -1% GDP. After the tremendous fell in 1986, the economy regain recorded positive GDP growth until double dip recession in 1998 and 2001 which caused fell in GDP to less than zero.

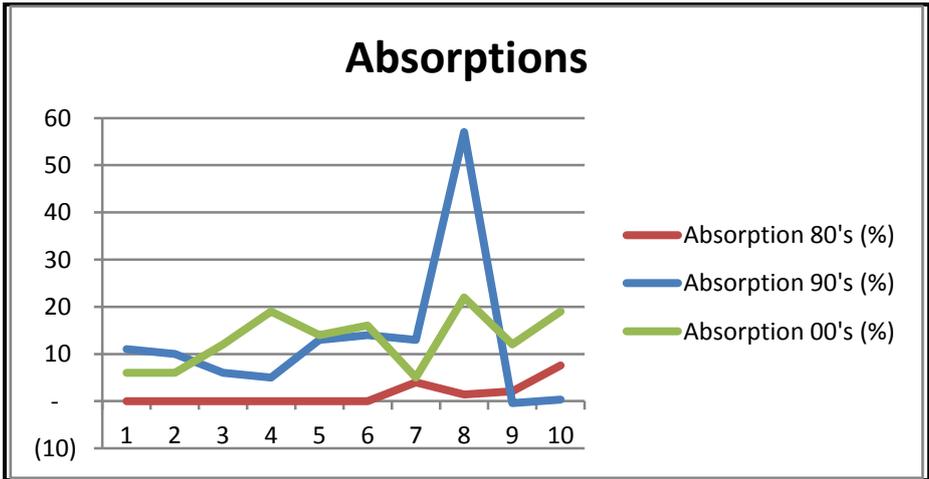
The recession was not too long this time where after the turmoil in 2001 the economy managed to catch up with increase GDP in years 2000s. In the early 2000s, the economy managed to climb back with positive GDP but suddenly the economy experienced another crisis which saw the largest drop in the GDP ever recorded in the country since the last one in

1986. This was due to large budget and balance of payments deficits in foreign debt. However, the economy has shown signs of recovery.

The Malaysia's GDP has had a long period of positive growth with average growth above 10% recorded before 1997. In 1998, the economy fell sharply, the GDP dropped tremendously to -7%. At this time, the crisis was triggered by the Asian financial crisis, which mainly stressed on stock market. The crisis started in Thailand, and then spread along other South East Asian countries. Malaysian ringgit was forced to float, making its value deteriorate. To make thing worse, the boom of lower cost of labour in China and India has slowed down foreign direct investment and slowed the economy.

The economy then showed immediate recovery in 1999 and 2000 before it dropped sharply again below 0%, this time due to the Y2K crisis. After the Y2K crisis, the economy started gradually to recover. Nevertheless, in 2009 the economy once more experienced a sudden drop effect of a global economic crisis triggered by the US subprime market issues. The economy suffered a large declined in export and increased in inflation rate, which drove down GDP growth to almost -2%.

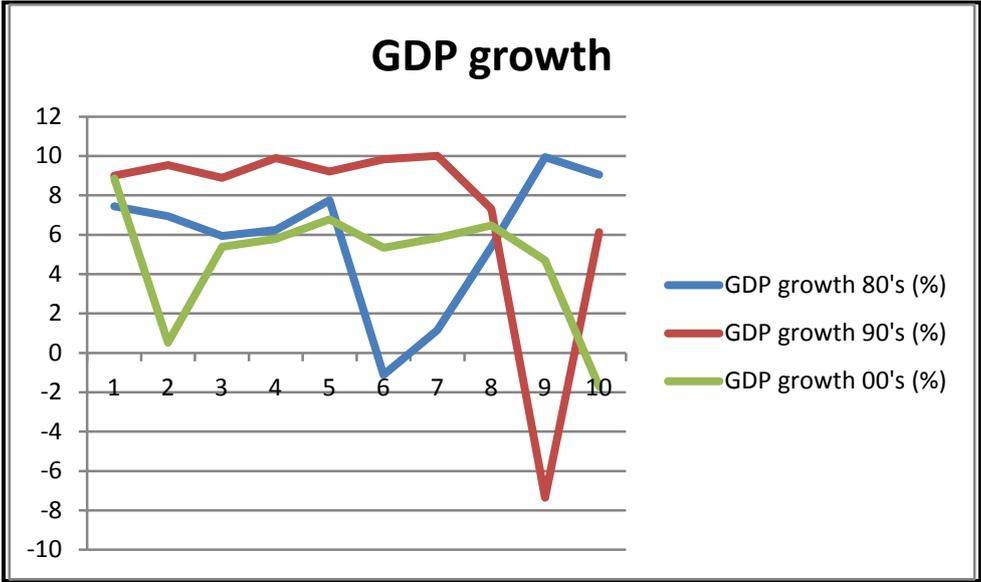
**5.3 Periods of Real Estate Cycle and Business Cycle**



**Figure 8:** Kuala Lumpur existing office built absorption rates in decades

As for the purpose of this section, the absorption graph has been plotted under one graph for each decade to observe the pattern and determine similarities between each absorption decade. From the figure above, a recurrence series of up and down patterns were detected. Based on

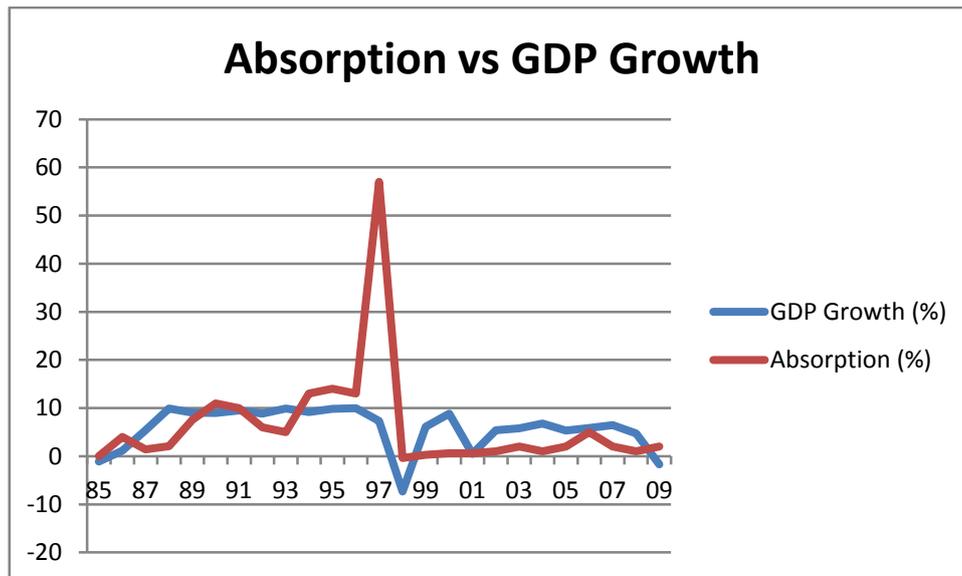
the graph, each decade illustrate almost similar upward trend in absorption pattern, which is indicated in the third quarter of their decades. All of them show a peak performance within the period. The absorption seems to change its pattern every quarter of the decades. They did not stay long with the previous performances which created a short cyclical pattern to each of the absorption. Overall, the absorptions present a steady growth of the supply and demand of office space rates in Kuala Lumpur.



**Figure 9:** Malaysia’s annual GDP growth in decades  
*Source: World Bank*

The graph above shows relationship between business cycles performance in every decade. A volatile movement in each business cycle, with sudden swing in GDP growth performance is shown, despite a steady growth as compared to absorption rates performance. The series of cycles differ with each other adversely. Despite the period of the cycle, the series or shapes of each cycle looked almost similar. There are significant dual drops recorded in each decade’s cycle. They appeared to occur in every first and last quarters of the decade. Throughout the decade, GDP growths fluctuated in most years with some years recorded U and V-shaped of GDP growth. The cycle period seems to create a long cyclical pattern in the 1980’s compared to a short period in the 1990’s and recent years. However, it is hard to predict the cycles of the GDP growth as it depends most on a unique economic environment.

**5.4 Relationship and Sequences between Real Estate Cycle and Business Cycle**



**Figure 10:** Kuala Lumpur absorption rates vs GDP growth

The figure above shows the relationship of real estate cycle and business cycle. The cycles are both presented by office absorption rate and GDP growth since 1980 to 2009. These cycles are plotted in a single graph to depict relationship in term of phases, pattern and period of the cycles.

There are series of expansion and recession shown in the graph. Kuala Lumpur's business cycle and real estate cycle portray a recurrence of cyclical movement in each cycle. The cycles move almost in the same direction. However, there are some years that illustrate a negative relationship between directions of the patterns. Based on the chart, there are five positive cycles and six negative cycles in absorption rate, while eight positive and eight negative cycles in GDP rate. This shows that business cycles have more cycles as opposed to real estate cycles.

The period of the cycles range between two to three years approximately. However, the period of each phase in the cycle is hard enough to be interpreted. Based on the graph, the period of occurrence in absorption seems to be consistent compare to GDP. This can be explained by the co-occurrence of the peak phase in the 1990's and 2000's on the eighth year of each decade.

Absorption seems to move in advance compares to GDP growth. This is depicted in the graph, where a negative sequence in absorption during the early 1990's is followed by GDP in

the late 1990's. While for the positive sequence of absorption in the late 1990's followed by GDP in its early 2000's. This had happened due to Malaysia's policy which most of its economy is depending on stimulus and incentives, that provided funds and incentives to not only developer but also to consumers in developing and consuming real estate.

## 6. CONCLUSIONS

In answering the nature of the relationship between real estate cycle and business cycle applied for Kuala Lumpur's office market. First, characteristic of the cycles will be looked into. The study had showed that real estate cycle and business cycle do move in recurring wave-like fluctuations that are in a circular motion. There are series of expansions, peaks, contractions and trough recorded from the absorption and GDP growth graph discussed earlier. These support earlier research on cyclical behavior of real estate and business cycle and made the first hypothesis valid.

Secondly, there were several cycles occurring for period of three decades in real estate and business cycles in Kuala Lumpur. Although it happens consequently, there are no cycles in the same duration and amplitude. As stated in most studies done previously, period of cycles are unique, as there are unclear definitions on the length of the cycles.

Thirdly, every cycle differ from each other. In Kuala Lumpur's office market, its real estate seems to act in advance compare to the business cycle. This sequence makes Fanning (2007) theory to be accepted compare to Mueller (2002). This might happened due to different set of economic environment, government intervention in a certain country. However, as stated previously in the hypothesis, there is no clear decision on which cycles come first. So, this coincidence might as well changes once the Kuala Lumpur's government policies or the economic environment in the country reduces its incentives toward the real estate sector.

Last but not least, real estate and business cycle relationship is found to be related to each and another, and if monitored seriously, they may produce great opportunity in boosting Kuala Lumpur's economy.

### *6.1 Closing Discussion*

In conclusion to issues discussed, absorption and GDP have been two main factors indicating real estate and business cycle in Kuala Lumpur. Absorption main is to explain real estate performance, while GDP itself portrays business performance for the country. Both of these

variables have given a good feedback in shedding light on the relationship of real estate and business cycle in Kuala Lumpur in term of cycles phases, period and pattern of both cycles.

Even though this study may answer question posed earlier, it is actually complex even the cycles may sound uncomplicated. Lots of variables and forces contribute to the cycles such as economic and real estate outlook of the country, government intervention, and consumer behaviour or investor trends should also be looked into. It is undeniable that these factors play an important role in decorating pattern of economic and real estate cycle in Kuala Lumpur.

Besides, lack of information on Kuala Lumpur's real estate has created a need to have a sophisticated data bank to unfurl the risk of bias and misrepresent result for the study. Further detailed study need to be done especially relating to real estate cycle as this study has much potential in benefitting a number of parties. Continuous monitoring and observation on the matters should be applied and made available for the sake of transparency and better performance in the future.

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Appendix 1

**Pejabat Binaan Khas Sediada: Jumlah Ruang Dan Penghunian di Wilayah Persekutuan Kuala Lumpur Tahun 1985-2009 (Bangunan Kerajaan dan Swasta)**

*Existing Purpose Built Office: Total and Occupied Space in Wilayah Persekutuan Kuala Lumpur Year 1985-2009 (Government and Private Building)*

Year	Jumlah Ruang/ Total Space (m.p/s.m)	Jumlah Ruang Dihuni / Total Space Occupied (m.p/s.m)	Kekosongan/ Vacancy (m.p/s.m)	
			(m.p/ s.m)	(%)
1985	1,794,589	1,579,691	214,898	12.0
1986	2,359,065	1,816,480	542,585	23.0
1987	2,527,303	1,903,006	624,297	24.7
1988	2,565,267	2,018,906	546,361	21.3
1989	2,609,654	2,274,326	335,328	12.8
1990	2,609,654	2,446,952	162,702	6.2
1991	2,625,855	2,534,881	90,974	3.5
1992	2,658,938	2,579,170	79,768	3.0
1993	2,966,048	2,699,988	266,060	9.0
1994	3,136,905	2,949,527	187,378	6.0
1995	3,388,793	3,205,509	183,284	5.4
1996	3,605,511	3,431,198	174,313	4.8
1997	3,941,345	3,865,305	76,040	1.9
1998	4,668,381	3,832,318	836,063	17.9
1999	5,027,037	3,867,172	1,159,865	23.1
2000	5,233,175	3,945,217	1,287,958	24.6
2001	5,560,085	4,035,844	1,524,241	27.4
2002	5,702,030	4,214,868	1,487,162	26.1
2003	5,742,163	4,459,348	1,282,815	22.3
2004	5,831,640	4,628,078	1,203,562	20.6
2005	5,854,987	4,796,936	1,058,051	18.1
2006	5,928,254	4,849,178	1,079,076	18.2
2007	6,068,548	5,068,256	1,000,292	16.5
2008	6,302,550	5,198,735	1,103,815	17.5
2009	6,495,731	5,402,851	1,092,880	16.8

Source: VPSD taken from <http://www.jp-ph.gov.my>

## Appendix 2

### Annual GDP growth in Malaysia Year 1985-2009.

Years	GDP growth (annual %)
1980	7
1981	7
1982	6
1983	6
1984	8
1985	-1
1986	1
1987	5
1988	10
1989	9
1990	9
1991	10
1992	9
1993	10
1994	9
1995	10
1996	10
1997	7
1998	-7
1999	6
2000	9
2001	1
2002	5
2003	6
2004	7
2005	5
2006	6
2007	6
2008	5
2009	-2

Source: World Bank taken from [www.worldbank.org](http://www.worldbank.org)

Appendix 3

Absorptions rate in Kuala Lumpur office market

Years	Total Space (s.m)	Occupied space (OC) (s.m)	Vacancy (s.m)	Vacancy (%)	OC (t) - OC (t-1)	Existing stock(t) - OC (t)	Absorption
1985	1,794,589	1,579,691	214,898	12.0		214,898	-
1986	2,359,065	1,816,480	542,585	23.0	236,789	542,585	44
1987	2,527,303	1,903,006	624,297	24.7	86,526	624,297	14
1988	2,565,267	2,018,906	546,361	21.3	115,900	546,361	21
1989	2,609,654	2,274,326	335,328	12.8	255,420	335,328	76
1990	2,609,654	2,446,952	162,702	6.2	172,626	162,702	106
1991	2,625,855	2,534,881	90,974	3.5	87,929	90,974	97
1992	2,658,938	2,579,170	79,768	3.0	44,289	79,768	56
1993	2,966,048	2,699,988	266,060	9.0	120,818	266,060	45
1994	3,136,905	2,949,527	187,378	6.0	249,539	187,378	133
1995	3,388,793	3,205,509	183,284	5.4	255,982	183,284	140
1996	3,605,511	3,431,198	174,313	4.8	225,689	174,313	129
1997	3,941,345	3,865,305	76,040	1.9	434,107	76,040	571
1998	4,668,381	3,832,318	836,063	17.9	(32,987)	836,063	-4
1999	5,027,037	3,867,172	1,159,865	23.1	34,854	1,159,865	3
2000	5,233,175	3,945,217	1,287,958	24.6	78,045	1,287,958	6
2001	5,560,085	4,035,844	1,524,241	27.4	90,627	1,524,241	6
2002	5,702,030	4,214,868	1,487,162	26.1	179,024	1,487,162	12
2003	5,742,163	4,459,348	1,282,815	22.3	244,480	1,282,815	19
2004	5,831,640	4,628,078	1,203,562	20.6	168,730	1,203,562	14
2005	5,854,987	4,796,936	1,058,051	18.1	168,858	1,058,051	16
2006	5,928,254	4,849,178	1,079,076	18.2	52,242	1,079,076	5
2007	6,068,548	5,068,256	1,000,292	16.5	219,078	1,000,292	22
2008	6,302,550	5,198,735	1,103,815	17.5	130,479	1,103,815	12
2009	6,495,731	5,402,851	1,092,880	16.8	204,116	1,092,880	19

**\*Note:**

$$\text{Absorption Rate} = \frac{\text{Occupied Space (t)} - \text{Occupied Space (t-1)}}{\text{Existing Stock (t)} - \text{Occupied Space (t-1)}} \times 100$$