THE STRUCTURE OF THE REAL ESTATE SECTOR: ITS IMPLICATION ON THE RAISING COST OF THE RAW MATERIAL

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Abstract
The objective of the paper is to determine the market structure of the real estate sector and its implication on costs. The study uses the data from a sample population of seventy-six real estate developers listed on the main board of the Bursa Malaysia. The model uses structural variable, Hirschman Herfindahl Index (HHI) and other three related variables, namely; market share, current assets and non-current assets. The result of the regression on the property firms’ data using the fixed effect model found that the HHI and the non-current assets violated the expectation of the structure-performance theory. HHI and the market share of the sector imply that there is an insignificant market concentration of the industry. Thus, it indicates that the real estate industry is competitive in nature. Hence, firms compete for the raw material available in the industry that will eventually cause the price of the material to be very elastic.

Keywords: Market share; Accounting profit; Return on sales; Return on capital; Return on equity.

JEL Classification Codes: L6; Q14.

1. Introduction
Real estate, also real property, reality or immovable property, refers to land and anything permanently affixed to the land, including the air above it and the ground below it, and any building or structures on it (Investor’s World, 2008). Real estate can also be defined as land or buildings or improvements on it and its natural assets, such as water. The profession of an agent in the purchase and sale of the real estate and the buying and selling activities of real estate for investment or speculations are also called as real estate.

There are various real estate businesses which include construction or property development, appraisal, brokerage, property management, real estate marketing and investment, relocation services, and corporate real estate. Within each field, a business may specialized in different types of real estate property, such as residential or housing, commercial, industrial, agricultural, leisure and land development as shown in Table 1 below. Usually larger companies developed mixed real estate projects in which an area consists of different types of properties. However, projects of smaller companies will usually focus on the development of a particular type of property only, that is either housing, commercial or industrial properties in a particular area.

<table>
<thead>
<tr>
<th>Types of Real Estate Property</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential or Housing</td>
<td>- Single storey terraced house&lt;br&gt;- 2-3 storey terraced house&lt;br&gt;- Single storey semi-detached house&lt;br&gt;- 2-3 storey semi-detached house&lt;br&gt;- Detached&lt;br&gt;- Town House&lt;br&gt;- Cluster&lt;br&gt;- Flat&lt;br&gt;- Apartment&lt;br&gt;- Service apartment</td>
</tr>
<tr>
<td>i) low-cost</td>
<td></td>
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<td>ii) low-medium cost</td>
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<td>iii) medium cost</td>
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<td>iv) high cost</td>
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According to Coiacetto (2006), real estate market is difficult to define because the products are highly heterogeneous even if the properties are classified into the same category. For example, the medium cost single-storey terraced houses might differ from one another in terms of its design, finishing, materials, and location. Therefore, there is no property which is fully substitutable. The real estate sector is also multi-dimensional since its characteristics and value can be determined through different aspect of site and infra-structure, the features of the property itself, and its location, which encompasses the issues of potential development, tenure, landscaping, flooding, designs and material of the building. It should also have easy access to resources such as labor, schools, transportation and jobs. In other words it is a bundle of commodities that cannot be priced and traded independently.

Henceforth, the price of a house will have to include the value of the land plus all related items mentioned earlier. Properties that are located in the middle of the cities, which can be easily accessed via public transportation systems and surrounded by well-developed infrastructure, will be highly priced compare to those in the suburban areas where such facilities are not present or less sophisticated. However, the true market value of the property is seldom or will not be revealed at all in the market. Normally the exact value will only be known between the developers and property brokers.

The real estate sector has played an important role in the development of the Malaysian economy especially in the late 1980s up to mid 1990s. During this period the construction industry has contributed significantly to the country’s economic growth as it actively developed the infrastructure and various types of real estate property development. Since the economic crisis in 1997, construction sector contribution toward Malaysia’s gross domestic product (GDP) dropped. In 2003 the sector’s contribution was only RM7,359 million or 3.2 percent of the overall GDP. The share keeps on decreasing in 2004, 2005 and 2006 with GDP contribution of 2.9, 2.7 and 2.6 percent respectively. However, in 2007 the sector’s contribution showed an increase in GDP up to 3 percent. Hence, in 2008 the sector’s share in the growth of GDP is expected to maintain at 3 percent even though the growth in productivity is estimated to increase by 5.9 percent (Department of Statistics, 2007).

The growth in the construction sector in 2007 was actually supported by the implementation of the infrastructural projects under the Ninth Malaysia Plan. In 2008 growth in this sector is expected to increase under similar condition. Residential and non-residential property sectors such as commercial and industrial properties will still continue to be the significant booster of the construction industry.
2. Real Estate Sector and Market Structure

As reported by the Ministry of Housing and Local Government, there are more than 3,600 private real estate developers throughout the country in 2007. Out of the 3,600 companies majority are small property developers whose details are undisclosed to the public. In order to relate the market structure of the sector, it is important to examine the number of competitors who operate in the market and the distribution of the market shares and the conditions of exit and entry into the industry. Just considering the characteristics of product and the market of real estate sector in Malaysia will not provide enough information relating to the number and size distribution of the firms in the economy as a whole.

At a glance, one may conclude that the market structure may be competitive in nature, but due to the differentiated nature of the product and the market distribution, it seems to have some degree of market concentration because of the ability of some firms to dominate the market. Shilling and Foo Sing (2006) stated that real estate market is an oligopoly market, because the products tend to be homogeneous with a small degree of differentiation and inflexible production techniques. Therefore there will be only few large real estate developers that have the capacity to increase market share and earn economic profit. This could also be firm’s strategy to deter the entrance of new firms into the industry. Capacity constraints will increase the incentives for real estate firm to concentrate, while increase in product variety will generally decrease firm concentration. Mason (1939) and Bain (1951) based on structure-conduct-performance paradigm analysis purported that there is a positive relationship between market concentration and profitability. Besides, Bain also established few elements of market structure; such as economies of scale, absolute cost advantage and product differentiation advantage, to affect the ability of the established firms to prevent its super-normal profit from being eroded by entry of other firms. Coicetto (2006) supported the idea that the real estate development industry structure as being highly oligopolistic based on the nature of its development planning and regulation. He argued that the real estate sector is an industry which gives advantage for large and expanding firms, but at the same time offers opportunities to many small firms. In this case market structure depends on various factors such as government policies and regulations, features of market segmentation, consumer requirements and positive externalities. Hence, for the purpose of enforcement of government policies and firm’s planning strategies information on market structure is extremely important (Chih Min, 2004).

Generally the market structure of the real estate sector is rather complicated. Due to legal and physical characteristics of the real estate products, market adjustments can never happen instantaneously. Developers and consumers cannot respond immediately to any changes in the market due to factors such as property rights, length of property development process, the physical nature of the property and high transaction costs (D’Arcy, 2006). Essentially whether or not firms’ operations enhance economic welfare is one of the main concerns (Ferguson and Ferguson, 1994). Firms should be able to satisfy consumers’ requirements in the current time period and avoid wasteful use of available factors of production. In other words firms should be productively and allocatively efficient, in which they produce the ‘right’ goods and the ‘right’ quantities.

3. Methodology and Theory

The structure-conduct-performance paradigm assumes that there is a stable causal relationship between the structure of an industry, firm conduct and market performance (Church and Ware, 2000). Typical SCP exercise consists of specifying a measure of market performance and a set of observable structural variables to explain inter-industry differences and market performance. Bain, (1951), in his SCP analysis explained the correlational relationship between market structure and profitability. Church and Ware in their model estimated the structural variables consisting of seller concentration (CON) and a number of barriers to entry such as economies of scale, product differentiation and the absolute cost advantage (BE1, BE2, to BEn). Hence, market performance, represented by profits ($\pi$), is the dependent variable, while the independent variables are consisted of the structural variables as follows:

$$\pi = \alpha + \beta CON + \beta BE_1 + \beta BE_2 + \ldots + \beta BE_n + \nu$$

Where, $\pi$ : profitability of firm

$\alpha$ : constant

CON : seller concentration

BE : barrier to entry

$\beta$ : coefficient

$\nu$ : residual

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Profit ($\pi$) represents the economic profit or the difference between revenues and the opportunity cost of all inputs. In the long run, economic profits are an indicator of market power if there are entry barriers. However, it is not unusual that firms’ profitability can also be measured by its accounting profits taken from the balance sheet and the income statement of the firm. Accounting profits are the difference between revenues, the cost of sales and expenses incurred during the production process. It can be profit before tax or profit after tax, where profit before tax measures the earning ability of the firm before the deduction of its tax item. Firm’s profitability can also be measured by indices such as rate of return, returns on equity, and returns on assets, liquidity ratios and solvency ratios.

The independent variables are consisted of the structural variables, with sellers’ concentration being the most important. It refers to the number and size distribution of firms. Fewer and larger firms lead to increases in seller concentration. Positive relationship between seller concentration and market power indicates the ability of sellers to reduce competition and coordinate their pricing behavior, so that price increases as the degree of concentration increases. There are two common measures of sellers concentration, namely; the concentration ratios and Herfindahl Hirschman Index (HHI).

The most common statistical measure of concentration as an index of market structure is the $k$-firm concentration ratio, ($CR_k$), which is the share of the industry sales accounted by $k$ largest firms. The number of firms used in the measurement of $CR_k$ can be four or eight firms, denoted as four-firm’s concentration ratio ($CR_4$) or eight-firm’s concentration ratio ($CR_8$) respectively.

Using Herfindahl Hirschman Index (HHI) we take the sum of squares of the market shares. It does not concentrate only on the number of larger firms in the industry but it takes into account the market share of all firms in the industry. Therefore, HHI is a more representative measure of the seller’s concentration relative to $k$-firm concentration ratio. The index can vary between zero (0), for perfect competition; and one (1) for monopoly. Fewer firms and larger variations in the market share will increase the index which indicates a greater degree of seller concentration in the market.

To comply with Bain (1956) analysis of market structure and profitability, relationship between market power and concentration should be presented when entry barriers exist. Hence, coefficients of the structural variables indicating entry barriers will be estimated. Each coefficient represents the effect of market power from the changes in each structural variable and each of it is estimated to have positive relationship to profitability and statistically different from zero.

Bass et.al. (1978) in their model illustrated the dependency of the firms profitability on the structural and firm-related variables as shown below,

$$P = \beta_0 + \beta_1AS + \beta_2C + \beta_3G + \beta_4MS + \beta_5S + \beta_6D + \mu$$

Where,

- $P$: profitability of firm - measured by the ratio of net income after taxes to shareholder’s equity
- $AS$: weighted average of industry advertising-to-sales ratios
- $C$: weighted average of the four-firm concentration ratio
- $G$: weighted average of changes in industry demand
- $MS$: weighted average of the firm’s market share
- $S$: size of firms - measured by the reciprocal of the logarithm of firm’s assets
- $D$: diversification of the firm
- $\mu$: disturbance term

The structural variables in the model consist of the industry concentration ratio, the industry advertising-to-sale ratio, and the industry growth rate. According to them, these elements of market structure will explain the inter-industry variation in profitability. The firm related variables such as market share, firm size, and degree of diversification, will explain the intra-industry variation in profit rates. They estimated the model using Ordinary Least Square (OLS) they found that the coefficients for market share, advertisements and growth have significant impact.
For our purpose, in order to examine the relationship between the market structure and profitability of the Malaysian real estate sector, model following Bass et al. is being used with little modification so as to suit the nature and the availability of the data. The number of the independent variables will be reduced to one structural variable and three firm-related variables. The structural variable used here is represented by the HHI as a measure of the industry’s seller concentration in order to determine the market structure of the real estate sector. While the firm related variables used are the market shares of the listed property companies, and the firm size which accounted by current assets and the non-current assets of these companies. Such variables will provide the measure for entry barriers of new firms into the industry. As according to Bass et. al. firm-related variables will explain the real estate intra-industry variations in profitability. Hence, the model to be estimated is

\[ P = \alpha + \beta_1 HHI + \beta_2 MS + \beta_3 CA + \beta_4 NCA + \mu \]  

Where:
- \( P \): profitability of firm
- \( HHI \): hirschman herfindahl index concentration ratio
- \( MS \): market share of firms in the industry
- \( CA \): value of current asset
- \( NCA \): value of non-current asset
- \( \alpha \): constant
- \( \beta \): coefficient
- \( \mu \): disturbance term

Bass et. al. measured profitability by using the ratio of net income after taxes to shareholder’s equity, or simply the returns on capital or returns to equity or investment. Church and Ware (2000) also suggested that the rates of returns on capital are often the preferred measure of profitability, since the amount of capital varies across industry. An industry may have large economic profit, being highly capital intensive, but profit alone may be an imperfect indicator.

In \([1]\) profitability of firm, denoted by \( P \), is each firm’s returns on capital. Instead of using net income after tax we use the ratio of firm’s profits before tax to its total capital. Where returns on capital is measured by dividing profit before tax to total capital employed by firm. Such profitability measure has been used in most of the recent performance studies and provides least problem when comparing firm’s different short term performance (Hammes and Chen, 2005).

In order to measure the seller concentration for the real estate sector the Hirschman Herfindahl Index (HHI) is used. Here the HHI or the function of all individual firm’s market share is defined as the sum of squared values of the firm’s share in the industry, calculated using the following formula:

\[ HHI = \sum_{i=1}^{n} S_i^2 \]  

Where,
- \( S_i \): the share of \( i \)th firm in the market
- \( n \): total quantity of firm in the market.

The HHI is obtained by summing up every firm’s revenue data from the year 2001 until 2006 of each property companies. The revenue of the listed property companies is derived from property development activities and gross dividend received from a subsidiary company. The value of HHI varies between zero and one. The closer HHI value to one, the more concentrated the industry will be.

Another firm-related variables used here is the market share; that is the share of the industry’s total revenue. It is one of the key elements of an industry’s structure referring to the size distribution of firms in the industry. It indicates the degree of monopoly power and can be used as a proxy for market power. For our purpose, the market share of each property firm in the real estate sector can be calculated by dividing the revenue of each firm with the sum of the industry’s revenue in each respective year using the following formula:
\[ MS = \frac{\text{Revenue of firm } i}{\text{Sum of the industry's revenue}} \]  

However, the possibility of whether the market share will reflect the market power depends on the barriers to enter the market (Bain 1956). In this model the barrier to entry in this model is defined by the firm’s size represented by the firm’s current assets which include the property development costs, inventories, trade and receivables, tax recoverable, cash, and cash equivalent. While the firms’ non-current assets consist of property, plant, and equipment, land held for property development, investment in subsidiary companies plus other investment. Following Bass et. al., the firm’s size is measured by the inverse of the logarithm of each firm’s assets. Hence, the value of the current asset and non-current asset in the model is obtained as follows;

\[ \text{CA or NCA} = \frac{1}{\text{The log of the firm's current asset}} \]

The use of assets as proxy to firm’s size reflects the definition of assets by Hogget et. al. (2006). They defined assets as the actual resources controlled by the business which bring future economic benefits and income to flow into the company. Further, current and non-current assets have different level of liquidity. Current assets are generally liquid assets that can be easily converted to cash, whereas non-current assets are less liquid. Therefore, the segmentation of both types of assets in the model will highlight the importance of each asset and its component in influencing the profitability of the industry. the larger the firm’s size, the more significant would be the cost advantage for the firm in terms of economies of scale and the sunk capital investment, thus, demotivate new entrants into the industry and the economic profit remains with the larger incumbent firms.

The hypothesis is consistent to the objectives of the study that is to measure the influence of the market structure on profitability of the real estate industry. The null hypothesis (H0) indicates that profitability increases if HHI is greater than zero (0), and the alternative hypothesis (H1) implies that profitability decreases if HHI is equal to zero.

Henceforth, the annual data of seventy-six (76) listed real estate firms in the main board of Bursa Malaysia will be regressed using panel data to estimate Ordinary List Square (OLS) parameters to get the optimal fit. This sample of listed real estate firms is chosen to represent the whole population of the real estate sector due to the following reasons. Firstly, these firms represent larger size of property developer companies as compared to the non-listed ones which are generally smaller firms. Secondly, due to the unavailability of quality data of the unlisted companies, thus, they are being excluded from the study.

4. Results and Analysis
One of the important key elements of a market structure is the industry’s size distribution of firms which can be measured by the market concentration and the market share (Coiacetto, 2006). The HHI varies between zero and one. Industry with the value of HHI less than 0.01 is classified as low concentrated industry. The closer HHI to one, the more concentrated the industry will be (Church and Ware, 2000). Specifically Coiacetto classified the market with HHI value of less than 0.01 as low concentrated industry, while market with HHI value between 0.01 and 0.1 is considered as moderately concentrated. Market with high seller’s concentration is when the HHI value is between 0.1 and 0.18.

In this study the Hirschman Herfindahl Index (HHI) is used to measure the concentration of the property firms in the real estate industry. The result of the index calculated annually is summarized in Table 2 below.
Table 2: HHI For The Real Estate Sector In Malaysia

<table>
<thead>
<tr>
<th>Year</th>
<th>HHI</th>
</tr>
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<tbody>
<tr>
<td>2001</td>
<td>0.053</td>
</tr>
<tr>
<td>2002</td>
<td>0.044</td>
</tr>
<tr>
<td>2003</td>
<td>0.039</td>
</tr>
<tr>
<td>2004</td>
<td>0.037</td>
</tr>
<tr>
<td>2005</td>
<td>0.051</td>
</tr>
<tr>
<td>2006</td>
<td>0.042</td>
</tr>
</tbody>
</table>

The real estate firms under study have the average HHI value equal to 0.044 throughout the six year period. Therefore it can be concluded that the real estate sector in Malaysia is moderately concentrated. The index also indicated that the sector has concentration equivalence of about twenty-three equally sized property companies in the industry. Based on Coiacetto analysis, he will categorize this industry as loose oligopoly that possesses some degree of market power.

Another measurement of the industry’s size distribution is market share, which is also a firm-related variable. It is the firm’s share of the market based on the industry’s total revenue, which indicates the degree of firm’s monopoly power or market power. The market share of each property firm is calculated by dividing the revenue of each firm with the sum of the industry’s revenue in each respective year. The higher the percentage of the firm’s market share, the higher will be the firm’s market power dominating the market. The market power is considered to begin when the market share of the firm is in the area of 15 percent of the total market. The market influence will be more significant when the market share falls between 25 to 30 percent, and it is considered as strong as 40 to 50 percent share of the overall industry (Coiacetto; 2006). The market share of the property companies in Malaysia’s real estate sector shows the existence of some degree of market power in the industry, since 50 percent of the share has been dominated by an average of nine listed property companies.

The regression analysis to estimate the parameter coefficients is done by using data on profit before tax, revenue, equity, current assets and non-current assets taken from the annual reports of each of the seventy-six listed property companies starting from 2002 and 2006. Below is the result of the regression estimation using pooled data with the t-value shown within the brackets.

\[
P = -0.14 - 0.29\text{HHI} + 4.14\text{MS} + 2.34\text{CA} - 1.64\text{CA} + \mu
\]

\[
(-0.16) (-0.12) (3.58)^* (1.83)^* (1.59)^*
\]

Note: t-statistics are within the parenthesis

* shows 1% significant level
** shows 10% significant level

The results obtained have only two coefficients for the independent variables with positive signs as expected. The HHI and non-current assets have insignificant negative impact on profitability, whereas the market share and current assets have positively significant effect on firms’ profitability. The results indicate that when HHI increases by 1 percent, the profit will decrease by 0.29 percent, and when market share increases by 1 percent, profit will increase by 4.14 percent. Here different types of assets give different impact on profitability. When current assets increase by 1 percent, there is a significant increase in profit by 2.34 percent. In contrast, 1 percent increase in non-current assets cause profitability to decrease by 1.64 percent.

5. Summary and Conclusion
The study of the market structure and profitability of the real estate sector in Malaysia takes into account the structure and performance of the real estate developers of all types of properties all over Malaysia. The seventy-six (76) real estate developers listed on the main board of Bursa Malaysia are among the largest property developers that could not be classified into specific types of property businesses as their property development projects are varied and nationwide. The measurement of the Hirschman Herfindahl (HHI) and market share of the real estate sector in Malaysia imply that there is rather insignificant market concentration in the industry. The HHI highlights that the real estate sector in Malaysia has concentration of about twenty-three (23) equal size property companies in the industry in terms of equity and number of its employees.
This is further supported by the calculation of market share which indicates that 50 percent of the market is dominated by an average of nine (9) listed property companies in the industry. Thus, it can be concluded that the real estate sector in Malaysia falls into the category of loose oligopoly market structure, (as proposed by Coiacetto) with six-year average HHI value of 0.044 that should directly affect firm’s profitability.

The regression result found that the market share is positively significant in affecting profitability of the firm. This higher the market share of a firm in the industry, the higher will be the profitability gain by the firm. On the other hand, if market share falls profitability of the firm will be lowered. Further, the insignificant negative impact of HHI on profitability of the real estate firm means that profitability of each firm is not dependent on HHI. In other words the level of concentration in the industry will not necessary affect the profitability of each firm and none of the firms in the market is significant enough to affect the profitability earned by any other firm in the industry. This situation holds even if the firms try to concentrate or collude in the market where firms behave rather competitively. One of the reasons for this situation to happen may be due to the nature of the real estate business. In order to gain higher market share, firms must acquire large volume of resources such as land held for property development, plants and equipment, and human resource that involve higher cost. Generally the high cost of property development is associated with the high cost of land and building material created through demand and supply forces. The higher demand for these scarce resources by highly competitive property companies will cause the price of those resources to rise. Firms with large amount of current assets are more profitable because of its ability to acquire more assets. But non-current assets seem to be negatively related to profitability of the firms. Large volume of fixed assets acquired by the property companies in the form of land, plants and building equipments will cause the firm to incur much higher costs. Firm’s profitability is also negatively affected if large amount of the current assets are used in the non-current assets acquisition and investments.

On the whole, the finding suggested that the conduct of the real estate sector in Malaysia is competitive in nature since market concentration does affect firms’ profitability. Property companies may be dominant in their respective region, but not comparatively at national level. Thus, companies have to compete among each other in order to obtain highly valuable resources such as strategic location, high quality building materials without affecting companies’ profitability. They also have to compete in getting buyers by supplying high quality real estate property for higher quality of life. At the same time there is not much incentive for the real estate companies to increase their profitability. In order to expand they have to acquire large volume of non-current assets, especially land for property development projects. Besides, they also have to bear higher cost of building material that keep on increasing, jeopardizing the opportunity to increase their market share and henceforth their profitability. On the other hand, even how competitive the industry can be, the pricing of the products is beyond the control of the real estate sector companies. Property buyers have access to the price of each property offered by developers. The demand is relatively elastic and companies may loose buyers as a result of a slight increase in price of the properties. Thus, this sector offers vast research opportunities such as those in the policy areas, industry’s efficiency and growth that can benefit the property companies specifically and the consumers as a whole.

References
