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This journal serves as a platform for the exchange of information and ideas on property issues. It seeks to:

- address areas of major interest and practical relevance to the real estate profession
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- discuss policy issues and regulations and their implications on the property market

We therefore welcome articles with theoretical and practical relevance to the real estate industry and profession, property valuation, property management, property investment and property market

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REFEREE PANEL

Family Decision-Making In Purchasing A Home: A Case Study In Kota Bharu, Kelantan

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Abstract

Households or families play an important role in residential real estate industry. To a great extent, their preferences and needs have a significant impact on both the demand and supply of this product. Hence an understanding of the behaviour and process of decision-making in families is significant in achieving the success of marketing real estate product. This paper seeks to examine the roles played by different family members and their influence at different stages of the decision-making process in purchasing a home. The paper concluded that the roles played by family members can be correlated to stages of family decision making.

Keywords: Decision-making process, family, preferences, behaviour.

Introduction

A family is defined as "a group of two or more persons related by blood, marriage or adoption, and residing together as a household" (Lawson *et al.* 1996). Consumer behaviour of the family is crucial to the marketers in real estate industry because it is considered as the decision-making and consumption unit to their products. Since the family decision-making plays an important role, the interaction between family members is likely to be more significant than those smaller groups, such as friends or colleagues (Solomon, 1999).

Several studies in family decision-making have examined the extent of influences exerted by family members and their influences at each stage of the decision-making process (see for examples Beatty and Talpade, 1994; Na *et al*, 1998; Lee and Marshall, 1998; Samsinar *et al*, 2004). A study by Davis and Rigaux (1974) suggested three (3) stages of family decision-making process; while Woodside and Motes (1979) argued that there are nine (9) stages in the process of decision-making of a family. Nevertheless, it has been argued that relatively little study has been carried out on family decision making in real estate decision. Deborah and Lee (2002) suggested a 5-stages model comprising problem recognition, product specification, information search, alternative evaluation and final choice in providing a platform of understanding of family decision making in the context of buying a home.

The question is whether the family decision-making in practice follows the conceptual structure of family decision-making outlined in the theory. What is the real decision-making process undergoing by families when they want to purchase a house? What are the key roles played by each family member? Who is the initiator? Who is the influencer, information gatherer, gatekeeper, decision maker or who is actually the purchaser?

This paper presents a study conducted via a questionnaire survey amongst the households in a densely populated area of Kota Bharu, Kelantan. The survey intends to examine the key role that influences the decision-making at different stages. For this purpose, the model developed by Deborah and Lee (2002) is adopted as the analytical framework for this study. This five (5) stages model is considered as appropriate as it covers all the important decision-making stages. Using too many stages is perceived to be cumbersome and may stifle the interview.

Kota Bharu is chosen as a case study area in an attempt to provide an insight into the real family decision making process in purchasing a home. Yin (1994) argued that the case study provides vicarious experience, in the form of 'full and thorough knowledge of the particular'. Case study is a particular method of qualitative research (Stake, 1995). Rather than using large samples and following a rigid protocol to examine a limited number of variables, case study methods involve an in-depth, longitudinal examination of a single instance or event: a case. They provide a systematic way of looking at events, collecting data, analysing information, and reporting the results. As a result the researcher may gain a sharpened understanding of why the instance happened as it did, and what might become important to look at more extensively in future research. Stake (1995) also commented that case study facilitates 'naturalistic generalisation', and thereby builds up the body of tacit knowledge on the basis of which people act. He stated that what is required in adopting a case study approach is not that they provide generalisations but rather describe the case study in a way that captures its unique features. Stake (1995) further concluded that a case study is a bounded system that exists independently of inquiry.

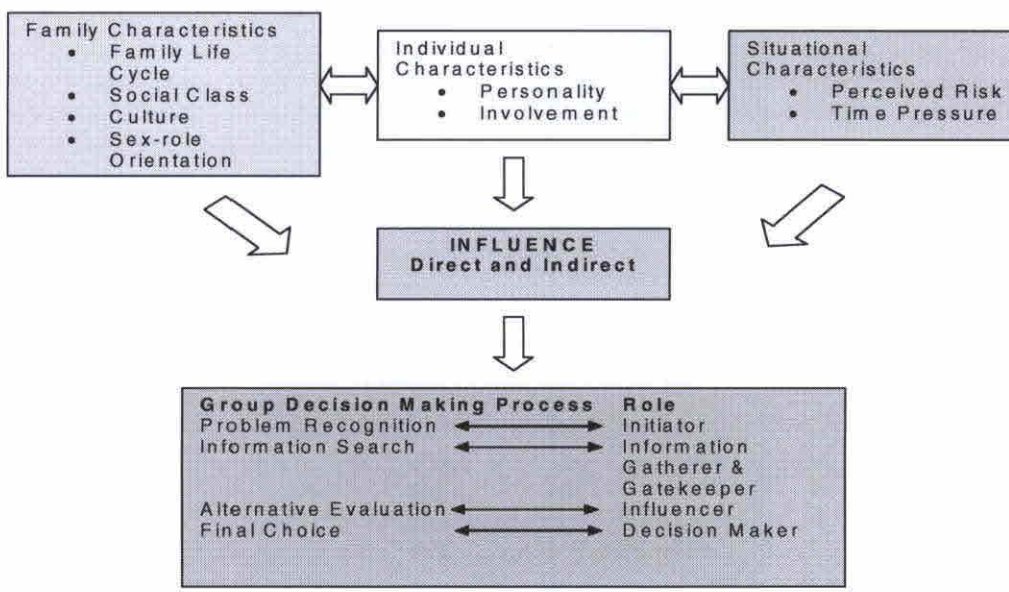
Hence, a case study had been carried out in this study in order to visualise the whole process of family decision making in purchasing as well as preparing to purchase house. Kota Bharu, the state capital of

Kelantan, which means 'new city' or 'new castle/fort' in Malay, is chosen as a case study for this purpose. Suffice it to claim that Kota Bharu provides several points of interest. It comprises the highest population in Kelantan of about 280,000 people which represent about 20 percent of the whole population of Kelantan (Department of Statistics, 2000). Majority of citizens in Kota Bharu are Malays, followed by Chinese, Indians, Siamese and other races. It is also a rapid growing town being the focal point for Kelantan's administration and business activities. Kelantan itself appealed as an interesting case study based on two key reasons. First, the fact that in general, the state is perceived as synonymous with "female-bread winner state" due to high percentage of women involved in business entrepreneurship compared to male. Second, Kelantan is the only state in Malaysia governed by an opposition political party, Parti Islam Semalaysia (PAS), and yet enjoys a very good relationship with the Federal Government. It is claimed that political environment and difference between the State and Federal Government is never a problem for investment. All policies concerning investment in Malaysia are determined by the Federal Government and the state government serves to facilitate and accommodate investors.

A framework of family decision-making in buying a home

There are indeed many factors that affect the family decision-making in buying a home. Deborah and Lee (2002) suggested three key factors which include family characteristics, individual characteristics as well as situational characteristics. These characteristics are related between each other and they either influence directly or indirectly to the decision-making process (see Figure 1 below). Nevertheless, the family characteristics play the most significant role among these characteristics. The family characteristics include family life cycle, social class and culture as well as sex-role orientation. These characteristics influence directly or indirectly on the group decision-making process.

Figure 1: Framework of Family Decision-making



Source: Deborah and Lee, 2002: 322.

In sum, this model comprises five (5) stages of family decision-making process further describe as follows:

a. problem recognition
b. product specification
c. information search
d. evaluation of alternatives, and
e. final choice

a. Problem Recognition

The problem recognition stage is when a member or members of a family recognised that there is a problem that warrants solution. For example, in the context of a house purchase, a couple expecting their third child's birth and may realise that they need more space since their current home has only two bedrooms. The wife could be the one who highlights the problem, as women generally is more sensitive toward the needs of her family in term of space requirement.

b. Product Specification

At this stage, property characteristics and descriptive of property characteristics or choice criteria is determined. Family members will for instance, identified the premier factor of their new home such as the location, what type of property as well as design of the property.

c. Information Search

This is the stage where the family begin to search for a house. In this case, one member of the household plays a greater role in searching for relevant information pertaining the house to be purchased. There could be several reasons for this. For example, the head of family may be more interested in real estate compared to others; hence he will be the person who seeks to find out details of available property in the market rather than the children or his partner.

d. Alternative Evaluation

At this stage, interested members of the family will jointly evaluate their views in order to make a final decision. For example, a couple may together assessed the different properties they have inspected. Each of them will have their own views and preferences. Thus, at this stage a form of conflict may stir up and be resolved through negotiation.

e. Final Choice

This is the last stage of the decision-making process when the family makes the final choice. At this stage the couple makes an offer to purchase the house they have both agreed on. Either the husband or wife could be a major influence at this stage.

Although a number of researchers assumed that the decision-making process occurs in a linear, step-by-step process, others (see for example, Gersick, 1988; Lee and Marshall, 1998) contested this assumption. Hence, the process can also be either non-linear, or proceed in iterative cycles.

In relation to this 5-stage of decision-making process, Assael (1987) suggested that the stages in the decision-making process are usually linked to the decision-making roles as illustrated by Table 1.

Table 1: Family Decision-making Roles and Stages

Roles	Tasks Carried Out in Stages of Decision-making Process
Initiator	Recognises the problem or need for an item
Influencer	Apply personal influence on other family members regarding a particular purchase situation
Information Gatherer	Assemble the information related to a possible purchase
Decision Maker	Has the authority to make the buying decision
Purchaser	Complete the purchase process

(Source: Adapted from Deborah and Lee, 2002)

Other writers have argued that role specialisation occurs in many family purchase decisions (Woodside and Motes, 1979; Pervan and Lee, 1998). For instance, husbands usually tend to specialise in instrumental roles, which means that he has the most influence in decisions which are related to the functional or economic aspects of the decision, for example: maintenance, finance, location and structure. Wives, on the other hand, tend to resume on expressive roles, which relate to the aesthetic and emotional needs of the family. Thus wives would have the most influence over decisions relating to colour and design, or flow of the house, or the needs of the children. Woodside and Motes (1979) agreed that there is a grey area of roles played by husbands and wives due to the changes in the roles and occupations of men and women in today's society.

To purchase or not to purchase?

The decision on whether to purchase or not to purchase also largely depend on the choice of housing available in the market. In contemporary rational choice theory, Elster (1986) commented that the choice situation is defined by three key elements. First, it refers to a set of all feasible courses of action. Second is the judgement about what courses of action will lead to what outcomes (relationship between means and ends) and finally the ranking of the feasible alternatives, where rational choice means the choice of highest-ranked element relative to the preference. Therefore, in choice situation individuals make a rational choice in the sense that they select the course of action that most probably leads them to meet the highest preference.

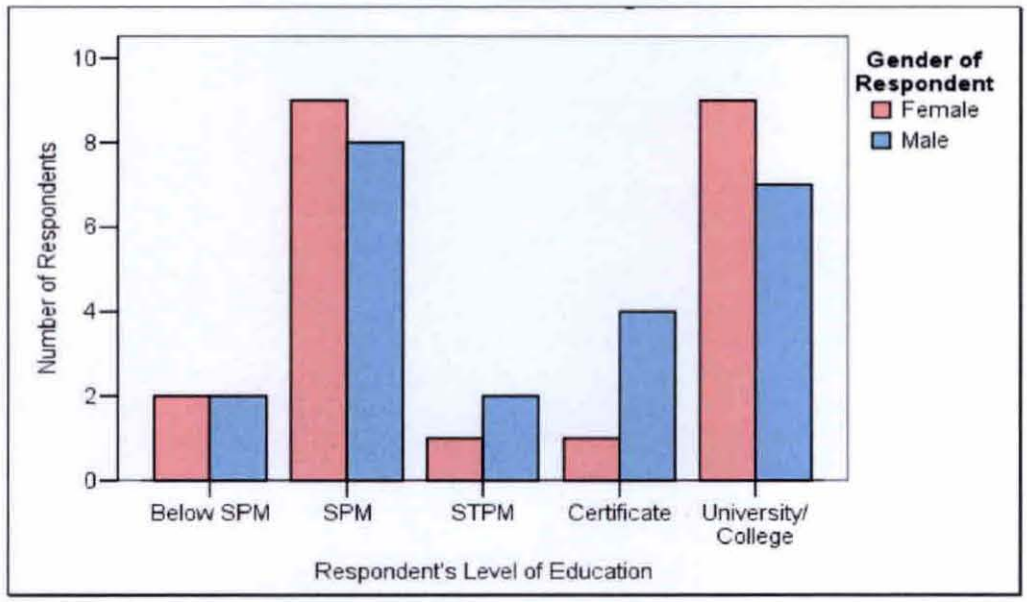
In economic research, Clark (1987) asserted that housing choice is most frequently viewed as a result of a rational decision making process, where individual evaluates perceived costs and benefits of one location versus another, and the cost of moving versus not moving. The decision to choose a particular house and to move is made when the benefits are regard to prevail over costs.

Against the above background, the next section of this paper will examine what is the real decision-making process experienced by families in purchasing a home. The key aim is to determine what are the key roles played by each member of the family in line with the family decision-making model discussed in the earlier section of this paper.

The case study

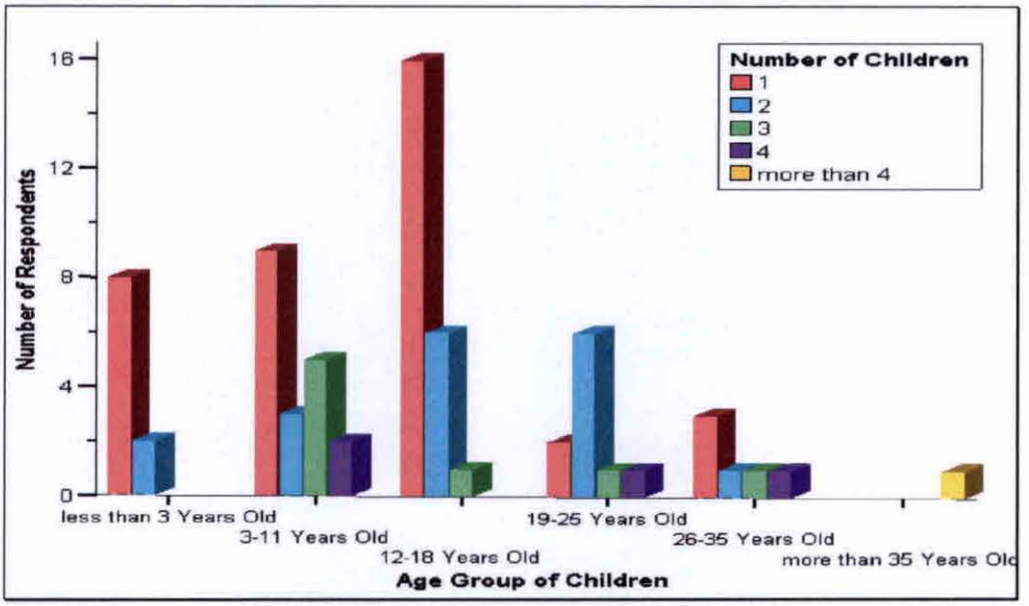
A total 45 face-to-face interviews was conducted in December 2005 using a structured questionnaire to examine the family decision making in purchasing a home. The outcome of the survey of these respondents selected at random shows an equal percentage of male and female. Gender is considered important in this study, as it is one of the factors that attribute to the process of family decision-making. Level of education and income of respondents are also considered as these two factors reflect the respondents' social class whether they are in the lower, middle or upper class. The findings show that the majority of the respondents are educated (see Figure 2) and earned less than RM5,000 per month.

Figure 2: Level of education of respondents



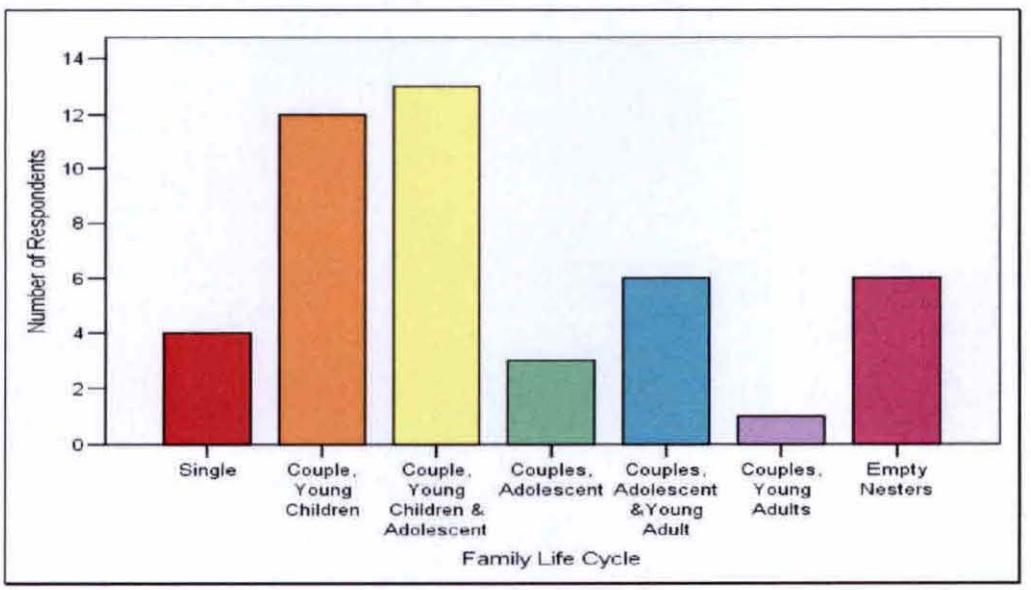
The respondents' family background is significant especially to group them in which family life cycle they belong to. Hence, prior to determining the stage of family life cycle, the group of children has to be first categorised. Figure 3 demonstrates the number of children in the respondents' families. The children are classified into four (4) groups, i.e., young children, adolescent, young adults and adults. Young children refer to children aged less than 11 years old; while those who were 12 to 18 years old are termed as adolescent. Children who aged from 19 to 25 are labelled as young adults whilst those in the age group above 26 are considered as adults. The groupings are important because it will influence the family life cycle which is considered as one of the key issues in this study.

Figure 3: Number of Children according to Age Group



After clustering the children into relevant group, family life cycle is then ascertained. Family life cycles comprise seven (7) stages as illustrated by Figure 4. The cycle is also one of the important variables as it may influence decision-making in purchasing a home. In this study, the phase of single (unmarried) is included as the decision-making of buyers who are single. In addition, the other factor that was considered is the empty nester which refers to couples with children aged above 25 years old.

Figure 4: Family Life Cycles



Discussion of the result

The findings indicate that at the problem recognition stage which is the first stage of family decision making in purchasing home, majority of the buyers initiated residential mobility when they sense that larger space is required to accommodate the increasing number of family members (see Table 2). The second key factor that triggers the respondents to move is the desire to move up the social ladder. Changes in individual's social status which indicates better affordability coupled with the aspiration to own a property rather than continuing to rent has to some extent illustrated these two factors are the second most important characteristic of decision-making by family in purchasing a home.

At this infancy stage, the type of roles played by the family members is perceived as another important element in family decision-making. Figure 5 presents the data on this issue. It illustrates that husbands frequently initiates the family decision–making to purchase a home rather than wives. In Kota Bharu which is famous for a notion that "women are the breadwinner of the family rather than men" this is indeed astounding. To a lesser extent, this demonstrates a clear distinction between feminine and masculine type roles where husbands dominated the problem recognition process as expressed by Green and Cunningham (1979).

Table 2: Reasons for Buying House

Reasons for Buying House	Responses of Buyers	
	N	Percent
Tired of Renting	10	17.5%
Larger Space	17	29.8%
Marriage	2	3.5%
Improvement in Social Status	10	17.5%
Investment	9	15.8%
Safety	3	5.3%
Others	6	10.5%
Total	**57**	**100.0%**

The second stage of decision-making process is product specification which is done by stakeholder or user. The finding shows that the roles of stakeholders in Kota Bharu are played by husbands and wives, and to a lesser extent, their children as well (see Figure 6). Together, they listed out the requirements such as location, purchase price and other criteria. Amongst the key factors specified is location near shopping centres, working place and mosque, depending on which stage of family life cycle they are in. Other than that, the purchase price must be in the range of their affordability level. Furthermore, the types of home they preferred are generally the one that is able to accommodate relevant space for each need.

Figure 5: The Initiator

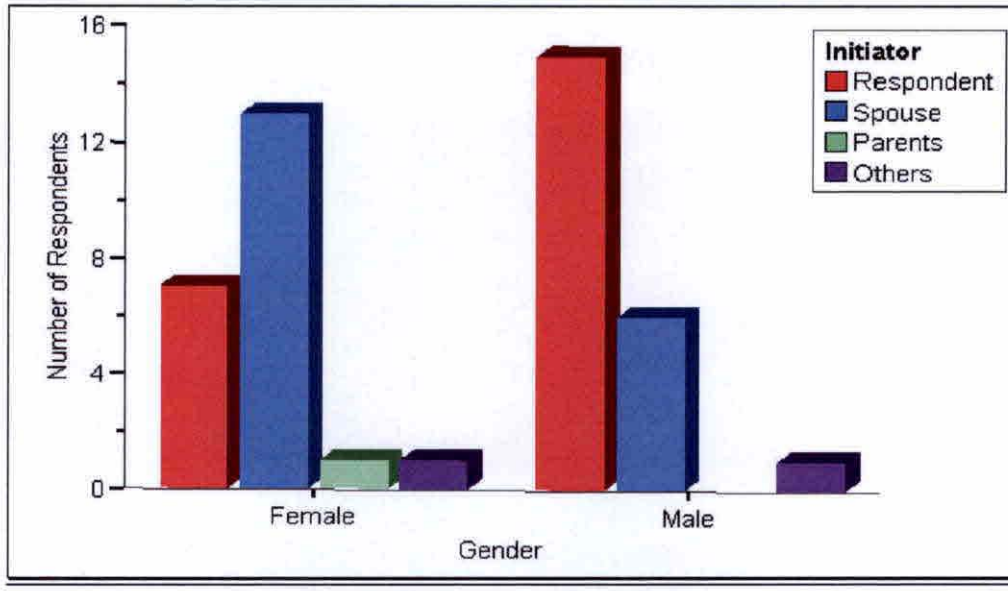
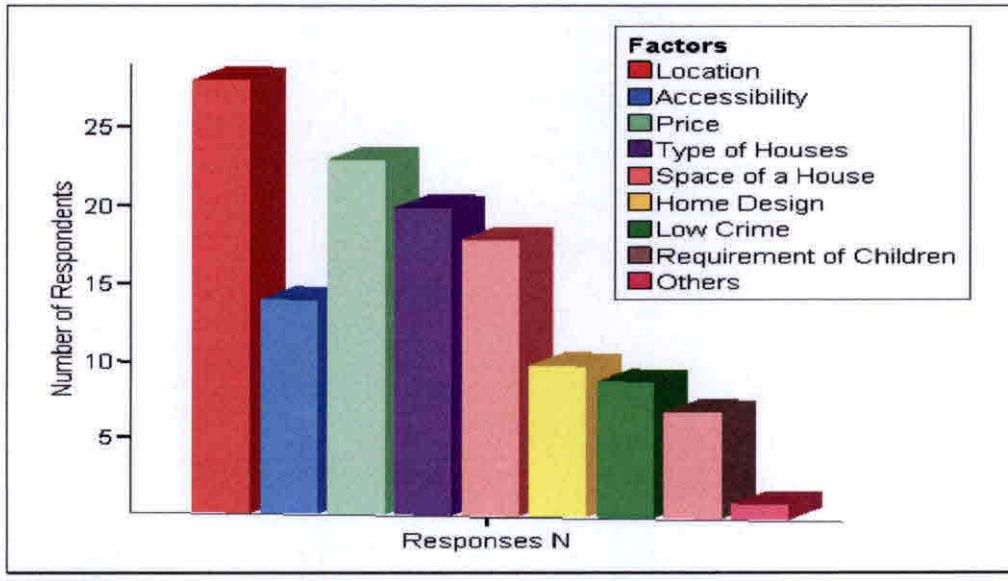
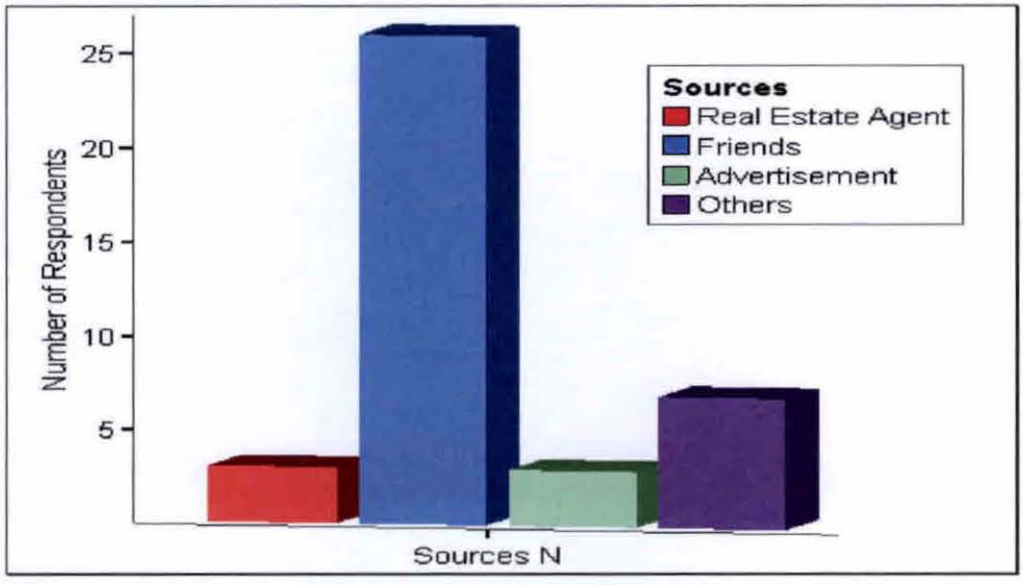


Figure 6: Factors Considered by Buyers



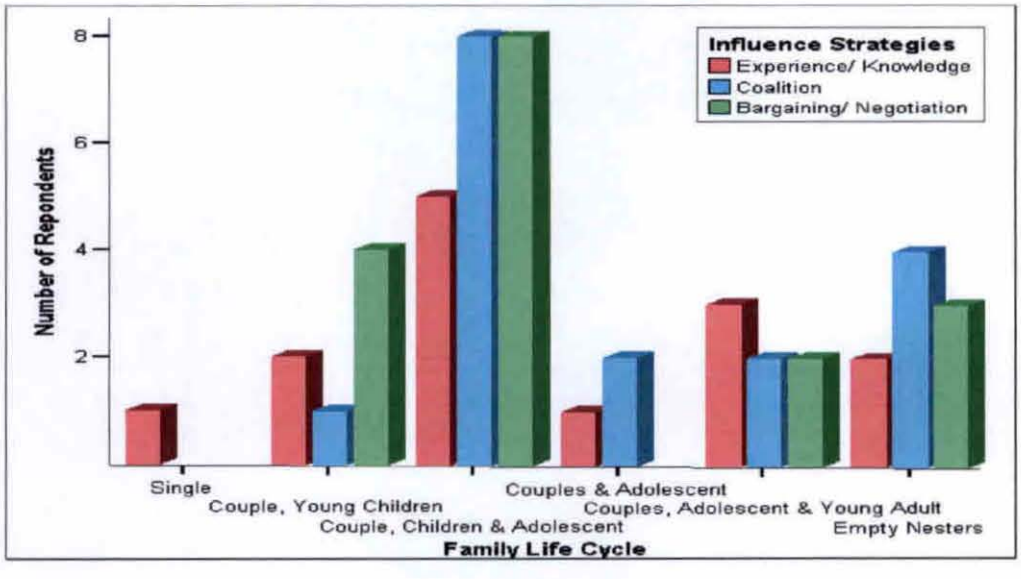
Eventually, once the family has settled on the main attributes of their search, information is gathered. The person that collects information to purchase is termed as information gatherer. The result in Figure 7 shows that a clear majority of respondents obtained information based on recommendation of friends rather than by professional real estate agents. Perhaps the close knit of communities in Kota Bharu explained this puzzle.

Figure 7: Sources of Information Sought by Buyers



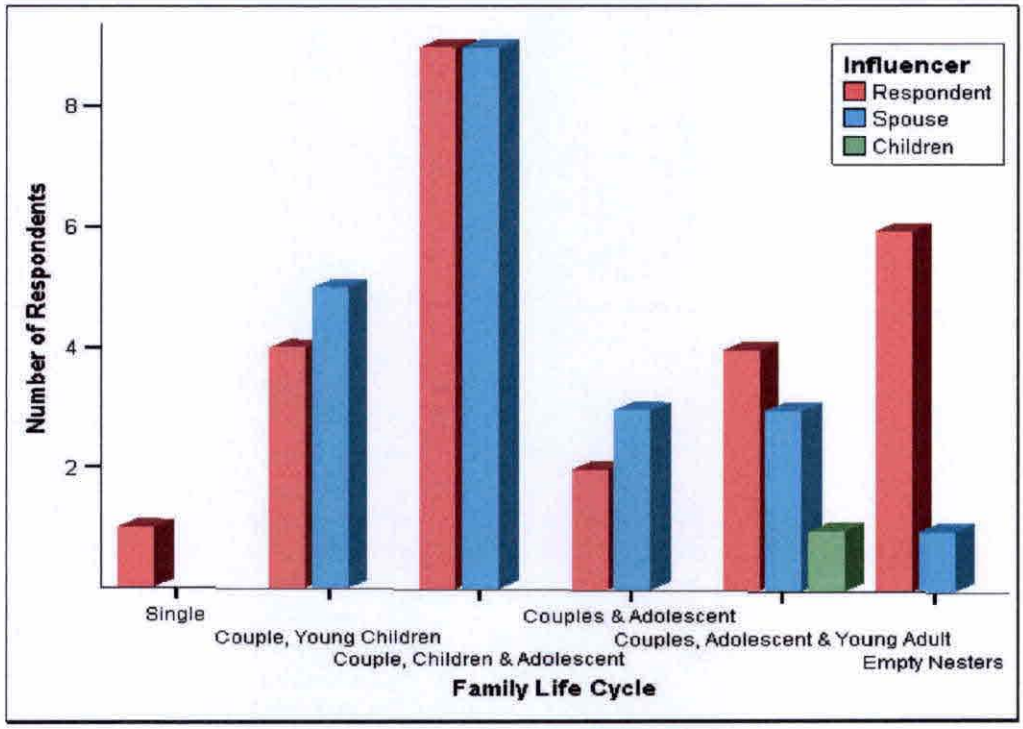
The following stage is alternative evaluation which involves inspection of alternatives properties before final decision is made to purchase a home. Our findings show that in general the influence of male members is dominant. To a lesser extent, wives and children do get involved at this stage. Various approaches of influence strategies are practiced to determine the house to purchase (see Figure 8). For instance, in the life cycle of couples with young children, the strategy being widely used is bargaining or negotiation. The couples negotiated to make a decision to purchase. They used coalition and negotiation strategies so that the other family members agreed to move.

Figure 8: Influence Strategies Used by Influencer According to Family Life Cycle



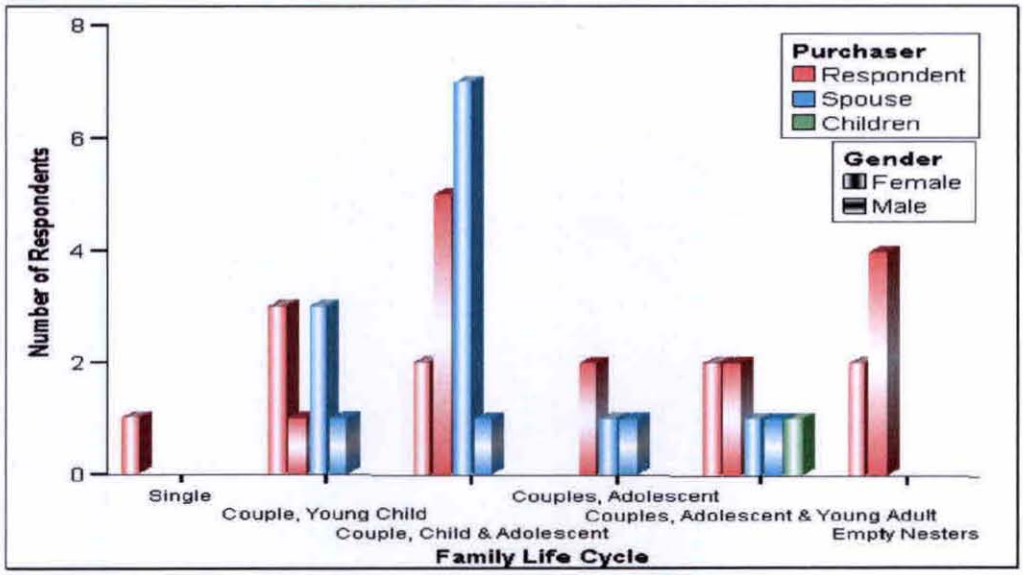
For the second, third and fourth stage of family life cycle, the influencing roles appears to be almost balance between husbands and wives, whereby the strategies are sharing experiences and coalition (see Figure 9). However, couples with adolescent did not apply negotiation techniques in influencing others. Instead, at this life cycle where young adults were involved, they tend to influence their parents in purchasing a home. In contrast, during the last stage of life cycle where the children left home, the role of husbands as influencer is evident.

Figure 9: Influencer According to Family Life Cycle



The last stage of the 5-stage family decision-making model is the final choice that involves negotiation of price, contract and the purchase of the property. The person involve in decision-making to purchase a home is termed as decision-maker while in negotiating, signing Sales and Purchase Agreement is known as purchaser. The findings illustrated that male respondents dominate (see Figure 10) this last stage of family decision making in purchasing a home.

Figure 10: Decision Makers According to Family Life Cycle



Conclusion

Decision-making in purchasing a home by families is indeed very complex. There are a variety of needs that may influence preferences for housing characteristics and individual decisions for purchasing a home. Yet not all decision-making are triggered by housing motives and with the aim of improving the housing situation or promotion in housing career. The findings of the empirical analysis indicate how the family decision-making practiced by respondents in Kota Bharu corresponds to the model postulated by Deborah and Lee (2002). To a certain degree, this model is important for any family making decisions to purchase a home. It implies that family pass through all the five (5) stages in every decision-making process to purchase a home. The buying process starts with problem recognition. At this stage, the family recognised a problem or need. This then forces them to decide the product specification which suggests that location and affordability criteria as the most influential determinants at this stage. Since purchasing a home is a high-involvement purchase, the decision to purchase is unlikely to be made there and then. Thus, the process of information search begins. Indeed, information can be obtained from several sources but this research suggests that the families in Kota Bharu, Kelantan value and respect personal sources more that commercial sources (the influence of 'word of mouth'). This raises a challenge to real estate agent in Kelantan in general. The fact that their expertise and professionalism in property industry were not acknowledged as the most influential sources pose a challenge. In the evaluation stage, the family must chose between the alternatives houses available. At the last stage where decision to purchase is made, it suggests that indeed, all the family members is involves in defining the specific product to purchase but the outcomes illustrates that it is the head of family who made the final decision to proceed with the necessary actions to successfully negotiate the purchase. Figure 11 summarised the outcome of this study.

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Strategies To Prevent Mid-Stream Abandonment Of Housing Projects In Malaysia

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Abstract

Housing delivery systems around the globe may be categorised into two types: "Build then Sell" (BTS) and "Sell then Build" (STB). BTS is implemented in developed countries such as the United Kingdom and Australia where housing demand and supply are quite adequate. On the other hand, STB is normally implemented in developing countries like Malaysia. Now, as the country is facing the challenges of globalisation, there is a renewed call to change the system from STB to BTS. The purpose of this paper is to study the possibility of implementing BTS concept in Malaysia. Postal questionnaire has been used as a means of primary data collection. A group of 20 developers and 100 persons have been randomly selected for questionnaires distribution. The findings indicated that BTS concept could be implemented in Malaysia. However thorough study needs to be carried out by the relevant bodies in order to ensure the success and promotion of BTS. Perhaps this paper could help the government agencies and developers to overcome hurdles faced in implementing such concept.

Keywords: Housing delivery system, BTS, STB, abandoned projects, housing problems.

INTRODUCTION

Housing delivery system can be categorised into two types; **"Sell then Build" (STB) and "Build then Sell" (BTS)**. BTS has been implemented in developed countries such as the United Kingdom and Australia where housing demand and supply is quite adequate. Meanwhile, STB is normally been implemented in developing countries such as Malaysia and China as a result of high rates of population growth (Yang, 2001). Now, these countries are facing the challenges of globalisation and a comeback from the economic crisis partly contributed by an inflated property market, there is a renewed call to change the system from STB to BTS.

In Malaysia, the conventional approach to housing provision is the STB system. The housing development industry is principally regulated by the Housing Developer Act (Control & Licensing) 1966 (Act 118). In order to obtain a license to carry out any development, a developer has to comply with all requirements under the Act as well as other related statutory requirements. Having obtained the license, the developer is permitted not only to commence construction but also to initiate sales and enter into Sale and Purchase (S&P) Agreements with the house buyers. S&P agreements would allow the developer to collect progress payments in accordance with a progress certification made by a certified architect or a quantity surveyor, appointed by the developer. In short, the purchase price is collected progressively prior to the completion of the project. This is clearly permitted in the Housing Developer Act (Control & Licensing) 1966 (Act 118).

However, the present arrangement has its shortcomings. There is a possibility that the developer will fail to complete the project due to financial and management problems, incompetent contractors, unsuitability of sites and location, delays in getting plans approved and ultimately a "softening" of the property market. A study conducted by Newell and MacFarlane (1993) found that property investors consistently underestimate the risk associated with property investments. As a result, the investors may not be achieving an adequate anticipated return from their investment in the development to compensate for the relatively high level of risk.

BTS CONCEPT

BTS is not a new concept in the construction industry worldwide. According to National Housing Department, Ministry of Housing and Local Government, unlike the sell then build concept, housing developers can only sell the fully constructed houses together with the issuance of Certificate of Fitness for Occupancy (CFO). There is no progress payment made by house buyers to the developers under this concept. The developers have to bear all costs by using their own capital or loans from financial institutions or both. In short, BTS is totally a reversal of the current housing development practice of STB. The BTS concept can be explained as follows:

i) A developer cannot sell his product until completion (with the Certificate of Practical Completion or Certificate of Fitness for Occupancy (CFO) issued); and
ii) A developer can sell his product before or during construction but he can only collect a small deposit from the house buyer. The developer is not allowed to collect progress payments based on certifications from architect, as under the STB concept.

The first interpretation is similar with the definition given by the Ministry of Housing and Local Government (MHLG). The latter, however, is more likely to what is being practiced in Australia whereby a developer can collect certain amount of the selling price (10%) from potential house buyers once the

Sales and Purchase Agreement (S&P) is signed. The 10% amount is held by a stakeholder. The balance of the selling price is paid at the end of the construction period with the issuance of CF. In other words, there will be no progress payment made by the house buyers, as currently been practiced in Malaysia construction industry. Under STB concept, a developer will begin launching their units after the approval of Building Plans and Development Order by relevant local authority. In these circumstances, the developer is hoping to sell as many houses as possible and collect the progress payments made by the house buyers. The developer then initiates construction works including construction of the unsold units. This may help them to ease from the unnecessary financial burden since part of the project costs would have already been paid by buyers through end finance.

Over the past 40 years, it is proven that STB concept had been successful in fulfilling or meeting the housing demands in Malaysia. The only problem is that some of the projects lack the quality of the end product i.e. the completed house. The other weakness of the STB concept is that the house buyers are at risks where the project could be abandoned at any time due to a possible financial problem faced by the developers. The introduction of Housing Developers Account and standard Sale and Purchase Agreement by the government has been slow in tackling this problem of abandoned housing projects.

However it cannot be totally solved since a projects are abandoned for a host of other 'non-financial' reasons, such as problems with squatters, disputes between developers and architects, management problems, developers disappearance, problems with Public Works Department, etc. (Sothi, 1992). Malaysia is a country that has a Housing Developers Act, standard Sale & Purchase Agreements and Housing Development Regulations. In some countries like China there are no standard S&P agreements and trust accounts available therefore, it is difficult to buy a house and have it delivered properly as compare to Malaysia.

HISTORY OF BTS IN MALAYSIA

As one of the developing countries, Malaysia faced an insufficient supply of housing units aside from other problems such as difficulty in getting CFO and the land titles approval, late delivery and abandoned projects which have affected most house buyers (Sen 1985). The issue of BTS was raised again by the then Minister of Housing and Local Government at the end of January 1999. The **2002 statistics from the Ministry of Housing and Local Government shows the number of abandoned housing projects nationwide was 544, involving 125,649 units of houses worth over RM9.4 billion and affecting 80,070 buyers**.

Historically, the Federation of Malaysia Consumers Associations (FOMCA) first called for such a concept as early as 1980 after the problems of abandon projects faced by house buyers become more serious. Later, in the mid-80's, when the number of abandoned projects increased substantially, the BTS concept resurfaced. Newspaper reports indicated that in 1986, the Real Estate Housing Developers Association (REHDA) itself, through an executive official, suggested BTS concept as a solution to the problem of abandoned projects. In the late 1980's, the MHLG identified the Housing Development Account as a solution to the problem of abandoned projects and is undeterred in their persistency in their call for the implementation of the BTS concept.

Under the enforcement of Housing Development Account as in Section 7A, Housing Developers Act (Control and Licensing) 1966 (Act 118), states that every developer is required to have an account for every development either in banks or financial institutions. All incomes and expenses with regard to the development are required to be

paid into or through this account. This regulation was introduced on 26 August 1991. After almost a decade, it can be seen clearly that the Housing Development Account itself cannot resolve the problem of abandoned projects because it is not applicable to Sabah and Sarawak i.e. the west coast states of Malaysia. In addition, up to 70% of the projects are abandoned for a host of other 'non-financial' reasons, such as problems with squatters, disputes between developers and architects, management problems, developers "disappeared" and problems with Public Works Department (Sothi, 1992).

BTS VS STB
ADVANTAGES OF BTS

These are the advantages of BTS concept:

Ready Product with Certificate of Fitness for Occupancy (CFO)

Under the BTS concept, buyers are able to see and inspect the house that they are buying, just like buying a car. It is generally believed that the readymade unit can help the house-buyer to make the right decision asides from the paramount consideration of the unit pricing.

One of main problems faced by the STB house-buyers is that the vacant house is handed over without a CFO. Without the CFO, the house-buyers could not occupy the unit. There are several cases whereby the house-buyers did not get the CFO, even ten (10) years after the hand-over date. By implementing the BTS concept, all the problems could be solved.

Minimising House-buyer's Risks and Extra Expenses

When house-buyers buy off the plan, they have to shoulder many risks, whether or not the house will be completed on time, the possibility of the project being abandoned, delayed or varied from its original plan. Meanwhile, they may have to incur rental or other expenses while waiting to move into the new house. Thus, substantial savings in interest payment and no rental payments are necessary. Razzi (1995) considered that buying an un-built house was an act of faith because of the possible major and/or excessive buildings defects. Buyers often need to spent substantial time and effort to negotiate with developers to rectify problems. Blumenthal (1994) reported that although warranties are generally provided on the new residential properties, the coverage is limited.

House Quality and Availability

Under BTS concept, a potential house-buyer can see and inspect the units physically before deciding whether to buy or not. In this circumstance, the developer will have to do a better job, i.e. good design, good quality of workmanship, faster completion and high quality of finishes. As for the house-buyers, they can benefit through the quality of the units whereby the developers can gain through the shorter duration of the project which shortens the holding cost and can save on the development cost. By implementing a BTS concept, the house-buyers can move in straight away to their new house. Obviously, the house-buyers will be too happy to buy a completed house as they can pick and choose and then move in right away instead of having to wait for two to three years for the house to be completed and take vacant possession.

A sell than build property buyer is exposed to certain risks such as higher building defect risk. Building defects have always been a concern for a newly developed residential property taken over by a forward house-buyer. They may range from minor problems such as missing window screen to serious water leakage problem caused by poor workmanship (Razzi, 1995).

Reducing the Possibility of Abandoned Project

The advent of BTS concept will reduce the incidence of abandoned projects. Although it may not totally eliminate the problem, nevertheless, in the event that such incidences do occur, the house-buyers or end-financiers will not be caught. There would also be fewer obstacles in reviving abandoned projects as the question of obtaining concurrence from house-buyers to waive their claims for liquidated damages for late delivery will no longer arise. The other advantages of BTS concept are: no requirement for a Housing Development Account, less administrative works and maximisation of developer's profit.

DISADVANTAGES OF STB

There are several disadvantages of STB Concept. They are:

Abandoned Housing Project

Principally, the main reason why the Ministry of Housing and Local Government introduced BTS concept is to overcome the abandoned projects problem. There is financial risk incurred by buyers who make progress payment when something goes wrong with the project, for instance, the project is abandoned. The buyers then have to repay the loan sums plus the interest to the bank or loan provider, although without ever getting delivery of the house due to the abandonment of the project. Failure to complete the project does not only happened to private developers, but also happened to the cooperatives, statutory bodies and state development corporations. Statistic shows that only 30% of abandoned projects are caused by financial problems (Gurmeet, 1999). The majority of others are caused by non-financial factors such as incompetent contractors, unsuitability of sites and locations, inadequate market survey and/or feasibility study and delays in getting plan approval. All these problems are faced by the developers. Unfortunately, it is the buyer who has to bear with the problems caused by the abandoned project.

Late Delivery of Houses

Previous studies e.g. Sothi, 1992, have shown that 80% of developers failed to complete their projects and deliver the house to the buyer within the specified time of 24 months as required by The Housing Developers Act (Control & Licensing) 1966 (Act 118). This is due to the lack of expertise. The other reasons are factors such as uncertain climates/ weather, shortage of building materials and/ or labor and delayed in certain works. The lost will then be transferred to the house-buyers. It is true that The Housing Developers Act (Control & Licensing) 1966 (Act 118) protects house-buyers' by requiring developers to deliver the house within 24 months from the date of Sales and Purchase Agreement is signed. Furthermore, the regulations also provide a measure of compensation for late delivery as laid down under Item 20, Schedule G (S&P Agreement) of the Act 118, "the vendor shall pay immediately to the house-buyer liquidated damages to be calculated from day to day at the rate of 10% per annum of the purchase price." However, it is common that erring developers do not comply with the regulations. In addition, most of the house-buyers do not know of their rights. The BTS concept is introduced with the intention to solving the problem.

Failures/postponement in the issuance of Certificate of Fitness for Occupancy (CFO)

The Housing Developers Act 1966 stipulates that a house is deemed to be delivered on the issue of Certificate of Fitness for Occupancy (CFO) and once the water and electricity supply has been connected (item 21, Schedule of the 118 Act). Nevertheless, the Ministry did not link the house delivery with the issuance of a CFO. Without a CFO, house-buyers cannot move into the new completed house since it is considered as an illegal house.

This will therefore cost them extra expenses for renting a house.

Local Authority Act 1976 (Act 171) stipulated that owner/buyer of any house which has not been issued with CFO will lose their right to occupy or to do any alteration to the building due to safety reasons. Only buildings that have been certified as fit and safe to be occupied by human will be given a CFO by a local authority. In issuing a CFO, the local authority will carry out inspection on the building to ensure that it is safe to be occupied and comply with current local construction law. The introduction of BTS concept will mean that house-buyers will be spared from this dilemma (Kasi, 1992). This is due to the fact that under the BTS concept, the buyers will be handed over the completed unit together with the CFO issued by respective local authority. This problem have been faced by buyers in Taman Desa Tebrau, Johor Bahru, whereby the house has been delivered to them in April 1999, but the CFO was only issued in September 1999 (five (5) months later).

Housing features mismatch

In a purchase of an uncompleted project, house-buyers do not have the chance to view or inspect the real or completed house while purchasing them. What they can see is a show house or what they can imagine through architect's drawings and model houses. There are some aspects such as traffic flow, the eventual environment of the housing scheme and the gradient of the road which they probably will fail to understand through a drawing or model house. Indeed, this is the crucial aspect that should help them in making their decisions. However, through BTS concept, the buyers or potential buyers can have real view and experience of the house and its surrounding since it has been completed before sale or earlier.

PROJECT FUNDING

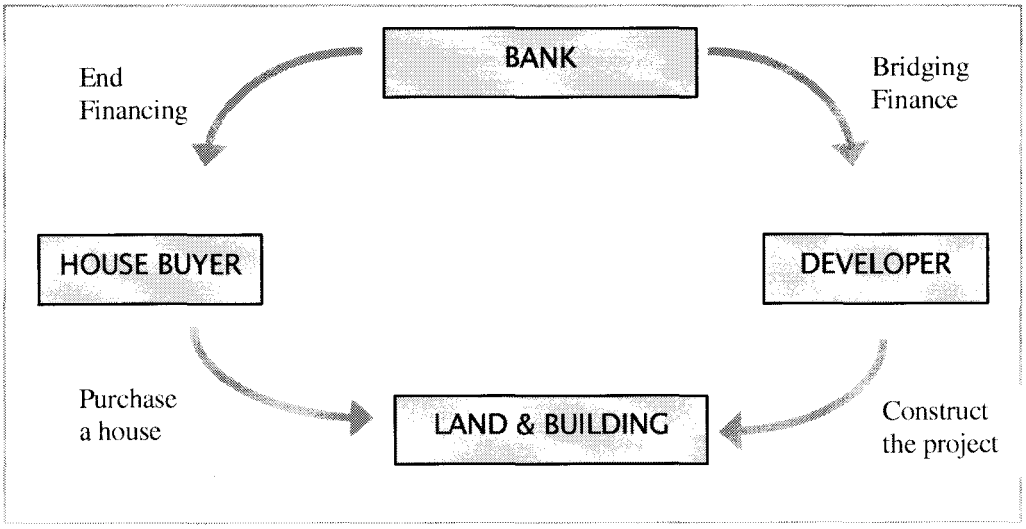
Under the STB approach, there are several sources that a developer can raise his working capital for development projects. According to The Association of Banks in Malaysia (1992), the developer can raise their fund through:

i. Its own capital fund
ii. Financing from banks, financial institutions or building societies such as Malaysian Building Societies Berhad (MBSB) and Borneo Housing Mortgage Finance Berhad (SHMFB) through bridging finance
iii. Credits from suppliers (contractors or material suppliers)
iv. Progress payments from house buyers and end-financiers.

Payment from house buyers or end-financiers is the main and the biggest source of funding for a housing development project. According to MHLG, a developer can sometimes raise up to sixty five percent (65%) of the total development cost from the house buyers or end-financiers. The balance (35%) could be raised either from the developer's own capital or through bridging finance from financial institutions. As a result, the developer can save its development cost from the interest payment to banks or financial institutions. Unfortunately, under the BTS concept, the developer can only raise the fund through the first three sources but not progress payments from the house buyers. In this circumstance, the developer has to either "back-up" its development cost through his own capital fund or increase the margin of bridging finance from financial institutions. In other words, bridging finance from the banks or financial institutions could be increased to about 80% to 90% of the total development cost, depending on the developer's working capital.

This, however, will increase the risk borne by the developer. This is the main reason why REHDA is against the idea of BTS, because it will increase the developer's burden on interest. In other words, interest payable to banks or financial institution is relatively higher compare to STB approach. A relationship among bank-developer-house buyer in financing a housing development scheme is shown in Diagram 2.1.

Diagram 2.1: Relationship between Bank-Developer-House buyers in financing Housing Development Scheme



Source: Raymond, 1981

Bridging Finance

Raymond (1981) defined bridging finance as a manner that a corporation can use revolving credit loans to make progress payments on new construction. After the construction is completed, the corporation sells common stock of long-term bonds and uses the proceeds to pay off the revolving credit loans. There are two advantages of bridging finance. First, the corporation borrows only as much money as required. Second, the financing is not obtained until needed. This financing strategy thus allows the corporation to avoid rising too much or too little in the way of long-term funds. Other definition of bridging finance refers to short-term financing, usually to cover a gap in time between someone's expenditure and funds for a house and that person's later receipt of funds, often from the sale of his or her house (Michael *et al.* 1984).

Bridging finance is utilised to supplement the upfront funding of the project, for example, land cost, preliminary expenses such as conversion fees, consultancy fees and costs of construction. Disbursements are normally calculated based on the value of work done supported by relevant architect's or quantity surveyor's certificate. The margin of advance on the certificate of claim depends on the agreement stated on the Sale and Purchase Agreement signed by the developer and the house buyer. The amount of finance required

varies depending on the developer's financial strength but generally bridging finance represents thirty to thirty five percents (30% - 35%) of the total project cost.

The formula of interest rate payment for Bridging Finance is:

$$\frac{1}{3} A \times \frac{1}{2} B \times C$$

Where, A = Total Development Cost
B = Development Period
C = Banks Interest Rate

Repayment period is normally timed to expire on the proposed completion date of the project. During the interim period, the developer is expected to service the monthly interest payment. Principle payment can be in the form of bullet payment or gradual redemption of titles (normally from end-financing as and the houses are sold).

End Financing

End Financing refers to the funding provided (or payment made) by the house buyers and their bankers to the developer. Upon signing the S&P, the house buyer would pay a sum of 10% of the purchase price as down payment and usually, finances balance of the purchase price through loans from financial institutions. The loan amount approved together with the difference between the loan amount and the balance of purchase price will be paid progressively to the developer in accordance with various stages of construction work. Hence, once the moment the sale is secured, the construction of the house is self-financing. The end financiers are placed with the burden to disburse the approved loan progressively. They are duty-bound to ensure the loans disbursed are for work performed by the developer and they are usually supported in the form of Architect's Certification.

RESEARCH METHODOLOGY

QUESTIONNAIRE DESIGN

The questions was structured and piloted with a small group, to ensure participants would be clear about the response needed. This included a small number of open ended questions to elicit a broad range of views. The length of questionnaire was also limited so that it would not take too much time to complete. Respondents were advised that comments would remain confidential and would be averaged so that no individual response could be identified. There will be two sets of questions which have been asked to two different groups of respondent, namely housing developers and house-buyers or potential house-buyers. Questions on set A will be asked to a group of twenty developers while set B questions will be asked to a group 100 house-buyers which have been randomly selected.

RESEARCH SURVEY ANALYSIS

1. Response from the developers

Respondent's background

For the purpose of this research, 20 developers were randomly selected comprising six small scale companies; nine medium scale companies and five big scale companies. All of them records of being fully aware of the build then sell concept. However, only 40% of the respondents mentioned that they would prefer the BTS concept while the other 60% claimed that they would prefer the STB concept. Amongst them, only two who had actually experienced the build then sell projects.

Willingness to adopt BTS Concept

25% of the respondents claimed that they would be willing to adopt the build then sell concept, 45 % were not willing whilst the other 30% were not sure whether or not they would implement such a concept in their projects. This showed that, the developers were still

worried about the success of this concept. Furthermore, only 25% of the respondents claimed that the percentage of their readiness to implement such concept was more than 50%. The rest claimed that they were less than 50% ready to implement it.

Possibility of implementing BTS Concept

25% of the respondents pointed out that it would be impossible to implement the build then sell concept in Malaysia in the near future whilst 35% claimed that it would be possible to implement the concept with support from the government and market. Five respondents (25%) claimed that the main obstacle in implementing build then sell concept was the financial capability. Most of developers in Malaysia are small scale and medium scale company. Therefore, they can't afford to bare the construction or project cost using their own money. By implementing build then sell concept, it would mean that they have to bare 100% of the project cost without the help of financial institutions. Under current practice, about half of the project cost is financed by commercial banks with the rest paid by buyers through progress payment. 15% stated that the concept would be possible if implemented on small or medium scale projects.

Government supports

40% of the respondents indicated that the concept would be more attractive if the government offered tax relief as this would help to reduce their financial burden. Another 25% claimed that fast approval would help to make the concept succeed while 20% pointed out that less bureaucracy in the development approval would also help. At the same time, most of them agreed that they would also need support from financial institutions in order to make the concept possible to be implemented.

2. Response from the house buyers
Respondent's background

76 percent of the respondents were those who had bought a house whilst 24 percent had yet to buy a house. When being asked about their awareness of build then sell concept, all of them claimed that they were aware about the concept. However, 4 of them confessed that they did not really know what the concept was all about.

Respondent's Preference

100 percent of the respondents claimed that they would prefer the build then sell concept since it would help to reduce buyer's risks. In addition, it would also reduce the risk of the project being abandoned. Some of them commented that house buyers were the parties who had to bare the financial cost once the project was abandoned. This would totally burden the house buyers whereby a dream to own a house suddenly changed to a nightmare.

The house buyers were also asked about the problems with current delivery system of sell then build. 43 percent of them claimed that the main problem with current practice was abandoned project. Another 40 percent highlighted the late delivery problem, 10 percent said that the project faced a high risk of being in-completed while the another 7 percent claimed that poor quality of houses was one of the problems caused by the current system. Some of the respondent did comment that the main reason why BTS concept is failed to be implemented in Malaysia was because of the developers' attitude. The developers were not willing to bare the burden of financing the project using their own money. As a result, it is the buyers who had to faced or take the burden. They added that the government should give some incentive to the developers who are willing to adopt the BTS concept. At the same time, cooperation or support from the financial institution would be crucial in order to make the concept possible to be implemented.

SURVEY DISCUSSION

The survey revealed that the build than sell concept was possible to be implemented in

Malaysia. All parties agreed that it was the best solution to overcome housing problems caused by the current system. However, a thorough study needed to be carried out in order to find the best way that could be implemented. The advantages offered by the BTS concept include: a ready product, better quality houses, overcome problem of abandoned projects and protecting the buyers' interests. On the other hand, this concept was not being implemented by the majority of housing developers in Malaysia because of their lack of capital and financial capability due to their small scale. As a small company, they are not financially strong enough to undertake such concept. In order to make it possible to be implemented in Malaysia, the writers would like to make some recommendations as follow:

a) Developers could form a joint venture company to undertake BTS project.
b) Developers could form a consortium or syndication amongst small scale developers, so that small developers can be weeded out.
c) Developers could initiate the concept on a small/medium scale project.
d) Developers could use this on low/ medium cost houses.
e) The government could give tax incentive to the developers who practiced BTS concept.
f) Developers could collect some amount of money (i.e. 10 – 15%) which would be kept by third party/when the Sales and Purchase Agreement was signed as a booking fee.
g) The government could give incentive to the financial institutions who support the implementation of such concept.

CONCLUSION

Private sector developers have played a dominant role in assisting the government to provide sufficient dwellings to the social community under the conventional STB method. This research has tested the viability of the BTS concept. The BTS concept was determined to eliminate the differences in opinion between the buyer and producer about the quality and price paid for the product as the buyer would be able to see, feel and touch what they were paying for.

From the research, it can be concluded that the new concept sounds possible to be implemented in Malaysia. However, the concept of BTS applied in the UK cannot be fully imitated in Malaysia due to different market condition in both countries. It is totally impossible to move from STB to BTS concept within a short time period because of the existing housing development in Malaysia. If the BTS was to be enforced, the general consensus is that a lot of smaller and poorly managed developers would fail which would prevent the government providing sufficient housing for the social benefit. In order to avoid this, two procedures need to be addressed. Firstly, "Minimal Deposit System" which is implemented in Australia should be used.

Under this system, developers are allowed to collect certain amount (10% to 15%) of selling price from purchasers as a commitment to the development project. The advanced payment can also be considered as an initial deposit on new houses. This system not only reduces the developers' risks by assuring the feasibility and viability of the project, but also helps them obtain a small amount of finance from the purchasers. In addition, the commitment will also help developers in getting loans more easily from the financial institutions.

Secondly, the government should encourage developers to practice BTS concept with some assistance and incentives. Since the Housing and Developers Act (Control & Licensing) 1966 has clearly stated that BTS-practiced developers could enjoy the exception from

having any Housing Development Account and the developers are more flexible in using their own capital, the government could also assist the developers with other benefits. The government could assist developers in obtaining the financial assistance with the support from National Bank of Malaysia (BNM). In addition, the government could use money from the Abandoned Housing Projects Fund to help developers in raising their working capital instead of funding the projects that have been abandoned.

Furthermore, the government could ensure that CFO was issued at an earlier stage. For example, the developers would be allowed to sell their units after 80% of the total construction works had been completed, in order to reduce the holding cost bear by the developers while waiting for the house buyers to purchase the units. As the house buyers, they can enjoy the advantages by having extra two years to accumulate capital and could probably settle the balance of their deposit by selling their existing property before moving into new ones. The government should undertake a thorough study to examine, scrutinise and analyse the concept's abilities and limitations, after giving good thoughts and consideration to the present and future housing development scenarios

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Stability Of Dividends And FFOs: The Case Of REITs In Malaysia

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Abstract

Historically, the dividends of real estate investment trusts (REITs) contribute significantly towards the total return of REITs. This paper examined whether dividend returns of REITs/LPTs in Malaysia are affected by economic conditions and whether the level of dividends declared could be sustained in a weak economy.

The research shows that the dividends declared by listed property trusts (LPTs) are found to be not stable as it is affected by the level of funds from operations (FFOs) attained by LPTs. FFOs are in turned affected by its sources of income. LPTs with investments of unstable market values e.g. shares which have declined in values is found to affect FFOs due to the need to account for its diminution of values in the accounts.

The findings have an impact on investors who expect consistent dividend distributions from LPTs thereby affecting their investment allocations on LPTs.

Keywords: dividends, FFOs, LPTs, Malaysia.

Introduction

Real estate investment trusts (REITs) have traditionally been able to attract investors because of their relatively low risks and high dividend yields. The high dividend yield of REITs is the main reason investors invest in the REIT market. Investors e.g. pensioners who rely on regular dividend payments are attracted to REITs as an income producing investment.

REIT returns are composed of both price appreciation and rental yield from real estate. The rental component forms a significant portion of REIT return. Income streams from real estate are more predictable and relatively low in volatility compared to changes in capital values. The low volatility coupled with the high payout in the form of dividends adds a bond-like feature to REITs.

However rental incomes from investment properties are cyclical and may come under pressure during poor economic conditions. Thus the stability of dividends of REITs is an important issue.

The reasons why REITs consistently pay out high dividends are for the following reasons (Chan, Erickson and Wang 2003):

(a) to reduce agency costs,
(b) to signal private information,
(c) to signal the volatility of future cash flows,
(d) to reduce information asymmetry,
(e) to attract investors.

REIT is a unique corporate structure due to tax requirement to distribute 95% of net income to its shareholders. REITs in US are required by law to pay out 90% of their net cash flow from operations. The scope for REITs to determine their dividend payout policy is more limited compared to non-REIT companies. Wang, Erickson and Gau (1993) reported many REITs pay out more than the minimum requirement. REITs generally declare higher than average dividend yield compared to shares. The average yield on REIT is about 7% as compared to 2% for companies in the Standard & Poor's 500 stock index.

Investors who rely on regular dividend payments will be attracted to REITs. However economic conditions would affect the performance of real estate. In particular during a weak economy, rental income from commercial properties will be under pressure causing reduced rental income. Since rental income forms a large portion of funds from operation (FFOs), the declinein rental income will affect directly the FFOs. Dividends are distributed from FFOof a REIT. A high FFO indicates the potential of a high dividend distribution and there arise the issue of the stability of REIT dividends. Finance theory posits that firms with fluctuating dividends will be penalised (Kallberg, Liu and Srinivasan, 2003).

In this paper the issue of stability of REIT dividends is investigated. REITs with different investments are included in the study and an analysis of the relationships among the funds from operations (FFO), its dividends and market price are examined. It is hypothesised that a weakened economy will put downward pressure on FFO leading to reduce dividend distribution.

Literature review

Dividend policy is relevant for portfolio considerations because of the likely impact on the risk-return characteristics of individual stocks. Wang, Erickson and Gau (1993) examined the dividend policies of 123 REITs in USA between 1985 and 1988. They found that equity REITs pay a significant higher portion of their incomes as dividends than mortgage REITs. The authors also observed that REITs often pay out more dividends than are required by tax regulations, which suggests that their dividend decisions are dictated by imperfect information in the real estate market and the resulting agency costs.

In another study, Bradley, Capozza and Seguin (1998) examine the link between cash-flow volatility and dividend payout. Using the asymmetric and signaling theories, they developed a single-period model that predicts a negative relationship between dividend payouts and cash-flow volatility. They argue that firms with cash flow volatility would seek to minimise the penalty associated with dividend cuts by announcing a lower current dividend. Using a sample of seventy-five equity REITs over the 1985 – 1992 period, the authors found evidence of a negative relationship between cash-flow volatility and dividend levels. In addition, REITs with low debt to total assets ratio and large, well diversified property portfolios pay out more dividends.

The REIT industry use funds from operation (FFO) to measure performance and to establish dividend payouts. FFO is defined as the net income, excluding gains and losses from debt restructuring and property sales, adding back property depreciation and amortisation, and after adjustments for unconsolidated partnerships and joint ventures.

Kallberg *et al* (2003) reported that REITs consistently pay out about 85% of FFO as dividends. The payouts from REITs are consistently higher than other types of regular equities.

Wang, Erickson and Gau (1993) found that REITs on average pay 165% of their taxable income. Bradley, Capozza and Seguin (1998) also report that the dividend payouts are about twice the level of net income.

Chan, Erickson and Wang (2003) find that equity REITs pay out more dividends than mortgage REITs. Finite-life REITs also pay out more income as dividends than infinite-life REITs. The reason is because finite-life REIT have no growth potential and therefore do not need to conserve cash for new investments.

Wang, Erickson and Gau (1993) find an abnormal return on dividend increase announcements of 0.66% for equity REITs and 0.38% for mortgage REITs. For dividend decreases, the authors reported a corresponding figures of -1.9% and -0.11%.

Aharony and Swary (1980) argue that dividend payments can serve as market signals, conveying asymmetric information regarding the firm's future earnings. Kallberg *et al* (2003) reported that the current dividend payout of REITs is a credible signal of the future prospects of the firm. The dividend pricing model is also reported to be a better model that fit REITs than for other equities.

Using a sample of 75 REITs, Bradley, Capozza and Seguin (1998) report that the stock market reacts negatively to REIT dividend-cut announcements. The ability to continue paying high dividends is determined largely by the return characteristics of the underlying properties held in a portfolio. They further report that REITs with greater leverage, smaller asset bases or undiversified assets offer lower dividend payout rates when compared to other REITs.

Data and research method

The data used in this study span the years from 1989 to 2005 cover a complete property cycle. This study period allows an investigation of LPTs ability to sustain dividend payouts under different market conditions in particular the impact of recession on dividend payouts.

For this study only the listed property trusts (LPTs) are used i.e. Amanah Harta Tanah PNB (AHP), Amanah Harta Tanah PNB 2 (AHP2), AmFirst Property Trust (AMFPT) and First Malaysia Property Trust (FMPT). The number of total LPTs in the Malaysian market was down from five in 1997 to four in 2001 with FMPT having being liquidated from the Bursa Malaysia.

REITs in Malaysia are first introduced in 2005 hence new REITs (i.e. Starhill, UOA, Tower, Alaqar and Axis REITs) are not included in this study. Since November 2006, AMFPT is in the process of conversion into a REIT known as AmFIRST REIT.

Data for the calculation of FFOs and dividend information on LPTs are collected from the respective LPT annual reports. Monthly closing prices of LPTs are collected from Investors Digests.

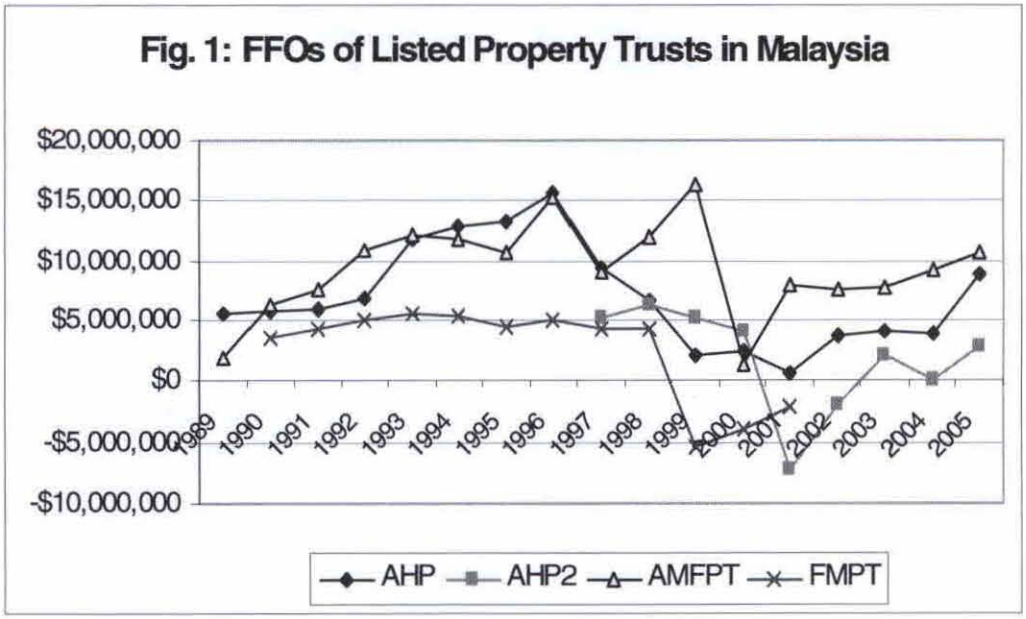
Results and analysis

Table 1 provides the descriptive statistics for the average LPT prices and monthly returns. Three of the LPTs provide positive average monthly returns except for AHP2 which has a negative average monthly return of -0.69% for the 1997-2005 period.

Table 1: Average dividends, LPT prices and share returns

	Average dividends pa	Average monthly LPT price (RM)	Average monthly returns (%)
AHP (1989-2005)	7.56%	1.34	2.36%
AHP2 (1997-2005)	5.00%	0.567	-0.69%
AMFPT (1990-2005)	8.40%	1.015	0.52%
FMPT (1990-2001)	5.64%	0.98	1.03%

Fig. 1 and 2 shows the trends of annual FFOs and dividend distributions over the study period



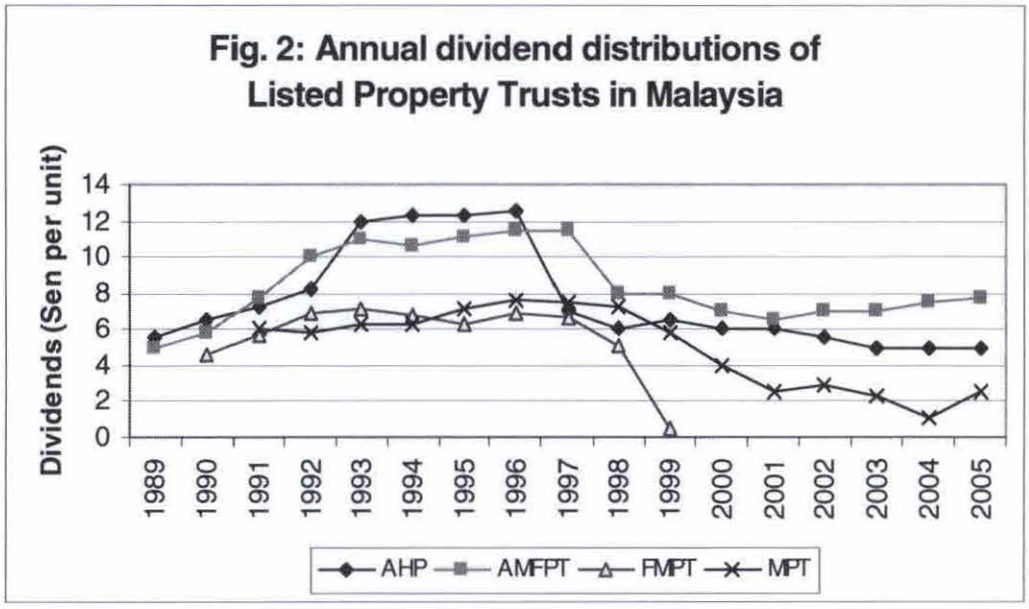


Table 2 reports the descriptive statistics for the FFOs and the dividend per share (DPS). Among the four LPTs, AHP2 shows the lowest average FFO values and also the lowest average DPS indicating a possible close relationship between FFOs and dividends.

Table 2: Descriptive statistics

	FFO (Maximum) RM	FFO (Minimum) RM	FFO (Average) RM	DPS (Maximum) %	DPS (Minimum) %	DPS (Average) %
AHP (1989-2005)	15,557,930	693,777	7,002,629	12.50	5.00	7.56
AHP2 (1997-2005)	6,247,068	-7,319,478	1,865,701	7.50	1.05	3.98
AMFPT (1990-2005)	16,396,109	1,305,560	9,775,625	11.50	5.75	8.61
FMPT (1990-2001)	5,584,477	-5,380,221	2,529,987	7.18	0.00	4.70

Table 3 shows the correlation coefficients between FFOs and dividends per share. The results for the overall period show a relatively high correlation between these two variables indicating a close relationship between FFOs and dividend payouts. Overall in the long run, there is a strong positive relationship between FFOs and dividend distributions.

Table 3: Correlation coefficients between FFOs and dividends per share

	AHP	AMFPT	FMPT	AHP2
Overall period				
1989-2005	0.841	0.633		
1990-2001			0.963	
1997-2005				0.66
Buoyant period				
1989-1997	0.925	0.879		
1990-1997			0.865	Note 1
Recessionary period				
1998-2000	-0.553	0.958	0.976	0.998
Recovery period				
2001-2005	-0.726	0.288	Note 2	-0.196

Note 1: AHP2 is listed in 1997.
Note 2: FMPT is delisted in 2001.

Table 3 further shows the results of the correlation analysis between FFOs and dividend distributions for buoyant, recessionary and economic recovery periods.

Buoyant period (1989-1997)
The correlation coefficients are high for the buoyant period (1989-1997) with values higher than 0.86 indicating a close relationship between FFOs and dividend distributions. Fig.3 to Fig. 6 shows rising FFOs during the buoyant period indicating higher income levels from its investments. In tandem with higher FFOs, LPTs have declared higher DPS.

Recessionary period (1998-2000)
A mixed result is found for the recessionary period. A very strong correlation is found for AMFPT, FMPT and AHP2 (r e" 0.958). But there is a negative correlation coefficient for AHP.

AHP has been consistently declaring a dividend of 6% during this period despite the FFOs have declined. The declination in FFO is due to accounting treatment of value of investments in quoted shares. Thus the decline in FFO is merely due to accounting loss which did not affect AHP's ability to declare stable dividends.

AHP is owned by Permodalan Nasional Berhad (PNB), the largest government unit trust agency in Malaysia which has the responsibility to consistently declare dividends to its national unit trusts holders to achieve social restructuring of equity and wealth. For this reason AHP has been

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declaring stable dividends of about 6% pa even though its FFOs are declining during the recession period.

Recovery period (2001-2005)

For the recovery period, a mix set of correlation coefficients is found. AHP and AHP2 was found to have a negative correlation between FFOs and dividend distributions. Again the explanation for AHP is that it is declaring dividends to fulfill its social obligations. The same explanation can be offered to AHP2 since the trust was taken over by PNB in 2001.

Figure 1 to 4 shows graphically the FFOs of the four LPTs. Generally there is a decline in FFOs of the four LPTs during the recession period of 1998-2000.

Fig. 3: AHP - FFOs and Dividends

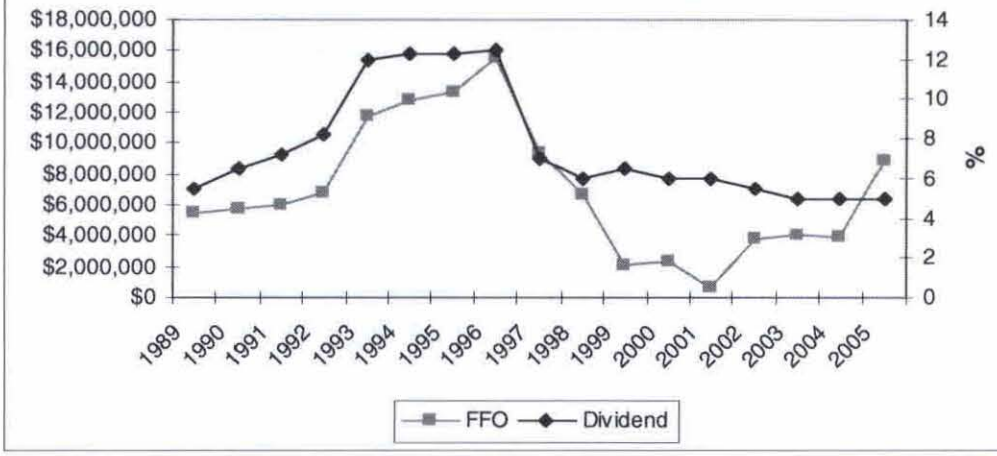


Fig. 4: AHP2 - FFOs and dividends

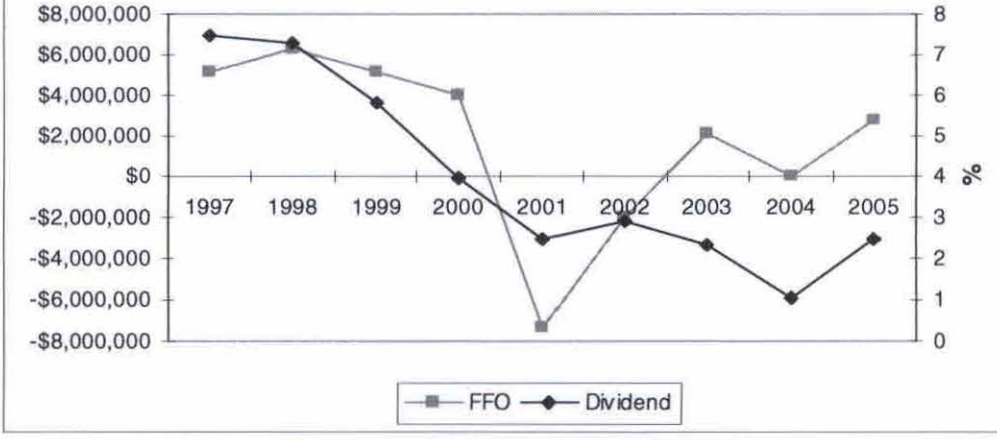


Fig. 5: AMFPT - FFOs and Dividends

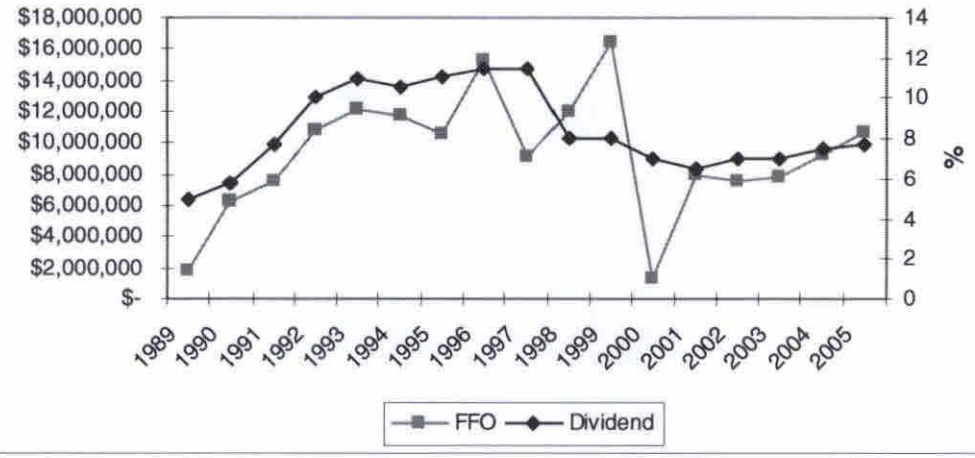
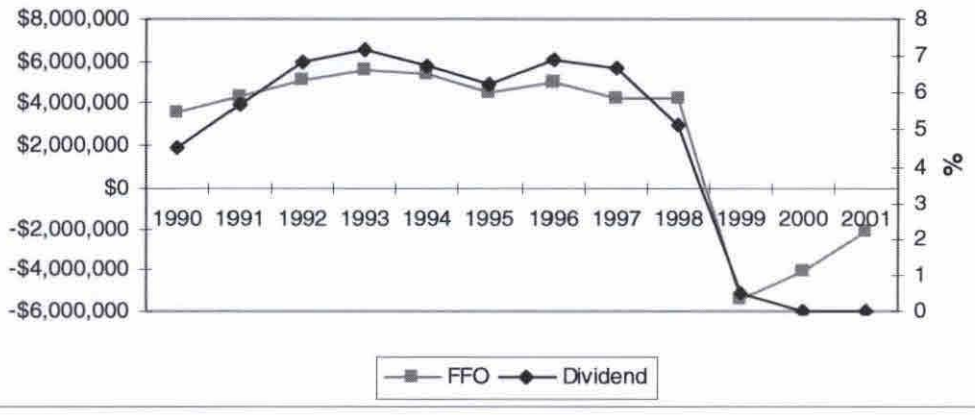


Fig. 6: FMPT - FFOs and Dividends



Case study: AHP

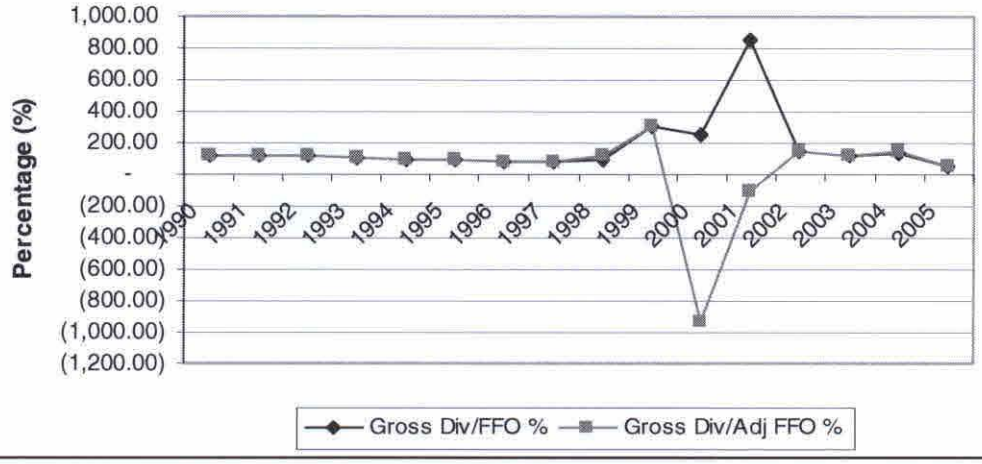
AHP was initially launched as a finite LPT. Under the Deed of Trust, AHP would be terminated after the expiration of seven years and before the expiration of ten years from the date of the principal Deed of Trust. However AHP was converted from a finite to an infinite property trust upon the approval of its unitholders at the EGM convened on 3 November 1998 with the extension of the term to an indefinite period upon its expiry in 20th March 1999.

AHP being a finite LPT (1989-1998) and holding a mixed investment portfolio offers an interesting case for a detailed analysis.

(a) Does a finite LPT (e.g. AHP) pay out more dividends than infinite LPTs?

The average gross dividend to FFO payout ratio is 99.18% for the finite trust period and 267.39% for the infinite trust period. However the payout ratios are distorted by provisions for diminution of share values. To reflect the actual level of FFOs, the FFOs are adjusted for the diminution of share values. Fig. 7 shows the trend of adjusted FFOs.

Fig.7: AHP - Dividend to FFO Payout ratios



With the adjustment, the average gross dividend to adjusted FFO ratio is 102.3% for the finite trust period (1990 to 1998) whilst the same average ratio is -35.7% for the infinite trust period (1999 to 2005).

The result indicates a higher payout ratio during the finite trust period compared to the infinite trust period. However the result is inconclusive since the 1999 to 2005 period is distorted by poor economic condition which affects income from property investment and the poor stock market performance has affected share returns. In addition the issue is complicated by the fact that AHP has been declaring consistently high dividend distributions due to its social obligations to its unitholders.

(b) FFOs and share investments

AHP has investments in quoted shares. Due to accounting policies, the fluctuations in the market value of quoted shares are found to affect the calculation of FFOs where shares are stated at cost less provision for diminution

in value of investment. The average dividend to FFO for the 1990-2005 period of AHP is 163%. However after adjusting the FFOs for diminution of value of investment in quoted shares, the payout ratio has dropped to 107%.

The sources of income differ among the LPTs. In the case of AHP and AMFPT, both have invested in quoted shares. For AHP, the decline in FFOs is partly due to the decline in income from share investments.

Thus the calculation of FFO is found to be affected by provision for diminution in value of investment, particularly share investment.

Conclusions

The above research shows that the FFOs of LPTs is affected by economic conditions and the sources of income for FFOs.

The stability of dividends declared by LPTs are found to be unstable as it is affected by the level of FFOs attained by LPTs. FFOs are in turn affected by its sources of income. A LPT with unstable investment market values e.g. shares affects FFOs due to the need to comply with accounting standards.

The findings have an impact on the attractiveness of LPTs as a source of investment that could provide stable income distributions throughout its investment holding period. Investors may need to investigate the types of investments comprising the investment portfolios. Share investments are found to introduce a higher level of variability in the FFO levels thereby causing higher level of uncertainty in dividend distributions.

Since the bulk of source of income of LPTs are derived from rentals, future research may look into the impact of the types of property owned, the portfolio mix, types of tenants on locations etc. on FFOs.

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Geo-Information Neural System For Single-Property Valuation

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Abstract

An Automated Valuation Model (AVM) named Geo-Information Neural System (GINS) is developed as an integrating technology in the valuation of single-property. GINS integrates Geographical Information System (GIS) technique and computing intelligent Artificial Neural Networks (ANN). It covers the establishment of a GIS database management system, GIS location measurements, spatial queries and thematic mapping. ANN is employed to replicate the way the human brain might process data by learning relationships, in this case the one existing between property characteristics such as physical and location attributes and sales price. A sample of 100 sales of detached houses in Damansara Heights, Kuala Lumpur is trained. The model is built on a GIS platform, which will allow for GINS automation as well as the conduct of interactive valuations. A graphical user interface is developed for seamless integration and user interaction. The results indicate that GINS provides an efficient AVM tool that provides superior residential property valuations, while accuracy is improved by minimising the influence of subjective judgements. The technique may be used to check valuations generated by more traditional methods as well as further improve the overall quality of single-property valuations.

Keywords: single-property valuation; automated valuation model; geographic information system; artificial neural networks.

Introduction

The purpose of this paper is to demonstrate the potential of computer modelling artificial neural network and GIS to improve the accuracy of value estimation for residential property. Property valuation is no longer a traditional business that relies only on expert opinions of value. The profession is now facing greater transformation in the valuation process and methodology, along with innovations in information and communication technology. Technological progress is continuing at a rapid pace and leading to a wide range of new applications.

Technology is having profound effect on the profession, as well as influence on the property valuation process, largely pressured by the needs of today's clients who demand quick, easy and more objective process to arrive at the opinion of value. The needs somehow motivate dependency on automated valuation that allows clients to get faster and better results. Advancement in information technology changes how the process is carried out and leads to more analytical applications within the valuation profession.

Regression analysis and other advanced statistical techniques have been used to automate valuation with varying degrees of success (Wyatt, 1996). Automated valuation modelling (AVM) is one of the new techniques in assessing single-property value (Waller, 1999; Robbins, 2001). Based on computing model, it is recognised as a new valuation tool in the 21st century (Waller *et al,* 2001). AVM is able to carry out automated valuation process, either in personal computers or more integrated systems such as on-line over wide area network and the internet. Robbins (1998) reported the advantages of AVM in property valuation process; "AVMs are used to reduce the time and costs associated with loan underwriting and help the valuer prepare more accurate and supportable valuation. The objective should not be to replace the valuer but rather to increase the valuer's efficiency in rendering an opinion of value."

Among the AVM techniques are statistical-based hedonic pricing models such as multiple regression (MRA) and price-time indexing and artificial intelligence-based such as artificial neural networks (ANN), expert systems and case-based reasoning (Waller *et al,* 2001). Empirical analyses show that these techniques have proven their successes in producing reasonably and acceptable valuation of single-property. MRA is the most popular quantitative technique in property valuation. It has been applied in various residential property valuations to assist valuer in statistical analysis and complement the traditional sales comparison approach.

An alternative to multiple regressions is intelligent-based ANN. Similar to MRA, ANN models the relationships between property attributes and sales price. The main difference is in its structure. ANNs are distributed arrays of highly interconnected processing elements. Each connection has an associated strength or weight. Processing at each node involves a weighted sum of each connection forming a single input to a non-linear transfer function. The output from each node becomes the input to successive nodes (Lewis, 1999). Many empirical researches have approved that ANN is unique by its model structure and algorithms that are not only intelligent, but can emulate comparison approach and can be applied to prediction and regression tasks in valuation analysis.

A number of renowned valuation firms have adopted more advanced database systems and analytical techniques such as Geographic Information System (GIS) that allow for not only easy, but more efficient and effective management of spatial data (Almond *et al,* 1997). This is true as the greater availability of data today leads to a new set of methods for analysing properties. The ability to apply more advanced tools to analyse data allows for that

quicker response. Those methods tend to be based on quantitative analysis as well as GIS (Mattson-Teig, 2000). GIS uses digital technology, which combines hardware and software to meet user needs in handling spatial data to produce graphical output. GIS-based automated appraisal systems – on desktop computers and over the internet will inevitably and profoundly change the appraisal industry (Castle, 1998).

In this paper, we highlight how ANN and GIS technology provide the valuation profession with new technique. The aim is to present the development of an AVM named Geo-Information Neural System (GINS). The following section reviews the relevant research in the literature about a new quantitative method in single-property valuation using GIS technology and ANN computing model. Data and methodology for the development of GINS are described in Section 3 and GINS implementations in single-property valuation are discussed in Section 4. We conclude the paper by summarising the results and conclusion.

Automated Valuation Model (AVM)

Valuation is the process of assigning a value to a property at the date of valuation for specific purposes. Valuation exists as a field because there is uncertainty on the part of potential buyers, sellers, investors and others. This stems in part from the complex nature of the product (the real estate itself), and from the uninformed, imperfect, complex nature of the real estate market (Kinnard Jr., 2001).

The sales comparison approach is the most common method in single-property valuation especially for residential (Ismail, 1997). It is a method of estimating the market value of a subject property by analysis of sales of similar properties. Market value is the estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without compulsion (International Valuation Standard, 2003).

The philosophy is based on the existence of direct relationships between market value of a subject property and selling prices of comparison properties in the market represent competitive investment alternatives. Valuation factors such as physical characteristics, location, quality and other economic factors are considered in the comparable analysis. These factors affect the supply and demand of property and expressed in valuation models. In practice, valuers often rely on past transaction data to arrive at a market value. Adjustments are made for any differences using comparison unit and become the basis for comparison. Using AVM, valuers can produce valuations that take into account more economic factors than usually are considered in conventional single-property valuations.

AVM is a computer program that utilise relevant property information to calculate a value for a specific property. The sales comparison models in AVM generally have the following form:

$$Y = f(X_1, X_2, X_3, X_4, X_5, ...X_n) \quad [1]$$

where Y is estimated sale price; f is 'a function of' and (X_1, X_2, X_3, ...X_n) are location and property characteristics. Models can be in the form of additive, multiplicative or hybrid. ANN modelling may be used to calibrate the models.

Traditionally, automated valuation is commonly used to estimate the value of residential property in computer-assisted mass-appraisal (CAMA), mostly for statutory purposes such as rating and taxation (O'Rouke, 1998; Rossini, 1999). However, AVMs are now getting wide acceptance as an alternative to estimate the value of single-property (Robbins, 2001; Waller *et al*, 2001). The important aspects of AVM are quantitative-based analysis, consistency,

speed, ease of use and reasonable accuracy (Valentine, 1999). Although AVM may not provide the most accurate estimate of an individual property value, it may provide better indication and objective justification of the value.

Artificial Neural Networks

Artificial Neural Network (ANN) is a system of a massively distributed parallel processing that has a natural propensity for storing experiential knowledge (Gopal, 1998). An ANN is composed of a set of nodes and a number of interconnected processing elements. ANNs use learning algorithms to model knowledge and save this knowledge in weighted connections, mimicking the function of a human brain (Turban and Aronson, 2001). The nodes generally have three layers: input nodes, hidden nodes and an output node. Figure 1 shows a generic model of an ANN.

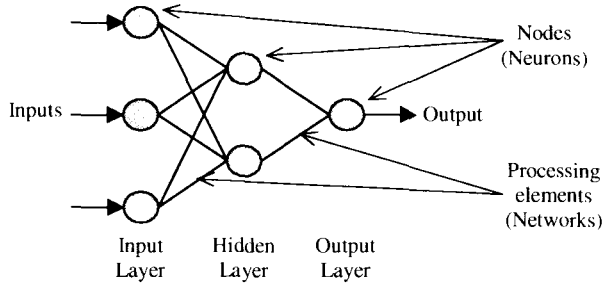

Figure 1: A generic ANN model

The most popular ANN model used in prediction and regression tasks is Multi-layer Perceptron (MLP) with Feed-forward Back-error Propagation (BP) type of learning algorithm, or simply as MLP-BP. The model has three layers interconnected to each other's nodes by the networks (Figure 1). Input nodes receive independent variables while hidden nodes run the learning process before passing on to output node (a dependent variable) for prediction. Each network carries weights (w1, w2, w3). These weighted connections act as coefficients to the input nodes. The hidden nodes (sum of the weighted inputs) compute network output (feed-forward) through a non-linear activation function, determining the difference (error) to the expected output (actual output). This error is distributed among the connections weights (back-propagation) in order to progressively reduce the error. These steps are repeated for many cycles in the learning phase until the desired error level is obtained and the system has achieved desired accuracy. The network is then verified with new data to verify the generalisation capability.

Figure 2 illustrates the MLP-BP model.

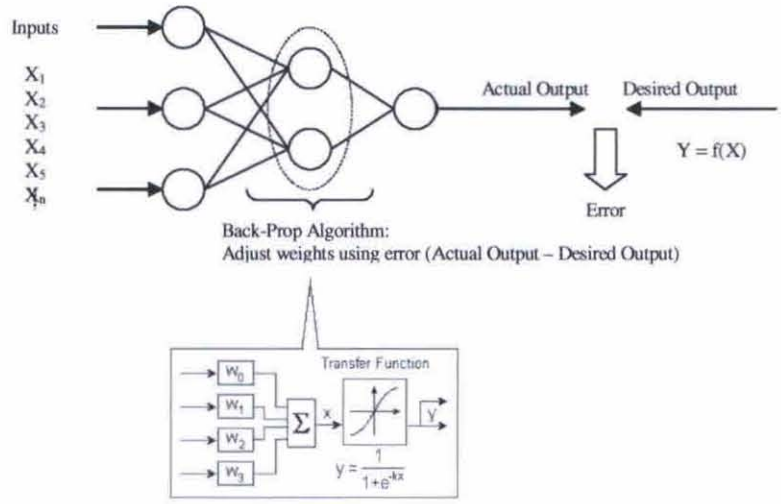

Figure 2: ANN MLP-BP model

ANN's back-error propagation learning algorithm has been investigated quite extensively to model residential property value by many researchers. For examples, refer to Borst, 1992; Evans *et al,* 1992; Do and Grudnitski, 1992; Tay and Ho, 1992; Worzala *et al,* 1995; McCluskey *et al,* 1997; Kwon and Kirby, 1997; McGreal *et al,* 1998.

Integration with Geographic Information System

Environmental Systems Research Institute (ESRI) (1990) defines Geographic Information System (GIS) as an organised collection of computer hardware, software, geographic data and personnel designed to efficiently capture, store, update, manipulate, analyse and display all forms of geographically referenced information. Previous studies have acknowledged that property valuations benefited from the application of GIS in many forms (see Longley *et al,* 1993; Fung *et al,* 1995; Rodriguez *et al,* 1995; Wyatt, 1995; Wyatt, 1996; Wyatt, 1997; McClusky *et al,* 1997; Thrall, 1998; and Castle, 2000).

One of the GIS's significant applications is property location analysis in comparison approach. For example, Rodriguez *et al.* (1995) studied on the application of GIS "shortest path" algorithm to analyse the effect of location on property value. They concluded that, "distance variables are easily produced with GIS such as the shortest-path algorithm that produces a superior distance variable relative to the traditionally used straight-line distance variable and has significant relationship with residential sales prices. The GIS created variables expedite analysis within or outside the GIS environment."

According to Thurston (2002), the integration of ANN modelling in GIS can be applied in many applications to improve decision making process. Experimental studies have been

carried out on the integration of ANN model and GIS system in property valuation (Brondino and Silva, 1999; Moon and Hagishima, 2001; and Hall and Morgan, 2001).

For example, Hall and Morgan (2001) developed an automated valuation system named Spatial Aspect-Computer-Assisted Valuation Decision Support Tool. This software integrates GIS and ANN modelling. Sales of 181 residential properties in Turks & Caicos Islands, Central America were used as sample study. Attributes of property were trained and tested in ANN to get the predictive function. GIS was utilised for spatial analysis and visualisation. Property location factor was analysed in GIS to measure accessibility, while comparison analysis was carried out spatially to produce graphical outputs. Visualisations of raster-format spatial distribution of property prices and elevation models that shows parcel contours and the neighbourhood boundaries were produced. The ANN predictive function was then integrated with GIS location to determine a property value.

Data and Model Design

The first step in AVM modelling is data collection. Property specific data were acquired from the government's Department of Valuation & Property Services. Sales of 138 detached properties were gathered and thoroughly analysed to select the most recent transactions and good data. Spatial data that consists of digital map of property parcels and building footprints were acquired from the GIS Unit of Kuala Lumpur City Hall. Data were categorised as either qualitative or quantitative and edited in GIS MapInfo Professional. Qualitative data were coded to a numeric form. Table 1 shows the data types and its representation used in this analysis.

Table 1: Data Representation

Attributes	Data Types	Value (Min – Max)	Representation
Selling price (RM mil)	Continuous numeric	1.50 – 5.65	Numeric
Lot area (sqm)	Continuous numeric	441.0 – 1275.3	Numeric
Building MFA (sqm)	Continuous numeric	158.5 – 568.7	Numeric
Building AFA (sqm)	Continuous numeric	22.0 – 380.0	Numeric
Building age	Continuous numeric	2 – 35	Numeric
Number of storey	Discrete numeric	2, 3	Numeric
Number of bedroom	Discrete numeric	3, 4, 5, 6	Numeric
Repair condition	Categorical	Good, Average	One-of-N code
Finishes quality	Categorical	Good, Average	One-of-N code
Distance to exit points (km)	Continuous numeric	0.1 – 5.0	Numeric
Distance to commercials (km)	Continuous numeric	0.05 – 3.5	Numeric
Distance to schools (km)	Continuous numeric	0.05 – 3.5	Numeric

The construction of ANN valuation model begins with learning process in Tiberius Neural Data Mining, a proprietary ANN software. Figure 3 illustrates a neural network model to property valuation in the study. Input training and testing datasets that are stored in Microsoft Access are called and form an ANN MLP-BP structure. ANN learning computes the prediction output and is adjusted by an error term with the required output to minimise mean absolute error (MAE), the same way to reduce root mean squared error (RMSE) or $E2$ (Figure 4).

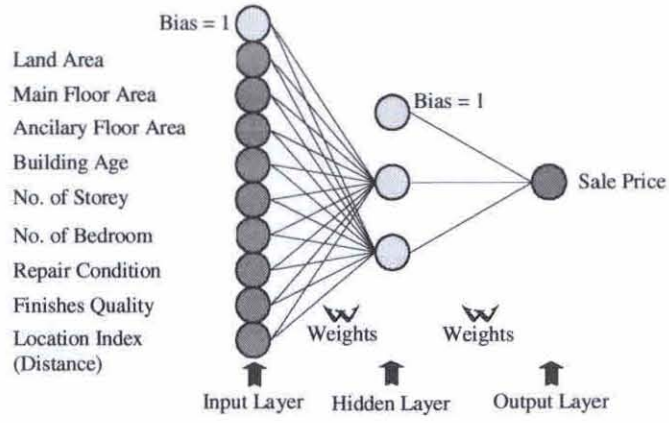

Figure 3: ANN property valuation model

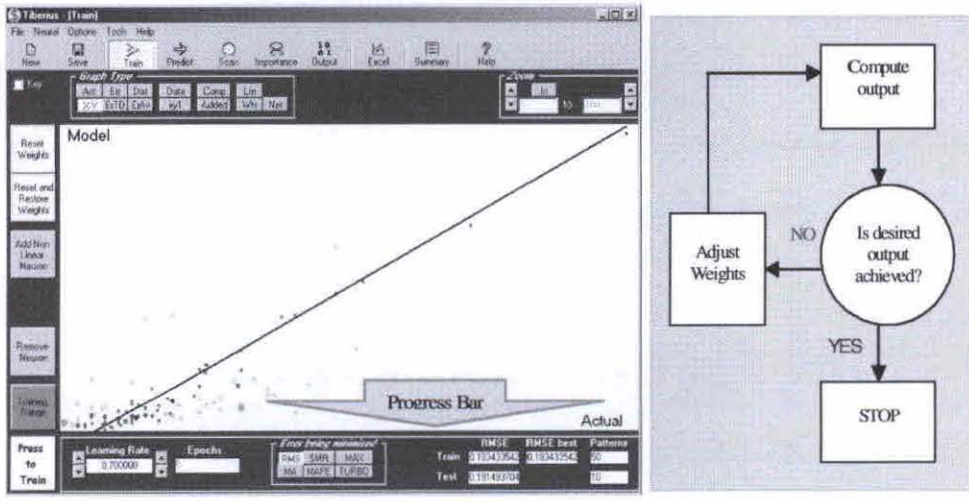

Figure 4: ANN learning in Tiberius

As the training run, Tiberius identifies the factors that contribute the most to the inputs in relation to sale prices and show the results when the desired output is obtained (Figure 5).

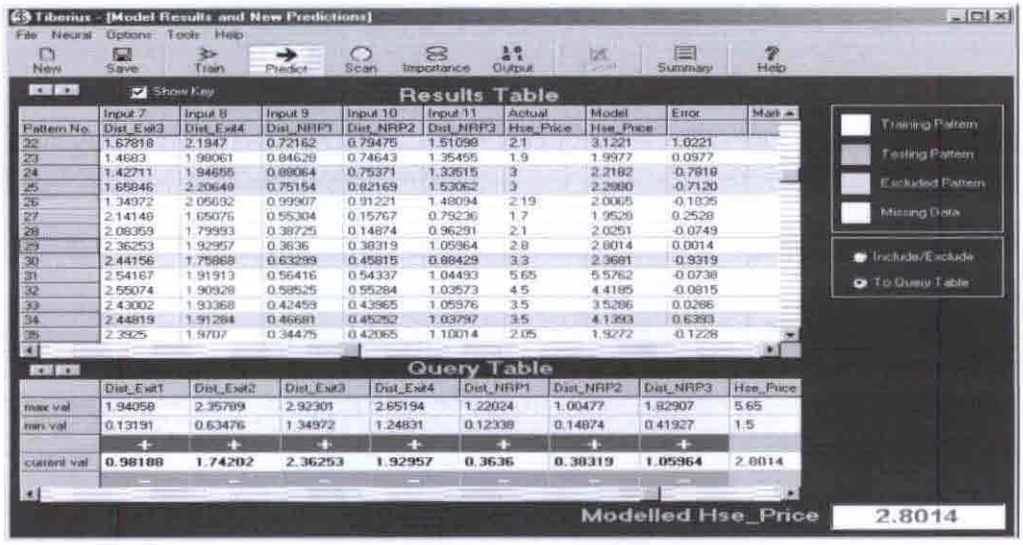

Figure 5: ANN learning result and predictive model

The location value analysis provides a means of adjusting for location in econometric modelling. Distance measurement functions are utilised based on *the shortest straight line* algorithm in MapInfo. In this study, we use accessibility and proximity factors to measure distances from a property to value influence centres such as commercial centres and main exit points of the neighbourhood. Figure 6 exhibits the main exit points as applied in the study.

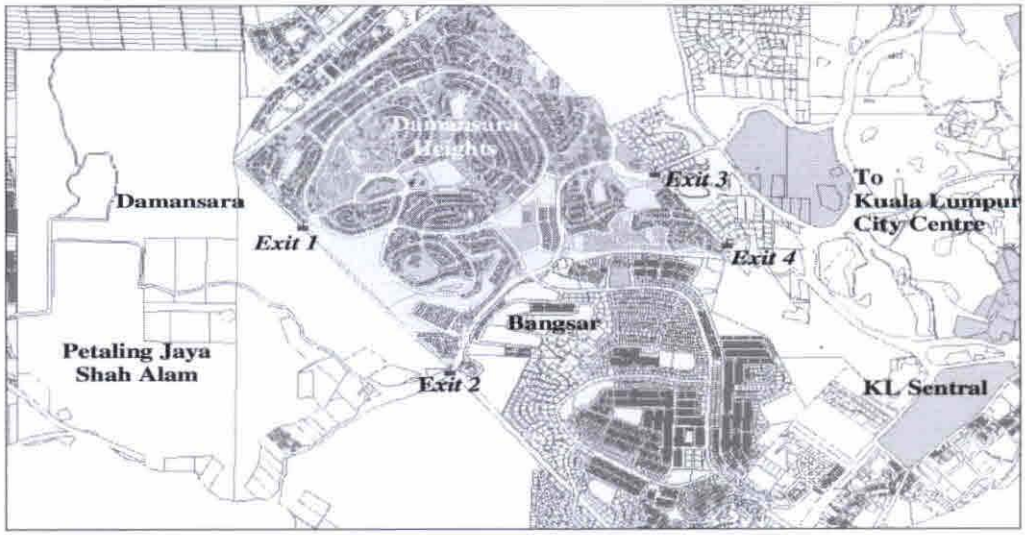

Figure 6: Main exits of Damansara Heights

Conceptual Model

The model is conceptually illustrated in Figure 7. It integrates various computer applications. Tiberius Neural Data Mining is employed for analysis of property attributes and the construction of predictive modelling. MapInfo Professional is utilised to acquire and analyse spatial data, besides location spatial analysis, queries and thematic mapping. Microsoft Access is used for relational database to work as storage and data editing. A Visual Basic Graphical User Interface (VB-GUI) is developed for seamless integration between applications and the automation process of property valuation interactively. As the figure shows, AVM generates tabular and spatial data and generates a property value by user input. Upon user interaction, GINS releases a trained neural network, which is the "goodness-of-fit" model from Tiberius and embedded into VB-GUI and links to MapInfo for spatial visualisation.

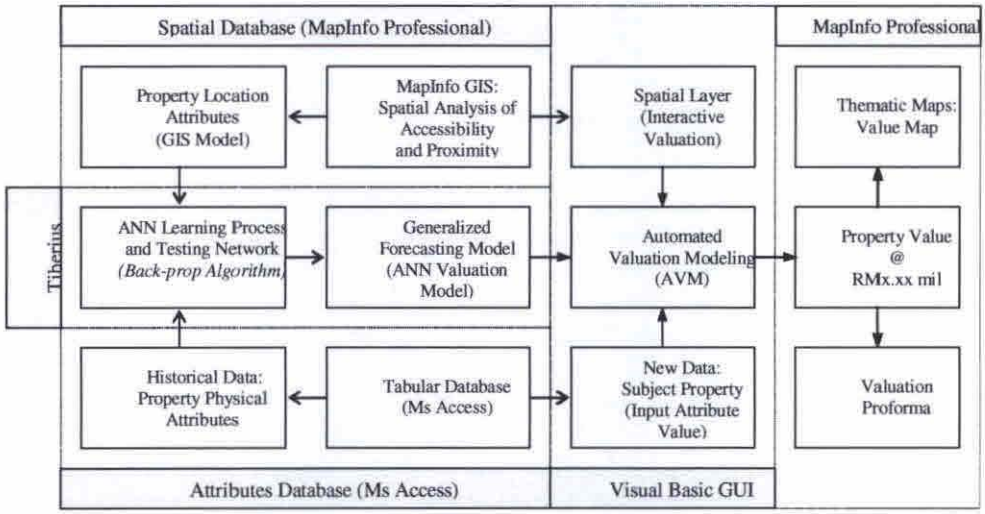

Figure 7: GINS conceptual design

GINS Implementation

The model is implemented in prototype software (GINS) that operates within Microsoft Windows. This user-friendly software generates tabular and spatial output and provides user interface with dialog windows, menus and toolbars. Tiberius, which is GINS valuation engine comes in a dynamic link library package and cannot be customised in the system GUI. GINS can only invoke the whole application through a shell function into VB multiple document interface (MDI) form. However, ANN weight file can be modified in GUI by Tiberius software development kit. It is then linked to spatial layers in MapInfo using ID number. Figure 8 shows the MDI forms to begin GINS and its menus and toolbars.

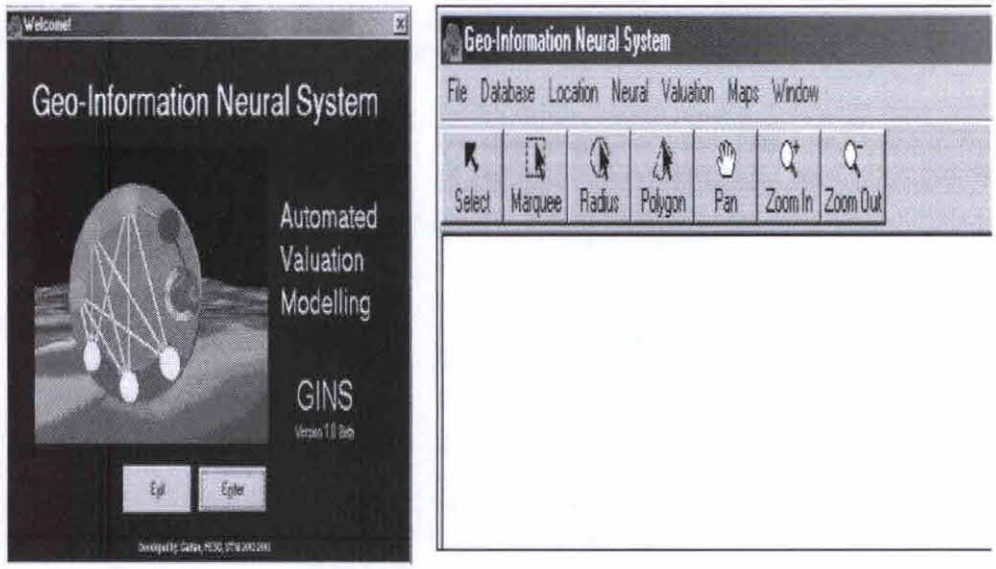

Figure 8: GINS MDI forms

Property attributes in Microsoft Access that can read by Tiberius are written out from MapInfo. Tiberius enables the construction of non-linear regression model and uses its back-propagation algorithm in multi-layer perceptron for the construction of predictive modelling. Spatial layer is created in MapInfo street file together with parcel and building layers which are previously geocoded. Property location indexes are built in MapInfo to measure shortest path distance for each property to all street segments to account for accessibility and proximity. The indexes are then sent to Tiberius for modelling with other property attributes. The program runs several training and testing to develop a function that yields the prediction of sale price as a function of all property attributes. The "goodness-of-fit" model is run using the subset of variables that proves significant after adjustment of response coding to correct any error term.

Once the model is developed in Tiberius, the coefficients of ANN prediction model could be applied to tables in MapInfo. Call function is built in VB program that could be accessed from within the proprietary valuation engine that is GINS. User can either click at a particular property or comparable properties in the spatial layer or enter property specific attributes under valuation pull-down menu. Clicking evaluate, the system multiplies the values entered by their respective coefficients and add in the model constant term and return the market value of the subject property. Figure 9 illustrates the valuation process in GINS.

Figure 9: Valuation process in GINS

Results

The ANN predictive model is verified with new property data. The experiment indicates favourable prediction results with the actual property prices of detached houses. Minimum and maximum errors are 1% and 11% respectively, while median error is 5% and 6% (Table 2).

Table 2: Results of ANN predictive modelling

No.	ANN Model Output (RM mil)	Actual Property Prices (RM mil)	Value Difference (RM mil)	Error (%)
1	1.947	2.100	-0.153	7.86
2	2.193	2.030	0.163	7.43
3	2.538	2.480	0.058	2.29
4	2.071	2.000	0.071	3.43
5	1.776	1.750	0.018	1.02
6	2.205	2.300	-0.095	4.31
7	1.788	1.680	0.108	6.04
8	2.895	1.100	-0.206	10.87
9	2.334	2.180	0.154	6.59
10	1.807	1.900	-0.093	5.15

Therefore, from this perspective, ANN valuation model in this study gave a reasonable and acceptable value of property.

Conclusion

The model demonstrates the potential of GIS and ANN as emerging tools in acquiring and analysing spatial and attributes data. The model application can significantly reduce time and cost required to value a property, while enhancing the accuracy of value estimates. The automated valuation system product consists of a shell built around a valuation engine, which allows users to

perform specific tasks and obtain desired outputs. This shell can be customised to meet special user needs and to adapt to changing data conditions. Nevertheless, the valuation core remains relatively stable and will require alteration only when enhancements are added (Robbins, 1998).

The establishment of GINS can change the way property valuation services perform today by acquiring its competitive edge. GINS can possibly become an IT-intruder that is able to compete with other quantitative tools, thus bringing an alternative or improvement in the valuation profession and the real estate industry.

Although the results from this study seem appealing in enhancing valuation technique, there are still concerns need to be further research in future studies. For instance, GINS conceptual model can be improved for other application domain and can be enhanced to meet current market and user needs. Hence the future study will try to identify more variables to be added in ANN valuation model, i.e. economy and socio-economic factors.

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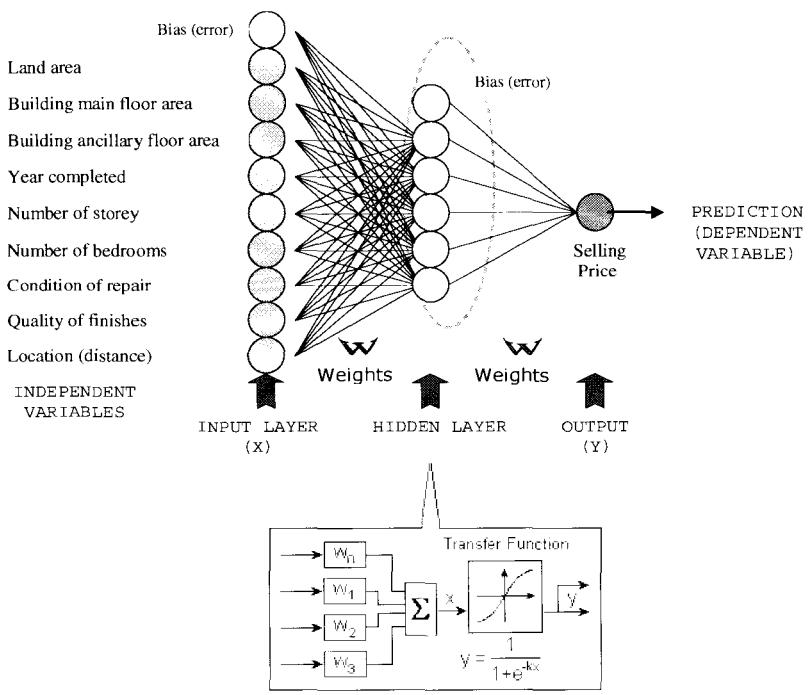
Appendix A: GINS Summary

Neural Network Structure

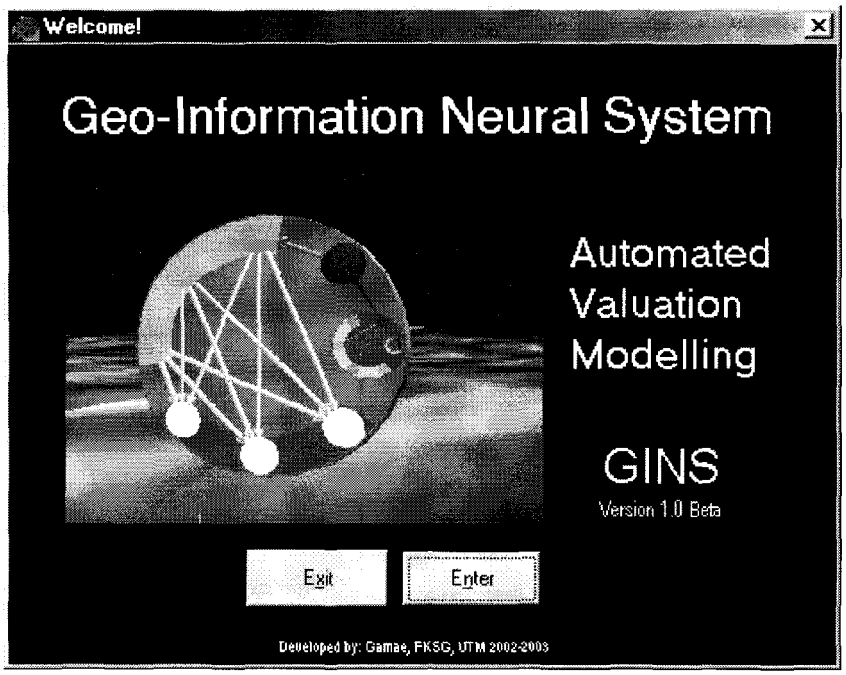
Architecture : 3-layer perceptron fully interconnected neurons
Algorithm : Back-error Propagation
Objective : To predict selling price of a house within 10% error of estimation
Target : Actual selling prices of houses in training dataset
Output : Estimated selling price of a house
Dataset : 100 sales data of detached houses in Damansara Heights, Kuala Lumpur
Dataset Date : 3-year from 2001 – 2003
Dataset Ratio : Training > Testing > Validation (80:10:10)

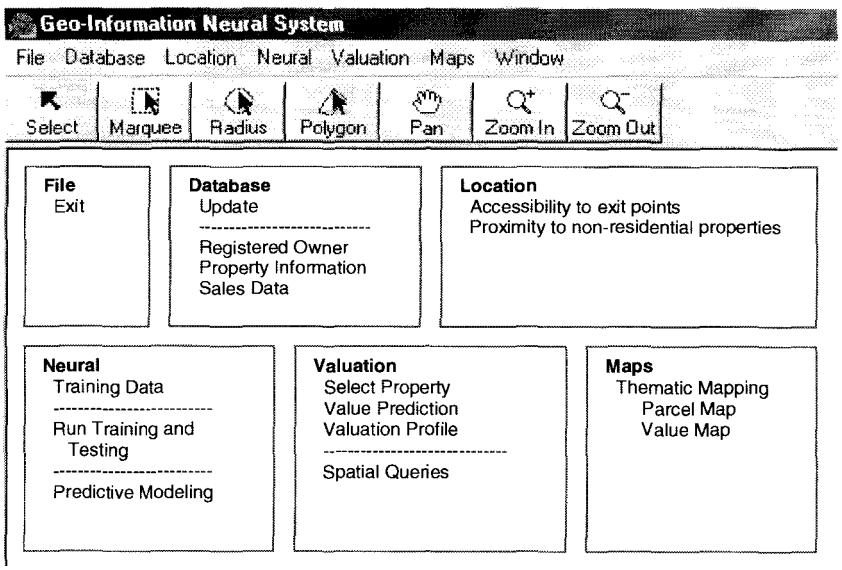
How it works?

- Uses Sales Comparison Approach: Property Value = Comparisons ± Adjustments
- ANN adds the intelligent factor into data analysis.
- Non-linear processing through hidden layer using summation and activation function.
- Algorithm:
  - Pass training data through network.
  - Adjust network weights to reduce error.
  - Validate network with out-of-sample data.
  - Use network to predict real data.



Guides on how to use GINS to value a property





Step-by-step Guide

1. Browse through the entire menu (Database; Location; Neural; Valuation; Maps) in the main interface to see the drop-down sub-menu functions.

2. Use icons to manipulate the graphic features.

3. Click on *Database* menu to browse the attributes and spatial data of sales and property information.

4. Click on *Location* menu to see the spatial analysis of property location. The location is calculated based on MapInfo 'straight line distance' algorithm of the following criteria:
   - o *Accessibility* measures distances from a property to four exit points of Damansara Heights.
   - o *Proximity* measures distances from a property to nearby commercials and schools.
   - o The distances values then feed into neural networks database.

5. Click on *Neural* menu to begin artificial neural networks modeling process.
   - o User determines the desired target (say, error of estimation < 10%).
   - o Open the database and selects property variables for inputs and output.
   - o Determine the neural networks structure – hidden layer.
   - o Begins *Training* on the property physical and location data and simultaneously *Testing* the network through the progresses.
   - o User retains the best network (*Predictive Modeling*) based on the progress charts windows and save as weight file to pass on to Valuation.

6. *Valuation* menu is the core in GINS that performs valuation procedure.
   - o User can make *Spatial Queries* (SQL) based on specific requirements.
   - o User *Select Property* to value.
   - o The system will generate a subject property value through *Value Prediction.*
   - o Alternatively, user can enter property inputs in *Value Prediction.*
   - o *Valuation Profile* shows the estimated value of the subject property and related summary.

7. Click on the *Maps* menu to view the graphical visualisation of thematic maps of distribution of values.

Benefits of GINS to Single-Property Valuation

1. Improved replication of valuations and decreased subjectivity.
2. Greater reduction in required time to process valuations (greater automation).
3. Incorporate existing spatial data and spatial analysis.
4. GIS visualisation and exploration.

The Development Of Asset Securitisation In Malaysia

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Abstract

The Capital Market Masterplan released in February 2001 for the Malaysian financial market has identified asset securitisation as part of the strategy to develop the corporate bond market and as a competitive source of financing for companies with good assets. This paper will examine the current state of asset securitisation in the Malaysian financial market. The focus will be on asset backed securitisations (ABS), collateralised bond obligations (CBO) and collateralised loan obligations (CLO) which are introduced in the past two years. The paper will also examine the impediments, challenges and prospects of asset securitisation in Malaysia.

Keywords: asset backed securitisation, CLO, CBO.

Introduction

Following the 1997 financial crisis, securitisation activities have increased significantly in several Asian countries that include Korea (1997) and Singapore (1998). In Malaysia, the trend for securitisation has pick up since 2001 with the introduction of the Capital Market Masterplan.

The Capital Market Masterplan outlines the recommendations in the strategic positioning and future direction of the Malaysian capital market. The Masterplan has laid the foundation for asset securitisation by recommending the introduction of a framework for the issuance of asset backed securities. The Masterplan recommends that asset securitisation be part of the strategy to develop the corporate bond market as a competitive source of financing. The financial crisis has revealed that there is a funding mismatch particularly in the property sector where short term debt is used to meet long term needs. With an economic downturn many companies that have taken loans are unable to service their loan debts resulting in rising non-performing loan among local banks. Companies find that there is a need to find alternative long term financing options.

With the ABS framework in place, companies with sound assets will be able to turn illiquid assets into liquid and tradeable market instruments. Cash strapped companies with weak credit ratings but having good cash flow generating assets will have access to a wider scope of corporate financing options and at cheaper funding costs.

The private debt securities market is not well developed as evidenced by public debt securities constituting barely a quarter of outstanding bank loans.

Early securitisation development in Malaysia

The incorporation of Cagamas Bhd, the National Mortgage Corporation, in 1986 paved the way towards the development of securitisation in Malaysia.

Cagamas's role is to promote the secondary mortgage market in Malaysia by buying housing loans from banks and finance companies. Cagamas therefore functions as a special purpose vehicle between the house mortgage lenders and investors of long term funds. The aim of Cagamas is to improve liquidity in the lending system by providing liquidity to long term mortgage loans (15 to 30 years) given out by banks and finance companies. By providing liquidity to the banks, the banks are able to provide continuous supply of mortgage funds to needy house purchasers.

However, as Cagamas Berhad retains full recourse against the financial institutions from which it purchased the housing loans, Cagamas bonds are not true asset backed securities. The types of bonds issued by Cagamas are Tier-1 and Tier-2 bonds. Tier-1 bonds are backed by the purchase of conventional housing loans including civil servant housing loans whilst Tier-2 bonds are backed by the purchase of industrial property loans. In early 1998, Cagamas extend its activities by purchasing other receivables.

To be eligible for sale to Cagamas, the housing and industrial property loans must:

- be for financing or refinancing the purchase, construction or renovation of residential and industrial properties
- be fully disbursed
- at the time of sale must not be more than three months in arrear
- for industrial properties the book balance less unearned interest not exceeding RM20 million per loan

As at end of December 2002 (see Table 1), the total amount of outstanding housing loans purchased by Cagamas amounted to RM14.823 billion and its total debt securities outstanding amounted to RM24.97 billion.

Table 1: Issuance of CAGAMAS debt securities by year

	1998		1999		2000		2001		2002	
Type of issue	RM million	No.of issues	RM million	No.of issues	RM million	No.of issues	RM million	No.of issues	RM million	No. of issues
Fixed Rate Bonds	3,250	8	4,425	14	8,403	26	6,430	25	8,925	16
Floating Rate Bonds	0	0	0	0	0	0	0	0	0	0
Notes	16,845	21	20,625	22	14,182	22	10,970	19	10,015	18
Mudharabah Bonds	70	1	0	0	144	1	0	0	610	3
Total	**20,165**	**30**	**25,050**	**36**	**22,729**	**49**	**17,400**	**44**	**19,550**	**37**

Source: (Cagamas 2003)

Apart from property mortgages being securitised by Cagamas, securitisation market for other assets has not developed fully in Malaysia.

Securitisation has not developed in a major way in the 1990s due to several issues (Low 1997):

(a) To control inflation, Bank Negara Malaysia does not approve of any securitisation which places upward pressure on inflation particularly the securitisation of consumption credit assets.

(b) The lack of transparency due to the Banking & Financial Institutions Act 1989 which require confidentiality by banks of the identity and information of its customers.

(c) Unfavourable taxation issues. For example the issue of stamp duty on securitisation transactions which could increase the costs of securitisation deals.

Apart from Cagamas, two other institutions are set up in response to the increasing non-performing loans arising from the 1997-8 financial crisis. These two bodies are Danaharta Nasional Bhd and Danamodal Nasional Bhd.

Danaharta Nasional Bhd was established in May 1998 to purchase non-performing loans from the financial sector. Danamodal Nasional Bhd is set up to finance bank recapitalisation.

Recent development in securitisation

The Securities Commission is the single authority to give approvals for securitisation applications effective from 1st July 2000.

With the Capital Market Masterplan launched to facilitate and develop asset backed securitisation in Malaysia, the Securities Commission has issued *Guidelines on the Offering of Asset Basked Securities* on 11th April 2001. Asset backed securitisation is made possible with the issuance of the ABS Guidelines by the Securities Commission.

By late August 2003, ten securitisation proposals/deals amounting to RM5.89 billion have been approved (see Table 2).

Table 2: Asset securitisation in Malaysia (June 2001 to August 2003)

Month announced	Company	Types of securitisation	Amount
June 2001	First Silicon	Synthetic securitisation[@]	RM950m
September 2001	Prisma Assets (Arab-Malaysian Merchant Bank*)	CBO[#]	RM225m
December 2001	Pengurusan Danaharta Nasional Bhd	CLO[+]	RM310m
2002	Commerce International Merchant Bankers Bhd*	CBO	RM385m
January 2002	Chin Foh Bhd	Asset-backed bonds Asset backed commercial papers	RM60m RM200m
April 2002	WCT Engineering Bhd	Commercial paper	RM350m
May 2002	Sunway City Bhd	Commercial property ABS	RM891.6m
November 2002	Aegis One (Affin Bank*)	CLO	RM1 billion
July 2003	Wijaya Baru Global Bhd	Asset backed serial bonds	RM1.31 billion
August 2003	Sunway Hldgs Inc. Bhd Sunway Construction Bhd	Property ABS	RM240 million
TOTAL			**RM5.89 billion**

[@] Whole business securitisation
* Lead manager and arranger
[#] Collaterised bond obligations
[+] Collaterised loan obligations

Securitisation transactions in Malaysia

Collaterised Bond Obligations (CBOs)

Arab-Malaysian Merchant Bank acting as underwriter, arranger and lead manager is the earliest to launch the first asset backed securitisation product in Malaysia: a CBO issue of RM255 million in September 2001. The asset backed securities is issued by Prisma Assets Bhd, the special purpose vehicle involving two classes of bonds of a senior tranche of RM225 million class A bonds and a subordinated tranche of RM30 million class B bonds for business purposes.

Commerce International Merchant Bankers Bhd has also launched a CBO issue involving RM126.93 million senior Class A bonds and RM385 million mezzanine Class B bonds to finance business activities:

Company	Issue year	Credit rating	Issue amount	Maturity	Security
Arab-Malaysian Merchant Bank	2001	AAA (Rating Agency Malaysia)	RM255m	5 years (2005)	Private debt securities/corporate bonds
Commerce International Merchant Bankers Bhd	2002	AAA AA3 (Rating Agency Malaysia)	RM126.93m RM385m	7 years	Private debt securities of 27 companies

Chin Foh Bhd issued RM60 million asset backed bonds and RM200 million asset backed commercial papers/medium term notes in January 2002 for the purchase of stocks and raw materials and implementation of a new computer system for the group.

WCT Engineering Bhd has issued RM350 million commercial paper for the construction and completion of the Guthrie Corridor expressway.

In July 2003, Wijaya Baru Global Bhd issued RM1.31 billion asset backed serial bonds to fund the purchase of land for property development and for the repayment to Danaharta and other outstanding loans.

Collaterised Loan Obligations (CLOs)

Pengurusan Danaharta Nasional Bhd (Danaharta)

Pengurusan Danaharta Nasional Bhd is the first to use CLO through its special purpose vehicle, Securita ABS One Bhd, which offered RM310 million. The CLO is issued on two tranches, the senior bonds worth RM310 million and the junior bonds worth RM283.96 million. The unrated junior bond which is taken up by Danaharta will act as collateral for the senior bond.

The bond has a AAA-rating by Rating Agency Malaysia (RAM). The issue will provide a yield of 4% which is 75 basis points above the four year Malaysian Government Securities benchmark. The issue was oversubscribed by 3.5 times. The investors comprise:

(a) Institutions	29%
(b) Banks/Financial institutions	26%
(c) Money managers	21%
(d) Pension funds	16%
(e) Insurance funds	8%

For the issued CLO, the composition of the RM570m security portfolio is comprise of:

Industries	%
Property loans	59.5
Automobile loans	11.2
Health care & pharmaceutical loans	6.2
Building material loans	3.6
Others (industrial, consumer, finance etc)	19.5
Total	**100.0**

The table below shows the composition of the security portfolio:

	%
Term loans	52
Revolving credit	14
Omnibus	33
Overdrafts	1
Total	**100**

Danaharta has used the ABS issue as part of its programme to restructure its non-performing loans. Danaharta may also use foreign denominated ABS to securitise its foreign non-performing loans amounting to US$1billion.

Affin Bank Bhd.

In November 2002, Affin Bank Bhd, acting as the originator, advisor and lead arranger, has arranged the largest CLO deal in Malaysia amounting to RM1billion. The securitisation raised new loans for a group of medium size listed companies from 16 different industries. The amount of loan borrowed by the listed companies range between RM25 million to RM50 million. The minimum credit rating of the 25 companies is BBB.

The special purpose vehicle, Aegis One Bhd, issued RM900 million AAA-rated senior bonds and RM100 million Junior bonds. The investors are banks, institutions and fund managers. The AAA-bonds carry a coupon rate of 5.2% and the Junior bonds would carry a variable coupon rate depending on credit rating.

Table 3: Collaterised loan obligations by Affin Bank Berhad to selected companies

MAIN BOARD (KLSE)	SECTOR	AMOUNT RAISED	TENURE	PURPOSE OF LOAN
TNTT	Trading/Services	RM50m	5 years	Expansion of container haulage and logistics business
Ireka	Construction	RM40m	5 years	
Hunza Property	Property	RM40m	5 years	For working capital purposes
SECOND BOARD (KLSE)	**SECTOR**	**AMOUNT RAISED**	**TENURE**	**PURPOSE OF LOAN**
Harrisons	Trading	RM40m	5 years	For investment & working capital
PJI Holdings	Trading/Services	RM50m	5 years	To provide additional funds for working capital and future investment opportunities
WCT	Construction	RM50m	5 years	For investment & working capital
Elba Holdings	Consumer	RM45m	5 years	For future business expansion & working capital
Malaysian AE Models	Industrial Products	RM40m	5 years	To reduce short-term borrowings and provide for sufficient working capital
Britac	Trading	RM45m	5 years	For working capital and business expansion

Asset backed securitisation

Sunway City Berhad (Suncity) has undertaken the disposals of six investment properties including plant & machinery and its lease rights and redeemable preference shares of RM892 million to ABS Real Estate Berhad (AREB), a special purpose and bankruptcy remote vehicle, under an asset backed securitisation (ABS) exercise (refer Table 4). Suncity will receive a sale consideration comprising cash and Subordinated Class D Notes from AREB. The Subordinated Class D Notes will be redeemed upon the maturity of the ABS notes.

Table 4: Details of the disposals by Sunway City Berhad

Properties & shares	Types of property/ Share	Built up area (sq.ft.)	Cash RM'000	Subordinated Class D notes RM'000	Total RM'000
Sunway College	Education College	704,529	61,600	73,400	135,000
Sunway Lagoon Resort Hotel	Hotel	1,050,463 (441 rooms)	121,464	218,536	340,000
Sunway Hotel Penang	Hotel	192,382 (240 rooms)	10,305	29,695	40,000
Sunway Hotel Seberang Jaya	Hotel	167,621 (208 rooms)	10,058	31,942	42,000
Menara Sunway	Office	654,783	52,894	72,106	125,000
Sunway Lagoon Theme Park assets & rights	Assets & rights on Resort	-	69,846	21,697	91,543
Sunway Pyramid Preference shares	Preference share	-	108,833	9,240	118,073
TOTAL			**435,000**	**456,616**	**891,616**

AREB issued Ringgit denominated senior ABS notes to investors in the Malaysian debt capital market to finance the purchase of the properties and shares from Suncity.

Suncity raised RM435 million under the ABS exercise. In addition, Suncity will issue commercial paper and medium term notes to raise RM250 million for the repayment of existing debts and for working purposes.

The ABS exercise is a landmark property deal as it involves the largest property and asset sale by a single corporation in Malaysia. This is also the first ABS that is backed mainly by property assets.

AREB has also undertook a sale and leaseback arrangement by granting operating leases to Suncity to operate the investment properties for 35 years and the theme park for 10 years. Suncity will have the option to purchase back the properties by the end of year 5.

The ABS issue involved the issuance of the Senior and Subordinated notes (refer Table 5). The ABS Notes is secured against the investment properties and shares, lease payments and redemption and dividends of the preference shares.

Table 5: Types of Notes issued

Types of Notes	Coupon rate (%)	Amount
Class A	5.250	RM120 million
Class B	5.750	RM330 million
Class C1	8.000	
Class C2	7.875	
Subordinated Class D Notes	20.000	RM457 million
TOTAL		**RM907 million**

Sunway City Berhad had undertook the securitisation exercise for the following reasons:

(a) to enable the company to obtain a fair sale price for the properties owned;
(b) to enable the company to continue to enjoy productive use of the properties by a sale and leaseback option;
(c) to reduce gearing of the company, enhance earnings per share and other performance ratios of the company;
(d) to raise funds for working capital and expansion of the company's property development business at a lower cost.

In mid-August 2003, another two companies of the Sunway Group i.e. Sunway Holdings Ins. Corp. Bhd and Sunway Construction Bhd, have undertaken another real estate asset backed securitisation. The securitisation will involve the disposal of properties and companies owned by Sunway Holdings for RM185 million and Sunway Construction will also dispose properties for RM55 million. The Sunway Holdings disposal will be satisfied by RM108 million Subordinated Class ABS Notes and RM77 million. Sunway Construction will receive RM32 million Subordinated Class ABS Notes and RM23 million cash.

The Sunway companies have undertaken the securitisation route for the following reasons:

(a) To realise immediate cash proceeds of RM100 million to repay borrowings;
(b) To convert non-core property assets into cash;
(c) To fetch a reasonable price for the disposal of non-core property assets;
(d) To achieve lower gearing and interests savings.

In addition to the real estate asset backed securitisation, the exercise involved also an issuance of RM350 million five-year unsecured bonds by Sunway Holdings. The fund raised from the bond will enable Sunway Holdings to redeem its outstanding US$ denominated bonds. The impact of the bond issue is to eliminate foreign exchange exposure and to change from short term revolving credit facilities to a five year fixed rate bond.

Table 6: Terms of the ABS Notes by Sunway Group of Companies

Terms	Sunway City Bhd	Sunway Holdings Ins. Corp. Bhd Sunway Construction Bhd
SPV/Issuer	ABS Real Estate Bhd (AREB)	ABS Land & Properties Bhd (ALP)
Arranger/Lead manager	Deutsche Bank (Malaysia) Bhd	Deutsche Bank (Malaysia) Bhd
Mode of issue	Private placement	Private placement
Date announced	16.5.2002	15.8.2003
Primary subscriber	Deutsche Bank (Malaysia) Bhd	Deutsche Bank (Malaysia) Bhd
Facility description	ABS notes issued via an asset backed securitisation comprise (a) Senior Class A, B, C1 and C2 Notes and (b) Subordinated Class D Notes. Only Class A, B, C1 and C2 Notes will be distributed to investors	ABS notes issued via an asset backed securitisation structure.
Issue size	Senior Class A RM120 m Senior Class B, C1 and C2 RM330m	RM240 million
Legal maturity date	6 years from the date of issue of the ABS notes	6 years from the date of issue of the ABS notes
Coupon rate	**Senior Notes** **Coupon (%)** Class A 5.250 Class B 5.750 Class C1 8.000 Class C2 7.875 **Subordinated Notes** Class D 20.000	To be determined
Coupon frequency	Semi-annual based on actual/365 days	Semi-annual based on actual/365 days
Redemption	**Senior ABS Notes** Mandatory redemption on legal maturity date Early redemption possible by Suncity. **Subordinated notes** Can only be redeemed after all outstanding principal and interests have been fully repaid.	Up to 6 years from the date of issuance of the ABS Notes
Status of the ABS Notes	Secured against properties, shares, lease payments on the properties and redemption and dividends of the redeemable preference share	Secured against properties, shares and rental payments on the properties
Listing	Will not be listed on the KLSE	Will not be listed on the KLSE

Synthetic securitisation

Synthetic securitisation is not strictly asset securitisation as there is no true sale of assets by the company to a special purpose vehicle. Synthetic securitisation may involve whole business or operating revenue securitisation where the business of the company is seen as a series of cash flows. A company is able to achieve better credit ratings by credit enhancements and structuring of the cash flows.

Nomura Securities has completed a US$250 million deal for a whole-business or operating-revenues securitisation involving a high technology business in June 2001. The securitisation involved the securitisation of First Silicon, the first wafer foundry in Malaysia located in Kuching, Sarawak.

Initially, the plant will be funded by syndicated bank credit, and upon production it will be refinanced by securitisation. The bonds will be backed by sale revenues of the wafers.

Issues constraining growth of ABS

Various tax and accounting issues exist that prevent securitisation to take off in a big way in Malaysia:

(a) absence of tax incentives for asset securitisation and lack of support from tax legislation. For example how is the income derived by the SPV will be treated by the tax authority.

(b) Lack of clarity on accounting issues

(c) Markets reluctance in accepting papers rated below AA

(d) Absence of tax incentives – Without tax neutrality, securitisation may lead to additional tax burdens for originators. Among the tax issues pertinent to the originator is the transfer of assets under securitisation transactions that include determining the disposal price and gain or loss on the sale or receivables and other assets to special purpose vehicles and the treatment of lump sum receipts from sale of future receivables (and other assets).

(e) Excess domestic liquidity has made borrowing cheaper in the domestic market.

(f) Financial institutions are governed by the Banking and Financial Institutions Act and comes under the purview of Bank Negara Malaysia (BNM). A new guidelines on securitisation is required to be prepared by BNM for financial institutions to get involved in ABS.

Current development and future potential

The Securities Commission, Finance Ministry and the Inland Revenue Board are currently in discussions to formulate a set of tax treatments that would provide a tax neutrality framework for asset securitisation transactions.

Securities Commission are also working on accounting and other regulatory issues.

The Malaysian Accounting Standards Board will study and clarify appropriate accounting treatment applicable for securitisation transactions.

Bank Negara Malaysia is also looking into coming out with guidelines for financial institutions to be involved in securitisation. In particular, risk management requirements, capital requirement, provision of credit enhancement and liquidity facilities.

Assets owned by the banking sector is among the biggest in Malaysia. Mortgages owned by banks amount to RM79 billion, corporate bonds RM66 billion, hire purchase RM40 biilion and credit card RM7.6 billion in 2001. ABS is expected to grow once financial institutions are allowed to securitise their mortgages.

Conclusion

It is hope that with the efforts put in to remove the tax and accounting impediments, a more efficient and facilitative framework will be created to facilitate the development of securitisation in Malaysia. Given time, asset securitisation will emerge as a viable and significant source of competitive financing for the corporate sector in Malaysia.

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Glossary

Bankruptcy remote – A descriptive term for an entity that has been created and structured to prevent any party attempting to its winding-up.

CBO - Collaterised bond obligation is a bond issued against a pool of bond assets or other securities.

CLO - Collaterised loan obligation is a bond issued against a pool of bank loan assets.

CMO – Collaterised mortgage obligation is a form of bond which comprises several classes of bond issued against a pool of mortgage assets.

Senior debt – Debt ranking in order of priority prior to subordinated debt for repayment purposes.

Senior notes – Senior debt issued in the form of notes.

Serial bonds – These are corporate bond issues structured in such a way that specified principal amounts become due on specified dates.

Subordinated debt – Debt which is subject to subordination to senior debt in order of priority of repayment.

Subordinated notes – Subordinated debt issued in the form of notes.

Subordination – The ranking of debts owed to one creditor behind debts owed to another creditor.

The Mediating Effects Of Attitude On The Relationship Between Housing Characteristics And Housing Satisfaction: A Case Study On Penang Development Corporation (PDC)

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Abstract

This study attempts to improve understanding of the determinants of housing satisfaction among the residents of Penang Development Corporation (PDC)'s development projects. The population being studied involves residents of 21,123 housing units sold by PDC. Two types of measures have been combined in this study: the objective measures representing the housing characteristics and the cognitive measures of attitude such as perceptions on housing and neighbourhood environment. The mediating effects of attitude have been examined based on the Baron and Kenny (1986) model. The results of this study revealed that neighbourhood safety and neighbourhood social interaction fully mediate the relationship between project type and housing satisfaction. Furthermore, neighbourhood social interaction also fully mediated the relationship between length of residency and housing satisfaction.

Keywords: Housing characteristics, housing satisfaction and neighbourhood attitude.

Introduction

PDC is a semi-government body, established by the State Government of Penang on November 17, 1969 to initiate, plan, implement and promote socio-economic development projects for the benefit of the people. Its main activities include property development, development of industry, commerce, trade and tourism, development of industrial parks and undertaking the land reclamation work.

With evidence of strategic links between satisfaction and the overall firm performance (Anderson, Fornell & Lehmann, 1992; cited in Fournier & Glen Mick, 1999), it is now common to find mission statements designed around the satisfaction notion and incentive programs that target satisfaction as a goal. Hence, with its mission "to be a premier corporation in property development, investment, consultancy and tourism towards satisfying customer needs", PDC is no exception. Residential unit buyers represent the main bulk of the PDC customers and this group will be the focus in this research study. The concept of housing satisfaction has been used as an ad hoc evaluative measure for judging the success of housing developments constructed by the public sector and private sector. According to Shapiro (1973), the overall success of a non-profit organisation can be measured only in terms of the attainment of goals related to client satisfaction.

The overall objective is focused on assessing the mediating effect of housing & neighbourhood attitude (namely, perception on housing physical structure, neighbourhood safety and social interaction) on the relationship between the independent variables (that is, housing characteristics) and the dependent variable (housing satisfaction).

Thus, the following hypothesis have been formulated to test the relationship.

(i) <u>Project Tpye:</u>

H1a *There is a positive relationship between Project Type and Perception of Housing Physical Structure.*

H1b *There is a positive relationship between Project Type and Confidence With Neighbourhood Safety*

H1c *There is a positive relationship between Project Type and Neighbourhood Social Interaction/Network*

(ii) <u>Price Of House:</u>

H2a *There is a positive relationship between House Price and Perception of Housing Physical Structure.*

H2b *There is a positive relationship between House Price and Confidence With Neighbourhood Safety*

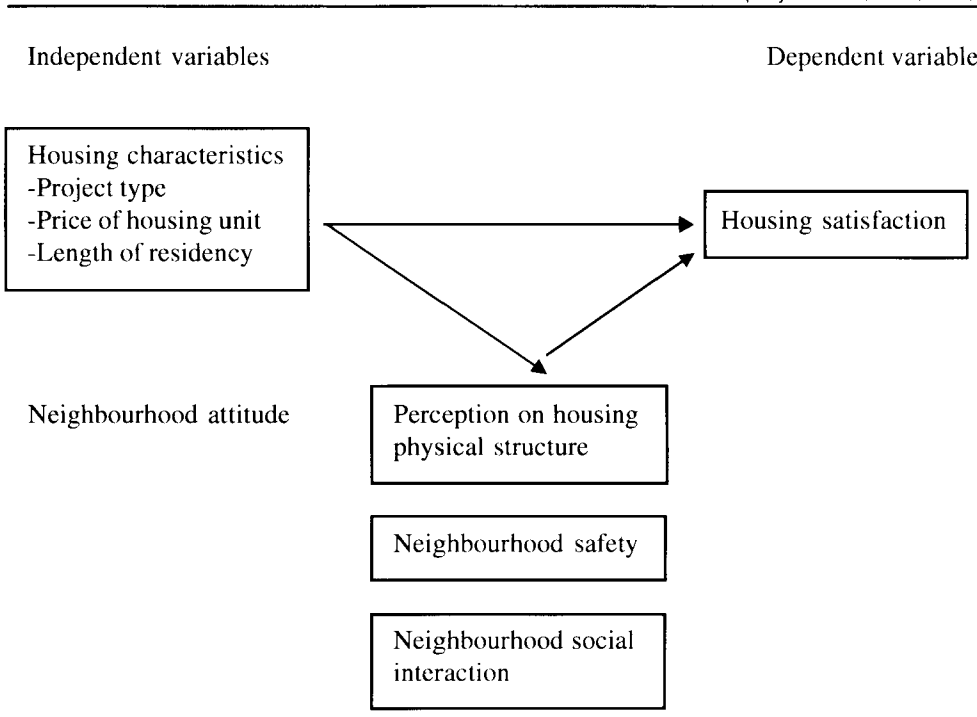
H2c *There is a positive relationship between House Price and Neighbourhood Social Interaction/Network*

(iii) Length of Residency:

H3a *There is a positive relationship between Length of Residency and Perception of Housing Physical Structure.*

H3b *There is a positive relationship between Length of Residency and Confidence With Neighbourhood Safety*

H3c *There is a positive relationship between Length of Residency and Neighbourhood Social Interaction/Network*



LITERATURE REVIEW

Housing satisfaction is defined by Galster (1987, p.93; cited in Varady & Preiser, 1998) as the "perceived gap between a respondent's needs and aspiration and the reality of the current residential context". McCray and Day (1977) refers housing satisfaction to the degree of contentment experienced by an individual or a family member with regard to the current housing situation. Housing satisfaction is a complex attitude (Satsangi & Kearns, 1992). It encompasses satisfaction with the dwelling unit and satisfaction with the neighbourhood and the area (Onibokun, 1974). According to Ogu (2002) the concept of housing or residential satisfaction is often employed to evaluate residents' perceptions of and feelings for their housing units and the environment.

There is considerable evidence in the literature that shows that housing satisfaction is influenced by a broad array of objective and subjectively perceived conditions (Theodori, 2001). Habitability of a house, according to Onibokun (1974), is influenced not only by the engineering elements, but also by social, behavioural, cultural, and other elements in the entire societal-environmental system. The house is only one link in a chain of factors that determine people's relative satisfaction with their accommodation.

It is in the nature of housing...that the immediate physical environment and the society about the household qualifies the kind of enjoyment which the household can expect from its dwelling. The appearance of neighbouring houses, the activities of neighbours, and the reputation of the neighbourhood...may add to or detract from the ultimate housing satisfactions...(Smith, 1970; p.26).

According to Francescato, *et al,* (1987), two aspects of variables considered by a study of residential satisfaction should be examined: First; the relative importance of predictor variables in accounting for the variation in overall satisfaction and second; the degree to

which the same predictor variables, taken together, explain the variation in overall satisfaction. Housing satisfaction in this sense becomes a criterion variable, and all components, aspects, factors, dimensions, or variables of a study should be examined for their ability to predict variation in the criterion.

Overall, the concept of housing does not lie on the individual's dwelling. It is a composite of the overall physical and social components that makeup the housing system (Francescato, *et al,* 1987). Further, housing satisfaction is influenced by the numerous components in the system and the background characteristics of the occupants. Factors that have been found related to housing satisfaction include: length of residency (Brown, 1993; Marans & Rogers, 1975; cited in Theodori, 2001; Varady & Preiser, 1998), housing physical characteristics (Kaya & Feyzan, 2001; Yeh, 1972), satisfaction with housing physical condition and management services (Varady & Carrozza, 2000), social participation and interaction (Mohd Zulfa, 2000; Varady & Preiser, 1998) and past living conditions as well as residential mobility and future intention to move (Morshidi, *et al.,* 1999; Yeh, 1972). Those studies have combined both the objective measures such as demographics and physical characteristics of housing developments and the cognitive measures (such as perceptions and beliefs of residents about the physical environment).

RESEARCH METHODOLOGY

The Unit of Analysis and Population

The unit of analysis in this study is the residents of PDC's housing projects. They include PDC's housing buyers (owners) and tenants (renters). The population being studied involves the residents in 21,123 housing units sold by PDC in various locations in Penang.

Development of the scale item

Housing Characteristics

Prior research has shown that it is important to contextualise information on housing satisfaction by examining expected differences by development type, such as high-rise and landed (Popkin and Olson, 1995). PDC's housing development projects come in various characteristics such as in terms of type, size and price. These characteristics will be individually examined and analysed in relation to their contributions towards housing satisfaction.

Project Type

We expect the residents in landed property to be more satisfied with their house than those in high-rise because they generally have more space and privacy as compared to those in high-rise. Aspects of privacy have been used in Yeh (1972) and Ogu (2002) in their measures of housing satisfaction. For the purpose of our study, cluster type will be combined with landed type because of its structure, which is the same as landed.

Price of Housing Unit

PDC's housing development is categorised into five different classes according to the unit price as stipulated in Table 1. We expect that residents of a higher cost project will be more satisfied with their home than those of the lower costs. Residents of the higher cost projects are presumed to get a better housing environment, both in terms of physical structure and social environment. According to Andrews and Whitney (1976; cited in Ogu, 2002), residents' perception of their environment defines the quality of their lives. Housing satisfaction in turn is a predictor of an individual's perceptions of general quality of life (Campbell *et al,* 1976; cited in Djebarni and Al-Abed, 2000). Thus, for the purpose of our study, we will differentiate the low and low-medium cost projects from the other classes of development (medium and high costs).

Table 1: Project Class and Price Range

Class	Price Range
Low Cost	RM25,000 and below
Low-Medium Cost	Between RM25,001 and RM50,000
Medium Cost	Between RM50,001 and RM100,000
Medium-high costs	Between RM100,001 and RM150,000
High cost	More than RM150,000

Length of Residency

Tenure or length of residency could affect satisfaction with a dwelling unit (Ogu, 2001). According to Varady and Preiser (1998), long-term residents (that is, those who lived at their locations for six years or more) will have stronger social ties to their area and this will make them more satisfied with their homes. Therefore, based on the guideline of Varady and Preiser (1998), we will group our residents into those who have lived in their dwelling for six years or more from those who have stayed for less than six years. With these criteria, we will examine their relationships with housing satisfaction.

Neighbourhood attitude

Intervening variables in this study, representing attitudes towards housing and neighbourhood are also the independent variables for housing satisfaction. The variables were selected from past studies including Djebrani and Al-Abed (2000), Mohd. Isa *et al,* (1999), Mohd. Zulfa (2000), Tan and Hamzah (1979), Varady and Carrozza (2000), Varady and Preiser (1998), Varady, Walker and Wang (2001) and Yeh (1972).

Perception on Housing Physical Structure

Prior researchers (see for example: Mohd. Isa, *et al.,* 1990; Mohd. Zulfa, 2000; Ogu, 2002; Tan & Hamzah, 1979; Yeh, 1972) have included housing physical structure as one of their measures of housing satisfaction. Factors such as housing design, built-up area and position of bedroom, kitchen, bathroom and toilet, ventilation, sunlight, corridor and housing compound and building material have been included to make up the physical/ structure of a house that affect the householders' satisfaction towards their houses. As for the perception on housing structure, that the objective standard, largely physical structure of the dwelling forms one of the major components to define satisfaction (Smith, 1970). These structure attributes could be regarded as "shelter" as proposed by Orville (1943; cited in Mohd. Isa *et al,*1990). To measure the variable on objective standard or physical structure of housing, a straightforward Yes/No scale has been used to identify whether the items representing housing structure meet or does not meet the requirement of the householders.

Confidence with Neighbourhood Safety

Another condition that is expected to influence housing satisfaction is the neighbourhood safety. This variable will measure residents' safety in their home during night and safety on the streets near their home during the day (Mohd Isa *et al,* 1999; Mohd Zulfa, 2000; Varady & Carrozza, 2000) as well as safety of the residents from vehicles taking into account the surrounding streets, parking lots and pedestrian walkways (Djebarni & Al-Abed, 2000).

To measure safety, we will adopt the classification of index crimes that are being

used by the Chicago Police Department, the Singapore Police Force and the Malaysia Police Department (Polis Diraja Malaysia). In general, the police departments classify the index crimes into violent crimes and property crimes. Violent index crimes are those committed directly against a person, such as robbery and aggravated assault/battery. Whereas property index crimes are those in which there is no direct threat or harm to a person, such as theft and burglary (Chicago Police Department). We assume that the more serious the incidents of crimes in the neighbourhood perceived by the residents, the less confident would they feel with their safety and the less satisfied would they be with their houses. On the other hand, the more confidence the residents feel about their safety in the neighbourhood, the more satisfied would they be with their houses. Confidence on safety includes safety in the house during the day and at night as well as safety from vehicles (which was measured by incidents of "reckless driving"). The 7 point-Likert scale used from very serious to not serious at all.

Perception on Neighbourhood Social Interactions

Vale (1997) has pointed out that, one reason that public housing residents tend to be satisfied with their homes is that they have strong social networks. Residents are able to turn to neighbours during times of need. Yeh (1972) has described this as neighbourliness. Filkins, Allen and Cordes (2000), in studying community satisfaction felt among rural Nebraskans have found that respondents express more satisfaction with communities that they regard as being friendly, trusting and supportive. Their findings have also revealed that the social aspects of a community (social ties) and satisfaction with social/spiritual factors seem to be important determinants of community satisfaction. Other researchers in Malaysia, for example Mohd. Isa *et al,* (1999) and Mohd Zulfa (2000) have also included the extent of social network in their studies to determine levels of housing satisfaction. Thus, we expect that residents who has developed and relied upon a strong network would be more satisfied with their homes than those who are not. In our study, to measure social interaction, we will adopt the measures of the psychological sense of community developed by Nasar and Julian (1995). The same scale, a 7-point numerical scale anchored with "strongly disagree"(1) to "strongly agree"(7) was used to measure social interaction.

Housing Satisfaction

This study adopted the measures of housing satisfaction from Djebarni and Al-Abed (2000), Mohd Zulfa (2000) and Ogu (2002), a likert scale that ranges from 1 ("Very Dissatisfied") to 5 ("Very Satisfied").

ANALYSIS

Response Rate

Of the 550 questionnaires administered 223 were collected back. 9 questionnaires were found incomplete warranting their exclusion from the study. Hence only 214 usable questionnaires, representing a return rate of 38.9%.

Regression Analysis

Multiple regression analysis was conducted to predict the relationships between the independent variables and the dependent variable and the relationships between the independent variables and the intervening variable. Simple regression analysis was performed to ascertain the relationship between each of the intervening variable representing attitudes towards housing and neighbourhood and independent variable. The results of both regression analysis were also used to ascertain whether intervening variables exert mediating effects in the model using the procedures and conditions stipulated by Baron and Kenny (1986).

Relationships Between Independent Variables and Dependent Variable

Table 2 shows the relationships between Length of Residency, Project Type, Price of House and the independent variable, Housing Satisfaction. The F-value of 7.17 is significant at <0.01. R2 value of .093 indicates that only about 9.3% of the variations in the dependent variable can be explained by the independent variables jointly.

Table 2: Relationship between independent variables and dependent variable

Independent Variables	Beta Coefficients (β)
Project Type	0.186**
Price of House	0.175**
Length of Residency	0.145*

Relationship Between the Intervening Variables and Dependent Variable

To further examine the types of relationship that they have with the dependent variable, another regression analysis is conducted to examine variables representing attitudes towards housing and neighbourhood that have a significant relationship with housing satisfaction. The results of the regression have been summarised in Table 3.

Table 3: Results of Regression Analysis on Relationship Between the Intervening Variables and Dependent Variable

Perception	R2	Beta Coefficients
Housing Physical Structure	0.399	0.239**
Confidence With Neighbourhood Safety		0.234**
Neighbourhood Social Interaction/Network		0.490**

** Significant at p<.01

Relationship between the Independent Variables and the Intervening Variables

A set of regression analysis used to determine the relationships between the three independent variables and the three intervening variables (namely: perception on housing physical structure, neighbourhood safety and social network).

Table 4 shows that Project Type and House price are found to have a significant relationship with Perception on Housing Physical Structure at p<0.01 and p<0.05 respectively. Both Project Type and House price also have a significant relationship with neighbourhood safety at p<0.01 level. Besides that, length of residency and project type are found to have a significant relationship with neighbourhood social interaction at p<0.01.

Table 4: Relationship between Independent Variable and Intervening Variables

Independent variables	*Intervening variables*		
	Perception on housing physical structure(β)	*Neighbourhood safety*(β)	*Neighbourhood social interaction* (β)
Project Type	*-0.319***	*0.287***	*0.201***
Price of House	*0.145**	*0.218***	*0.033*
Length of residency	*0.071*	*0.044*	*0.239***

** Significant at p<.01
* Significant at p<.05

Each of the intervening variables that have a significant relationship with one or more of the independent variables will now be examined to ascertain whether there are any mediator effects of the particular intervening variable on the relationship between independent variables and the dependent variable. The results are shown as in Table 5.

Table 5: Summary of hierarchical regression between independent variables and dependent variables on housing and neighbourhood attitude.

	Perception on housing physical structure(β)		Neighbourhood safety(β)		Neighbourhood social interaction (β)	
	Before	After	Before	After	Before	After
Project Type	*-0.319***	0.255**	*0.287***	0.069	*0.201***	0.063
Price of House	*0.145**	0.134*	*0.218***	0.088	*0.033*	0.143
Length of residency	*0.071*	0.138*	*0.044*	0.147*	*0.239***	0.034
Perception on housing physical structure		0.241**				
Neighbourhood safety				0.363**		
Neighbourhood social interaction						0.505**

** Significant at p<.01
* Significant at p<0.05

Table 5 summarises the results of the hierarchical regression of the independent variables, perception on Housing Physical Structure, neighbourhood safety and neighbourhood social interaction and Housing Satisfaction. As presented in the table, the R^2 value for both models 1 and 2 with Housing Satisfaction as dependent variable is 12.5% and 14.5.0% respectively, with F values which are statistically significant

($p<.01$). The results indicate that Perception on Housing Physical Structure partially mediate the relationship.

With reference to Table 5, the Project Type's and House Price's beta coefficient for model 2 is significantly reduced, while it's still significant indicating a partial mediator effect of Perception on Housing Physical Structure on the relationship between House Price and Housing Satisfaction. Our hypothesis **H1a and H2a** is therefore partially supported.

As for neighbourhood Safety and Housing Satisfaction, the R^2 value for both models 1 and 2 with Housing Satisfaction as dependent variable is 13.2% and 20.8% respectively, with F values which are statistically significant ($p<.01$). The R^2 change is 7.6% and a calculated F change value of 13.59 is also statistically significant ($p<.001$). The results indicate that Confidence with Neighbourhood Safety does provide additional explanatory power to the variation in the dependent variable, Housing Satisfaction. With reference to Table 5, both Project Type and House Price's regression coefficient for model 2 are not significant ($h = 0$), indicating a full mediator effect of Confidence With Neighbourhood Safety on the relationship between the independent variables and Housing Satisfaction. There is therefore validity for our hypotheses **H1b** and **H2b**, confirming the indirect positive relationship (through Confidence With Neighbourhood Safety) between Project Type and House Price, and Housing Satisfaction.

For Perception on Neighbourhood Social Interaction, the R^2 value for both models 1 and 2 with Housing Satisfaction as dependent variable is 11.6% and 31.4% respectively, with F values which are statistically significant ($p<.01$). The R^2 change is 19.8%. The results indicate that Perception on Neighbourhood Social Interaction does provide additional explanatory power to the variation in housing satisfaction. The beta coefficients for Project Type and Length of Residency in model 2 are not significant ($h = 0$), indicating a full mediator effect of Perception on Neighbourhood Social Interaction on the relationship between the variables and Housing Satisfaction. There is therefore validity for our hypotheses **H1c** and **H3c** confirming the indirect positive relationship (via Perception on Neighbourhood Social Interaction) between Project Type and Length of Residency and Housing Satisfaction.

Summary

Upon examining the mediating effects of the intervening variables on the relationship between independent variables and dependent variable, the results indicate that, apart from providing additional explanatory power to the variation in the dependent variable, these intervening variables have also exerted a mediating effect on the relationship of independent and dependent variables.

DISCUSSION AND CONCLUSION

Project Type and Housing Satisfaction

The multiple regression analysis indicates that type of project was a significant predictor of housing satisfaction, supporting our hypothesis that landed residents are more satisfied with their house than those of high-rise. However, Project Type alone does not explain the customers' housing satisfaction. This is evidenced by our findings on the full mediating effects of the residents' attitudes towards their Neighbourhood Safety. However, the relationship between type of project and housing satisfaction was partially mediated by residents' perception on housing physical structure.

It is also useful to note that the relationship between Project Type and Perception on Housing Physical Structure was negative (Table 4), indicating that landed residents perceived the physical structure (which was measured by house design, ventilation, size and position of bathroom, bedroom and so on) of their houses as less meeting their

requirements than that of high-rise residents. Based on these results, we can conclude that even though high-rise residents perceived their housing units to have a better physical structure in terms of design, positions of bedroom and so on, landed residents are more satisfied with their housing (than that of high-rise) through their better perceptions on the neighbourhood environment. First, landed residents perceived their neighbourhood physical and social environment to be better than did high-rise residents. Second, landed residents feel more secured in terms of their safety in the neighbourhood; third, they perceived that they have better amenities in their neighbourhood and lastly, landed residents perceived that they have a stronger neighbourhood social ties or network as compared to that of high-rise. On the other hand, high-rise residents were less confident with their nighbourhood physical and social environment and safety (which had been measure by factors such as graffiti, litter/trash, noise from neighbours, housebreaking, theft and so on). In addition, they also perceived that their social network is not as strong as those in landed and that they have fewer amenities (facilities such as place of worships, transportation and so on) than that of landed.

Our findings above have been inline with previous studies of high-rise public housing whereby the main dissatisfactions (even though in general the respondents were satisfied with their housing) reported by the residents under study, were those matters pertaining to social and safety conditions as well as neighbourhood amenities. For example, in Tan and Hamzah (1979) - a study that included satisfaction of residents in Riffle Range flats, Kampung Melayu flats and a few other low cost flats in Penang, the residents had reported the following dissatisfactions with their flats:

- Noise level due to closeness of the blocks (45 feet apart, as the case of Riffle Range, whereby the minimum distance should be about 60 feet);
- Cleanliness of the area;
- Personal Safety;
- Non-availability of trishaw, which was a popular, individualised, cheap mode of transport in Penang (at that time – even though it is slower than bus);
- Distance between the flats and the city and to work
- Distance between the flats and medical facilities

House Price (Class of Project) and Housing Satisfaction

Residents of the higher cost projects were presumed to get a better housing, both in terms of physical and social environment. As noted by Smith (1970),"...the physical appearance of the neighbourhood – trees and grass belonging to prospective neighbours, the view obtained from the house in question...are also part of the housing 'package'.."(p8).

Based on our results of multiple regression analysis, we found that price of the housing unit was a significant predictor of housing satisfaction, supporting our hypothesis that residents of a higher cost which, in this study includes the medium and high cost classes are more satisfied with their houses than those of a low and low-medium cost projects. However, the influence of House Price has been mediated by the residents' perception on the housing physical structure, which was a partial mediator (in the relationship) and the neighbourhood safety, that have fully mediated the relationship (between House Price and housing satisfaction). These findings indicate that the high satisfaction of high cost residents has been partly influenced by their perceptions on housing physical structure. Whereas, the full mediator effects suggested that the high satisfaction of the high cost residents were fully influenced by the neighbourhood physical/social condition and safety. The high cost residents, as compared to that of the low cost perceived that their housing physical structure is better

and that they have had a better neighbourhood environment in terms of physical, social and safety condition and this made them more satisfied with their housing.

Length of Residency and Housing Satisfaction

Our findings revealed that housing satisfaction is also influenced by the duration or the number of years the residents has stayed in the housing location. Six years has been the cut-off duration in this study, based on Varady and Preiser (1998) that proposed that long-term residents, those who lived at their locations for six years or more will have stronger social ties to their areas and this will make them more satisfied with their homes. That findings was supported by Ogu (2001).

Our findings have also been inline with that of Varady and Preiser(1998) as well as Ogu (2001), whereby, Length of Residency was found to be fully mediated by Neighbourhood Social Interaction. In Varady, Walker and Wang (2001), - a study of relocation of public housing's voucher receipients, it was found that many of the respondents or voucher receipients have chosen to stay in the same area of the public housing neighbourhood. These findings, according to Varady, Walker and Wang (2001), reflected that voucher recipients sought to remain in or close to their original neighbourhood to be near to friends and relatives and familiar bus lines. This was reflected in our study whereby, those residents who stayed in their locations for six years or more perceived that they have a good neighbourhood amenities (which were measured by transportation, clinics, schools and so on) and this has made them more satisfied with their housing than those who had stayed for less than six years.

IMPLICATIONS AND RECOMMENDATION

With regards to the general satisfaction of PDC's housing customers, although the overall level of satisfaction was found to be above average, there are still rooms for improvements. For example, in terms of housing physical structure of landed property, it would be worthwhile to look into those items which received high percentages of unfavourable response, such as housing designs, size of kitchen and bathroom and etc. Same goes to high-rise type of projects that recorded high proportion of unfavourable responses in terms of availability and size of drying area. Further, with regards to residents' perception on neighbourhood, factors such as neighbourhood social interaction exerted the highest influence on housing satisfaction. Greatest implication would be on the part of planning especially for future development projects that would be undertaken by PDC. Factors such as access roads, transportation and so on would be a very important factor that requires close attention.

Another important finding that would require close attention in the part of not only PDC but also of other local authorities is on level of satisfaction attained by those residents of the low and low medium cost as opposed to those of the medium and higher cost projects. Our results indicated that the medium and high cost residents were more satisfied with their housing as compared to those of the low and low medium costs because (partly) they perceived that they have a better housing physical structure and neighbourhood environment in terms of the physical and social conditions and safety. Henceforth, in line with the PDC's fundamental objective in housing policy of providing for the housing needs of the Penang State's population particularly among the low and medium income groups, these findings would suggests that PDC, together with the relevant authorities look into these matters particularly on the socio-economics of the low cost residents.

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