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Purchase Intention of Apartments in a Metropolitan Area in Vietnam: The Mediating Role of Attitude Toward Behavior

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This study aims to investigate the intention to purchase an apartment to better understand the actual situation of the real estate market in the metropolis areas of Vietnam, like Ho Chi Minh City. Eight constructs are identified based on extending the theory of planned behavior (TPB), and eight hypotheses are proposed. A questionnaire is conducted with buyers of apartments which provided a total of 517 responses for a data

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analysis with the structural equation model in Bloemer and Kasper (1995), and used to validate the proposed hypotheses. Attitude toward behavior (ATB) is found to be the most important determinant, followed by subjective norms and perceived behavioral control. In addition, project facilities, location, environmental issues, and price and credit have positive effects on ATB and indirect effects on behavioral intention through ATB. Meanwhile, the relationship between physical quality and ATB is insignificant. Thus, ATB plays an important role in enhancing the purchase intention of buyers of apartments at this stage. The findings of the study have valuable implications for the government and real estate developers in order to meet consumer demand. Besides, the competitiveness and sustainability of the real estate industry in Vietnam might be enhanced through practical activities.

Keywords

1.   Introduction

Ho Chi Minh City is the largest urban area in Vietnam in terms of population and urbanization scale (population of more than 9 million people, and about 80% of the population lives in urban areas (General Statistics Office, n.d.). According to a survey done by the Ho Chi Minh City Department of Construction, nearly a quarter of the total number of households within the region in 2019 do not own their own house (Bùi, 2019). Due to the scarcity of land funds, apartments might be the best solution to meet the housing needs of residents who live in a city with a rapid population growth rate. Besides the rapid urbanization process, the price of land and single houses has increased. However, high risks still exist in buying land and already-built houses because of the remarkable decrease in income affected by the economic crisis, COVID-19 pandemic, etc. These risks have changed the attitude of Ho Chi Minh City residents in purchasing houses. Now, Ho Chi Minh City residents prefer to buy available apartments from real estate developers (hereinafter enterprises) rather than buy land to build houses.

The real estate market in Ho Chi Minh City is experiencing a housing supply shortage, especially affordable commercial housing (affordable housing). This type of housing meets the real needs of the majority of middle-income and urban low-income people. Even though the whole demand is significant, the lack of supply means that apartment prices have increased continuously for

more than five years (the price of apartments on average has increased by more than 10% each year (Vũ, 2019). Since 2020, the imbalance in both supply and demand of the housing market along with an imbalance in the high-end apartment sector have been evident, with affordable apartments comprising 1% of the new housing supply in 2020 and none in 2021, while luxury apartments comprise 74% of the housing supply (HoREA, 2021, January 8). Although the supply of apartments has decreased, the apartment inventory has increased with significant housing demand; hence, there is stiff competition in the market among enterprises to consume shared apartment inventory (CBRE, 2023).
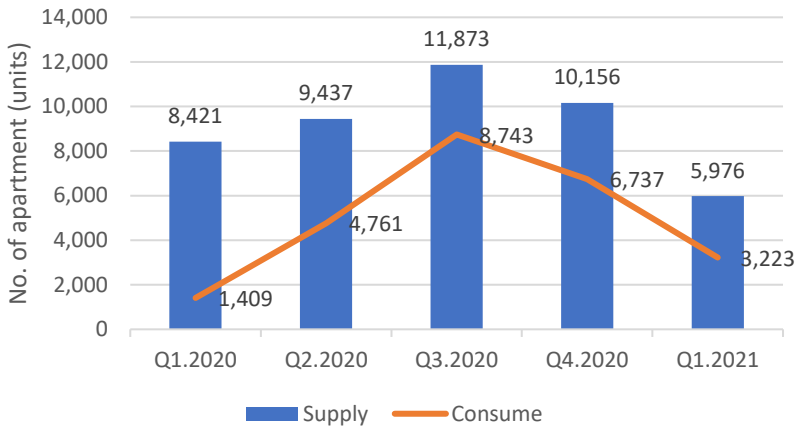
Figure 1   New Apartment Supply, Ho Chi Minh City
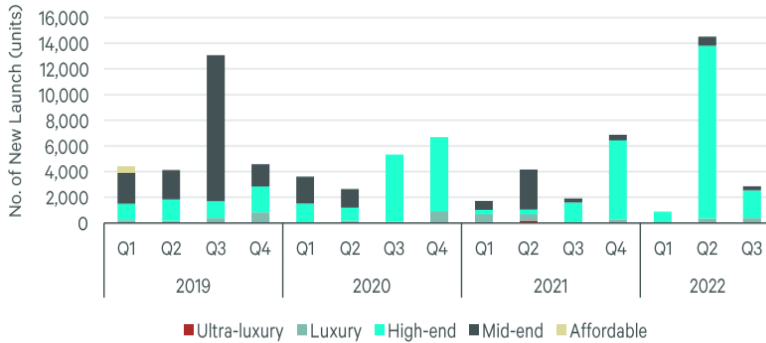
Source: CBRE Research and Consulting (CBRE, 2023)

Figure 2   Average Primary Price of Apartments, Ho Chi Minh City
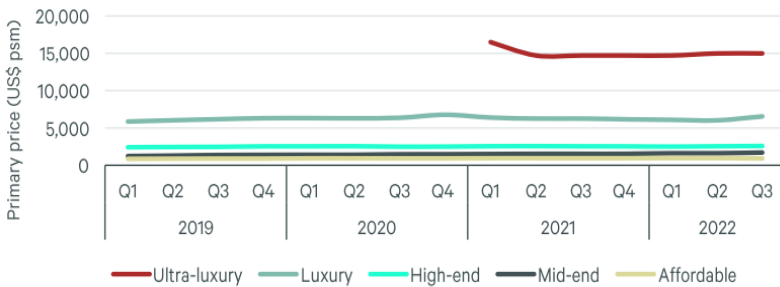
Source: CBRE Research and Consulting (CBRE, 2023)

Figure 3   Supply and Consumption of Apartments, Ho Chi Minh City

Source: CBRE Research and Consulting (CBRE, 2023)

Previous studies have addressed the intention of buyers to purchase apartments by using different critical points and theoretical models. The effect of the particularities of the apartments on the intention of buyers to purchase an apartment has been mostly discussed in those studies. However, the significance of the criteria that affect the intentions of buyers to purchase an apartment is inconsistent in their results (Al-Nahdi et al., 2015b; Haddad et al., 2011; Le-Hoang et al., 2020; Yoke et al., 2018; Zadkarim and Emari, 2011). Several studies have examined the mediating role of attitude toward behavior (ATB) in purchasing house behavior (Kamal and Pramanik, 2015; Zhang et al., 2018). Moon et al. (1999), Haryanto (2014), Kamal and Pramanik (2015), and Zhang et al. (2018) use structural equation modeling (SEM) to examine the mediating role of ATB in the relationship between product attributes and purchase intention (PI). The findings suggest that ATB plays an important mediating role for product attributes in promoting PI.

Buying an apartment is one of the most important economic decisions of buyers, so they must consider a large volume of information about the features, quality, amenities, design, price and environment of the property (Kiefer, 2007; Zadkarim and Emari, 2011). PIs are complex due to the high-value characteristic of apartments. In order to understand the needs of apartment buyers, it is necessary to understand the factors that affect their intention to buy an apartment. Suppose the enterprises want to attract buyers and increase their intention to buy an apartment, and maintain the sustainable development of the real estate market. In that case, it is necessary to implement an analysis of the behavioral intention and attitude toward buying apartments. Therefore, this study focuses on the relationship between the accessible behavioral beliefs about buying an apartment, social influence, self-efficacy with PI, and the

affected apartment attributes and buying attitude of buyer toward apartments. The research result is used as the basis for suggesting implications that support government and enterprises to improve their competitiveness and develop a sustainable real estate market.

2.   Literature Review

2.1   Definitions and Relationships

The theory of planned behavior (TPB) is an extension of the theory of reasoned action (TRA) and applied to predict behavior in practice (Ajzen, 1991; Azjen and Fishbein, 1980). The behavioral intentions of an individual are influenced by his/her ATB, subjective norms (SNs), and perceived behavioral control (PBC). The TPB has been accepted as a standard theory to explain and predict human behaviors (Numraktrakul et al., 2012). The TPB has also been used to investigate the factors that affect the residential PI of buyers (Al-Nahdi, 2015; Le-Hoang et al., 2020; Numraktrakul et al., 2012; Phungwong, 2010; Zhang et al., 2018).

According to Ajzen (1991), a person whose belief is the result of performing a positive behavior will have a positive attitude toward the performance of the behavior. In contrast, a person whose belief results from performing a negative behavior will have a negative attitude toward accomplishing that behavior. ATB is one of the decisive factors that affect individual behavior (Gibler and Nelson, 2003). Attitude affects the intention of consumers to buy high-value goods (Chung and Thorndike Pysarchik, 2000; Summers et al., 2006). Many studies worldwide indicate that the buying attitude of buyers significantly influences their intention to buy houses and apartments (Al-Nahdi, 2015; Numraktrakul et al., 2012; Phungwong, 2010; Sangkakoon et al., 2014; Yoke et al., 2018; Zhang et al., 2018). Furthermore, Luo and James (2013) also suggest that attitude affects housing buying behavior. In this study, attitudes refer to the positive or negative evaluations of an apartment by the buyer.

Many studies in the literature have analyzed the relationship between the beliefs of consumers about product attributes, and their attitude towards a product. The learning theory states that the attitude of a user toward an object is the sum of his/her evaluative judgments for each attribute of that object multiplied by his/her belief that each attribute is actually in place. Consumers build their attitudes toward a product based on their beliefs and evaluations of each attribute of a product. Afterwards, consumers make purchasing decisions by comparing their attitude toward competing products and taking into account other personal and social factors that may influence their decision (Azjen and Fishbein, 1980). Some studies have examined the mediating role of ATB (Kamal and Pramanik, 2015; Moon et al., 1999; Zhang et al., 2018). In the case of buying a home, the buyer will consider several product attribute factors such

as location (LC), cost-related dimensions (price, credit, payment instalments), physical and environmental quality, and project facilities (PFs) (Khaled et al., 2012; Le-Hoang et al., 2020; Zadkarim and Emari, 2011).

The PFs of an apartment are the facilities that come with the building. These facilities enhance the livability environment of the residents with convenience and modernity. The needs may vary, such as the need for car parks, children's playground, elevators, generators, shopping malls, community rooms, schools, gymnasiums, parks, and swimming pools (Khaled et al., 2012; Singh, 2013). Moreover, intra-apartment facilities affect customer satisfaction (Zadkarim and Emari, 2011), and buying attitudes (Kamal and Pramanik, 2015).

Apartment location (CalcWorkshop, 2020) is related to the attractiveness of a residential area and the ease of getting from there to various preferred locations. There are several desired aspects, such as park accessibility; distance from home to work, home to school, home to shopping destination, and home to entertainment and religious venues; and the transportation costs between home and destinations (Aluko, 2011). The apartment location is the most critical predictor of attitude towards apartments (Kamal and Pramanik, 2015; Khaled et al., 2012; Labib et al., 2013; Le-Hoang et al., 2020; Zadkarim and Emari, 2011).

A number of studies also recommend considering environment issues (EIs) as an important factor in the decision to buy real estate. Purchasing an apartment with a suitable living environment is a status symbol and enhances the quality of life (Okunola and Amole, 2012; Salleh et al., 2015). The quality of the living environment affects the satisfaction of apartment buyers (Zadkarim and Emari, 2011). Moreover, buyers might consider spending the rest of their life in the chosen apartment, and even their children might want to live there during their lifetime too, so they need to make the right decision by weighing the pros and cons. Spaces with poor environmental quality (i.e., noise pollution, poor garbage disposal facilities, high population density) will seriously affect the quality of life of the residents and their family, and might lead to the decision to move to a new residence.

Buyers usually consider all the physical elements as well as the design of the apartment. The apartment features influence PI, especially when there is little information about the apartment itself (Aaker, 2009). Physical quality (PQ) also influence buyer satisfaction in the purchase of apartments (Zadkarim and Emari, 2011) and affects their ATB (Kamal and Pramanik, 2015). It can be said that the characteristics of apartment buildings, including both external and internal ones, will influence the ATB of buyers when they consider the purchase of an apartment.

The critical importance of factors such as home price, collateral and financial constraints that home buyers might face is also discussed in the literature

(Maoludyo and Aprianingsih, 2015; Opoku and Abdul-Muhmin, 2010). These factors significantly affect customer satisfaction (Zadkarim and Emari, 2011). To buy an apartment in Ho Chi Minh City, buyers need a considerable amount of money which may be even more than their savings. Therefore, they might finance the purchase by incurring debt, or through a mortgage obtained from financial institutions, which may affect their attitude toward buying an apartment.

SNs refer to the influence of influential people or groups of people who are considered as a reference group for someone when that person exhibits particular behaviors (Ajzen, 1991; Han and Kim, 2010; Tonglet et al., 2004). The reference group strongly influences PI (Numraktrakul et al., 2012; Razak et al., 2013). Al-Nahdi et al. (2015) and Sangkakoon et al. (2014) suggest that children and spouses influence the PI of houses. Friends, colleagues, and spouses influence 45% of home purchase decisions (Susilawati and Anunu, 2001). In summary, a number of studies indicate that SNs affect purchase intentions of a home (Al-Nahdi, Habib, et al., 2015; Le-Hoang et al., 2020; Numraktrakul et al., 2012; Phungwong, 2010; Yoke et al., 2018; Zhang et al., 2018).

PBC is the perceived ease or difficulty of performing a particular behavior, which is dependent on the availability of resources and opportunities to perform the behavior (Ajzen, 1991). PBC positively affects residential PIs (Al-Nahdi, Habib, et al., 2015; Numraktrakul et al., 2012; Phungwong, 2010; Sangkakoon et al., 2014; Yoke et al., 2018; Zhang et al., 2018). In the case of the apartment market, PBC is one of the problematic aspects for buyers when purchasing an apartment. PBC could motivate buyers to carry out their intention to buy an apartment while their ATB or SNs are sometimes not the driving force.

2.2   Proposal Research Model

Based on the literature review, the proposed model in Figure 4 is built based on the following hypotheses:

- *Hypothesis 1 (H1): PFs positively impact ATB.*
- *Hypothesis 2 (H2): LC positively impacts ATB.*
- *Hypothesis 3 (H3): Eis positively impact ATB.*
- *Hypothesis 4 (H4): PQ positively impacts ATB.*
- *Hypothesis 5 (H5): Price and credit (PC) positively impact ATB.*
- *Hypothesis 6 (H6): ATB positively impacts the PI of apartments.*
- *Hypothesis 7 (H7): SNs positively impact the PI of apartments.*
- *Hypothesis 8 (H8): PBC positively impacts the PI of apartments.*

Figure 4   Theoretical Framework
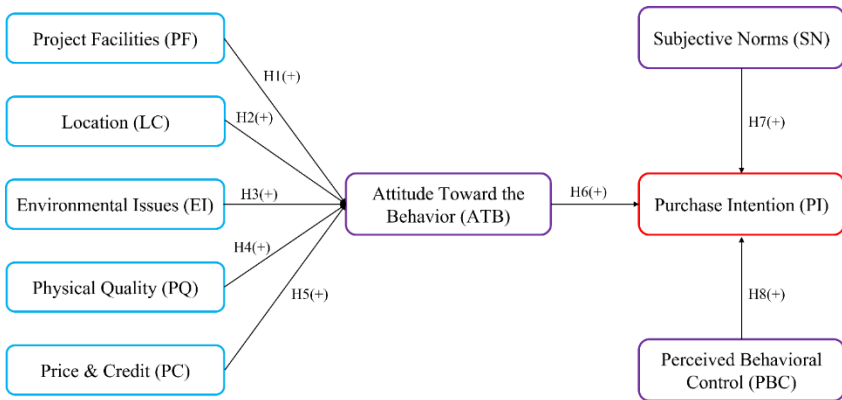
2.3   Aim of Study

Predicting PI is the first step toward predicting the actual buying behavior (Howard and Sheth, 1969). Moreover, the apartment market is fiercely competitive in Ho Chi Minh City. In order to maintain a competitive advantage, it is essential for enterprises to understand the critical factors that influence the intention of buyers to purchase an apartment. Therefore, this study aims to identify and measure the factors that affect intention to buy an apartment in Ho Chi Minh City.

3.   Data and Methods

3.1   Data Collection

This study uses the primary data collected through ae structured questionnaire, which has been built based on theory. All of the scales that concern the PFs, LC, EIs, PQ, PC, ATB, SNs, PBC, and PI are based on a five-point Likert scale (from 1 – strongly disagree to 5 – strongly agree). The survey participants met the following criteria: 1. have the ability and willingness to buy an apartment in Ho Chi Minh City, 2. at least 18 years old, and 3. a Vietnamese citizen. Data were collected during a period of three months (1st January to 31st March 2022) until the sample size met the target. In this study, a convenient sampling method is applied. The questionnaire is randomly distributed to buyers who contact real estate businesses/agents in Ho Chi Minh City to buy an apartment. A total of 600 questionnaires were distributed to these predetermined participants. Of the 600 questionnaires, 562 questionnaires were returned (response rate equals 93.7%), but 45 are incomplete so they are excluded. Therefore, a total of 517 (86.2%) questionnaires are used for the data analysis. This sample size ensures

a minimum sample size to apply the structural equation model for the analysis (Hair et al., 2010).

3.2   Measurement Scales

The measurement scales for PFs, LC, EIs, PQ, PC, ATB, SNs, PBC, and PI are built by using information in previous studies, as shown in **Table 1**:

Table 1   Measurement Scales and References for the Proposed Constructs

Construct	Corresponding Item	Indicator	Source
Project Facilities (PFs)	Model Town/ Mini Town under the Projects	PF1	Zadkarim and Emari, 2011; Kamal and Pramanik, 2015
	Car parking facilities	PF2	
	Lift facilities and generator	PF3	
	Community hall room	PF4	
	Playground for children	PF5	
Location (LC)	Near main road	LC1	Adair et al., 1996; Le-Hoang et al., 2020
	Near educational facilities	LC2	
	Closer commute to workplace	LC3	
	Availability of shopping malls	LC4	
	Near parks and entertainment facilities	LC5	
Environmental Issues (EI)	Residential living environmental	EI1	Adair et al., 1996 Zadkarim and Emari, 2011
	Environmental pollution	EI2	
	Noise and sound from adjacent areas	EI3	
	Regional security	EI4	
	Living environment is constrained and lacks freedom	EI5	
Physical Quality (PQ)	Size of apartment	PQ1	Zadkarim and Emari, 2011; Le-Hoang et al., 2020
	Interior and exterior design	PQ2	
	Raw material quality of the apartment	PQ3	
	Water facilities of the apartment (drainage, plumbing, water quality and water pressure)	PQ4	
	Lighting (electric lighting and windows)	PQ5	
Price and Credit (PC)	Reasonable price	PC1	Adair et al., 1996; Zadkarim and Emari, 2011
	Availability of bank loan	PC2	
	Reasonable loan interest rate	PC3	
	Loan term and monthly repayments	PC4	
Attitude Toward Behavior (ATB)	Buying a house is a beneficial decision	ATB1	Ajzen, 2002; Al-Nahdi, 2015; Yoke et al., 2018
	Buying a house is a good idea	ATB2	
	Buying a house is a wise decision	ATB3	
	Buying a house is an admirable decision	ATB4	

(Continued…)

(Table 1 Continued)

Construct	Corresponding Item	Indicator	Source
Subjective Norms (SNs)	My family thinks that I should buy an apartment	SN1	Ajzen, 2002; Al-Nahdi, 2015; Yoke et al., 2018
	My family would want me to buy an apartment	SN2	
	My family agrees with me to buy an apartment	SN3	
	My family thinks that buying an apartment is a wise decision	SN4	
	I buy the apartment because I see my friends doing the same	SN5	
	My friends recommend buying an apartment	SN6	
Perceived Behavioral Control (PBC)	I have adequate opportunity (I have easy access to the market) to make a decision to buy an apartment	PBC1	Ajzen, 2002; Al-Nahdi, 2015; Yoke et al., 2018
	I have enough time to make a decision to buy an apartment	PBC2	
	I have enough money to buy an apartment	PBC3	
	I have enough skills and knowledge about apartments to make a decision if I would like to buy an apartment	PBC4	
	I have complete control over buying an apartment	PBC5	
Purchase Intention (PI)	I want to buy an apartment in the future	PI1	Ajzen, 2002; Al-Bagozzi, 1992; Nahdi, 2015; Yoke et al., 2018
	I intend to buy an apartment in the future	PI2	
	I plan to buy an apartment	PI3	
	I will try to buy an apartment	PI4	
	I want to buy an apartment	PI5	

3.3   Data Analysis

SPSS (version 20) and AMOS (version 20) are used to analyze the data. First, the Cronbach's alpha coefficients for each scale are checked to see if they meet the minimum value of 0.6 (Nunnally and Bernstein, 1994). Hence, an exploratory factor analysis (EFA) is used to study the factor structure of the questionnaire and determine the latent components. The Bartlett's test of sphericity is used to see if the observed variables in the factor are correlated, and the Kaiser-Meyer-Olkin (KMO) index is calculated to check if it has a value of at least 0.5. SEM is used to analyze the multidimensional relationships between the variables in the model. SEM has three significant advantages over traditional multivariate techniques: 1) detailed assessment of measurement errors, 2) estimate of latent variables via observed variables, and 3) a model test where a structure can be imposed and assessed to fit the data. The values of the degrees of freedom for the chi-square coefficient, root mean square error approximation (RMSEA), Tucker-Lewis index (TLI), and comparative fit index (CFI) are calculated to assess the fit of the model.

4.   Empirical Results

4.1   Demographic Characteristics

Table 2 shows the general demographic characteristics of all of the participants whose answers are used for the data analysis. The proportion of females who participated in the survey is 58.6%, which is slightly higher than the males (41.4%). The age group with the highest participation rate is over 45 years old. Among the respondents, most have a Bachelor's degree (38.3%), followed by those with a high school diploma (32.8%).

Table 2   General Demographic Characteristics

Characteristic	Frequency (n=517)	Percentage (%)
Gender		
Male	214	41.4
Female	303	58.6
Age (years-old)		
18-24	120	23.2
25-35	116	22.4
36-45	131	25.3
Over 45	150	29
Highest educational level achieved		
High school	184	35.6
College degree	76	14.7
Bachelor's degree	198	38.3
Master's or PhD/Doctorate degree	69	13.3
Occupation		
Blue-collar	80	15.5
White-collar	120	23.2
Entrepreneur	120	23.2
State employee	70	13.5
Other	127	24.6
Average personal income in recent 12 months (USD/month)		
Under $850	70	13.5
$851 to under $1,300	176	34
$1,300 to under $1,750	111	21.5
$1,750 to under $2,150	85	16.4
At $2,150 and higher	75	14.5

4.2   Cronbach's Alpha, EFA and CFA Results

Table 3 provides the results of all of the tests used to calculate the Cronbach's alpha and the EFA and confirmatory factor analysis (CFA) indexes. All of the scales in the model have high reliability, with a Cronbach's alpha that ranges from 0.833 to 0.904. The KMO test for all of the variables is 0.884 (much higher

than 0.50), which is greater than the confidence interval level (p-value > 0.05) (Kaiser, 1974). Furthermore, the factor loadings of the eight factors are all greater than 0.50. The eight factors extracted account for 59.625% (>50%) of the variability (Field, 2005). The results of the factor analysis indicate that the data are valid and meet the requirements to be used for further analyses. A CFA is performed to test the relationship between the categories and their respective latent variables by using AMOS 20. The combined confidence value of the composite reliability (CR) of each latent variable ranges from 0.833 to 0.906. CR with a value greater than 0.6 is considered to be indicative of strong internal consistency. An average variance extracted (AVE) greater than the output of 0.50 (ranging from 0.501 to 0.666) is acceptable. The analytical results conclude that the latent variables: PFs, LC, EIs, PQ, PC, ATB, SNs, PBC, and PI, have high reliability and convergent values.

Table 3   Cronbach's Alpha, EFA and CFA Results

Construct	Item	CR	AVE	Cronbach's Alpha	Loading
Project Facilities (PFs)	PF1	0.833	0.501	0.833	0.697
	PF2				0.750
	PF3				0.665
	PF4				0.720
	PF5				0.695
Location (LC)	LC1	0.876	0.595	0.872	0.831
	LC2				0.788
	LC3				0.851
	LC4				0.516
	LC5				0.846
Environmental Issues (EIs)	EI1	0.905	0.657	0.904	0.796
	EI2				0.797
	EI3				0.831
	EI4				0.786
	EI5				0.816
Physical Quality (PQ)	PQ1	0.898	0.640	0.901	0.810
	PQ2				0.888
	PQ3				0.806
	PQ4				0.730
	PQ5				0.787
Price and Credit (PC)	PC1	0.846	0.579	0.844	0.751
	PC2				0.766
	PC3				0.727
	PC4				0.804
Attitude Toward Behavior (ATB)	AT1	0.888	0.666	0.888	0.817
	AT2				0.844
	AT3				0.781
	AT4				0.754

(Continued…)

(Table 3 Continued)

Construct	Item	CR	AVE	Cronbach's Alpha	Loading
Subjective Norms (SNs)	SN1	0.863	0.512	0.881	0.685
	SN2				0.740
	SN3				0.727
	SN4				0.700
	SN5				0.763
	SN6				0.704
Perceived Behavioral Control (PBC)	PBC1	0.867	0.567	0.873	0.804
	PBC2				0.772
	PBC3				0.717
	PBC4				0.760
	PBC5				0.712
Purchase Intention (PI)	PI1	0.860	0.553	0.860	0.688
	PI2				0.720
	PI3				0.747
	PI4				0.710
	PI5				0.721
KMO				**0.884**	
Bartlett's Sig				**0.000**	
Eigenvalues				**1.272**	
Cumulative %				**59.625**	

Note: AVE: Average Variance Extracted; CR: Composite Reliability.

4.3 Structural Equation Modeling

Table 4 lists the results of the fit indices for the CFA and SEM. The results show that each construct of the research model has strong reliability, and convergent and discriminant validity. Therefore, SEM is well suited for this study.

Table 4 Fit Indices for Measurement and Structural Models

Index	Recommended Value	Measurement Model	Structural Model	Result	Reference
χ^2/df	≤ 5	1.180	1.238	Very good	Hair et al., 2010
GFI	≥ 0.9	0.920	0.914	Very good	Hair et al., 2010
AGFI	≥ 0.8	0.908	0.903	Good	Etezadi-Amoli and Farhoomand, 1996
NFI	≥ 0.9	0.919	0.914	Very good	Hair et al., 2010
TLI	≥ 0.9	0.985	0.981	Very good	Bollen, 1989
CFI	≥ 0.9	0.987	0.982	Very good	Hair et al., 2010
RMSEA	$\leq 0,08$	0.019	0.021	Very good	Hair et al., 2010

Notes: GFI: Goodness of Fit Index, AGFI: Adjusted Goodness of Fit Index, NFI: Normed Fit Index, TLI: Tucker-Lewis index; CFI: Comparative Fit Index; RMSEA: Root Mean Square Error Approximation

Table 5 and Figure 5 show that seven of the eight hypotheses are supported, with H4 being the only one that is not supported in the proposed model. The R-square of ATB and PI is 0.267 and 0.507, respectively, which explains for 26.7% of the variance in ATB and 50.7% of the variance in PI towards purchasing an apartment in Ho Chi Minh City.

Table 5   Results of Path Analysis of SEM

Hypothesis	Structural Path	SWR	S.E.	C.R.	P-value	Hypothesis Result
H1	ATB<---PF	0.303	0.059	6.228	***	Supported
H2	ATB<---LC	0.182	0.040	4.004	***	Supported
H3	ATB<---EI	0.138	0.043	3.099	0.002	Supported
H4	ATB<---PQ	0.081	0.050	1.801	0.072	Not Supported
H5	ATB<---PC	0.189	0.063	4.038	***	Supported
H6	PI<---ATB	0.451	0.023	10.013	***	Supported
H7	PI<---SN	0.370	0.053	7.689	***	Supported
H8	PI<---PBC	0.270	0.030	6.178	***	Supported

Note: SWR: Standardized Regression Weights, S.E.: Standard Error, C.R.: Critical Ratio

Figure 5   Standardized Structure Equation Model
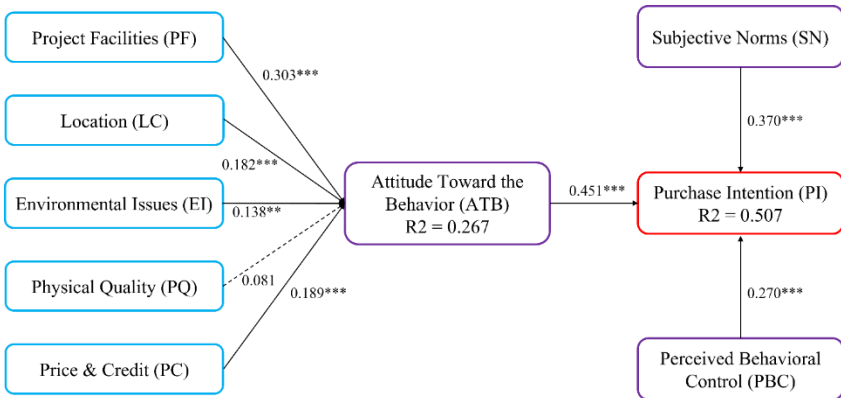
Notes: *** p <0,01; ** P<0,05; R^2=Squared Multiple Correlation

5.   Discussion

The research results show that ATB is the most significant determinant of intention to buy an apartment, followed by SNs and PBC. In addition, PI is indirectly affected by PFs, LC, EIs, and PC via ATB. ATB, SNs, and PBC positively impact PI, which is consistent with the findings in existing studies (Al-Nahdi, Habib et al., 2015; Le-Hoang et al., 2020; Yoke et al., 2018; Zhang

et al., 2018). The findings of the study confirm the importance of ATB, SNs, and PBC in affecting the PI of apartments in Ho Chi Minh City.

Likewise, PFs have the highest indirect influence on PI via ATB. Therefore, it can be concluded that PFs play an important role in influencing buyers to purchase an apartment. This is consistent with the findings in Kamal and Pramanik (2015). In fact, today's buyers are especially interested in spaces that benefit and accommodate their children. Therefore, they will look for apartment projects with a spacious environment. Enterprises should therefore focus on investing in amenities and playgrounds for children to attract buyers. Most of the current apartment projects offer a number of internal amenities to ensure that they fully meet the fundamental demands of their residents. However, in comparing different projects, the amenities and their quality vary depending quite a lot on the capacity of the investor and the location of the apartment project. Buyers will choose apartment projects with better facilities to improve the quality of life of their family. Apartment projects in the vicinity of the city center have many advantages with building parks, community areas, parking lots, etc., because the land area is large enough and the cost is low.

Furthermore, PC, LC, and EIs have significantly positive indirect effects on PI through ATB, and these findings are consistent with Zadkarim and Emari (2011), and Le-Hoang et al. (2020). However, according to Kamal and Pramanik (2015), the relationship between EIs and ATB is not statistically significant. Buying an apartment is probably the biggest financial decision for most people in Vietnam. Buying a house will be a barrier without good financial preparation and planning. Buyers want to purchase an apartment in accordance with their financial ability, and need to carefully consider the intricacies of the bank loan, such as loan amount, flexible principal payment policy, and interest rate, because the majority do not have enough financial resources to pay a lump sum when buying an apartment. Apartment prices increase by more than 10% each year (Vũ, 2019), and the housing price index in Vietnam is more than 20 times higher than the average income, thus making it challenging for many households and individuals to own a house. In comparison to industrialized countries, the house price index is only 6 to 7 times higher than the average income (CBRE, 2023). Therefore, the government should consider removing the legal "obstacles" of apartment projects, such as construction investment procedures, auction of land use rights, and calculation of "land use fees" for commercial housing projects. These might help to increase the supply of apartments in the market, while applying a property tax policy to reduce apartment prices.

The respondents are also interested in apartments that are located near their workplace, schools, the city center, and shopping centers to meet their daily needs. The reason is that the traffic system in the suburbs is not synchronized, and the public transport system is not convenient. Traffic jams are frequent, which affect the daily life of families. Besides, buyers also care about the living

environment because it will affect their long-term quality of life as well as that of their family. The surveyed individuals do not want their apartment to be located near areas with noise pollution, unsanitary conditions, or other social evils. In fact, the pollution from the Da Phuoc landfill has forced many residents to sell their house in the Phu My Hung urban area.

Nevertheless, the findings in this study indicate that PQ is not related to ATB. This is contrary to the research results in Kamal and Pramanik (2015), who claim that PQ has a significant degree of positive influence on ATB, and Le-Hoang et al. (2020) who suggest that features affect the PI of customers in Ho Chi Minh City (at a 90% confidence level). We can explain this difference in findings by confirming that apartments in Ho Chi Minh City are designed and constructed by many reputable contractors and almost identical. In other words, buyers are satisfied with the PQ of the apartments. However, residents face difficulties in the procedures for changing the original structure of their apartment, which might be a barrier that discourages them to make any physical changes.

There are several practical implications that can be considered through the findings of this study. Businesses should focus on strategies that positively influence buying attitudes to improve the perspective of the buyers of the apartment characteristics, and these buyers should feel safe that society, experts or consultants will support their decision to buy an apartment. The government needs to plan for enough land funds to build apartments in areas along key public transport connection points, such as the Metro No. 1 (to the east of Thu Duc city), Metro No. 2 (to the north, including the Tan Binh district, District 12), and Metro 3A (to the west, including the Binh Tan and Binh Chanh districts) lines. This might make help enterprises increase the supply of apartments, and improve locational and environmental factors. In particular, one of the barriers that reduce the supply and increase the price of condominiums by more than double digits is that the legal procedure for construction investment and "land use fees" has not been resolved by the government within a certain period of time. This barrier causes investment costs to increase significantly over time. Removing this barrier will encourage businesses to enter the market to increase the supply of apartments. At the same time, apartment prices will decrease, thus contributing to the sustainable development of the real estate market in Vietnam.

On the other hand, enterprises need to plan a strategy to develop apartment projects at an appropriate scale to provide community facilities and ensure quality assurance at an acceptable price based on the consumption capacity of the market so as to enhance the competitiveness of enterprises. Another limitation of consumer intention with ATB is whether consumers can control behavior, or, in other words, whether they can perform the behavior at will (Ajzen, 1991). Buyers may want to purchase an apartment, but given their

income, they need a bank that agrees to mortgage the apartment at a reasonable interest rate.

For most homebuyers, financial ability is the first consideration when making the decision to purchase a home. Therefore, if investors can pay for the loan interest, this will benefit the buyers, especially those who do not have strong finances. Specifically, apartment buyers can borrow up to 75% of the value of the purchase for a maximum period of 25 years. This preferential period with 0%-5% interest rate is determined from the time of receiving the first loan (after the buyer signs the purchase and sales contract) until 50% payment is paid and the apartment is handed over according to the payment schedule (maximum not more than three years). After the preferential period, the bank will apply an interest rate equal to the 12-month savings rate plus 3-3.5%/year, which will create the most favorable conditions for people with real housing needs to easily access apartment projects.

In addition, enterprises should focus on strategies to increase the influence of family and friends, such as focusing marketing activities at amusement parks and shopping centers, and organizing events that attract large numbers of participants to enhance communication with loyal customers and share good experiences about the product. Word-of-mouth plays a more important role which has a more decisive impact on buyer behavior as opposed to advertising and other channels (Herr et al., 1991). Moreover, building a prestigious brand image and good product quality are always advantageous to SNs. Strategies to support consumer awareness and self-determination should be implemented, by using social networks and virtual reality technology so that buyers can stay up to date and find information anytime, anywhere (Loureiro et al., 2012). This means that if buyers could easily access the market and have a positive experience with their apartment, their awareness of controlling their behavior would be increased.

However, several limitations are found in this study which could be addressed in further studies. First, this study solely focuses on the real estate market in Ho Chi Minh City, which does not represent the overall Vietnamese real estate market. Hence, future studies could consider increasing the sample size to include other regions and comparing them. Second, the real estate markets in Vietnam have similar characteristics, and the findings of this study can only apply to nations with similar systems. Finally, the respondents in our study are limited to urbanites who may have a more solid financial capacity.

6. Conclusion

This study aims to investigate the intention of buyers to purchase an apartment in Ho Chi Minh City. Research on applying the TPB and supplementing the product attribute structure is the premise of ATB for PI. The findings show a

strong fit of the proposed theoretical framework. The proposed model and the measurement scales are also confirmed to be suitable for the study. The intention of buyers to purchase an apartment could be directly predicted by using ATB, SNs, and PBC and indirectly by using PFs, LC, EIs, PC, and PQ through ATB. Overall, ATB has the most direct positive influence on PI, followed by SNs and, finally PBC. However, PQ has no relationship with ATB.

References

Aaker, D. A. (2009). *Managing brand equity*. USA, Simon and Schuster.

Adair, A., Berry, J., and McGreal, S. (1996). Valuation of residential property: analysis of participant behaviour. *Journal of Property Valuation and Investment*, 14(1), 20-35. https://doi.org/10.1108/14635789610107453

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. https://doi.org/https://doi.org/10.1016/0749-5978(91)90020-T

Al-Nahdi, T. (2015). Purchasing housing in Saudi Arabia a behavioral study. *Journal of Applied Science and Agriculture*, 10(2), 12-21.

Al-Nahdi, T. S., Habib, S. A., Bakar, A. H. A., Bahklah, M. S., Ghazzawi, O. H., and Al-Attas, H. A. (2015a). The effect of attitude, dimensions of subjective norm, and perceived behavior control, on the intention to purchase real estate in saudi arabia. *International Journal of Marketing Studies*, 7(5), 120. https://doi.org/http://dx.doi.org/10.5539/ijms.v7n5p120

Al-Nahdi, T. S., Nyakwende, E., Banamah, A. M., and Jappie, A. A. (2015b). Factors affecting purchasing behavior in real estate in Saudi Arabia. *International Journal of Business and Social Science*, 6(2).

Aluko, O. (2011). Sustainable housing development and functionality of planning laws in Nigeria: the case of cosmopolitan Lagos. *Journal of Sustainable Development*, 4(5), 139.

Azjen, I., and Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Prentice-Hall.

Bloemer, J. M., and Kasper, H. D. P. (1995). The complex relationship between consumer satisfaction and brand loyalty. *Journal of Economic Psychology*, 16(2), 311-329. https://doi.org/https://doi.org/10.1016/0167-4870(95)00007-B

Bollen, K. A. (1989). *Structural equations with latent variables* (Vol. 210). John Wiley & Sons. https://doi.org/https://psycnet.apa.org/doi/10.1002/9781118619179

Bùi, Y. (2019). About 476,000 households in Ho Chi Minh City do not own their own houses. *Phap Luat*. 17 September. Available at: https://baophapluat.vn/bds/khoang-476-ngan-ho-gia-dinh-tai-tp-hcm-chua-co-nha-rieng-post317822.html

CalcWorkshop. (2020). *Normal Approximation w/ 5 Step-by-Step Examples!* Retrieved 2022, October 06 from https://calcworkshop.com/continuous-probability-distribution/normal-approximation/

CBRE. (2023). *Ho Chi Minh City Figures Q3 2022*. Retrieved 2022, November 11 from https://www.cbrevietnam.com/insights/figures/ho-chi-minh-city-figures-q3-2022

Chung, J. E., and Thorndike Pysarchik, D. (2000). A model of behavioral intention to buy domestic versus imported products in a Confucian culture. *Marketing Intelligence & Planning*, 18(5), 281-291. https://doi.org/10.1108/02634500010343982

Etezadi-Amoli, J., and Farhoomand, A. F. (1996). A structural model of end user computing satisfaction and user performance. *Information & management*, 30(2), 65-73. https://doi.org/https://doi.org/10.1016/0378-7206(95)00052-6

Field, A. P. (2005). Is the meta-analysis of correlation coefficients accurate when population correlations vary? *Psychological methods*, 10(4), 444. https://doi.org/https://psycnet.apa.org/doi/10.1037/1082-989X.10.4.444

General Statistics Office. (n.d.). Population. Retrieved 11 July, 2023 from https://www.gso.gov.vn/en/population/

Gibler, K., and Nelson, S. (2003). Consumer Behavior Applications to Real Estate Education. *Journal of Real Estate Practice and Education*, 6(1), 63-83. https://doi.org/10.1080/10835547.2003.12091585

Haddad, M., Judeh, M., and Haddad, S. (2011). Factors affecting buying behavior of an apartment an empirical investigation in Amman, Jordan. *Research Journal of Applied Sciences, Engineering and Technology*, 3(3), 234-239.

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective* (7th ed.). Pearson Education.

Han, H., and Kim, Y. (2010). An investigation of green hotel customers' decision formation: Developing an extended model of the theory of planned behavior. *International Journal of Hospitality Management*, 29(4), 659-668. https://doi.org/https://doi.org/10.1016/j.ijhm.2010.01.001

Haryanto, B. (2014). The influence of ecological knowledge and product attributes in forming attitude and intention to buy green product. *International Journal of Marketing Studies*, 6(2), 83. https://doi.org/http://dx.doi.org/10.5539/ijms.v6n2p83

Herr, P. M., Kardes, F. R., and Kim, J. (1991). Effects of Word-of-Mouth and Product-Attribute Information on Persuasion: An Accessibility-Diagnosticity Perspective. *Journal of consumer research*, 17(4), 454-462. https://doi.org/10.1086/208570 %J Journal of Consumer Research

HoREA. (2021, January 8). 02/2021/CV-HoREA, ngày 08 tháng 01 năm 2021 Báo cáo đánh giá thị trường bất động sản năm 2020, dự báo thị trường bất động sản năm 2021 [*Real estate market assessment report in 2020, real estate market forecast in 2021*]. Retrieved 2022, November 6 from http://www.horea.org.vn/hoat-dong-horea/022021CV-HoREA-ngay-08-thang-01-nam-2021-Bao-cao-danh-gia-thi-truong-bat-dong-san-nam-2020-du-bao-thi-truong-bat-dong-san-nam-2021.html

Howard, J. A., and Sheth, J. N. (1969). *The theory of buyer behavior* (Vol. 63). New York.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31-36.

Kamal, M., and Pramanik, S. A. (2015). Customers' intention towards purchasing apartment in Dhaka City, Bangladesh: offering an alternative buying intention model. *European Journal of Business and Management*, 7(35). https://ssrn.com/abstract=2823377

Khaled, M. C., Sultana, T., Biswas, S. K., and Karan, R. (2012). Real estate industry in Chittagong (Bangladesh): A survey on customer perception and expectation. *Developing country studies*, 2(2), 38-45.

Kiefer, H. (2007). *Essays on applied spatial econometrics and housing economics* The Ohio State University]. http://rave.ohiolink.edu/etdc/view?acc_num=osu1180467420

Labib, S., Bhuiya, M. M. R., and Rahaman, M. Z. (2013). Location and size preference for apartments in Dhaka and prospect of real estate market. *Bangladesh Research Publications Journal*, 9(2), 87-96.

Le-Hoang, P. V., Ho, Y. T. T., Luu, D. X., and Le, T. T. T. (2020). Determinants of customer's apartment purchase intention: is the location dominant? *Independent Journal of Management and Production*, 11(4), 1303-1322.

Loureiro, S. M. C., Ruediger, K. H., and Demetris, V. (2012). Brand emotional connection and loyalty. *Journal of Brand Management*, 20(1), 13-27. https://doi.org/10.1057/bm.2012.3

Luo, Q., and James, P. T. (2013). Influences on the buying behavior of purchasing commercial housing in Nanning city of Guangxi province, China. *Journal of Management and Marketing Research*, 12, 1.

Maoludyo, F. T., and Aprianingsih, A. (2015). Factors influencing consumer buying intention for housing unit in Depok. *Journal of Business and Management Science*, 4(4), 484-493.

Moon, W., Florkowski, W. J., Beuchat, L. R., Resurreccion, A. V., Chinnan, M. S., Paraskova, P., and Jordanov, J. (1999). Effects of product attributes and consumer characteristics on attitude and behavior: The case of peanuts in a transition economy. *Agribusiness: An International Journal*, 15(3), 411-425. https://doi.org/https://doi.org/10.1002/(SICI)1520-6297(199922)15:3%3C411::AID-AGR8%3E3.0.CO;2-M

Numraktrakul, P., Ngarmyarn, A., and Panichpathom, S. (2012). *Factors affecting green housing purchase* 17th International Business Research Conference, Toronto - Canada.

Nunnally, J. C., and Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Okunola, S., and Amole, D. (2012). Perception of Safety, Social Participation and Vulnerability in an Urban Neighbourhood, Lagos, Nigeria. *Procedia - Social and Behavioral Sciences*, 35, 505-513. https://doi.org/https://doi.org/10.1016/j.sbspro.2012.02.116

Opoku, R. A., and Abdul-Muhmin, A. G. (2010). Housing preferences and attribute importance among low-income consumers in Saudi Arabia. *Habitat International*, 34(2), 219-227. https://doi.org/https://doi.org/10.1016/j.habitatint.2009.09.006

Phungwong, O. (2010). *Factors influencing home purchase intention of Thai single people* [Doctoral Dissertation, University of South Australia, Adelaide, Australia].

Razak, I., Ibrahim, R., Hoo, J., Osman, I., and Alias, Z. (2013). Purchasing intention towards real estate development in Setia Alam, Shah Alam: Evidence

from Malaysia. *International Journal of Business, Humanities and Technology*, 3(6), 66-75.

Salleh, N. A., Zoher, S. A., Mahayuddin, S. A., and Abdul, Y. (2015). Influencing Factors of Property Buyer in Hillside Residential Development. *Procedia - Social and Behavioral Sciences*, 170, 586-595. https://doi.org/https://doi.org/10.1016/j.sbspro.2015.01.060

Sangkakoon, P., Ngarmyarn, A., and Panichpathom, S. (2014). *The influence of group references in home purchase intention in Thailand* (IDEAS Working Paper Series, Issue. https://eres.scix.net/pdfs/eres2014_191.content.pdf

Singh, T. (2013). Identifying key factors affecting purchase decision of residential apartments: An exploratory study in peripheries of Chandigarh. *International Journal of Applied Services Marketing Perspectives*, 2(3), 493.
Summers, T. A., Belleau, B. D., and Xu, Y. (2006). Predicting purchase intention of a controversial luxury apparel product. *Journal of Fashion Marketing and Management: An International Journal*, 10(4), 405-419. https://doi.org/10.1108/13612020610701947

Susilawati, C., and Anunu, F. B. (2001). Motivation and perception factors influence buying home behaviour in Dilly, East Timor. The 7th Pacific Rim Real Estate Society Annual Conference,

Tonglet, M., Phillips, P. S., and Read, A. D. (2004). Using the Theory of Planned Behaviour to investigate the determinants of recycling behaviour: a case study from Brixworth, UK. *Resources, Conservation and Recycling*, 41(3), 191-214. https://doi.org/https://doi.org/10.1016/j.resconrec.2003.11.001

Vũ, L. (2019). House prices in Ho Chi Minh City escalate for 5 years. VnExpress. 16 September. Available at: https://vnexpress.net/gia-nha-tai-tp-hcm-leo-thang-trong-5-nam-3982506.html

Yoke, C. C., Mun, Y. W., Peng, L. M., and Yean, U. L. (2018). Purchase Intention of Residential Property in Greater Kuala Lumpur, Malaysia. *International Journal of Asian Social Science*, 8(8), 580-590. https://doi.org/10.18488/journal.1.2018.88.580.590

Zadkarim, S., and Emari, H. (2011). Determinants of satisfaction in apartment industry: Offering a model. *Journal of civil engineering and urbanization*, 1(1), 15-24.

Zhang, L., Chen, L., Wu, Z., Zhang, S., and Song, H. (2018). Investigating Young Consumers' Purchasing Intention of Green Housing in China. 10(4), 1044. https://www.mdpi.com/2071-1050/10/4/1044