

THE CONDOMINIUM BUSINESS AND SEISMIC RISK IN CHIANG MAI, THAILAND

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Abstract: This research investigated consumers' perception towards seismic risk that affected their intention and decision to purchase a condominium in Chiangmai, Thailand. This study was conducted in several Chiangmai areas and employed a questionnaire as data collection instrument with a sampling population of 400. Descriptive statistics and chi-square value were utilized for data analysis of a variety of marketing mix factors, occurrences of earthquake and other geographical factors. Our findings showed that earthquake-related factors influenced condominium buying decision considerably. Building's structural integrity, past occurrences of earthquake, availability of earthquake warning and disaster assistance systems all contributed to consumers' buying decision. Household expenses contributed at 0.01 significance level. Earthquake-related and project-related factors (including marketing strategy, reputation, and social and physical nature of the project) all contributed at 0.05 significance level. In addition, safety, architectural design, and maintenance service were factors that consumers also keenly took into consideration.

JEL Classification: M01; M02; M03; O01 and O02.

Keywords: Business; Condominium; Seismic Risk; Chiang Mai, Thailand.

1. INTRODUCTION

Presently, the condominium sector in downtown Chiangmai has become much more globally focused. Many developers have tried to improve their design and product quality, enabling Chiangmai condominiums to compete with those in other major cities around the world. Moreover, developers have also taken into consideration changes in people's lifestyle as new Thai generations shifted their decision from buying a single house towards buying a condominium unit. Studies of consumers' behaviors help firms and organizations improve their marketing strategies by recognizing what consumers are thinking about, feeling towards, reasoning on and selecting from different alternatives.

Consumers' decision to purchase depends on various factors such as demographic and marketing factors. For instance, according to Wongfu (1998), most condominium buyers were working males between 21-40 years old, single, and bachelor's degree graduates. Perner (2007) also mentioned that consumers' purchasing behaviors are related to demographic composition including income, level of education, occupation, and age.

Since demographic and marketing factors play a significant role in consumers' decision to purchase a condominium, this study, therefore, aimed to identify and investigate these factors.

Additionally, consumers' perception towards seismic risk was investigated. Earthquakes occurring on previously unrecognized faults have caused fractures in buildings previously considered impervious to earthquake. For almost all of these structures, the damages were completely hidden, and the problems were only accidentally discovered by construction crews erecting steel frames for new buildings. They observed that the new buildings' beam column connections, yet to be hidden beneath the fire-proofing and wall cladding, were compromised. A U.S. monitoring agency has recently reported that Chiangmai, Thailand and some regions northeast of Rangoon in Myanmar were struck by a strong earthquake of magnitude 6.8.

1.1. Objective of the Study

This study aimed to examine consumers' perception towards seismic risk which affected their intention and decision to purchase a condominium in Chiangmai, Thailand, taking into account a variety of marketing mix factors, occurrences of earthquake and other geographical factors.

1.2. Research Question

What were the factors influencing consumers' decision to purchase a condominium in the Chiangmai area? The assumptions were as follows:

1. Differences in gender, age, educational level, occupation affected consumers' decision to purchase a condominium in Chiangmai;
2. Income did so;
3. Factors in marketing mixes (product, price, place and promotions) did so; and
4. Occurrences of earthquake also did so.

1.3. Significance of the Study

This study sought to comprehend customers' attitude towards marketing mix strategies, demographic composition, and geographical factors (including occurrences of earthquake) that affected their purchase decision of a condominium in Chiangmai. Chiangmai is considered a new metropolitan area where real estate developers and consumers are attracted to. The results of this study will help marketers to better understand the property market's trend and business growth opportunities. They will also help developers in preparing new strategies to serve consumers by taking into consideration their marketing mix strategies, the demographic profile of the consumers, and the geographical factors.

2. LITERATURE REVIEW

Phanachunwongsakun (2007) and Kamchadthuk (2009) explained that convenient and inexpensive transportation and availability of public utilities were important factors affecting consumers' decision to purchase a residence. Saing Jomdangtham (1994) found that consumers' travelling needs, before and after staying in their previous residence, affected their choice of living in a condominium. Saiyood Kirdsawasd (2003) found that consumers required that their preferred housing project should be located conveniently near the main road and on buses routes, equipped with full public utilities, free of pollutions, and safe. Wattanateerathum (1998) and Rakbumrung (2011) stated that residents wanted to have full public utilities and convenient facilities. Weihrich and Koontz (1993) mentioned that the idea of accommodation selection depended on customers' previous experience whether their needs were satisfied or not. Catalano (1993) found that consumers considered carefully how far it was to travel from their residence to their workplace and where other people lived. Goodall (1972) found that people also considered the convenience of transportation from their residence's location as well as other criteria such as environment, community, features of accommodation, and proportion between living area and whole property. Day and Cervero (2010) and Royalhouse Group (2012) found that location, quality of construction, price, financial condition, facilities, company's reputation, special offerings (such as a model room), and promotion were important factors affecting consumers' decision to buy a residence. Thanon Angkanawatana (1991) stated that people who earned high income tended to move to a condominium after considering its location, price, services (such as restaurant and laundry), transportation time, distance between the condominium and their workplace, facilities, structure and design, reputation of the engineer and architect, and financial conditions. Location was the most important factor in consumers' decision to buy a condominium as had found out (Chutimavoraphand and Kecharananta, 2011). They reported that people thought that location and services were the important factors in making a buying decision. Kotler (1997) listed the most important factors affecting consumer's decision to buy a residence as the following: location, price, quality and facility, company profile, financing, and project progression. Pornarit Chounchaisit (1992) reported that the single factor influencing condominium buyers in Bangkok was low price. On the other hand, Surathomtawee and Pachravanich (2011) stated that a medium price condominium was more attractive, and buying it from a reputable company that accepted down payment as installments was also favorable.

Chedsadwarangkul, Wareewanich and Saranrom (2010) reported that the factors of environment, economic and marketing mix all affected consumers' decision to buy a residence in central Bangkok. Kuo, Chou, and Sun (2011) concluded that improved service quality and reliability satisfied residents of condominiums as well as the pleasing looks of the building and its surroundings. Although findings varied among researchers, location and price were the most important factors

affecting consumers' decision to buy a residence. In this study, demographic factors (i.e., gender, marital status, and income) were investigated in order to see if they would affect consumers' behavior towards buying a condominium. Earthquake disaster can affect condominium buying decision as well. Hisagi, Ishikawa and Saito (2012) mentioned that people should be prepared for emergency situations which may occur in various forms. Condominium residents should be educated of escape routes and safe places to turn to when disaster strikes. Softbiz Plus Company (2007) stated that every condominium building must be designed to withstand the vibration of an earthquake and pass an inspection required by law. A condominium must be checked for stability and safety every year and have a major inspection every five years. All of these precautions will boost consumers' confidence as they consider buying a condominium. Alexander (2011) studied the development of urban search and safety measures on the Internet. He proposed plans to reduce non-structural as well as structural risks and plans to educate people on worldwide networks, sharing knowledge about earthquake and what to do when an earthquake hits. Shinobu (2002) reported that consultants were responsible for coordinating civil engineering, architectural and other related agencies to serve new development in safe condominiums and to make plans, internally and externally, to handle damages in case of an earthquake strike. Also included were the sharing of knowledge and useful information for earthquake victims.

3. METHODOLOGY

The pieces of information collected in this study include the following: the primary data that was collected by a convenient sampling method; and the secondary data that was gathered from many sources such as related independent studies, textbooks, articles, and websites related to the principal topics of the study. The target populations of this study were people who were living in the Chiangmai area. A small number of people in the target population were selected as the target sample. The exact number was calculated from Yamane's formula.

3.1. Sampling

In order to obtain the appropriate sample size for this study, the author used the Taro Yamane's (1993) formula to calculate the number of people in the target population who would be able to complete the questionnaire. This formula is shown below:

$$n = \frac{N}{1 + Ne^2}$$

n = number of sample size

N = number of population

e² = square of the maximum allowances of error between the true proportion and sample proportion (the confidence interval is 95%, so the standard error is 0.05)

$$\begin{aligned}
 n &= \frac{89,454}{1 + 89,454(0.05)^2} \\
 &= 398.22 \\
 &\approx 400
 \end{aligned}$$

From the calculation, the sample size (n) is equal to 400 samples. Therefore, this study used this number of questionnaires as a minimum to gather data from respondents. These 400 samples were gathered from three districts: Muang District, Hangdong District, and Sansai District.

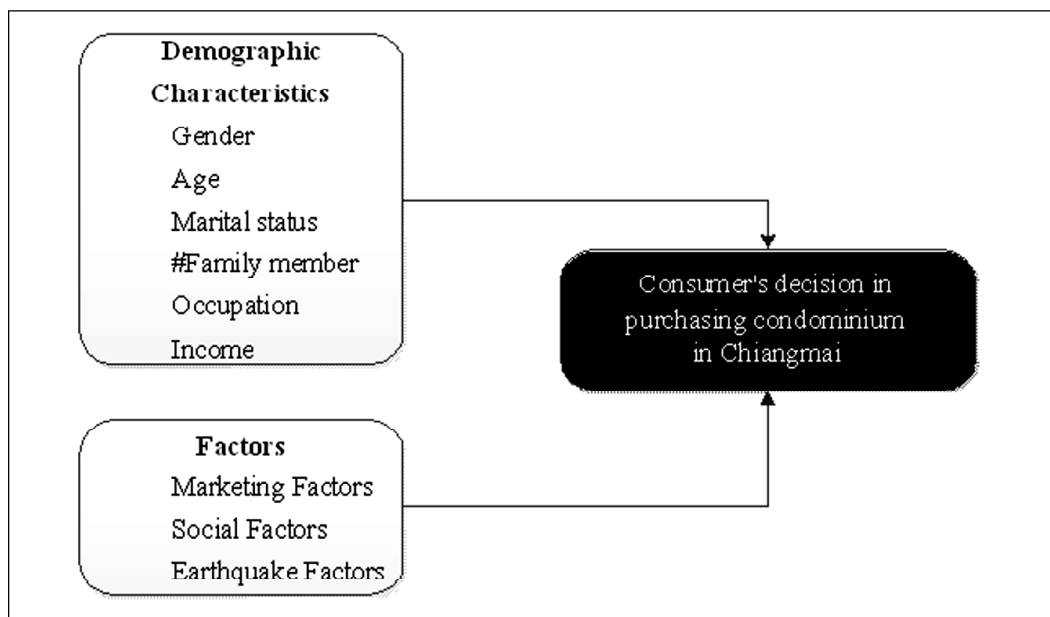
3.2. Research Instrument

The instrument used for data collection was a questionnaire. The questionnaire was categorized into two parts as follows:

Part 1: In this part, the questions were about personal information in terms of gender, age, educational level, occupation, and monthly income. The questions were designed to be nominal scale.

Part 2: In this part, the respondents were asked about factors that influenced their buying decision of a condominium in Chiangmai. The questions were about marketing factors, social factors, and earthquake factors that the respondents took into consideration in order to choose their prospective residence. The questions were rating scale that required the respondents to choose a level of importance.

Figure 1: Conceptual Model



3.3. Validity and Reliability Assessment

The whole questionnaire was developed by the authors reviewing related books and previous research studies and was examined for its content validity by an expert panel under the supervision of an independent study adviser before it was pre-tested. The reliability test was applied before collecting the primary data. The reliability of the questions was measured by using Cronbach's Alpha coefficient. Pre-testing was done with 50 participants in the Lamphoon area. Data was analyzed by SPSS. The resulted alpha coefficient was found to be 0.9409 (as shown in appendix A), confirming the high reliability of the questions. Thus, the author deemed that the questionnaire was acceptable.

3.4. Data Collection

The primary data was gathered by directly distributing 400 questionnaires to people who were interested in and able to make a decision to buy a condominium in the Chiangmai area. The questionnaires were collected in January, 2012. Our representatives checked that all of the respondents had filled in their questionnaire completely before they were collected. This study also used definitions and theories found in textbooks, online resources, articles, and research papers to support its assertion.

3.5. Data Analysis

Data was analyzed by using the SPSS software. The following were the statistics used in data analysis as follows:

First, descriptive statistics were used to describe and summarize information about the population and the sample in the forms of frequency distribution, percentage distribution, arithmetic mean and standard deviation as follows. Frequency distribution was used to summarize the number of times a particular value of a variable occurred. The variables were gender, age, marital status, education, occupation, and monthly income. Percentage distribution was used to summarize the percentage value associated with the frequency distribution of a variable. These values were the proportions in the consumers' demographic profile. Mean was used to measure the central tendency of a variable. In this study, the interpretation of an average weighted mean score was set by assigning a value between 1.00 and 4.00. And lastly, standard deviation was used to measure the spread and variability or dispersion.

Second, inference statistics were used to make inferences or judgments about a population on the basis of a sample. T-test was used to compare the means of two independent groups of sample in order to test our hypothesis at 0.05 level of significance. F-test (One-Way ANOVA) was used to compare the means of more than two independent groups of sample in order to test our hypothesis. The author had set the significant level at 0.05. A Post Hoc Test, Fisher's Least Significant

Difference (LSD), was used after the F-test (One-Way ANOVA) when the author had found that the significant level was less than 0.05. The Post Hoc Test was used to identify the difference between each pair of groups or populations.

4. FINDINGS

This paper examined the effect of occurrences of earthquake on condominium business in Chiangmai and investigated condominium selection behavior of consumers in Chiangmai. A questionnaire was used as an instrument to collect data from 400 samples. The results are shown as follows:

Part I: Number and percentage of items of general information of the respondents, of items of information prior to making a buying decision, and of household’s ecological and sociological factors influencing buying behavior;

Part II: Mean, standard deviation, and interpretation of two groups of factors influencing buying decision: project-related factors and earthquake-related factors;

Part III: Number and percentage of correspondents with reasons for buying a condominium;

Part IV: Hypothesis testing.

Part I: Number and percentage of items of general information of the respondents, of items of information prior to making a buying decision, and of household’s ecological and sociological factors affecting condominium buying behavior.

Table 1
Number and Percentage of Items of General Information of the Respondents

<i>Respondent’s General Information</i>	<i>Number</i>	<i>Percentage</i>
Gender		
Male	192	48.00
Female	208	52.00
Total	400	100.00
Age		
Less than 30 yrs.	216	54.30
30-40 yrs.	119	29.90
41-50 yrs.	57	14.30
51 yrs. or higher	6	1.50
Total	398	100.00
Educational Level		
High School or lesser	41	10.30
Diploma	74	18.60
Graduated (B.A) or equivalent	236	59.30
Postgraduate	47	11.80
Total	398	100.00
Occupation		
Civil Servant / State Enterprise	39	12.10
Merchant / Business Owner	89	27.60
Employee / Private Employee	128	39.80
Freelance / Employed	66	20.50
Total	322	100.00

As shown in Table 1, the number and percentage of items of general information of the respondents are as follows. Out of the total of 400 respondents, most were female (52%). Out of the total of 398 respondents, most were less than 30 years old (54.30%), followed by 30-40 years old (29.90%), 41-50 years old (14.30%), and 51 years old or higher (1.50%). Out of the total of 398 respondents, the majority had a Bachelor's Degree or equivalent (59.30%), followed by a diploma (18.60%), a postgraduate degree (11.80%), and a high school diploma or lower (10.30%). Out of the total of 322 respondents, the majorities were employees/private employee (39.80%), followed by merchant/business owner (27.60%), freelance/employed in general (20.50%), and civil servant/state enterprise (12.10%).

Table 2
Number and Percentage of Items of Information Prior to Making a Buying Decision

<i>Information Prior to Making a Buying Decision</i>	<i>Number</i>	<i>Percentage</i>
Description of Residence		
Government / Corporate Housing	20	5.10
Own house	119	30.20
Rented house	86	21.80
Living with parents / relative	41	10.40
Other	128	32.50
Total	394	100.00
Original Domicile		
Sansai	153	38.20
Hangdong	28	7.00
Muang (Chiangmai)	219	54.80
Total	400	100.00
Year of Condominium Buying		
N/A	183	47.80
1987 – 1997	13	3.40
1998 – 2007	59	15.40
2008 and afterwards	128	33.40
Total	383	100.00
Project Location		
Muang	350	92.10
Mae Rim	6	1.60
San Sai	9	2.40
Other	15	3.90
Total	380	100.00

As shown in Table 2, the number and percentage of items of information of respondents prior to making a buying decision are as follows. Regarding the description of residence, out of 394 respondents, the majority were living in dormitory/rented room (32.50%), followed by own house (30.20%), rented house (21.80%), living with parents/relatives (10.40%), and government/corporate housing (5.10%). Regarding the original domicile, out of 400 respondents, the majority's original domicile were in Chiangmai (54.80%), followed by Sansai (38.20%), and Hangdong (7%). Regarding the year of buying, out of 383 respondents,

most did not specify the year of buying (47.80%), followed by buying in 2008 or afterwards (33.40%), in 1998-2007 (15.40%), and in 1987-1997 (3.40%). Regarding the project location, out of 380 respondents, most resided in Muang District (92.10%), followed by other locations (3.90%), San Sai (2.40%), and Mae Rim (1.60%).

Table 3
Number and Percentage of Household's Ecological and Sociological Factors
Influencing Buying Behavior

<i>Household's Ecological and Sociological Factors</i> <i>Influencing Condominium Buying Behavior</i>	<i>Number</i>	<i>Percentage</i>
Condominium Price		
N/A	104	26.70
Less than THB 500,000	52	13.40
THB 500,000 – 1,000,000	164	42.10
THB 1,000,001 – 1,500,000	29	7.50
THB 1,500,001 or higher	40	10.30
Total	389	100.00
Household Income		
N/A	150	37.50
Less than THB 10,000	23	5.80
THB 10,000 – 20,000	36	9.00
THB 20,001 – 30,000	49	12.30
THB 30,001 – 40,000	49	12.30
THB 40,001 or higher	93	12.30
Total	400	100.00
Monthly Average Household Expenses		
Less than THB 10,000	87	21.90
THB 10,000 – 20,000	113	28.40
THB 20,001 – 30,000	92	23.10
THB 30,001 – 40,000	40	10.00
THB 40,001 or higher	66	16.60
Total	398	100.00
Number of Family Members		
N/A	59	15.00
1 - 2 persons	110	27.90
3 - 4 persons	189	48.00
5 - 6 persons	28	7.10
More than 6 persons	8	100.00
Total	394	100.00
Amount of Savings		
N/A	267	66.80
Less than THB 50,000	63	15.80
THB 50,000 – 100,000	58	14.50
THB 100,001 – 200,000	4	1.00
THB 200,001 – 300,000	2	0.50
THB 300,001 or higher	6	1.50
Total	400	100.00
Marital Status		
Single	262	67.20
Married	122	31.30
Divorced	6	1.50
Total	390	100.00

Table 3, shows the number and percentage of household's ecological and sociological factors influencing condominium buying behavior. They are as follows. Regarding the condominium price, out of 389 respondents, the majority were interested in a condominium within a price range of THB 500,000 - 1,000,000 (42.10%), followed by not specifying price (26.70%), with a price less than THB 500,000 (13.40%), within a price range of THB 1,500,001 or higher (10.30%), and within a price range of THB 1,000,001 - 1,500,000 (7.50%). Regarding the household income, out of 400 respondents, most did not specify their household income (37.50%), followed by an income of THB 40,001 or higher (23.10%), THB 20,001 - 30,000 (12.30%), THB 30,001 - 40,000 (12.30%), THB 10,000 - 20,000 (9%), and less than THB 10,000 (5.80%). Regarding the household expenses, out of 398 respondents, the majority reported their household income as ranging from THB 10,000 - 20,000 (28.40%), followed by THB 20,001 - 30,000 (23.10%), less than THB 10,000 (21.90%), THB 40,001 or higher (16.60%), and THB 30,001 - 40,000 (10%). Regarding the number of family members, out of 394 respondents, the majority reported their number of family members as 3 - 4 persons (48%), followed by 1 - 2 persons (27.90%), not specifying (15%), 5 - 6 persons (7.10%), and more than 6 persons (2%). Regarding the amount of savings, out of 400 respondents, most did not specify the amount of their savings (66.80%), followed by specifying an amount of less than THB 50,000 (15.80%), an amount in the range of THB 50,000 - 100,000 (14.50%), THB 300,001 or higher (1.50%), THB 100,001 - 200,000 (1%), and THB 200,001 - 300,000 (0.50%). Regarding the marital status, out of 390 respondents, the majority reported their marital status as single (67.20%), followed by married (31.30%), and divorced (1.50%).

PART II: Mean, standard deviation, and interpretation of projected-related factors and earthquake-related factors influencing a condominium buying decision.

As shown in Table 4, the mean, standard deviation, and interpretation of project-related factors that influenced buying decision are as follows. Overall, the marketing factors influenced buying decision highly ($M = 3.55$) for individual aspects, travel economy influenced buying decision the most ($M = 4.03$), followed by Interest rate lower than normal rate. ($M = 3.49$), project offering loan from financial institution ($M = 3.45$), and project allowing withdrawal from occupational welfare ($M = 3.01$). Overall, the social factors influenced buying decision highly ($M = 3.63$) for individual aspects, life and asset safety influenced buying decision the most ($M = 4.12$), followed by proximity to workplace/child's school and habitants of relatively high quality ($M = 3.99$), a multitude of habitants ($M = 3.31$), proximity to parents/relatives ($M = 3.25$), and relatives/neighbors bought one ($M = 3.04$).

Table 4
Mean, Standard Deviation, and Interpretation of Project-Related Factors
Influencing Buying Decision

<i>Project-Related Factors influencing buying decision</i>	<i>Mean</i>	<i>S.D.</i>	<i>Interpretation</i>
Marketing Factors			
Terms and conditions of monthly installment of the project are more attractive than those of other projects	3.77	0.95	Highly
Travel economy	4.03	0.81	Highly
Interest rate is lower than normal rate	3.49	1.18	Highly
The project offers loan from financial institution	3.45	2.38	Highly
The project allows withdrawal from occupational welfare	3.01	1.30	Highly
Overall	3.55	0.92	Highly
Life and asset safety are more secured than those offered by other projects	4.12	0.93	Highly
Proximity to parents / relatives	3.25	1.20	Highly
Relative / neighbor also buys one	3.04	1.30	Highly
Desire to stay near workplace/child's school	3.99	1.07	Highly
Environment not congested	3.73	1.03	Highly
A multitude of habitants	3.31	1.03	Highly
Habitants are of relatively high quality	3.99	0.96	Highly
Social Factors	3.63	0.69	Highly

Table 5
Mean, Standard Deviation, and Interpretation of Earthquake-Related Factors
Influencing Buying Decision

<i>Earthquake-Related Factors that influenced buying decision</i>	<i>Mean</i>	<i>S.D.</i>	<i>Interpretation</i>
Structural building is sturdy according to engineering principle	4.21	0.79	Mostly
Earthquake warning is available	3.67	1.24	Highly
Assistance system, by land and by air, is available in case of an earthquake	3.58	1.17	Highly
No history of earthquake occurrences at project location, and no fault line	3.74	1.17	Highly
Project location is near a fire station	3.63	1.10	Highly
Overall	3.72	0.95	Highly

As shown in Table 5, overall, it was found that the earthquake-related factors influenced buying decision highly ($M = 3.72$) for individual aspects, sturdy structural building in accordance with engineering principle influenced buying decision the most ($M = 4.21$), followed by no history of earthquake and no fault line ($M = 3.74$), availability of earthquake warning system ($M = 3.67$), project location near a fire station ($M = 3.63$), availability of assistance system by land and by air in case of an earthquake ($M = 3.58$).

PART III: Number and Percentage of Correspondents with Reasons for buying a Condominium

Table 6
Number and Percentage of Correspondents with Reasons for Buying a Condominium

<i>Reasons for Buying Condominium</i>	<i>Number</i>	<i>Percentage</i>
<i>Reasons for purchasing a condominium (more than one choice is allowed)</i>		
Former residence is deteriorating	8	1.53
Former residence is far from office	204	38.92
Want to possess own house	114	21.76
Environment is nicer than the old residence's	53	10.11
Relocation of office	55	10.50
Others (speculative, rent, for relaxation)	90	17.18
Overall	524	100.00
<i>Description of Former Residence</i>		
Single house	235	59.90
Twin house	11	2.80
Town house	33	8.40
Commercial building	29	7.40
Others	72	18.40
No idea	12	3.10
Overall	392	100.00
<i>Reasons not to buy a desired residence</i>		
Too expensive	142	36.80
Unsuitable to the family size	20	5.20
Desiring upland residence	12	3.10
Undesirable location	68	17.60
Having own house, just look for a reserve	89	23.10
Others (e.g. it shall facilitate business operation)	55	14.20
Overall	386	100.00
<i>Buying Method</i>		
N/A	185	47.40
Cash	81	20.80
Loan from financial institution	124	31.80
Overall	390	100.00

contd. table 5

<i>Reasons for Buying Condominium</i>	<i>Number</i>	<i>Percentage</i>
Information source supporting a purchase decision		
Seeking it by themselves	152	38.80
Ads from various media	124	31.60
Friends / Relatives	87	22.20
Salesperson	13	3.30
Others	16	4.10
Overall	392	100.00
Person supporting the purchase decision		
Self-determination	149	37.81
Own decision and family members	194	49.24
Father / Mother / Relatives	49	12.44
Others	2	0.51
Overall	394	100.00
Pleasant	291	73.90
Unpleasant	17	4.30
No idea	86	21.80
Overall	394	100.00
Opinion after moving into the condominium		
Pleasant as expected	166	42.10
Unpleasant as expected	30	7.60
No problems	198	50.30
Overall	394	100.00
Future role of condominium		
Very important	252	64.00
Uncertain	132	33.50
Less important	10	2.50
Overall	394	100.00
Factors influencing the intent of future purchase		
Physical nature of condominium	116	29.44
Family's economy	171	43.40
Social factors	69	17.51
Others	38	9.65
Overall	394	100.00

As shown in Table 6, most respondents bought a condominium because their former residence was far from their workplace (38.92%), followed by because they desired to possess their own residence (21.76%), because of other reasons (e.g. speculative, rent, for relaxation) (17.18%), because of relocation of office (10.50%), because new environment is nicer than the old one (10.11%), and because former residence was deteriorating (1.53%). Regarding their former residence, out of 392 respondents, the majority had lived in a single house (59.90%), followed by the

'others' category (18.40%), town house (8.40%), commercial building (7.40%), 'no idea' category (3.10%), and twin house (2.80%). Regarding the reasons not to buy a desired residence, out of 386 respondents, the majority reasoned that it was too expensive (36.80%), followed by already having their own house, just looking for a reserve (23.10%), Undesirable location (17.60%), 'other' category (e.g. it shall facilitate business operation) (14.20%), unsuitable to the family size (5.20%), and desiring an upland residence (3.10%). Regarding the buying method, out of 390 respondents, most did not specify their buying method (47.40%), followed by loan from a financial institution (31.80%), and cash (20.80%). Regarding the information source supporting their purchase decision, out of 392 respondents, the majority obtained information by seeking for it by themselves (38.80%), followed by ads in various media (31.60%), friends/relatives (22.20%), 'others' category (4.10%), and salesperson (3.30%). Regarding the person supporting the purchase decision, out of 394 respondents, most were self supported and supported by their family members (49.24%), followed by self-determination (37.81%), father/mother/relatives (12.44%), and 'others' category (0.51%). Regarding the opinion prior to moving into the condominium, out of 394 respondents, the majority considered the residence pleasant (73.90%), followed by 'no idea' (21.80%), and unpleasant (4.30%). Regarding the opinion after moving into the condominium, out of 394 respondents, the majority considered the residence as not having any problems (50.30%), followed by pleasant as expected (42.10%), and unpleasant as expected (7.60%). Regarding the future role of condominium, out of 394 respondents, most considered it as very important (64%), followed by uncertain (33.50%), and less important (2.50%). Regarding the factors influencing the intent of future purchase, out of 394 respondents, the majority thought that their family's economy was the most important factor (43.40%), followed by physical nature of condominium (29.44%), social factors (17.51%), and 'other' category (9.65%).

PART IV: Hypothesis Testing

H1: Household's ecological and sociological factors: condominium price, household income, and household expenses were correlated to project-related factors: marketing, social, physical nature, and reputation.

Table 7
Relationships between Condominium Price and Project-Related Factors

<i>Project-Related Factors Influencing a Buying Decision</i>	<i>Correlation</i>	<i>Sig.</i>
Marketing	0.075	0.134
Social	0.028	0.579
Physical nature and reputation	0.058	0.250

* Statistically significant level .05

** Statistically significant level .01

As shown in Table 7, there was no relationship between condominium price and all 3 project-related factors at statistically significant level .05.

Table 8
Relationships between Household Income and Project-Related Factors

<i>Project-Related Factors influencing a buying decision</i>	<i>Correlation</i>	<i>Sig.</i>
Marketing	0.034	0.501
Social	-0.033	0.514
Physical nature and reputation	0.096	0.055

* Statistically significant level .05

** Statistically significant level .01

As shown in Table 8, there was no relationship between household income and all 3 project-related factors at statistically significant level .05.

Table 9
Relationships between Household Expenses and Project-Related Factors

<i>Project-Related Factors influencing a buying decision</i>	<i>Correlation</i>	<i>Sig.</i>
Marketing	0.049	0.325
Social	0.033	0.512
Architecture and Engineer Reputation	0.175**	0.000**

* Statistically significant level .05

** Statistically significant level .01

As shown in Table 9, there was a relationship between household expenses and architect and engineer reputation at statistically significant level .01, whereas there was no relationship between household expenses and marketing and social factors.

H2: Household’s ecological and sociological factors: condominium price, household income, and household expenses were correlated with earthquake-related factors.

Table 10
Relationship between Condominium Price and Earthquake-Related Factors

<i>The Earthquake-Related Factors Influencing a buying decision</i>	<i>Correlation</i>	<i>Sig.</i>
The earthquake-related factors influencing a buying decision	0.022	0.656

* Statistically significant level .05

** Statistically significant level .01

As shown in Table 10, there was no relationship between condominium price and earthquake-related factors at statistically significant level .05.

Table 11
Relationship between Household Income and Earthquake-Related Factors

<i>The Earthquake-Related Factors Influencing a buying decision</i>	<i>Correlation</i>	<i>Sig.</i>
The earthquake-related factors influencing a buying decision	0.013	0.802

* Statistically significant level .05

** Statistically significant level .01

As shown in Table 11, there was no relationship between household income and earthquake-related factors at statistically significant level .05.

Table 12
Relationship between Household Expenses and Earthquake-Related Factors

<i>The Earthquake-Related Factors Influencing a buying decision</i>	<i>Correlation</i>	<i>Sig.</i>
The earthquake-related factors influencing a buying decision	0.008	0.869

* Statistically significant level .05

** Statistically significant level .01

As shown in Table 12, there was no relationship between household expenses and earthquake-related factors at statistically significant level .05.

H3: Project-Related Factors including marketing, social, and physical nature and reputation were associated with earthquake-related factors.

Table 13
Relationship between Earthquake-Related Factors and Project-Related Factors

<i>Project-Related Factors Influencing a buying decision</i>	<i>Correlation</i>	<i>Sig.</i>
Marketing	0.416**	0.000**
Social	0.479**	0.000**
Physical nature and reputation	0.661**	0.000**

* Statistically significant level .05

** Statistically significant level .01

As shown in Table 13, earthquake-related factors were moderately correlated with all 3 project-related factors: marketing, social, and physical nature and reputation at statistically significant level .05.

5. CONCLUSION

This study of the effect of earthquake occurrences on condominium business in Chiangmai aimed to investigate the factors that potentially affected the condominium business and the buying behavior of consumers in Chiangmai. The statistics employed include percentage, mean, standard deviation, and chi-square.

5.1. Discussion

The majorities of respondents were female, younger than 30 years old, had a Bachelor's Degree or equivalent, and worked as an employee/private employee. Most respondents reported their residence of choice to be other types of residence, for example, dormitory and rented room. Their original domicile was up-country. Most of them did not specify the year of their buying. The majority of them lived in the Muang district area.

As for the household's ecological and sociological factors influencing buying decision, most of the respondents were interested in a condominium with a price

ranging from THB 500,000 - 1,000,000. Most of them did not specify their household income while their monthly household expenses ranged from THB 10,000-20,000. The majority reported to have 3-4 family members. Most of them did not specify the amount of their savings. They mainly were single.

As for the project-related factors influencing buying decision, the marketing factors influenced buying decision considerably. For individual aspects, travel economy influenced buying decision the most, followed by terms and conditions on monthly installment, offered loan from a financial institution, and withdrawal from occupational welfares. Social factors also influenced buying decision considerably for individual aspects, life and asset safety influenced buying decision the most, followed by proximity to workplace/child's school, habitants are of relatively high quality, environment not congested, proximity to parents/relatives, and relatives/neighbors also bought one. Overall, physical factors and reputation have influenced buying decision considerably. For individual aspects of areas, desired location influenced buying decision the most, followed by well-equipped infrastructure and facility, high level of life and asset security, condominium and accommodation style is fine, and pleasant environment, fine materials and construction, space is suitable to family numbers, and project owner is reputable and trustworthy.

As for the earthquake-related factors, it was found that they influenced buying decision considerably. for individual aspects, sturdy building structure in accordance with engineering principle influenced buying decision the most, followed by no history of occurrences earthquake and fault line, availability of earthquake warning, proximity to fire station, availability of assistance system, by land and by air, and availability of emergency plan in the event of natural disasters.

As for the reasons for purchasing a condominium, most of the respondents gave the reason that their former residence was far from the office. Before buying a condominium, they mainly lived in a single house. The reason most of them gave for not buying a condominium was because it was too expensive. They mainly did not specify a buying method. Most of them sought information by themselves and made a decision based on self-determination and family members' opinion. Before most of them moved into the condominium, they perceived it as pleasant and reported no problem after moving into it. The future role of condominium is quite important to most of them. The factor influencing future buying decision was mostly household's economy.

As for the test results of H1, household expenses were found to correlate slightly with the physical nature and reputation of the builder at statistically significant level of 0.01, while not correlating significantly with other project-related factors.

As for the test results of H2, household's ecological and sociological factors showed no significant correlation with earthquake-related factors.

As for the test results of H3, moderate correlations were found between earthquake-related factors and project-related factors at statistically significant level of 0.05.

5.2. Implication

Our findings demonstrated that the main reason for buying a condominium is proximity to the office. This is consistent with the findings of Kanchana Kaewyam's work (1996) on the housing needs of students at KMUT Thonburi. She pointed out that most students moved from their domicile to a rented condominium close to their university where they could spend less than an hour traveling to the university. Factors influencing their choice of rented residence, from the highest order of priority to the lowest, included traveling convenience, room size, rental price, environment, and need for independent stay. Most students had wished that their university provided housing that fulfilled their needs.

Our study found that location, most strongly, influenced the respondents' decision to buy a condominium, followed in this order by well-equipped infrastructure and facility, heightened security for life and asset, fine accommodations, and pleasant living environment. This is consistent with Papakorn Suwanthada's findings (2008). She examined the housing need of Khonkaen University students. She found that students were very satisfied with the location of their dormitory because it provided traveling convenience. The factors influencing the students' choice of residence, from the highest to the lowest priority, were environment as well as safety, cleanliness, convenience, and telecommunication and computer modeling.

In our study, earthquake-related factors influenced our respondents' buying decision substantially. Most respondents reported that they felt confident in a building that was constructed in accordance with sound engineering principles. This preference is followed by preference for a location that had no history of earthquake occurrences and fault line.

5.3. Limitation

The limitation of our study lies in the reliability of the data collected and the participated respondents. Some of the participants had only recently lived in the Chiangmai area, so they did not have an actual experience of an earthquake. Moreover, the survey was conducted during rush hours, so there was a possibility that some participants did not pay full attention to the questions in the survey. Because of these reasons, some participants might not fully realize the impact of an earthquake, and therefore, might not be able to respond meaningfully to the survey.

5.4. Recommendation

Since data was gathered using a questionnaire in our survey, it was possible that miscommunication might have occurred. In future work, it is suggested that data collection be made by interviewing to improve the reliability of the investigation. Also, in the present study, data collection was incomplete for some of the questions in the questionnaire. This might result in errors. It is suggested that factors affecting the expectation and satisfaction of condominium residents be investigated to identify other important issues on consumers' decision to buy a condominium. In addition, cleanliness and safety are also important issues that need to be addressed. The agency that runs a residence should adopt a measure to maintain the cleanliness of the residence and its surroundings. More importantly, as safety is regarded as the most important factor in making a buying decision, the agency should assure buyers by implementing strict and effective safety measures.

5.5. Future Research

In order to ensure full access to reliable data, a future research agenda needs to address more residential areas that directly experience impacts from earthquakes. Also, recruitment should include, especially, participants who have already faced an earthquake because they will be able to relate to it more realistically, and so, will be able to respond to a survey more meaningfully. Moreover, questionnaire items should cover more topics such as safety concerns and facilities. Another future agenda may be to initiate collaborations from related business entities and governmental agencies in order to brainstorm and formulate sound recommendations and effective preventive action plans for handling future earthquakes.

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