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ECONOMY AND COMMERCIAL CONSTRUCTION CYCLE IN MALAYSIA

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Abstract**:**

An analysis of economy, construction and commercial property cycle indicates that for some type of construction sector, there is evidence of general economy influence. Nonetheless, there is insufficient to conclude the significant influence of general economy on certain type of development in Malaysia. Whilst, it is easier to show such impact on office sector, it cannot be statistically proven for hotel and retail. The role of other factors such as, institutional, which has not been considered in this study may offer better explanation on the cycle of such developments.

Keyword: Cycles, business, construction, commercial, offices, retail and hotels.

1.0 Introduction

It is generally accepted that the rate of construction or the supply of property is initiated by demand for it. Demand is influence by the level of user's activities, which is link to the state of economy. Consequently, the overall process is influenced by the state of economy of that particular country. As a result, there is possibility of establishing the link between the economic growth and the construction of property. As introduced by Hirschman (1958), an industry is said to have strong forward linkages effects if it is likely to prompt the setting up of new

industries, which use its output. An expanding construction industry will prompt investment in domestic construction material production, such as cement.

Numerous works have been undertaken in attempt to explain the business cycles. Business cycles are fluctuations in economy activity, which shows up virtually in all measures of economic activity, output, income, employment, retail sales, new order, etc. The diffusion (a particular tendency to affect many sector and may measures of economic activity in the same direction) of the business cycle throughout the economy, whether a recession or a boom, has long been recognised and is well documented. Many work have reveals that cumulative rise and fall in the general level of activity is very similar in most business theories, that is, nothing is constant over the business cycle and nothing really returns to its starting place.

In addition to the above, business cycle researchers are now attempting to establish pattern in co-movement between macro-economic time series and aggregate output changes, without restriction imposed by economic theory. The study on construction cycle has been undertaken based on the same premise. Construction activity is subject to the fluctuations in level of demand and hence the output. The period between two successive peak and through in the total volume of construction is called construction cycle. Kafandaris (1980) provides a comprehensive review on the cyclical nature of construction activity in order to develop appropriate proposition to aid the formulation of policy to stabilise construction activity. The study was then extended to sub-sector of construction industry such as office and retail. Ofori (1900) observes that early theories on construction cycles were based on the phenomenon of over-production. It is suggested that in a period of relative prosperity, the construction industry adds sharply to the level of aggregate demand, leading to increase in the price of the economy and subsequently, those of building inputs. The industry quickly uses up its excess capacity and then faces difficulty owing to the time lag between the commencement and completion of projects, and the commitment of contractors to the existing contract.

Tsolacos (1991) regards construction commercial cycle is under-researched area especially for sub-sector like retail and hotel. The important of the commercial sector as an accelerator to the economy has call for systematic analysis of the construction cycle to stabilise the equilibrium state of the property market. Hence overbuilding could be minimised. This is important as disinvestments as a result of poor demand can severely affect the industry.

Extensive studies on construction/development cycle have been carried out in the UK and USA. The studies demonstrate empirically that different types of construction product have quite different behaviour. The emphasis on office seems to be driven by data accessibility. Works such as Gardner (1993), Grenadier (1995), Voith and Crone (1988), Wheaton (1988, 1999) and Wheaton and Rossof (1998) have clearly shown the persistence pattern of construction cycle of office. The studies demonstrate various levels of association with the overall economy, thus provide a useful insight of the construction cycle. Retail, as part of commercial property, receives less coverage than offices. This is highlighted in Wheaton (1999) that the study of retail cycle is constrained by the difficulties of defining its sub-markets. The study indicates the link do exist between retail sector and the overall general economy. For hotel industry, Wheaton (1998) observes the cyclic behaviour of the US lodging industry move closely with the US economy.

While numerous studies have been undertaken overseas, similar study is almost non-exist in Malaysia. Construction, as an important player in the national's economy is clearly affected by the fluctuation in overall economy. The issue need to be addressed is how severe is the impact of economy cycle on the construction cycle in this country. This paper addressed the above issue and aims to link the economy and commercial construction cycle in Malaysia. It explains the cycle of economy, construction and commercial property in Malaysia from 1981 to 1999. The impact of the economy on commercial property is examined hence the relationship between them can be established.

This paper is structured into five main sections. Section 2.0 reviews related literature for this study. The methodology of the study is illustrated in detail in Section 3.0. Section 4.0 discusses the analysis and findings of the study. The conclusion and limitation of the study are presented in Section 5.0.

2.0 Literature review

The review addresses three main areas; economic/business cycle, construction and commercial construction cycle.

The prosperity of the economy is reflected in the economic growth which refers to increases over time in a country's real output of goods and services or real output per capita which is measured by Gross Domestic Product (Zuvekes Jr, 1979). Healthy economy, thus provide better environment for development and better growth in economic sectors leads to healthier economy and vice-versa. The fluctuation in economy has attracted researchers to study the cyclic behaviour of the economy.

Gordon (1986) provides an exhaustive study of business cycles in the US. The study on the economy cycle is normally based on the objective of stabilising the equilibrium state of demand and supply of an economy sector. Cycles were considered as fluctuations around a long-term trend are normally discussed as business cycle. The studies on business cycle or commonly used to refer to the economic cycle, have widely undertaken. Nonetheless the findings was neither conclusive nor generalise as there is no two cycles which are similar, even in one country. The dynamic of business cycle is varies from one sector to another. The characteristics of business cycle as adapted by MacGregor and Hoesli (1999) is progress through the following framework;

- Business upturn and development: an upturn in the business cycle, typically at a time of low real interest rates and high capital availability. The scenario generates a rise in economic activity and strong user demand.
- Business downturn and overbuilding: Real interest rates rise in response to the boom and the business cycle turns down wards.
- Adjustment.
- Slump where the growth fall at the lowest level
- The next cycle: as soon as the slump over, the new cycle is generated. The new cycle will follow the same characteristic, however, the length of the cycle will differ from one to another.

The cyclic nature of business activity, which has been of interest to the economies since the late 19^{th} century is extended to other economics sub-sectors. The same interest arises in the construction industry although at the rate slower than other economy sector. In some works construction cycle is refer as development cycle. MacGregor and Hoesli (1999) regard development/construction cycle as part of the general business cycle. A comprehensive review of such cyclic nature has been shown in Kafandaris (1980). The objective of such works has been to develop appropriate propositions to aid the formulation of policy to stabilise construction activity mainly through public work. This is based on the premise that the role of construction industry involves expanding productive capacity of the national economy to increase the supply, or improve the quality of the goods and services of the disposal of the citizens. The role of construction in capital formation hence plays a significant role in economic growth has been identified in United Nations Centre on Transnational Corporation (1989).

The public construction generates significant contribution to the construction industry have been highlighted in Shui Peng (1995). Nonetheless, it is important to realise that the share of private investors in commercial sector is almost as important as government. Commercial construction

is regarded as an accelerator (Ofori, 1988). Demand for commercial buildings is governed by the acceleration principles, which state that if the demand for any consumption good increases, the demand for the investment goods used in its production will increase at a greater rate. Even in the same country, the effect of accelerator varies over time.

In attempt to link construction and economy, Bon (1992) explores the relationship between construction activity and economic development. The study posed two questions; are construction activities and economic development positively or negatively related. Over-production has been the main factor initiated early theories on construction cycles. Excessive supply has led to malinvestment. Bon (1989) relates construction cycles and discuss the principle of malinvestment. He suggests that building cycles differ in term of their pattern and intensity, as the factors underlying each cycles are different and the understanding of cycles and the necessary strategies increase over time.

In many works, *construction cycle* is refer to a period between two successive peaks and through in the total volume of construction. MacGregor (1999) proposes that the simplest explanation of development cycles is that they are part of the general business cycle. Construction activity is subject to fluctuations in level of demand and, hence, output. As a result, similar fluctuations would be expected in the demand for, and in the production of property, if there were cyclical fluctuation in output.

Demand for construction rise or fall. If the demand continues to rise, the industry will reach its capacity. However, as the business atmosphere changes and the prospect for the economy looks less bright, demand for construction would begin to fall. Similarly the demand for property for occupation is derived a demand, that is, it is derived from the need to occupy property to undertake such activities, such as the production of goods and services, for which demand exists. There is no direct measure of this demand so it has to be measured by proxy. The usual

measures relate to output of, expenditure in, or employment in, sectors of the economy relevant to the type of property under consideration. These might, for example, be business services employment for offices, retail sales for retail and manufacturing output for industrial and tourist arrival for hospitality industry. These are all measures of economic activity and fluctuations are evident in each of them. Established works have identified a number of economic and other variables that are important in explaining the flow of new construction hence the cycle. These factors include Gross Domestic Product, Employment, Vacancy rate, Total office stock (Rosen, 1984: Hekman, 1985 and Wheaton, 1987).

Several articles in real estate literature suggest that causes real estate to react to underlying economic trends hence create cycle. These include; long term nature of real estate investment, long time lag required to deliver the product to the market, demand uncertainty, adjustment costs and unbridled optimism of developers (Gardiner, 1993 and Grenadier, 1995). Long construction lags increase the likelihood of overbuilding and help explain the persistence of development cycle whereas shorter lags lead to less volatile market. When the cyclic behaviour of some property is close to the economy, the cycle is largely due to alternating demand shock. Other types have much longer swings that bear almost no relation to broader economic cyclicality.

The most comprehensive study on development cycle in the UK is to be found in Barras (1983, 1994) and Barras and Ferguson (1985, 1987a, 1987b). Barras (1983) focuses on the office market, whilst work with Ferguson also covers housing. Basic model used to explain the cycle is central on demand both as the determinant of long run equilibrium level of development and, through business cycle, as the main source of shocks to the property market. The notion that the lag between demand and supply, combined with accelerator principles, produce an endogenous mechanism, which generates the cyclical tendencies in property development. The cycles are independent of fluctuations in demand.

The model for development start produced consists of the equilibrium path with respect to exogenous path of user activity and the deviation from the equilibrium path caused by disturbance. Thus, according Barras, with realistic values of parameters, the model produces the observed fluctuations in the UK office development activity. Fluctuations in business activity trigger and sustain development cycle: a business cycle of 4 to 5 years produces a development cycle of 8 to 10 years. The two are coincident every second business cycle and reinforce each other.

In Barras and Ferguson (1987a), the equilibrium level of new development in commercial is most closely related to the level of user activity. There is evidence of an endogenous cycle mechanism in development which operates through construction lags and which produces a major cycle of nearly nine years. There is shorter cycle around 18 quarter which is produced be exogenous demand fluctuations from the business cycle. The cycle is weakest in the commercial sector, which is dominated by its autonomous supply cycle. Development is influenced by investment activity, which may reinforce the short cycle effect. There appear to be an inverse relationship between the level of investment in property and return from alternative forms of investment. The weakest influence on the development cycles is development costs, such as construction costs and interest rates.

In recent years, a number of studies have examined the cyclic movement of the United States commercial property market. Wheaton (1987), King and McCue (1987), Voith and Crone (1988) and Grenadier (1994) all document long run movements in office vacancy, rents and construction that do not closely match the more frequent fluctuations of the U.S economy. By contrast, studies of the U.S housing market, both multi and single family, have tended to show a much closer alignment of market movements with that of the overall economy (Grebler and Burns, 1982; and DiPasquale and Wheaton, 1992, 1994).

Wheaton (1998) constructed data series on lodging industry in the USA to show that the industry has experienced two rather large building booms from 1969 to 1994. By contrast, hotel demand seems to move closely with the United States economy, at a much higher cyclic frequency.

The influence of economic cycle on property development cycle has been demonstrated in many works with mix findings. For example, Barras (1994) argues that the industrial development is more strongly influenced by the business cycle whilst Grenadier (1995), however, suggests that the industrial markets display cyclical behaviour. As a result, there has been problem in explaining the business and construction cycle. Difference between the pattern of fluctuations in development and demand is not explained. There is a relationship between demand and construction and a coincidence between cycles of demand and construction starts. The actual explanation however is more complex than this. Barras and Ferguson (1985) found that the commercial and industrial property new orders are virtually coincident with the business cycle but the construction completions lag by three to four quarters. Key et.al (1994a) reach similar findings that construction starts are coincident with the economic cycle and that construction completion lag it by one to two years. The above indicates that differences in the pattern of fluctuations in demand and development suggest that the relationship is complex.

It is clear that the above studies reveal the cyclic behaviour of different commercial sector through the adaptation of general business cycle and the adaptation of statistical approach. However, the adaptation of general business cycle to construction cycle has been undertaken with some problems. Key et. al (1994b) argue that the literature on business cycles suggests a persistent cycle, usually of three to five years, which is irregular in period and amplitude, and thus hard to predict, but which is systematic in most indicators of economic activity, although with various leads and lags. This is considered as a universal phenomenon in modern economies.

Most works model the relationship between property cycles and other explanatory factors, but less emphasise on explaining the sensitivity of such factor to the development cycle. Factor model, as suggested by Sharpe et.al (2000) has potential addressing the issue.

The above discussion shows that number of works on construction and development cycles have been undertaken in the USA and United Kingdom. Mixed findings have been proposed which mean that different location and economic scenario will exhibit different conclusion on whether the economy affect the new development or not. Will the finding applicable in Malaysia or not? This is explored in Section 4.0.

3.0 Methodology

The study aims at explaining the relationship between commercial construction cycle (output of construction in commercial property) with the cycle of economy. The methodology of the study is as follows;

a) Variable identification.

In the literature review, several works have proposed that the fluctuation in the construction commercial cycle and their relationship with other factors can be observed. Conceptualisation of the model in Section 2.0 have reveals some important issues. Economic cycle in the present study is defined as fluctuation in the Gross Domestic Product (GDP) and Gross National Product (GNP), which will be subjects in the analysis. In addition to this, there are other variables which is expected to exhibit some relationship with the stock-flow are employment level (TEMP), unemployment level (UEMP), changes in service sector (SERCHG), increase in

population (POP) and variables that related to stock completion itself, such as occupancy and rental rate.

Construction commercial cycle refers to fluctuations in office, retail and hotel stock flow. Attempt to explain changes occur in the stock completed is carried out by comparing the level of flow in the sectors with related variables.

b) Data collection

Data on yearly supply for offices, retail spaces and hotel room is gathered. The period of the analysis covers 1981 – 1999 for better insight of the subject under investigation. The stage of data collection is faced with some fundamental problem. The attempt to analyse the whole Malaysia is constrained by the absence of reliable and sufficient time-series data on the required sectors. Furthermore, the market of other regional town is confined and fairly new compared to the Kuala Lumpur sector. As a result, the study is focuses on Kuala Lumpur market. The market has been long established therefore reasonable information available for the analysis. The problems encountered in the survey were due to the heterogeneity nature of property under investigation. Average price is very difficult to obtain, hence figure provided in the government has to be accepted.

Relevant information is gathered from the government publication; Annual Economic Report and Annual Property Market Report. Variables included are listed in Exhibit A.

c) Model development

A factor model is developed. The model attempts to capture the major economic forces that systematically move the construction of commercial sector. Implicit in the construction of a

factor model is the assumption that the stock flow of commercial property will be correlated – that will move together only through a common reaction to one or more factor specified in the model. Unexplained variation is assumed to be unique elements of stock-flow. Therefore, the primary goal of construction analysis is to determine factors influence stock-flow and the sensitivities of it to movements in them.

Simple regression analysis that shows relationship between GDP growth and stock flow, can be expressed as follow;

$$C_{SF} = a + bGDP_t + e_t$$

Where: C_{SF} is a stock-flow of commercial sector

GDP_t is the rate of growth in GDP in period e

b is the sensitivity of stock flow to the GDP growth

a is the zero factor for GDP.

To enable multiple factors to be considered in the model, multiple regression analysis is performed.

d) Analysis

The analysis performed on the time-series information using trend analysis. Further attempt to establish the relationship through the statistical test is performed. Correlation analysis is performed to investigate the bivariate association between variables. A factor model is used to explain the sensitivity of the each sector to factors selected. Factor model attempts to capture

the major economic forces that systematically move the construction of commercial sector. The findings of the study are discussed in Section 4.0.

4.0 Empirical Findings

The empirical findings are divided into three stages.

Stage 1- Time-series observation

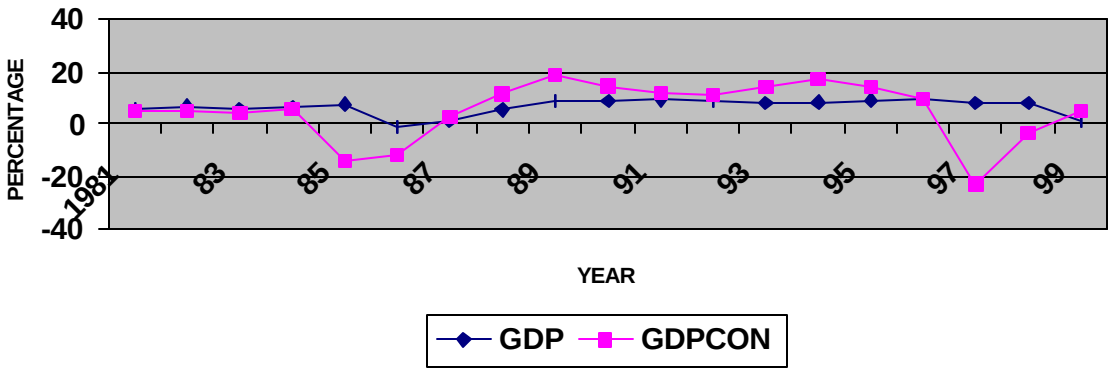
In order to analyse the trend of stock-flow for each sector; office, retail and hotel, a time- series of related information is constructed. The information consists of stock entered the market since 1981 until 1999. In addition to this, the movement of economic represented by the growth of GDP and the growth of construction sector is observed. The analysis of time-series data on construction output and Gross Domestic Product growth is summarised in Figure 1.0.

The figure exhibits three cyclic behaviours in overall economy. The first cycle in economy occurs between 1981-1984.The cycle is less volatile. Second cycle appears between 1985-1989. The third cycle overall economy is a long cycle, which runs from 1990 to 1997. The new cycle starts at 1998 and the length is yet unknown. During the longest cycle, the nation enjoyed economy prosperity. The growth of more than 7% annually was recorded for eight consecutive years. 1998 has seen a beginning of new cycle for Malaysia economy for which the length is yet unpredictable.

The same pattern as economy cycle is indicated by construction as the construction output, however it is more persistent compared to general economy. The short cycle of 1981 to 1984 signal the close co-movement between construction output and general economy. Nonetheless, as second cycle appears between 1985-1989, economic shrunk affects construction

significantly. The construction sector shrunk at rate higher than overall economy. The phenomenon, however improved as new cycle formed corresponding to the demand created prior economic improvement in late 1980s. The completion of stock during 2-3 years after this period witnessed 6 years cycle. The cycle is the most volatile compared to the cycles earlier. Early observation from Figure 1.0 indicates that there is a pattern of procylicality between economy and construction activity.

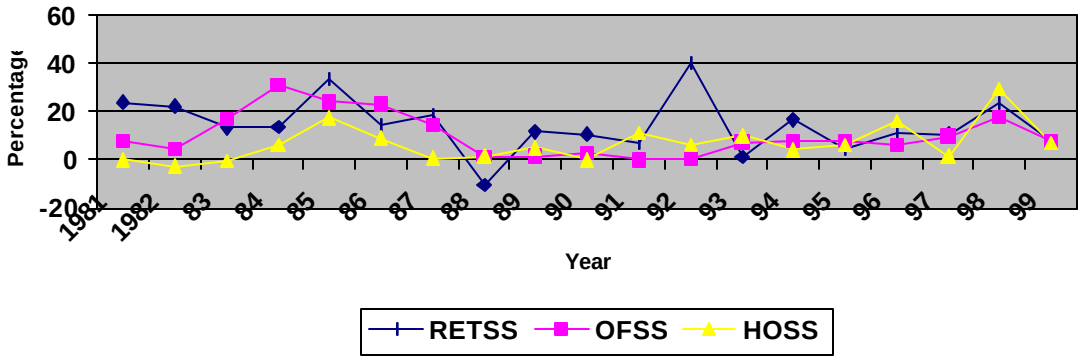
FIGURE 1.0 THE GROWTH OF ECONOMY AND CONSTRUCTION IN MALAYSIA (1981-1999)



Source: Economic Reports/Property Market Reports

Commercial Sector: The supply of commercial space is exhibited in Figure 2.0. Generally completed stock cycle is volatile and run for about three years and longer cycle is almost non-exist. Demand exists at high time hence lead to a completion of stock 2-3 year later. Retail sector is more volatile compared to the other sectors. Shorter cycle is more persistent in the sector. This may be due to the speculation associated with the growth potential in income stream of this sector. Hotel and office development experienced longer cycle compared to retail.

FIGURE 2.0 ANNUAL GROWTH IN SUPPLY OF COMMERCIAL SPACE



Source: Economic Reports/Property Market Reports

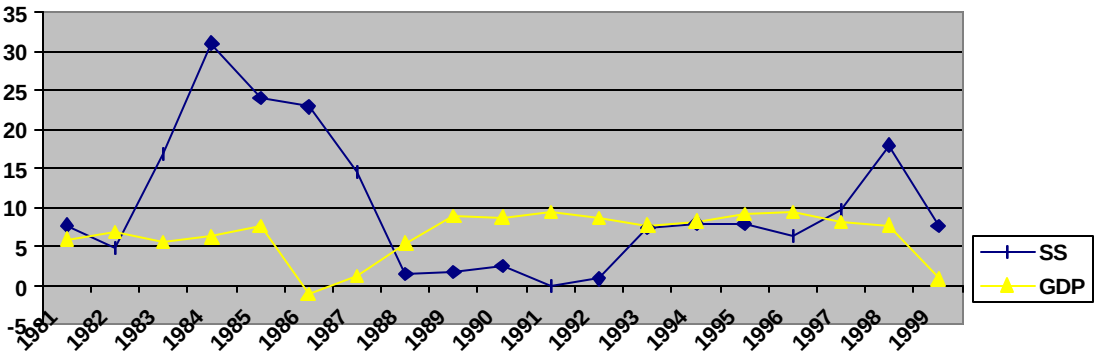


FIGURE 3.0 THE GWORTH OF OFFICES STOCK FLOW AND THE ECONOMY

Source: Economic Reports/Property Market Reports

Office stock cycle and general economy: The first four years cycle of stock occurs in 1981 - 1984. Second cycle runs from 1984 to 1990 followed severed recession in mid 1980s (as economic slump for 5 years). The phenomenon exhibits some link between economy and office stock flow. However the recession symptom affected the supply of office as the stock flow cycle tend to correspond slower compared to the third economic cycle. The higher growth of office stock flow occur in the 1990 hence marked the third cycle which run for 4 years. Slower growth recorded as a result of low demand anticipation due to recession. Although. In 1993,

the growth of both are equal, as a result of development lag, office stock flow exhibits another cyclical behaviour from 1993 to 1998 despite the general economy which is more stable.

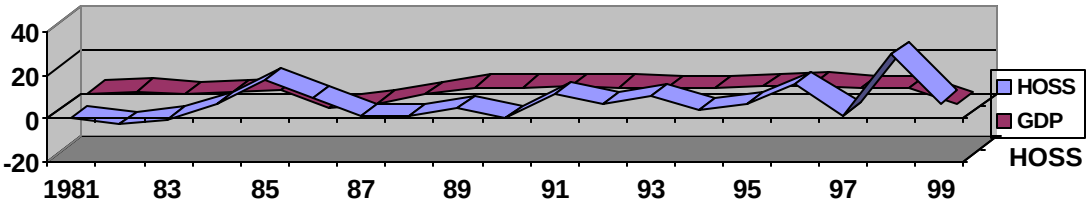


FIGURE 4.0 THE CITY OF KUALA LUMPUR : THE GROWTH OF ECONOMY AND HOTEL SUPPLIES

Source: Economic Reports/Property Market Reports

Figure 4.0 shows the growth in hotel stock flow and general economy in the City of Kuala Lumpur. The stock flow of hotel sector is more volatile compared to economy as a whole. The stock flow cycles run for 3-4 years and the flow was peak after 2-3 years after high demand occurrence. The high demand created by campaign and promotions such as Visit Malaysia Years. The above figure shows very little evidence that economy associated with the level of stock flow.

Retail: Figure 5.0 illustrates the cycles of retail stock flow and GDP or economic cycle. It is very difficult to visualise the relationship between them. As a result, it can be concluded that the flow of retail space is influence by other forces apart from economy. This is explained by the attractive rental level command by retail space as well as low vacancy rate especially in newly built complexes. The space is easily taken up due short lease structure practised in this country.

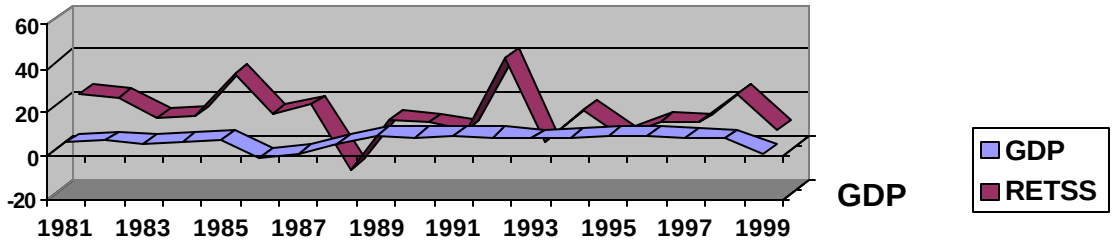


FIGURE 5.0 THE CITY OF KUALA LUMPUR: THE GROWTH OF ECONOMY AND RETAIL SUPPLY

The above discussion shows that procyclicality that is positive relationship of macroeconomic time series in relations to commercial construction output can be seen in sector such as offices. There is an existence of counter cyclicality (negative relationship) between selected indicators in this study.

Although, there is the analysis signals the possible link between the general economy, further analysis on correlation and sensitivity between the variables and commercial construction stock flow.

Stage 2: Correlation Analysis

A correlation analysis performed to investigate the level of association between the selected indicators. A summary of correlation matrix is shown in Exhibit A.

Economy as indicated by GDP exhibits average to low level of association with supply of offices, retail and hotel (-0.330, 0.151 and 0.134 accordingly). This signals that the influence of economy on the growth of stock flow is statistically insignificant. However, it is interesting to note that the mediocre to strong associations occur between GDP and demand indicators, such

as occupancy rate and rental command. While at the same time, the growth of stock flow is significantly associated with rental and occupancy rate. This consequently explains the phenomenon that it is the demand forces influence the stock flow. Economy, however provide a framework within which the demand forces and interacted to initiate the supply of commercial construction output.

Stage 3: Sensitivity Analysis

The regression analysis runs for three sectors failed to show the significant of GDP to the cycle of commercial output in the City of Kuala Lumpur. For example, GDP explains only 32% of variation in the office stock flow. The level of variation explained hence indicates the low sensitivity of explanatory variable to the investigated matter. Other indicator shows considerable higher level of sensitivity, for example, stock flow of offices is quite sensitive to the growth of service sector (53.9%).

OSS = 4837033.2 -343289.5 (GDPSER)

In all cases (office, retail and hotel), demand indicators such as rental are more sensitive to GDP whilst these forces will affect supply. Therefore the impact of economy is translated into commercial supply through two stages. The retail supply, for example is 33.5% sensitive to the rental level.

Similarly, based on the information collected it is difficult to show the association between hotel supply and economy. Nonetheless, the supply tends to be mildly associated with rental or room rate.

The sensitivity analysis performed in this study, therefore, unable to reveal the sensitivity of economy on the stock flow model as suggested in previous works reviewed in Section 2.0.

5.0 Conclusion

The cycle of stock flow for commercial sector in the City of Kuala Lumpur is more volatile compared to the overall economy. The cycle of commercial output is more persistent compare to economy growth. The economy cycle run for a longer duration compared to commercial construction output.

It can be concluded that the stock flow model for commercial sector in the City of Kuala Lumpur is less sensitive to the economy as a whole. Although there is slight indication of economy influence on development, the impact can be considered as second stage. The direct impact of economy growth is clearly seen on occupancy and rental rate of commercial space. The supply of space will follow the demand pursuit. As a result, significant association is observed between economy and demand-related variables. In case of office there is evidence of association between the growth of output and service sector. However, for retail and hotel, it is hard to observe any relationship to economy-related indicators. Hence it can be conclude that the development of retail and hotel is determined by demand side factors. In case hotel, tourism campaign and big event such as Commonwealth Games affect the growth of hotel construction output. This impact has not been considered in the development of the model.

Although the study is unable to show the sensitivity of stock flow model to the national economy it is hope that the study could be extended in the near future. It is believed that more rigorous information would yield better findings.

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EXHBIT A CORRELATION ANALYSIS

		OSS	ODD	OCRAT	ORNT	RETSS	RETOO	RETRNT	HSS	HORAT	HRNT	TEMP	GNP	GDP	GDPCON	GDPSER	CPI	UNEMPL
OSS	Pearson Correlation	1.000	-.022	-.435	.012	.525*	-.530*	.433	.677**	-.731**	.203	-.004	-.685**	-.330	-.579**	-.752**	-.296	-.124
	Sig. (2-tailed)	.	.929	.063	.961	.021	.020	.064	.001	.000	.406	.987	.001	.166	.009	.000	.221	.614
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
ODD	Pearson Correlation	-.022	1.000	.310	.004	-.286	.121	.134	-.408	.326	.375	.427	.169	.180	-.158	.130	-.367	-.011
	Sig. (2-tailed)	.929	.	.196	.988	.234	.621	.586	.082	.173	.761	.068	.488	.462	.518	.597	.122	.965
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
OCRAT	Pearson Correlation	-.435	.310	1.000	.650**	.026	.576**	.236	-.200	.558*	.413	.230	.517*	.819**	.237	.646**	.423	-.566*
	Sig. (2-tailed)	.063	.196	.	.003	.915	.010	.331	.412	.013	.079	.343	.023	.000	.328	.003	.071	.011
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
ORNT	Pearson Correlation	.012	.004	.650**	1.000	.450	.294	.779**	.310	.155	.878**	.139	.352	.552*	.154	.287	.293	-.846**
	Sig. (2-tailed)	.961	.988	.003	.	.053	.222	.000	.197	.528	.000	.570	.139	.014	.530	.234	.223	.000
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
RETSS	Pearson Correlation	.525*	-.286	.026	.450	1.000	.002	.578**	.679**	-.306	.496*	-.024	-.146	.151	-.223	-.282	.103	-.457*
	Sig. (2-tailed)	.021	.234	.915	.053	.	.994	.009	.001	.202	.031	.924	.551	.538	.359	.243	.675	.049
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
RETOO	Pearson Correlation	-.530*	.121	.576**	.294	.002	1.000	.049	-.236	.599**	.142	.169	.597**	.560*	.257	.621**	.502*	-.229
	Sig. (2-tailed)	.020	.621	.010	.222	.994	.	.841	.331	.007	.561	.489	.007	.013	.288	.005	.029	.346
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
RETRNT	Pearson Correlation	.433	.134	.236	.779**	.578**	.049	1.000	.543*	-.085	.868**	.149	.108	.286	-.140	-.057	.075	-.858**
	Sig. (2-tailed)	.064	.586	.331	.000	.009	.841	.	.016	.731	.000	.544	.660	.232	.569	.818	.760	.000
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
HSS	Pearson Correlation	.677**	-.408	-.200	.310	.679**	-.236	.543*	1.000	-.453	.483*	-.220	-.348	.134	-.148	-.458*	.015	-.423
	Sig. (2-tailed)	.001	.082	.412	.197	.001	.331	.016	.	.052	.036	.366	.144	.586	.544	.049	.951	.072
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
HORAT	Pearson Correlation	-.731**	.326	.558*	.155	-.306	.599**	-.085	-.453	1.000	.061	.192	.767**	.588**	.548*	.737**	.227	-.088
	Sig. (2-tailed)	.000	.173	.013	.528	.202	.007	.731	.052	.	.805	.432	.000	.008	.015	.000	.350	.721
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
HRNT	Pearson Correlation	.203	.073	.413	.878**	.496*	.142	.868**	.483*	.061	1.000	.276	.340	.473*	.178	.166	.063	-.825**
	Sig. (2-tailed)	.406	.761	.079	.000	.031	.561	.000	.036	.805	.	.253	.155	.041	.465	.496	.799	.000
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
TEMP	Pearson Correlation	-.004	.427	.230	.139	-.024	.169	.149	-.220	.192	.276	1.000	.229	.263	.177	.165	-.284	-.194
	Sig. (2-tailed)	.987	.068	.343	.570	.924	.489	.544	.366	.432	.253	.	.346	.277	.469	.499	.239	.426
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
GNP	Pearson Correlation	-.685**	.169	.517*	.352	-.146	.597**	.108	-.348	.767**	.340	.229	1.000	.470*	.651**	.772**	.281	-.335
	Sig. (2-tailed)	.001	.488	.023	.139	.551	.007	.660	.144	.000	.155	.346	.	.042	.003	.000	.244	.160
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
GDP	Pearson Correlation	-.330	.180	.819**	.552*	.151	.560*	.286	.134	.588**	.473*	.263	.470*	1.000	.346	.560*	.376	-.564*
	Sig. (2-tailed)	.168	.462	.000	.014	.538	.013	.232	.586	.008	.041	.277	.042	.	.147	.013	.113	.012
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
GDPCON	Pearson Correlation	-.579**	-.158	.237	.154	-.223	.257	-.140	-.148	.548*	.178	.177	.651**	.346	1.000	.543*	.239	-.158
	Sig. (2-tailed)	.009	.518	.328	.530	.359	.288	.569	.544	.015	.465	.469	.003	.147	.	.016	.325	.518
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
GDPSER	Pearson Correlation	-.752**	.130	.646**	.287	-.282	.621**	-.057	-.458*	.737**	.166	.165	.772**	.560*	.543*	1.000	.600**	-.308
	Sig. (2-tailed)	.000	.597	.003	.234	.243	.005	.818	.049	.000	.496	.499	.000	.013	.016	.	.006	.199
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
CPI	Pearson Correlation	-.296	-.367	.423	.293	.103	.502*	.075	.015	.227	.063	-.284	.281	.376	.239	.600**	1.000	-.354
	Sig. (2-tailed)	.221	.122	.071	.223	.675	.029	.760	.951	.350	.799	.239	.244	.113	.325	.006	.	.137
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
UNEMPL	Pearson Correlation	-.124	-.011	-.566*	-.846**	-.457*	-.229	-.858**	-.423	-.088	-.825**	-.194	-.335	-.564*	-.158	-.308	-.354	1.000
	Sig. (2-tailed)	.614	.965	.011	.000	.049	.346	.000	.072	.721	.000	.426	.160	.012	.518	.199	.137	.
	N	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19