

**A HEDONIC PRICE MODEL FOR BRAND VALUATION:
A CASE OF THE THAI PROPERTY MARKET**

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ABSTRACT

This research aimed to identify and measure the brand value of major detached house developers in Bangkok by applying the Hedonic Price Model. The researcher collected 306 items of secondary data based on the price lists and key attributes of different detached house projects from 9 major selected developer companies listed on the Stock Exchange of Thailand. Results showed that most brands, along with some major attributes such as locations, house size, transportation facilities and numbers of bedrooms and restrooms, all contained significant value added premiums. Therefore, it can be concluded that consumers' willingness to pay is an important criterion when considering buying a house.

In this paper, all developers were ranked in order of their brand's premium value. Results showed that Quality House, Sansiri, and Land & House were the top three developers with the highest brand premiums. This research is expected to be a good source of data for existing developer companies and new business entrants when considering appropriate pricing strategies.

KEY WORDS: HEDONIC PRICE MODEL / BRAND VALUATION / DETACHED HOUSE / PRODUCT ATTRIBUTE

31 pages

การใช้ตัวแบบเฮโดนิคในการประเมินมูลค่าตราสินค้าสำหรับกรณีศึกษาโครงการบ้านจัดสรรในประเทศไทย

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บทคัดย่อ

งานวิจัยชิ้นนี้จัดทำขึ้น เพื่อศึกษาและประเมินมูลค่าตราสินค้าของโครงการบ้านจัดสรรในเขตกรุงเทพมหานคร โดยใช้ตัวแบบเฮโดนิคในการวิเคราะห์ข้อมูล ผู้จัดทำได้รวบรวมข้อมูลราคาและคุณลักษณะโดยละเอียดของบ้านจัดสรรแต่ละโครงการ เป็นจำนวน 345 ตัวอย่าง โดยรวบรวมข้อมูลจากโครงการบ้านจัดสรรขนาดใหญ่ 9 แห่งที่จดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย ผลการวิจัยแสดงให้เห็นว่า โครงการบ้านจัดสรรส่วนใหญ่และคุณลักษณะบางประการ อาทิเช่น ทำเล ขนาดพื้นที่ใช้สอย สิ่งอำนวยความสะดวกต่อการเดินทาง และจำนวนของห้องนอนและห้องน้ำ มีความสำคัญต่อการพิจารณาเลือกซื้อโครงการบ้านจัดสรรของผู้บริโภค

ในส่วนของผลสรุปของงานวิจัยชิ้นนี้ ผู้จัดทำได้เรียงลำดับมูลค่าตราสินค้าของโครงการบ้านจัดสรรของแต่ละโครงการไว้ โดยควอลิตี้เฮาส์ แอสเสอรี่ และแลนด์แอนด์เฮาส์มีมูลค่าตราสินค้าสูงสุดเป็น 3 อันดับแรก ผู้จัดทำหวังว่าข้อมูลดังกล่าวจะเอื้อประโยชน์ต่อโครงการบ้านจัดสรรในปัจจุบัน หรือต่อบริษัทใหม่ที่ประสงค์จะดำเนินธุรกิจโครงการบ้านจัดสรร ในด้านการสร้างกลยุทธ์การตั้งราคาบ้านให้เหมาะสมต่อสถานการณ์ของธุรกิจประเภทนี้ต่อไป

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CHAPTER I

INTRODUCTION

1.1 Background of Thai Property Market

Nowadays, dwellings have become more than a fundamental necessity for human living. Rather than accommodating purpose, consumers consider other supplementary factors, facilities, and even look at the liability of the housing developers when buying houses. The demand for houses follows the growth of the population, especially in the crowded and big cities, like Bangkok and its vicinity. From an economic aspect, the housing sector is considered a major economic indicator of the country. It generates revenue for other relevant businesses such as construction materials, electronic appliances, timber and furniture, financial institutions and also creates job opportunities for Thai labor. The housing and real estate business was ranked third in contributing to the employment rate of the country. In the third quarter of 2009, the employment rate from the housing and real estate sector was 3 million workers, which accounted for 12.95% of total national employment (Real Estate, 2009). Given such advantages, the government has attempted to stimulate the housing business by initiating several schemes in order to boost the housing sector and, consequently, aim to drive the Thai economy forward. One of effective action was the tax measure implementation, which government kept extending in the past 2 years (See Table 1.1 for government tax measures in detail).

Table 1.1 Thai government tax measure during 2008-2010

Approval date	Applicable tax and fee measures	Implementation period
Mar-08	<ul style="list-style-type: none"> * Reduction of the specific business tax from 3% to 0.1% of sales price * Reduction of the transfer fee from 2% to 0.1% * Reduction of the mortgage registration fee from 1% to 0.01% (account for fee less than THB 200,000) 	28 Mar 08- 30 May 10
Jan-09	<p><u>For newly purchase:</u></p> <ul style="list-style-type: none"> * Personal tax exemption on purchase price less than THB 300,000 * Retaining tax exemption on interest rate within THB 100,000 amount (Implemented since 01 Jan 07) 	<p>Purchase within year 2009</p> <p>Applicable till now</p>

Source: Real Estate, 2009

Consumers remain interested in the government plans on the tax and fee measurement. A consultant of the Ministry of Finance, Somchai Sakulsurarat (Real Estate, 2009), cited that the housing business sector tended to improve in 2010, based on the 5% increase in the value of the approved loans during the third quarter of 2009 as a result of the tax reduction scheme which was originally announced for termination on December 31, 2009. Government had announced an extension of the reduction of this transfer fee plan to the end of May 2010.

It was not surprising that the largest portion of the units of land allotment permits granted nationwide were in Bangkok and its vicinity. This accounts for 7,297 units from a total of 9,495 units, or around 77% of the entire country (Real Estate Information Central (REIC), 2009a). See Figure 1.1 below for an illustration.

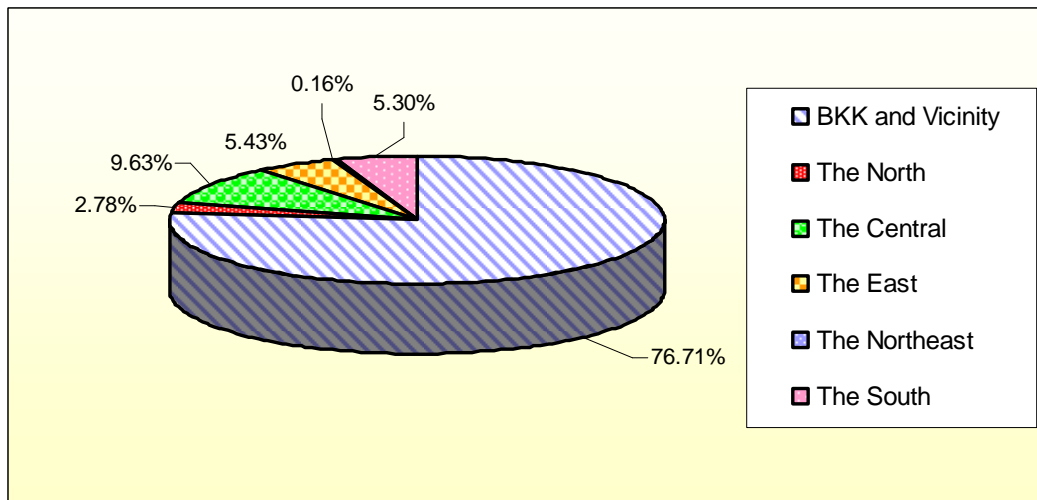


Figure 1.1 Land allotment permits nationwide, number of units, by regions in the third quarter of 2009

Source: REIC, 2009a

By focusing on Bangkok and its vicinity, among all available types of housing, such as detached houses, duplexes, townhouses, condominiums, commercial buildings and apartments, REIC (2009b) shows the highest value of registration of transferred property accounts for detached houses where its year-to-date 2009 (as of the third quarter of 2009) registration value was THB 80.49 billion out of the total housing registration value of THB 234.74 billion or around 34% of all housing types in the area. This value decreased from a year-to-date 2008 value of THB 84.33 billion, or 5% decline on changes in the YOY (year-over-year) from 2008. In terms of units registered, condominiums instead accounted for the largest number of unit registrations of transferred property for the year-to-date 2009 (as of the third quarter of 2009). The detached houses have declined in popularity to condominiums and townhouses recently. This can be seen from the increase in both the values and the numbers of unit registrations of both housing types from 2008 to 2009. However, the detached house registration value still occupied the largest portion. See Figures 1.2 and 1.3 for more details.

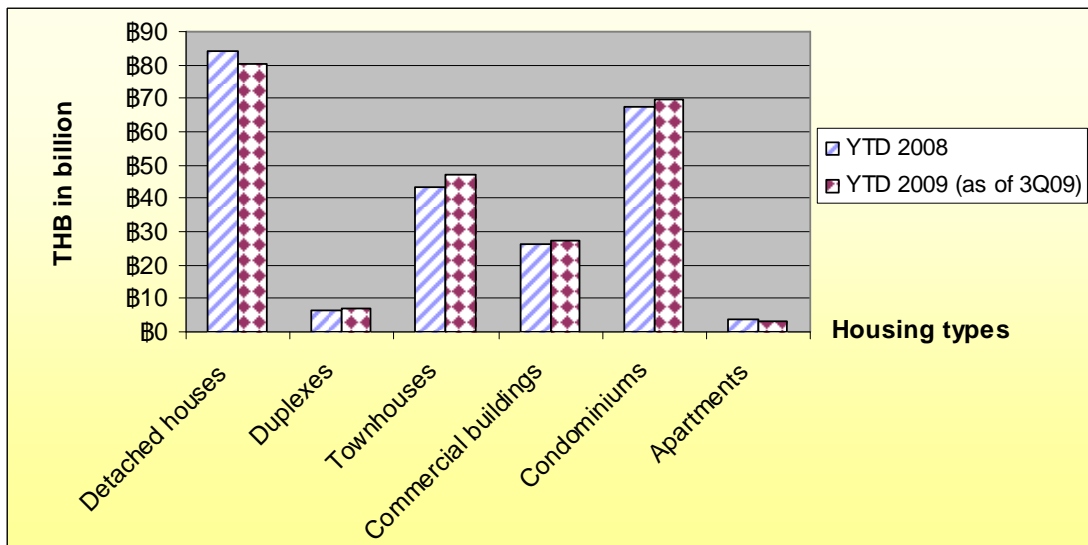


Figure 1.2 Value of registration of transferred property by housing type in Bangkok and vicinity

Source: REIC, 2009b

Note: Units in THB billions

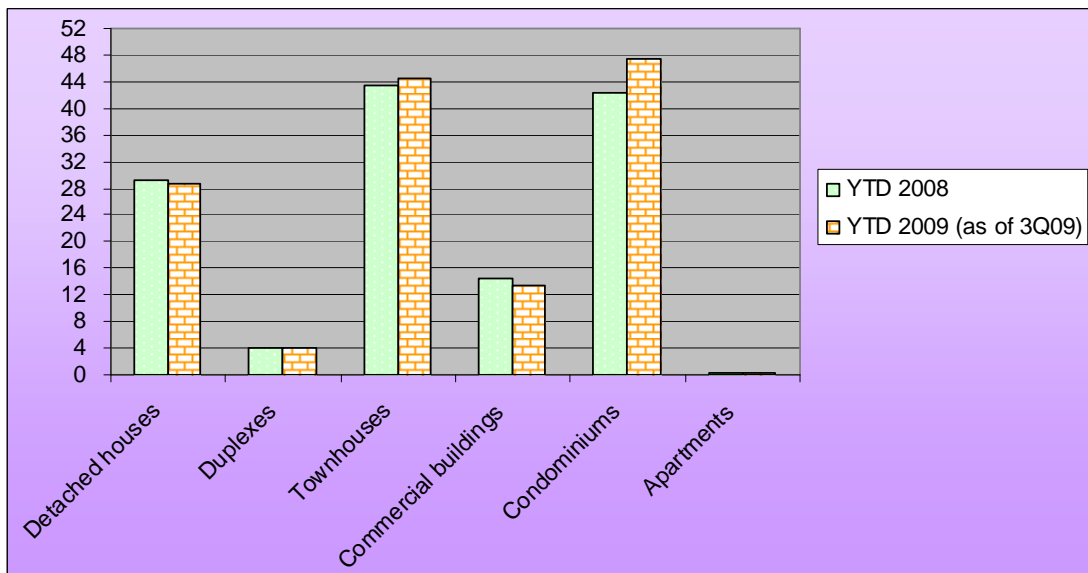


Figure 1.3 Number of housing unit registrations of transferred property by housing type in Bangkok and vicinity

Source: REIC, 2009c

Note: Units in thousands

As we focus more on the detached houses segment in Bangkok and its vicinity, Table 1.2 and Figure 1.4 below demonstrate the historical yearly proportion in units of newly registered detached houses to the total of newly registered housing. The ratio shows a significant decline in units of registered detached houses for the entire industry in recent years, from 38.57% in 2004 to only 10.95% in 2009 (as of November 2009). For the number of projects, Figure 1.3 shows fluctuations for 6 years. The number of projects sharply decreased to 225 projects in the 3rd quarter of 2009. However, the total of newly registered units for the entire housing segment still increased constantly from 75,110 units in 2007 to 83,009 units in November 2009. This obviously implies a downtrend of Bangkok and vicinity consumer preferences for detached houses. The highest number of registered units in recent years instead reflected mainly on other accommodation types, especially condominiums. The primary reason for the condominium boom was due to the increase in oil prices which makes consumers prefer living downtown to driving from Bangkok's suburban areas.

Table 1.2 Newly registered detached houses units by project developer in Bangkok and vicinity, total units of newly registered housing and total number of housing projects, by year

Items	2004	2005	2006	2007	2008	2009 (As of 3-4Q)
Number of newly registered units (Detached House)	26,631	23,889	16,700	16,390	13,437	9,091
Total newly registered units (all housing types)	68,300	70,408	78,611	75,110	83,065	83,099
Proportion	38.99 %	33.93 %	21.24 %	21.82 %	16.18%	10.94%
Total Number of housing projects granted permits	463	538	395	509	408	225

Source: REIC, 2009d and 2010

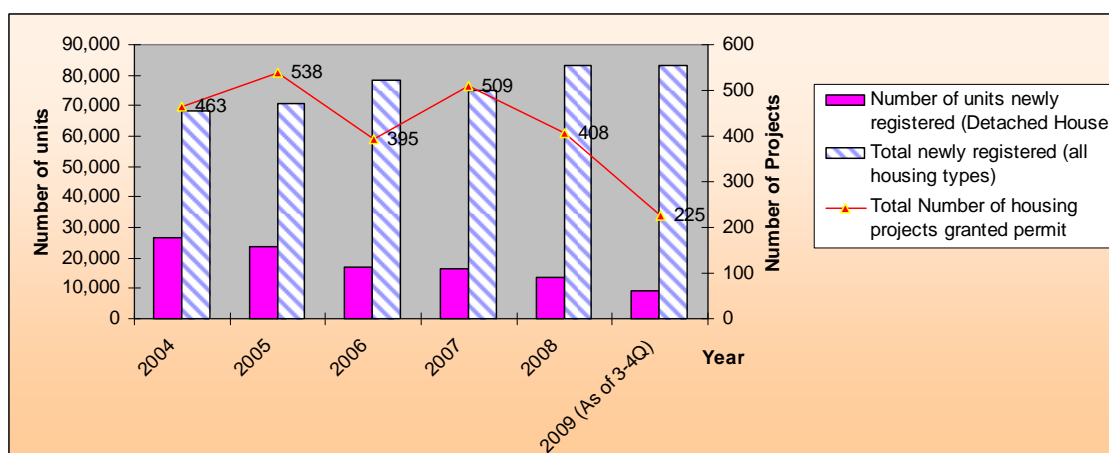


Figure 1.4 Newly registered detached houses units by project developers in Bangkok and vicinity, total units of newly registered housing and total number of housing projects, by year

Source: REIC, 2009d and 2010

Competition in the Thai property market is relatively intense and comprises large numbers of operators. The nine major housing developers listed in the Stock Exchange of Thailand are shown in Table 1.3.

Table 1.3 List of housing developers and their listed names

Developers	Company name
LH	Land And Houses Public Company Limited
QH	Quality Houses Public Company Limited
SIRI	Sansiri Public Company Limited
AP	Asian Property Development Public Company Limited
PF	Property Perfect Public Company Limited
SENA	Sena Development Public Company Limited
SPARI	Supalai Public Company Limited
NOBLE	Noble Development Public Company Limited
PRIN	Prinsiri Public Company Limited

Source: Stock Exchange of Thailand, 2010

Figure 1.5 also shows the asset value from 2007 to the 3rd quarter of 2009 and the number of current projects during 2008 till the present for those major developers. Apart from being the leader in asset value, Land & Houses has also

received the market leader title in the property business, recognized by consumers (Real Estate, 2009) and for employing basic marketing strategies of high involvement in product sales. Other brand projects also took steps as market followers adopting similar strategies. Nowadays, Bangkok and its vicinity are replete with housing projects offered by these developers.

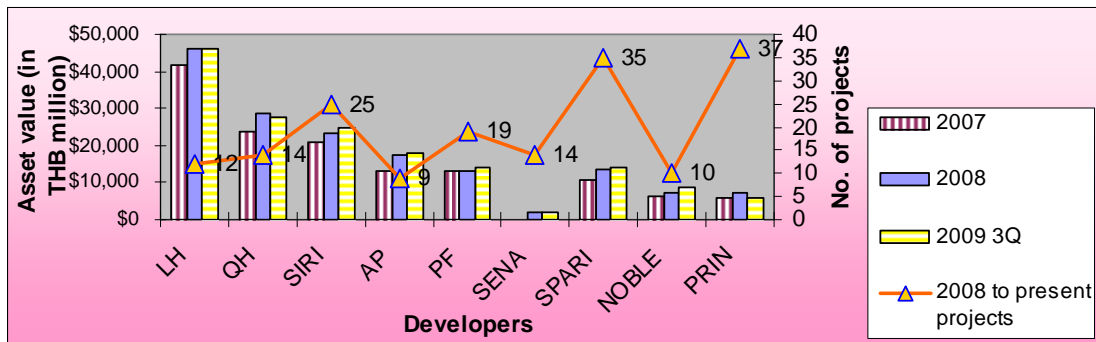


Figure 1.5 Financial asset value and number of projects of major housing developers

Source: Stock Exchange of Thailand, 2010 and LH, QH, SIRI, AP, PF, SENA SPARI, NOBLE, and PRIN websites, 2010

From the many choices of housing projects offered by the developers, detached houses are one of the necessary accommodation types made available by all developers in the business. Figure 1.6 shows the breakdown in the numbers of projects for SDH (Single detached houses), condominiums and townhouses by each housing developer.

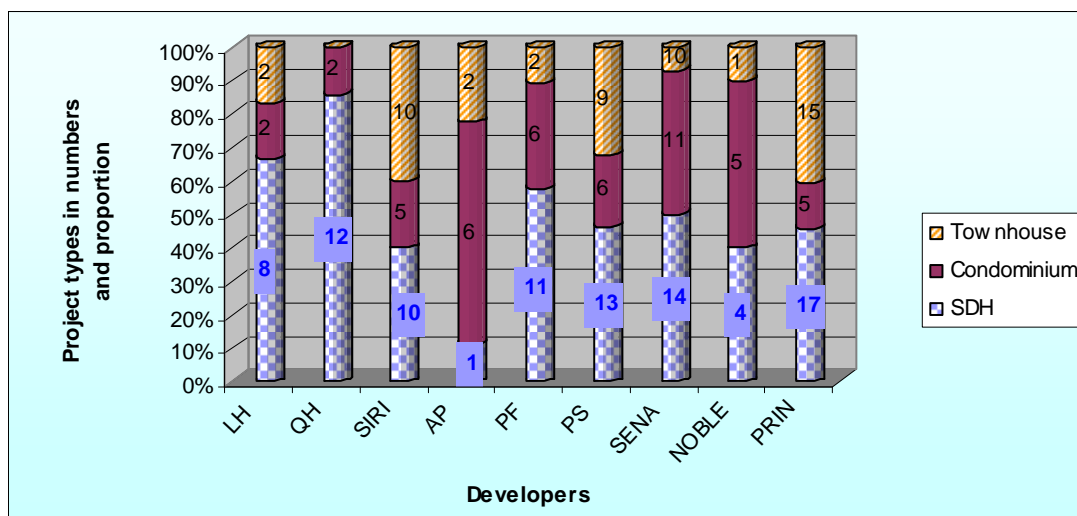


Figure 1.6 Number of projects breakdown by types by major developers

Source: LH, QH, SIRI, AP, PF, SENA, SPARI, NOBLE, and PRIN websites, 2010
Note: SDH refers to Single Detached House

Since 1963, when housing development commenced its operation in Thailand, business performance has been unstable throughout. Property prices have fluctuated widely due to several factors, such as government policies, oil prices, construction material prices, the economic situation, etc. Table 1.4 exhibits the housing price index for medium-to-low price houses in recent years, the base year being 1991. The third quarter of 2007 showed slight changes in price. Despite the surging construction material price in 2008, most developers decided to maintain the housing price, while reducing the sizes of the houses or projects so that the sales could be made rapidly.

Table 1.4 Housing price index

	2002	2003	2004	2005	2006	2007 (3Q)
Land	142.3	144	146.1	155.3	161.7	167.1
Detached house with land	131.8	135.7	143	154.4	160.2	161.4
Townhouse with land	128.6	131.5	136	144.1	150.2	153.1

Source: REIC, 2008a

Note: Base year 1991: 100

There is no single standard as to how the detached houses are classified. Each developer may have their own classification definition in place. Most of the developers segregate their segments by their project brands, which are also attached to the location of the houses. For this paper, we will classify houses by their price ranges. Figure 1.7 shows that in 2008, a price range from THB 1.0 to 2.9 million was the most popular launched segment and accounted for 52% of all the price range. For the year 2009, housing projects with prices less than THB 5 million will not be affected as the actual demand for this range is still valid.

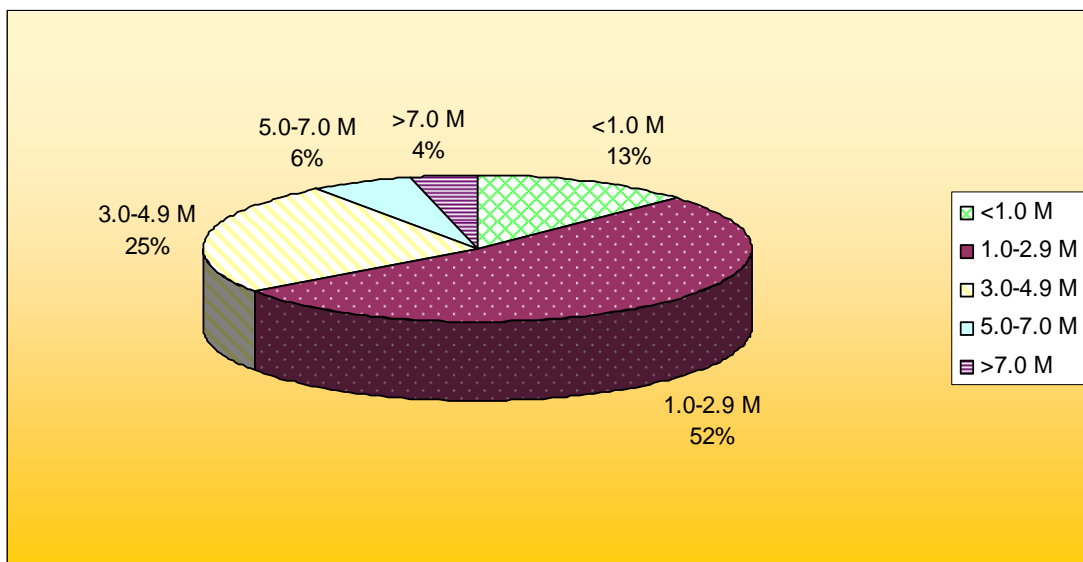


Figure 1.7 Launched low-rise housing classified by prices in 2008

Source: REIC, 2008b

New detached housing projects dropped in 2009 as mentioned earlier in Figure 1.4. Consequently, the house price did not increase significantly, as market demand has been less. As the expiry of government tax measures approached, the competition among developers was quite high as can be seen from competing sales prices and promotions offered by project developers.

Buying a house involves deep consideration of various attributes. Due to the relatively high price, buying a house is not a small decision for most people. Chysacorn (2006) revealed the factors that influence house purchasing decisions in Bangkok, in order of importance. They are reasonable prices, facilitating locations,

reliability and reputation of the developers, and marketing promotions according to a survey of 400 persons. Figure 1.8 shows the factors in percentages.

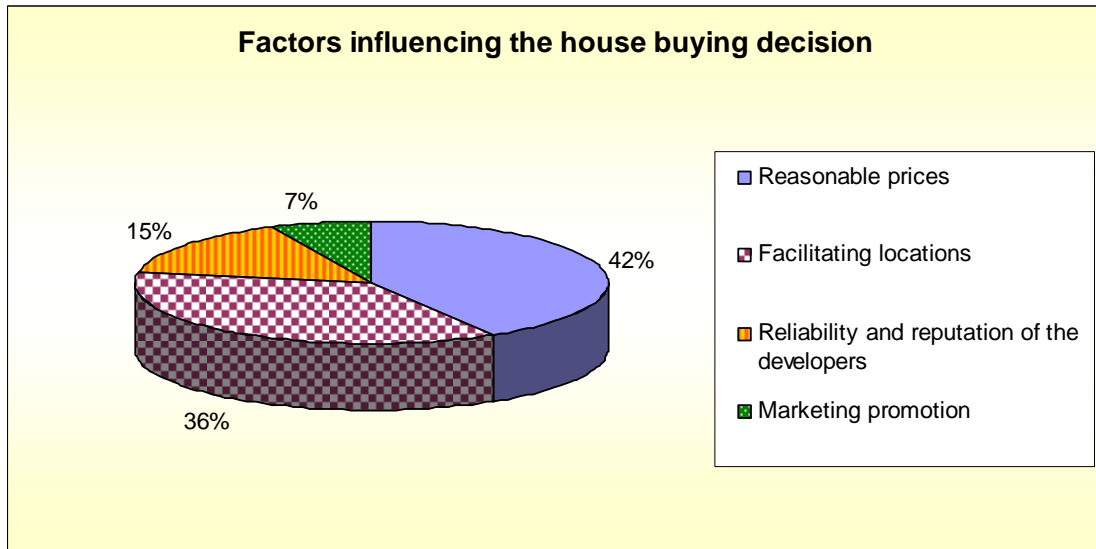


Figure 1.8 Factors influencing the house buying decision in Bangkok in 2006

Source: Chysacorn, 2006

Note: from A sampled group of 400 persons

In terms of reasonable price, the study shows the different levels of house price influences by the sampled group demonstrated below in Table 1.5.

Table 1.5: Level of house prices and number of persons intending to buy,

House Price Level	Number of persons	Percentage
1.00 M-3.00 M	236	59.00%
3.01 M-4.00 M	84	21.00%
4.01 M-5.00 M	63	15.80%
5.01 M above	17	4.30%

Source: Chysacorn, 2006

Note: n=400

In considering the marketing promotions, buyers are interested in both the products attributes and the services or sales promotions provided. The survey shows the level of interest in average scores from the sampled group, towards those different attributes as demonstrated in Tables 1.6 and 1.7.

Table 1.6: Average scores showing level of interest from the sampled group towards different product attributes

Products / Attributes	Average score of importance	Meaning
Construction quality	4.51	Very important
Size of utilizing area	4.35	Very important
House Pattern	4.23	Very important
Size of area	4.02	Important
No. of bedrooms	3.71	Important
No. of toilets	3.62	Important

Source: Chysacorn, 2006

Note: (Ranging from 5=most important, 4= very important, 3= important, 2= less important, 1= not important), n=400

Table 1.7: Average scores showing level of interest from the sampled group towards different sales promotion attributes

Sales promotion attributes	Average score of importance	Meaning
Transportation convenience	4.39	Very important
Price Discount	4.26	Very important
Free air conditioners	4.25	Very important
Location of the project	4.23	Very important
Free Furniture	4.21	Very important
Free stay trial	4.16	Very important
Communication facility	4.14	Very important
Variety of house types availability at the sales office	4.13	Very important
Free of transfer charge	4.10	Very important
Vouchers/ reward coupons	4.10	Very important
Information availability at the sales office	4.04	Very important
Front yard/ garden provided	3.97	Important
Presence at booth and house fairs	3.94	Important
House fairs by government and private sector	3.90	Important

Source: Chysacorn, 2006

Note: (Ranging from 5=Very important, 4= very important, 3= important, 2= less important, 1= not important), n=400

1.2 Research Objectives

The main purpose of this study is to identify the key attributes influencing the buying decision for detached houses in Bangkok and its vicinity. Then, the brand premium will be identified, using the Hedonic Price Model in order to compare brand values among major players in developing housing projects.

1.3 Benefits of Research

In spite of the downturn in the economic situation, the Thai property was still on hold. With the substantial support the government has given this business sector, it continues to make a significant contribution to national consumption levels. However, the competition among housing businesses is relatively intense in Bangkok and its vicinity. It would be beneficial for project developers to understand the factors influencing consumers' willingness to pay. Both intrinsic factors, which are physical characteristics of the products or so-called tangible aspects, and extrinsic factors, which refer to brand images or the intangible aspects, should be considered by firms in valuing the consumer's willingness to pay in buying houses. The tangible aspects are the product's attributes which can be simply quantified, on the other hand, the difficulties lie in selecting the method to value the intangible aspect or brand images which is significantly helpful for a firm to understand its competitive advantage vis-à-vis other competitors. Moreover, this resource is also valuable for new entrants, who would like to understand the current business and properly employ its strategies, especially in terms of pricing to compete in the industry.

1.4 Scope of Study

In this paper, the Hedonic Price Model will be used to identify the brand premium of the Thai property, relating to only detached housing projects in Bangkok. The derived housing information is taken from the same period among housing developers. The newly built houses with the projects' completion ranged from 2007 to 2011 would be covered.

The researcher employs the price premium approach of the Hedonic Model, which is identified from the outcome of the market on brand attributes, in valuing brand premiums for major housing projects.

1.5 Limitation

The major limitation of this research is that the house price lists are collected from 9 selected housing developers and limited to only houses in Bangkok area which may not represent the entire housing sector of Thailand. However, those developers are well known brands which are listed on the Stock Exchange of Thailand and occupy the main market share of the industry. Moreover, Bangkok area represents the largest portion or 76.71% of the land allotment permitted nationwide. To a greater extend, this research can include more brand dummy variables in order to cover more ranges of house prices and generate further meaningful results.

CHAPTER II

LITERATURE REVIEW

2.1 Meaning of Brand

Brand has been proven to be an important key in representing the image of a company and in helping firms to differentiate themselves from other competitors. Haigh (2010) mentioned that brand can promote the company's competitive advantage which depends on how much it can satisfy not only the physical requirement of the consumers, but also fulfill their intangible needs. Brand is "a- substantial source of value creation" as it can encourage the consumers to understand not only, what firm's product is for but also how it means to them.

Previous research papers have attempted to define the concept of brands differently, but somehow, similarly admitted the positive contributions of brand. One of the most comprehensive meanings of brand equity by Aaker (1991) is "a set of brand assets and liabilities linked to a brand, its name and symbol that adds to or detracts from the value provided by a product or service to a firm and / or to the firm's customers". Murphy (1990) stated that "it is not only an actual product, but it is also the unique property of a specific owner and has been developed over time so as to embrace a set of values and attributes – both tangible and intangible – which is meaningfully and appropriately differentiates products which are otherwise very similar". Haigh (2010) also stated in his paper the three concepts of 'brand'. First, brand is defined as "logos and associated visual elements", including trade names, trade marks and trade symbol which provide the context of legal protection and licensing. The other two definitions are broader in meanings. One refers to 'brand' as "a larger bundle of trademark and associated intellectual property rights" which is extended to a wider definition of several "marketing intangibles such as domain names, product design rights, trade dress, packing, copyrights in associated colors, smells, sounds, descriptors, logotypes, advertising visuals and written copy". The last definition is provided in much broader terms as a "holistic company or organizational

brand” which incorporates the entire organization of the specific logo and associated visual elements. It is “a combination of all legal rights together with the culture, people and programmes of an organization that provide a basis of differentiation and value creation and represent a specific value proposition and bring up the basis for strong customer relationships.”

Many previous studies also show the existence of a positive relationship between brand equity and the firms’ performance (Park and Srinivasan, 1994). Kim et al. (2003) presented the examination of a positive correlation between consumer-based brand equity and the financial performance of luxury hotels. Their findings confirmed that brand equity was strongly represented by brand loyalty, brand awareness, perceived quality and brand image which showed a positive effect on the hotel’s financial performance. With respect to all the proven significances of brands in monetary value, more researchers are interested in identifying the means of the brand valuation; consequently, more academic studies in the mentioned field are becoming increasingly available in recent decades.

2.2 Approaches to Brand Valuation

Two interesting questions in Haigh (2010)’s article regarding brand valuation are what is actually valued and what is the purpose of valuation. Haigh suggested a branded business which has a more holistic associated elements value of an organization to be valued, while the two purposes in valuation are technical valuations used to conduct “balance sheet reporting, tax planning, litigation, licensing, mergers and acquisitions and investor relations purposes” and the commercial valuation which aims for “brand architecture, portfolio management, market strategy, budget allocation and brand scorecards” purposes.

There are quite a large number of studies exhibiting the methods of brand valuation. If they are grouped, the two most referenced methods in valuing brands are the financial or accounting-based approach and the marketing or consumer-based approach.

For the marketing approach, Aaker (1991) concentrated on customer behavior and suggested the five basic components of brand equity, namely brand awareness, brand associations, perceived quality, brand loyalty and other proprietary

assets used to give weight on average to identify the brand-earning multiplier. Kamakura and Russell (1993) involved the consumers' perception to introduce the three key components of brand equity, which include the perceived value, the brand dominance and the intangible value in addition. The marketing approach was criticized for its disadvantage of lacking the substantial references to the accounting or financial basis of the brand equity.

Representing a financial approach, Simon and Sullivan (1993) employed a financial-market-value-based method to evaluate the brand equity of a firm. They used the stock price to evaluate the brand equity value which is identified from the incremental cash flow of the branded products to the non-branded products. Simon and Sullivan suggested that the financial approach did not ignore the marketing attributes since the stock price also incorporated the marketing decision.

A certain number of research papers attempted to introduce new models in quantifying the brand equity. Motameni and Shahrokhi (1998) presented both the marketing and financial approach and integrated them to identify their interrelationships. They believed the Global Brand Equity (GBE) Model could effectively evaluate the brand equity and show the sources of equity. The GBE is derived from the net earnings and multiples of product brand, based on brand strength, which is identified by the positioning, the operating market, the competition and the past performance of the brand. Srinivasan, Park, and Chang (2005) proposed another survey-based approach, which is to measure, analyze and predict the equity of brand for a product market. In their approach, they utilized three sources of brand equity which are brand awareness, attribute perception biases, and non-attribute preference. Then, they identify how much each source could contribute to the brand equity. The special contribution of paper was the "what-if analysis capabilities" which was used to predict the possible impacts of the alternative strategies to enhance a brand's equity. The approach contributed to assisting brand managers to evaluate the impact of the additional alternatives on the brand's equity. The model was applied to Korea's digital cellular phone market and the findings showed the largest contributor to brand equity was the brand awareness component, second was the non-attribute preferences and the last contribution was from enhanced attribute perceptions.

2.3 Hedonic Price Model

The Hedonic Price Model was widely accepted and used in many research papers to identify the key attributes affecting the consumers' willingness to pay (WTP). According to Rosen (1947), product's value can be evaluated from its attributes and characteristics. The Hedonic price implies the premium value of each attribute towards particular goods.

According to Dunse and Jones (1998)'s research, the Hedonic Price Model is a well-recognized statistical tool and has been commonly used in analyzing prices in the housing market for more than 30 years. Dunse and Jones suggested that Hedonic technique can be applied to identify or quantify the significant determinants of value for a variety of product values, along with their associated characteristics.

The Hedonic Price Model has been widely applied to analyze a number of products throughout all industries. It has been used to analyze the significant determinants of office rental in major cities of the United Kingdom (Dunse and Jones, 1998). The secondary data was collected from 477 samples of asking rents along with a number of identified attributes of the office rents, included the physical accommodation, location and tenure rights. Physical accommodation features referred to the capacity of the office floor area, the physical structures such as the age of the building and car parking spaces, its internal accessibility by the availability and quality of building elevators, and its internal services, including air conditioning, heating, computer and phone cables, etc. The location attribute referred to the proximity of the central business district (CBD) which provides the business environment of services, labor, and information technology. The result showed the high significance of the building age and location in CBD on the office rents. Tenants were willing to pay the premium to occupy the office building in city centre locations.

Hedonic Model is also used in quantifying the monetary value of the environmental asset. In Morancho (2003)'s paper, Hedonic technique was applied to identify the relationship between the dwelling price in Castellon, Spain and urban green areas endowments, using the 3 environmental variables which are the existence or view of a park or public garden, distance between the dwelling and the nearest green area, and the size of that green space, along with the fundamental attributes of housing price, such as house size, age and number of rooms. From 810 dwelling sales

price data sets, the result shows that distance from the green area is the only significant feature among the other environmental factors with an inverse relationship to the house price. The paper indicated a price drop of 300,000 pesetas for every 100 meters further from the green area.

One of the remarkable products that successfully utilized the Hedonic model was to measure the price over its attributes was the Spanish red wine (Angulo et al., 2000). The researcher referred to the wine book *Guia de vinos Gourmmet 1998* for the retail prices of more than 1,000 wine variables and for the information on their production origins, grape varieties, the year vintage and expert quality rating as the major attributes of the paper. The result revealed that the origin or the wine growing area was the most significant factor affecting wine price. The grape vintage year was also another determinant of wine price, as the higher production cost was associated to the longer maturation process, while the variety of grape did not affect the wine price.

Referring to Lee et al. (2002), the Hedonic technique was used to value the premium of internet information. The study attempted to measure the consumer's willingness to pay for features of the internet connection charge. The data was gathered from the questionnaires distributed to 160 students from two universities in Seoul. The result showed that the internet connection charges vary according to the amount of information searching and e-shopping. The average price elasticity of 0.046% and 0.024% for the usage of information searching and shopping online could be estimated on the Internet connection service charge. The researchers also suggested the increasing tendency of the Internet information value as the Internet usage was surging and that the Internet information providers could charge for the information service instead of providing it for free, if they were able to segment the consumers by their willingness to pay for different information required.

Recently, the Hedonic Model was also applied to analyze mobile phone prices in the German market (Dewenter et al., 2006). The secondary data was gathered on 302 mobile prices from 25 manufacturers, along with the identified features of the mobile phones. The results indicated the significance of a number of ringtones, talk time battery life and additional features such as MMS, MP3 or Bluetooth which positively affected the higher price of a mobile phone. Moreover, a

number of brand names, such as LG, Nokia, Motorola and Samsung were positively creating premiums for mobile phones in Germany.

CHAPTER III

METHODOLOGY

In general, the Hedonic Model comprises the dependant variable, willingness to pay (WTP) as a function of multiple attributes or characteristics of the products (x_1, x_2, \dots, x_n) as independent variables, which then form the model shown below, where i represents a particular product:

$$P_i = f(x_{1i}, x_{2i}, \dots, x_{ni}) \quad (1)$$

To extend a more meaningful model, a specific variable, which may represent the time, quality, or other significant dummies, might be added to the Hedonic function, as another dependant variable. From one example, Thanasuta et al. (2009) applied the additional variable in the Hedonic Model, using dummies of different brands and countries of origin to study the brand premiums of the automobile industry in Thailand.

This paper uses the list prices of newly built detached houses in Bangkok and its vicinity (P) offered by the major developers. Key attributes (x_1, x_2, \dots, x_n) such as locations, availability of the nearby transportation facilities, house size, house type and its key differences, number and types of rooms, number of units of the same type availability, management fees, other offered premiums, furniture, electronic appliances, wall paper, and decorations are listed. In addition, dummy variables which represent different brands of the housing developers (z_1, z_2, \dots, z_m) are added to the model. Since one brand may contain several different housing projects, which also contain several house types, contributing to different prices in it. Thus the model would look more complex, as follows:

$$P_i = f(x_{1i}, x_{2i}, \dots, x_{ni}, z_{1i}, z_{2i}, \dots, z_{mi}) \quad (2)$$

The data of newly built detached houses list prices are mainly gathered during the 22nd Housing & Condo Festival on February 18-21, 2010 at Queen Sirikit National Convention Center. More data of attributes were also collected from the developers' website and via the researcher's visit to the developers' sales office. Samples of 306 from major developers were evaluated to identify the brand premiums.

On gathering the price data and attributes of the detached houses for all selected brands, Table 3.1 demonstrates the prices, brands, and the explanations of the major attributes of detached houses.

Table 3.1 Variables of brands and features, explanations, and descriptive statistics of detached houses

Variable	Mean	Std Dev	Explanation
SENA	0.14	0.35	Sena Brand = 1, others =0
PRINSIRI	0.06	0.24	Prinsiri Brand = 1, others =0
AP	0.07	0.26	AP Brand = 1, others =0
LH	0.33	0.47	LH Brand = 1, others =0
NOBLE	0.06	0.23	Noble Brand = 1, others =0
PROPERTY	0.11	0.31	Property Brand = 1, others =0
QH	0.06	0.24	QH Brand = 1, others =0
SANSIRI	0.07	0.25	Sansiri Brand = 1, others =0
SUPALAI	0.11	0.31	Supalai Brand = 1, others =0
PRICE	6,656,426	4,896,366	House price in THB
METRO	0.05	0.22	BKK Metro zone = 1, others =0
NORTH	0.52	0.50	BKK North zone = 1, others =0
EAST	0.27	0.45	BKK East zone = 1, others =0
WEST	0.10	0.30	BKK West zone = 1, others =0
UTIL_AREA	186.88	60.54	Size of the utilizing area in square meters
CARPARK	2.02	0.31	Number of car parks available
BEDROOM	3.19	0.42	Number of bedrooms
RESTROOM	2.92	0.69	Number of restrooms
TRANSPORT	0.90	0.53	Availability to express way/ BTS/ MRT = 1, none = 0
ACCESSIBILITY	5.18	3.04	Number of hypermarkets and schools nearby

Note: The zone criteria are referred as, 'Home Buyer' magazine. The selection criteria of important attributes are based on the research into the factors that influence house purchasing decisions in Bangkok, (Chysacorn, 2006)

From the secondary data of 9 house developers' brands, the most available or 33% of the data is from Land and House. Only 6% each of data could be gathered

from Prinsiri, Noble, and Q-House brands, while 7% each represents the data from Asian Property and Sansiri brands. Eleven percent each of data is from Property Perfect and Supalai brands, while the other 14% are collected from Sena Development brand. The different portions of data gathering are due to the availability of information for the newly-built houses with criteria limited to within the last 3 years.

The average house price among the selected brands in Bangkok area is around THB 6.66 million. It is interesting that the lowest house price of the secondary data is offered by Sena Development with THB 1.8 million price for a 138 square meter house, which is located in Rangsit Klong 11 area while the highest house price of THB 41.5 million is offered by Q-House for 500 square meter house located in Rachapreuk-Sathon area.

The secondary data also shows that most of the data or 52% of houses are located in northern Bangkok which represents the area from the north-western zone to the north-eastern zone of Bangkok. As expected, only 5% of the houses are built in the metro zone of Bangkok. Detached houses are found rather in the suburban area due to the larger space required for construction and the high property prices in the Bangkok metro area where a series of condominiums are preferably built for mass accommodation in the rather limited space required.

The data shows the average size of utilized area is 186.88 square meters while, on average, the house offers only 2 car park spaces, 3 bedrooms and restrooms. Most of the detached houses, or around 90%, are built within an area with accessibility to the express way, BTS sky train (Bangkok Mass Transit System) or MRT (Mass Rapid Transit) and, also surrounded by a number of hypermarkets and schools, which is a primary requirement for house developers in marketing their projects.

CHAPTER IV

RESULTS AND ANALYSIS

Table 4.1 shows the results from the Hedonic Models of detached house projects in Bangkok area, while table 4.2 demonstrates the brand valuations on price ranked in order of valuation.

Table 4.1 Results from the Hedonic Models of detached houses

Variable	PriceR	Log(PriceR)
PRINSIRI	2,493,577.00 (4.35)**	0.40 (5.91)**
SENA	1,670,523.00 (4.55)**	0.08 (1.65)
AP	2,519,061.00 (4.18)**	0.51 (8.56)**
LH	2,532,532.00 (7.35)**	0.41 (10.50)**
NOBLE	156,501.20 (0.20)	0.27 (3.70)**
PROPERTY	1,950,781.00 (5.18)**	0.27 (5.77)**
QH	5,141,233.00 (4.33)**	0.45 (5.06)**
SANSIRI	3,451,116.00 (7.66)**	0.49 (12.07)**
METRO	2,680,618.00 (2.07)**	0.11 (1.12)
NORTH	1,320,955.00 (2.50)**	0.12 (2.55)**
EAST	1,596,414.00 (2.91)**	0.12 (2.62)**
WEST	1,737,203.00 (2.62)**	0.12 (2.03)**
UTIL_AREA	46,334.15 (8.51)**	0.01 (10.39)**
CARPARK	870,360.70 (1.02)	0.02 (0.39)
BEDROOM	1,535,468.00 (3.48)**	0.08 (2.18)**
RESTROOM	1,069,699.00 (3.51)**	0.16 (6.01)**
TRANSPORT	430,333.30 (2.23)**	0.13 (5.64)**
ACCESSIBILITY	-29,228.77 (-0.70)	0.00 (-0.94)
N	306	306
Adjusted R ²	0.86	0.87
Durbin-Watson	1.33	1.21
F-Statistic	109.06	117.76

Note: Reference choice is the Supalai brand. Numbers in parentheses are white heteroskedasticity-consistent t-statistics. ** P-value < 0.05 and * P-value < 0.10.

The result confirms that brands are one of the most important factors that determine the house's price. Most of the brands, include Prinsiri, Sena, Asian Property, Land & House, Property Perfect, Q-House, and Sansiri and Supalai, were

undoubtedly significant, as expected for they were well known brands in the property market. Only one famous brand, Noble, was insignificant. One possible reason is that its price is not extremely high compared to other premium brands in the same locations. The constant value of a negative THB 15.59 million refers to the reference brand, which is Supalai. Consequently, Supalai is ranked as the lowest brand among others. The top four brand premiums are Q-House, Sansiri, Land & House and Asian Property respectively which are relatively more competitive than other brands and have premium values of THB 2.5 to 5.1 million over the reference brand, Supalai. Noble, which has an insignificant result, still contains a price premium of THB 156,501 over Supalai, while the medium ranked brands, Prinsiri, Property Perfect and Sena have premium values from THB 1.67 to 2.49 million over Supalai. Table 9 lists the brand values in order, from the lowest to the highest rank.

The results also show the significant effects of several features on house prices, which are the location, the utilizing area size and the accessibility to the transportation facilities, such as express way, BTS and MRT. The locations are defined as Bangkok metro, north, east and west zones according to the original eight zones defined in House Buyer Magazine. Metro zone has the highest premium of THB 2.68 million above the Supalai brand, while other zones also significantly contain premium values. The utilizing area size has a positive premium of THB 46,334 per square meters, while the house with express way, BTS or MRT surrounding also offers a premium of THB 430,333 of value added. The numbers of schools or hypermarkets near the project were negative and insignificant, as most of the housing projects usually have accessibility to those places, which is a fundamental criterion for the developers in advertising the projects.

Table 4.2 Brand valuation on price premiums of detached houses

Brand	Brand Value in THB million (Absolute)	Brand Value in THB million (Relative)
SUPALAI	-15,585,247	0.00
NOBLE	-15,428,746	156,501
SENA	-13,914,724	1,670,523
PROPERTY	-13,634,466	1,950,781
PRINSIRI	-13,091,670	2,493,577
AP	-13,066,186	2,519,061
LH	-13,052,715	2,532,532
SANSIRI	-12,134,131	3,451,116
QH	-10,444,014	5,141,233

CHAPTER V

CONCLUSION

The research has shown that brand is considered one of the most significant factors for consumers in buying a house; as a result, brand premiums are incorporated in determining the price of houses for project developers. The quality of houses is attached to the brand and the developers' reputations themselves. A well known brand such as Q-House is definitely reliable in customer perception than a no-name brand and therefore has an impact on the customers' willingness to pay.

The Hedonic Model can be well applied to obtain the brand premium of detached houses. Table 5.1 summarizes the significant result of brands, and the attributes, which are the major determination of consumers' willingness to pay. Most well-known brands, i.e. Q-House, Sansiri, Land & House, Asian Property, Prinsiri, Property Perfect and Sena results are statistically higher and more significant, while a well-known brand like Noble is not significant.

Table 5.1 Summary of results from the hedonic models of detached houses

Detached Houses	
Significant Brands	Q-House
	Sansiri
	Land & House
	Asian Property
	Prinsiri
	Property Perfect
	Sena Development
Insignificant Brands	Noble
	Supalai
Attributes	Locations (in particular Metro, North, West and East zones)
	Size of utilizing area
	Number of car parks, bedrooms and restrooms
	Surrounded by hypermarkets and schools
	Transportation facilities

Q-House, Sansiri, Land & House have positioned themselves as high-end brands, and therefore, set their prices rather higher than other brands for projects in the same areas. Land & House continues to maintain its build-before-sale strategy which is beneficial for a high price set up. Asian Property and Prinsiri set their price ranges a little lower from the high-end rates. Surprisingly, Noble which is perceived to be one of the high-end brands has set the price quite low for the larger sized houses, therefore, this has resulted in an insignificant premium compared to a low-end brand like Sena. Property Perfect, as a medium-end brand, mostly puts its projects in the outer Bangkok areas with a wide range of prices from lower to quite high prices and enjoys a significant brand premium.

It can be concluded that brand, other than some important attributes offerings, is considered one of the competitive advantages for the house development business. Consequently, brand can also be considered an entry barrier for new competitors. It is necessary for the existing well known brands to maintain their position in order to compete in the market. It is such a great challenge for new entrants to the business to overcome in this intensively competitive detached house business, which is an important industry in the Thai economy and continually receives support from government. This research can also be beneficial to new housing businesses in setting their pricing strategy. It provides the comparable price ranges, for high, medium or low-end brands, which the new coming developers can use it in referring to their prices according to their entry level.

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