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THE INFLUENCE OF PERSONAL AND ENVIRONMENTAL FACTORS ON BUSINESS START-UPS: A CASE STUDY IN THE DISTRICT OF DILI AND OECUSSE, TIMOR-LESTE

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Abstract

Small enterprise has been playing important role in economic development of every country. Small enterprises participation in economic development gave direct impact on creating jobs, creating competitive advantage, and an important career option. This paper aims to investigate the influence of personal (demographics and personal traits) and environmental factors on business start-ups in Dili and Oecusse Districts, Timor-Leste. Sample of this population came from small enterprises in both districts, 178 small enterprises have been identified as target population, only 134 sample size used for this study. Linear structural relationship statistics provide a systematic understand of the effect of personal and environmental factor on business start-ups. Under significant analysis, the result pointed that variables of demographics, personal traits, and environmental factors have influenced business start-ups. The most important is government and business and professional service providers should create appropriate facilities and professional assistance for entrepreneurial development.

Keywords: Entrepreneurship, Small businesses, Entrepreneur, business start-ups, Economics, start-up motivation, demographics, personal traits, environmental determinants.

Introduction

The focus of this study is about the influencing of personal and environmental factors on business start-ups. New business play important role in creating new job. Based on national report in many counties, include Thailand national report, shown that in some specific number of jobs came from

small enterprise and medium enterprise. Second, new business also creates competitive advantage. New firms often come up with new ideas or new model of quality of product and services. By new firm's presence, it is also challenging existing enterprise to improve their product and service quality. Third, starting a business is an important career option. In this term, starting a business is one way how to maximize freedom of economic opportunity

Previous researchers have found the important variable such demographics (gender, age, education level, and working experience), personality traits (desire for independence, need for achievement, locus of control, risk taking propensity, and recognition of opportunity), and environmental factors (financial support, government support, education and training, business and professional infrastructure, access to physical infrastructure, and cultural and social norms), all these variables have been identified as factors influencing entrepreneurial activity. However, this study has been developed in different testing procedures, sampling and country specific factors. Furthermore, this is the first research related business start-ups in Timor-Leste, which enterprises development target has been part of The Strategic Development Plan after restoration independence in 2000.

Literature review

Apart from economic development, the entrepreneur has been approached under of different perspectives. Since the beginning of the century, the entrepreneurs and entrepreneurship became enthusiasm of many aspects. This interest has related in the academic activities, which are an impressive increased in the number of study that relate this subject. Researchers have identified that new firm creation is an important factor for economic growth, creating many new jobs (Birley, 1987; Reynolds, 1987; Dyck and Ovaska, 2011), and creating competitive advantage.

Previous studies have identified the entrepreneur's personal and environmental play critical role in entrepreneurial formation. Not surprisingly, many researchers concept of entrepreneurship based on the definition of Low and McMillan (1988) as the "creation of new enterprise" (p.141). This concept came from a growing awareness that entrepreneurship is a "process of becoming rather than state of being" (Bygrave, 1989, p.21). Surely that starting a business is a process that takes many years to develop gradually and come to successfully.

The process of starting a business is the focus of this research. This process related to two perspectives:

1) The influence of the personal factors on business start-ups;

2) The influence of the environment factors on business start-ups.

Some definitions of entrepreneurship

Low and McMillan (1988) stated good science has to begin with good definitions. However, some empiricists believe they can go forward (function) without appropriate definitions, but many researchers are questioning it. The problem is how can empiricists know what phenomenon they are studying if they cannot define what they have

observed? Some researchers believed only theorists function if define with exact definitions. After all, both models and theories can predict the result of operations. As Bygrave and Hofer (1991) stated it is impossible to operationalize a concept if it cannot be defined. Bridgman (1927) and Dewey (1929) wrote: "the concept is synonymous with the corresponding set of operations."

As Low and MacMillan (1988) that the phenomenon of entrepreneurship is interrelation with complex issues such as management of change, innovation, technological and environmental turbulence, new product development, small business management, individualism and industry evolution. Furthermore, the phenomenon can be investigated from varied disciplines such as economics, sociology, finance, history, psychology, and anthropology, each of this discipline uses its own concepts and operates within its own terms of reference.

The definition of entrepreneurship for this study related with statement of Low and MacMillan (1988) that entrepreneurship as the “creation of new enterprise”, it mean that entrepreneurship seeks to explain and simplify the role of new enterprise in bring forward economic progress. "Explanation" it pushes researchers not only staying in descriptive studies, but also to follow causal inference. Through "facilitation" it pushes researchers to maintain relevance factor for practice and to consider both micro and macro perspectives. Entrepreneurship is a process that evolves with time, which is changing over time, and only can understands within observe what happening in the field.

The model and studies related demographic

Under personal factors, numerous factors have identified relation with demographic, such as gender, age, education level, working experience.

According to studies in different countries, it has found that there are determining the links between demographic and entrepreneurship. Previous researchers have found the gender differences are not significant with business start-ups (Bergmann and Sternberg, 2007; Rosti and Chelli, 2005; Williams, 2004; Remeikiene and Startiene, 2008).

Some specific age can be representative of person maturity in making decision to become an entrepreneur (Blanchflower and Meyer, 1994; Bergmann and Sternberg, 2007). As Ritsilä (2002) stated that the age of 26 to 40 can be considered a period of readiness the choice of occupation. People at these ages are possibilities to come success. However, as Parker (2004) stated age can positive correlation if its connected with the professional experience, self-reliance, availability of capital increase.

Enter business activities with sufficient knowledge are needed. Researchers have found that knowledge and information are basic elements for initial self-confidence of individuals in an entrepreneur venture (Minniti and Bygrave, 1999; Aldrich and Martinez, 2001). With sufficient knowledge, transferring idea into an organization can make entrepreneur obtain resources.

Attitudes are usually formed by previous experience, it was logical that entrepreneur who direct experienced with entrepreneurial activities in the past

would have stronger entrepreneurial attitudes (Harris and Gibson, 2008). Moreover, Harris and Gibson found students who have experience with family business are possible to be an entrepreneur. Students whose family owned a business had a greater sense of achievement, innovation, and personal control as a result of interacting and working within the business.

The model and studiesa related personal traits

Trait theory argues that individual always have the personality traits to determine which action should be taking. Under the content of entrepreneurship, personal characteristics or traits became focused of many researchers that make distinguish entrepreneurs from the general population (Low & MacMillan, 1988). Five factors were decided to be part of this study:

1) Desire for independence

2) Need for achievement

3) Locus of control

4) Risk taking propensity; and

5) Recognition of opportunity.

Some researchers found person decides to become an entrepreneur is because they want to be independence and not to work for other (Kirkwood and Walton, 2010; Lee, 1997). These studies showed the basic difference between the role of a person become entrepreneur and a person working for others.

McClelland (1967) pointed achievement motivation is an important factor provide some light to the entrepreneurship mindset and challenges, especially for the motivational disposition of the entrepreneurs. A person have characteristics of high need for achievement that appreciates and willing to take responsibility, prefers solving problem without any assistance, taking risk, and respect all outcomes of their own decision (McClelland, 1967; Sesen, 2013).

Under the personal characteristic theory, locus of control has been one of the focus studies. Locus of control is a complex individual phenomenon which has concerned with determining the effects of the perception of an individual to control all events that implies to their lives.

Risk-taking propensity is another psychological characteristic often related to entrepreneur intention of starting a new business venture. Ability for risk-taking also a significant dimension under content of entrepreneurship. In responding to the risks, entrepreneurs always learn how to handle it from their previous mistake attitude, environment, and from other experience (Stokes and Blackburn, 2002; Harrison and Leitch, 2005).

Shane and Venkataraman (2000) in their study suggest two factors implies a person to recognize particular opportunities: 1) congruent information from previous and current can affect a person on recognizing a business opportunity, 2) the cognitive characteristics are needed to evaluate these opportunities and later make a decision to exploit them. Every person has different abilities to recognize specific opportunities, it's depend on availability of information. Availability of information defines mental structure, which provides process of recognizing new information. To recognize an opportunity, every entrepreneur should congruent with previous information and

new information. Under cognitive science, Researchers pointed people always combine existing concept and information into new ideas based on their ability.

The model and studies related envtironmental factors

Personal decision to become an entrepreneur is not only personal factor issues, but also environment factor issues as well (Bird, 1988). As Stevenson and Jarill (1990) stated that environmental factors are also relevant because environments conducive can direct influence to new business success.

Studies about environmental factors influencing business start-ups come from difference macro economics, institution and cultural characterizing the country or from macro or regional in time period, or specific issue of industries. Even though, a topic related to environmental factors are very abroad and diverse to integrate effectively. As Gnyawali and Fogel (1994) stated there is no integrated scheme to identifying environmental conditions conducive for business activities. Based on literatures, there was many research highlighted different environmental factors on business start-ups, but for needs of this study only six factors considerable.

1) Financial support

2) Government (policy and programs),

3) Education and training,

4) Business and professional infrastructure,

5) Access to physical infrastructure; and

6) Cultural and social norms.

Formation of new organization requires resources include financial resources. When an entrepreneur transforms their idea into a firm, financial resources are important factors to be considered such as financial institution, investors and others. This financial resource use for financing operation such as security deposits, transaction, and others, or for investment such as loans (Evans and Jovanovic, 1989). However, Kim *et al*. (2006) stated that for many reasons, get money from bank loan or investors can be difficult because they just start and it might faced high risk, lenders are usually do not want to provide capital and some compensate through cost of borrowing.

Under the social development theory, government policy and programmes play an important role to ensure quality change in the structure and framework of society that helps the society to realize aim and objectives of life. As previous studies pointed that government policy, institutions, and programmes can influence business start-up in many ways (Reynolds *et al*, 1994; Yusuf, 1995).

Through cognitive test with student samples (who have studied at a university), Peterman and Kennedy (2003) pointed education is an important factor influencing students cognitive to be an entrepreneur. Feasibility and desirability perceptions also consider as factor influence individual intention to make the decision to be an entrepreneur, especially when they finished their study at university or any education level (Krueger, 1993; Shapero and Sokol, 1982). As Greene and Brown (1997) noted, a certain amount of knowledge that a person obtains from formal education, working experience or

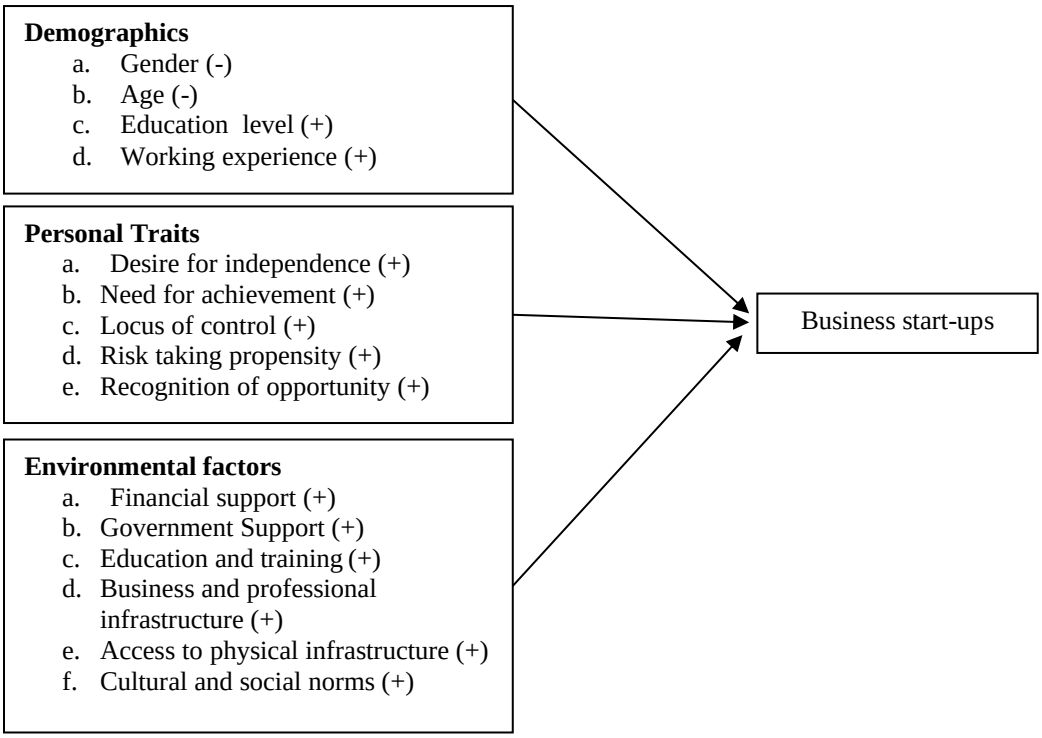
additional training is measurement for a new business venture.

Business and professional services defined as technical and/or unique functions performed by independent contractors/consultants provide professional assistance on business success. Grimaldi and Grandi (2005) stated that Business and Professional infrastructure play important role in providing support services and assistance in business activities.

Infrastructure influencing economic development has been well recorded in the academic studies and in the policy debate (Aschauer, 1989; Munnell, 1990; World Economics Forum, 2013). Moreover, the World Economics Forum reported that good infrastructure plays an important role in macro and micro level enhance effective functioning of economic growth. If at macro level physical infrastructure is an important factor, then at micro level also consider as an important factor. Sahoo *et al*. (2010) stated that good physical infrastructure has been effected on (i) production facilities; (ii) minimizing cost of the transaction and cost of trade can create and improve the competitive; and (iii) provides employment opportunities.

There also appears in society that people often respect for those who have hard work and success started their own business. Through environmental where persons success, potential entrepreneurs and entrepreneurs, where both can discuss ideas, challenges and solutions, new business will be produced (Gomezelj and Kušce, 2013; Ajzen, 1991).

Previous subsections were identified that personal and environmental factors influencing business start-ups. Researchers have proposed conceptual framework of creating new venture which both factors are considerable. Bird (1988) stated that in business creation both personal and environmental define entrepreneurial intentions. Greenberger and Sexton (1988) stated that personal characteristics collaborate with environmental factors determining new venture creation. Thus this study proposed a specific model of the personal and environmental factors influencing business start-ups.



Methodology

Research design

The sample has selected based on the enterprises information in the district of Dili and the district of Oecusse. The enterprise information has been collected based on enterprises categorized such as company registration year, number of employment, and type of industry/business. The result showed there are 178 small enterprises became the target of studies, however, only 134 used for the analysis.

Research tool: quantitative research

This exploratory research will choose quantitatively. The study has investigated the personal and environmental factors on business start-ups.

Part one, the questionnaire form has started with personal information, such as age, gender, education level, and working experience. This information has been considered as factors affecting a person to create a business venture.

Part two, this part related assessment of the important factors were effected a person's decision to start their own business such as personal traits with variable desire for independence; need for achievement; locus of control; risk taking propensity; and recognition of opportunity. This questionnaire also relation to characteristics of the business environment such as financial support, government support, education and training, business and professional

infrastructure, access to physical infrastructure; and cultural and social norms.

Part three, this part related company information, such as type of industry or business, year of establishment, and number of employees. This part has related to small enterprises categorized.

Data measurement and analysis

This study sets a different statement for each of those dimensions using Likert scale. Each question has a statement followed by a five-point Likert scale ranging from 'strongly disagree' to ' strongly agree'

This study also used two procedure model to analyze the correlation between personal information with factors and also correlation independent factors and dependant factors. For first model, A chi-square analysis of the relationship between demographics and business start-ups. For the second model, the ANOVA procedure will use to analyze the significant level among independent variable and dependent variable.

Analysis

Demography characteristics

The sample represented a diversity of gender, age group, education level, and working experience group. In the category of gender participation, there are male participated in the survey by 90.3% than female participated by 9.7%. Under age category, there are 47.8% of respondent from age 25 to 40 years old, by 41 % of respondents in the range 41 to 50 years old, 6.7% of the respondents from age 51 and above years old, and 4.5% in the range 15 to 24 years old.

In terms of education level, the most responded sample came from participants who finished their Senior High School by 40.3%, following by 37.3% of Junior High School, by 19.4% of Bachelors Degree, by 3.0% of Primary School, Masters Degree and PH.D., was not participating in this study. Most of entrepreneurs who had started their own business has working experience with humanitarian organizations (local or international NGOs) by 32.1%, by 31.3% of profit organization (local or international companies) and unemployed, and by 5.2% with government.

Respondent in the sample came from different business activities, restaurant companies were dominated with 27.6%, by 19.4% of agriculture, by 10.4% of electronic companies, by 9.7% of construction and furniture companies, by 9.0% of health care companies, by 3.7% of hotels, by 5.3 of music, by 3.0% night clubs, by 1.5 of education, and 2.2% have considered as missing date.

Analysis of level of agreement

Each question has a statement followed by a five-point Likert scale ranging from 1= strongly disagree, 2=somewhat disagree, 3=neither agree or disagree, 4=somewhat agree, and 5=strongly agree. The levels of the important value are calculated as follows:

$$\frac{5-1}{5} = 0.80$$

The mean of each score as following explanation:

4.21 – 5.00 are considered as strongly agree

3.41 – 4.20 are considered as agree

2.61 – 3.40 are considered as neutral

2.81 – 2.60 are considered as disagree

1.00 – 1.80 are considered as strongly disagree

Table 1 Analysis of level of agreement

	DI	NA	LC	RTP	RO	FS	GS	ET	BPI	API	CSN
Mean	4.197	3.609	3.597	3.689	4.244	4.241	4.299	4.343	4.259	4.246	3.264

The mean value of the desire for independence (DI) showed the apparently turned out to be approximately 4. 197 which shows the agree level of agreement**,** the mean value of the need for achievement (NA) apparently turns out to be about 3.609 which shows the agree level of agreement, the mean value of the locus of control (LC) which the apparently turned out to be about 3. 597 which shows the agree level of agreement**,** the mean value of the risk taking propensity (RTP) which the apparently turned out to be approximately 3.689 which shows the agree level of agreement**,** the mean value of the recognition of opportunity (RO) which the apparently turned out to be approximately 4. 244 which shows the agree level of agreement**,** the mean value of the financial support (FS) which the apparently turned out to be approximately 4.241 which shows the strongly agree level of agreement**,** the mean value of the government support (FS) which the apparently turned out to be approximately 4. 299 which shows the strongly agree level of agreement**,** the mean value of the education and training (ET) which the apparently turned out to be approximately 4.343 which shows the strongly agree level of agreement**,** the mean value of the Business and professional infrastructure (BPI) which the apparently turned out to be approximately 4. 259 which shows the strongly agree level of agreement**,** the mean value of access to professional infrastructure (API) which the apparently turned out to be approximately 4. 246 which shows the strongly agree level of agreement**,** the mean value of the cultural and social norms (CSN) which the apparently turned out to be approximately 3.264 which shows the strongly agree level of agreement**.**

Correlation analysis

Correlation analysis also statistic tool used to analyze the strength and direction of a linear relationship between two

variables. There are a number of different statistical that available, depending on level of measurement. For this study, analysis had focused on a bivariate Pearson product-moment correlation coefficient. A value of the correlation coefficient r is used to describe the magnitude of the relationship of two variables.

Table 2 Correlation analysis

	DI	NA	LC	RTP	RO	FS	GS	ET	BPI	API	CSN	BSU
DI	1											
NA	.430**	1										
LC	.493**	.684**	1									
RTP	.354**	.305**	.554**	1								
RO	.650**	.376**	.480**	.388**	1							
FS	.707**	.330**	.324**	.367**	.595**	1						
GS	.814**	.408**	.462**	.334**	.588**	.728**	1					
ET	.806**	.210*	.274**	.275**	.541**	.707**	.766**	1				
BPI	.860**	.295**	.358**	.260**	.531**	.683**	.793**	.825**	1			
API	.791**	.390**	.427**	.351**	.613**	.710**	.818**	.763**	.798**	1		
CSN	.372**	.214*	.213*	.178*	.222**	.288**	.466**	.355**	.371**	.337**	1	
BSU	.733**	.626**	.612**	.354*	.570**	.424**	.516**	.438**	.455**	.550**	.213*	1

The correlation matrix analysis showed that all the variables specified above were related and significant with each other such as desire for independence, need for achievement, locus of control, risk taking propensity; recognition of opportunity, financial support, government support, education and training, business and professional infrastructure, access to physical infrastructure; and cultural and social norms. Moreover, factors under personal and environmental have positive correlation with business start-ups.

Hypothesis testing

Since measurement relationship was consistent with the data, the structure model has evaluated. An examination of the structure model involves significant model to estimate coefficient, which give as basic decision to accept or reject the proposed relationship between latent structure.

Table 2 pointed the result of the model estimate with parameter estimate of the hypothesized chi-square. The results of the model testing with chi-square has showed $\boldsymbol{x^2}$ statistic, degrees of freedom, significant level has been pointed and it has given a basic decision. Based on result, education level and working experience was significant level at 0.05. Two other factors, gender and age, was negative influence on business start-ups.

Table 3 Chi-Square Tests between demographics and business start-up

	Gender	Age	Education level	Working experience
Pearson Chi-Square	5.839[a]	16.151[b]	30. 271[b]	30.180[a]
Df	6	18	18	18
Asymp. Sig.	.441	. 582	. 035	. 036

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 67.0.
b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 33.5.
Hypothesis1 demographics were significant relation with business start-up in different way.

Analysis of variance test in table 4 provides the degree of freedom and the significance level of the population; *df1* is one less than the number of sample each of variable, and *df2* is the difference between the total sample size and the number of sample each variable, F statistical and also highlighted significant level at 0.01 and 0.05.

Table 4 ANOVA Tests of personal traits and environmental factors on business start-up

		Sum of Squares	df	Mean Square	F	Sig.
DI	Between Groups	21.058	4	5.265	54.861	.000
	Within Groups	12.379	129	.096		
	Total	33.437	133			
NA	Between Groups	13.910	5	2.782	18.235	.000
	Within Groups	19.527	128	.153		
	Total	33.437	133			
LC	Between Groups	15.895	6	2.649	19.178	.000
	Within Groups	17.542	127	.138		
	Total	33.437	133			
RTP	Between Groups	4.519	5	.904	4.001	.002
	Within Groups	28.918	128	.226		
	Total	33.437	133			
RO	Between Groups	12.307	6	2.051	12.328	.000
	Within Groups	21.130	127	.166		
	Total	33.437	133			
FS	Between Groups	6.456	4	1.614	7.717	.000
	Within Groups	26.981	129	.209		
	Total	33.437	133			
GS	Between Groups	9.154	4	2.289	12.158	.000
	Within Groups	24.283	129	.188		
	Total	33.437	133			
ET	Between Groups	7.518	3	2.506	12.569	.000
	Within Groups	25.919	130	.199		
	Total	33.437	133			
BPI	Between Groups	7.946	4	1.987	10.053	.000
	Within Groups	25.491	129	.198		
	Total	33.437	133			
API	Between Groups	10.815	4	2.704	15.419	.000
	Within Groups	22.622	129	.175		
	Total	33.437	133			
CSN	Between Groups	3.214	5	.643	2.722	.023
	Within Groups	30.223	128	.236		
	Total	33.437	133			

Based on the result analysis of variance in table 4, the decision has been made as follows:

Hypothesis 2 Personal traits were positive relation with business start-up.

Hypothesis 3 Environmental factors were positive relation with business start-up

Conclusion

Small enterprise has been playing an important role in the economic development of every country. Small enterprises participation in economic development provided direct impact on creating jobs, creating competitive advantage, and an important career option. However, there are different characteristics of entrepreneurs and the reasons behind them to build an enterprise**.**

1. In four factors of demographic, there are only two factors affecting on business start-ups. If the education level and working experience are not part of the initial process (preparation), self confidentce for business start-ups will change with different direction. Two other factors of demographics are gender and age are no statistical significant, so no conclusion can draw with this relationship with business start-ups.

2. Personal traits have positive relation with business start-ups. Individuals with personal traits will adapt every challenge and find a way to do the right things. Strong characteristics are needed to start a business venture.

3. Environmental factors have positive relation with business start-ups. environmental factor play important role to protect and facilitate economic moviment through institution and regulation. Lack of facilities, professional services and regulation can change with different direction.

Implication of the study

The outcomes of this study pointed a successful utility the concept of personal and environmental factors as a conceptual framework to identify how a person creates their own business.

Previous researches were pointed that demographics, personal traits, and environmental factors are important factors for business start-ups. Related studies were held in many countries, but all these researchers focused on existing entrepreneurs and potential entrepreneurs. Measurement for potential entrepreneurs are somewhat “fuzzy” due there is no available information related potential entrepreneurs. Therefore, this study focused on existing entrepreneurs.

This study is the first study related with Timor-Leste context. The contribution of this study is to provide and initiate information for next interest study. Based on behavioral theory, personal interest comes because there was available and comprehensive information, and this study can contribute in this content. Moreover, this study also contributes to potential entrepreneurs to aware personal and environmental factors, education institutions as service institutions should aware of these factors and design learning curriculum based on practical issues, financial service providers are needed to improve their quality and accessibility services, government as a public servant should develop regulation, provide capacity building to potential entrepreneurs to participate in economic activities.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2): 179-211.

Aldrich, H. E. and Martinez, M. A. (2001). Many are called, but few are chosen: An evolutionary perspective for the study of entrepreneurship. *Entrepreneurship theory and practice 25*(4): 41-56.

Aschauer, D. A. (1989). Is public expenditure productive?. *Journal of monetary economics, 23*(2): 177-200.

Bergmann, H., & Sternberg, R. (2007). The changing face of entrepreneurship in Germany. *Small Business Economics, 28*(2-3), 205-221.

Bird, B. (1988). Implementing entrepreneurial ideas: The case for intention. *Academy of management Review, 13*(3): 442-453.

Birley, S. (1987). New ventures and employment growth. *Journal of Business Venturing, 2*(2): 155-165.

Blanchflower, D. G., Meyer, B. D. (1994). A Longitudinal Analysis of Young Self-Employed in Australia and the United States. *Small Business Economics*, 6, 1-19.

Bridgman, P. W., *et al*. (1927). *The logic of modern physics*. New York:Macmillan.

Bygrave, W. D. and Hofer, C. W. (1991). Theorizing about entrepreneurship. *Entrepreneurship theory and practice, 16*(2): 13-22.

Bygrave, W.D. (1989). The entrepreneurship paradigm: a philosophical look at research methodologies. *Entrepreneurship Theory and Practice*, Vol. 14 No. 1, (pp. 7-26).

Dewey, J. (1929). *The quest for certainty*. New York: J.J. Little and Ives Company

Dyck, A. and Ovaska, T. (2011). Business Environment and New Firm Creation: An International Comparison. *Journal of Small Business & Entrepreneurship, 24*(3): 301-317.

Evans, D. S. and Jovanovic, B. (1989). An estimated model of entrepreneurial choice under liquidity constraints. *The Journal of Political Economy, 97*(4): 808.

Evans, D. S. and Leighton, L. S. (2002). Some empirical aspects of entrepreneurship. *Entrepreneurship: Critical Perspectives on Business and Management*, 1: 146.

Gnyawali, D. R. and Fogel, D. S. (1994). Environments for entrepreneurship development: key dimensions and research implications. *Entrepreneurship theory and practice, 18*: 43-43.

Gomezelj, D. O. and Kušce, I. (2013). The influence of personal and environmental factors on entrepreneurs' performance. *Kybernetes, 42*(6): 906.

Greenberger, D. B. and Sexton, D. L. (1988). An interactive model of new venture initiation. *Journal of Small Business Management, 26*(3): 1-7.

Greene, P., and Brown, T. (1997). Resource needs and the dynamic capitalism typology. *Journal of Business Venturing, 12*(3), 161–173.

Grimaldi, R., & Grandi, A. (2005). Business incubators and new venture creation: an assessment of incubating models. *Technovation, 25*(2), 111-121.

Harris, M. L. and Gibson, S. G. (2008). Examining the entrepreneurial attitudes of US business students. *Education+ Training, 50*(7): 568-581.

Harrison, R. T. and Leitch, C. M. (2005). Entrepreneurial learning: researching the interface between learning and the entrepreneurial context. *Entrepreneurship theory and practice, 29*(4): 351-371.

Hornaday, J. A. (1982). Research about living entrepreneurs. *Encyclopedia of entrepreneurship*: 20-34.

Hung, D. K. M., *et al*. (2004). A Preliminary Study of Top SMEs in Malaysia: Key Success Factors vs Government Support Programs. *Journal of Global Business and Econoics, 2*(1): 49-58

Kim, P. H., *et al*. (2006). The impact of financial, human, and cultural capital on entrepreneurial entryin the United States. *Small Business Economics, 27*(1): 5-22.

Kirkwood, J. and Walton, S. (2010). What motivates ecopreneurs to start businesses? *International Journal of Entrepreneurial Behaviour & Research, 16*(3): 204-228.

Krueger Jr, N. F., *et al*. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing, 15*(5): 411-432.

Krueger, N. F. and Carsrud, A. L. (1993). Entrepreneurial intentions: applying the theory of planned behaviour. *Entrepreneurship & regional development, 5*(4): 315-330.

La'o Hamutuk Repport. (2011). *Timor-Leste's Economy and State Budget*. Retrieved February 26, 2014, from http://www.laohamutuk.org/econ/training/Present UNTL-VUEn.pdf

Lee, J. (1997). The motivation of women entrepreneurs in Singapore. *International Journal of Entrepreneurial Behaviour & Research, 3*(2): 93-110.

Low, M. B. and MacMillan, I. C. (1988). Entrepreneurship: Past research and future challenges. *Journal of management, 14*(2): 139-161.

McClelland, D.C. (1967). *The achieving society*. New York: Free Press

Minniti, M. and Bygrave, W. (1999). The microfoundations of entrepreneurship. *Entrepreneurship theory and practice, 23*: 41-52.

Munnell, A. H. (1990). Why has productivity growth declined? Productivity and public investment. *New England Economic Review(Jan)*: 3-22.

Parker, S. C. (2004). The economics of self-employment and entrepreneurship. Cambridge University Press.

Peterman, N. E. and Kennedy, J. (2003). Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship theory and practice, 28*(2): 129-144.

Reynolds, P. D. and White, S. B. (1997). *The entrepreneurial process: Economic growth, men, women, and minorities*. Quorum Books Westport, CT.

Reynolds, P. D., (1987). New firms: societal contribution versus survival potential. *Journal of Business Venturing, 2*(3) : 231-246.

Reynolds, P.D. (2005). Understanding business creation: Serendipity and scope in two decades of business creation studies. *Small Business Economics, 24*, 359–364.

Reynolds, P.D., *et al*. (1994). Cross-national comparisons of the variation in new firm formation rates. *Regional Studies, 28*(4). 443–456.

Ritsilä, J., & Tervo, H. (2002). Effects of unemployment on new firm formation: Micro-level panel data evidence from Finland. *Small business economics*, *19*(1), 31-40.

Rosti, L., & Chelli, F. (2005). Gender discrimination, entrepreneurial talent and self-employment. *Small Business Economics*, *24*(2), 131-142.

Sahoo, P., *et al*. (2010). Infrastructure development and economic growth in China. *Working paper*.

Sesen, H. (2013). Personality or environment? A comprehensive study on the entrepreneurial intentions of university students. *Education+ Training, 55*(7): 1-1.

Shane, S. and Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management Review 25*(1): 217-226.

Shapero, A. (1982). Some social dimensions of entrepreneurship. In C. Kent, D. Sexton, and K. Vesper (Eds.), The encyclopedia of entrepreneurship. Englewood Cliffs, NJ: Prentice Hall.

Startienė, G., & Remeikienė, R. (2008). Gender gap in entrepreneurship. *Engineering economics*, *5*(60), 95-103.

Stevenson, H.H. and Jarillo, J.C. (1990). A paradigm of entrepreneurship research: Entrepreneurial management. *Strategic Management Journal, 11*, 17–27.

Stokes, D. and R. Blackburn (2002). Learning the hard way: the lessons of owner-managers who have closed their businesses. *Journal of Small Business and Enterprise Development, 9*(1): 17-27.

Williams, D. R. (2004). Youth self employment: Its nature and consequences. *Small Business Economics*, *23*(4), 323-336.

Yusuf, A. (1995). Critical success factors for small business: perceptions of South Pacific entrepreneurs. *Journal of Small Business Management 33*: 2-68.

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FACTORS DETERMINING PERFORMANCE OF BANKS LISTED ON SHANGHAI STOCK EXCHANGE AND STOCK EXCHANGE OF THAILAND

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Abstract

The purpose is to investigate how do the bank specific factors as liquidity, capital adequacy, assets quality and management efficiency determine performance expressed by return on equity, return on assets and net interest margins of banks listed on Shanghai Stock Exchange and the Stock Exchange of Thailand. Further, GDP growth as macroeconomic variable was added into the investigation.

The findings showed Banks listed on Shanghai Stock Exchange own the Capital Adequacy, Asset Quality, Management efficiency and GDP Growth as significant variables. While banks listed on the Stock Exchange of Thailand own Capital Adequacy, Asset Quality and Management efficiency as significant variables. However, liquidity was found to be insignificant to all chosen banks.

Keywords: listed banks, bank performance, bank specific factors, macroeconomic variable

Introduction

With chasing back to past 20 years, the global banking sector had been transformed in the environment with impacts on bank performance. By seeing the internal and external factors been affecting bank's profitability throughout the time manner, study on the factors determining bank performance has been hot topic that attracts the concern of purposes of academic research, financial market and banking supervising. On review of the global finance crisis which have had an impact on the worldwide banking industry, study of bank performance has been more important (Dietricha and Wanzenried, 2009).

China-Thailand relationship began since 1975, the relationship between 2

countries has grown significantly (Liu, 2012). The bilateral trade relations grow every year. Updates till 2012, China has become Thailand's largest principal export destination, and the second large principal import source.

China opened the banking markets to foreign investment by the end of 2006. Since 2005, foreign investors could purchase a limited amount of shares with partial privatization in three out of four big state-owned banks, which are listed on the HK and Shanghai Stock Exchange. The state-owned banks were with high non-performing loans, and were re-capitalized during the special government bonds issue, then the non-performing loans were transferred to asset management companies in 1997 (Heffernan and Fu, 2008).On the Thailand side, before 1997 another financial crisis ahead of the global one. Local banks were close the local investors, as the foreign banks focus on the wholesale customers. While after the 1997 crisis, local banks began to attempt for foreign investment, in order to collect large amount of new capital which could not be provided by the local investors (Chantapong, 2003).

The "Global Financial Crisis" began from the developed countries to global. Which led to series of downturns and slump of the global economic in 2007 summer.These 2 countries, as a part of Asia were hence affected, even though they are away from the crisis burst point. Stock market in China was damaged since October of 2007 (Schmidt, 2009).On Thailand's side, the Thai economy was shrinking with the global slump (Chirathivat and Mallikamas, 2010).

This study will refer to the commerce part, particularly the listed banks on Shanghai Stock Exchange (SSE) and Stock Exchange of Thailand (SET). With on side, 14 banks in China and 10 banks in Thailand are chosen.

Financial statements and financial ratios will be utilized to measure bank performance. On the other hand, GDP growth as a measure of economic growth that affects demand of bank asset will be involved (Ongore and Kusa, 2013).

Literature review

Performance is a channel to define the existence of the set objectives or goals of a firm are achieved in a particular time period. Bank performance is defined as the capacity to generate sustainable profitability (Dr. Oladele, et al., 2012). The damage done by financial crisis has become seriously for emerging market countries. While a decline to downturn of profitability might decrease banks' ability to tolerate risk.(Chantapong, 2003).Impact from banks characteristics, macroeconomic variables and financial structure could be utilized for bank performance examination purposes.(Björnsdóttir, 2010).As most studies proof capital, loans loss and expense control are factors affecting performance, bank-specific along with macroeconomic factor across banks and time periods can be utilized to examine the contribution to variance in profitability (Vong and Chan,

2009).Financial statement analysis is a way to measure the past, current performance of firms. It tells the terms of assets and the terms of the source of capital, therefore presents the internal structure (Appiagyei et al., 2012).

ROE (Return on Equity), ROA (Return on Asset) and NIM (Net Interest Margin) are used to evaluate banks performance on profitability as dependent variables.

ROE refers to the ratio of net income compared to the total equity or capital (Khrawish, 2011). It measures how efficiently a company operates the money from shareholders (Wen, 2010). Which is the return to the shareholders of their equity, without involving the risk level that is linked to the leverage (Dietricha and Wanzenried, 2009). This ratio is related to practice and, therefore, considered to be a good indicator for investments, but it is irrelevant to debts and such ratio should be observed through a long period when applied for analysis (Björnsdóttir, 2010). A profitable feedback on equity is what a business supposed to be and what the investors expect in return. Because the ROE states the efficiency of how a bank is generating the investors' funds (Ongore and Kusa, 2013). ROA tells the profit that returns from per unit of assets and indicates the effectiveness of the bank on generating profit (Dietricha and Wanzenried, 2009). It states the efficiency of a bank using the resources for its income and the ability of management to utilize the asset (Ongore and Kusa, 2013). Return on assets measures how profitably a company operates related to the assets (Wen, 2010). Furthermore, it states the bank's efficiency of using the resources from the institution for its income (Khrawish, 2011). Investors can see how efficiently the bank converts its assets to net earnings by observing the return on asset (Chantapong, 2003). NIM expresses the financial institution's operation efficiency and the ability to generate income and expenses (Omran, 2007). It measures a difference of bank's interest income without interest payout as the net, to the average earning asset (Ongore and Kusa, 2013). NIM is stated as a percentage of earning on loans in an exact period of time and amount of asset out of costs from interest on borrowed funds, divided by an average of assets in the same period (Gul, Faiza and Khalid, 2011). NIM is the measurement of the gap of interest income and interest expenses, compared to the asset. The higher the ratio indicates, the higher profitable and the more strength the financial institution is (Khrawish, 2011).

LTD (liquidity management), CA (Capital adequacy), AQ (Asset quality), ME(Management efficiency) and GDPD (GDP growth) are utilized as independent variables.

LTD relates to the ability of repaying depositors' funds redemption (Sarita, Zandi and Shahabi, 2012).Liquidity is associated with lower rate of return, when LTD ratio is higher, the liquidity will be lower, in other words, higher LTD ratio leads to lower profitability (Dang, 2011; Said and Tumin, 2011). CA refers to the firm's available capital to cover the business risk (Athanasoglou et al. 2005). There are supports that the capital to

assets ratio negatively relates to the total revenue dependent variables (Staikouras and Wood, 2011). However, there are as well points explain the positive relationship, a higher ratio might bring higher profitability by reducing subjects related to risk and alternatively expand into some other profitable subjects (Berger, 1995). AQ measures non-performing loans level as the loan portfolio effects banks profitability by its quality. It's the most risky issue for a bank to confront losses that incurred by delayed or illicit borrows (Dang, 2011).The lower the ratio the better the asset quality is (Sangmi and Tabassum, 2010). ME is the capability of the board of management (Dang, 2011).Such to measure the percentage of operating profit from income (Ongore and Kusa, 2013; Sangmi and Tabassum, 2010).

GDPG as a measure of economic activity of an economy, is commonly used as a macroeconomic variable, GDP Growth is supposed to effect bank performance positively (Said & Tumin, 2011). In positive relationship, banks' asset quality that depends on the growth cycle and non-performing loans that relates to the default risk would be larger in downturns than in upturns. While in negative relationship, as higher GDP growth would mean that the banks are operating in a more competitive environment of interest and margins (Staikouras and Wood, 2011).

Table 1 Ratios definition

Ratios	Formulas description
ROE	Net profit after tax divided by stockholder's Equity
ROA	Total income to total asset
NIM	Interest profit divided by average earning assets
LM	Total Loans to total deposit
CA	Total Capital to total assets
AQ	Nonperforming Loans to total loans
ME	Total profit to Total operating revenue
GDPG	Gross Domestic Product Growth

Conceptual framework

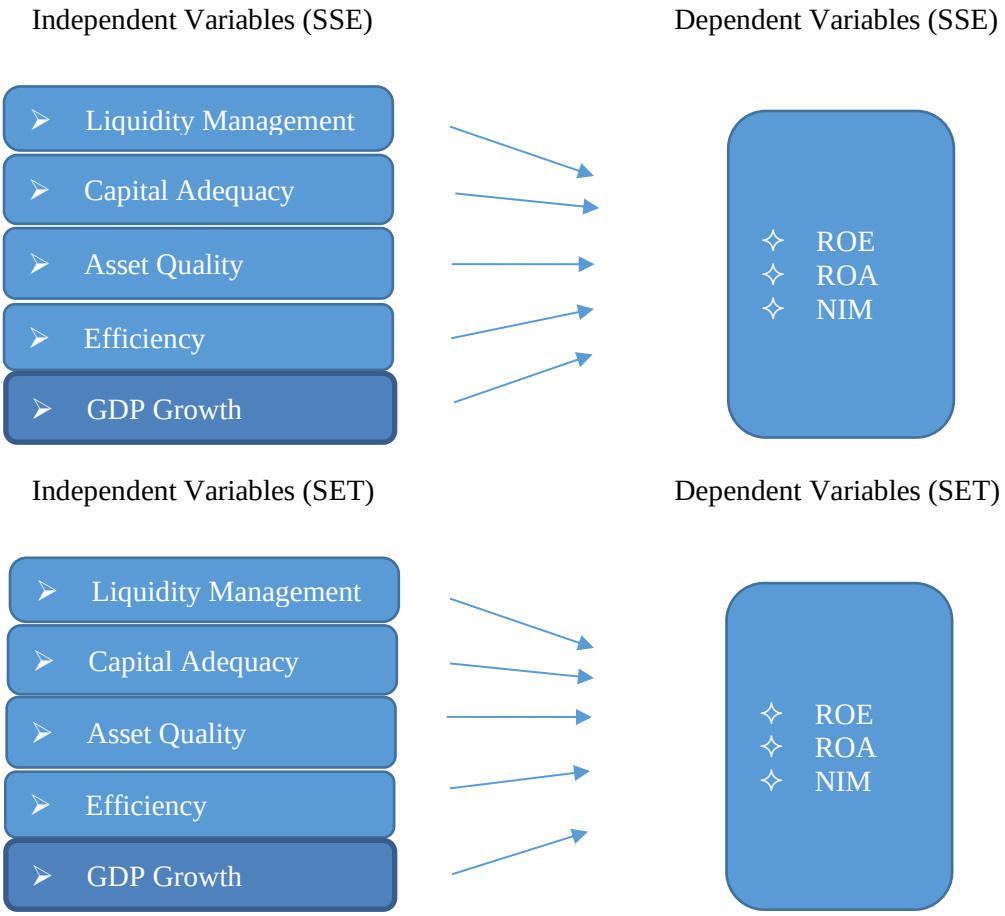

Figure 1 Conceptual framework

Methodology

This study will apply the income statement and balance sheet which are from each listed bank's annual reports from 2007-2012. The data set contains 14 listed banks from Shanghai Stock Exchange, and 10 from 11 listed banks from Stock Exchange of Thailand. In particular, the "LHBANK : LH FINANCIAL GROUP PUBLIC COMPANY LIMITED" from Stock Exchange of Thailand is excluded, due to this listed bank provides annual report from 2010 to 2012, which does not meet the required data time range that begins from 2007.

In purpose to measure banks performance, financial ratios formulas are applied for the calculation. Outcome of the calculation will be utilized onto the

model specification, therefore to access the result of bank performance.

The Dependent variables used to indicate bank performance are ROE, ROA and NIM. While Liquidity, capital adequacy, asset quality and efficiency are taken as the independent variables, GDP will be external variable.

- Listed banks in Shanghai Stock Exchange

$$n_{it} = a_0 + b_1(LM_{it}) + b_2(CA_{it}) + b_3(AQ_{it}) + b_4(ME_{it}) + b_5(GDP_{CNt}) + \varepsilon_{it} \ldots$$

- Listed banks in The Stock Exchange of Thailand.

$$n_{it} = a_0 + b_1(LM_{it}) + b_2(CA_{it}) + b_3(AQ_{it}) + b_4(ME_{it}) + b_5(GDP_{THt}) + \varepsilon_{it} \ldots$$

Where:

n_{it} = Performance of bank i at time t represented by ROA, ROE, NIM

a = Intercept

LM_{it} = Liquidity of bank i at time t

CA_{it} = Capital adequacy of bank i at time t

AQ_{it} = Asset quality of bank i at time t

ME_{it} = Management Efficiency of bank i at time t

GDP_{CNt} = Gross Domestic Product Growth of China at time t

GDP_{THt} = Gross Domestic Product Growth of Thailand at time t

$b_1 - b_5$ = Coefficients parameters

ε_{it} = Error term where i is cross sectional and t time identifier

Analyze data with the statistical program. Firstly summarize the quantitative description of features of samples and data (Mann, 2013).Then proceed the validity test to exam multicollinearty and see whether there is correlation between independent variables in a regression model (Rahmawati and Hosen, 2012). Heteroskedasticity test is to see if there is different variance from the residual between observations in the regression or not (Suhardjanto, et al., 2009). Autocorrelation test is to exam whether there the correlation between the error in period t with bullies error in period t-1 (previous period) exists in the linear regression model (Rahmawati and Hosen, 2012).Finally to run the multiple regression analysis.

Results

Analysis

Analyze financial performance of listed banks on SSE and SET from 2007 to 2012. Begins with 2007, banks listed on SET performed better than banks listed on SSE, till 2009 these figures declined for both listed banks in SET and listed banks in SSE. This might be caused by the effect of the global economic crisis and its effect on Asia. Then from 2010 onward, the trend of performance for listed banks on both sides begins to increase. As overview for the average performance, it shows investment opportunity and profitability. Further, by the end of 2012, value of ROE, ROA and NIM of listed banks in SSE and banks in SET both increased to be even higher than 2007, and banks in SSE performed slightly better than banks in SET.

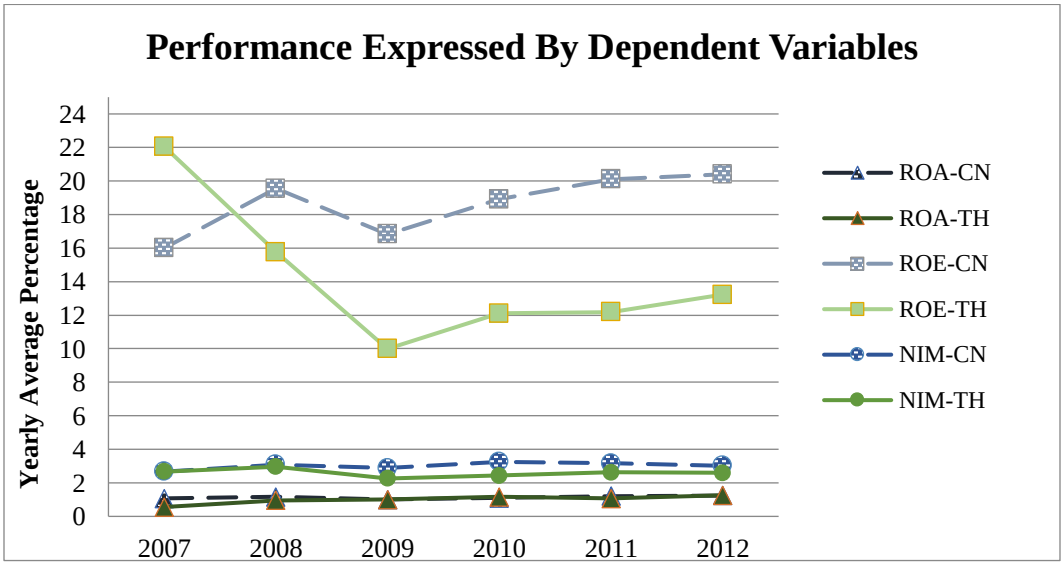

Figure 2 Performance expressed by dependent variables

Description Statistics provides mean score of ROE, ROA and NIM. It states the listed banks on Shanghai Stock Exchange perform slightly better on return on equity and return on assets than those on the Stock Exchange of Thailand. While banks on SET earn higher net income margin than banks on SSE.

Mean score of liquidity for listed banks on SSE is lower than banks listed on SET, listed banks on SSE have higher ability to repay depositors' funds redemption, and on the other hand with higher liquidity. Mean score of capital adequacy states lower than those on SET, with lower profit, the higher score

represents less risky investment preference. Asset quality states listed banks on SSE are with lower credit risk. The last internal independent variable is management efficiency, it states banks listed on SSE higher operating better than and those on SET.

Table 2 Description statistics

Variables	Location	MAX	MIN	MEAN	MEDIAN	Std. DEV	Obsn
ROE	SSE	30.01	-6.02	18.63	18.86	4.92	84
	SET	227.20	-96.00	14.67	12.32	32.38	60
ROA	SSE	2.53	0.41	1.13	1.14	0.29	84
	SET	3.26	-6.36	1.05	1.06	1.15	60
NIM	SSE	3.42	1.82	2.59	2.59	0.37	84
	SET	5.07	0.45	2.95	3.07	0.92	60
LM	SSE	85.11	50.84	68.64	70.94	6.95	84
	SET	128.36	57.76	94.81	94.74	11.94	60
CA	SSE	26.51	0.00	12.20	11.97	3.20	84
	SET	18.20	1.48	14.58	15.18	2.54	60
AQ	SSE	23.57	0.38	1.57	1.10	2.56	84
	SET	18.59	2.10	6.84	4.90	4.57	60
ME	SSE	77.56	18.49	47.31	49.13	9.77	84
	SET	222.05	1.19	38.89	36.26	28.31	60
GDPG	SSE	14.16	7.70	10.08	9.47	2.01	84
	SET	7.80	2.30	3.47	3.75	3.79	60

From the observation in table description statistics above, mean score of ROE, ROA and NIM during 2007 – 2012 is 18.63, 1.13 and 2.59 on SSE, while 14.67, 1.05 and 2.95 on SET respectively. It shows that the listed banks on Shanghai Stock Exchange perform slightly better on return on equity and return on assets than those on the Stock Exchange of Thailand. While banks on SET earn higher net income margin than banks on SSE.

From that table, it shows the data on description statistic of the factors that independently affect the performance of the listed banks on Shanghai Stock Exchange and on the Stock Exchange of Thailand as well.

As seen from the table, mean score of liquidity for listed banks on SSE is 68.64, which is lower than 94.81 for banks listed on SET. It indicates the percentage of using depositors' funds on lending. With regarding to the "loans to deposit" ratio definition, listed banks on SSE have a

higher ability to repay depositors' funds redemption, and on the other hand with higher liquidity.

Mean score of capital adequacy states at 12.20 for banks listed on SSE, and 14.58 for those on SET. With a lower profit, the higher score represents less risky investment preference. An asset quality is stated at an average of 1.57 and 6.84 for banks listed on SSE and SET respectively, as the percentage of non-performing loans out of total loans, listed banks on SSE are with lower credit risk. The last internal independent variable is management efficiency, its mean score is at 47.31 and 38.87 for banks listed on SSE and SET. The percentage of operating profit to total income, can be used to show the wellness of the banks' operating function.

Validity test outcome

Validity test found that there is no multicollinearity problem in the regression equations. Multicollinearity is tested with correlation coefficients. Absolute Correlation coefficients above 0.8 among variables indicates the multicollinearity.

Table 3 Correlation among independent variables

Variables SSE	**LM**	**CA**	**AQ**	**ME**	**GDPG**
LM	1				
CA	-0.323	1			
AQ	-0.171	-0.394	1		
ME	-0.139	0.443	-0.168	1	
GDPG	-0.030	-0.022	0.367	-0.182	1
Variables SET	**LM**	**CA**	**AQ**	**ME**	**GDPG**
LM	1				
CA	0.411	1			
AQ	-0.045	-0.361	1		
ME	0.152	0.042	0.136	1	
GDPG	0.049	-0.007	-0.109	-0.026	1

The absolute correlation among the independent variables of banks listed on SSE and SET are all below 0.8, hence, there is no existence of serious multicollinearity problems.

On the other hand, the multicollinearity can be tested by an observation on the VIF value. According to Guajarati (2004), VIF above 10 indicates to the problem of the multicollinearity. According to table of variance inflation factor of variables below, data shows that there is no existence of multicollinearity.

Table 4 Variance Inflation Factor of Variables

VARIABLES	VIF	
	SSE	SET
Liquidity	1.28	1.25
Capital Adequacy	1.81	1.41
Asset Quality	1.61	1.21
Management Efficiency	1.30	1.05
GDP Growth	1.25	1.02

However, there is existence of either or both Heteroskedasticity and Autocorrelation. Heteroskedasticity and autocorrelation test are based on the original multiple regression model equations of listed banks on the Shanghai Stock exchange and the Stock Exchange of Thailand. In purposes to solve the problems, equation estimation will be progressed on least squared with consistent coefficient of Newey-West.

Relationship between dependent and independent variables

This section states briefly about the relationship among dependent and independent variables, and their relationship with the bank performance expressed by ROE, ROA and NIM. The coefficients in between each explanatory and explained variables shows the measurement and trend of the relationship, which can be strong, weak, positive or negative.

A higher value of the coefficient refers to a stronger relationship, while a lower value indicates a weaker one. A positive score presents the positive relationship, then a negative score means the opposite.

Table 5 Correlation coefficient among variables of SSE

SSE	ROE	ROA	NIM
LM	0.240290	-0.147069	0.089814
CA	0.077746	0.680808	-0.005382
AQ	-0.610298	-0.145005	0.099295
ME	0.320886	0.646932	-0.195588
GDPG	-0.252952	-0.138739	0.076591

Table 6 Correlation coefficient among variables of SET

SET	ROE	ROA	NIM
LM	-0.437518	-0.126502	0.286931
CA	-0.684715	-0.087617	0.337392
AQ	0.046958	-0.397164	-0.641846
ME	-0.444574	-0.622710	-0.031055
GDPG	0.037587	0.019182	0.026148

Coefficient of Liquidity from banks listed on SSE shows positive relationship between ROE and NIM while negatively related to ROA, and on SET there is only NIM related positively. However, by observing the Capital Adequacy part, variables are positively related to the ROE and ROA, but negatively to NIM on SSE, especially to ROA the most strongly, and less strongly to ROE, then to the NIM. This might state that the banks meet no uncertainty on earnings due to leverage. But on SET, Capital Adequacy shows the negative relationship between ROE and ROA, then strongly relates to ROE, but for NIM it states positive and second strong relationship. This might indicate that it is safe assets investment preference for high Capital Adequacy.

Assets Quality as the percentage of non-performing loans out of total loans, represents the banks credit risk level. On SSE, correlation coefficient shows negatively to ROE, ROA and positively to NIM. The higher the ratio is, the more poor banks perform. The correlation is strong with ROE. It might be because the loans are fixed with the largest percentage of assets which earn from the equity. On the other side, Assets Quality on SET correlates to ROE positively, then negatively to ROA and strongly to NIM. This might be due to the fact that banks listed on SET prefer lower non-performing loans percentage by decreasing the income from assets.

Management Efficiency is another explanatory variable. It is related to ROE and ROA positively, then to NIM negatively for banks listed on SSE, however, it is negatively related to ROA strongly of banks listed on SET. This, from another point of view, indicates that banks try to low down the non-performing loans percentage by sacrificing operating income amount.

The external variable would be the Gross Domestic Product Growth which from the table shows negative relationship between ROE and ROA, then a positive relationship with NIM for banks listed on SSE, but shows positive relationship among all explained variables of banks listed on SET. This kind of relationship is mixed. When it shows negatively and strongly with banks listed on SSE, and positively and weakly with banks listed on SET.

Regression result

Regression result proves hypothesis, that Liquidity, Capital Adequacy, Assets Quality or Management Efficiency affects the performance of banks listed on SSE and SET. The result presents that Capital Adequacy, Assets Quality and Management efficiency affect banks listed on SSE and SET significantly. For hypothesis H7, that GDP Growth affects listed banks performance as external factor, which is proofed as well. As there the GDP Growth significantly and negatively effects performance of banks listed on SSE.Capital Adequacy, Assets Quality and Management Efficiency are significantly related to performance expressed by ROE of bank listed on SSE. For model ROA, Capital Adequacy, Assets Quality and Management Efficiency are significant.While on model NIM, there only the Asset Quality states at the significant level. However, on SSE the Liquidity management was found to be non-significant.

On the other side, model ROE of banks listed on SET owns Capital Adequacy, Assets Quality and Management Efficiency as significant. Then for model ROA, there the Assets Quality and Management Efficiency state significantly.On model NIM, there only the Assets Quality presents significant relationship. While the Liquidity management was still found to be non-significant.

Externally, GDP Growth as macroeconomic variable is stating significantly related to performance expressed by ROA of banks listed on SSE only.

Table 7 Regression Output Adjusted With Consistent Coefficient of Newey-West.

Variables / SSE	Model 1 (ROE)	Model 2 (ROA)	Model 3 (NIM)
Constant	13.34167	-0.470538	2.127812
	(1.872332)	(-1.081538)	**(3.340441)***
LM	0.047199	0.006771	0.008607
	(0.540725)	(1.625283)	(1.164603)
CA	-0.520760	0.060356	0.026740
	(-3.593680)*	**(3.625773)***	(1.342171)
AQ	-1.331417	0.029874	0.026982
	(-10.57728)*	**(3.849468)***	**(2.062466)***
ME	0.188795	0.011920	-0.009510
	(2.644162)*	**(3.409544)***	(-1.942228)
GDPG	0.155414	-0.020829	-0.004892
	(1.067347)	**(-2.2029910)***	(-0.200338)
R^2	0.516627	0.661688	0.077998
Adjusted R^2	0.485642	0.640002	0.018896
Variables / SET	**Model 1 (ROE)**	**Model 2 (ROA)**	**Model 3 (NIM)**
Constant	191.7115	3.810329	1.969969
	(4.167668)*	**(3.417392)***	**(2.105147)***
LM	-0.298020	0.003226	0.019929
	(-1.161441)	(0.300323)	(1.775872)
CA	-8.619944	-0.100873	-0.000269
	(-3.287494)*	(-1.454577)	(-0.007499)
AQ	-1.042657	-0.100976	-0.128624
	(-2.437676)*	**(-2.691846)***	**(-4.602928)***
ME	-0.435212	-0.022912	0.000577
	(-4.145226)*	**(-2.543214)***	(0.210080)
GDPG	0.274371	-0.003916	-0.013684
	(0.467549)	(-0.197556)	(-0.919118)
R^2	0.674913	0.525417	0.482167
Adjusted R^2	0.644812	0.481474	0.434220

- *Coefficient states above*
- *T-Statistics states in the parentheses*
- Significant states with "*"

From observation, data can prove hypotheses, that Liquidity, Capital Adequacy, Assets Quality or Management Efficiency affect the performance of banks listed on SSE and SET. The result shows that Capital Adequacy, Assets Quality and Management efficiency affect banks listed on SSE and SET significantly. For hypothesis H7, GDP Growth affects listed banks performance as external factor which is proofed as well. As the GDP Growth has significant and negative effects on performance of banks listed on SSE.

To be more specific, the T-Statistic value of model ROE of banks listed on SSE

with Liquidity, Capital Adequacy, Assets Quality and Management Efficiency are 0.54, -3.59, -10.58 and 2.64 respectively. These present Capital Adequacy, Assets Quality and Management Efficiency are significantly related to performance expressed by ROE of bank listed on SSE at a minimum confidence level of 95%. For model ROA, these four explanatory variables stated with 1.63, 3.63, 3.85 and 3.41, this means Capital Adequacy, Assets Quality and Management Efficiency are significantly related to performance expressed by ROA of bank listed on SSE. While for model NIM, there is only the Asset Quality showing at the significant level. However, on SSE the Liquidity management was found as non-significant.

On the other side, model ROE of banks listed on SET, T-statistic value of the explanatory variables stated at -1.16, -3.29, -2.44 and -4.15 respectively, this result indicates that the Capital Adequacy, Assets Quality and Management Efficiency are significantly related to performance expressed by ROE of bank listed on SET. Then for model ROA, the Assets Quality and Management Efficiency show significantly at -2.69 and -2.54. Similar to banks listed on SSE, on model NIM, only the Assets Quality with T-statistic value -4.60 presents the significant relationship. While the Liquidity management is non-significant.

Externally, GDP Growth as macroeconomic variable is shown at 1.067, -2.202 and -0.200 for T-statistic value with ROE, ROA and NIM of banks listed on SSE, then -0.198, -0.0.200 and -0.919 with dependent variables of banks listed on SET, So it is found as significantly related to performance expressed by ROA of banks listed on SSE only.

Conclusion and discussion

Conclusion

The objective of this study is to examine the factors that determine performance of listed banks on Shanghai Stock Exchange and The Stock Exchange of Thailand.

With purpose to achieve the objective, six years panel data for total 24 listed banks was analyzed with multiple regression models. In order to see the effects across year and banks, penal data is utilized. During the analysis, factors that determine listed banks performance expressed by ROE, ROA and NIM were tested. The Capital Adequacy, Assets Quality and Management Efficiency are found to be significantly affecting listed banks performance expressed by ROE, ROA and NIM.

This study owns the Capital Adequacy, Assets Quality and Management Efficiency as significant factors to the performance expressed by ROE of listed banks on SSE. The effectiveness level from high to low ranks as Assets Quality, Capital adequacy then Management Efficiency. However, for banks listed on SET, there the variables exist as Capital adequacy, Assets Quality then Management Efficiency.

Discussion

Such so, for banks listed on SSE. Capital adequacy states negative relationship in model ROE which stands in line with Flamini et al. (2009) and Staikouras and

Wood (2011), while positive in model ROA supports Berger (1995) and Tan and Floros (2012). Assets Quality states most strong and negative correlation coefficient with ROE, and positive with ROA and NIM, hence, while the non-performing loans percentage increases, the return on assets increases. This might be listed banks in SSE tend to utilize a part of the loans to promo the total income by generating assets, and in such concern, while total asset remains, the outcome is with higher percentage but anyway in such situation the risk increases as well. Management efficiency states significant and positive relationship to the bank performance expressed by ROE and ROA. This presents banks listed on SSE generate the operating revenue well as a part of the total income.

Capital adequacy presents significant and negative relationship with performance expressed by ROE listed on SET, supports the point of Dietricha and Wanzenried (2009). Assets Quality states negative correlation coefficient with ROE, ROA and NIM, hence, while the non-performing loans percentage increases, the return on equity or asset, as well the net income margin decrease. This result supports the point that Asset Quality correlated to bank performance negatively along with Ongore and Kusa (2013), Dang (2011) and Sangmi and Tabassum, (2010). Management efficiency states significant and negative relationship to the bank performance expressed by ROE and ROA.This might be due to the banks internal management decision and strategy, that after the financial crises, investors realized it's more important to look at ability withstand finance shocks,by reducing the interest rate to gain more investment and borrowing, which helps to enlarge the revenue meanwhile increases assets and decreases the non-performing loans amount, hence ROE and ROA are increased.

Liquidity presents no significant relationship with either listed banks performance on SSE or SET. With standing in line with Said and Tumi (2011) and Ongore and Kusa (2013).

Then, it's to conclude that for banks listed on SSE, the ones with lower capital ratio and non-performing loans ratio, or higher total operating revenue to total profit gains more return on equity. These variables are found to be positively related to ROA, and positively related to the NIM as well. For banks listed on SET, those own lower Capital adequacy, Assets Quality then Management Efficiency ratios again higher return on equity and asset, while the ones with lower non-forming loans percentage earn more net income margin.

Limitation and recommendation

This study only groups banks listed on SSE and SET as samples. However, does not involve all the listed banks in China. There is the "Shenzhen Stock Exchange" as another stock exchange in mainland China not involved. Therefore, further research can be proceed with sampling the listed banks on "Shenzhen Stock Exchange" as it is the another stock exchange in mainland China. In order to understand whether there would be different regression outcome for listed banks in different stock exchange while in the same country and economy.

In this study, independent factors were selected based on CAMEL rating system (Dang, 2011) and macroeconomic variable involved GDP growth only. The further research can utilize other bank specific factors and inflation as macroeconomic variable, in order to find the main factors to develop the model.

As per the regression output and statistics, recommendation would refer the significant factors and their correlation with the dependent variables.

For investors investment preferences decisions. A bank with lower capitalization could be more able to catch the potential profitable trading opportunities, which benefits investors with the higher return from investment. A bank with relatively lower non-performing loans percentage means higher stability and lower risk, which benefits investors with more stable invest environment. A bank with relatively higher operating profit percentage means higher ability the bank can arrange investor's funds to generate income, which benefits investors with higher profit. A bank can survive in the a competitive environment means that bank made correct decisions, and can benefit investors more than banks operate in a less competitive environment. Further, investors do not have to consider the liquidity as it is not affecting the bank performance significantly. Investments can be considered on banks listed on SSE as they own relatively higher value of ROE and ROA while comparing with banks listed on SET, so it means banks listed on SSE are more profitable and the investment will be with higher return.

For bank management implications. As the performance of Banks listed on SSE is strongly and negatively correlated to the Asset Quality, banks could consider to further increase the loans amount in purpose to increase loan portfolio quality, which could further attract investments and enlarge the return on equity. For the other side, banks listed on SET might consider to focus more on the Capital Adequacy as it is strongly and negatively relates to bank performance. Banks could manage to catch more investments opportunities which could gain profit, and provide more return on shareholder's equity. And the higher benefit to shareholders would as well attract more investments. Therefore, banks are to: Firstly, catch more potential trading opportunities with their capitalization. Which would provide the investors with higher return on their investments, meanwhile build up reputation of banks then further attract more investments which contributes to the improvement of the sources of funds. Secondly, increase the operating profit by reducing the operating cost, in order to lowering the chances that incurring bank failure in incidents. Which would represent the management efficiency in operating banks then further gain the investors' confidence. Thirdly, lower the non-performing loans percentage as it is the risk that might lead to bankrupt throughout economic changes. The raise of non-performing loans will increase banks operation difficulties by affecting on their utilization of total loans. Lower the loans risk, higher the sustainability of banks while the economic shrinks.

However, this research limits by only studying sample groups of banks listed on SSE and SET. However, it does not cover all the listed banks in China. There is the "Shenzhen Stock Exchange", another stock exchange in mainland China which is not covered. Therefore,

for further research, it can be processed with sampling the banks that listed on "Shenzhen Stock Exchange" which is another stock exchange in mainland China. In order to understand whether there will be a different regression outcome for listed banks in different stock exchange market, while in the same country and economy.

In this study, independent factors were selected based on CAMEL rating system (Dang, 2011) and macroeconomic variable involved GDP growth only. The further research can use other bank specific factors and inflation as macroeconomic variables, in order to find the main factors to develop the model.

References

Aburime, U. (2005). *Determinants of Bank Profitability: Company-Level Evidence from Nigeria*. Nigeria: University of Nigeria, Enugu Campus.

Agbada, A.O., & Osuji, C.C. (2013). The Efficacy of Liquidity Management and Banking Performance in Nigeria. *International Review of Management and Business Research*. Vol.2, Issue.1, 2013, ISSN: 2306-9007.

Al-Tamimi, H., Hassan, A. (2010) *Factors Influencing Performance of the UAE Islamic and Conventional National Banks*. Department of Accounting, Finance and Economics, College of Business Administration, University of Sharjah.

Appiagyei, A.T., Peprah, E., Adu-Mintah, P., Amponsah, G., Tuffour, I., & Asare, E. (2012). Using Financal Ratios to Assess the Performance of Banks: A Case study of Asante Akyim Rural Bank Limited. Christain Service University College in Partial.

Athanasoglou, P.P., Sophocles, N.B., & Matthaios, D.D. (2005). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Working paper*, Bank of Greece. 1(1), 3-4.

Bayoud, N.S., Kavanagh, M., & Slaughter, G. (2012). Factors Influencing Levels of Corporate Social Responsibility Disclosure by Libyan Firms: A Mixed Study, *International Journal of Economics and Finance*, Vol. 4, No. 4; April 2012.

Berger, A. (1995). The Relationship between Capital and Earnings in Banking. *Journal of Money, Credit and Banking, Vol. 27*, No. 2, 432-456.

Björnsdóttir, A.R. (2010). *Financial Feasibility Assessments: Building and Using Assessment Models for Financial Feasibility Analysis of Investment Projects*. Faculty of Industrial Engineering, Mechanical Engineering and Computer Science University of Iceland, P 15-16.

Bourke, P. (1989). Concentration and Other Determinants of Bank Profitability in Europe, North America and Australia. *Journal of Banking and Finance, Vol. 13*, 65-79.

Chantapong, S. (2003). Comparative Study of Domestic and Foreign Bank Performance in Thailand: The Regression Analysis. Financial Institutions Policy Group (FIPG), Bank of Thailand.

Chirathivat, S., & Mallikamas, S. (2010). Thailand's Economic Performance and Responses to the Global Crisis. Chulalongkorn University.

Dang, U. (2011). *The CAMEL Rating System in Banking Supervision: A Case Study*. Arcada University of Applied Sciences, International Business, 2011.

Dietricha, A. & Wanzenried, G. (2009). *What Determines the Profitability of Commercial Banks: New Evidence from Switzerland*. Institute of Financial Services IFZ, Lucerne University of Applied Sciences, Grafenauweg 10, 6304 Zug, Switzerland.

Dr. Oladele, P.O., Dr.Sulaimon, A.A., & Akeke, N.I. (2012). Determinants of Bank Performance in Nigeria. *International Journal of Business and Management Tomorrow. Vol.2,* No.2. ISSN: 2249-9962.

Flamini, C., Valentina C., McDonald, G., Liliana, S. (2009). *The Determinants of Commercial Bank Profitability in Sub-Saharan Africa*. IMF Working Paper.

Gujarati, D.N. (2004). *Basic Econometrics*. 4th edition, The McGraw-Hill Companies, 2004.

Gul, S., Faiza, I., & Khalid, Z. (2011). Factors Affecting Bank Profitability in Pakistan. *The Romanian Heffernan Economic Journal*, 2(3), 6-9.

Hair, J.F., *et al*. (2009). *Multivariate Data Analysis*. 7th edition. Upper Saddle River: Prentice Hall, 2009. Print.

Heffernan, S., & Fu, M. (2008). *The Determinants of Bank Performance in China*. City University London, University of Macau, 6-9.

Khrawish, H.A. (2011). Determinants of Commercial Banks Performance: Evidence from Jordan. *International Research Journal of Finance and Economics*. Zarqa University, 5(5), 19-45.

Lee, A.C., Lee, J.C., & Lee, C.f. (2009). *Financial Analysis, Planning and Forecasting: Theory and Application*. 2nd ed. Singapore: World Scientific Publishing Company.

Liu, A. (2012). Expanding Sino-Thai Relations: Implications for transformation of regional political landscape. *First Thai-Chinese Strategic Research Seminar*, Bangkok, 24-26, Aug., 2012.

Mann, P.S. (2013). *Introductory Statistics*. 8th ed. International Student version.

Omran, M. (2007). *Privatization, State Ownership, and Bank Performance in Egypt. World Development*. 2007 Published by Elsevier Ltd.

Ongore, V.O., & Kusa, G.B. (2013). Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues, Vol.3*, No.1, 2013, pp.237-252 ISSN: 2146-4138

Paul, R.K. (2006). *Multicollinearity: Causes, Effects and Remedies*. M. Sc. (Agricultural Statistics), Roll No. 4405. I.A.S.R.I, Library Avenue, New Delhi-110012

Rahmawati, R., & Hosen, M.N. (2012). Efficiency of Fund Management of Sharia Banking in Indonesia (Based on Parametric Approach). *International Journal of Academic Research in Economics and Management Sciences April 2012, Vol. 1*, No. 2 ISSN: 2226-3624.

Said, R.M., & Tumin, N.H. (2011). Performance and Financial Ratios of Commercial Banks in Malaysia and China. *International Review of Business Research Papers. Vol. 7*. No. 2. March 2011. Pp. 157-169.

Sangmi, M., & Tabassum, N. (2010). Analyzing Financial Performance of Commercial Banks in India: Application of CAMEL Model. *Pakistan Journal Commercial Social Sciences*.

Sarita, B., Zandi, G., & Shahabi, A. (2012). Determinants Of Performance In Indonesian Banking: A Cross-Sectional And Dynamic Panel Data Analysis. *International Journal of Economics and Finance Studies. Vol 4*, No 2, 2012 ISSN: 1309-8055 (Online).

Schmidt, D. (2009). The Financial Crisis and Its Impact on China. China Analysis 67, 2009.

Staikouras, C.K., & Wood, G.E. (2011). The Determinants of European Bank Profitability. *International Business & Economics Research Journal. Vol.3*, NO.6.

Suhardjanto, D., Sulistyorini, E.J., & Hartoko, S. (2009). The Influence of Fiscal Decentralization on the Public Expenditure in Indonesia. *Journal Siasat Bisnis Vol. 13 No. 3, Desember 2009* Hal: 233-252.

Tan, A.Y. & Floros, C. (2012). Bank profitability and GDP growth in China: A Note. *Journal of Chinese Economics and Business Studies*, 10 (3). pp. 267-273. ISSN 1476-5284

Vong, A.P.I., & Chan, H.S. (2009). *Determinants of Bank Profitability in Macao*. Faculty of Business Administration, University of Macau.

Wen, W. (2010). *Ownership Structure and Banking Performance: New Evidence in China*. Universitat Autònoma de Barcelona Departament D'economia de L'empresa, 2010.

Williams, B. (2003). Domestic and International Determinants of Bank Profits: Foreign Banks in Australia. *Journal of Banking and Finance*, 27(6), 1185–1210.

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CORPORATE GOVERNANCE AND PERFORMANCE IN COMMERCIAL BANKS IN NEPAL

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Abstract

This journal examines the Corporate Governance and performance of Nepalese Commercial Banks. This research covers a total of 27 commercial banks in Nepal from 2010 to 2014. The study focuses on 5 aspects of Corporate Governance namely, Board Size, Board Diligence, Board independence, Ownership Structure and Internal Control as well as three control variables also. Banking performance is measured through Efficiency (Non-performing Loans/ Total Loans), Return on Assets (ROA) and Return on Equity (ROE). The Multiple regression analysis is used to study which Corporate Governance and Control variables affect the banking performances in terms of Efficiency, ROA and ROE. The regression results indicate that Board Diligence and Ownership Structure are significant variables affecting Efficiency. The factors affecting ROA are Board Size, Board Independence, Bank Size, Internal Controls and CAR, while ROE is affected by Bank Size, CAR and Bank Age.

Keywords: Corporate Governance, Banking performance, Efficiency, Return on Assets (ROA), Return on Equity (ROE), Commercial Banks in Nepal.

Introduction

The Asian financial crisis of 1997/98 as well as the global financial crisis of 2007/08 highlighted the need for Corporate Governance in banking sector even more. The lack of Corporate Governance in Banks can make the market to lose confidence in its ability and leads to economic crisis (Garcia-Marco & Robles- Fernandez, 2008). On the other hand, good governance has lots of advantages like strong property rights, minimum transaction cost and capital market development (Claessens & Fan, 2002). For a developing country like Nepal, Corporate Governance reforms are more significant as it helps to attract

more foreign direct investment and mobilizes greater savings through capital markets (Maskey, 2004). The Corporate Governance scenario gathered momentum only after 2002 when the central bank of Nepal, Nepal Rastra bank (NRB) issued Corporate Governance directives. Till today, the regulatory requirements of Nepal Rastra Bank (NRB) solely act as the Corporate Governance benchmark. The Bank run of Nepal Bangladesh Bank (NB Bank) in November of 2006 (Upreti, 2008) and the Vibor Bikas Bank (VBB) crisis in 2011 (Sapkota, 2011) , in which the Central Bank (NRB) had to rescue VBB, are the two remarkable banking crisis in Nepal. Vibor Bikas Bank's crisis can be compared to Lehman Brothers (Sapkota, 2011). Similarly, the bankruptcy of Nepal Development Bank in 2009 was also one of the dark phases of Nepalese banking sector (Sapkota, 2009). However, all three cases were linked to the failures in the implementation of Corporate Governance. In 2005 the central bank of Nepal, Nepal Rastra Bank issued directives to strengthen Corporate Governance, but it however reported several lapses in several banks. Hence, this research paper aims to find out the discrepancies and offer recommendations to it. The objectives of this research include: (1) To study the effect of Corporate Governance factors (Board Size, Board Diligence, Board Independence, Ownership Structure and Internal Control) on the performance variables Efficiency, Return on Assets (ROA) and Return on Equity(ROE) of Nepalese Commercial Banks; (2) To study the effect of control factors (Bank Age and Bank Size) on the performance variables Efficiency, Return on Assets (ROA) and Returns on Equity (ROE) of Nepalese Commercial Banks.

Literature review

Previous studies on Corporate Governance put forward many dimensions and behaviour of companies with different affecting variables. Though Martin and Cullen (2006) argued that none of the theoretical perspective can fully summarize the complicities of an organization, Corporate Governance mechanisms like Board Characteristics, Audit Committee characteristics, Ownership Structures, are considered the measure for Corporate Governance variables (Poudel & Hovey, 2013). This section summarizes the studies that have been done in terms of Corporate Governance as well as Corporate Governance variables like Board size, Board Diligence, Board Independence, Internal controls and Ownership Structure, Control variables like Bank Age and Bank Size, and their impact on Efficiency, Return on Assets and Return on Equity.

For a developing country like Nepal, Corporate Governance plays a significant role to attract Foreign Direct Investment and Foreign Portfolio Management and to mobilize capital market saving (Sapkota, 2008). Similarly Basel committee (2006) advises that to implement the Corporate Governance principles, a bank should be proportionate with the group to which it belongs in terms of structure, risk profile, size, complexity and economic significance.

Corporate governance variables

Board size

Based on the Codes of Corporate Governance in Nepal, the board of directors consists of five to nine members. Some studies have suggested smaller boards are better for improving firm performance (Lipton & Lorsch, 1992; Barnhart & Rosenstein, 1998) while other studies provide positive relationship between Board Size and firm performance (Zahra & Pearce, 1989; Mak & Li, 2001). However, Ghabayen (2012) in his research about board characteristic and firm performance in Saudi Arabia found no any relationship between Board Size and a firm's performance. Poudel and Hovey (2013) found Board Size to be statistically significant to performance in the research about Efficiency of Nepalese Commercial Banks from 2005-2011. Tai (2015) found significance of Board Size in ROA, but the contribution of Board Size on Efficiency and ROE is insignificant in the study of Gulf Banks.

Board independence

The Nepal Rastra Bank, the central Bank of Nepal emphasizes on having at least 1 independent director on the board. Some researchers like Baysinger and Butler (1985) and Ezzamel and Watson (1993) found outside directors are positively related with a firm's performance whereas Wen et al. (2002) and Brick and Chidambaran (2008) observed the negative result between outside directors and a firm's performance.

However, Poudel and Hovey (2013) found no significant effect of Board Size on Nepalese Commercial Banks. On the contrary, El-Chaarani (2014) found Board Independence to be extremely significant on the performance variables like ROA and ROE in the study about Lebanese banks.

Board diligence

Based on code of Corporate Governance in Nepal, board has to sit at least twelve times per year. When boards hold regular meetings, they are more likely to remain informed and knowledgeable about relevant performance of the company leading them to take or influence and direct the appropriate action to address the issue (Abbott et al., 2003). Likewise, Hermanson et al. (2002) put forward the number of board meetings as a factor related to Board Diligence, referring Board Diligence to be the proxy of the frequency of board meetings. Poudel and Hovey (2013) in the context of Nepalese Banks, found Board Diligence to be statistically significant.

Ownership structure

Relevant literature on Corporate Governance provides much attention to the issue of shareholder identity (Shleifer & Vishny, 1997). It is accepted that foreign ownership plays crucial role in a firm's performance, particularly in developing and transitional economies (Görg & Greenaway, 2004). Clarke et al. (1999) have argued that foreign banks are more profitable than domestic once in developing countries and less profitable in industrial countries in their research about foreign entry in banking sector in Argentina. Poudel and Hovey (2013) found Institutional Ownership to be significant in Nepalese Banks but failed to find significance in foreigner ownership.

Internal control

The significant components of control (Internal) are the procedures relating to control and environment, and accounting system (Harvey & Brown, 1998). Jansen (1998) pointed out that historically internal controls, has focused conforming employees' actions to the desires of management. Internal controls are there to protect a financial institution from loss or misuse of its assets (khan, 1994). Poudel and Hovey (2013) found audit committee size to be statistically significant. Ramiz and Inayat (2012) also found audit committee size to be negatively significant on performance variables, ROA and ROE in Pakistani Banks.

Control variables

Bank size

There are several literatures about the size of bank and the performance. Some researchers indicate that a medium sized bank is more efficient than large and small banks (Berger et al., 2005; Noulas et al., 1990; Mester, 1992; Clark, 1996). Drake and Hall (2003) found strong relationship between bank size and technical efficiency and scale efficiency. Similarly, El-Chaarani (2014) found Bank Size to be statistically significant in the study about corporate governance and performance in Lebanese Banks

Bank age

DeYoung and Hasan (1998) found that bank performances are positively affected by bank age. DeYoung et al. (1999) asserted that the bank begins its operations as a financial intermediary firm entering the market and competition on a certain scale. The age of a bank positively affects the bank performance due to age having a positive correlation with experience (i.e. learning curve) which finally leads to higher performance (DeYoung & Hasan, 1998; DeYoung et al., 1999). However, El-Chaarani (2014) found no significance between the age of bank and performance in the study about Lebanese banks from 2006-2010.

Capital adequacy ratio

Previous studies on bank performance show that Capital Adequacy Ratio (CAR) also affects the performance of the banks (DeYoung & Hasan, 1998). A Capital Adequacy Ratio is set by the regulators to meet minimum capital requirements so bank's management will manage their assets properly and will have an increase in performance (Unite & Sullivan 2003; Naceur & Kandil 2009). The operational functions and security functions can be increased by the compliance with a Capital Adequacy Ratio (Siamat 2004). The performance of the bank can be improved by an adequate level of Capital Adequacy Ratio accompanied by effective and efficient bank management and lending activities (Utama & Musa 2011).

Methodology

A quantitative method of data analysis which involves a descriptive analysis and multiple regression analysis is employed to analyse the normal distribution and the deviation of regression variables. Multiple regressions are conducted to achieve the purpose of the study: corporate governance and performance in Commercial Banks in Nepal.

Population and sample of the study

In this study the population consists of the commercial banks of Nepal with are total 30 in numbers as per their listing on Nepal Stock Exchange (NEPSE) index. As the population of Class A bank is 30, but 3 banks are excluded, hence the sample size will is 27 banks. Nepal Rastra Bank is excluded from the research due to unavailability of data, Civil Bank Ltd and Century Commercial Bank Ltd are excluded as they were established in 2011, whereas the data has been collected from 2010-2014 .

The plan that is used for the research is the secondary data from annual reports, financial statement, the website of the respective banks as well as the website of Central bank and yearly report of Nepal Rastra Bank (central bank). The performance of Banks from their annual reports is the elements of population of research and the data from 2010-2014 is taken as 7 banks were established in between 2008/2009 fiscal year. Hence for 1 bank the data for 5 years is used and for 27 banks the number sums up to 135 observations.

Regression models

The performance of the bank is measured by Efficiency, ROA and ROE. Hence, three measures of regression models are used to find the Bank performance.

1) Efficiency= $\beta 0 + \beta 1BS + \beta 2BD + \beta 3BI + \beta 4OS + \beta 5IC + \beta 6BkS + \beta 7BA$ + e
2) ROA= $\beta 0 + \beta 1BS + \beta 2BD + \beta 3BI + \beta 4OS + \beta 5IC + \beta 6CAR + \beta 7BkS + \beta 8BA$+ e
3) ROE= $\beta 0 + \beta 1BS + \beta 2BD + \beta 3BI + \beta 4OS + \beta 5IC + \beta 6CAR + \beta 7BkS + \beta 8BA$+ e
Where,

Table 1 Description of variables

Acronym	Variables	Description
BS	Board Size	the number of directors on the board
BD	Board Diligence	the number of board meeting held during the year
BI	Board Independence	the percentage of independent director to board size at the end of each year
OS	Ownership Structure	percentage of ownership owned by institutional owners and large shareholders
IC	Internal Controls	the number of member in audit committee at end of each year
BKs	Bank Size	natural logarithm of total assets.
BA	Bank Age	age of bank since its establishment.
CAR	Capital Adequacy Ratio	Percentage of capital reserved for liquidity
	Dependent Variables	
EFF	Efficiency	ratio of non-performing loan to total loan at the end of each year
ROA	Return on Assets	Net income divided by total assets
ROE	Return on Equity	Net income divided by common equity

Empirical findings

Descriptive statistics were calculated for Corporate Governance variables and Control variables against firm performance variables of Efficiency, ROA and ROE in this study. Descriptive statistics describe the characteristics of Board Structure, Ownership Structure, Bank Size and Age among Commercial Banks in Nepal and the variables used to measure the performance of these Commercial Banks. Similarly the descriptive statistics also describe the measurement variables of different size and different age with the performance (Table 2).

Table 2 Descriptive statistics of corporate governance and control variables

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
EFF (%)	135	.000	24.200	2.314	3.306
BS (No.)	135	4	10	7.50	1.251
BD (No. of Times)	135	12	67	15.21	8.670
BI (%)	135	10.00	25.00	13.764	2.644
OS (%)	135	.12	100.00	50.273	26.611
IC (No.)	135	2	5	3.68	.769
BKS (ln)	134	21.570	25.206	24.047	.649
BA(Years)	27	5	77	17.78	15.240
ROA (%)	135	-4.96	8.15	1.492	1.285
ROE (%)	135	-278.73	65.56	14.420	27.858
CAR (%)	135	-11.13	70.00	13.228	7.416

Before running a regression, a correlation test is done among the explanatory variables to identify the multicollinearity problem (Table 3). The correlation coefficient examines the relation between the financial variables. According to Tabachnick and Fidell (2007), the correlation exceeding ±0.9 is supposed to have multicollinearity problem. The table 3 shows there is multicollinearity problem between two independent variables Board Size and Board Independence with the correlation coefficient of -0.973. Hence, two separate regression for each model is conducted one excluding Board Size and another, excluding Board Diligence.

Table 3 Correlation

	EFF	BS	BD	BI	OS	IC	BKS	BA	ROA	ROE	CAR
EFF	1										
BS	-.108	1									
BD	.245**	.116	1								
BI	.096	**-.973****	-.083	1							
OS	-.191*	-.040	.000	.065	1						
IC	-.052	.134	.189*	-.147	.128	1					
BKS	.071	-.171*	.213*	.195*	.087	.298**	1				
Bank age	.193	-.503**	-.183	.524**	-.610**	-.369	-.089	1			
ROA	-.346**	-.158	.201*	.204*	.172*	.208*	.143	-.283	1		
ROE	-.468**	-.081	.031	.105	.130	.068	.222**	.734**	.628**	1	
CAR	-.184*	.247**	.091	-.286**	.095	.013	-.534**	-.675**	.169	-.036	1

The regression of Corporate Governance and Control variables on Dependent variable Efficiency, ROA and ROE is done in Table 4 as follows:

Table 4 shows the multiple regressions of all the 3 models with 135 observations for each model. The Durbin-Watson statistics range between 1.515-1.956, which shows the absence of significant autocorrelation. The F-statistics explains the most possible combination of predictor variables that could contribute to the dependent variables Efficiency, ROA and ROE.

Table 4 Regression

Independent	**Model 1**		**Model 2**		**Model 3**	
Variable	**Efficiency**	**Efficiency**	**ROA**	**ROA**	**ROE**	**ROE**
BS	-.358		-.241***		-.353	
BD	.102***	.099***	.020	.019	-.128	-.126
BI		.146		.145***		.379
OS	-.024**	-.024**	.005	.004	.113	.091
IC	-.302	-.302	.237	.262*	-.265	-.133
BKs	.146	.156	.362*	.341	13.869***	13.711***
BA	-.005	-.004	-.003	-.006	.744*	.722*
CAR			.051***	.145***	.693	.705*
R square	.122	.117	.188	.214	.100	.100
Durbin-Watson	1.720	1.738	1.575	1.515	1.897	1.901
F Statistics	2.954	2.832	4.200	4.947	2.005	2.204
Observations	135	135	135	135	135	135

*Note: ***- Significant at 0.01 level **- Significant at 0.05 level *- Significant at 0.1 level.*

The regression of Efficiency and Corporate Governance is shown on Model 1 in table 4. Efficiency is measured by the ratio of Non-Performing loan, the lower the NPL the higher the efficiency of banks. We can see negative coefficients between Efficiency and Board Size, Ownership Structure, Internal Control and Bank Age. The independent variable Ownership Structure has significant negative relationship with Efficiency which implies that higher number of institutional ownership has significant

effect on bank's efficiency. Similarly, Board Diligence has significant positive relation with Efficiency which implies less numbers of board meetings has better effect on Efficiency.

The given table 4 (Model 2) gives the result of the regression of dependent variable ROA with Corporate Governance and control variables. The Corporate Governance variables like Board Size, Board Independence, Internal Controls, Bank Size and Capital Adequacy Ratio have significant effect on ROA. The negative relationship between Board Size shows that decreasing the board size will yield better ROA. Similarly, increasing the size of total assets also significantly increases the ROA. Capital Adequacy Ratio is found to be significant in case of ROA, maintaining the adequate level of capital can give higher Return on Assets (ROA).

The table 4 (Model 3) shows the result of the regression between dependent variable ROE and independent variables. Here we can see the minimal significance between ROE and Corporate Governance variables. However, ROE is significantly affected by control variables Bank Size and Bank Age. The positive relationship shows that increasing the total assets will improve ROE ratio in Nepalese commercial banks. Similarly, the newly established banks are found to be low in ROE. The independent variables like Board Size, Board Diligence, Ownership Structure and Internal Control have minimal significance with ROE.

Conclusion and discussion

Conclusion

The study found that Board Diligence and Ownership Structure have significant effect on Efficiency of Commercial Banks in Nepal. Board Diligence has positive relation with Non-performing Loan to Total Loan ratio, decreasing the frequency of board meetings will have positive impact on Efficiency of banks. Similarly Ownership Structure has negative relation with Non-performing Loan to Total Loan ratio, increasing the percentage of institutional and foreign ownership will have positive effect on Efficiency of Commercial Banks in Nepal.

ROA is another dependent variable which is significantly affected by Board Size, Board Independence, Bank Size, Internal Controls and Capital Adequacy Ratio. Board Size has negative impact on ROA, proposing smaller board size is good for ROA. Similarly, Board Independence has positive contribution to ROA. Increasing the percentage of outside directors can increase the ROA. Bigger banks are found to be more efficient in terms of ROA. The Audit Committee should also be bigger for better ROA, which is shown by significant positive contribution by Internal Controls. Similarly Capital Adequacy Ratio has positive impact hence increasing the CAR will have positive impact on ROA.

The analysis of ROE shows that ROE is positively affected by control variables Bank Age, CAR and Bank Size. The older banks are found to be better performing on giving returns to its shareholders. Similarly the large sized banks are more efficient on giving higher Return on Equity. The adequate level of Capital Adequacy Ratio is also necessary for better Return on Equity.

Discussions

Board size

This research found that large Board Size positively impacts the performance of commercial banks in Nepal. In case of Efficiency, the Board Size is negative, meaning large membered Board Size is responsible for lower Non performing loans (NPL). This is consistent with the findings of Zhara and Pearce (1989) and Mak and Li (2001) which suggest positive relationship between Board Size and Performance. However ROE has negative but insignificant relation with Board Size, which is in line with Ghabayen (2012) where no relationship with Board Size and performance is established. ROA has a very significant negative relation with Board Size. The result of this study does not support the findings of Haniffa and Hudaib (2006) that proposed a statistically significant relationship and positive relationship with Board Size and ROA. Mangla (2012) also found significant relation between Board Size and ROA and ROE in the research about banks in Pakistan. However Willesson (2014) failed to find any significant relation between ROA and Board Size in the study about Corporate Governance in European Banks. Similarly, Ajanthan et al. (2013) also failed to find significant relation between Board Size and ROA and ROE in the study about Corporate Governance and banking performance in Sri Lanka.

Board diligence

The study found significant positive relation between the ratio of NPL (Efficiency) and Board Diligence, meaning higher number of board meeting will have negative impact of performance. This is consistent with the research of Vaefas (1999) and Poudel and Hovey (2013) that concluded negative relation between Board Diligence and performance. Similarly, both ROA and ROE have no significant relationship with Board Diligence, which is consistent with Velnampy (2013), Klien (1998), Tai (2015), Brick and Chidambaran (2008), Bhagat and Black (2000), which failed to find any significant relationship between board monitoring and accounting returns.

Board independence

The result of this study showed not any significant effect of Board independence and performance measures of Efficiency and ROE, and a significant positive effect on ROA. This supports Klien (2002) that independent directors are not effective. Similarly, the result also supports Bhagat and Black (2002) and Kajola (2008) that failed to find relationship between performance and Independent Director. The significant positive relation between Board independence and ROA is consistent with Zhara and Pearce (1989) and Choe and Lee (2003) which emphasized higher proportion of independent directors for better performance. Tai (2015) in the study about Gulf Banks found the contribution of Board independence and ROA and ROE not statistically significant.

Ownership structure

The study found Significant negative relation between Non- performing loan and Ownership structure, which means Institutional Ownership has positive relation with efficiency. This is consistent with the findings of Poudel and Hovey (2013) and Han and Suk (1998) that emphasized that higher institutional ownership is positively

related to performance as the top management is monitored more actively. However other 2 Accounting measures (ROE and ROA) have no significant relationship with Ownership Structure. Mangla (2012) in the research about banks in Pakistan also failed to find significant relation between Ownership Concentration on both ROA and ROE.

Internal control

This study is able to find significant positive contribution of internal controls on ROA, other than those other Models of bank performance do not have significant contribution. This finding is consistent with Klien (2002) and Poudel and Hovey (2013) which found significant positive relationship. The findings of this study disagree with Rouf (2011) in Bangladesh and Ghabayen (2012) in Saudi Arabia, which found no significant effect of audit committee size on performance.

Bank size

The study found significant relationship with Bank Size and Bank performance in Nepal. The relationship with ROA and ROE is found to be statistically significant. Utma and Musa (2011) found the Bank Size to be positively significant on both ROA and ROE in the study about Corporate Governance and performance in Indonesia. Love and Rachinsky (2007) also found Bank Size to be positively significant with ROE in Russia and positively significant with both ROA and ROE in Ukraine. This relationship is also emphasized by Drake and Hall (2003) and Miller and Noulas (1996). Similarly, Hasan and Marton (2003) also found Bank Size positively related with efficiency in Banks in Hungary. Sathye (2001) also found a positive relation between performance and size in Australian Banks.

Bank age

The control variable Bank Age has been found to have positive significant effect on ROE. Other dependent variables Efficiency and ROA do not have significant impact on Bank Age. El-Chaarani (2014) in the research about Lebanese banks found Bank Age to be without any significance on ROA and ROE.

Capital adequacy ratio

This study used capital adequacy ratio for accounting performance only, hence only ROA and ROE was used to find the contribution of Capital Adequacy Ratio in Nepalese Commercial Banks. The study found CAR statistically significant positive relationship with ROA and positive relationship with ROE. The significant relationship between ROA and CAR is recognized by Praptiningish (2009) in the study about Corporate Governance and Bank Performance in Indonesia, Philippines, Malaysia and Thailand. Similarly the positive but insignificant relation is consistent with Aebi et al. (2012) in the research about corporate governance and bank performance in financial crisis. Fanta et al. (2013) also found significant positive impact of CAR on ROA.

Implication of the study

In terms of Efficiency, there should be lower number of board meetings as high frequency of Board meetings negatively affects the efficiency while the banks with higher institutional ownership perform better. To increase the ROA, the Board Size should be smaller, Independent director percentage in the

board should be high and the total assets should be greater in proportion to other banks. Similarly, the leverage should be below 20% and there should be more than 10% of capital reserved for CAR. ROE is mostly affected by the control factors, Bank Size and Bank Age. The results indicate that Bigger and older banks are more efficient in terms of ROE. They are able to mobilize funds better than new and smaller banks.

Research recommendation

For banks

The study recommends that the Board Size in Nepalese Commercial banks should not be large. The percent of independent directors (Board Independence) should also be high, as all banks have only 1 independent director, therefore the bigger Board Size make the percentage of independent director low. The bigger sized banks (Bank Size) are performing better, so it is necessary to maintain sufficient capital to attain better performance. The research also found that the older banks (Bank Age) are more efficient than the new banks. Hence, the new banks should follow the strategy of old banks to be more successful.

For policy makers and regulators

The result obtained from this research has several recommendations for policy makers and Regulators. The Central Bank of Nepal, Nepal Rastra Bank (NRB) is the sole body to implement the corporate governance as well as other banking policies and regulating them. The findings stress the importance of central bank in monitoring and guiding the commercial banks for better performance. The results, shows the Board Size was exceeded to 10 persons in 1 bank, hence effective monitoring is necessary. Regarding Board Diligence, most of the banks are having board meetings 12 times a year, just to maintain the central bank guideline, but there is no maximum limit and board meetings have been held 67 times also. There should be a policy for maximum number of board meetings also as higher numbers of board meeting are negatively contributes to the performance of commercial banks. The results also show the some of the banks are not maintaining the Capital Adequacy Ratio of 10% as proposed by Basel Committee, hence effective regulations are also necessary.

Limitations

The sample of this study has excluded three banks. Rastriya Banijya Bank is excluded because of unavailability of data. Similarly, Civil Bank and Century Commercial Bank are excluded as they were established on 2011, whereas the data is collected from 2010 to 2014. Hence, the outcome of this study misses the data of these 3 banks. The study considers the data of 5 years from 2010 to 2014. For better understanding of the situation, multiple numbers of years has to be considered, as 5 years is a short time. The data used in this study are collected from the annual reports and financial statement of commercial banks, annual reports of the central bank and the respective banks websites. The data in the reports are subjected to manipulation, the assets may be undervalued, the different methods of depreciation used by banks may produce alterations, different ways of treatment of certain expenditure

and revenue items. The study explored only 7 Corporate Governance and Control factors, however in general there are a lot of factors like GDP growth rate, inflation, foreign exchange rate, market interest rates (Poudel and Hovey, 2013) that affect the performance of banks.

The researcher believes that these limitations do not compromise on the validity or conclusions drawn based on the results.

Further research

For future research, it is suggested that the use of larger data set, including the cross-sections and time series data, in order to get more accurate and reliable data analysis. The sample size should be increased along with the number of years considered for data collection, similarly, instead of yearly data, quarterly data set can be used in order to be able to assess the effectiveness and implication of policies related to the corporate Governance and Control mechanisms. Future research should also consider adding more Corporate Governance and Control factors like the number of board members attending the board meeting, number of audit committee meeting, the qualification of board members, the average tenure of the board members, market returns as well as macroeconomic factors than the existing 7 in this study. The ownership structure can also be divided into domestic institutional ownership and foreign institutional ownership to test the Corporate Governance and performance in further studies.

References

Abbott, L. J., Parker, S., Peters, G.F., & Rahunandan, K. (2003). The Association Between Audit Committee Characteristics and Audit Fees.*Auditing*,*22*(2), 17-32.

Aebi, V., Sabato, G., & Schmid, M. (2012). Risk management, corporate governance, and bank performance in the financial crisis. *Journal of Banking & Finance*, *36*(12), 3213-3226.

Ajanthan, A., S. Balaputhiran, & B. Nimalathashan. (2013) Corporate Governance and Banking Performance: a Comparative Study between Private and State Banking Sector in Sri Lanka. *European Journal of Business and Management*, *5*(2013), 92-100.

Barnhart, S.W & Roseinstein, S. (1998). Board composition, managerial ownership, and firm performance: An empirical analysis, *The Financial Review*, *33* (4), 1- 16

Basel Committee (2006). Enhancing Corporate Governance for Banking Organizations, section II, *Bank for International Settlements,* CH-4002 Basel, Switzerland. The online version is available at http://www.bis.org/publ/bcbs122.pdf.

Baysinger, B. D. & Butler, H. N. (1985). Corporate governance and the board of directors: Performance effects of changes in board composition. *Journal of Law, Economics, & Organization*, 101-124.

Berger, A. N., G. R. G. Clarke, R. Cull, L. Klapper, & G. F. Udell (2005). Corporate governance and bank performance: A joint analysis of the static, selection, and dynamic effects of domestic, foreign, and state ownership. *Journal of Banking and Finance,29*, 2179-2221.

Bhagat, S & Black, B. (2002). The Non-Correlation between Board Independence and Long-Term Firm performance, *Journal of Corporate Law*, *27* (2), 231-274.

Brick, I. E., & Chidambaran, N. (2008). Board monitoring, firm risk and external regulation, *Journal of Regulatory Economics*, *33*(1), 87-116.

Choe, H, & Lee, B.S. (2003). Korean bank governance reform after the Asian Financial crisis, *Pacific-Basin Finance Journal*, *11*(4), 483-508

Clark, J. A. (1996). Economic cost, scale efficiency, and competitive viability in banking. *Journal of Money, Credit and Banking*, 342-364.

Clarke, GRG., Cull, R., D'Amato, L., & Molinari, A. (1999). The effect of foreign entry On Argentina's domestic banking sector, *World Bank Policy Research*, Working Paper 2158, available in SSRN, http:/ssrn.com/absract=620681 viewed 15 July, 2012

Claessens, S., & Fan, JPH. (2002). Corporate governance in Asia: A survey, *International Review of Finance*, *3*(2), 71-103.

DeYoung, R., & I. Hasan. (1998). The performance of the Novo bank commercial bank: A profit efficiency approach. *Journal of Banking and Finance 22*, 565-587

DeYoung, R., L.G. Golberg, & L.J. White. (1999). Youth, adolescence, and Maturity of banks: credit availability to small business in an era of banking consolidation. *Journal of Banking and Finance 23*, 463 – 492.

Drake, L., & Hall, M. J. (2003). Efficiency in Japanese banking: An empirical analysis. *Journal of Banking & Finance*, *27*(5), 891-917.

El-Chaarani, H. (2014). The Impact of Corporate Governance on the Performance of Lebanese Banks. *The International Journal of Business and Finance Research*, *8*(5), 35-46.

Ezzamel, M. & Watson, R. (1993). Organizational Form, Ownership Structure and Corporate Performance: A Contextual Empirical Analysis of UK Companies, *British Journal of Management*, *4*(3), 161-176

Fanta, A., Kemal, K., & Waka, Y. (2013). Corporate governance and impact on bank performance. *Journal of Finance and Accounting*, *1*(1), 19-26.

García-Marco T., & Robles-Fernández, MD. (2008). Risk-taking behaviour and ownership in the Banking industry: The Spanish evidence, *Journal of Economics and Business, 60*(4), 332-354.

Ghabayen, M.A. (2012). Board characteristics and firm performance: Case of Saudi Arabia, *International Journal of Accounting and Financial Reporting*, *2(*2), 168-200

Görg, H. & Greenaway, D. (2004). Much ado about nothing? Do domestic firms really benefit from foreign direct investment?, *The World Bank Research Observer, 19*(2), 171-197.

Han, K.C., & Suk, D.Y. (1998). The effect of ownership structure on firm performance: Additional evidence, *Review of Financial Economics, 7*(2), 143-155.

Haniffa, R., & Hudaib, M. (2006). Corporate governance structure and performance of Malaysian listed companies. *Journal of Business Finance & Accounting, 33*(78), 1034-1062.

Harvey, D.F. & Brown, D.R. (1998). *An Experiential Approach to Organisation Development*, 3rd Edition, Prentice Hall, p.68

Hasan, I., & Marton, K. (2003). Development and efficiency of the banking sector in A transitional economy: Hungarian experience. *Journal of Banking & Finance, 27*(12), 2249-2271.

Hermanson, D. R., Carcello, J. V., Neal, T. L., & Riley, R. A. (2002). Board Characteristics and Audit Fees. *Contemporary Accounting Research*, *19*(3), 365-384.

Jansen, M.S. (1998) *Corporate Governance: Lessons from the 1986s*, Howard University Press

Kajola, S.O. (2008). Corporate Governance and Firm Performance: The Case of Nigerian Listed Firms, *European Journal of Economics, Finance and AdministrativeScience,14* (5), 16-28

Khan, M.Y. (1994). *Financial Services*, Tata McGrawhill Education.

Klien, A. (2002). Audit committee, board of director characteristics, and earnings management, *Journal of Accounting and Economics, 33*(3),375-400.

Lipton, M., & Lorsch, J.W. (1992). A modest proposal for improved corporate governance, *Business Lawyer*, *48*, 59-77

Love, I., & Rachinsky, A. (2007). Corporate governance, ownership and bank performance in emerging markets: evidence from Russia and Ukraine. *World Bank, Working Paper*.

Mak, YT., & Li, Y. (2001). Determinants of corporate ownership and board structure: Evidence from Singapore, *Journal of Corporate Finance, 7* (3), 235-256

Mangla, I. U. (2012). Does Corporate Governance Influence Banking Performance? *Journal of Leadership, Accountability and Ethics*, *9*(3), 86-92.

Martin, K. D., and Cullen, J.B. (2006).Continuties and Extensions of Ethical Climate Theory: A Meta-analytic Review. *Journal of Business Ethics 69*(2), 175-194.

Maskay, B.K. (2004). Does corporate governance Affect productivity? Evidence from Nepal', in Gonzalez, E.T.(Ed), *Asian Productivity Organization, Tokyo, Japan*, 240-274.

Mester, L. J. (1992). Traditional and non-traditional banking: an information-theoretic approach. *Journal of Banking & Finance*, *16*(3), 545-566.

Miller, S. M., & Noulas, A. G. (1996). The technical efficiency of large bank production. *Journal of Banking & Finance*, *20*(3), 495-509.

Naceur, S. B., & M. Kandil.(2009). The impact of capital requirements on banks Cost of intermediation and performance: the case of Egypt. *Journal of Economics and Business*, *61*, 70 – 89.

Noulas, A. G., Ray, S. C., & Miller, S. M. (1990). Returns to scale and input substitution for large US banks. *Journal of Money, Credit and Banking*, 94-108.

Poudel R. & Hovey M. (2013). Corporate Governance and Efficiency in Nepalese Commercial Banks, *International Review of Business Research Papers*, *9*(4), 53-64

Praptiningsih, M. (2009). Corporate governance and performance of banking firms: evidence from Indonesia, Thailand, Philippines, and Malaysia. *Jurnal Manajemend an Kewirausahaan (Journal of Management and Entrepreneurship)*, *11*(1), 94.

Rouf, M. (2011). Corporate characteristics, governance attributes and the extent of voluntary disclosure in Bangladesh. African Journal of Business Management, 5(19), 7836-7845.

Sapkota, M.N. (2008). Corporate Governance in Nepalese Financial Institutions (in context of Financial Sector Reform), *Faculty of Management*, Tribhuvan University.

Sapkota C. (2009). Why Nepal Development Bank (NDB) should be put to rest? *Republica*, issue june 2, Kathmandu, Nepal. Retrieved from http://sapkotac.blogspot.com/2009/06/why-nepal-development-bank-ndb-should.html

Sapkota C. (2011). Nepalese Banking Crisis Explained, *Institute of Chartered Accountants of Nepal*, Vol.13, No.4, Kathmandu, Nepal. Retrieved from http://www.sawtee.org/sawtee-in-media/nepalese-banking-crisis-explained.html

Sathye, M. (2001). X-efficiency in Australian banking: An empirical investigation. *Journal of Banking & Finance*, *25*(3), 613-630.

Shleifer, A., & R. Vishny. (1997). "A Survey of Corporate Governance." *Journal of Finance*, 52(2): 737-84.

Siamat, D. (2004). Manajemen Lembaga Keuangan Edisi Keempat. Jakarta: Lembaga Penerbit Fakultas Ekonomi Universitas Indonesia.

Tabachnick, BG., & Fidell, LS. (2007). *Using multivariate statistics*, 5th ed. Boston, Allyn and Bacon

Tai, L. (2015). The Impact of Corporate Governance on the Efficiency and Financial Performance of GCC National Banks. *Middle East Journal of Business*, *10*(1).

Unite, A. A., & Sullivan, M. J. (2003). The effect of foreign entry and ownership structure on the Philippine domestic banking market. Journal of Banking & Finance, 27(12), 2323-2345.

Upreti B. (2008). Keeping Money Clean. *Nepali Times* issue 323. Retrieved from http://nepalitimes.com/news.php?id=12777#.VbRyLnIVih0

Utama, C. A., & Musa, H. (2011). The Causality between Corporate Governance Practice and Bank Performance: Empirical Evidence from Indonesia. *GadjahMada International Journal of Business*, *13*(3).

Vafeas, N (1999). Board meeting frequency and firm performance, *Journal of Financial Economics*, *53*(1), 113-142.

Velnampy, T. (2013). Corporate Governance and Firm Performance: A Study of Sri Lankan Manufacturing Companies. *Journal of Economics and Sustainable Development*, *4*(3), 228-235.

Wen, Y., Rwegasira, K., & Bilderbeek, J. (2002). Corporate Governance and capital structure decisions of the Chinese listed firms, *Corporate Governance: An International Review, 10* (2), 75-83.

Willesson, M. (2014). Financial crisis and bank profitability, *Bank Performance, Risk and Firm Financing*.

Zahra, SA, & Pearce, JA (1989). 'Boards of directors and corporate financial performance: A review.

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ONLINE KNOWLEDGE COMMUNITY PARTICIPATORS' USAGE BEHAVIOR

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Abstract

Based on a review of previous studies, several variables associated with online knowledge community participators' usage behavior were formulated and tested through a self-administered questionnaire among Chinese educational organizations. From theoretical viewpoint, many of the research performances were reported in previous theoretical discussions were conducted in the context of western societies were confirmed. However, there were new findings related to significant direct, indirect, and total effects on individual's online knowledge community usage behavior due to the current online educational environment in China were identified through structural equation modeling analysis. And, the practical implications were discussed from the perspective of improving online knowledge community management with positive consequences for their participator's knowledge cognition requirement and especially for explained their online information behavior.

Keywords: Social Cognitive Theory; System Quality, Online Interaction, Personal Outcome Expectancies, Continuance Intentions, Perceived Usefulness, Structural Equation Modeling

Introduction

With the changing of information demand, the current development trends for online information environment is characterized by "User-Centered Design", "Interaction", "Sharing" and "Coordination", which serve as the core development value. It means anyone can be the main body of information resources to create any form of information resources. As proof, there are various models of online knowledge platform and personal academic spaces such as WikiLeaks, Baidu Knows, and Zhihu, have recently emerged, which cover knowledge discoveries, integrated, application, and instruction (Boyer, 1991). And, those online knowledge communities are no longer just activity is

controlled by “a privileged few”, but also a communication process in a broader context of dialogue across different individuals and teams, which could directly motivate relevant users to do information collaboration, connect, sharing and discovering ("iStockAnalyst Has Merged Into The Tokenist - The Tokenist", 2020).

However, many of them are not fully aware of the nature of the online knowledge environment and the need for them to do development strategies that will enhance their competitive position and have positive influences on related participators’ usage behaviors although many online knowledge communities have been invested. So, the purpose of this paper is to explore the influence of online knowledge community’s environment and participator’s cognition process on their continued using behavior by social cognitive theory. And, the following three core research questions are expected to explain; (1) what are the component factors that organize the online knowledge community environment; (2) what are the factors that influence the relevant user's intention; (3) and, what are the factors influence the user's continued using behavior.

Literature reviews

The social cognitive theory was promoted by Bandura in 1986, which focuses on the dynamic interaction among personal determinants, behavioral determinants, and environmental determinants. Furthermore, personal determinants and behavioral determinants generate interdependence relationships in his model, which represents the interaction schema always exists between personal behavior and human cognition that could be changed base on related environmental changes (Bandura, 2000). So, those interaction effects can be understood as;

i. The interaction exists between human cognition and personal behavior presents the cognitive process mediate the effect of feelings on social behavior, which also approve the behavior of the groups (or individual) in the social environment that can improve people’s original cognition process (Bandura, 2009).

ii. The interaction exists between environment and personal behavior explain why the individual (or group) will present different behavior in different environments (Wong & Candolin, 2015). As a part of the environment, the behavior also exerts a significant influence on the environment, which refers to the static and dynamic environment (Bandura, 2002).

iii. Human cognition is examined and confirmed by the environmental determinants and renewed and improved constantly by environment factors (Lerner, 1982; Bandura, 1990). The people’s cognition produces personal attitudes (or intention) also make an impact on environment segmentations (Gangestad & Snyder, 2000).

Then, the basic research concept in this paper is on how the characteristics and mutual relationships among personal behavior, human cognition, and the online knowledge environment factors in social cognitive theory affect the continued using behavior for online knowledge community also exploit a new research channel for new online social networking behavior research. For

further discussion, the research structure can be presented as follows;

Behavioral factors

In social cognitive theory, the behavioral factors are presented as user's continuance intentions and continued using behaviors. Refer to the statements in reasoned action theory, technology acceptance model, and planned behavior theory, intention is an important indicator that is used to present the specific behavior of the users (Ajzen, 1991; Venkatesh & Davis, 2000; Doswell et al., 2011). So, the user's continuance intention for online knowledge community can be seen as an inner compass for predicting user behavior and measuring online conversion rates (Lin, 2007; Gudigantala et al., 2016).

Cognition factors

Cognition factors explain an individual's psychological function in the view of information processing, which is the activity subject cognize social phenomenon and human relations in the society (Sternberg & Sternberg, 2009). And, the main subject presents a desire for perceived performance which is about an individual's behavioral consequences. So, the desire for perceived performance as personal outcome expectancies is an important cognitive factor in social cognitive theory, which refers to the feedback from subjective awareness of behavioral consequences. Then, personal outcome expectancies represent the interaction process for human behavior and subjective cognition. In order words, if the user accesses one online knowledge community makes his outcome expectancies get satisfaction; it will strengthen the user's continuance intentions. Besides, personal outcome expectancies also could be in material level because the satisfaction degree from outcome expectancies can be used to measure the criterion of a positive real investment return to the related online knowledge community users (王伟军, 甘春梅, 2014). When the personal outcome expectancies are achieved, the perceived usefulness from the related webpage will be increased, conversely, related perceived usefulness will be decreased if the related website can not satisfy the personal outcome expectancies (Zhou, 2011). So, the degree of outcome expectancies satisfaction also is an overall assessment for the related website's contents and service quality because the change of satisfaction degree directly presents the user's continuance intentions (Zhou et al., 2010). Furthermore, in the technology acceptance model, the perceived usefulness focus on the effectiveness of using information service, the perceived ease of use aims at understanding the ease of using the system (Davis,1989). For now, there is much-related research already indicate the perceived usefulness is a significant variable for predicting online users' attitudes and behavior, while, the effects for perceived ease of use are not obvious throughout the online user's experiences (Venkatesh & Davis, 2000). So, perceived usefulness also is the most important variable for online knowledge community user’s behavior determination.

Environment factors

Based on the foregoing context in social cognitive theory, there is a complicated relationship among the human cognitive

process, personal behavior, and environment which interacts with each other. As the details, it shows different representations of individual cognition processes and behaviors make a complex and various environment; by the same token, individual cognition process and behavior are influenced by the surrounding environment because the environment provides the seedbed for their development. So, this paper extracts system quality, the quality of knowledge, and online interaction as the major factors to measure the environment affects the individual behavior's three aspects.

1) System Quality

The system quality indicates the performance and the functionality of online knowledge community, which often appears as the server's stability, extensibility, and ease of use, and esthetic. Furthermore, it is only after the online knowledge community meets those conditions that can motivate the members (or users) in online system to present their strong continuance intentions (Fang et al., 2014).

2) Quality of knowledge

The quality of knowledge refers to whether the exchange information and knowledge in online knowledge community are reliable, integrated, relevant, and usefulness. Generally, when the quality of information; information content; information expression; information system and information utility concepts of online knowledge community can meet their demand, the users will consider whether this webpage will be sustainable used (张婉, 2015). And, those quality performances will indirectly be influenced affect the knowledge searching intentions by the knowledge searching attitude from the users (Lai et al., 2014).

3) Online Interaction

Refer to the traditional information transmission model on the general website, online knowledge community depends on reliable knowledge; interaction and interplay of the users affect their stickiness and continuance intention (周军杰, 2015). So, the interaction relationship for "user to user" and "user to information" affect the individual cognition process; and another user understands the potential value on the webpage, which decides whether to access this webpage or not- and do information interaction in this system.

Research model and design

Based on former statements from related theories and previous discussions, the proposed conceptual model is shown in Figure1.

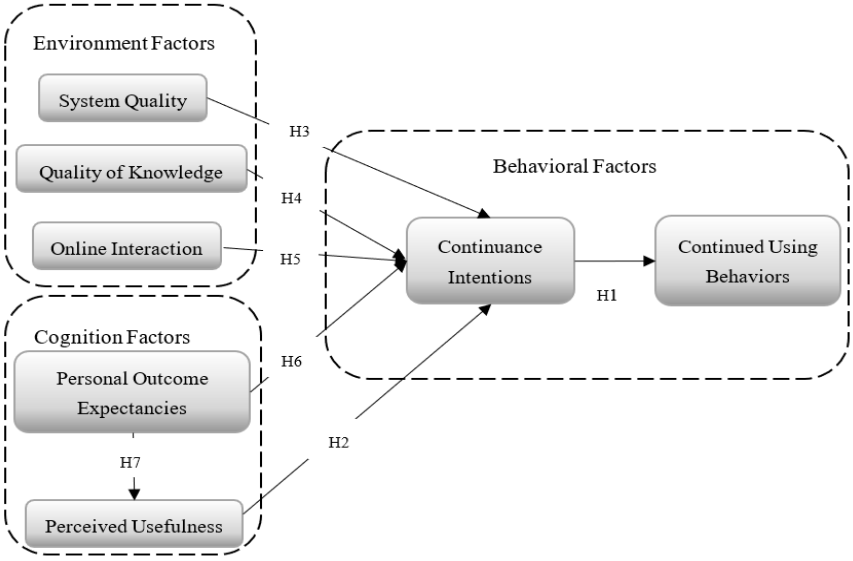

Figure 1 Proposed conceptual model

And, there are 7 research hypotheses associated has been notated for identification with the direct causal effect relationships among the variables as the statements in Table 1 together with the references from the related previous studies. And, those references are used to identify a logical relationship between two variables involved in the hypothesis.

Table 1 Research hypothesis

Research Hypothesis	Reference
H1: Continuance Intentions has a significant positive direct relationship with Continued Using Behaviors.	Bandura, 2000; Ajzen, 1991; Venkatesh & Davis, 2000; Lin, 2007; Doswell et al., 2011; Gudigantala et al., 2016
H2: Perceived Usefulness has a significant positive direct relationship with Continuance Intentions.	Bandura, 2000; Zhou et al., 2010
H3: System Quality has a significant positive direct relationship with Continuance Intentions	Bandura, 2000; Fang et al., 2014
H4: Quality of Knowledge has a significant positive direct relationship with Continuance Intentions	Bandura, 2000; Lai et al., 2014; 张婉, 2015
H5: Online Interaction has a significant positive direct relationship with Continuance Intentions	Bandura, 2000; 周军杰, 2015
H6: Personal Outcome Expectancies has a significant positive direct relationship with Continuance Intentions.	Bandura, 2000; Zhou et al., 2010; 王伟军, 甘春梅, 2014
H7: Personal Outcome Expectancies has a significant positive direct relationship with Perceived Usefulness.	Bandura, 2000; Zhou, 2011

However, there are no research hypotheses in Table 1 concerning the indirect effects, which will be the limitation of this research paper. For further understanding, the structural equation modeling analysis will be used to analyze, report, and identify whether there are any significant mediation effects are existing among those variables.

As following, Table 2 shows the labels for the indicators which were measured on five-point Likert scales and treated as interval scale measures. And, the references from previous studies were used as the source of the current measuring instrument in the following table.

Table 2 Measurement scales and instruments

Continued Using Behavior (Single scale)	PU3: Overall, the services in this website are useful for me.	QK4: The knowledge in the website relate to my searching topic.
How many hour(s) do you spend on online knowledge community in each week?	**System Quality (Latent)**	**Online Interaction (Latent)**
Continuance Intentions (Latent)	SQ1: The system in the website is simple to use.	OI1: I am close to the other users in this website.
CI1: I plan to continue to use this website and will not quit this website.	SQ2: The system in the website is stable.	OI2: I spend a lot of time to do communication with the other users on this website.
CI2: I plan to continue to use this website and will not use another similar website.	SQ3: The speed of response times in the website is fast.	OI3: There are more and more intercommunications between some users in the website and me.
CI3: All in all, I will continue to use this website system.	**Quality of Knowledge (Latent)**	**Personal Outcome Expectances (Latent)**
Perceived Usefulness (Latent)	QK1: The knowledge in the website is easy to understand.	POE1: The service experience from the website has surpassed my expectations.
PU1: The knowledge and information in this website can improve my performance.	QK2: The knowledge in the website is accurate.	POE2: The service level from the website has surpassed my expectations.
PU2: The knowledge and information in this website can increase my efficiency.	QK3: The knowledge in the website is an integrated system	POE3: Generally, most of my expectations for the website services are confirmed.

Data preparation and preliminary analyses

Through online questionnaire collection, there were 489 samples were obtained including two universities, one high school, and two social educational institutions in China. But there were 76 responses were removed from the samples because they have missing values and data entry errors. Finally, the leaving final sample size was 413.

The characteristics of respondents

Table 3 Personal characteristics of respondents

	Frequency	Percent	Cumulative Percent
Occupation			
Secondary School Student	66	16.0	16.0
Undergraduate Student	202	48.9	64.9
Graduate Student	36	8.7	73.6
Instructor in Secondary School	15	3.6	77.2
Instructor in Undergraduate School	48	11.6	88.9
Instructor in Graduate School	21	5.1	93.9
Others	25	6.1	100.0
Total	413	100.0	-
Age			
13 to 18	50	12.1	12.1
19 to 24	224	54.2	66.3
25 to 30	40	9.7	76.0
31 to 36	36	8.7	84.7
37 to 42	38	9.2	93.9
Over 43	25	6.1	100.0
Total	413	100.0	-
Gender			
Male	164	39.7	39.7
Female	249	60.3	100.0
Total	413	100.0	-

From Table 3, there were over 60 percent of the respondents were females in this research. And, the main age arrangement of the respondents was from 19 to 24 with 54.2 percentages. Among the 7 levels of educational occupation (or program) being undertaken by the respondents, most are undergraduate students in the university.

Model variables analysis: Validity, reliability and descriptive statistics

Table 4 Model variables analysis: Validity, reliability and descriptive statistics

Variable and Indicator		Validity/ Reliability			Descriptive Statistics			
		Factor Loading	Eigen value (% of Variance)	Cronbach Alpha	Mean	Standard Deviation	Skewness	Kurtosis
Perceived Usefulness	PU1	.88	6.48	.92	3.70	.96	-.54	.14
	PU2	.90	(34.11)		3.58	.96	-.48	-.04
	PU3	.87			3.61	.94	-.62	.34
Continuance Intention	CI1	.87	2.84	.92	3.27	1.03	-.04	-.46
	CI2	.90	(14.92)		3.31	1.01	-.21	-.27
	CI3	.84			3.39	.97	-.21	-.08
System Quality	SQ1	.88	2.24	.89	3.13	.90	.02	.08
	SQ2	.90	(11.81)		2.93	.95	.21	.06
	SQ3	.87			3.10	.87	.10	.38
Online Interaction	OI1	.88	1.71	.88	3.76	.838	-.10	-.69
	OI2	.87	(8.99)		3.83	.854	-.09	-.89
	OI3	.89			4.17	.841	-.59	-.65
Personal Outcome Expectancies	POE1	.81	1.29	.85	3.75	.77	.10	-.70
	POE2	.82	(6.81)		3.83	.83	-.06	-.85
	POE3	.75			3.75	.81	-.04	-.66

Note for factor analysis: *Extraction method:* Principal component analysis. *Rotation method:* Equamax with Kaiser normalization. Rotation converged in 6 iterations. Kaiser-Meyer-Olkin measure of sampling adequacy=0.859. Bartlett's test of Sphericity components with eigenvalues less than 1 are not shown. Percentage of total variance explained=76.641%.

Principal component factor analysis was used to examine the construct validity of the measures of the latent variables in the theoretical model, which required indicators to load onto only the component that was proposed to measure with a loading factor of at least 0.4 in magnitude and with an eigenvalue of at least 1 associated with the component (Straub & Gefen, 2004). And, cronbach alpha coefficieFnts were used to exam the internal consistency reliability of the measures of the indicators for each of the latent variables. The final analytical results in Table 4 present the quality of knowledge in the purposed theoretical model was removed from the further analyzing process because the internal consistency reliability of this variable was questionable (George & Mallery, 2003). Furthermore, as shown in Table 4, the magnitudes of the measures of skewness and kurtosis for each variable and indicator are within the acceptable limits of 3 and 7, respectively, required for the use of maximum likelihood estimation in subsequent SEM analyses (Kline, 2010).

Correlations analysis among profile and model variables

Table 5 Correlations analysis among profile and model variables

	Profile Variables			Model Variables														
Variables (Indicators)	Gender	Age	Occupation	Perceived Usefulness			Continuance Intention			System Quality			Online Interaction			Personal Outcome Expectancies			Continued Using Behavior
				PU1	PU2	PU3	CI1	CI2	CI3	SQ1	SQ2	SQ3	OI1	OI2	OI3	POE1	POE2	POE3	
Profile Variables																			
Gender	1																		
Age	0.020	1																	
Occupation	0.023	0.726	1																
Model Variables																			
PU1	0.093	-0.04	-0.083	1															
PU2	0.080	-0.08	-0.130	0.817	1														
PU3	0.078	-0.05	-0.089	0.761	0.794	1													
CI1	-0.069	-0.07	-0.065	0.254	0.233	0.259	1												
CI2	-0.037	-0.08	-0.087	0.255	0.197	0.231	0.809	1											
CI3	-0.036	-0.10	-0.080	0.281	0.234	0.272	0.764	0.787	1										
SQ1	-0.096	0.03	0.051	0.131	0.157	0.145	0.258	0.203	0.209	1									
SQ2	-0.060	-0.02	0.033	0.099	0.113	0.116	0.220	0.180	0.172	0.770	1								
SQ3	-0.034	0.02	0.075	0.093	0.086	0.113	0.308	0.256	0.224	0.705	0.719	1							
OI1	-0.031	-0.03	-0.017	0.127	0.039	0.055	0.187	0.198	0.272	0.087	0.052	0.086	1						
OI2	-0.016	-0.04	-0.035	0.123	0.054	0.088	0.187	0.175	0.272	0.130	0.066	0.107	0.707	1					
OI3	-0.027	0.00	-0.015	0.154	0.109	0.069	0.142	0.133	0.212	0.099	0.012	0.036	0.715	0.709	1				
POE1	-0.055	-0.07	-0.056	0.280	0.233	0.268	0.416	0.353	0.435	0.338	0.284	0.275	0.278	0.325	0.271	1			
POE2	-0.062	-0.09	-0.050	0.301	0.249	0.265	0.414	0.347	0.457	0.295	0.249	0.233	0.291	0.344	0.256	0.686	1		
POE3	-0.088	-0.12	-0.093	0.336	0.294	0.318	0.425	0.408	0.443	0.385	0.317	0.318	0.247	0.275	0.215	0.654	0.631	1	
CUB	-0.045	-0.20	-0.209	0.221	0.167	0.202	0.272	0.216	0.276	0.101	0.147	0.091	0.228	0.277	0.176	0.330	0.380	0.349	1

The correlation coefficients among the variables in this research model and variables are used to examine the characteristics of the responders are displayed in Table 5. Furthermore, the coefficients in bold type are statistically significant at a level of 0.05 or less, and shaded cells identify significant positive correlations that referred to the 7 direct causal effects in the theoretical model. As shown in this table, all the variables in this research are significantly positively correlated with each other and there are a few significant correlations between model variables and variables used to measure the characteristics of the participants. Besides, there five additional plausible causal effects are suggested by significant correlations: System Quality →Personal Outcome Expectancies; Online Interaction →Personal Outcome Expectancies; Online Interaction →Continued Using Behavior; Perceived Usefulness →Continued Using Behavior, Personal Outcome Expectancies →Continued Using Behavior.

SEM Analysis and research model development

Figure 2 shows the results of the SEM analysis of the research model by using AMOS 24 software.

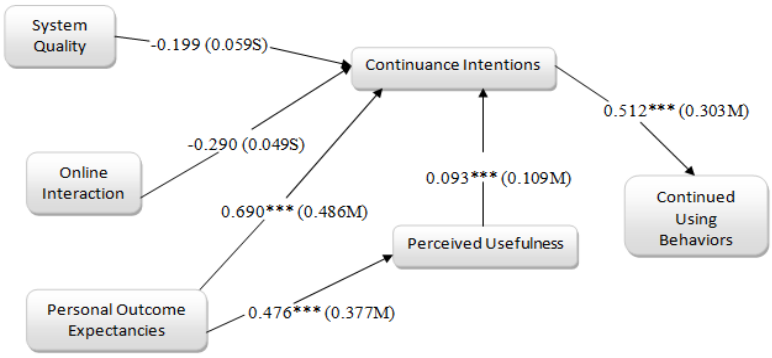

Figure 2 SEM Analysis for research model

In Figure 2: (a) the unstandardized direct effect is shown first followed by *, **, or *** if the effect is statistically significant at a level of 0.05, 0.01, or 0.001, respectively; (b) in parentheses the standardized direct effect is shown with S, M, or L to indicate that the magnitude of the effect is small, medium, or large, respectively (Cohen, 1988). These notations are used throughout subsequent analyses of effects.

Table 6 shows the values of the range of fit statistics for the theoretical model in Figure 2 as recommended by Kline in 2010.

Table 6 Fit statistics for research model

Model	N	NC (χ^2/df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
Research Model	413	197.795/96 = 2.0604	0.063	0.943	0.919	0.953	0.975	0.975	0.051
		R^2: Perceived Usefulness (0.142); Continuance Intentions (0.343); Continued Using Behaviors (0.092)							

Note: *R^2 is the proportion of the variance of each endogenous variable that is explained by the variables affecting it.*

In Figure 2, System Quality and Online Interaction present a small statistically insignificant effect on Continuance Intentions and from Table 6 the fit statistics are barely satisfactory, especially the values of RMR, RMSEA, and NC. Consequently, it was desirable to seek a model with improved values for the fit statistics and direct effects that were at least medium in magnitude and statistically significant. In the analysis of correlations presented in Correlations Analysis among Profile and Model Variables, five additional plausible direct causal effects were suggested. These five effects were used to change the model in Figure 2 were made optional and the specification search facility in AMOS 24. Following Kline's statements from this analysis the final model was selected as the one with the smallest value for χ2/df (Normed Chi-square). The final research model is shown in Figure 3 and its fit statistics are shown in Table 7.

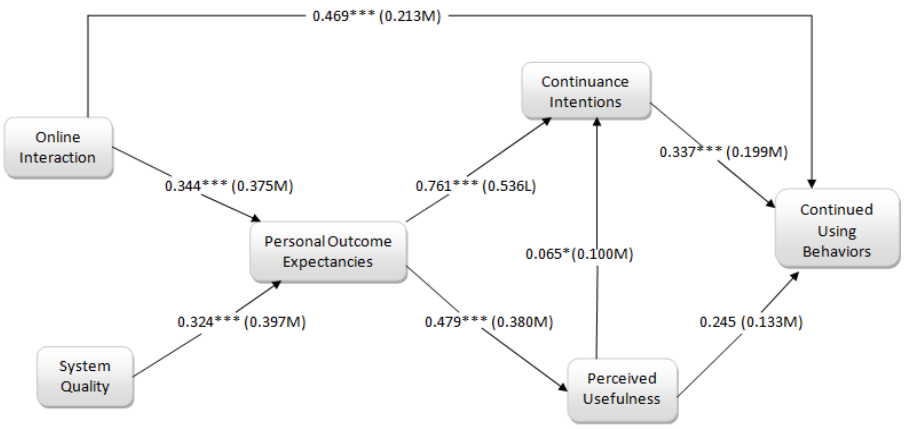

Figure 3 Final research model analysis

In Figure 3: (a) the unstandardized direct effect is shown first followed by *, **, or *** if the effect is statistically significant at a level of 0.05, 0.01, or 0.001, respectively; (b) in parentheses the standardized direct effect is shown with S, M, or L to indicate that the magnitude of the effect is small, medium, or large, respectively (Cohen, 1988). These notations are used throughout subsequent analyses of effects.

Table 7 Fit statistics for final research model

Model	N	NC (χ^2/df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
Final Research Model	413	174.780/96 = 1.8206	0.042	0.949	0.927	0.959	0.981	0.981	0.045
		R^2: Personal Outcome Expectancies (0.329); Perceived Usefulness (0.144); Continuance Intentions (0.338); Continued Using Behaviors (0.148)							

Note: *R^2 is the proportion of the variance of each endogenous variable that is explained by the variables affecting it.*

From Table 7 it is seen that the final model has an acceptable set of fit statistics and that very reasonable proportions of the variance associated with the endogenous variables are explained by the model. Further systematic dropping and adding of variables and effects based on significant correlation coefficients and the statistical significance and magnitude of other effects did not improve the fit of the final model and so this model was accepted and analyzed in full detail.

New findings

Table 8 Path analysis for final research model

	Variable	Effect	Endogenous Variable: Intervening: Personal Outcome Expectancies	Intervening: Continuance Intentions	Intervening: Perceived Usefulness	Dependent: Continued Using Behavior
Exogenous	System Quality	Direct	0.323***(0.396M)	Nil	Nil	Nil
		Indirect	Nil	SQ-POE-CI 0.246*** (0.212M)	SQ-POE-PU 0.154*** (0.150M)	SQ-POE-CI-CUB 0.100*** (0.051M) SQ-POE-PU-CI-CUB 0.005*** (0.004M)
		Total Indirect	Nil	0.246*** (0.212M)	0.154*** (0.150M)	0.105*** (0.055M)
		Total	**0.323***(0.396M)**	**0.246*** (0.212M)**	**0.154*** (0.150M)**	**0.105*** (0.055M)**
	Online Interaction	Direct	0.344***(0.376M)	Nil	Nil	0.484***(0.220M)
		Indirect	Nil	OI-POE-CI 0.262 *** (0.202M)	OI-POE-PU 0.164 *** (0.142M)	OI-POE-CI-CUB 0.107*** (0.049M) OI-POE-PU-CI-CUB 0.005*** (0.004M)
		Total Indirect	Nil	0.262 *** (0.202M)	0.164 *** (0.142M)	0.112*** (0.053M)
		Total	**0.344***(0.376M)**	**0.262 *** (0.202M)**	**0.164 *** (0.142M)**	**0.112*** (0.053M)**
Intervening	Personal Outcome Expectancies	Direct	Nil	0.761***(0.536L)	0.476***(0.378M)	Nil
		Indirect	Nil	Nil	Nil	POE-CI-CUB 0.310*** (0.129M) POE-PU-CI-CUB 0.015*** (0.010M)
		Total Indirect	Nil	0.761***(0.536L)	0.476***(0.378M)	0.325***(0.139M)
		Total	**Nil**	**0.761***(0.536L)**	**0.476***(0.378M)**	0.325***(0.139M)
	Continuance Intentions	Direct	Nil	Nil	Nil	0.408***(0.242M)
		Indirect	Nil	Nil	Nil	Nil
		Total Indirect	Nil	Nil	Nil	Nil
		Total	**Nil**	**Nil**	**Nil**	**0.408***(0.242M)**
	Perceived Usefulness	Direct	Nil	0.079* (0.105M)	Nil	Nil
		Indirect	Nil	Nil	Nil	PU-CI-CUB 0.032*** (0.025M)
		Total Indirect	Nil	Nil	Nil	0.032*** (0.025M)
		Total	**Nil**	**0.079* (0.105M)**	**Nil**	**0.032*** (0.025M)**

Table 8 is designed to present that: (a) all of the effects are positive and statistically significant at a level of 0.01or less; (b) there are several small effects which are statistically significant and this highlights the importance of considering the magnitude of effects and not only their statistical significance; (c) there are no situations where the direct effect of one variable on another is exceeded by the indirect effect through intervening variables.

According to analysis results, this study noticed personal expectation outcome, as an intervening variable, affects continuance using behavior. Also, online interaction has a significant positive effect on participator's continuance using behavior. And, the occurrence of this phenomenon is the change in people's information behavior which is induced by the modern information environment. At the same time, this research also approves the performance for system quality and online interaction has a significant effect on the participator's expectation outcome.

For further discussion, this trend can be explained as follows:

i. The online participators' perceived interaction and immersion were researched to some extent with the new information technology support (Fornells-Ambrojo et al., 2016). Online knowledge community participators always present strong attention to perceived interaction means they are willing to control information and join information (knowledge) interaction with a strong intention. If this kind of intention gets satisfaction, there are more opportunities for those online knowledge community participators to get a belonging need, also affect other participators for the sharing values (Shih & Huang, 2012). Besides, the new technology does not only provide a strong tie between related participators and online knowledge community, but also create a platform for the participators, who have similar interest, experience, and research areas, to share their new experience in near real-time. Meanwhile, this kind of change is easy for the participators to do knowledge exchange and sharing with others on a particular subject with a long-time connection because new technology adds social function in information (or knowledge) spreading, which can be considered as an inner experience for the participators, which finally will affect the participators continuance using behavior (Bai & Guo, 2017). Also, related new information technology development and application directly satisfy the participator’s requirements and expand new space for current network users' information-seeking behaviors.

ii. This trend presented knowledge utilization more effectively which also

approves the channel for the people to access knowledge and information is becoming more varied because of the technology innovation and changes in information behavior. Also, it has fully displayed a pluralistic knowledge structure and increasing personal information needs. However, information (knowledge) overload has already become a problem now facing each of us under this background. As an example, when information (or knowledge) is overload, the people think it would be difficult to do precise understanding and controlling the objective content and feature of the knowledge (Farhoomand & Drury, 2002). Besides, it is hard to find some expert participators with very authoritative and influential in some online knowledge communities, as a kind of phenomenon, make most of the participators only pay great attention to the searching questions, but neglects accuracy class for the contents. The online knowledge community is a kind of open knowledge-sharing platform with a wide range of participation groups, which presents a diversity to adapt the complicated participation groups. Some people think the online knowledge community is a kind of new strange situation; some of them also think online knowledge communities are a kind of contradictory situation; some people consider it as an unstructured situation. But by whatever situation, the understandings for online knowledge communities present the participator's ability to adapt to an uncertain situation. Generally, people with high adapting capability for uncertain situations always have very high autonomy ability for information (or knowledge) understanding and acceptance (Anderson, 2001). But, most of the respondents in this research are bachelor and secondary school students who only do their best to seek feedback when they are doing intellectual inquiry (Mclain et al, 2015). Also, this group always presents high attention to online interaction comparing with the other age groups. It is perhaps for this reason that most online knowledge community users do much more to post the question for feedback than knowledge exploration.

Practical implications of the findings

Base on the former statements from related theories and previous discussions, the following recommendations should be explored for online knowledge community management and operation.

To do upgrades and technical refreshes for online knowledge community's interface operation system.

With updating and developing of network terminal products, online knowledge community has to modify and optimize the human-machine operation interface and continue to launch a new application system. In the meantime, the online knowledge community intends to preserve the safe and stable virtual environment while allowing the service system to create a different homepage base on the characteristics of different participators' information needs and information behaviors. And only if so, can ensure positive participator's experience for related online knowledge community is constructed.

To create a good connection environment for online interaction.

In the operation process, online knowledge community design should consider how to ratchet up the incentive for active participators; organize some interactions can attract more participation. After all, online knowledge community should select the most influential participators in their respective fields with a special title to create a positive effect on the interaction atmosphere. Beyond that, the administrator in online knowledge community should be required to organize, evaluate the contents is created by the participators as it is produced, make efforts to keep the knowledge information in online knowledge community is in a state of order.

To form a new understanding of the quality of knowledge.

Based on the characteristics of traditional cognition theory, we just focus on the specialism of knowledge because it is the main reason lies in it to distinguish between the other online mediums and online knowledge community. It also explains why most online knowledge communities have fallen lopsided and simplifying in the field of knowledge spreading, which depends on online knowledge communities' understanding and cognition for knowledge. So, the problem statements for knowledge quality that are shown in this research process can be acceptable. For this, the traditional perception of knowledge should be changed because the current qualified knowledge is managed and produced base on the quality of content, the quality of expression, the quality of effectiveness, and the quality of user satisfaction from the people's knowledge requirements.

Research limitations

Indeed, this research also exposed some limitation as follows:

1) The main data comes from the students at school. Even some lecturers did participation in this research; there still

exist defects about the lack of samples because the responders for the specific variable group are not enough. So, the future study must strengthen attention on the users with working experience will increase the universality of the research.

2) This article mainly discusses the influence of the system environment and interaction behavior on continuance using behavior. But it has not analyzed the factors for knowledge cognition and quality of knowledge. So, the future study should discuss what are the related factors in the new information environment that could affect knowledge cognition and quality of knowledge.

3) In addition to the influence factors that this research has already discussed, the continuance using behavior also can be affected by other factors, such as trust, investment cost, and use cost, etc. If it is possible, how those related factors and environment affect online knowledge community user's information behavior should be systematically investigated and analyzed in the following studies.

References

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

Anderson, M.D. (2001). Individual Characteristics and Web-based Courses. In Christopher R. Wolfe, *Learning and Teaching on the World Wide Web, Volume* (1st ed., pp. 45-72). San Diego: Academic Press.

Bai, B., & Guo, Z. (2017). The factors affecting the continuance usage behavior of university students towards mobile online group-buying in China. In *3rd IEEE International Conference on Control Science and Systems Engineering in Beijing, China*. Beijing China.

Bandura, A. (1990). Some Reflections on Reflections. *Psychological Inquiry*, *1*(1), 101-105. https://doi.org/10.1207/s15327965pli0101_26

Bandura, A. (2002). Social Cognitive Theory in Cultural Context. *Applied Psychology*, *51*(2), 269-290. https://doi.org/10.1111/1464-0597.00092

Bandura, A. (2009). Cultivate self-efficacy for personal and organizational effectiveness. In *Handbook of principles of organization behavior* (2nd Ed., pp. 179-200). New York: Wiley

Boyer, E. (1991). The Scholarship of Teaching from: Scholarship Reconsidered: Priorities of the Professoriate. *College Teaching*, *39*(1), 11-13. https://doi.org/10.1080/87567555.1991.10532213

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. L. Erlbaum Associates.

Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, *13*(3), 319. https://doi.org/10.2307/249008

Doswell, W., Braxter, B., Cha, E., & Kim, K. (2011). Testing the Theory of Reasoned Action in Explaining Sexual Behavior Among African American Young Teen Girls. *Journal Of Pediatric Nursing*, *26*(6), e45-e54. https://doi.org/10.1016/j.pedn.2011.03.007

Fang, Y., Qureshi, I., Sun, H., McCole, P., Ramsey, E., & Lim, K. (2014). Trust, Satisfaction, and Online Repurchase Intention: The Moderating Role of Perceived Effectiveness of E-Commerce Institutional Mechanisms. *MIS Quarterly*, *38*(2), 407-427. https://doi.org/10.25300/misq/2014/38.2.04

Farhoomand, A., & Drury, D. (2002). Managerial information overload. *Communications Of The ACM*, *45*(10), 127-131. https://doi.org/10.1145/570907.570909

Fornells-Ambrojo, M., Elenbaas, M., Barker, C., Swapp, D., Navarro, X., & Rovira, A. et al. (2016). Hypersensitivity to Contingent Behavior in Paranoia. *The Journal Of Nervous And Mental Disease*, *204*(2), 148-152. https://doi.org/10.1097/nmd.0000000000000414

Gangestad, S., & Snyder, M. (2000). Self-monitoring: Appraisal and reappraisal. *Psychological Bulletin*, *126*(4), 530-555. https://doi.org/10.1037/0033-2909.126.4.530

George, D., & Mallery, P. (2003). *SPSS for windows step by step*. Allyn and Bacon.

Gudigantala, N., Bicen, P., & Eom, M. (2016). An examination of antecedents of conversion rates of e-commerce retailers. *Management Research Review*, *39*(1), 82-114. https://doi.org/10.1108/mrr-05-2014-0112

iStockAnalyst Has Merged Into The Tokenist - The Tokenist. The Tokenist. (2020). Retrieved 8 August 2020, from http://www.istockanalyst.com/article/viewiStockNews/articleid/2270426

Kline, R. (2010). *Principles and Practice of Structural Equation Modeling, Third Edition*. Guilford Publications.

Lai, H., Chen, C., & Chang, Y. (2014). Determinants of knowledge seeking in professional virtual communities. *Behaviour & Information Technology*, *33*(5), 522-535. https://doi.org/10.1080/0144929x.2013.864709

Lerner, R. (1982). Children and adolescents as producers of their own development. *Developmental Review*, *2*(4), 342-370. https://doi.org/10.1016/0273-2297(82)90018-1

Lin, J. (2007). Online stickiness: its antecedents and effect on purchasing intention. *Behaviour & Information Technology*, *26*(6), 507-516. https://doi.org/10.1080/01449290600740843

McLain, D., Kefallonitis, E., & Armani, K. (2015). Ambiguity tolerance in organizations: definitional clarification and perspectives on future research. *Frontiers In Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.00344

Shih, H., & Huang, E. (2012). Influences of Web interactivity and social identity and bonds on the quality of online discussion in a virtual community. *Information Systems Frontiers*, *16*(4), 627-641. https://doi.org/10.1007/s10796-012-9376-7

Sternberg, R., & Sternberg, K. (2009). *Cognitive psychology* (6th ed.). Wadsworth, Cengage Learning.

Straub, D., & Gefen, D. (2004). Validation Guidelines for IS Positivist Research. *Communications of The Association for Information Systems*, *13*. https://doi.org/10.17705/1cais.01324

Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, *46*(2), 186-204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, *46*(2), 186-204. https://doi.org/10.1287/mnsc.46.2.186.11926

Wong, B., & Candolin, U. (2015). Behavioral response to changing environments Behavioral Ecology. *Behavioral Ecology*, *26*(3), 665-673. https://doi.org/10.1093/beheco/aru183

Zhou, T. (2011). An empirical examination of users' post-adoption behaviour of mobile services. *Behaviour & Information Technology*, *30*(2), 241-250. https://doi.org/10.1080/0144929x.2010.543702

Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. *Computers In Human Behavior*, *26*(4), 760-767. https://doi.org/10.1016/j.chb.2010.01.013

周军杰. (2015) 社会化商务背景下的用户粘性：用户互动的剪接影响及调节作用. 管理评论, 27(7); 127-136

张婉. (2015) 问答社区信息质量凭借指标体系构建研究. 安徽大学

王伟军，甘春梅，(2014) 学术博客持续使用意愿的影响因素研究。 科研管理，35 (10)：121-127.

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RELATIONSHIP BETWEEN INDEPENDENT DIRECTORS, OWNERSHIP CONCENTRATION AND LEVEL OF ENVIRONMENTAL INFORMATION DISCLOSURE

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Abstract

Purpose: The purpose of this research is to examine the relationship between independent directors, ownership concentration and level of environmental information disclosure.

Data and Methodology: This study uses sample companies for 836 non-financial companies from year 2016 to 2017 listed on the Stock Exchange of Thailand. The multiple regression analysis is conducted to examine the relationship between independent directors, ownership concentration and level of environmental information disclosure. In addition, non-linear relationship of independent directors, ownership concentration and level of environmental information disclosure are investigated.

Findings: The results show that there is a positive and significant relationship between independent directors and level of environmental information disclosure. In addition, the significant non-linear relationship between independent directors and level of environmental information disclosure is found. However, there is no significant relationship between ownership concentration and level of environmental information disclosure. In addition, board size, firm size and industry type are positively and significantly related to level of environmental information disclosure.

Keywords: Independent Directors, Ownership Concentration, Environmental Information Disclosure, Corporate Governance Mechanisms

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Introduction

The influence of economic development has been publicly considered as a major factor for environmental impact from their activities. Suttipun and Stanton (2012) address that the development of economics causes several environmental impacts and in the past decade, several scandals and crisis occurred from business' operations. Environmental information is one of effective communication channels that the business can use to deliver their environmental activities to the stakeholders (Amran et al., 2014: Akbas, 2016). Milne and Patten (2002) addressed that environmental information would be one of the factors that help management to identify environmental risks, structure of costs, finance issue and investment. The management can use environmental information to predict the risk and be prepare for risk management. Akbas (2016) state that stakeholders consider environmental information is one of important factors that help business realize the impact of their business's operations on environment. Stakeholders consider environmental information as a source of information of business' operations that could possibly have impact on the environment and sustainability of the corporations. The Stock Exchange of Thailand (SET) has requested the listed companies to disclose corporate social responsibility which include the environmental report. Until now there is an increasing number of business around the world that disclose their environmental information in recognizing that it is an important dimension of accounting information systems (Ahmad and Mousa, 2010; Amran et al., 2014).

As environmental issue becomes in the public attention, it is important to understand the factors that influence on level of environmental information disclosure. One organization that pays highly attention to the environment issue is Global Reporting Initiative (GRI). GRI is "an international independent standards organization that helps business, governments and other organizations understand and communicate their impacts on issues such as climate change, human rights and corruption" (Global Reporting Initiative Sustainability Report, 2011). GRI standard aims to help businesses and governments to understand and communicate their impact on critical sustainability issues. (Global Reporting Initiative, 2006). GRI's vision is "a sustainable global economy where organizations manage their economic, environment, social and governance performance and impacts responsibility and report transparently" (Global Reporting, 2010, p.2). It is a crucial to understand the factors that influence on the level of environmental information disclosure. Different regions have different structures of organizations which can influence to the businesses' operations including the level of environmental information disclosure. Therefore, this study is interested to examine: (i) the relationship between independent directors and level of environmental information disclosure in case of listed companies in the Stock Exchange of Thailand; (ii) the relationship between ownership concentration and level of environmental information disclosure in the case of

companies listed in the Stock Exchange of Thailand. This study employs other factors as control variables including board size, profitability, firm size, leverage and industry types. Moreover, this research will examine the non-linear relationships of independent directors, ownership concentration and environmental information disclosure.

Theoretical framework

Since several scandals of environmental damaged by the economic development and companies' activities. Independent directors and ownership concentration are called as factors that need an attention to examine if they are related to the level of environmental information disclosure by those companies (Said et al., 2019; Herda et al., 2012; Arora and Dharwadkar, 2011). This research will review the related theories.

Stakeholder theory

Freeman (1984, p. 46) states that stakeholder is "any group or individual who can affect or is affected by the achievement of the organization's objectives". Nutt and Backoff (1992, p. 439) address that stakeholders is "all parties who will be affected by or will affect the organization's strategy". Similarly, Bryson (1995, p. 27) defines that stakeholder is "any person group or organization that can place a claim on the organization's attention, resources, or output, or is affected by that output". Donaldson and Preston (1995, p. 66) suggest that "the stakeholder theory is also instrumental which established a framework for examining the connection, if any, between the practice of stakeholder management and the achievement of various corporate performance goals". Moreover, Friedman (2006) states that the stakeholder theory is concerned with how managers and stakeholders should act and view their roles and actions. The organization itself should manage its business based on stakeholders' interest and their viewpoints. Freeman (2004) states that stakeholders are the groups who are vital to the survival as well as success of the corporation since stakeholders may bring an action against the managers for the failure to perform the duty of care. Freeman et al. (2010, p. 859) state that stakeholder theory as individuals, groups and organizations that have an interest in the processes and outcomes of the firm. The groups of people can be defined as, for example, customers, employees, suppliers, financiers, communities, special interest group or environmental groups Freeman et al. (2010). In overall, stakeholder theory is about how managers treat stakeholders, if the organization treats the stakeholders based on the stakeholder interests, the organization will be more successful in the long run.

Agency theory

Agency theory is defined as the relationship between principals and agents. The principals can be referred to shareholders or owners and the agents can be referred to manager (Berle and Means, 1932). Agency theory is addressed as in modern corporation, the principal hires an agent to operate the business. This theory deals with the conflict of interests between the principal and the agent, which is known as "Agency Problem (Berle and Means, 1932). Chaklader and Gulati (2015) argue that stakeholder theory can be

linked to the "Agency Theory" as agency theory literately considers environmental problem as a conflict of interest between principal and agent. Berle and Means (1932); Blair and Stout (1999) suggest that since the enlarge of the organization, a separation between management and shareholders exists. Agency theory provides the framework to link to the corporate governance to environmental disclosure. One of the reasons is because the corporate governance mechanisms are considered as the factors that can control the agency problem between firms and stakeholders (Allegrini and Gerco, 2013; Ho and Wong, 2011). Mousa and Hassan (2015) suggest that stakeholders would pay highly attend to the potential financial risk associated with companies' activities such as the prosecution of companies for damaging environment. In several developed countries, environment legislation has increased civil and criminal penalties. Therefore, companies need to consider environmental issues in their financial shareholders' and stakeholders' risk and return assessment (Mousa and Hassan, 2015). Hussainey and Salama (2010) suggest that managers need to ensure that financial reports would deliver relevant information including economic performance and environmental information to outsider of the firm. It is important to consider that agency problem can incurred if environmental information is not sufficiently disclosure to stakeholders and those stockholders cannot pressure on a firm to improve the firm's behavior (Mousa and Hassan, 2015; Rosthorn, 2000). In this context, agency theory provides a linkage to the corporate governance mechanisms to that environmental disclosure due to the reason that corporate governance mechanisms are the functions to control the agency problem of environmental information disclosure.

Triple bottom line concept

In the past years, globalization of business has led to the development of technologies, logistic and infrastructure. While several entities are expanding their business globally, several scandals and crises that harm not only the environment but also communities and stakeholders' communities. The scandals have led to an attention of the pubic to protect the environment and stakeholders' interests. Several organizations and United Nations aware of sustainability of the business globally has organized the United Nations Conference on Environment and Development in 1992. Both public and private organizations discuss on the environment, sustainability development and to rethink about the economic development and find ways to halt the destruction of irreplaceable natural resources and pollution of the world (United Nation, 1992). Brundtland (1987, p.3) defines the triple bottom line as "…the development that meets the needs of the present generations without compromising the ability of the future generations to meet their own needs". Elkington (1997) addresses that the triple bottom line includes three "P" formulation which include "People, Planet and Profits". The triple bottom line is structured based on integration of the economic development, social development, and environmental protection (United Nation, 1992). United Nations has released concern on their major issues including (i) economic development: (ii) social responsibility; and (iii)

environmental protection which are altogether known as "triple bottom line" (United Nation, 1992; Global Initiative Reporting Initiative, 2006). There is a linkage of triple bottom line and stakeholder theory by the Global Reporting Initiative (2006, p.9) which argues that the relationship of sustainability reporting to stakeholders' dialogue that "Reports alone provide little value if they fail to inform stakeholders or support a dialogue that influences the decisions and behavior of both the reporting organization and its stakeholders". In addition, United Nation (1992) states that protecting the environment and human's future is to prevent pollution and to consume resources efficiency including recycling, reducing power consumption. Currently, the main factors of business to be successful needs to focus on both maximizing profit and also concerning on environment to achieve the business sustainability (Setyorini and Ishak, 2012). Based on the theories addressed earlier in this paper, the stakeholders are now not only the shareholders but also the communities and environmental. In 21st century, due to several scandals caused by companies, environmental information disclosure and sustainability of businesses have come to an attention of public. In addition, it is interesting to know that what kind of companies' characteristics have significantly impact on environmental information disclosure. Several prior studies addressed earlier have examined the relationship of several factors, for instance board structure, ownership concentration and environmental information disclosure. Still there is no clear out of the results as different countries as different business environment and characteristic.

Literature review

Independent directors

Board independent is one of corporate governance mechanisms that widely used as a factor influence on the level of environmental information disclosure (Chau and Gray, 2010). Khan et al. (2013) suggest that it is well know that independent directors are considered as a balance mechanism to ensure that firms act in the best interests of shareholders, stakeholders and society. From this point of view, independent directors would have influence to encourage firms to disclose more environmental information to stakeholders. Webb (2004) has studied the differences between firms with socially responsible have more independent directors compare to firms with non-socially responsible. Some studies suggest that there is a positive relationship between the proportion of independent directors and level of environmental disclosure (Bajahar and AI-Hajili, 2017). Liao et al. (2015) argue that independent directors is positively related to extensive disclosure of environmental information of 329 large companies in UK. Herda et al. (2012) examine the effect of independent directors on the sustainability reporting of 450 large firms in the United States in year 2008. The results show that independent director variable is positively and significantly related to likelihood of voluntarily issuing sustainability report. They argue that a higher proportion of independent directors on the board are more likely to disclose sustainability reports. In addition, Arora and Dharwadkar (2011) examine the influence of corporate governance and corporate social

responsibility reporting of companies from S&P 500 and KLD during 2001-2005. They suggest that proportion of independent directors is positively and significantly related to corporate social responsibility disclosure. Uwuigbe et al. (2011) address that a proportion of independent directors on the board is positively associated with level of corporate environmental disclosure of 40 listed firms in Nigeria Stock Exchange of year 2010. They argue that increasing the proportion of independent directors on the board can lead to better corporate environmental disclosure and that cause the companies attempt to disclosure more of their environmental information. Ofoegbu et al. (2018) examine the association between corporate governance mechanisms and the environmental disclosure in case of Nigeria Stock Exchange and Johannesburg Stock Exchange in South Africa. The results of their study show that there is a positive and significant relationship between independent directors and environmental disclosure in the case of Nigeria while this kind of relationship is insignificant in the case of South Africa. In contrast, Majeed et al. (2015) suggest that independent directors have a negative and significant relationship to corporate social responsibility reporting in the case listed companies at KSE Pakistan between year 2007-2011. Said et al. (2009) find that there is no significant relationship between independent director and level of environmental information disclosure of listed firms in Malaysia in year 2006. In case of Turkish listed companies, Akbas (2016) suggests that independence directors are insignificantly related to level of environmental information disclosure. Rabi (2019) addresses that the proportion of independent directors is insignificantly associated to the level of environmental information disclosure in the case of Amman Stock Exchange in Jordan for year 2014-2017. Based on the prior studies, there is no clear cut on the relationship between independent directors and level of environmental information disclosure, especially in the case of listed firms in Thailand. Therefore, this study aims to examine the relationship between independent directors and level of environmental information disclosure. This study hypothesizes that:

H1: There is a positive and significant relationship between independent directors and level of environmental information disclosure.

Ownership concentration

Several studies point out that ownership concentration is one of effective mechanisms in monitoring the management to operate business for the best interest of shareholders and stakeholders. Zhijuan and Chaoyang (2017) examine the factors that influence on the environmental disclosure of Chinese's mining listed companies. They suggest that ownership concentration is positively related to level of environmental information disclosure. Said et al. (2009) also suggest that concentrated ownership is positively related to level of environmental information disclosure. Chang and Zhang (2015) address that firms with concentrated ownership increase level of environmental information disclosure in case of Chinese firms in polluting industries in year 2008-2012. This is consistence with the findings of Roberts (1992); Cullen et al. (2002) argue that

there is a positive relationship between ownership dispersion and level of corporate social responsibility information disclosure. In contrast, Darus et al. (2014) suggest that ownership concentration has no relationship to the environmental information disclosure in case of Malaysia. Othman and Zeghai (2010) suggest that there is a negative relationship between concentrated ownership and level of environmental information disclosure in case of Middle Eastern and North African firms. Based on the studies reviewed, this study hypothesizes that:

H2: There is a positive and significant relationship between ownership concentration and level of environmental information disclosure.

Board size

Board size is considered as a crucial corporate governance mechanism which influence on the level of environmental information (Allegrini and Gerco, 2013). Said et al. (2009) examine the relationship between corporate governance mechanisms and level of CSR information disclosure in Malaysian listed companies. They suggest that the relationship between board size is positively related to level of CSR information disclosure. Mgbame and Onoyase (2015) examine the effect of corporate governance on the extend of environmental reporting in the case of Nigerian oil industry. They find that board size is positively and significantly related to environmental information reporting. Akbas (2016) studies the relationship between board characteristics and environmental information disclosure of Turkish listed companies. Akbas (2016) suggests that board size is positively and significantly related to level of environmental information disclosure. On the other hand, Unwuigbe et al. (2011) suggest that there is a significant negative relationship between board size and level of environmental information disclosure. Jensen (1993) suggests that a larger board can results to less effective coordination, communication and decision making. This can lead to lower quality of information disclosure. Based on the studies reviewed, this study hypothesizes that:

H3: There is a positive and significant relationship between board size and level of environmental information disclosure.

Profitability

Profitability is widely used as one of factors that could influence on environmental information disclosure. Zhijuan and Chaoyang (2017) examine relationships of several factors that could influence on level of environmental disclosure of 75 Chinese mining listed companies in year 2015. One of their factors is profitability and they find a positive relationship between profitability and level of environmental information disclosure. Similarly, Hanniffa and Cooke (2005) suggest that there is a positive relationship between profitability and level of environmental information disclosure. In contrast, Smith et al. (2005) suggest that firms with high profitability is negatively related to the level of environmental information disclosure. Elshabasy (2018) argues that profitability has positive and significant relationship to the environmental information disclosure in

case of listed firms in Egypt. Welback et al. (2017) argue that profitability is not significantly related to level of information disclosure in the case of listed companies in Ghana. Bhalla and Singh (2018) suggest that there is no significant relationship between profitability and the extend of environmental information disclosure in the companies' websites. According to the prior studies, this study hypothesizes that:

H4: There is a positive and significant relationship between profitability and level of environmental information disclosure.

Firm size

Firm size is adopted in several studies as it might influence level of environmental information disclosure by the entities. Cormier and Magnan (2003) suggest that there is a positive association between firm size and environmental information disclosure. Akrout and Othman (2013) disclose that firm size is positively and significantly related to environmental information disclosure. Welback et al. (2017) examine the determinants of environmental disclosure of listed firms in Ghana. They find a positive and significant relationship between firm size and environmental disclosure. Buniamin (2010); Juhmani (2013) address that there is a positive relationship between firm size and level of environmental information disclosure. Nguyen et al. (2017) examine the factors that have influence on the level of environmental accounting information of 74 Vietnam listed companies from year 2013-2016. They find that firm size has positive impact on level of environmental information disclosure. Bhalla and Sign (2018) also find positive relationship between firm size and level of information disclosure. In contrast, Elshabasy (2018) suggest that firm size is insignificantly related to environmental information disclosure in case of Egypt listed firms. Based on studies in the past, this study hypothesizes that:

H5: There is a positive and significant relationship between firm size and level of environmental information disclosure.

Leverage

Leverage is one of the important factors that has influence on the environmental information disclosure. Chiu and Wang (2014): suggest that there is a negative relationship between leverage and level of environmental information disclosure. Nguyen et al. (2017) find a negative impact of financial leverage on level of information disclosure in of 64 Vietnam listed firms between year 2013-2016. Zhijuan and Chaoyang (2017) suggest that there is a negative impact of leverage on level of information disclosure in case of 75 Chinese mining listed companies in of year 2015. On the other hand, Bhalla and Singh (2018) find a negative relationship between leverage and level of information disclosure of listed companies on Bombay Stock Exchange. Adenniyi and Adebayo (2018) find no significant relationship between these two factors in case of listed firms in Nigerian. According to the prior empirical studies, this study hypothesizes that:

H6: There is a positive and significant relationship between profitability and level of environmental information disclosure.

Industry type

According to Welback et al. (2017) suggest that industry type is one of important factors influence on level of environmental information disclosure. Robert (1992) suggests that industries that more likely effect on environment highly concern on reaction from the communities and are likely to disclose more environmental information. Bhalla and Singh (2018) address that there is no significant association between industry type and level of environmental information disclosure of firms listed on Bombay Stock Exchange between year 2011-2016. They argue that industry type does not make different that firms are more or less sensitive towards environment as firms are commonly expected to disclose of their environmental information irrespectively towards their environment activities. Odoemelam and Regina (2018) argue that there is no significant relationship between industry type and level of information disclosure in case of listed non-financial firms in Nigeria. Welbeck (2017) argue that firms in sensitive industries comply with environmental regulations due to the emission effect of their activities and therefore should disclose their environmental concerns. Based on the review of industry types of literature, this study hypothesizes that:

H7: There is a positive and significant relationship between industry type and level of environmental information disclosure.

Research methodology

Data collection

This study uses non-financial[2] companies listed on the Stock Exchange of Thailand (SET) from year 2016 – 2017. The companies in some sector which is property funds and (REITS)[3] are removed from the initial sample since they have insufficient data for the analysis. The sample companies are totally 836 companies which are 418 companies from each year. The SET has 8 industry-groups which included 28 sections as shown in Table 1.

2 This study excludes firms in financial sectors as those companies have some factors such as high leverage which does not normally have the same meaning as for non-financial companies (Fama and French, 1992).

3 A real estate investment trust (REITS) is a closed-end investment company that owns assets related to real estate such as buildings, land and real estate securities (source: https://investinganswers.com/dictionary/r/real-estate-investment-trust-reit)

Table 1 Industry group, sector and sector index of the stock exchange of Thailand

No.	Industry Group	Sector
1	Agro &Food Industry [AGRO]	Agribusiness
		Food & Beverage
2	Consumer Products [CONSUMP]	Fashion
		Home & Office Products
		Personal Products & Pharmaceuticals
3	Financials4 [FINANCIAL]	Banking
		Finance & Securities
		Insurance
4	Industrials [INDUS]	Automotive
		Industrial Materials & Machinery
		Packaging
		Paper & Printing Materials
		Petrochemicals & Chemicals
		Steel
5	Property & Construction [PROPCON]	Construction Materials
		Construction Services
		Property Development
		Property Fund & REITs
6	Resources [RESOURC]	Energy& Utilities
		Mining
7	Services [SERVICE]	Commerce
		Health Care Services
		Media & Publishing
		Professional Services
		Tourism & Leisure
		Transportation & Logistics
8	Technology [TECH]	Electronic Components
		Information & Communication Technology

Moreover, the average number of accompanies in the sample are presented in Table 2.

4 This study will not include financial companies.

Table 2 Average number of sample companies between 2016-2017 by industry and sector in the stock exchange of Thailand

Industry Group Name	Sector Name	Average Number of Firms (Year 2016-2017)
Agro &Food Industry [AGRO]	Agribusiness	11
	Food & Beverage	36
Consumer Products [CONSUMP]	Fashion	18
	Home & Office Products	11
	Personal Products & Pharmaceuticals	7
Industrials [INDUS]	Automotive	17
	Industrial Materials & Machinery	10
	Packaging	14
	Paper & Printing Materials	1
	Petrochemicals & Chemicals	14
	Steel	22
Property & Construction [PROPCON]	Construction Materials	17
	Construction Services	21
	Property Development	51
Resources [RESOURC]	Energy& Utilities	39
	Mining	1
Services [SERVICE]	Commerce	22
	Health Care Services	18
	Media & Publishing	25
	Professional Services	3
	Tourism & Leisure	11
	Transportation & Logistics	17
Technology [TECH]	Electronic Components	10
	Information & Communication Technology	22

source:https://www.set.or.th/set/mainpage.do?language=en&country

Methodology

This study uses secondary data obtained from the Stock Exchange of Thailand's database and official websites of sample firms which include annual reports, Form 56-1 (Stock Exchange of Thailand, 2019) and some companies disclose sustainability information separately from the annual reports. This study employs two models. The first one is Model 1 which is used in examining the relationship between independent directors and level of environmental information disclosure.

$$EID_{i,t} = \beta_0 + \beta_1 INDIR + \beta_2 BSIZE + \beta_3 PROFIT + \beta_4 FIRMSIZE + \beta_5 LEVERAGE + \beta_6 INDUSTRY + \varepsilon_{i,t} \quad \text{---------- ------ (Model 1)}$$

The second one is Model 2 which is used in examining the relationship between ownership concentration and level of environmental information disclosure.

$$EID_{i,t} = \beta_0 + \beta_1 OWN10 + \beta_2 BSIZE + \beta_3 PROFIT + \beta_4 FIRMSIZE + \beta_5 LEVERAGE + \beta_6 INDUSTRY + \varepsilon_{i,t} \quad \text{---------- --------(Model 2)}$$

These two models include control variables which might have impact on level of environmental information disclosure. The variables and definitions are presented in Table 3.

Table 3 Variables and definitions

Dependent Variable		
Environmental Information Disclosure (EID)	=	The score will be given 1 for each criteria the firm disclosure the information. This study employs the criteria from GRI standards in 2010 (Global Reporting Initiative, 2010). The criteria of 12 aspects that GRI addressed which includes (1) Materials; (2) Energy; (3) Water; (4) Biodiversity; (5) Emissions; (6) Effluents and Waste; (7) Products and Services; (8) Compliance; (9) Transport; (10) Overall; (11) Supplier Environmental Assessment; and (12) Environmental Grievance Mechanisms. For example, if the company discloses all items stated above, it will have 12 scores (Global Reporting Initiative,2006; Global Reporting Initiative 2010; Chang and Zhang, 2015; Welbeck et al.,2017). The firm disclosure environmental information according to the criteria of GRI will earn 1 score for each criterion.
Independent Directors (INDIR)	=	The percentage of independent directors of the total number of directors on the board (Said et al.,2009; Akbas, 2016).
Ownership Concentration (OWN10)	=	Ownership concentration is measured by the percentage of share hold by the top ten largest shareholders of a company. (Said et al. 2009).
Control Variables		
Board Size (BSIZE)	=	The total number of directors on the board of a firm (Akbus, 2016; Cheng and Courtenay, 2006).
Profitability (PROFIT)	=	The ratio of net profit after tax to total equity at the average of the year Akbas, 2016; Nguyen et al., 2017).
Size (FIRM SIZE)	=	The logarithm of assets (Akbas, 2016; Nguyen et al., 2017).
Leverage (LEVERAGE)	=	The ratio of the total debt to total asset at the average of the year (Nguyen et al., 2017; Zhijuan and Chaoyang, 2017).
Industry (INDUSTRY)	=	Dummy variable which is equal to 1 if the firm operates in an environmentally sensitive industries including mining, oil and chemical industries, and 0 otherwise (Mahmood, 1999; Reverte, 2009). Mahmood (1999) and Reverte (2009) suggest that the types of industry including Agriculture, Automotive, Paper and Printing, Petrochemical, Oli and Chemical, Steel, Energy, Mining, Electronic should be emphasized as sensitive industry. Therefore, this study includes the following industry as sensitive industry: Agribusiness, Automotive, Industrial Materials & Machinery, Paper & Printing Materials, Petrochemicals & Chemicals, Steel, Energy & Utilities, Mining, Media & Publishing, and Electronic Components.
ε	=	a random error of variable.

Furthermore, this study conducts descriptive statistics of variables, and the test of variance Inflation Factor (VIF) and correlation coefficient. Then, the multiple regression analyses will be used to examine the relationship between independent directors, ownership concentration and level of environmental information disclosure. The descriptive statistics are employed to examine tendency and distribution of variables by presenting mean, median, and standard deviation. Table 4 presents the descriptive statistics of dependent, independent and control variables. From Table 4, it shows that mean of environmental information disclosure (EID) is 3.17, INDIR is 41.71% and

OWN10 is 69.64%. Furthermore, the mean of BSIZE is 10.23, PROFIT is 13.70, FIRMSIZE is 30,559.61 million baht and LEVERAGE is 0.53. This study also tests the independent and control variables to ensure that the variables will not have significant influence each other. The test will be set into two sets. The first test is for the set of Model 1 with independent director (INDIR). The second one is for the set of Model 2 with ownership concentration (OWN10). If multicollinearity condition exists, the variances of some estimated regression coefficient may cause an unstable and/or mislead estimation of the regression model (Ramanathan and Rajarshi, 1992; Akrout and Othman, 2016).

Table 4 Descriptive statistics of variables

Variable	Mean	Median	Std. Deviation	Minimum	Maximum
EID (Score)	3.17	3.00	1.67	1.00	11.00
INDIR (%)	41.71	40	8.83	33.33	85
OWN10 (%)	69.64	71.57	15.84	23.30	98.93
BSIZE (Person)	10.23	10.00	2.43	5.00	23.00
PROFIT (Million Baht)	13.70	6.89	207.99	-78.00	6,012
FIRMSIZE (Million Baht)	30,559.61	5,274.47	12,932.63	89.55	2,232,331
LEVERAGE (Ratio)	0.53	0.42	2.20	0.03	56.34

The results of the test of multicollinearity condition of variables are shown in Table 5 and 6. The results from Table 5 and 6 indicate that the VIF of variables are not more than 2.0 which means that the multicollinearity condition does not exist that could distort the results of the analysis (Allison, 2012; Akrout and Othman, 2016).

Table 5 Variance inflation factors of independent variables of model 1

	Variance Inflation Factor (VIF)
INDIR	1.008
BSIZE	1.084
PROFIT	1.006
FIRMSIZE	1.231
LEVERAGE	1.008
INDUSTRY	1.001

Table 6 Variance inflation factors of independent variables of model

	Variance Inflation Factor (VIF)
OWN10	1.035
BSIZE	1.027
PROFIT	1.076
FIRMSIZE	1.008
LEVERAGE	1.027
INDUSTRY	1.035

Furthermore, this study also conducts the test of correlation coefficient as shown in Table 7. The results in Table 7 show that correlation coefficient of most independent variables and control variables are not found to be significantly correlated with each other. Only some independent variables which are INDIR and FIRMSIZE are significantly correlated but the coefficient are very small.

Table 7 Correlation coefficients test of independent variables

	INDIR	OWN10	BSIZE	PROFIT	FIRMSIZE	LEVERAGE	INDUSTRY
INDIR	1						
OWN10	-0.019	1					
	(0.577)						
BSIZE	0.081	-0.19	1				
	(0.07)	(0.582)					
PROFIT	0.003	0.034	0.070*	1			
	(0.937)	(0.32)	(0.043)				
FIRMSIZE	0.431*	0.034	0.043	0.021	1		
	(0.002)	(0.323)	(0.215)	(0.553)			
LEVERAGE	-0.39	0.017	-0.071	-0.002	0.001	1	
	(0.264)	(0.621)	(0.140)	(0.964)	(0.995)		
INDUSTRY	0.021	0.157	0.022	0.004	0.029	-0.012	1
	(0.545)	(0.210)	(0.523)	(0.904)	(0.410)	(0.730)	

Multiple regression analysis

Independent directors and level environmental information disclosure

Regression analysis is applied in this study to analysis the Model 1 and Model 2. Using regression analysis to examine the relationship between independent directors and level of environmental information disclosure, the results are shown in Table 8.

Table 8 Relationship between independent directors and level of environmental information disclosure (Model 1)

Independent Variables	Model 1 Dependent Variable EID
INDIR	0.161 *** (0.000)
BSIZE	0.645*** (0.000)
PROFIT	0.014 (0.30)
FIRMSIZE	0.0002*** (0.000)
LEVERAGE	-0.006 (0.13)
INDUSTRY	0.512** (0.000)
Intercept	3.152*** (0.000)
Adjusted R-squared	0.47
F-statistic	78.55
P-value	0.000

***** *Indicate significance at the 10% level.* *** *** *Indicate significance at the 5% level.*
*** * *** *Indicate significance at the 1% level.*

The results show that there is a positive and significant relationship between INDIR and EID at 1% level. This confirms that the larger percentage of independent directors leads to a higher level of environmental information disclosure. Interesting BSIZE and FIRMSIZE variables are positively and significantly related to EID at 1% level. The variable of INDUSTRY is positive and significant to EID at 5% level. For Model 1, this study accepts:

Hypothesis 1: There is a positive and significant relationship between independent directors and level of environmental information disclosure.

Hypothesis 3: There is a positive and significant relationship between board size and level of environmental information disclosure.

Hypothesis 5: There is a positive and significant relationship between firm size and level of environmental information disclosure.

Hypothesis 7: There is a positive and significant relationship between industry type and level of environmental information disclosure.

Furthermore, the results show that PROFIT variable is positive but insignificant related to EID. On the other hand, a LEVERAGE variable is negative and insignificant associated with EID. For Model 1, this study rejects:

Hypothesis 4: There is a positive and significant relationship between profitability of firm and level of environmental information disclosure.

Hypothesis 6: There is a positive and significant relationship between leverage

of firm and level of environmental information disclosure.

Ownership concentration and level of environmental information disclosure

This study examines the relationship between ownership concentration and level of environmental information disclosure. The results of the relationship are presented in Table 9.

Table 9 Relationship between ownership concentration and level of environmental information disclosure (Model 2)

Model 2	
Independent Variables	**Dependent Variable EID**
OWN10	0.008
	(0.033)
BSIZE	0.61***
	(0.000)
PROFIT	0.001
	(0.731)
FIRMSIZE	0.003***
	(0.000)
LEVERAGE	-0.005
	(0.929)
INDUSTRY	0.574***
	(0.000)
Intercept	1.001***
	(0.000)
Adjusted R-squared	0.35
F-statistic	48.50
P-value	0.000

***** *Indicate significance at the 10% level.* *** *** *Indicate significance at the 5% level.*
*** * *** *Indicate significance at the 1% level.*

The results in Table 9 shows that the OWN10 variable is positive and insignificant to EID. Similarly, the PROFIT variable is positive and insignificant related to EID. The LEVERAGE variable is insignificantly related to EID. For Model 2, this study rejects:

Hypothesis 2: There is a positive and significant relationship between ownership concentration and level of environmental information disclosure.

Hypothesis 4: There is a positive and significant relationship between profitability of firm and level of environmental information disclosure.

Hypothesis 6: There is a positive and significant relationship between leverage and level of environmental information disclosure.

Interestingly, this study finds that control variables including BSIZE, FIRMSIZE, and INDUSTRY variables are positive

and significant to EDI at 1% level. Therefore, this study accepts:

Hypothesis 3: There is a positive and significant relationship between board size and level of environmental disclosure.

Hypothesis 5: There is a positive and significant relationship between firm size and level of environmental disclosure.

Hypothesis 7: There is a positive and significant relationship between industry type and the level of environmental information disclosure.

Non-linear relationship between independent directors and level of environmental information disclosure

Based on the entrenchment assumption some studies, for instance ones of Morck et al., 1988; McConnell and Servaes, 1990, have considered non-linear form because they believe that there should have non-linear relationship between interested variables. This study will further examine of there is the "non-linear relationship" between independent directors and level of environmental information disclosure. According to Morck et al. (1988); McConnell and Servaes (1990); Short (1994) suggest that the results of studies which assumed a linear relationship could possibly bring misleading results. There may have the opposite relationship at a certain range of selected independent variable(s) to the dependent variable. This study will adopt the method of examining non-linear relationship from McConnell and Servaes (1990) that the INDIR variable and INDIR square variable will be used as shown in Model 3.

$$EID_{i,t} = \beta_0 + \beta_1 INDIR + \beta_2 INDIR^2 + \beta_3 BISZE + \beta_4 PROFIT + \beta_5 FIRMSIZE + \beta_6 LEVERAGE + \beta_7 INDUSTRY + \varepsilon_{i,t} \quad \text{----} \quad \text{(Model 3)}$$

From this model, this study hypothesizes that

Hypothesis 8: There is a significant non-linear relationship between independent directors and the level of environmental information disclosure.

The regression analysis is conducted based on Model 3 and the results are shown in Table 10. The results show that the INDIR variable is positive and significant related to EID at 1% level. In contrast, the $INDIR^2$ variable is negative and significant related to EID at 5% level. The results in this study show that there is a non-liner relationship between independent directors and EID.

Table 10 Non-linear relationship between independent directors and level of environmental information disclosure

Independent Variables	Model 3 Dependent Variable EID
INDIR	0.271*** (0.000)
$INDIR^2$	-0.050** 0.003
BSIZE	0.612*** (0.000)
PROFIT	0.002 (0.31)
FIRMSIZE	0.003*** (0.000)
LEVERAGE	-0.007 (0.05)
INDUSTRY	0.662*** (0.000)
Intercept	7.88*** (0.000)
Adjusted R-squared	0.40
F-statistic	32.09
P-value	0.000

***** *Indicate significance at the 10% level.* *** *** *Indicate significance at the 5% level.*
*** * *** *Indicate significance at the 1% level.*

The results from Table 10 including intercept, coefficients of INDIR and $INDIR^2$ are used in calculating to see the turning points which can be drawn as a graph shown in Figure 1.

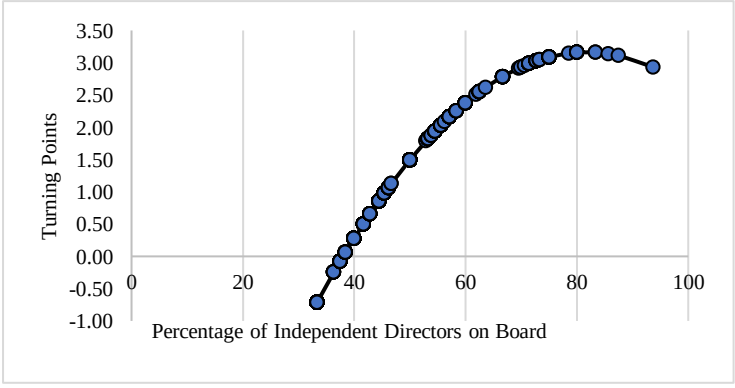

Figure 1 Turning point of a non-linear relationship of independent directors and the level of environmental information disclosure

The graph line will increase when the percentage of independent directors is more than approximately 38% till reach to around 80%, and then the line will drop afterwards. The result points out that having independent director between 38% to 80% would have positive relationship to level of environmental information disclosure. However, having independent directors more than 80% would probably have negative relationship to level of environmental information disclosure. This study accepts:

Hypothesis 8: There is a significant non-linear relationship between independent directors and the level of environmental information disclosure.

Non-linear relationship between ownership and level of environmental information disclosure

This study will further examine if there is a significant non-linear relationship between ownership concentration and the level of environmental information disclosure. The Model 4 can be set as follows:

$$EID_{i,t} = \beta_0 + \beta_1 OWN10 + \beta_2 OWN10^2 + \beta_3 BSIZE + \beta_4 PROFIT + \beta_5 FIRMSIZE + \beta_6 LEVERAGE + \beta_7 INDUSTRY + \varepsilon_{i,t} \quad \text{-- (Model 4)}$$

From model 4, this study hypothesizes that

Hypothesis 9: There is a significant non-linear relationship between ownership concentration and level of environmental information disclosure.

The results in Table 11 show that the non-linear relationship between OWN10 and level of EID exists but it is not significant. There is a negative relationship between OWN10 and EID and a positive relationship between $OWN10^2$ and EID. The results from Table 11 including intercept, coefficients of OWN10 and $OWN10^2$ are used in calculating to see the turning points which can be drawn as a graph shown in Figure 2.

Table 11 Non-linear relationship between ownership concentration and level of environmental information disclosure

Independent Variables	Model 4 Dependent Variable EID
OWN10	-0.0061
	(0.610)
$OWN10^2$	0.000036
	(0.786)
BSIZE	0.6095***
	(0.000)
PROFIT	0.0004
	(0.924)
FIRMSIZE	0.0001***
	(0.000)
LEVERAGE	-0.0456
	(0.2695)
INDUSTRY	0.575
	(0.000)
Intercept	0.8818
	(0.068)
R-squared	0.32
F-statistic	47.74
P-value	0.000

***** *Indicate significance at the 10% level.* ****** *Indicate significance at the 5% level.*
******* *Indicate significance at the 1% level.*

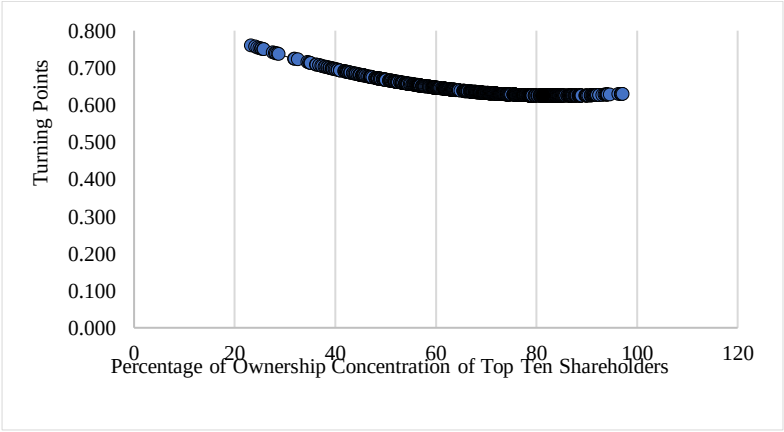

Figure 2 Turning point of a non-linear relationship of ownership concentration and level of environmental information disclosure

In Figure 2, the graph line will decrease when the percentage of ownership concentration is more than approximately 25% till reach to around 70%, and then the line will insignificantly increase afterwards. The results point out that having concentrated owners between 25% to 70% would have negative relationship to the environmental information disclosure. However, the results are insignificant. From Model 9, this study rejects:

Hypothesis 9: There is a significant non-linear relationship between ownership concentration and level of environmental information disclosure

Discussion and summary

This study finds that the larger percentage of independent directors are, the higher level of environmental information disclosure. This is because, according to Khan et al. (2013), independent board is one of governance mechanisms which can ensure that management acts in the best interests of stakeholders and society. This study also finds that ownership concentration has no significant relationship to level of environmental information disclosure. Concentrated owners are willing to disclose more environmental information to promote good image of business. That might be because there are some regulations that ruling listed companies to disclosure information. In addition, it is found that board size can increase level of environmental information disclosure. A larger board can increase the capacity of the board and this can improve the effective of environmental information disclosure (Lipton and Lorsch, 1992). Furthermore, this study finds that a larger firm tends to report more environmental information to ensure a positive social image in the public. Similarly, Buniamin (2010); Junmani (2013) suggest that larger firms are willing to publicize more voluntary environmental information disclosure to make the different from the counterpart. Industry type is one of factors that have significant relationship to level of environmental information disclosure. This is possibly because in disclosing environmental information entails cost which companies need to bear when there is sufficient profit beyond fulfilling shareholders' obligation. Also, this study suggests that there is no significant relationship between leverage and level of environmental information disclosure. Moreover, this study suggests that there is negative and insignificant relationship between them. This might be because firms with high leverage do not tend to have sufficient funds for financing environmental activities however, they still have to follow to rules and regulations of disclosing information (Ikpor and Agha, 2016). Interestingly, this study finds that there is non-liner relationship between independent directors and level of environmental information disclosure. This might be because different percentage of independent directors have different influence on management and disclosing information especially environmental information. In contrast, there is an insignificant non-linear relationship between ownership concentration and level of environmental information disclosure.

Expected benefits and further studies

The findings of this study is expected to be benefits to (1) regulators in consideration of setting rules and/or regulations related to the environmental information disclosure of the listed firm to benefit the Thai market capital, listed companies and stakeholders; (2) investors to understand the relationship between independent directors, ownership concentration and level of environmental information disclosure in making decision in investment ;(3) firms to understand the factors that could have influence on level of environmental information disclosure which possibly have impact on the business sustainability in the future; (4) researchers to do the further study examining more factors that could influence on the level of environmental information disclosure.

This study would also recommend for the further studies to examine (i) the relationship between managerial ownership and level of environmental information disclosure; and (ii) the relationship between ownership structure, including individual, family, government, institution, and foreign investors and level of environmental information disclosure. The further students would be able to provide more useful information to investors, regulator and researchers.

References

Adenniyi, S. I. and Adebayo, H.O. (2018). Effect of Financial Leverage on Voluntary Corporate Social Disclosure among Listed Firms on Nigerian Stock Exchange: A Study of Selected Manufacturing Firms. *Academic Journal of Economic Studies*, 4(3),18-24.

Ahnmad, S. and Mousa, R. (2010). Corporate Environmental Disclosure in Libya: A Little Improvement. World Journal of Entrepreneurship, *Management and Sustainable Development*, 6(1/2), 149-159.

Akbas, H. (2016). The Relationship Between Board Characteristics and Environmental Disclosure: Evidence from Turkish Listed Companies. *South East European Journal of Economics and business*, 11(2), 7-19.

Akrout, M. M., and Othman, H. B. (2013). A Study of the Determinants of Corporate Environmental Disclosure in MENA Emerging Markets. *Journal of Reviews on Global Economics*, 2, 46-59.

Akrout M.M., and Othman, H.B. (2016). Ownership Structure and Environmental Disclosure in Mena Emerging Countries. *Corporate Ownership & Control*, 13(4) Summer,381-388.

Allegrini, M. and Greco, G. (2013). Corporate Boards, Audit Committees and Voluntary Disclosure: Evidence from Italian Listed Companies. *Journal of Management & Governance*, 17(1),187-216.

Allison, P. (2012, September) When Can You Safely Ignore Multicollinearity?" Retrieved from http://statisticalhorizons.com/multicollinearity

Amran, A., Lee, P. and Devi, S. (2014). The Influence of Governance Structure and Strategic Corporate Social Responsibility Toward Sustainability Reporting Quality. *Business Strategy and the Environment*, 23 (4), 217-235.

Arora, P. and Dharwadkar, R. (2011). Corporate Governance and Corporate Social Responsibility (CSR): The Moderating Roles of Attainment Discrepancy and Organization Slack. Corporate Governance: An International Review, 19(2), 136-152.

Bajahar, M. and Al-Hajili (2017). The Impact of the Board of Directors' Structure on the Level of Voluntary Disclosure in Cement Companies Listed on the Saudi Stock Exchange. Arab Journal of Administrative Sciences, 24(3). 383-410.

Berle and Means (1932). *The Modern Corporation and Private Property*. New York, NY: Macmillan Company.

Bhalla, M. and Singh, I. (2018). Company Characteristics Influencing Web-Based Environment Disclosure- An Empirical Analysis of Selected Indian Manufacturing Companies. International *Journal of Social Science and Economic Research*. 3(1), 200-217.

Blair, M.M., and Stout, L.A. (1999). "A Team Production Theory of Corporate Law" Virginia Law Review, 85 (March), 287-319.

Brundtland, G. (1987). *Our common future: the world commission on environment and development*, Oxford, England: Oxford University Press.

Bryson, J. (1995). Strategic Planning for Public and Nonprofit Organizations, Sam Francisco, CA: Jossey-Bass.

Buniamin, S. (2010). The Quantity and Quality of Environmental Reporting in Annual Report of Public Listed Companies in Malaysia. *Issues in Social and Environmental Accounting*, 4(2), 115-135.

Chang, K. and Zhang, L. (2015). The Effects of Corporate Ownership Structure on Environmental Information Disclosure- Empirical Evidence from Unbalanced Penal Data in Heavy Pollution Industries in China. WSEAS TRANSACTIONS on SYSTTES and CONTROL, 10, 405-414.

Chau, G. and Gray, S. (2010). Family Ownership, Board Independence and Voluntary Disclosure: Evidence from Hong Kong. *Journal of International Accounting, Auditing and Taxation*. 19 (2), 93-109.

Chaklader, B. and Gulati, P. (2015). A study of corporate environmental disclosure practices of companies doing business in India. *Global Business Review*, 16(2), 321-335.

Chiu, T. K. and Wang, Y. H. (2014) Determinants of social Disclosure Quality in Taiwan: An Application of Stakeholder Theory. Journal of Business Ethics, 129(2), 379-398.

Cormier D. and Magnan, M. (2003) Environmental Reporting Management: A European Perspective. *Journal of Accounting and Public Policy*, 22(1), 43-62.

Cullen, F., Eck, J. and Lowenkamp, C. (2002). Environmental Corrections-A New Paradigm for Effective Probation and Parole Supervision. *Federal Probation*. 66 (2), 28-37.

Darus, F., Mad, S. and Yusoff, H. (2014). The importance of ownership monitoring and firm resources on corporate social responsibility (CSR) of financial institutions. *Social and Behavioral Sciences*, 145, 173-180.

Donaldson, T. and Preston, L. (1995). The stakeholder theory of the corporation: concepts, evidence, and implications. *Academy of Management Review*, 20, 65-91.

Elkington, J. (1997). *Cannibals with forks: The Triple Bottom Line of 21st Century Business*. Oxford: Capstone Publishers.

Elshabasy, Y. (2018). The Impact of Corporate Characteristics on Environmental Information Disclosure: An Empirical Study on the Listed Firms in Egypt. *Journal of Business and Retail Management Research*, 12(2), 232-241.

Freeman, R. E. (1984). Strategic Management: A Stakeholder Approach. Boston: Pitman.

Global Reporting Initiative (2002, September). Sustainability reporting guidelines. Retrieved from http://www.epeat.net/documents/EPEATreferences/GRIguidelines.pdf

Freeman, R.E. (2004). "A Stakeholder Theory of Modern Corporation". Ethical Theory and Business, 7th edn.

Freeman, R., Harrison, J. Purnell, A. and De Colle, S. (2010). Stakeholder Theory: The State of the Art, The Academy of Management Annals, 3 (1), 403-445.

Friedman, A.L. and Miles, S. (2006). "Stakeholders: Theory and Practice", Oxford University Press.

Global Reporting Initiative. (2006). Sustainability Reporting Guidelines. Retrieved from http://globalreporting.org.

Global Reporting Initiative (2010). A New Phase: The Growth of Sustainability Reporting. Retrieved from http://globalreporting.org.

Global Reporting Initiative Sustainability Report (2011). Retrieved from https://www.globalreporting.org/resourcelibrary/GRI-Sustainability-Report-2010-2011.

Global Reporting Initiative (2015). Global Reporting Initiative. Retrieved from https://en.wikipedia.org/wiki/Global_Reporting_Initiative.

Haniffa, R. and Cooke, T. (2005). The Impact of Culture and Governance on Corporate Social Reporting. *Journal of Accounting and Public Policy*, 24(5), 391-430.

Herda, D.N., Taylor, M. E., and Winterbotham, G. (2012). The Effect of Board Independence on the Sustainability Reporting Practices of Large U.S. Firms, *Issues in Social and Environmental Accounting*, 6(3), 178-197.

Ho, S. and Wong, K. (2011). A Study of the Relationship Between Corporate Governance Structures and the Extend of Voluntary Disclosure. *Journal of International Accounting, Auditing and Taxation*, 10(2), 139-156.

Hussainey, K. and Salama, A. (2010). The Importance of Corporate Environmental Reputation to Investors, Corporate Environmental Reputation, *Journal of Applied Accounting Research*, 11(3), 229-240.

Ikpor, I.M. and Aghna N. (2016) Determinants of Voluntary Disclosure Quality in Emerging Economics: Evidence from Firms Listed in Nigeria Stock Exchange. *International Journal of Engineering and Technology*, 4 (6): 51-66.

Jensen, M. (1993). "The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems", The Journal of Finance, 48, pp. 831-880.

Juhmani, O. (2013). Ownership Structure and Corporate Voluntary Disclosure: Evidence from Bahrain. *International Journal of Accounting and Financial Reporting*, 3(2),133-148.

Khan, A., Muttakin, M.B. and Siddiqui, J. (2013). Corporate Governance and Corporate Social Responsibility Disclosure: Evidence from Emerging Economy. *Journal of Business Ethics*, 114(2), 207-223.

Liao, L., Mukherjee, T. and Wang, W. (2015). Corporate Governance and Capital Structure Dynamics: An Empirical Study. *Journal of Financial Research*. XXXVIII (2), 169-191.

Lipton, M. and Lorsch, W.J. (1992). A Modest Proposal for Improved Corporate Governance. The Business Lawyer, 48 (1), 50-77.

Majeed, S., Aziz, T., and Saleem, S. (2015). The Effect of Corporate Governance Elements on Corporate Social Responsibility (CSR) Disclosure: An Empirical Evidence from Listed Companies at KSE Pakistan. International Journal of Financial Studies, 3, 530-556.

McConnell, J. and Servaes. H. (1990). "Additional Evidence on Equity Ownership and Corporate Value", Journal of Financial Economics, 27, pp. 595-612.

Mgbame, O. and Onoyase, J. (2015). The Effect of Corporate Governance on the Extent of Environmental Reporting in the Nigerian Oil Industry. International Journal of Business and Social Science, 6(10), 203–210.

Milne, M. and Patten, D. (2002). Securing organizational legitimacy – an experimental decision case examining the impact of environmental disclosures, *Accounting, Auditing and Accountability Journal*, 15(3), 372-405.

Morck, R., A. Shleifer and R. Vishny. (1988). "Management Ownership and Market Valuation: An Empirical Analysis", Journal of Financial Economics, 20, pp. 293-315.

Mousa, G. and Hassan, N. (2015). Legitimacy theory and environmental practices: short notes, *International Journal of Business and Statistical Analysis*, 2(1), 41-53.

Nguyen, L. S., Tran, M. D., Nguyen, T., and Le, Q.H. (2017). Factors Affecting Disclosure Levels of Environmental Accounting Information: The Case of Vietnam, Accounting and Finance Research, 6(4), 255-264.

Nutt, P. and Backoff, R. (1992). *Strategic Management of Public and Third Sector Organizations: A Handbook for Leaders*, San Francisco, CA: Jossey-Bass.

Odoemelam N. and Regina, O. (2018). The Influence of Corporate Governance on Environmental Disclosure of Listed Non-Financial Firms in Nigeria, *Indonesian Journal of Sustainability Accounting and Management*, 2(1), 25-49.

Ofoegbu, G., N., Odoemelam, N. and Okafor, R.G. (2018). Corporate Board Characteristics and Environmental Disclosure Quantity: Evidence from South Africa (Integrated Reporting) and Nigeria (Traditional Reporting), Cogent Business & Management, (5), 1-27.

Othman, B. and Zeghal, D. (2010). Investigating transparency and disclosure determinants at firm-level in MENA emerging markets. *International Journal Accounting Auditing and Performance Evaluation*, 6(4), 368-396.

Rabi, A.M. (2019). Board Characteristics and Environmental Disclosure: Evidence from Jordan. International Journal of Business and Management, 14(2), 57-65.

Ramanathan, M. and Rajarshi, M. (1992). Rank Tests for Testing Randomness of a Regression Coefficient in a Linear Regression Model. Metrika: International Journal for Theoretical and Applied Statistics, Springer, 39(1), 113-124.

Robert, R. (1992). Determinants of corporate social responsibility disclosure: an application of stakeholder theory. *Accounting, Organizations and Society*, 17(6), 565-612.

Rosthorn, J. (2000) Business Ethics Auditing-More than a Stakeholder's toy. *Journal of Business Ethics*, 24, 9-19.

Said, R., Zainuddin, Y. and Haron, H. (2009). The relationship between corporate social responsibility disclosure and corporate governance characteristics in Malaysian public listed companies. *Social Responsibility Journal*, (5), 212-226.

Short, H. (1994). "Ownership, Control, Financial Structure and the Performance of Firms", Journal of Economic Surveys, 8, No. 3, pp. 203-249.

Smith, J.V., Adhikari, A. and Tondkar, R.H. (2005). Exploring Differences in Social Disclosure Internationally: A Stakeholder Perspectives, Journal of Accounting and Public Policy, 24, 123-151.

Setyorini, C. and Ishak, A. (2012). Corporate social and environmental disclosure: A positive accounting theory viewpoint, *International Journal of Business and Social Science*, 3(9), 153-164.

Stock Exchange of Thailand (2019, 9 December). Retrieved from https://www.set.or.th/set/mainpage.do?language=en&country=US

Suttipun, M. and Stanton, P. (2012). A Study of Environmental Disclosure by Thai Listed Companies on Websites. *Procedia Economics and Finance*, 2, 9-15.

United Nation (1992, 3 June). United Nations Conference on Environmental and Development (UNCED), Earth Submit. Retrieved from https://sustainabledevelopment.un.org/milestones/unced.

Uwuigbe, U., Egbide, B.C., and Ayokunle, A. M. (2011). The Effect of Board Size and Board Composition on Firms Corporate Environmental Disclosure: A Study of Selected Firms n Nigeria. ACTA Universitatis Danubius, 7(5), 164-176.

Webb, E. (2004). An examination of socially Responsible Firms' Board Structure. *Journal of Management and Governance*, 8, 255-277.

Welbeck, E. E., Owusu, G.M. Y., Bekoe, R. A., and Kusi, J. A. (2017). Determinants of Environmental Disclosures of Listed Firms in Ghana. International Journal of Corporate Social Responsibility. 2(11), 2-12.

Zhijuan, L. and Chaoyang, Z. (2017). An Empirical Study on the Influencing Factors of Environmental Information Disclosure of Chinese Mining Listed Companies. Advances in Economics, Business and Management Research, 26, 488- 493.

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EQUITY PREMIUM PUZZLE IN THAILAND: REVISITED

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Abstract

This paper empirically studies the standard consumption-based asset pricing model of Lucas (1978), Breeden (1979) and the consumption-based asset pricing model with recursive utility of Weil (1989) using quarterly data from Thailand from 2000 to 2016. The equity premium is calculated using FEDR returns, which includes dividend and right benefits and considers the effect of stock split. The result confirms that the models, which are the standard consumption-based asset pricing model of Lucas (1978), Breeden (1979) and the consumption-based asset pricing model with the recursive utility of Weil (1989), assuming consumption growth are iid and Markov processes, cannot explain observed expected equity premium and observed expected risk-free return in Thailand data. Thailand's quarterly financial data from 2000 to 2016 exhibit the equity premium and risk-free rate puzzles.

Keyword: Equity premium puzzle, Risk-free rate puzzle, FEDR return

Introduction

The study of asset returns is an important topic in finance and ecomomics. Many models have been developed to study the asset returns in the market. One of the most important model is the Capital Asset Pricing Model (CAPM) introduced by Sharpe (1964) and Lintner(1965) which shows the relationship between asset returns and systematic risk, represented by each asset's market beta, the sensitivity of asset returns to the movement of the market premium. The Consumption Capital Asset Pricing Model (CCAPM) extends the CAPM model and uses consumption beta in place of the market beta. This consumption-based asset pricing model, introduced by Lucas (1978) and Breeden

(1979), is an important theory to explain the relationship between consumption and asset returns.

Asset pricing models are important in understanding asset retuens. Consumption-based asset pricing models, in particular, are important in linking macroeconomics and finance theories together. An empirical study of consumption-based asset pricing models can help in the understanding of the relationship between macroeconomic risk factors and asset prices with implications in policy development and economic decision making. Consumption-based asset pricing models have not been studied extensively in Thailand. This paper aims to provide a comprehensive empirical study of consumption-based asset pricing models with Thailand data for the purpose of providing an extensive study of the relationship between macroeconomics and finance, through consumption growth and asset growth, respectively.

This paper utilizes Financial and Economic Data for Research (FEDR) from the University of the Thai Chamber of Commerce (UTCC), which are research-quality financial data, to represent Thailand financial market return. As far as we know, currently, this is the only research-quality financial data in Thailand, therefore, utilizing FEDR financial data should provide more accurate results than raw market data.

Models that are studied in this paper include the standard consumption-based asset pricing model of Lucas (1978), Breeden (1979), and the consumption-based asset pricing model with recursive utility of Weil (1989). For each model we assume consumption growth are independent and identically distributed (i.i.d.) and Markov processes. Thus, there are four different models studied in this paper.

The remainder of the paper is organized as follows. We discuss the theoretical background of the consumption-based asset pricing models in section 2. Here we discuss the models as well as the results of other related studies and their findings. We also discuss an important result from the literature that are the equity premium puzzle and the risk-free rate puzzle. The empirical estimation of model parameters are done in in section 3. The findings are summarized in section 4 as well as the discussion of the results. We conclude our paper and discuss future research implications in section 5.

Theoretical background

The consumption-based asset pricing model of Lucas (1978) and Breeden (1979), which is based on a representative agent's preference maximization problem, is an important theory to explain the relationship between consumption and asset returns by linking macroeconomics and finance theories together. There have been many papers that test the consumption-based asset pricing model by using both financial and macroeconomic data. One seminal paper is Mehra and Prescott (1985) which investigated U.S. data from 1889 to 1978, using two-state Markov

and i.i.d. log-normal consumption growth process, and found that the empirical equity premium is too large to be explained by reasonable preference parameter values, specifically the risk aversion parameter. Hansen and Singleton (1982) estimated preference parameters including risk aversion coefficient and the time discount factor by using the generalized method of moments (GMM) framework with U.S. data from 1959 to 1977. The result also showed that the equity premium cannot be explained by reasonable values of preference parameters. This problem came to be called the "equity premium puzzle".

Several papers attempted to solve the equity premium puzzle. Weil (1989) tried to solve the equity premium puzzle using the consumption-based asset pricing model with Epstein and Zin (1989) recursive preferences. These preferences allow for the separation between risk aversion and the intertemporal elasticity of substitution. As in Mehra and Prescott (1985), Weil (1989) considered both two-state Markov and i.i.d. log-normal consumption growth process and used the same data from U.S. and found that separating risk aversion and intertemporal elasticity of substitution is not sufficient to solve the equity premium puzzle. In addition, the paper found that the expected risk-free return from the model is too low which cannot be explained with reasonable values of model parameters. This is known as the "risk-free rate puzzle".

Sedthapinun (2000) studied the equity premium using the same methodology as Hansen and Singleton (1982) using Thailand quarterly data[1] from June 1986 to December 1996. The result showed that there is no equity premium puzzle with Thailand financial data. On the other hand, Duangthong (2014) used Thailand quarterly data[2] from 1993 to 2010 and showed that the equity premium puzzle exists and can be detected using Hansen–Jagannathan bound (Hansen and Jagannathan, 1991). Similarly, Harnphattananusorn (2014) showed that equity premium puzzle exists under the consumption-based asset pricing model with time-separable constant relative risk aversion (CRRA) utility (Lucas, 1978) and i.i.d. log-normal consumption growth using quarterly Thailand data from 2000 to 2011[3]

Consumption-based asset pricing models

Lucas (1978) proposed a model to explain the equilibrium relationship

1 The data include real aggregate consumption of non-durable goods, real Stock Exchange of Thailand (SET) index and real time deposit interest rate of Thai government saving bank.

2 The data include real aggregate consumption of non-durable and service goods, 21 business categories of financial market, which will be used to analyzed the financial market real return and real time deposit interest rate of Thai government saving bank.

3 This data includes real aggregate consumption of non-durable and service goods, real stock Exchange of Thailand (SET) index and the real 90-day government treasury bill.

between consumption and asset returns in terms of expected equity premium and expected risk-free return. Consider a representative agent who maximizes a certain utility function defined over consumption C_t, $U(C_t)$

$$\max_{C_t} E_0\left(\sum_{t=1}^{\infty} \beta^t U(C_t)\right), \quad \textbf{(1)}$$

subject to period by period budget constraints

$$W_{t+1} = (W_t - C_t)R_{t+1}, \quad \textbf{(2)}$$

where parameter β is the time discount factor such that $0 < \beta < 1$ and W_t and C_t denote beginning of period wealth of agent and agent's consumption in period t. This agent can invest his net wealth after taking out his consumption, $W_t - C_t$. $R_{t+1} = \frac{P_{t+1}+C_{t+1}}{P_t}$ is a total return of assets in complete set which agent can freely buy or sell as much of payoff which is price and consumption in period $t+1$, where P_t is the price in period t of the market portfolio.

The first-order condition with respect to C_t for the agent's utility maximization problem yields the following Euler equation:

$$\mathrm{E_t}\left[\beta \frac{\mathrm{U'(C_{t+1})}}{\mathrm{U'(C_t)}} \mathrm{R_{t+1}}\right] = 1. \quad \textbf{(3)}$$

This Euler equation is the same as presented by Hansen and Richard (1987) and is an "Asset pricing model". This model tries to explain the fundamental prices or values of uncertain cash flows. To value an asset, we have to consider expectations of payoff and discount rate, that is

$$E_t\left[M_{t+1}Y_{j,t+1}\right] = P_{j,t},$$

where $Y_{j,t+1}$ is the total payoff in next period, and M_{t+1} is called stochastic discount factor or pricing kernel. The expectation is conditional on time t information. We can write in term of return as following;

$$E_t\left[M_{t+1}R_{j,t+1}\right] = 1. \quad (4)$$

Where $R_{j,t+1} = \frac{Y_{j,t+1}}{P_{j,t}}$ is return on asset j from period t to $t+1$. In general, $R_{j,t+1}$ is uncertain so the expected time conditional risky asset return on asset j is

$$E_t\left[R_{j,t+1}\right] = \frac{1-\mathrm{Cov}_t\left(M_{t+1},R_{j,t+1}\right)}{E_t(M_{t+1})}.$$

If we define a riskless asset as a security paying one unit ($Y_{j,t+1} = 1$) then the risk-free return, $R_{f,t+1} = \frac{1}{P_{f,t}}$, can be written as:

$$R_{f,t+1} = \frac{1}{E_t[M_{t+1}]}.$$

This model can be explained using stochastic discount factor, M_{t+1}. From Euler equation of Lucas (1978) (3) and pricing equation (4), the stochastic discount factor, M_{t+1} can be written as

$$M_{t+1} = \beta \frac{U'(C_{t+1})}{U'(C_t)}.$$

Time-separable utility model (Lucas, 1978; Mehra and Prescott, 1985)

Mehra and Prescott (1985) proposed a model following Lucas (1978) to explain the equilibrium relationship between consumption and asset returns in terms of expected equity premium and expected risk-free return. The representative agent's preferences are represented by the following constant relative risk aversion (CRRA) utility function

$$U(C) = \frac{C^{1-\gamma}}{1-\gamma}, \quad (5)$$

where γ is the relative risk aversion coefficient. By maximizing the expected utility in **(1)** with CRRA utility function (5), we get the following stochastic discount factor

$$M_{t+1} = \beta G_{c,t+1}^{-\gamma}, \quad (6)$$

where $G_{c,t+1}$ is the consumption growth $\left(\frac{C_{t+1}}{C_t}\right)$.

To be able to utilize the consumption-based asset pricing model presented above with empirical data, we need to specify the stochastic process of the consumption growth $G_{c,t+1}$ in equation (6).

Consumption growth process as a two-state Markov chain

Mehra and Prescott (1985) assumed that consumption growth, $G_{c,t+1}$, follows a two-state Markov chain. The two states are high (h) and low (l). Let $G_{c,s}$ be the consumption growth in states $s = \{h, l\}$.

We can write the vector of consumption growth across states as

$$G_{c,t+1} = \begin{pmatrix} G_{c,h} \\ G_{c,l} \end{pmatrix} \tag{7}$$

Accordingly, the stochastic discount factor in each state can be written as

$$M_{t+1} = \begin{pmatrix} M_h \\ M_l \end{pmatrix} = \begin{pmatrix} \beta G_{c,h}^{-\gamma} \\ \beta G_{c,l}^{-\gamma} \end{pmatrix}. \tag{8}$$

The transition matrix of the Markov chain is given by

$$\boldsymbol{\pi} = \begin{pmatrix} \pi_{h,h} & \pi_{h,l} \\ \pi_{l,h} & \pi_{l,l} \end{pmatrix}, \tag{9}$$

where $\pi_{s,s'}$ is the transition probability of being in state $s' = \{h, l\}$ after being in state $s = \{h, l\}$ in the previous period. The steady state probability for state $s = \{h, l\}$ is denoted by Π_s, and the vector of the probability is given by

$$\boldsymbol{\Pi} = \begin{pmatrix} \Pi_h \\ \Pi_l \end{pmatrix}, \tag{10}$$

where $\Pi_h + \Pi_l = 1$. The risk-free return is

$$R_{f,t+1} = \frac{1}{E_t[M_{t+1}]}. \tag{11}$$

Therefore, the expected risk-free return is

$$E(R_f) = \Pi_h R_{f,h} + \Pi_l R_{f,l}, \tag{12}$$

where the risk-free return in states $s = h, l$ are

$$R_{f,h} = \left[\pi_{h,h}\, \beta\, G_{c,h}^{-\gamma} + \pi_{h,l}\, \beta\, G_{c,l}^{-\gamma}\right]^{-1},$$

$$R_{f,l} = \left[\pi_{l,h}\, \beta\, G_{c,h}^{-\gamma} + \pi_{l,l}\, \beta\, G_{c,l}^{-\gamma}\right]^{-1}.$$

Similar to the risk-free asset, the expected return of the market portfolio can be derived. Following Lucas (1978), the model assumes the market clearing condition. This implies that the agent consumes only dividend benefit (D_t) after agent invests in financial assets ($C_t = D_t$).

Therefore, the payoff of the market portfolio in period $t + 1$ is $P_{t+1} + C_{t+1}$, and its return is given by

$$R_{m,t+1} = \frac{P_{t+1} + C_{t+1}}{P_t} = R_{t+1}, \tag{13}$$

which can be rewritten in terms of consumption growth, $G_{c,t+1}$, and price-consumption ratio, $Z_t = \frac{P_t}{C_t}$, as follows:

$$R_{m,t+1} = \frac{1+Z_{t+1}}{Z_t} G_{c,t+1}. \tag{14}$$

As a result, the expected return on the financial market portfolio or the market return is

$$E(R_m) = \Pi_h R_{m,h} + \Pi_l R_{m,l}\,, \tag{15}$$

where the market return in each state $s = \{h, l\}$ are

$$R_{m,h} = \pi_{h,h}\left(\frac{1+Z_h}{Z_h} G_{c,h}\right) + \pi_{h,l}\left(\frac{1+Z_l}{Z_h} G_{c,l}\right),$$

$$R_{m,h} = \pi_{h,h}\left(\frac{1+Z_h}{Z_h} G_{c,h}\right) + \pi_{h,l}\left(\frac{1+Z_l}{Z_h} G_{c,l}\right). \tag{16}$$

The pricing equation, or expected equity premium, is defined by the difference of the expected net market return and the expected net return on the risk-free asset:

$$E\left(r_m - r_f\right) = \Pi_h\left(R_{m,h} - R_{f,h}\right) + \Pi_l\left(R_{m,l} - R_{f,l}\right), \tag{17}$$

where $r_{f,t} = R_{j,t} - 1$ denotes the net return of asset j. The derivation of this condition is in Appendix A.

Consumption growth process as i.i.d. log-normal process

An alternative formulation in the literature is to assume that the consumption growth process is independent and identically distributed log-normal (i.i.d. log-normal) as in Breeden (1986); Hansen and Singleton (1982). Particularly in Thailand, all previous works regarding equity premium puzzle employ the i.i.d. log-normal assumption. Another benefit of this model is the ability to identify the market price of risk and the consumption risk. The pricing equation with the i.i.d. log-normal consumption growth and the asset return can be written as:

$$E(m_{t+1}) + E\left(r_{j,t+1}\right) + \tfrac{1}{2}\mathrm{Var}(m_{t+1}) + \tfrac{1}{2}\mathrm{Var}\left(r_{j,t+1}\right) + \mathrm{Cov}\left(m_{t+1}, r_{j,t+1}\right) = 0\,, \tag{18}$$

where $m_{t+1} = \log M_{t+1}$ and $r_{j,t+1} = \log R_{j,t+1}$ are the logarithm of the stochastic discount factor, and the logarithm of returns of asset j, respectively. With the CRRA utility function (3),

$$m_{t+1} = \log \beta G_{c,t+1}^{-\gamma} = \log \beta - \gamma g_{c,t+1}. \tag{19}$$

Where $g_{c,t+1} = \log G_{c,t+1}$ is the logarithm of the consumption growth rate. As a result, the expected risk-free rate can be written as

$$E(r_{f,t+1}) = -\log\beta + \gamma E(g_{c,t+1}) - \frac{1}{2}\gamma^2 \mathrm{Var}(g_{c,t+1}), \tag{20}$$

where $r_{f,t+1} = \log R_{f,t+1}$. Similarly, the expected equity premium, which assumes $r_{f,t+1} = r_{m,t+1}$, is

$$E(r_{m,t+1} - r_{f,t+1}) = \gamma \mathrm{Var}(g_{c,t+1}) - \frac{1}{2}\mathrm{Var}(r_{m,t+1}). \tag{21}$$

This expected equity premium (21) is called the "Consumption Capital Asset Pricing Model (CCAPM)". The detailed derivation of the pricing equation for the expected risk-free return (20) and the expected equity premium (21) are in appendix B.

Epstein and Zin recursive utility model (Kreps and Porteus, 1978; Epstein and Zin, 1989; Weil, 1989)

Following Weil (1989), a new class of preferences under constant elasticity of intertemporal substitution and a constant risk aversion, which are independent of each other, are used to study the equity premium puzzle (Kreps and Porteus, 1978; Epstein and Zin, 1989; Weil, 1989). In particular, the representative agent is to maximize the following recursive utility

$$V(W_t) = \max_{C_t} U(C_t, E_t[V(W_{t+1})]), \tag{22}$$

where $V(\cdot)$ is the value function for a representative agent with wealth, W_t, that maximizes the utility function

$$U(C,V) = \frac{\left((1-\beta)C^{1-\frac{1}{\psi}} + \beta\left(1+(1-\beta)(1-\gamma)V\right)^{\frac{1-\frac{1}{\psi}}{1-\gamma}}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} - 1}{(1-\beta)(1-\gamma)}, \tag{23}$$

and ψ is the elasticity of intertemporal substitution. This model is subject to the period-by-period budget constraint (2). The first-order condition with respect to C_t and $V(W_t)$ then yields the following Euler equation:

$$E_t\left[\left(\beta\left(\frac{C_{t+1}}{C_t}\right)^{-\frac{1}{\psi}}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} R_{t+1}^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right] = 1. \tag{24}$$

As a result, the stochastic discount factor (M_{t+1}) is

$$M_{t+1} = \left(\beta G_{c,t+1}^{-\frac{1}{\psi}}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} R_{t+1}^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}. \tag{25}$$

This equation emphasizes that both the complete market returns R_{t+1} and consumption growth $G_{c,t+1}$ affect the stochastic discount factor M_{t+1}. The separable utility model is a special case of the recursive utility model. If we set $\gamma = \frac{1}{\psi}$, the stochastic discount factor formula will be the same as the one from (4). Following Weil (1989), the model assumes the market clearing condition ($C_t = D_t$). Thus, the stochastic discount factor (25) can be written in term of price-consumption ratio as follows:

$$M_{t+1} = \left(\beta G_{c,t+1}^{-\frac{1}{\psi}}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \left(\frac{1+Z_{t+1}}{Z_t}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}. \tag{26}$$

Again, to be able to utilize the consumption-based asset pricing model presented above with empirical data, we need to specify the stochastic process of the consumption growth, $G_{c,t+1}$.

Consumption growth process as a two-state Markov chain

Using the same specification as section 2.2.1, the stochastic discount factor (26) of being in a state $s' \in \{h, l\}$ after being in state $s \in \{h, l\}$ in the previous period is

$$M_{s,s'} = \left(\beta G_{c,s'}^{-\frac{1}{\psi}}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \left(\frac{1+Z_{s'}}{Z_s}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}. \tag{27}$$

Similarly, the expected risk-free return is

$$E(R_f) = \Pi_h R_{f,h} + \Pi_l R_{f,l}, \tag{28}$$

where the risk-free return in each state $s \in \{h, l\}$ are

$$R_{f,h} = \left[\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\left(\pi_{h,h}\, G_{c,h}^{-\gamma}\left(\frac{Z_h+1}{Z_h}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} + \pi_{h,l}\, G_{c,l}^{-\gamma}\left(\frac{Z_l+1}{Z_h}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}\right)\right]^{-1}, \tag{29}$$

$$R_{f,l} = \left[\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \left(\pi_{l,h}\, G_{c,h}^{-\gamma} \left(\frac{Z_h+1}{Z_l} \right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} + \pi_{l,l}\, G_{c,l}^{-\gamma} \left(\frac{Z_l+1}{Z_l} \right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} \right) \right]^{-1}. \quad (30)$$

The expected market return is

$$E(R_m) = \Pi_h R_{m,h} + \Pi_l R_{m,l} \quad (31)$$

where the market return in each state $s \in \{h, l\}$ are

$$R_{m,h} = \pi_{h,h} \left(\frac{1+Z_h}{Z_h} G_{c,h} \right) + \pi_{h,l} \left(\frac{1+Z_l}{Z_h} G_{c,l} \right),$$
$$R_{m,l} = \pi_{l,h} \left(\frac{1+Z_h}{Z_l} G_{c,h} \right) + \pi_{h,l} \left(\frac{1+Z_l}{Z_l} G_{c,l} \right), \quad (32)$$

Following Weil (1989), the expected equity premium is

$$E\left(\frac{R_m}{R_f} \right) = \Pi_h \frac{R_{m,h}}{R_{f,h}} + \Pi_l \frac{R_{m,l}}{R_{f,l}}. \quad (33)$$

The detailed derivations of the pricing equations for the expected risk-free return (28) and the expected equity premium (33) are in appendix C.

Consumption growth process as i.i.d. log-normal process

If the consumption growth process ($G_{c,t+1}$) is assumed to be i.i.d. log-normal, as in section 2.2.2, the stochastic discount factor (26) can be written as:

$$m_{t+1} = \frac{1-\gamma}{1-\frac{1}{\psi}} \log \beta - \gamma g_{c,t+1} + \frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}} \log \left(\frac{1+Z_{t+1}}{Z_t} \right). \quad (34)$$

Similar to the asset pricing equation in Section 2.2.2, the expected logarithm of risk-free return ($r_{f,t+1} = \log R_{f,t+1}$) is

$$E\left(r_{f,t+1}\right) = -\log \beta + \frac{1}{\psi} E\left(g_{c,t+1}\right) - \frac{\gamma\left(1+\frac{1}{\psi}\right)-\frac{1}{\psi}}{2} \mathrm{Var}\left(g_{c,t+1}\right), \quad (35)$$

and the expected equity premium, which assumes that $r_{t+1} = r_{m,t+1}$, is

$$E\left(r_{m,t+1} - r_{f,t+1}\right) = \gamma \mathrm{Var}\left(g_{c,t+1}\right) - \frac{1}{2} \mathrm{Var}\left(r_{m,t+1}\right), \quad (36)$$

where $g_{c,t+1}$ is the logarithm of consumption growth and $r_{m,t+1}$ is the logarithm of market returns. The equity premium (36) is the same formula as the equity premium (21) in Section 2.2.2. The detailed derivations of the asset pricing equations are in appendix D.

In addition, if we set $\gamma = \frac{1}{\psi}$, then the expected logarithm of risk-free return

(35) is the same as expected logarithm of risk-free return (20) under time-separable utility model in Section 2.2.2

Equity premium puzzle and risk-free rate puzzle

The equity premium puzzle was discovered by Mehra and Prescott (1985) when they used the standard consumption-based asset pricing model with time-separable CRRA utility and two-state Markov of consumption growth. The Equity premium model and risk-free rate model are shown in equation (17) and equation (10) which are

$$E(r_m - r_f) = \Pi_h(R_{m,h} - R_{f,h}) + \Pi_l(R_{m,l} - R_{f,l}),$$
$$E(R_f) = \Pi_h R_{f,h} + \Pi_l R_{f,l}.$$

They tried to compare the equity premium and risk-free rates above with actual observed equity premium and risk-free return of U.S. annually data from 1889 to 1978. They claimed that the reasonable risk aversion value should be between 1 and 10. For example, they found that the largest average equity premium from the model is 0.35 % using risk aversion ($\gamma = 10$), or using risk aversion ($\gamma = 2$), the average risk-free return from the model is at least 3.7 % While the actual average observed equity premium and risk-free return during this period were around 6 % and 0.8 %, respectively. The results show that the models cannot simultaneously explain why actual observed average equity premium was so high while the actual observed average risk-free return was so low. They call this problem "equity premium puzzle".

Mehra and Prescott (1985) suggested that the reason for the puzzle could be because of the restriction of time-separable CRRA utility in which the elasticity of intertemporal substitution must be a reciprocal of the risk aversion. Weil (1989) tried to solve the equity premium puzzle using the consumption-based asset pricing model with the Epstein and Zin (1989) recursive preferences in which the risk aversion and elasticity of intertemporal substitution are independent of each other and considered both two-state Markov and i.i.d. log-normal consumption growth processes. The result showed that the equity premium puzzle still exists. However, the puzzle can be separated into an equity premium puzzle and a risk-free rate puzzle.

Weil (1989) showed that the equity premium from the model was still much

lower than the actual observed equity premium. This discrepancy was the result of only the risk aversion coefficient, similar to the result of Mehra and Prescott (1985). In addition, Weil (1989) showed that the risk-free rate from the model was much higher than the actual observed risk-free rate. However, this discrepancy was not related to the high risk aversion coefficient but rather the elasticity of intertemporal substitution coefficient.

The result shows that the equity premium puzzle still exists even after the separation of risk aversion and elasticity of intertemporal substitution. However, the puzzle can now be separated into the equity premium puzzle and risk-free rate puzzle. The equity premium puzzle shows that a higher-than-reasonable risk aversion parameter must be used for the equity premium from the model to be close to the actual observed equity premium. For the risk-free rate puzzle, Weil (1989) could not find any value of the elasticity of intertemporal substitution coefficient that can produce a risk-free rate from the model that is reasonably close to the actual observed risk-free rate. The risk-free rate from the model is consistently much higher than the actual observed rate.

Calibration of asset pricing models

We can fit the parameters of the consumption-based asset pricing models discussed in section 2 with empirical data. In this section, we calibrate the model parameter using FEDR market returns.

Data

Data used to study the equity premium, and risk-free rate puzzle in Thailand in this paper is the Financial and Economic Data for Research (FEDR) from the University of the Thai Chamber of Commerce (UTCC) which adjusts financial data from the Stock Exchange of Thailand (SET). The FEDR market returns are constructed using a similar framework to the CRSP market returns from the Center for Research in Security Prices at the University of Chicago. In particular, the returns for each stock are calculated as the sum of the returns from the capital gains, cash dividends, stock dividends, and right benefits, taking into account stock split/reverse. The FEDR market returns are the returns of the value-weighted portfolio of all stocks in the SET.

The key advantage of the FEDR market returns over the SET Total Returns Index provided by SET is that the former returns are available since April 1975, while the latter is available only after January 2002. Figure 1 shows the quarterly FEDR market returns, quarterly SET total returns, and risk-free quarterly returns. To avoid the complication of the financial crisis of 1997, the main analyses in this paper use quarterly data from the first quarter of 2000 onwards.

The observed risk-free returns, $R_{f,t+1}$, are the 3-month time deposits average returns of main Thai Commercial

Banks[4] , taken from the Bank of Thailand (BOT). The main reason for using the deposit rates as risk-free returns is the availability of the data. This choice is different from the literature (e.g., Mehra and Prescott, 1985), which used the ninety-day government Treasury bill. The ninety-day Treasury bill returns of Thailand are available only after 2005, while the deposit rates are available since 1978.

Consumption data are taken from the seasonally-adjusted, real private consumption expenditure (PCE) on domestic non-durable goods and services, developed by the Office of the National Economic and Social Development Board (NESDB). They are converted into per capita consumption, C_t using Thai population data, N_t collected by Department of Provincial Administration and are converted from nominal to real using the consumption Price Index (CPI), CPI_t which is taken from the Bureau of Trade and Economic Indices (BTEI). Real consumption growth is calculated using year-over-year measurements of quarterly data to adjust for seasonal effect as following

$$G_{c,t} = \frac{C_t}{CPI_t \cdot N_t} \cdot \frac{CPI_{t-4} \cdot N_{t-4}}{C_{t-4}} \tag{37}$$

This data is presented in Figure 3

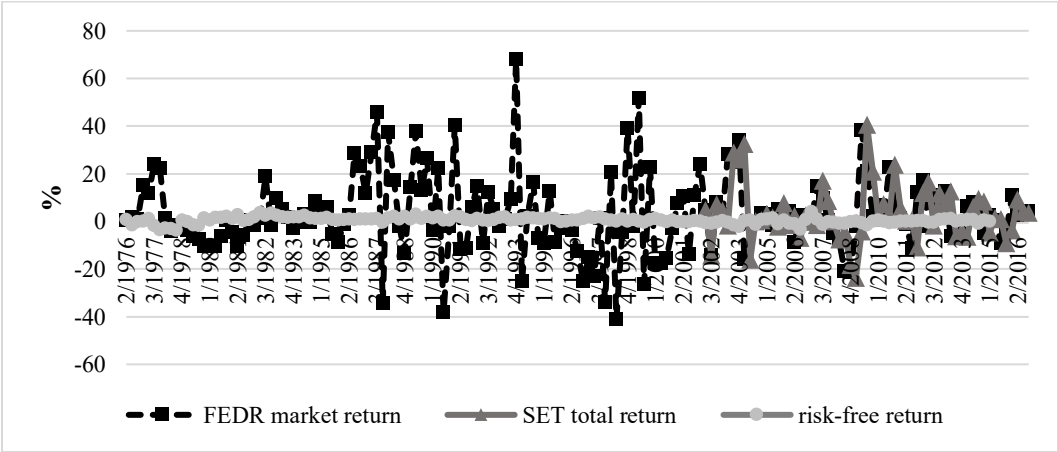

Figure 1 the quarterly observed data of the FEDR real market returns (1976-2016), SET real total returns (2002-2016), and real 3-month time deposits average rate of the Thai Commercial Banks (1978-2016).

4 the Thai Commercial Banks includes Bangkok Bank, Krungthai Bank, The siam Commercial Bank, Kasikorn Bank and Bank of Ayudhya.

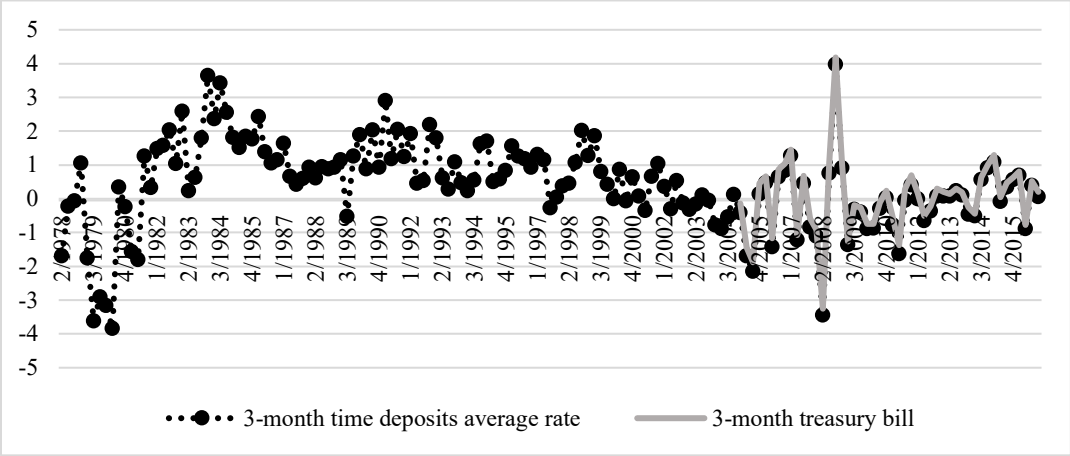

Figure 2 the quarterly observed data of the real 3-month time deposits average rate of the Thai Commercial Banks (1978-2016) and ninety-day treasury bills (2005-2016).

Table 1 presents the summary statistics of the observed real market returns, the observed real risk-free returns, the observed real equity premium, and observed real consumption growth.

Table 1 the summary statistics of quarterly observed data from 2000-2016.

	R_m	R_f	$R_m - R_f$	G_c
Mean (%)	2.74	-0.8	2.83	4.06
Standard deviation(%)	12.15	0.97	12.37	2.02
Autocorrelation	0.3143	0.2349	0.3148	0.5129

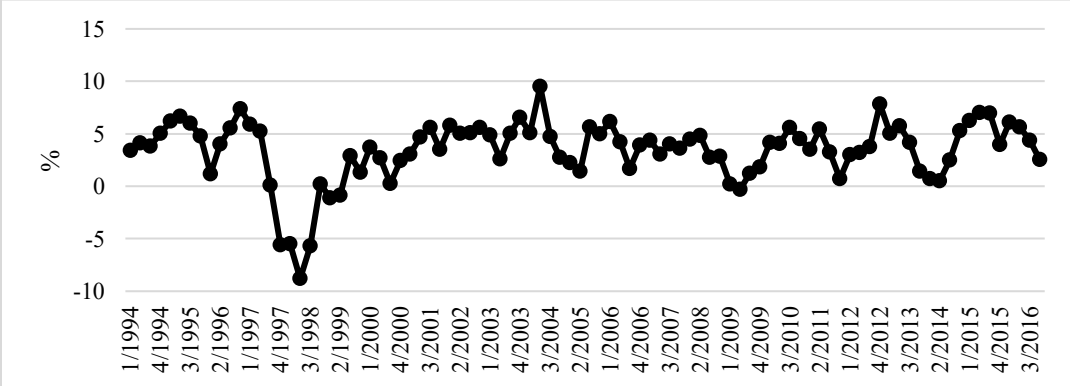

Figure 3 the real observed consumption growth, $G_{c,t}$ since 1993-2016

The standard asset pricing model

Calibration of asset pricing model when consumption growth process is a two-states Markov chain

We calibrate the preference parameter from the standard consumption-based asset pricing model with the two-state Markov chain consumption growth process which follows Mehra and Prescott (1985). From

$$E(r_m - r_f) = \Pi_h(R_{m,h} - R_{f,h}) + \Pi_l(R_{m,l} - R_{f,l}),$$

where the market returns in each state $s = h, l$ are

$$R_{m,h} = \pi_{h,h}\left(\frac{1+Z_h}{Z_h}G_{c,h}\right) + \pi_{h,l}\left(\frac{1+Z_l}{Z_h}G_{c,l}\right),$$

$$R_{m,l} = \pi_{l,h}\left(\frac{1+Z_h}{Z_l}G_{c,h}\right) + \pi_{h,l}\left(\frac{1+Z_l}{Z_l}G_{c,l}\right).$$

The risk-free returns in each state $s = h, l$ are

$$R_{f,h} = \left[\pi_{h,h}\,\beta\,G_{c,h}^{-\gamma} + \pi_{h,l}\,\beta\,G_{c,l}^{-\gamma}\right]^{-1},$$

$$R_{f,l} = \left[\pi_{l,h}\,\beta\,G_{c,h}^{-\gamma} + \pi_{l,l}\,\beta\,G_{c,l}^{-\gamma}\right]^{-1}.$$

The price-consumption ratio is

$$\begin{pmatrix} Z_h \\ z_l \end{pmatrix} = [1 - \beta\boldsymbol{\Gamma}]^{-1}\beta\boldsymbol{\Gamma}\begin{pmatrix} 1 \\ 1 \end{pmatrix}, \text{ and } \boldsymbol{\Gamma} = \begin{pmatrix} \pi_{h,h}G_{c,h}^{-\gamma} & \pi_{h,l}G_{c,l}^{-\gamma} \\ \pi_{l,h}G_{c,l}^{-\gamma} & \pi_{l,l}G_{c,l}^{-\gamma} \end{pmatrix}.$$

We calibrate the risk aversion coefficient, γ, by minimizing the error distance between the equity premium equation and the observed expected equity premium for a given value of time discount factor β.

$$\min_{\gamma} \sqrt{\left[E(r_m - r_f) - \left(\Pi_h(R_{m,h} - R_{f,h}) + \Pi_l(R_{m,l} - R_{f,l})\right)\right]^2}$$

We assume that consumption growth process $G_{c,t+1}$ is

$$G_{c,h} = \mu + \sigma, \tag{38}$$

$$G_{c,l} = \mu - \sigma. \tag{39}$$

where μ is the mean of consumption growth and σ is the standard derivation of consumption growth which are shown in Table 1.

We also assume that the transition matrix $\boldsymbol{\pi}$ is symmetric, i.e., $\pi_{s,s'} = \pi_{s',s}$ for all $s, s' \in \{h, l\}$. The symmetry implies that the matrix can be completely determined by the autocorrelation of consumption growth ρ alone:

$$\boldsymbol{\pi} = \begin{pmatrix} \pi_{h,h} & \pi_{h,l} \\ \pi_{l,h} & \pi_{l,l} \end{pmatrix} = \begin{pmatrix} \frac{1+\rho}{2} & \frac{1-\rho}{2} \\ \frac{1-\rho}{2} & \frac{1+\rho}{2} \end{pmatrix}. \quad (40)$$

The observed autocorrelation of consumption growth ρ is 0.5129, as shown in Table 1. As a result, the symmetry also implies that the steady state probability Π_s is 0.5 for every state $s \in \{h, l\}$.

Similar to Weil (1989), we set time discount factor, β, to be 0.95; 0.96; 0.97; 0.98. This is to be consistent with the estimated beta from the literature where the value is confirmed to be a high value close to 1.00 (Hansen and Singleton (1983).) Table 2 shows the calibration results. Calibrated risk aversion coefficient γ in Table 2 is higher than 10 for all chosen levels of time discount factor β.

Table 2 the calibrated risk aversion γ which matches expected equity premium from Equation (17) using the observed equity premium in Table 1 and implied expected risk-free return from Equation (10)

β	γ from equation (17)	Net expected risk-free return from equation (10) (%)
0.95	127.9820	3669.80
0.96	128.5036	3671.47
0.97	129.0197	3673.08
0.98	127.5304	3674.65

Calibration of asset pricing model when consumption growth process is i.i.d. Log-normal

The standard consumption-based asset pricing model assumes i.i.d. Log-normal of consumption growth which follows Breeden (1986) and Hansen and Singleton (1982). We calibrate the asset pricing model using the expect equity premium (21) and the expected logarithm of risk-free return (20)

$$E\left(r_{m,t+1} - r_{f,t+1}\right) = \gamma \mathrm{Var}\left(g_{c,t+1}\right) - \frac{1}{2}\mathrm{Var}\left(r_{m,t+1}\right),$$

$$E(r_{f,t+1}) = -\log\beta + \gamma E(g_{c,t+1}) - \frac{1}{2}\gamma^2 \mathrm{Var}(g_{c,t+1}).$$

Now we can calibrate risk aversion γ using only expected equity premium (21) as follows:

$$\gamma = \frac{E(r_{m,t+1} - r_{f,t+1}) + \frac{1}{2}\mathrm{Var}(r_{m,t+1})}{\mathrm{Var}(g_{c,t+1})}. \quad (41)$$

The calibrated risk aversion coefficient γ from the equation (41) is 75.4422. This value of risk aversion coefficient γ contradicts the literature as in the case of two-states Markov chain presented earlier.

Table 3 The summary statistics of quarterly real observed logarithm data of financial market returns ($r_{m,t+1}$), risk-free returns ($r_{f,t+1}$), equity premia ($r_{m,t+1} - r_{f,t+1}$) and consumption growth ($g_{c,t+1}$) since 2000-2016.

	$g_{c,t+1}$	$r_{m,t+1}$	$r_{f,t+1}$	$r_{m,t+1} - r_{f,t+1}$
Mean (%)	3.97	2.03	-0.089	2.12
stand derivation (%)	1.94	11.72	0.97	11.95
Autocorrelation	0.5177	0.3237	0.2335	0.3244
Covariance with $g_{c,t+1}$	0.0004	-0.00003	-0.00001	-0.00002

Table 4 The result of the logarithm of expected risk-free return equation (20) when the observed logarithm of mean risk-free returns $E(r_{f,t+1}) = -0.089$ %.

β	γ from equation (41)	$E(r_{f,t+1})$ from equation (20) (%)
0.95	75.4422	197.55
0.96	75.4422	196.50
0.97	75.4422	195.46
0.98	75.4422	194.44

The recursive consumption-based asset pricing model

Calibration of asset pricing model when consumption growth process is two-states Markov chain

The recursive consumption-based asset pricing model assumes a two-states Markov chain of the consumption growth process, which follows Weil (1989). We simultaneously calibrate the asset pricing model using the expected equity premium (33) and the expected risk-free return (28) as

$$E\left(\frac{R_m}{R_f}\right) = \Pi_h \frac{R_{m,h}}{R_f, h} + \Pi_l \frac{R_{m,l}}{R_f, l},$$

$$E(R_f) = \Pi_h R_{f,h} + \Pi_l R_{f,l},$$

where the risk-free returns in each state $s \in \{h, l\}$ are

$$R_{f,h} = \left[\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \left(\pi_{h,h}\, G_{c,h}^{-\gamma} \left(\frac{Z_h+1}{Z_h} \right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} + \pi_{h,l}\, G_{c,l}^{-\gamma} \left(\frac{Z_l+1}{Z_h} \right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} \right) \right]^{-1},$$

$$R_{f,l} = \left[\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \left(\pi_{l,h}\, G_{c,h}^{-\gamma} \left(\frac{Z_h+1}{Z_l} \right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} + \pi_{l,l}\, G_{c,l}^{-\gamma} \left(\frac{Z_l+1}{Z_l} \right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} \right) \right]^{-1}.$$

The market return in each state $s \in \{h, l\}$ are

$$R_{m,h} = \pi_{h,h} \left(\frac{1+Z_h}{Z_h} G_{c,h} \right) + \pi_{h,l} \left(\frac{1+Z_l}{Z_h} G_{c,l} \right),$$
$$R_{m,l} = \pi_{l,h} \left(\frac{1+Z_h}{Z_l} G_{c,h} \right) + \pi_{h,l} \left(\frac{1+Z_l}{Z_l} G_{c,l} \right),$$

and price-consumption ratio in each state $s \in \{h, l\}$ are

$$Z_h = \beta \left(\pi_{h,h} G_{c,h}^{1-\gamma} (Z_h + 1)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} + \pi_{h,l} G_{c,l}^{1-\gamma} (Z_l + 1)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \right)^{\frac{1-\frac{1}{\psi}}{1-\gamma}},$$

$$Z_l = \beta \left(\pi_{l,h} G_{c,h}^{1-\gamma} (Z_h + 1)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} + \pi_{l,l} G_{c,l}^{1-\gamma} (Z_l + 1)^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \right)^{\frac{1-\frac{1}{\psi}}{1-\gamma}}.$$

We calibrate these asset pricing models with our data to find preference parameters which are both risk aversion, γ, and the elasticity of intertemporal substitution, ψ. We follow section 3.1.1 and use Thailand quarterly financial data from 2000-2016. The observed real equity premia, $\frac{R_{m,t+1}}{R_{f,t+1}}$ and the logarithm of observed real equity premia, $r_{m,t+1} - r_{f,t+1}$ are shown in Table 5.

Table 5 The summary statistics of quarterly real observed equity premia ($\frac{R_{m,t+1}}{R_{f,t+1}}$) and logarithm of equity premia ($r_{m,t+1} - r_{f,t+1}$) since 2000-2016.

	$\frac{R_{m,t+1}}{R_{f,t+1}}$	$r_{m,t+1} - r_{f,t+1}$
Mean	1.0286	2.12%
standard derivation	0.1235	11.95%
Autocorrelation	0.3125	0.3244
Covariance with $G_{c,t+1}$	-0.00006	N/A
Covariance with $g_{c,t+1}$	N/A	-0.00002

We find both the risk aversion coefficient, γ, and the elasticity of intertemporal substitution, ψ, by minimizing the error distance of the equity premium equation (33) and the expected risk-free return (28)

$$\min_{\gamma,\psi} \sqrt{\left(E\left(\frac{R_m}{R_f}\right) - (\Pi_h \frac{R_{m,h}}{R_{f,h}} + \Pi_l \frac{R_{m,l}}{R_{f,l}})\right)^2 + \left(E(R_f) - (\Pi_h R_{f,h} + \Pi_l R_{f,l})\right)^2}. \quad (42)$$

Table 6 The result of risk aversion coefficient, γ, and elasticity of intertemporal substitution, ψ are given time discount factor, β.

β	γ	ψ
0.95	79.8870	-0.9444
0.96	-53.8815	3.6950
0.97	-45.4243	2.1916
0.98	47.6275	3.4705

Calibration of asset pricing model when consumption growth process is i.i.d. Log-normal

The recursive consumption-based asset pricing model assumes i.i.d. log-normal of the consumption growth process which follows Weil (1989). We calibrate the asset pricing model using the expected logarithm of equity premium (36) and expected logarithm of risk-free return (35) as

$$E(r_{m,t+1} - r_{f,t+1}) = \gamma \mathrm{Var}(g_{c,t+1}) - \frac{1}{2}\mathrm{Var}(r_{m,t+1}),$$

$$E(r_{f,t+1}) = -\log\beta + \frac{1}{\psi}E(g_{c,t+1}) - \frac{\gamma\left(1+\frac{1}{\psi}\right)-\frac{1}{\psi}}{2}\mathrm{Var}(g_{c,t+1}).$$

The risk aversion coefficient, γ, can be calibrated with

$$\gamma = \frac{E(r_{m,t+1}-r_{f,t+1})+\frac{1}{2}\mathrm{Var}(r_{m,t+1})}{\mathrm{Var}(g_{c,t+1})} \quad (43)$$

Therefore, we can find an elasticity of intertemporal substitution coefficient, ψ using only the expected logarithm of equity premium (36) for any given risk aversion coefficient, γ, and time discount factor, β, as follows:

$$\psi = \frac{E(g_{c,t+1})-\frac{\gamma-1}{2}\mathrm{Var}(g_{c,t+1})}{E(r_{f,t+1})+\log\beta+\frac{\gamma}{2}\mathrm{Var}(g_{c,t+1})}. \quad (44)$$

We now represent these observed equity premia, and risk-free returns are the same in Section 3.1.2 which are shown in Table 5.

As a result, the equity premium from equation (36) and the equity premium from equation (21) are identical when the consumption growth process as i.i.d. log-normal. As a result, the calibrated risk aversion coefficient, γ is 75.4422, the same as in Section 3.1.2. This value is too high to be consistent with the empirical evidence available in the literature. The only benefit of this Epstein and Zin (1989) recursive utility is to be able to calibrate the elasticity of intertemporal substitution, ψ independently from the calibrated value of risk aversion, γ. Therefore, we still cannot solve the equity premium puzzle because the model still requires an unreasonably low value of risk aversion.

Table 7 The result of elasticity of intertemporal substitution, ψ match the expected riskfree return equation (35) with mean of the logarithm of risk-free return in Table 5 when given discount factor, β.

β	γ	ψ
0.95	75.4422	-0.6755
0.96	75.4422	-0.9322
0.97	75.4422	-1.4938
0.98	75.4422	-3.7006

Summary and discussion

The summary result

We summarize the result of all four models studied in this paper.

Standard asset pricing model with a time-separable utility model

The result in table 8 shows that both calibrated risk aversion coefficient, γ, for each time discount rates β =0.95, 0.96, 0.97, 0.98 are not in the acceptable range of this value (between 1 and 10.) In addition, we cannot find the value of the average risk-free return that is close to the actual observed rate which is -0.8%.

Table 8 The calibrated risk aversion, γ and expected risk-free return under both two-state Markov chain assumption and i.i.d. log-normal assumption

	Two-state Markov chain		**i.i.d. Log-normal**	
β	γ (from eq. (17))	$E(R_f)$ (from eq.(10))	γ (from eq. (21))	$E(r_f)$ (from eq.(20))
0.95	127.9820	3769.80 %	75.4422	197.55 %
0.96	128.5036	3771.47 %	75.4422	196.50 %
0.97	129.0197	3773.08 %	75.4422	195.46 %
0.98	127.5304	3774.65 %	75.4422	194.44 %

The resulting risk aversion coefficients, γ, which are shown in the second and fourth columns of Table 8, contradict the literature (Mehra and Prescott, 1985), which suggested that the plausible value for the relative risk aversion coefficient, γ, should be between 1 and 10. Even if we could accept a large value of risk aversion coefficient, γ, as the true value, the model would have predicted an infeasibly large level of the average risk-free return as shown in the third and fifth columns of Table 8. This shows that the equity premium puzzle (according to Mehra and Prescott (1985)) exists in Thailand quarterly financial data from 2000-2016 with both the two-state Markov chain assumption and i.i.d. log-normal assumption under the time separable preference.

Epstein and Zin recursive utility model

This section shows that both calibrated risk aversion coefficient, γ, and calibrated elasticity of intertemporal substitution coefficient ψ for time discount rate β =0.95, 0.96, 0.97, 0.98 are not in a simultaneously acceptable length of value between 1 and 10 and more than 0, respectively. These results can conclude that the consumption-based asset pricing model with both the two-state Markov chain assumption and i.i.d. log-normal assumption under the Epstein and Zin recursive preference cannot explain observed equity premia and logarithm of risk-free returns.

Table 9 The result of risk aversion coefficient, γ, and elasticity of intertemporal substitution, ψ, given time discount factor β.

	Two-state Markov chain		**i.i.d. Log-normal**	
β	γ (from eq. (42))	ψ (from eq. (42))	γ (from eq. (41))	ψ (from eq.(44))
0.95	79.8870	-0.9444	75.4422	-0.6755
0.96	-53.8815	3.6950	75.4422	-0.9322
0.97	-45.4243	2.1916	75.4422	-1.4938
0.98	47.6275	3.4704	75.4422	-3.7006

The result from Table 9 still shows that we cannot find both reasonable values of the risk aversion coefficient, γ, as shown in the second and fourth columns of Table 9 which are not between 1 to 10. That is, the asset pricing model with Epstein and Zin (1989) recursive utility when the consumption growth process is two-states Markov chain and i.i.d. log-normal, cannot solve the equity premium puzzle and the risk-free rate puzzle. Even if, we could accept such a high value of risk aversion coefficient, γ as the true value. For time discount factors, β = 0.95, 0.96, 0.97, 0.98, the values of elasticity of intertemporal substitution are infeasible (negative value), which are shown the third and fifth columns in Table 9.

Discussion

We first calibrated the standard consumption-based model with time-separable utility function assuming that the consumption growth is both i.i.d. log-normal and a two-state Markov process. The result shows that the calibrated parameters were not in their acceptable ranges. We then calibrated the model with Epstein and Zin recursive utility function which relaxes certain conditions, more specifically, the elasticity of intertemporal substitution and risk aversion parameters are independent of each other, assuming that the consumption growth is both i.i.d. log-normal and a two-state Markov process. The result also shows that the calibrated parameters were not in their acceptable ranges. This result shows that neither modeling the consumption growth as i.i.d. log-normal or two-state Markov process, or relaxing certain conditions by utilizing a time-separable utility function can help the models in explaining equity premium puzzle and risk-free rate puzzle.

We also used FEDR market return data which is a Thai financial market dataset that includes dividend and right benefits and considers the effect of stock split and correspond to the theory of market returns which are different from data used in Duangthong (2014) who used the total return (includes dividend and right benefits and considers the effect of stock split) of only some companies in SET, and Sedthapinun (2000) and Harnphattananusorn (2014) who used the return of SET index (does not include dividend benefit but includes right benefit and the effect of stock split). Our

results are consistent with Duangthong (2014) and Harnphattananusorn (2014) which is that equity premium puzzle exists in Thailand financial data.

The empirical results with FEDR financial data show that we cannot explain the relationship between consumption risk and equity premium with the models used. This is shown in the resulting parameters that are outside the acceptable range. The implication here is that the four models used cannot explain the relationship between consumption growth and asset growth. The result is consistent with that of Duangthong (2014) which used data of some firms in market and Harnphattananusorn (2014) which used SET index. We conclude then that consumption growth data are not enough to explain equity premium and risk-free rate in Thailand data for the four models used in this paper, thus, confirming that the puzzles do exist in Thailand financial data. This result is also consistent with the result in the literature with US data as well (Mehra and Prescott (1985), Weil (1989).)

Conclusion

The consumption-based asset pricing model is an important theory to explain the relationship between consumption risk and asset returns by linking macroeconomics and finance theories together. The model can be used to explain the relationship between equity premium and consumption risk, that is, investors in risky assets should be compensated for bearing consumption risk, as well as how much the price of consumption risk should be.

There have been many empirical papers that study the consumption-based asset pricing model. Studies using US data show that the resulting parameters from the calibrated models should not be possible based on the literature. These results are known to be called the equity premium puzzle and the risk-free rate puzzle and imply that some consumption-based asset pricing models can not model the relationship between equity premium and consumption risk. Studies using certain Thailand data show that there are no equity premium and risk-free rate puzzles while other studies show that the puzzles do exist.

Our result with Thailand data, shows that none of the models can explain the observed equity premia and the risk-free returns using reasonable values of parameters. This important result shows that these models may not be appropriate when used as a basis to develop economic or financial policies for Thailand. Therefore, we suggest to investigate other models that may be more appropriate for Thailand.

It would be interesting to investigate whether long-run risk models can explain the equity premium in Thailand. This model has been used successfully in the literature for solving the equity premium puzzle and the risk-free rate puzzle in US data from 1930 to 2006 (Bansal et al, 2008).

Another important issue for this paper is that we did not consider the impact of the global financial crisis in 2008 on the

financial market return used in this paper. The crisis could affect the credit premium and liquidity premium of risk-free return, which could explain why the average value of equity premium is low. A more thorough investigation of this effect may provide interesting results.

As more data become available, data-driven models are becoming more important. These models rely on models that perform well under reasonable assumptions. Therefore, it is imperative to confirm the validity of models before using them as a base to develop policy or decision-making models. Our result shows that standard consumption-based asset pricing models, even when relaxing certain restrictions, cannot explain the relationship between consumption risk and equity premium in Thailand financial data. Therefore, it is important to investigate and develop better models for Thailand financial data.

References

Bansal, D., R. Yaron, and A. Kiku (2008). Risks for the long run: Estimation and inference. Wharton School, University of Pennsylvania.

Breeden, D. T. (1979). An intertemporal asset pricing model with stochastic consumption and investment opportunities. *Journal of Financial Economics, 7*(3):265–296.

Breeden, D. T. (1986). Consumption, production, inflation and interest rates: A synthesis. *Journal of Financial Economics, 16*(1):3–39.

Duangthong, S. (2014). Asset pricing puzzle in emerging markets: An evidence of Thailand. *Southeast Asian Journal of Economics, 2*(1):23–50.

Epstein, L. G., and Zin, S. E. (1989). Substitution, risk aversion, and the temporal behavior of consumption and asset returns: A theoretical framework. *Econometrica: Journal of the Econometric Society*, pages 937–969.

Hansen, L. P., and Jagannathan, R. (1991). Implications of security market data for models of dynamic economies. *Journal of Political Economy*, *99*(2):225–262.

Hansen, L. P., and Richard, S. F. (1987). The role of conditioning information in deducing testable restrictions implied by dynamic asset pricing models. Econometrica: Journal of the Econometric Society, pages 587–613.

Hansen, L. P., and Singleton, K. J. (1982). Generalized instrumental variables estimation of nonlinear rational expectations models. *Econometrica: Journal of the Econometric Society*, pages 1269–1286.

Hansen, L. P., and Singleton, K. J. (1983). Stochastic consumption, risk aversion, and the temporal behavior of asset returns. *Journal of Political Economy, 99*: 249-265.

Harnphattananusorn, S. (2014). Asset pricing in CAPM and CCAMP: Thailand case study. Proceedings of 52nd Kasetsart University Annual Conference: Education, Economics and Business Administration, Humanities and Social Sciences.

Kreps, D. M., and Porteus, E. L. (1978). Temporal resolution of uncertainty and dynamic choice theory. *Econometrica: Journal of the Econometric Society*, pages 185–200.

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics, 47* (February): 13-37.

Lucas, R. E. (1978). Asset prices in an exchange economy. Econometrica: Journal of the Econometric Society, pages 1429–1445.

Mehra, R. and Prescott, E. C. (1985). The equity premium: A puzzle. *Journal of Monetary Economics, 15*(2):145–161.

Sedthapinun, T. (2000). C-CAPM and equity risk premium in Thailand. Master's degree dissertation, Thammasat University.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance, 19* (September): 425-42.

Weil, P. (1989). The equity premium puzzle and the risk-free rate puzzle. *Journal of Monetary Economics, 24*(3):401–421.

A. The asset pricing equation in two-state Markov chain (Mehra and Prescott, 1985)

The consumption growth $G_{c,t+1}$ follows a two-state Markov chain which is shown in Section 2.2.1. We found risk-free return in state $s = h, l$ as following

$$R_{f,s} = \frac{1}{\sum_{s'=h,} \pi_{s,s'} M_{s'}} \tag{45}$$

We substitute stochastic discount factor in state $s = h, l$ in equation (6), then the risk-free return in state $s = h, l$ follows

$$R_{f,h} = \left[\pi_{h,h}\, \beta\, G_{c,h}^{-\gamma} + \pi_{h,l}\, \beta\, G_{c,l}^{-\gamma}\right]^{-1}$$

$R_{f,l} = \left[\pi_{l,h}\, \beta\, G_{c,h}^{-\gamma} + \pi_{l,l}\, \beta\, G_{c,l}^{-\gamma}\right]^{-1}$.

And expected risk-free return can be written as

$E(R_f) = \Pi_h R_{f,h} + \Pi_l R_{f,l}$.

In next step, we follow market return which we have to find price-consumption ratio in state $s = h, l$ by following Euler equation in Section 2.1 of being in state $s' = h, l$ after being in state $s = h, l$ in the previous period which is written as

$$\beta \sum_{s'=h,l} \pi_{s,s'}\, G_{c,s'}^{-\gamma} R_{c,s'} = 1. \tag{46}$$

The market return $R_{c,s'}$ follows equation (14) then Euler equation can be rewritten as

$$\beta \sum_{s'=h,l} \pi_{s,s'}\, G_{c,s'}^{-\gamma} \frac{1+Z_{s'}}{Z_s} = 1,$$

$$\beta \sum_{s'=h,l} \pi_{s,s'}\, G_{c,s'}^{-\gamma} (1 + Z_{s'}) = Z_s. \tag{47}$$

This Euler equation can be rewritten in term of matrix as

$$\begin{pmatrix} Z_h \\ Z_l \end{pmatrix} = \begin{pmatrix} \beta\pi_{h,h}\, G_{c,h}^{-\gamma}(1+Z_h) + \beta\pi_{h,l}\, G_{c,l}^{-\gamma}(1+Z_l) \\ \beta\pi_{l,h}\, G_{c,h}^{-\gamma}(1+Z_h) + \beta\pi_{l,l}\, G_{c,l}^{-\gamma}(1+Z_l) \end{pmatrix},$$

$$\begin{pmatrix} Z_h \\ Z_l \end{pmatrix} = \beta \boldsymbol{\Gamma} \begin{pmatrix} 1+Z_h \\ 1+Z_l \end{pmatrix} = \beta \boldsymbol{\Gamma} \begin{pmatrix} 1 \\ 1 \end{pmatrix} + \beta \boldsymbol{\Gamma} \begin{pmatrix} Z_h \\ Z_l \end{pmatrix}, \tag{48}$$

where

$$\boldsymbol{\Gamma} = \begin{pmatrix} \pi_{h,h}\, G_{c,h}^{-\gamma} + \pi_{h,l}\, G_{c,l}^{-\gamma} \\ \pi_{l,h}\, G_{c,h}^{-\gamma} + \pi_{l,l}\, G_{c,l}^{-\gamma} \end{pmatrix}.$$

Therefore, we found pricing consumption ratio in state $s = h, l$ which can be written as

$$\begin{pmatrix} Z_h \\ Z_l \end{pmatrix} = [I - \beta\boldsymbol{\Gamma}]^{-1} \beta \boldsymbol{\Gamma} \begin{pmatrix} 1 \\ 1 \end{pmatrix}. \tag{49}$$

We use price-consumption ratio to find (conditional expected) market return in state $s = h, l$ as follows:

$$R_{m,s} = \sum_{s'=h,l} \pi_{s,s'} G_{c,s'}^{-\gamma} \frac{1+Z_{s'}}{Z_s}, \tag{50}$$

or

$$R_{m,h} = \pi_{h,h}\left(\frac{1+Z_h}{Z_h} G_{c,h}\right) + \pi_{h,l}\left(\frac{1+Z_l}{Z_h} G_{c,l}\right),$$

$$R_{m,l} = \pi_{l,h}\left(\frac{1+Z_h}{Z_l} G_{c,h}\right) + \pi_{h,l}\left(\frac{1+Z_l}{Z_l} G_{c,l}\right),$$

and the expected market return is

$$E(R_m) = \Pi_h R_{m,h} + \Pi_l R_{m,l}.$$

The expected equity premium of Mehra and Prescott (1985) is

$$E\left(r_m - r_f\right) = \Pi_h\left(R_{m,h} - R_{f,h}\right) + \Pi_l(R_{m,l} - R_{f,l}).$$

B. The asset pricing equation in I.I.D. (Mehra and Prescott, 1985)

The consumption growth $G_{c,t+1}$ follows i.i.d. log-normal which is shown in Section 2.2.2. It affects the stochastic discount factor M_{t+1} as i.i.d. log-normal and we assume return on asset j Rj;t+1 is i.i.d. log-normal. Therefore the conditional expectations are the same as unconditional expectations which the pricing equation can be rewritten in terms of unconditional expectations as:

$$E\left(M_{t+1} R_{j,t+1}\right) = 1. \tag{51}$$

This pricing equation is simplified in term of logarithm which can be rewritten as:

$$E(m_{t+1}) + E\left(r_{j,t+1}\right) + \frac{1}{2}\mathrm{Var}(m_{t+1}) + \frac{1}{2}\mathrm{Var}\left(r_{j,t+1}\right) + \mathrm{Cov}(m_{t+1}, r_{j,t+1})=0,$$

where $m_{t+1} = \log M_{t+1}$ and $r_{j,t+1} = \log R_{j,t+1}$ are the logarithm of the stochastic discount factor, and the logarithm of returns on asset j make that $r_{j,t+1}$ can be approximately net returns on asset j, respectively. Under the CRRA utility function, the logarithm of stochastic discount factor is

$$m_{t+1} = \log\left(\beta G_{c,t+1}^{-\gamma}\right) = \log\beta - \gamma g_{c,t+1}.$$

We found expected and variance of the logarithm of stochastic discount factor m_{t+1}

$$E(m_{t+1}) = \log\beta - \gamma E\left(g_{c,t+1}\right), \tag{52}$$

$$\mathrm{Var}(m_{t+1}) = \gamma^2 \mathrm{Var}\left(g_{c,t+1}\right), \tag{53}$$

where $E(g_{c,t+1})$ is the mean of the logarithm of consumption growth, $\mathrm{Var}(g_{c,t+1})$ is the variance of the logarithm of consumption growth, $\mathrm{Var}(r_{m,t+1})$ is the variance of the logarithm of the market returns.

We found the expected logarithm of risk-free return ($r_{f,t+1} = \log R_{f,t+1}$) from equation (9) as

$$R_{f,t+1} = \frac{1}{E_t(M_{t+1})},$$

$$E(r_{f,t+1}) = -E(m_{t+1}) - \frac{1}{2}\mathrm{Var}(m_{t+1}) + \frac{1}{2}Var(E_t(m_{t+1})).$$

If m_{t+1} is i.i.d. then $E_t(m_{t+1})$ is constant and $Var(E_t(m_{t+1})) = 0$. Therefore,

$$E(r_{f,t+1}) = -E(m_{t+1}) - \frac{1}{2}\mathrm{Var}(m_{t+1}),$$

$$E(r_{f,t+1}) = -\log\beta + \gamma E(g_{c,t+1}), -\gamma^2\mathrm{Var}(g_{c,t+1}). \quad (54)$$

Under asset pricing equation 18, the risk premium on asset j can be written as

$$E(m_{t+1}) + E(r_{j,t+1}) + \frac{1}{2}\mathrm{Var}(m_{t+1}) = -\mathrm{Cov}(m_{t+1}, r_{j,t+1}) - \frac{1}{2}\mathrm{Var}(r_{j,t+1}),$$

$$+E(r_{j,t+1}) - (-E(m_{t+1}) - \frac{1}{2}\mathrm{Var}(m_{t+1})) = -\mathrm{Cov}(m_{t+1}, r_{j,t+1}) - \frac{1}{2}\mathrm{Var}(r_{j,t+1}),$$

$$E(r_{j,t+1} - r_{f,t+1}) = -\mathrm{Cov}(m_{t+1}, r_{j,t+1}) - \frac{1}{2}\mathrm{Var}(r_{j,t+1}), \quad (55)$$

where $\mathrm{Cov}(m_{t+1}, r_{j,t+1})$ is the covariance between the logarithm of stochastic discount factor m_{t+1} and the logarithm of return on asset *j*, $r_{j,t+1}$ which can be written as:

$$\mathrm{Cov}(m_{t+1}, r_{j,t+1}) = \mathrm{Cov}(\log\beta - \gamma g_{c,t+1}, r_{j,t+1}),$$

$$\mathrm{Cov}(m_{t+1}, r_{j,t+1}) = -\gamma\mathrm{Cov}(g_{c,t+1}, r_{j,t+1}), \quad (56)$$

where $\mathrm{Cov}(g_{c,t+1}, r_{j,t+1})$ is the covariance between the logarithm of consumption growth and the logarithm of returns on asset *j*. Therefore, the risk premium on asset *j* is

$$E(r_{j,t+1} - r_{f,t+1}) = \gamma\mathrm{Cov}(g_{c,t+1}, r_{j,t+1}) - \frac{1}{2}\mathrm{Var}(r_{j,t+1}). \quad (57)$$

Also, the risk premium on market return is the equity premium which can be written as

$$E(r_{m,t+1} - r_{f,t+1}) = \gamma\mathrm{Cov}(g_{c,t+1}, r_{m,t+1}) - \frac{1}{2}\mathrm{Var}(r_{m,t+1}), \quad (58)$$

where the logarithm of market return can be written as:

$$r_{m,t+1} = g_{c,t+1} + \log\left(\frac{1+Z_{t+1}}{Z_t}\right). \quad (59)$$

Note that, the price-consumption ratio is constant ($Z_{t+1} = Z_t$) when consumption growth is i.i.d. log-normal. Therefore we can rewrite equity premium as

$$E\left(r_{m,t+1}-r_{f,t+1}\right)=\gamma\mathrm{Cov}\left(g_{c,t+1},g_{c,t+1}+\log\left(\frac{1+Z_{t+1}}{Z_t}\right)\right)-\frac{1}{2}\mathrm{Var}\left(r_{m,t+1}\right),$$

$$E\left(r_{m,t+1}-r_{f,t+1}\right)=\gamma\mathrm{Cov}\left(g_{c,t+1},g_{c,t+1}\right)-\frac{1}{2}\mathrm{Var}\left(r_{m,t+1}\right),$$

$$E\left(r_{m,t+1}-r_{f,t+1}\right)=\gamma\mathrm{Var}\left(g_{c,t+1}\right)-\frac{1}{2}\mathrm{Var}\left(r_{m,t+1}\right). \quad (60)$$

C. The asset pricing equation in two-state Markov chain Weil (1989)

We follow consumption growth $G_{c,t+1}$ in equation (7) and the stochastic discount factor M_{t+1} in equation (26) which are shown in Section 2.3.1. Euler equation in equation (24) is

$$\sum_{s'=h,l}\left[\pi_{s,s'}\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}}G_{c,s'}^{\frac{1}{\psi}\frac{1-\gamma}{1-\frac{1}{\psi}}}R_{c,s'}^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]=1$$

$$\sum_{s'=h,l}\left[\pi_{s,s'}\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}}G_{c,s'}^{\frac{1}{\psi}\frac{1-\gamma}{1-\frac{1}{\psi}}}\left(G_{c,s'}\frac{1+Z_{s'}}{Z_s}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]=1$$

$$\sum_{s'=h,l}\left[\pi_{s,s'}\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}}G_{c,s'}^{1-\gamma}(1+Z_{s'})^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]=Z_s^{\frac{1-\gamma}{1-\frac{1}{\psi}}}$$

$$Z_s=\beta\left[\sum_{s'=h,l}\left[\pi_{s,s'}G_{c,s'}^{1-\gamma}(1+Z_{s'})^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]\right]^{\frac{1-\frac{1}{\psi}}{1-\gamma}}. \quad (61)$$

The price-consumption ratio in state $s=h,l$, Z_s are

$$Z_h=\beta\left[\pi_{h,h}G_{c,h}^{1-\gamma}(1+Z_h)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}+\pi_{h,l}G_{c,l}^{1-\gamma}(1+Z_l)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]^{\frac{1-\frac{1}{\psi}}{1-\gamma}},$$

$$Z_l=\beta\left[\pi_{l,h}G_{c,h}^{1-\gamma}(1+Z_h)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}+\pi_{l,l}G_{c,l}^{1-\gamma}(1+Z_l)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]^{\frac{1-\frac{1}{\psi}}{1-\gamma}}.$$

Now, the market return in state $s=h,l$, $R_{m,s}$ is

$$R_{m,s} = \sum_{s'=h,l} \pi_{s,s'} G_{c,s'} \frac{1+Z_{s'}}{Z_s} \tag{62}$$

or

$$R_{m,h} = \pi_{h,h} G_{c,h} \frac{1+Z_h}{Z_h} + \pi_{h,l} G_{c,l} \frac{1+Z_l}{Z_h}$$

$$R_{m,l} = \pi_{l,h} G_{c,h} \frac{1+Z_h}{Z_l} + \pi_{l,l} G_{c,l} \frac{1+Z_l}{Z_l}$$

and the expected market return is

$$E(R_m) = \Pi_h R_{m,h} + \Pi_l R_{m,l}.$$

We found (conditional expected) risk-free return in state $s = h, l$ as following

$$R_{f,s} = \frac{1}{\sum_{s'=h,l}\left[\pi_{s,s'} M_{s'}\right]}$$

$$R_{f,s} = \frac{1}{\sum_{s'=h,l}\left[\pi_{s,s'} \beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}} G_{c,s'}^{-\gamma} \left(\frac{1+Z_{s'}}{Z_s}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}\right]} \tag{63}$$

As a result, we substitute stochastic discount factor in state $s = h, l$ in equation (26) to found risk-free return in state $s = h, l$, as follows

$$R_{f,h} = \left[\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \left(\pi_{h,h} G_{c,h}^{-\gamma} \left(\frac{1+Z_h}{Z_h}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} + \pi_{h,l} G_{c,l}^{-\gamma} \left(\frac{1+Z_l}{Z_h}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}\right)\right]^{-1} \tag{64}$$

$$R_{f,l} = \left[\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}} \left(\pi_{l,h} G_{c,h}^{-\gamma} \left(\frac{1+Z_h}{Z_l}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}} + \pi_{h,l} G_{c,l}^{-\gamma} \left(\frac{1+Z_l}{Z_l}\right)^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}\right)\right]^{-1}, \tag{65}$$

and the expected risk-free return is

$$E(R_f) = \Pi_h R_{f,h} + \Pi_l R_{f,l}.$$

Therefore, the equity premium in state $s = h, l$ from Weil (1989) is

$$\left(\frac{R_{m,s}}{R_{f,s}}\right) = \left[\sum_{s'=h,l} \pi_{s,s'} \beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}} G_{c,s'}^{-\gamma} (1+Z_{s'})^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}\right] \left[\sum_{s'=h,l} \pi_{s,s'} G_{c,s'} \frac{1+Z_{s'}}{Z_s}\right],$$

$$\left(\frac{R_{m,s}}{R_{f,s}}\right)=\frac{\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}}}{Z_s^{\frac{1-\gamma}{1-\frac{1}{\psi}}}}\left[\sum_{s'=h,l}\pi_{s,s'}G_{c,s'}^{-\gamma}(1+Z_{s'})^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}\right]\left[\sum_{s'=h,l}\pi_{s,s'}G_{c,s'}(1+Z_{s'})\right], \quad (66)$$

and we substitute price-consumption ratio in state $s=h,l$ which is

$$\left(\frac{R_{m,s}}{R_{f,s}}\right)=\frac{\left[\sum_{s'=h,l}\pi_{s,s'}G_{c,s'}^{-\gamma}(1+Z_{s'})^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}\right]\left[\sum_{s'=h,l}\pi_{s,s'}G_{c,s'}(1+Z_{s'})\right]}{\left(\sum_{s'=h,l}\pi_{s,s'}G_{c,s'}^{1-\gamma}\left(1+Z_{s'}^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right)\right)}, \quad (67)$$

then the expected equity premium is

$$E\left(\frac{R_m}{R_f}\right)=\Pi_h\left(\frac{R_{m,h}}{R_{f,h}}\right)+\Pi_l\left(\frac{R_{m,l}}{R_{f,l}}\right). \quad (68)$$

D. The asset pricing equation in I.I.D. Weil (1989)

Following Section 2.3.2 and Appendix B, consumption growth $G_{c,t+1}$ follows i.i.d. log-normal then logarithm of stochastic discount factor is

$$m_{t+1}=\log M_{t+1}=\log\left[\left(\beta G_{c,t+1}^{-\frac{1}{\psi}}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}R_{t+1}^{\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}}\right],$$

$$m_{t+1}=\frac{1-\gamma}{1-\frac{1}{\psi}}\log\beta-\gamma g_{c,t+1}+\left(\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}\right)\log\left(\frac{1+Z_{t+1}}{Z_t}\right). \quad (69)$$

Again, the price-consumption ratio Z_t is constant when consumption growth $g_{c,t+1}$ is i.i.d. log-normal. Therefore we found price-consumption ratio from Euler equation (24) as

$$E_t\left[\left(\beta G_{c,t+1}^{-\frac{1}{\psi}}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}R_{t+1}^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]=1,$$

$$E_t\left[\left(\beta G_{c,t+1}^{-\frac{1}{\psi}}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\left(G_{c,t+1}\frac{1+Z_{t+1}}{Z_t}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]=1,$$

$$E_t\left[\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}}G_{c,t+1}^{1-\gamma}\left(\frac{1+Z_{t+1}}{Z_t}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}\right]=1,$$

from price-consumption ratio is constant then

$$\left(\frac{1+Z_{t+1}}{Z_t}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}=\frac{1}{\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}}E\left(G_{c,t+1}^{1-\gamma}\right)}. \tag{70}$$

We can rewrite in term of logarithm as follows:

$$\log\left(\frac{1+Z_{t+1}}{Z_t}\right)^{\frac{1-\gamma}{1-\frac{1}{\psi}}}=\log\frac{1}{\beta^{\frac{1-\gamma}{1-\frac{1}{\psi}}}E\left(G_{c,t+1}^{1-\gamma}\right)},$$

$$\log\left(\frac{1+Z_{t+1}}{Z_t}\right)=-\log\beta-\left(1-\frac{1}{\psi}\right)E\left(g_{c,t+1}\right)-\frac{1}{2}(1-\gamma)\left(1-\frac{1}{\psi}\right)\mathrm{Var}\left(g_{c,t+1}\right).$$

We found the moment of the logarithm of stochastic discount factor m_{t+1} including: expected and variance of logarithm of stochastic discount factor as

$$E(m_{t+1})=\frac{1-\gamma}{1-\frac{1}{\psi}}\log\beta-\gamma E\left(g_{c,t+1}\right)+\left(\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}\right)\log\left(\frac{1+Z_{t+1}}{Z_t}\right), \tag{71}$$

$$\mathrm{Var}(m_{t+1})=\mathrm{Var}\left(\frac{1-\gamma}{1-\frac{1}{\psi}}\log\beta-\gamma g_{c,t+1}+\left(\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}\right)\log\left(\frac{1+Z_{t+1}}{Z_t}\right)\right),$$

$$\mathrm{Var}(m_{t+1})=\gamma^2\mathrm{Var}\left(g_{c,t+1}\right). \tag{72}$$

We found the expected logarithm of risk-free returns $r_{f,t+1}$from equation (35) as

$$E\left(R_{f,t+1}\right)=R_{f,t}=\frac{1}{E(M_{t+1})},$$

$$E\left(r_f\right)=-E(m_{t+1})-\frac{1}{2}\mathrm{Var}(m_{t+1}), \tag{73}$$

$$E\left(r_{f,t+1}\right)=-\log\beta+\frac{1}{\psi}E\left(g_{c,t+1}\right)-\frac{1}{2}\left(\gamma\left(1+\frac{1}{\psi}\right)-\frac{1}{\psi}\right)\mathrm{Var}(g_{c,t+1}) \tag{74}$$

We found risk premium on asset *j* from equation (18) as

$$E\left(r_{j,t+1}-r_{f,t+1}\right)=-\mathrm{Cov}\left(m_{t+1},r_{j,t+1}\right)-\frac{1}{2}\mathrm{Var}(r_{j,t+1}). \tag{75}$$

We found that $\mathrm{Cov}\left(m_{t+1},r_{j,t+1}\right)$ is the covariance between the logarithm of stochastic discount factor m_{t+1} and the logarithm of return on asset *j* $r_{j,t+1}$ which can be written as:

$$\mathrm{Cov}(m_{t+1}, r_{j,t+1}) = \mathrm{Cov}\left(\frac{1-\gamma}{1-\frac{1}{\psi}}\log\beta - \gamma g_{c,t+1} + \left(\frac{\frac{1}{\psi}-\gamma}{1-\frac{1}{\psi}}\right)\log\left(\frac{1+Z_{t+1}}{Z_t}\right), r_{j,t+1}\right),$$

$$\mathrm{Cov}(m_{t+1}, r_{j,t+1}) = -\gamma\mathrm{Cov}(g_{c,t+1}, r_{j,t+1}). \quad (76)$$

Therefore, the logarithm of returns on asset *j*. The risk premium on asset *j* is

$$E(r_{j,t+1} - r_{f,t+1}) = \gamma\mathrm{Cov}(g_{c,t+1}, r_{j,t+1}) - \frac{1}{2}\mathrm{Var}(r_{j,t+1}). \quad (77)$$

In Addition, the risk premium on market return is the equity premium which can be written as

$$E(r_{m,t+1} - r_{f,t+1}) = \gamma\mathrm{Cov}(g_{c,t+1}, r_{m,t+1}) - \frac{1}{2}\mathrm{Var}(r_{m,t+1}). \quad (78)$$

In the assumption of the market return of Mehra and Prescott (1985); Weil (1989), market return $r_{m,t+1}$ follows equation (14) then we can rewrite equity premium as

$$E(r_{m,t+1} - r_{f,t+1}) = \gamma\mathrm{Cov}\left(g_{c,t+1}, g_{c,t+1} + \log\left(\frac{1+Z_{t+1}}{Z_t}\right)\right) - \frac{1}{2}\mathrm{Var}(r_{m,t+1}), \quad (79)$$

$$E(r_{m,t+1} - r_{f,t+1}) = \gamma\mathrm{Cov}(g_{c,t+1}, g_{c,t+1}) - \frac{1}{2}\mathrm{Var}(r_{m,t+1}), \quad (80)$$

$$E(r_{m,t+1} - r_{f,t+1}) = \gamma\mathrm{Var}(g_{c,t+1}) - \frac{1}{2}\mathrm{Var}(r_{m,t+1}). \quad (81)$$

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CHANGES IN THAI LABOR INCOME DISTRIBUTION FROM 1985 TO 2017: SOME EVIDENCE OF RISING DEMAND FOR HIGHER EDUCATION

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Abstract

This paper investigates changes in the distribution of the real hourly labor income in the Thai labor market from 1985 to 2017. The results show that overall labor income has increased over the past three decades. The gender earnings gap has substantially reduced; however, the disparity between regions still exists. The results also indicate an increase in labor income of workers with primary school and higher education during the past three decades. This study aims to evaluate the cause of the increase according to the changes in demand for labor. The results indicate that the increase in labor income of workers with higher education is due to the increase in their labor demand. In contrast, the increase in labor income of primary school workers is due to the increase in the minimum wage. The evidence on the industry-occupational distribution of workers supports the explanation of demand increase due to Skills-Biased Technological Change: SBTC.

Keywords: labor income, labor demand, higher education, Skill-Biased Technological Change

Introduction

Changes in the distribution of wages is an important research topic in labor economics since its impact directly affects workers' well-being and social justice. Recent literature has shown the dynamic changes in the trend of wages among different countries. For instance, the overall wage distribution in China has increased, as well as the rise in wages of college graduates compared to high-school graduates (Gustafsson & Wan, 2020). This trend is consistent with Thailand, where the wage and labor income of college graduates has significantly increased relative to workers with lower education levels (Lathapipat, 2011; Nada Wasi, Saiwimon

Warunsiri Paweenawat, Chinnawat Devahastin Na Ayudhya, Pucktada Treeratpituk, 2019).

Recent studies also emphasized the heterogeneity of labor compensation among gender. Literature found the convergence of wages or labor income among men and women in many countries during the recent decades, including United Kingdom, United States, France, Germany, Italy, Sweden, Poland, and Sri Lanka (Gallen, Lesner, & Vejlin, 2019; Gharehgozli & Atal, 2020; Hara, 2018; Majchrowska & Strawiński, 2018; Petrongolo & Ronchi, 2020; Seneviratne, 2020). The trend is consistent with findings in a local Thai labor market where the gender gap of wages and labor income decreased (Nakavachara, 2010; Pooittiwong, 2016; Srisomboon, 2016).

This paper contributes to the existing literature by updating the distribution trends with recently available data, i.e., the Thai Labor Force Survey from the year 1985 to 2017. This study also uses labor income instead of regular wages as it represents the more comprehensive labor compensation. This study serves as a robustness check as researcher can compare results in this study with other studies that use only regular wage. The various kinds of distribution are presented, including overall distribution, the distribution by gender, region, and education, respectively. This paper also tries to explain the cause behind some key findings, i.e., an increase in the labor income of workers with a college education. It provides some explanations associated with the change in labor demand and Skill-Biased Technological Change: SBTC.

This paper is organized as follows. The next section presents the literature review, section III describes the data set used in this paper, section IV presents the various dimensions of distributions from 1985 to 2017, section V presents the estimation of changes in labor demand from 1985 to 2017, section VI discusses some important results, section VII concludes, section VIII mention on limitations of this study and future research, and section IX discuss on managerial and public policy implication.

Literature review

Recent studies have investigated the labor income inequality in Thailand and relevant factors that contribute to the inequality. For instance, Wasi et al. (2019) studied the labor income inequality from 1988 to 2017 using Thai labor market data, i.e., the Thai Labor Force Survey (LFS) and the Social Security Office (SSO) employment data. The study found that the reduction in the inequality in the bottom part of the distribution could reduce overall inequality. However, the median wage gap between college and non-college has increased over time. Furthermore, the results found that employment history can describe wage inequality, e.g., workers who switch jobs or work in larger firm will receive a higher wage.

Suphanachart (2019) also documents the reduction in overall income inequality over the 1988 to 2017 period. The study uses the Total Factor Productivity (TFP) to proxy the technological progress and use the Gini coefficient to represent the income inequality. The results suggest that in the long run, income inequality

was reduced when TFP increased. The increase in human capital, income per capita, and the decline in agricultural GDP share contribute to reducing income inequality. However, the factors such as trade openness and FDI increase income inequality.

Some studies in the United States also investigate the role of technology in affecting wage inequality. For instance, Acemoglu (1998) suggests that the changes in labor supply of college graduates incorporate with technological advancement during that period can explain the college wage premium during the 1970s and 1980s. Acemoglu (2018) also investigate the role of technological progress toward wages and employment. The paper suggests that the new technology may replace human labor in the first place, but it could create a new task in which humans can work in complement with machines. Wage inequality will increase during the transition period but can stabilize in the long run.

Edwards and Lucke (2019) observed the UK's wage inequality changes from 1979 to 2000. The study points out the plausible cause of changes in wage inequality, including (i) trade, (ii) Skill-biased technical progress (SBTP), (iii) capital cheapening combined with capital-skill complementarity, (iv) taste parameters, (v) changes in intermediate input parameters, (vi) labor supply changes. The study used the computable general equilibrium (CGE) technique to decompose the inequality changes into each factor mentioned above. The results found that the rising supply of skilled labor negatively affects skills premium, but the effect is offset by Skill-biased technical progress, which favors skilled labor.

The distribution of wages among gender is also widely studied by the economist. For instance, Paweenawat and Liao (2019) investigate the inequality in wage among gender in the Thai labor market and factors contributing to the inequality. The results found that using the Thai Labor Force Survey (LFS) data from 1985 to 2017, the gender wage gap appears to converge. This convergence is related to many factors such as education, occupation, and industry. However, the study found an increase in inequality of wages between a woman who has and does not has children. Furthermore, the study also employs the panel data from Socio-Economic Survey (SES). The results indicate that male and female with children (i.e., has father or mother status) have lower wages than their counterparts, the phenomenon called a parenthood wage penalty.

Literature also reports the growth of wages and wage inequality in some emerging economy. Gustafsson and Wan (2020) observed the changes in wages and wage inequality in urban China by using the China Household Income Project Data from 1988, 1995, 2002, 2007, and 2013. The results show that the wage distribution substantially improves during the entire period. However, the results show an increase in the gender wage gap and the college-high school wage disparities. The data also document various changes in the labor market compared to the planned economy era, such as the middle-aged worker has higher wages than an old-age worker and wages being more correlated with education level. Wage premium also has

been found for a worker working in a foreign company or state own enterprise.

Data

This study uses the Thai Labor Force Surveys (LFS) data from 1985 to 2017. The National Statistical Office (NSO) has surveyed the LFS since 1963. The initial survey took place in the first quarter of the year, i.e., from January to March and the third quarter of the year, i.e., from July to September. Then from 1984 to 1997, the NSO extended the survey to include the second quarter, from April to June. Finally, from 1998 onward, the survey extended to include the fourth quarter, from October to December. This study uses data from the third quarter of each year since it took place during the agricultural season, where the labor force is fully employed. The LFS provides information on weekly working hours, wages, and other types of compensation, such as overtime, bonuses, and other money[1] . This study uses the above information to compute hourly labor income. The study also converts the nominal term of hourly labor income into real value by using the consumer price index with 2011 as a base year.

This paper restricts the sample set to wage earners, aged between 16 and 60, who worked at least 35 hours in the past seven days. This group of workers represents a potential workforce of the labor market. The Labor Force Survey data also provides a sample weight as a probability weight. This paper used this weight in all estimations.

The distribution of real hourly labor income from 1985 to 2017

This section provides empirical evidence of changes in the distribution of real hourly labor income from 1985 to 2017. The results include the various dimensions of distributions, i.e., the overall distribution, the distribution by gender, region, and education, respectively.

Overall distribution

This subsection presents the kernel density estimation of the real hourly labor income for four representative years, including 1985, 1995, 2005, and 2017. The graph in Figure 4 shows that labor income distributions increased over the past three decades. The distributions in the years 1995, 2005, and 2017 shifted to the right. These changes suggest an increase in overall labor income. The most significant change occurred between 2005 and 2017, where there was a dramatic increase in labor income for the entire distribution. Surprisingly, the proportion of workers who earn at the high wage position, i.e., higher than 50 baht per hour in real value, had dramatically increased during this period. This increase is in contrast with

1 The LFS also provides information on other types of in-kind compensations such as food, clothing, housing, and other money. However, the formats of these variables are not uniform across the period of study. From 1985 to 2000, these variables are dummy variable. The variable had the value of one when the worker received income and value of zero otherwise. Then from 2001, the variable indicates the monetary value of the in-kind income, which the respondent self-estimates. So, this study omits the information on in-kind compensation for the sake of consistency.

the prior period, where we observe that the shift only occurred at the lower part of wages distribution. The kernel density plot, therefore, reveals the increase of labor income in the upper part of the distribution in recent years.

Distribution by gender

The next trend of interest is the distribution of real hourly labor income by gender. Figure 5 presents the trend from 1985 to 2017 of men and women. The graph shows that there exists a gap between men and women at the beginning of 1985, where the real hourly labor income of men was higher than women. This unequal trend continued for two decades before converging in 2009. This phenomenon is consistent with existing literature in Thailand (Pooittiwong, 2016; Srisomboon, 2016) and in many other countries, e.g., Australia, China, Korea, Sri Lanka (Kennedy, Rae, Sheridan, & Valadkhani, 2017; Seneviratne, 2020; Tromp, 2019; Zhao, Zhao, Chou, & Leivang, 2019). The causes of convergence are mostly explained by the higher education of woman (Nakavachara, 2010), and the role of the minimum wage (Majchrowska & Strawiński, 2018).

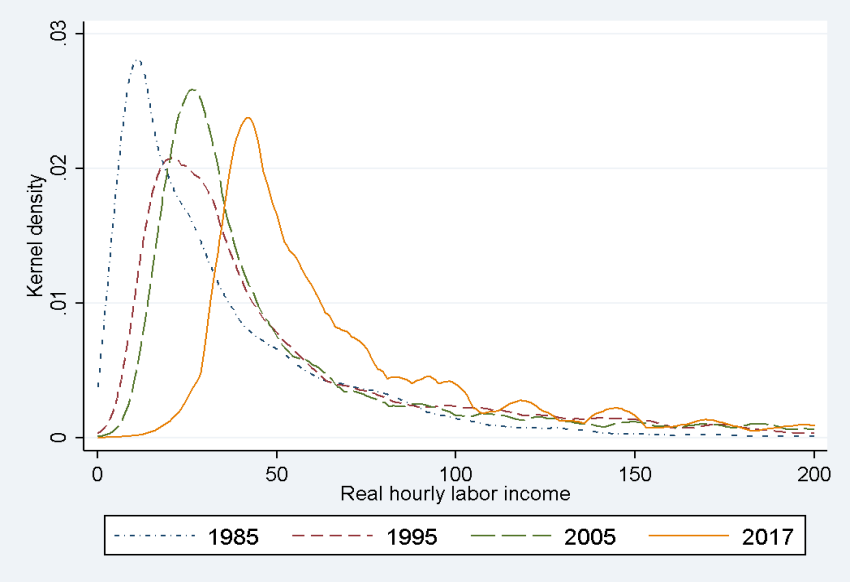

Figure *4* Kernel density estimation of real hourly labor income in 1985, 1995, 2005, and 2017

Source: Thailand Labor Force Survey (LFS), quarter 3

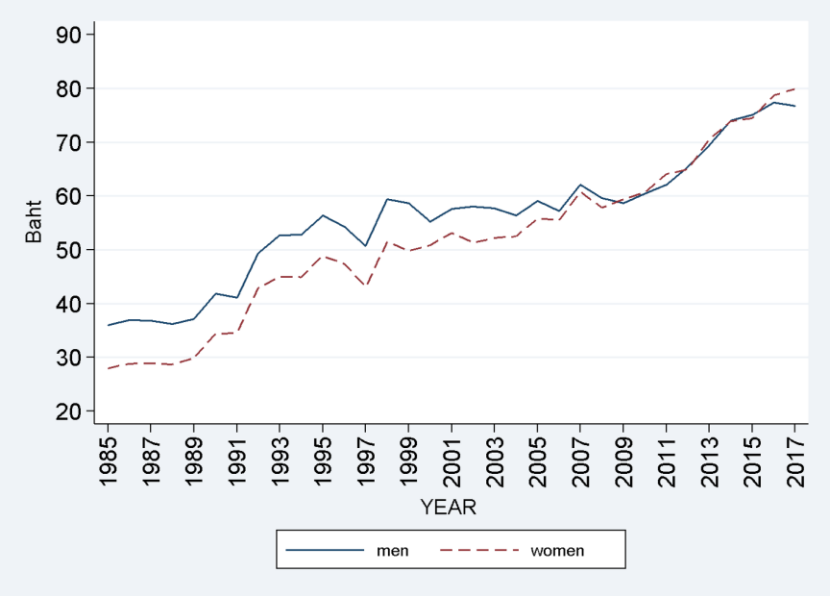

Figure *5* Real hourly labor income by gender, 1985 to 2017

Source: Thailand Labor Force Survey (LFS) data, quarter 3

Distribution by regions

Figure 6 presents the distribution from 1985 to 2017, separated by regions, including Bangkok Metropolitan, Central, North, North Eastern, and South, respectively. The graph also categorizes the distribution in each region by education level. This methodology aims to avoid bias if workers with a specific education tend to work in a specific region. The results show that Bangkok Metropolitan has the highest hourly labor income, followed by Central, South, North, and North Eastern, respectively.

The graph shows that there exists the heterogeneity of real hourly labor income between the regions; however, the gaps between regions had been relatively constant over the past three decades. Note that the gap between Bangkok Metropolitan and other regions seems to increase during the early 1990s. This result is consistent with the literature in another country where the metropolitan area has higher wages than other regions, see, e.g., South Korea (Kim, Min, & Choi, 2015).

Another interesting fact from the figure is that the average real hourly labor income of workers with zero to six years of schooling and workers with more than twelve years of schooling tends to increase. These two categories represent the educational level of primary school and higher education, respectively. The next subsection further investigates this issue by illustrating the trend of real hourly labor income by education level.

Distribution by education level

This section further investigates the distribution of real hourly labor income by workers' education. The results in Figure 7 show that the hourly labor income of workers with primary education and higher education increased. Note that the trends of wages for workers with seven to nine and ten to twelve years of schooling were relatively stable across the past three decades. These two education levels represent lower-secondary and upper-secondary, respectively.

Figure 8 confirms the facts in Figure 7 by presenting the percentage change of real hourly labor income in each education level. The results show that the changes for workers with zero to six years of schooling and more than twelve years of schooling are substantial, compared to other education groups. The increase in real value is ninety-five percent and seventy-six percent for those two education levels, respectively. This phenomenon has also been recognized in the United States labor market, where wage increases were polarized into high and low skills workers (Autor, Katz, & Kearney, 2006). The question that arises here is, what would be the cause of these increases?

Existing literature in Thailand points out that an increase in demand for highly educated workers plays a role in an increase in wages at the top-end of distribution from 1987 to 2006 (Lathapipat, 2011), while the minimum wage helps compress the wages in the lower part of the distribution from 1985 to 2010 (Leckcivilize, 2015). In this paper, the author proceeds to investigate this issue with real hourly labor income and more recent data. The next section provides the empirical estimation to see how much the results of changes in labor demand can explain the changes in labor prices from 1985 to 2017.

Change in labor demand from 1985 to 2017

This section provides the empirical test for the demand changes from 1985 to 2017 of workers at each education level. The changes in demand were measured in the form of demand shift index (Katz & Murphy, 1992), shown in equation (3) as follows,

$$\Delta X_k^d = \frac{\sum_j \alpha_{jk} \Delta E_j}{E_k}, \quad (3)$$

where ΔX_k^d denotes the demand shift index for workers in education level k, α_{jk} denotes the average share of total employment in sector j and education level k over the 1985 to 2017 period, ΔE_j denotes the change of employment share in sector j, and E_k denotes the employment share of group k between 1985 to 2017, respectively. The author computed the overall-industry demand

shift indexes by using equation (3) and categorizing sector *j* based on the industry-occupation group and computed the between-industry demand shift indexes by categorizing sector *j* based on the industry group. Then the author computed the within-industry demand shift indexes by subtracting the between-industry demand shift indexes from the overall-industry demand shift indexes. The overall demand shift indexes reflect the change in employment among the various groups of industries and occupations. In contrast, the between-industry demand shift indexes reflect the changes in employment among the various industries. Also, the within-industries demand shift indexes reflect the changes in employment among occupations within industries (Katz & Murphy, 1992).

Table 10 presents the demand shift indexes during the full period from 1985 to 2017 as well as the sub-periods from 1985 to 1995, 1995 to 2005, and 2005 to 2017, respectively. The author also summarizes the overall demand shift index in the graphs, where Figure 9 and Figure 10 present the overall demand shift indexes for men and women, respectively. The results of the overall-period from 1985 to 2017 clearly show that the demand shifts for overall industries are in favor of workers with thirteen or more years of schooling—workers with higher education. The demand shift indexes for workers in this group are positive and substantial. The demand shift of this group is in contrast with the other lower education groups, where the shifts are mostly negative, suggesting the reduction in demand. Note that the negative changes are most considerable for the workers with primary and secondary school education, respectively. These trends are similar for both men and women.

The results on the sub-period reveal the increase of labor demand for workers with lower and upper-secondary education in recent decades. The results in panel C show that the labor demand for these two groups increased from 1985 to 2017, while the results in panel B also suggest a small increase for the upper secondary education. Note that the demand for workers with higher education increased in all periods.

Table 10 also shows that the trends of within-industry are consistent with the overall industry. The within-industry demand shifts for workers with primary and secondary education are negative, while the shifts for workers with higher education are positive and substantial. This within-group demand shift indicates that the employment trend within the industry was moving toward higher education workers – workers who received college or university education. These full-period trends are consistent for both men and women.

The final part of the results presents the between-industry demand shift. The results show that the higher the workers' education level is, the higher the demand for workers. Workers with college or university education have maximum demand growth while workers with primary education have the least. Note that the demand shift for women with lower-secondary education is higher than the upper-secondary level in some sub-periods. The women's trend of demand shift is different from men, which exhibit the monotonically increasing among education levels.

At this point, it is reasonable to conclude that the increase in real hourly labor income of higher education workers is due mainly to the increase in labor demand. However, the demand for primary education workers did not increase as expected. The demand shifts for this group of workers show negative signs, which suggest a reduction in demand. In the next section, the author further discusses the cause of the increasing labor income of the primary-educated workers from non-market factors, i.e., the minimum wage. The author also further discusses the possible cause of an increase in demand for higher education workers based on Skill Biased Technology Change (SBTC).

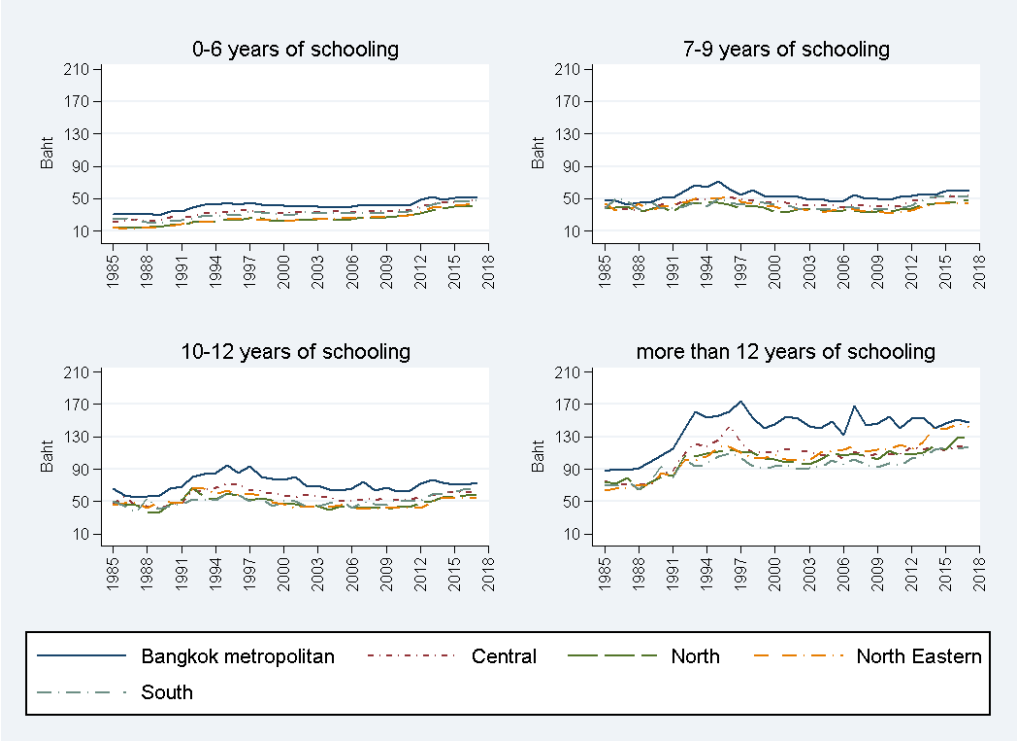

Figure *6* Real hourly labor income by region 1985 to 2017

Source: Thailand Labor Force Survey (LFS) data, third quarter

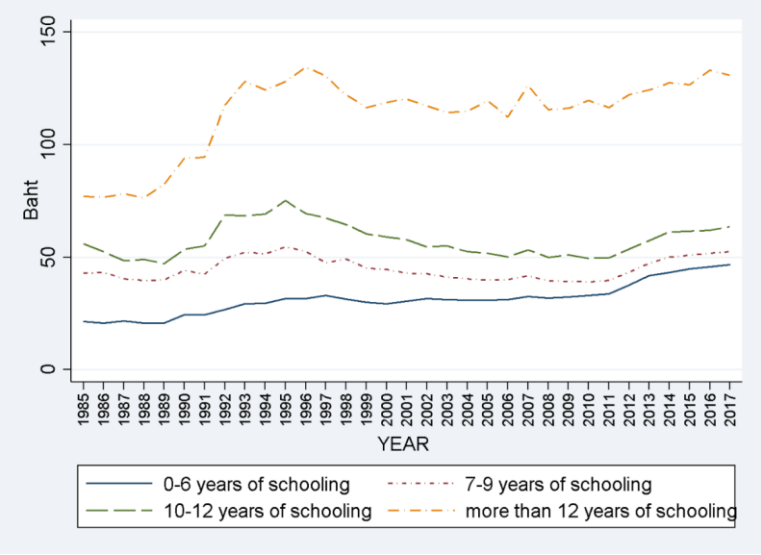

Figure *7* Real hourly labor income by education level from 1985 to 2017

Source: Thailand Labor Force Survey (LFS) data, quarter 3

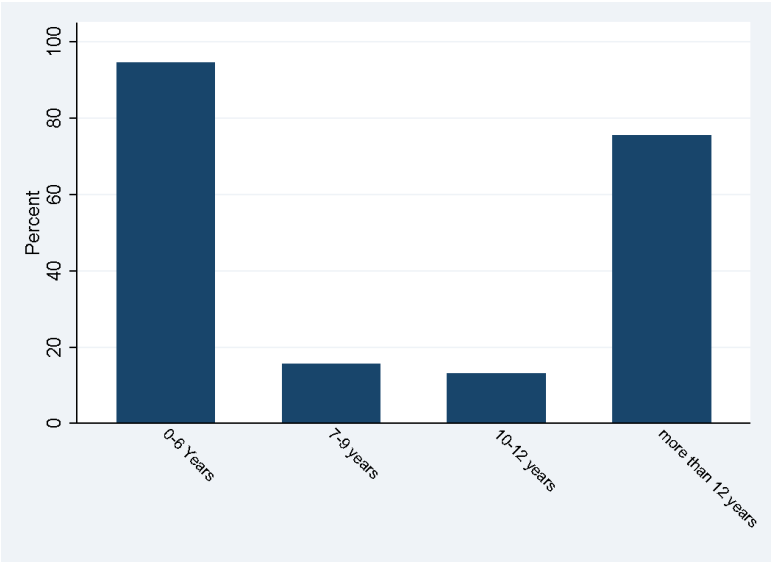

Figure *8* Percentage changes in real hourly labor income from 1985 to 2017, by education level

Source: Thailand Labor Force Survey (LFS) data, quarter 3

Table *10* Industry and Occupation Based Demand Shift Measure, 1985 to 2017

	Change in log relative demand (multiplied by 100)											
	Between Industry				Within industry				Overall (industry and occupation)			
Group	85-95	95-05	05-17	85-17	85-95	95-05	05-17	85-17	85-95	95-05	05-17	85-17
Men												
Primary school (0-6 years)	-0.91	0.38	0.39	-0.15	-3.00	-0.96	-2.61	-5.76	-3.91	-0.58	-2.22	-5.91
Lower secondary (7-9 years)	-0.14	1.00	0.85	2.24	-1.12	-5.59	1.53	-4.90	-1.26	-4.59	2.38	-2.66
Upper secondary (10-12 years)	1.00	2.83	0.87	3.58	-2.46	-1.20	1.88	-4.82	-1.46	1.64	2.75	-1.24
Higher education (13+ years)	1.20	2.09	0.00	4.12	2.01	5.19	4.53	2.53	3.21	7.28	4.53	6.65
Women												
Primary school (0-6 years)	-0.12	-1.36	1.37	0.10	-1.54	0.10	-2.83	-5.72	-1.66	-1.26	-1.46	-5.62
Lower secondary (7-9 years)	1.03	0.32	2.69	4.38	-1.84	-0.35	-0.75	-7.17	-0.81	-0.03	1.93	-2.78
Upper secondary (10-12 years)	0.37	0.49	2.32	3.76	-2.71	2.99	6.53	-5.82	-2.35	3.49	8.85	-2.06
Higher education (13+ years)	1.70	2.09	0.60	4.40	-4.42	5.64	3.74	0.73	-2.71	7.73	4.34	5.13

Discussion

In the last section, the results on the demand shift index indicate that the increase in primary school workers' labor income does not come from the increase in labor demand. However, there exists another explanation, i.e., the increase in the minimum wage. Literature suggest the role of the minimum wage in raising the wages of workers, especially for a worker earning at the bottom of the wage distribution (Adams, Schweitzer, & Wascher, 2000; Wascher, 2015). This explanation seems consistent with the empirical data of the Thai labor market. Figure 11 presents the trends of real hourly labor income and the real hourly minimum wage from 1985 to 2017, showing that the real hourly labor income and real hourly minimum wage tend to move in the same direction. This result is consistent with the existing study, which found that minimum wage helps compress wages at the bottom of the wage distribution (Leckcivilize, 2015). This evidence suggests that the minimum wage contributes to an increase in the labor price of primary school-educated workers.

In the preceding section, the results of the demand shift indexes support the explanation that an increase in demand for workers with higher education leads to an increase in their labor price. An immediate question arises here is what would be the cause of this demand increase? One possible explanation is the Skill-Biased Technological Change (SBTC) hypothesis. The hypothesis states that technological advancement replaced the physical labor who did a routine-task with a machine. It also creates a new task that requires workers to work in tandem with machines. (Acemoglu, 1998; Acemoglu & Restrepo, 2018; Katz & Murphy, 1992).

This argument is supported by empirical evidence, where

Table **11** shows an increase in employment for workers who cannot be

replaced by a machine such as skilled workers, professional workers, service workers, and plant and machine operators. The employment in industries with complex and non-routine tasks such as commercial, manufacturing, and construction also increased. These occupations and industries are likely to require workers and modern technology or machines to work together.

Higher education may support workers to work with modern technology and machines by providing them with *general skills*. General skills allow workers to work in various types of firms and do various types of tasks (Becker, 1967). These general skills may include critical thinking, essential knowledge such as mathematics and English language, and other skills such as communication and team organization. This set of skills allows workers to perform a complex, non-routine, and problem-solving task, the task which the modern computer and machine cannot accomplish yet. Therefore, the demand for workers with higher education increased from 1985 to 2017. This finding is consistent with the prior study, which suggests the role of SBTC in the Thai labor market (Lathapipat, 2011).

The other results in this paper can compare to recent literature as follow. For the study in Thailand, Wasi et al. (2019) found that the wage gap between college and high school has widened over time. This result is in line with this paper, which uses labor income instead of a regular wage. This paper shows that the labor income of workers with a college education has substantially increased compared to the lower education worker.

This result is also consistent with a study in China. Gustafsson and Wan (2020) found the increasing disparity of wages between college and high school. However, the gender wage gap in China has also increased. This result contrasts with this study which found that the gender wage gap has substantially decreased in Thailand. This result is consistent with Paweenawat and Liao (2019) which found that the gender wage gap appears to converge.

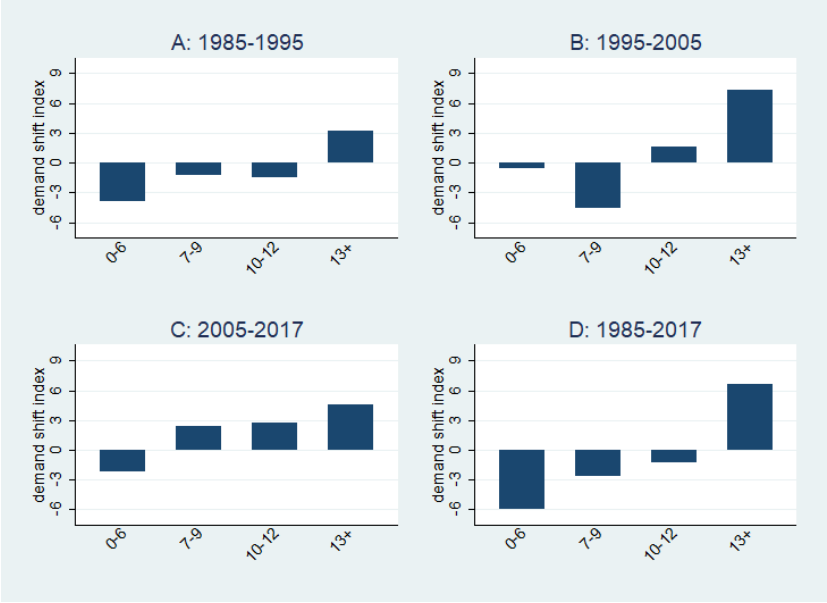

Figure *9* The overall industries demand shift index for men

Figure *10* The overall industry demand shift index for women

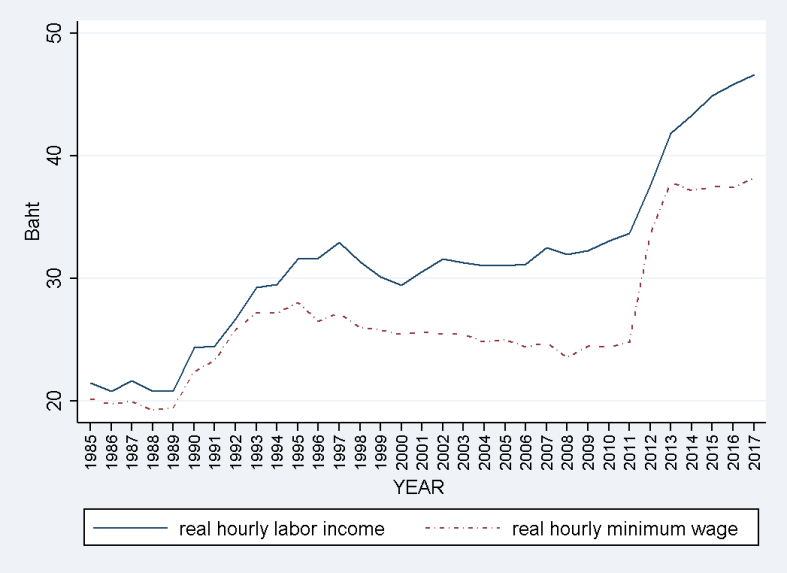

Figure *11* Real hourly labor income of workers with zero to six-year of schooling and real hourly minimum wage, 1985 to 2017

Table 11 Overall industries and occupation employment distribution, 1985-2017

	Percentage of employment shares				
	85-95	95-05	05-17	85-17	Full Period Change
Industry					
Agriculture, hunting, fishing	14.11	8.83	6.59	7.74	-6.38
Commercial	0.16	0.26	18.14	24.92	24.75
Construction	1.58	1.54	10.08	14.26	12.68
Manufacturing	19.85	21.21	26.09	35.89	16.04
Mining and quarrying	0.56	0.41	0.29	0.59	0.03
Others	0.06	0.02	4.47	1.70	1.64
Services	49.90	49.99	32.82	9.70	-40.21
Transport and communication	5.11	3.81	0.63	3.60	-1.51
Utilities	8.67	13.93	0.90	1.61	-7.06
Occupation					
Agricultural and fishery workers	14.11	9.30	3.28	2.05	-12.07
Clerks	11.90	11.16	9.42	8.00	-3.90
Managers and legislators	3.86	3.66	3.13	4.80	0.95
Plant and machine operators	7.37	6.59	15.45	15.40	8.04
Professionals	0.22	15.55	12.17	11.98	11.76
Service workers	6.36	6.03	12.66	16.19	9.83
Skilled workers	2.13	1.71	15.78	15.14	13.01
Technicians	26.03	20.75	10.12	7.97	-18.06
Unskilled workers	28.01	25.25	18.00	18.46	-9.55

Conclusion

This study investigates the changes in the distribution of the real hourly labor income in the Thai labor market from 1985 to 2017. The study found that the overall labor income distribution improved over the past three decades, suggesting that workers had received higher labor income. The results also suggest a reduction in the earnings gap between men and women.

Women's labor income has risen and converged with men since 2009. It also revealed the disparity of labor income among the regions, where the Bangkok Metropolitan ranks at the top and the North and Northeast at the bottom. The distributions by education levels reveal that the real hourly labor income of workers with primary school and higher education increased.

This study evaluated the cause of this increase according to changes in labor demand. The results indicated that demand for workers with primary school education had reduced; hence

the increase in their labor price is due to the increase of minimum wage. However, the demand shift index indicates a substantial increase in labor demand for workers with higher education. The evidence of the industry-occupational distribution of workers supports the explanation of demand increase due to Skills-Biased Technological Change: SBTC.

Limitations and future research

It is worth noting some limitations in this paper and the direction for study in the future. First, this paper shows the stylized facts about the change in labor income distribution in some key dimensions, such as overall distribution, distribution by gender, and region respectively. However, this paper did not investigate the factor associated with the change in these distributions. The study in the future can examine these factors. For instance, see Suphanachart (2019) for investigating factors affecting overall income inequality in the Thai labor market and Edo & Toubal (2017) for examine the effect of immigration on the gender wage gap in France. Having more detail on factors affecting labor income inequality in the Thai labor market will provide a more in-depth understanding of the labor market and support policy implications more effectively.

Second, the Thai government has implemented the policy to adjust the base salary of bachelor's degree graduates to reach 15,000 baht starting from January 2012. The policy has been implemented for government employees, but we can expect the spill-over effect to other sectors or the entire labor market as well. The analysis in this paper did not account for this policy yet. The study in the future can evaluate the role of this policy toward the changes in labor income of college graduates and the overall distribution.

Managerial, business, and public policy implication

The results in this paper show that workers' labor income has been increasing over the past three decades.

The increase occurs dramatically for the bottom and top of the distribution. The industries-occupations employment distribution also changes in favor of high-skills workers. These changes imply that Thailand is no longer an economy that relies on cheap physical labor. The recommendation of this paper is that for business to survive the competition, in the long run, firms and companies should adapt their production process to utilize more capital, such as modern technology and machines, and rely less on physical labor. Using high-skill workers to complement modern production technology will reduce the cost and improve firms' productivity and competitiveness in the long run.

In addition, the increase in labor demand and labor income for higher education may induce more students who finish high school to continue to study in higher education. For some students with financial obstacles, the government should support students by providing financial tools such as scholarships or student loan funds that provide loans base on student needs and market labor demand.

References

Acemoglu, D. (1998). Why do new technologies complement skills? Directed technical change and wage inequality. *Quarterly Journal of Economics*, *113*(4), 1055–1089.

Acemoglu, D., & Restrepo, P. (2018). The race between man and machine: Implications of technology for growth, factor shares, and employment. *American Economic Review*, Vol. 108, pp. 1488–1542.

Adams, S., Schweitzer, M., & Wascher, W. (2000). The Effects of Minimum Wages Throughout the Wage Distribution. *NBER Working Paper Series*, *39*(2), 39.

Autor, D. H., Katz, L. F., & Kearney, M. S. (2006). The polarization of the US labor market. *The American Economic Review*, *96*(2), 189–194.

Becker, G. S. (1967). Human Capital, A Theoretical and Empirical Analysis with Special Reference to Education. In *Revue économique* (Vol. 18).

Edo, A., & Toubal, F. (2017). Immigration and the gender wage gap. *European Economic Review*, *92*, 196-214.

Edwards, T. H., & Lücke, M. (2019). Decomposing the growth of the high-skilled wage premium in an advanced economy open to trade. *The Quarterly Review of Economics and Finance*.

Gallen, Y., Lesner, R. v., & Vejlin, R. (2019). The labor market gender gap in Denmark: Sorting out the past 30 years. *Labour Economics*, *56*, 58–67.

Gharehgozli, O., & Atal, V. (2020). Revisiting the gender wage gap in the United States. *Economic Analysis and Policy*, *66*, 207–216.

Gustafsson, B., & Wan, H. (2020). Wage growth and inequality in urban China: 1988–2013. *China Economic Review*, 101462.

Hara, H. (2018). The gender wage gap across the wage distribution in Japan: Within- and between-establishment effects. *Labour Economics*, *53*, 213–229.

Katz, L. F., & Murphy, K. M. (1992). Changes in Relative Wages, 1963-1987: Supply and Demand Factors. *The Quarterly Journal of Economics*, *107*(1), 35–78.

Kennedy, T., Rae, M., Sheridan, A., & Valadkhani, A. (2017). Reducing gender wage inequality increases economic prosperity for all: Insights from Australia. *Economic Analysis and Policy*, *55*, 14–24.

Kim, K. S., Min, I., & Choi, Y. S. (2015). Dynamic decomposition of regional wage differentials in Korea. *Social Science Journal*, *52*(3), 311–321.

Lathapipat, D. (2011). Changes in the Thai Wage Structure Before and after the 1997 Economic Crisis. *SSRN Electronic Journal*.

Leckcivilize, A. (2015). Does the minimum wage reduce wage inequality? Evidence from Thailand. *IZA Journal of Labor and Development*, *4*(1), 21.

Majchrowska, A., & Strawiński, P. (2018). Impact of minimum wage increase on gender wage gap: Case of Poland. *Economic Modelling*, *70*, 174–185.

Nakavachara, V. (2010). Superior female education: Explaining the gender earnings gap trend in Thailand. *Journal of Asian Economics*, *21*(2), 198–218.

Paweenawat, S., & Liao, L. (2019). Parenthood Penalty and Gender Wage Gap: Recent Evidence from Thailand.

Petrongolo, B., & Ronchi, M. (2020). Gender gaps and the structure of local labor markets. *Labour Economics*, 101819.

Pooittiwong, A. (2016). Three Essays on Gender Wage Gap. *ProQuest Dissertations and Theses*, p. 223.

Seneviratne, P. (2020). Gender wage inequality during Sri Lanka's post-reform growth: A distributional analysis. *World Development*, *129*.

Srisomboon, R. (2016). Market interruption and gender earning gap in Thai labor market. *UTCC International Journal of Business & Economics*, *8*(1), 103–132.

Suphannachart, W. (2019). Effects of Technological Change on Income Inequality in Thailand. *Southeast Asian Journal of Economics*, *7*(2), 85-106.

Tromp, N. (2019). The narrowing gender wage gap in South Korea. *Journal of the Japanese and International Economies*, *53*.

Wascher, W. (2015). Minimum Wages. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*.

Wasi, N., Paweenawat, S. W., Ayudhya, C. D. N., Treeratpituk, P., & Nittayo, C. (2019). Labor Income Inequality in Thailand: the Roles of Education, Occupation and

Employment History. *Bangkok: Puey Ungphakorn Institute for Enonomic Research*.

Zhao, X. Z., Zhao, Y. B., Chou, L. C., & Leivang, B. H. (2019). Changes in gender wage differentials in China: a regression and decomposition based on the data of CHIPS1995–2013. *Economic Research-Ekonomska Istrazivanja*, *32*(1), 3162–3182.

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THE EFFECTS OF ELECTRONIC WORD-OF-MOUTH (EWOM), PERCEIVED EASE OF USE, PERCEIVED USEFULNESS AND PERCEIVED RISK ON ONLINE HOTEL BOOKING APPLICATION LOYALTY OF YOUNG CONSUMERS

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Abstract

Customers adopted and used the online hotel booking application to reserve the hotels with the current business environment. In addition, the young consumers represented the new group of tourists with familiarity with the online business environments. Therefore, understanding the factors affecting their loyalty towards the hotel booking applications is highly useful for developing and improving their services effectively. The questionnaires were used to collect the data and 490 young consumers participated in the current study. The current study explored the effects of electronic Word-of-Mouth (EWOM), perceived risk, perceived ease of use, and perceived usefulness towards application loyalty for online hotel booking. The results indicated that perceived ease of use provided the strongest influence on application loyalty, followed by electronic Word-of-Mouth (EWOM), perceived usefulness, respectively, while perceived risk had no significant effect on application loyalty. Online hotel booking application developers and hotel managers should focus on the user-friendliness of the application. Furthermore, providing helpful information, reviews, and comments regarding the hotel services and tourism destinations can affect the application loyalty. Discussions with the past literature and conclusions as well as detailed recommendations were provided.

Introduction

Online services are a crucial part of our everyday life, ranging from shopping online, e-commerce, and online learning (Fan & Miao, 2012; Dimensions of Perceived Usefulness: Toward Enhanced Assessment, 2007; T. Zhang et al., 2019). In the context of tourism and hospitality, the hotel industry has relied heavily on the service of online travel agencies (OTA) to support hotel room reservation activities and to communicate with online consumers (Belarmino & Koh, 2018; Falk & Vieru, 2018).

Due to the higher competition among hotels and other accommodations, the hotel businesses face challenging times to attract new customers and retain current customers to use or reuse the hotel services (Moliner-Velázquez et al., 2019). In addition, the intensive application of online travel agencies (OTA) has been increasingly crucial among the hotel managers, and many hotels consider the adoption of OTA as the principal channel to provide hotel rooms to the customers (Chang et al., 2018; Zhang et al., 2014). Furthermore, the rise of new hotels and accommodations forces the hotel managers to find new ways to develop their marketing strategies to outperform their competitors. With the popularity of online hotel booking and the fast-growing group of young consumers, hotel businesses need to ensure the effectiveness of the online hotel booking applications that those applications meet with the young customers' demand, leading to a long-term relationship and higher loyalty towards the booking applications.

The research question was "What are the most influential factors (e.g. Electronic Word-of-Mouth, perceived risk, perceived ease of use and perceived usefulness) affecting the online hotel booking application loyalty?". The objective of the current study was to identify the effects of electronic Word-of-mouth, perceived risk, perceived ease of use, perceived usefulness in the context of online hotel booking, and their effects on application loyalty. The benefits of the study can help the practitioners improve the quality of hotel booking applications to enhance the loyalty toward using the application to book the hotel and accommodations in the long run. The past research studies highlighted that young consumers are the primary users of online applications and bookings (Kucukusta et al., 2015).

The young generation of hotel customers represents the fast-growing group with high purchasing power, and understanding their intention or behaviors can be helpful to predict their purchasing behaviors (Anubha & Shome, 2020). This current study emphasizes the young generations and their loyalty towards online hotel booking applications.

Literature review

This part provided the details of the definitions and background of major keywords used in the current study, including online hotel booking or electronic booking, electronic Word-of-Mouth (EWOM), perceived ease of use, perceived usefulness, perceived risk, and application loyalty.

Electronic or online hotel booking

Online hotel booking, also known as electronic booking (e-booking), has become the primary method for customers to search and find the potential hotels of their choices for their vacations or business travel purposes (Akhtar et al., 2020; Gulati, 2021; Yan et al., 2018). In addition, online booking for hotel rooms or accommodation has become more common in recent years, compared to traditional booking or booking directly at the hotel. The use of online travel agencies (OTA) is widespread among tourists worldwide (Kirillova & Chan, 2018). Online booking usually was conducted via smartphone application when the customers make the room reservation(Bae et al., 2020).

Application loyalty (Online hotel booking application loyalty)

Loyalty can be defined as one of the ultimate goals of all businesses to retain and to have their customers reuse, to revisit, to speak positively about the products and services, to encourage others to adopt or to use the products, and to recommend people around them to use the products (Bender Stringam & Gerdes, 2010; R. Lee et al., 2009; Ramanathan, 2012; Young et al., 2017). Online hotel booking application loyalty in this study can be defined as the attitudinal and behavioral intention of the consumers to continue to use and reuse the online hotel booking application to reserve the hotels or accommodations in the future (Hwang & Kandampully, 2012; S. Lee & Kim, 2021; Ryu et al., 2014).

Electronic Word-of-Mouth (EWOM)

Electronic Word-of-Mouth (EWOM) becomes the familiar word with the use of the Internet and social media to offer the information or to receive the information, and it is known to be a highly effective method in marketing and business management in the past decades (Breazeale, 2009; J. H. Chang & Wang, 2019; Reza Jalilvand & Samiei, 2012; Y. Zhang et al., 2021). The consumers adopted the information, comments, reviews, and other details regarding the products or services via the Internet, websites, or social media platform as a new trend in the lifestyles, especially for young generations (Abubakar et al., 2017; Suwandee et al., 2020)

Perceived risk

Perceived risk refers to the degree that a consumer believes that there is a probability of loss concerning the transactions or activities that one has to do or participate in, such as the privacy risk or product failure from using mobile applications (Kang & Namkung, 2019). Furthermore, perceived risk represented consumers' perception towards uncertain situations or negative consequences from their buying or consumption experiences (Ozturk, 2016). The perceived risk can also reflect the consumers' beliefs about the potentially negative experiences from the transactions from purchase either from online or offline experiences (Aldás-Manzano et al., 2009; Hadjikhani et al., 2011; Vida et al., 2012). The greater the degree of perception towards risk leads to the lower the probability of purchasing, consuming, or adopting the

products or services. Moreover, the concept of perceived risk has been used in the past research with its effects on intention to purchase, satisfaction, and loyalty (Chaudhuri, 1997; Hogg Margaret Bruce & Hill, 1998; Schlaegel, 2015; Tzavlopoulos et al., 2019). In addition, the importance of perceived risk has been raised in the context of consumer decision to book a hotel. (Bae et al., 2020; Chen et al., 2017)

Perceived ease of use

The technology acceptance model (Bae et al., 2020; Davis, 1989) stated the key factors, such as perceived ease of use and perceived usefulness when the users intend to use or use the new product, service of new technology (Akturan & Tezcan, 2012; Kucukusta et al., 2015; Park & Huang, 2017). Perceived ease of use and perceived usefulness are considered essential determinants of behavioral intention and loyalty (Daud et al., 2018; Van Der Heijden, 2004). Empirical research studies indicated that perceived usefulness and perceived ease of use showed the influence on intention to book online (Kucukusta et al., 2015). Moreover, perceived ease of use showed a significant relationship with customer loyalty (Lin et al., 2019; Tzavlopoulos et al., 2019)

Perceived usefulness

The term of perceived usefulness represented the extent to which one perceived or believed that the adoption of a product or service can improve their performance or achieve better outcomes (Aldás-Manzano et al., 2009; Calisir et al., 2009; Flavian et al., 2020; Reza Jalilvand & Samiei, 2012). Furthermore, perceived usefulness can lead to the intention to reuse or can have an impact on the satisfaction and loyalty of the customers (Ramayah et al., 2009). Furthermore, the relationship between perceived usefulness and loyalty is considered crucial to developing the long-term relationship between the business entity and the customers(Amoroso & Ogawa, 2013; Cha & Seo, 2020).

Research hypotheses

According to the past literature, the research hypotheses were developed as follows;

H1: Electronic Word-of-Mouth has a positive influence on Application Loyalty

H2: Perceived ease of use has a positive influence on Application Loyalty

H3: Perceived usefulness has a positive influence on Application Loyalty

H4: Perceived risk has a negative influence on Application Loyalty

The conceptual model based on the research hypotheses was presented as shown below.

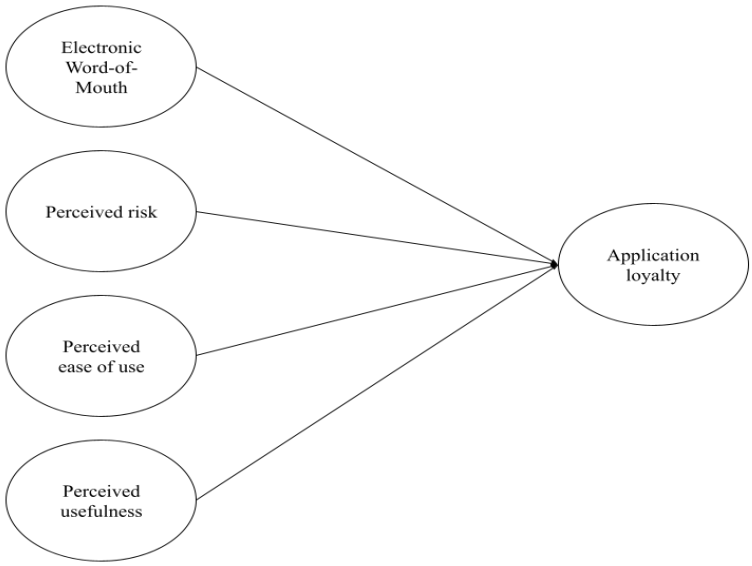

Figure 1 Conceptual model

Research methodology

The questionnaires were distributed to the college students to investigate the responses towards the factors including electronic Word-of-Mouth (EWOM), perceived ease of use, perceived usefulness, perceived risk, and hotel booking application loyalty. All the participants had the experiences with the online hotel booking applications, such as Agoda and Booking.com. The questionnaires were developed by adopting and modifying the questions from the past literature. The 490 usable questionnaires were analyzed by descriptive statistics and multiple regression with SPSS software.

Results

From the data collected in the current study, out of 490 college students, male respondents were 49.50%, and female respondents were 50.50%. Students from year 1 to year 4 participated in the study, while the third-year students represented 28.00%, 26.00% of the fourth-year students, 21.50% of the second-year students, and the rest was the first-year students. For the online hotel booking applications, the participants were asked to report the most frequently used application, and the participants used Agoda (35.50%), Booking.com (25.50%), Traveloka (20.50%), Expedia (15.00%), and other applications (3.50%). Moreover, in terms of the use of EWOM, most respondents reported that the most frequently used social media platform were as follows, YouTube (39.00%), Instagram (33.00%), Facebook (20.50%), and other applications (7.50%).

Table 1 Means, Standard deviation, Cronbach's alpha of the factors

	Mean	Std. Deviation	Cronbach's alpha	Number of Items
Application Loyalty	4.09	0.83	0.85	4
Electronic Word of Mouth (EWOM)	4.15	0.88	0.81	4
Perceived Risk	3.03	0.93	0.78	4
Perceived Ease of Use	3.85	0.89	0.83	4
Perceived Usefulness	4.45	0.84	0.84	4

From the above Table 1, each factor offered the acceptable reliability values (Cronbach's alpha), ranging from 0.78 to 0.85. The mean scores of the factors were between 3.03 and 4.45. The scales of the above factors were provided in the Appendix.

Table 2 Model summary and ANOVA

Model Summary						ANOVA	
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
1	.891	.793	.792	.37980	1.952	465.561	.000

Based on Table 2 above, the F-value of 465.561 and the ANOVA test showed the significant value of 0.000, indicating the appropriate regression model. R Square indicated that 79.30% of the Electronic Word-of-Mouth (EWOM), Perceived Risk, Perceived Ease of Use, and Perceived Usefulness can explain the variation of application loyalty. Additionally, Durbin-Watson was closer to the value of 2, indicating no autocorrelation issues for the data.

Table 3 Regression model results

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.354	.095		3.717	.000		
	Electronic Word of Mouth (EWOM)	.300	.033	.319	9.006	.000	.340	2.941
	Perceived Risk	-.003	.016	-.004	-.189	.851	.944	1.060
	Perceived Ease of Use	.344	.030	.372	11.428	.000	.402	2.485
	Perceived Usefulness	.288	.035	.291	8.221	.000	.341	2.933

a. Dependent Variable: Application Loyalty

From Table 3 above, the variance inflating factors (VIFs) for all the factors were less than 10, proving that the model had no multicollinearity issues. Regarding the standardized coefficients, perceived ease of use provided the highest influence (.372) on application loyalty, followed by EWOM (.319), Perceived usefulness (.291), while perceived risk had no significant effect on application loyalty.

Discussions

The results from regression analysis provided the empirical outputs for the study. Firstly, from *H1: Electronic Word-of-Mouth has a positive influence on Application Loyalty*; EWOM indicated a significant influence on application loyalty, similar to the works of other scholars (Ismagilova et al., 2017; Tzavlopoulos et al., 2019). Secondly, for *H2: Perceived ease of use has a positive influence on Application Loyalty*, the research findings also confirmed this hypothesis. The studies of past empirical studies (Daud et al., 2018; Lin et al., 2019) indicated similar findings. Thirdly, regarding *H3: Perceived usefulness positively influences Application Loyalty*, the perceived usefulness showed the statistically significant effect on the application loyalty. Past research studies confirmed the current study's findings (Bae et al., 2020; Daud et al., 2018; Lin et al., 2019). Lastly, for the last hypothesis, *H4: Perceived risk has a negative influence on Application Loyalty*, although several past research studies (Chaudhuri, 1997; Tzavlopoulos et al., 2019) indicated the negative relationship between perceived risk and loyalty. However, the current study showed no influence of perceived risk and application loyalty.

Conclusions and managerial recommendations

The current study achieved its objective in identifying the influential factors affecting application loyalty. The research contribution from the current study includes the followings. Perceived ease of use offered the most significant effect on application loyalty. It demonstrated that the online hotel booking application developers should emphasize and improve the functions and features of the application with the concept of designs and ease of use as a focus of their development for the hotel booking applications. Perceived usefulness showed a significant and positive effect on application loyalty, showing that it is not only the functionality and effectiveness of the application to complete its functions but the provision of additional information, reviews, comments, and other details, such as recommendations of restaurants and tourism destinations around the hotels or other helpful information reflecting the usefulness of the application for the young consumers. All the application improvements should lead to reuse and long-term loyalty of the customers towards the online hotel booking application.

Next, managers of the application development business should improve the strategies to attract the customers to visit and re-booking the hotels or accommodations by focusing on the adoption of social media and frequent

updates of the contents, and offering tips and tricks to highlight the advantages and benefits of their stays at those hotels and accommodations. Further, it is beneficial for the hotel business to emphasize effective communication of useful information with clear and concise content to offer to their customers. Additionally, social media marketers, hotel managers, and application developers should always learn the new tools and technology to meet the expectations and demands of their customers to ensure that the customers can easily find the features and functions to help them make better decisions to select the hotel choices.

Limitations and directions for future research

The current research is not without limitations. Firstly, the research adopted a cross-sectional research design, and therefore, generalization of the findings, in the long run, should be used with caution. Secondly, the research was conducted with self-administered questionnaires, and there might be some errors due to the lack of supervision during data collection. Regarding direction for future research, qualitative research should be further continued on this topic to understand the insights or additional reasons behind the influential relationships of these factors in the current study. In addition, the comparisons among young, middle-aged, and mature consumers may provide greater understandings for different groups and segmentations of the customers.

References

Abubakar, A. M., Ilkan, M., Meshall Al-Tal, R., & Eluwole, K. K. (2017). eWOM, revisit intention, destination trust and gender. *Journal of Hospitality and Tourism Management*, *31*, 220–227. https://doi.org/10.1016/j.jhtm.2016.12.005

Akhtar, N., Siddiqi, U. I., Akhtar, M. N., Usman, M., & Ahmad, W. (2020). Modeling attitude ambivalence and behavioral outcomes from hotel reviews. *International Journal of Contemporary Hospitality Management*, *32*(9), 2831–2855. https://doi.org/10.1108/IJCHM-11-2019-0962

Akturan, U., & Tezcan, N. (2012). Mobile banking adoption of the youth market. *Marketing Intelligence & Planning*, *30*(4), 444–459. https://doi.org/10.1108/02634501211231928

Aldás-Manzano, J., Lassala-Navarré, C., Ruiz-Mafé, C., & Sanz-Blas, S. (2009). Key drivers of internet banking services use. *Online Information Review*, *33*(4), 672–695. https://doi.org/10.1108/14684520910985675

Amoroso, D. L., & Ogawa, M. (2013). Comparing mobile and internet adoption factors of loyalty and satisfaction with online shopping consumers. *International Journal of E-Business Research*, *9*(2), 24–45. https://doi.org/10.4018/jebr.2013040103

Anubha, & Shome, S. (2020). Intentions to use travel eWOM: mediating role of Indian urban millennials' attitude. *International Journal of Tourism Cities*, *ahead-of-p*(ahead-of-print). https://doi.org/10.1108/IJTC-04-2020-0073

Bae, S., Mo Kwon, J., & Bosley, A. (2020). Factors influencing consumers' rejection to smartphone transactions in the lodging industry. *International Hospitality Review*, *34*(1), 29–40. https://doi.org/10.1108/IHR-09-2019-0020

Belarmino, A. M., & Koh, Y. (2018). How E-WOM motivations vary by hotel review website. *International Journal of Contemporary Hospitality Management*, *30*(8), 2730–2751. https://doi.org/10.1108/IJCHM-02-2017-0055

Bender Stringam, B., & Gerdes, J. (2010). Are pictures worth a thousand room nights? Success factors for hotel web site design. *Journal of Hospitality and Tourism Technology*, *1*(1), 30–49. https://doi.org/10.1108/17579881011023007

Breazeale, M. (2009). FORUM - Word of Mouse - An Assessment of Electronic Word-of-Mouth Research. *International Journal of Market Research*, *51*(3), 1–19. https://doi.org/10.1177/147078530905100307

Calisir, F., Altin Gumussoy, C., & Bayram, A. (2009). Predicting the behavioral intention to use enterprise resource planning systems. *Management Research News*, *32*(7), 597–613. https://doi.org/10.1108/01409170910965215

Cha, S. S., & Seo, B. K. (2020). The effect of food delivery application on customer loyalty in restaurant. *Journal of Distribution Science*, *18*(4), 5–12. https://doi.org/10.15722/jds.18.4.20204.5

Chang, J. H., & Wang, S. H. (2019). Different levels of destination expectation: The effects of online advertising and electronic word-of-mouth. *Telematics and Informatics*, *36*, 27–38. https://doi.org/10.1016/j.tele.2018.11.004

Chang, Y.-W., Hsu, P.-Y., & Yang, Q.-M. (2018). Integration of online and offline channels: a view of O2O commerce. *Internet Research*, *28*(4), 926–945. https://doi.org/10.1108/IntR-01-2017-0023

Chaudhuri, A. (1997). Consumption Emotion and Perceived Risk: A Macro-Analytic Approach. *Journal of Business Research*, *39*(2), 81–92. https://doi.org/10.1016/S0148-2963(96)00144-0

Chen, H. S., Jai, T.-M. (Catherine), & Yuan, J. (2017). Unveiling the role of information levels in consumers' evaluative process on opaque-selling hotel websites. *International Journal of Contemporary Hospitality Management*, *29*(8), 2139–2158. https://doi.org/10.1108/IJCHM-07-2015-0367

Daud, A., Farida, N., Andriyansah, & Razak, M. (2018). Impact of customer trust toward loyalty: The mediating role of perceived usefulness and satisfaction. *Journal of Business and Retail Management Research*, *13*(2), 235–242. https://doi.org/10.24052/jbrmr/v13is02/art-21

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339. https://doi.org/10.2307/249008

Falk, M., & Vieru, M. (2018). Modelling the cancellation behaviour of hotel guests. *International Journal of Contemporary Hospitality Management*, *30*(10), 3100–3116. https://doi.org/10.1108/IJCHM-08-2017-0509

Fan, Y.-W., & Miao, Y.-F. (2012). EFFECT OF ELECTRONIC WORD-OF-MOUTH ON CONSUMER PURCHASE INTENTION: THE PERSPECTIVE OF GENDER DIFFERENCES. In *International Journal of Electronic Business Management* (Vol. 10, Issue 3). http://www.sogi.com.tw

Flavian, C., Guinaliu, M., & Lu, Y. (2020). Mobile payments adoption – introducing mindfulness to better understand consumer behavior. *International Journal of Bank Marketing*, *38*(7), 1575–1599. https://doi.org/10.1108/IJBM-01-2020-0039

Gulati, S. (2021). Social and sustainable: exploring social media use for promoting sustainable behaviour and demand amongst Indian tourists. *International Hospitality Review*, *ahead-of-print*. https://doi.org/10.1108/IHR-12-2020-0072

Hadjikhani, A., Safari, A., & Thilenius, P. (2011). Does a web site's country of origin impact equally on young and adult consumers? *Young Consumers*, *12*(3), 229–242. https://doi.org/10.1108/17473611111163287

Hogg Margaret Bruce, M. K., & Hill, A. J. (1998). Fashion brand preferences among young consumers. *International Journal of Retail & Distribution Management*, *26*(8), 293–300. https://doi.org/10.1108/09590559810231742

Hwang, J., & Kandampully, J. (2012). The role of emotional aspects in younger consumer-brand relationships. *Journal of Product & Brand Management*, *21*(2), 98–108. https://doi.org/10.1108/10610421211215517

Ismagilova, E., Dwivedi, Y. K., Slade, E., & Williams, M. D. (2017). Electronic Word of Mouth (eWOM) in the Marketing Context. In *SpringerBriefs in Business*. https://www.google.com/books?hl=en&lr=&id=nHslDgAAQBAJ&oi=fnd&pg=PR6&dq=electronic+word+of+mouth&ots=2hxa5s1YUP&sig=Fg8JgvOE3zNv5wffQk6VG2VL5Sc

Kang, J. W., & Namkung, Y. (2019). The role of personalization on continuance intention in foodservice mobile apps: A privacy calculus perspective. *International Journal of Contemporary Hospitality Management*, *31*(2), 734–752.

https://doi.org/10.1108/IJCHM-12-2017-0783

Kirillova, K., & Chan, J. (2018). "What is beautiful we book": hotel visual appeal and expected service quality. *International Journal of Contemporary Hospitality Management*, *30*(3), 1788–1807. https://doi.org/10.1108/IJCHM-07-2017-0408

Kucukusta, D., Law, R., Besbes, A., & Legohérel, P. (2015). Re-examining perceived usefulness and ease of use in online booking. *International Journal of Contemporary Hospitality Management*, *27*(2), 185–198. https://doi.org/10.1108/IJCHM-09-2013-0413

Lee, R., Murphy, J., & Neale, L. (2009). The interactions of consumption characteristics on social norms. *Journal of Consumer Marketing*, *26*(4), 277–285. https://doi.org/10.1108/07363760910965873

Lee, S., & Kim, D.-Y. (2021). Brand tourism effect in the luxury hotel industry. *Journal of Product & Brand Management*, *30*(1), 90–103. https://doi.org/10.1108/JPBM-09-2019-2574

Lin, Y. H., Guo, J. L., Hsu, H. P., Yang, L. S., Fu, Y. L., & Huang, C. M. (2019). Does "hospital loyalty" matter? Factors related to the intention of using a mobile app. *Patient Preference and Adherence*, *13*, 1283–1294. https://doi.org/10.2147/PPA.S207031

Moliner-Velázquez, B., Fuentes-Blasco, M., & Gil-Saura, I. (2019). The role of ICT, eWOM and guest characteristics in loyalty. *Journal of Hospitality and Tourism Technology*, *10*(2), 153–168. https://doi.org/10.1108/JHTT-11-2017-0120

Ozturk, A. B. (2016). Customer acceptance of cashless payment systems in the hospitality industry. *International Journal of Contemporary Hospitality Management*, *28*(4), 801–817. https://doi.org/10.1108/IJCHM-02-2015-0073

Park, S., & Huang, Y. (2017). Motivators and inhibitors in booking a hotel via smartphones. *International Journal of Contemporary Hospitality Management*, *29*(1), 161–178. https://doi.org/10.1108/IJCHM-03-2015-0103

Ramanathan, R. (2012). An exploratory study of marketing, physical and people related performance criteria in hotels. *International Journal of Contemporary Hospitality Management*, *24*(1), 44–61. https://doi.org/10.1108/09596111211197791

Ramayah, T., Rouibah, K., Gopi, M., & Rangel, G. J. (2009). A decomposed theory of reasoned action to explain intention to use Internet stock trading among Malaysian investors. *Computers in Human Behavior*, *25*(6), 1222–1230. https://doi.org/10.1016/j.chb.2009.06.007

Reza Jalilvand, M., & Samiei, N. (2012). The impact of electronic word of mouth on a tourism destination choice. *Internet Research*, *22*(5), 591–612.

https://doi.org/10.1108/10662241211271563

Ryu, M. H., Kim, J., & Kim, S. (2014). Factors affecting application developers' loyalty to mobile platforms. *Computers in Human Behavior*, *40*, 78–85. https://doi.org/10.1016/j.chb.2014.08.001

Dimensions of Perceived Usefulness: Toward Enhanced Assessment, 5 Decision Sciences Journal of Innovative Education 289 (2007). https://doi.org/10.1111/j.1540-4609.2007.00142.x

Schlaegel, C. (2015). Understanding individuals' initial and continued use of online auction marketplaces. *Management Research Review*, *38*(8), 855–907. https://doi.org/10.1108/MRR-09-2013-0210

Suwandee, S., Surachartkumtonkun, J., & Lertwannawit, A. (2020). EWOM firestorm: young consumers and online community. *Young Consumers*, *21*(1), 1–15. https://doi.org/10.1108/YC-03-2019-0982

Tzavlopoulos, I., Gotzamani, K., Andronikidis, A., & Vassiliadis, C. (2019). Determining the impact of e-commerce quality on customers' perceived risk, satisfaction, value, and loyalty. *International Journal of Quality and Service Sciences*, *11*(4), 576–587. https://doi.org/10.1108/IJQSS-03-2019-0047

Van Der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Quarterly: Management Information Systems*, *28*(4), 695–704. https://doi.org/10.2307/25148660

Vida, I., Kos Koklič, M., Kukar-Kinney, M., & Penz, E. (2012). Predicting consumer digital piracy behavior. *Journal of Research in Interactive Marketing*, *6*(4), 298–313. https://doi.org/10.1108/17505931211282418

Yan, Q., Zhou, S., & Wu, S. (2018). The influences of tourists' emotions on the selection of electronic word of mouth platforms. *Tourism Management*, *66*, 348–363. https://doi.org/10.1016/j.tourman.2017.12.015

Young, C. A., Corsun, D. L., & Xie, K. L. (2017). Travelers' preferences for peer-to-peer (P2P) accommodations and hotels. *International Journal of Culture, Tourism and Hospitality Research*, *11*(4), 465–482. https://doi.org/10.1108/IJCTHR-09-2016-0093

Zhang, M., Zhang, G., Lu, Y., & Ye, Z. (2014). Measuring the value of online information to hotel e-bookings: an empirical study from China. *International Journal of Internet and Enterprise Management*, *8*(3). https://doi.org/10.1504/ijiem.2014.059178

Zhang, T., Wang, W. Y. C., Cao, L., & Wang, Y. (2019). The role of virtual try-on technology in online purchase decision from consumers' aspect. *Internet Research*, *29*(3), 529–551. https://doi.org/10.1108/IntR-12-2017-0540

Zhang, Y., Shao, W., & Thaichon, P. (2021). Investigating tourist post-travel evaluation and behavioural intention: a cultural intelligence perspective. *Asia Pacific Journal of Marketing and Logistics*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/APJML-08-2020-0584

Appendix

The scales of factors in the study

Electronic Word-of-Mouth

1. I frequently read online reviews to know about the hotels.
2. Prior to choosing the hotel, I frequently read tourists' online hotel reviews.
3. I frequently check online hotel reviews and suggestions to help me choose a hotel.
4. I frequently collect information and other details from tourists' online hotel reviews before my trip.

Perceived ease of use

1. The use of online hotel booking application is clearly understandable.
2. I can easily navigate through the menus and toolbars in the online hotel booking application.
3. From my experience, the online hotel booking application is user-friendly.
4. I feel that online hotel booking application's interface is easy to use.

Perceived risk

1. Online hotel booking is likely to have the poor performance.
2. Comparing with other methods, online hotel booking has more uncertainties.
3. Online hotel booking would not be effective as I think.
4. It is risky for me to provide the information to the online hotel booking application.

Perceived usefulness

1. Using online hotel booking application would save time.
2. Using the online hotel booking application would improve my performance in choosing the hotel.
3. Using online hotel booking application makes it easier for me to conduct my hotel booking transaction.
4. I would find the online hotel booking application useful in conducting my hotel booking transaction.

Online hotel booking application loyalty

1. I will speak well about this online hotel booking application to other people.
2. I will recommend this online hotel booking application if someone ask for my advice.
3. I will encourage my friends and relatives to use this online hotel booking application.
4. I intend to use this online hotel booking application for my next hotel booking.

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FOOD STORYTELLING IN CHEFS' TABLE: CREATING A COMPETITIVE ADVANTAGE OF THE RESTAURANT BUSINESS

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Abstract

The purpose of this study is to explore food storytelling patterns at chef's table restaurants in Thailand. In addition, the paper aims to investigate how chef's table restaurants achieve a competitive business advantage. A food storytelling structure is perceived as the key influencing factor to develop a competitive advantage for such firms. The study adopted a qualitative approach, using documentation research, semi-structured interviews, and participant observation to collect data for a content analysis. The key informants were chefs' table restaurant managers, chefs who cook and deliver food storytelling to the customers, and chefs' table restaurant customers. Interviews were conducted with 30 participants from chefs' table restaurants from Chiang Mai, Bangkok, Pattaya, and Phuket. The results of the interviews indicated seven key food storytelling patterns at chefs' table restaurants, including 1) Concept and origin of food 2) Cooking methods 3) composition of food dishes 4) Method of eating 5) Food benefits and nutritional values 6) Cleanliness and safety 7) Social responsibility and environmental concern. Furthermore, the findings found that food storytelling was a business strategy tool that impacted the competitive advantage of chefs' table restaurants. Three competitive advantages were found, namely 1) Cost leadership, 2) Differentiation, and 3) Quick response to guests' special requests. In turn, these competitive advantages led to better organizational performance, in both financial and non-financial terms such as net profit, guest satisfaction, guest loyalty, and word of mouth marketing to others.

Keywords: restaurant, storytelling, food storytelling, competitive advantage

Introduction

Attractive food and beverage services can generate substantial income for entrepreneurs and attract tourists to a destination. The type and quality of food and beverages available at a destination are key factors for tourists making travel decisions. According to a report from the Department of Business Development in 2019, the restaurant business market in Thailand in 2017 - 2018 was valued at more than 400 billion baht. In addition, the report found that the restaurant industry is displaying strong, continuous growth. Business profitability attracts new entrepreneurs to enter and the cycle of growth continues. In 2018, the restaurant industry generated revenue of 2,007,503 million baht, which is considered one of the country's primary incomes. Yoopetch (2021) and Stettler et al. (2018) stated that restaurants represent an essential part of the hospitality industry in Thailand, and food tourism is also a key driver of Thai tourism.

Furthermore, both Thai and foreign tourists' spending on food and beverages ranks as the third most important tourist expenditure after accommodation and transportation. The food and beverage industry is widely distributed among Thailand's many tourist destinations. However, according to the Department of Business Development (2019), most business operations are located in Bangkok, followed by Chon Buri, Phuket, Surat Thani, and Chiang Mai respectively. This is consistent with the world-class reputation of Thai food and the tangible support provided to primary and secondary cities by the public and private sector. These factors are expected to drive the continued growth for the restaurant industry in Thailand (Department of Business Development, 2019).

Consumer behavior continues to adapt, as technology influences the decision to use restaurant services together with the shift to food delivery applications. Supporting services have been developed to ensure that food delivery from restaurants to customers is undertaken quickly, such as Line Man (Line Man), Food Panda (Food Panda), and Grab Food (Grab Food), or the emergence of a website or page with food influencers such as Wongnai and Tripadvisor (Department of Business Development, 2019). In addition, being influenced by watching movies or documentaries about food is an important channel that can create awareness and pass on the experience to consumers. For example, Jay Fai (Auntie Fai), a street food restaurant in Bangkok, became famous through exposure in a Netflix documentary of street food. Creating food narratives in various forms through photographs, video clips, and food narratives is widely used to encourage consumers to try a service or taste a particular dish in both offline and online media.

Continuous growth of food and beverage businesses in the tourism industry, changing consumer behavior in the digital age, information technology and fast-changing social media require sophisticated marketing campaigns for food and beverage businesses. The importance of social media towards product and service adoption is highly relevant for today's hospitality businesses, including food and beverage and restaurant businesses (Plidtookpai &

Yoopetch, 2021). Restaurants need to develop a business strategy that can respond quickly to customer needs. Restaurant entrepreneurs have to develop a sustainable competitive business advantage to be able to continue to operate under increased competition. The chefs' table restaurant style is an innovative style of restaurant service. The style has become popular over this past decade and has been a growth trend in Thailand. Many famous chefs in fine dining restaurants or luxury hotel restaurants have introduced this style to attract customers. Most chefs' table restaurants provide food storytelling services. The chefs' table restaurant is a micro restaurant that accepts a limited number of customers. There is an open kitchen where the customer can see what is happening backstage while the chefs cook. At the same time, the story of each dish is verbally explained to customers during the delivery of the meal. This type of restaurant is now prevalent because of the chef's professional cooking skills and quality of raw materials provided. The increasing importance of this new dining experience leads to two research objectives. The first aim is to study the pattern of food storytelling in a chefs' table restaurant. The second objective is to study the competitive advantage generated by using food storytelling techniques in Thailand's chef's table restaurants.

Literature review

Types of restaurant concept

There are various classifications that categorize different types of restaurant concept. According to the description of restaurant type by Singjawala (2011), the Ministry of Commerce divides restaurants into four types, mainly classified by design and decoration as follows:

1) Fine dining restaurant has an exquisite design, beautiful materials and expensive equipment. In addition, the food garnish is beautifully presented and staff provide excellent service

2) Casual dining is a restaurant with a moderately decorated design, that focuses on a casual atmosphere with moderately priced food and service from staff,

3) Fast dining is a restaurant with a simple design and convenient service, that emphasizes fast food service with limited food items and allows fast turnover of customers in large quantities, and

4) Kiosk is a restaurant with a limited design, emphasizing one-dish food that can be cooked easily and quickly. Basically, it is a small business with shop owners who cook by themselves (Rungsatianputorn, 2016).

Similarly, Chef Duangporn Songvisawa (Sukhothai Thammathirat Open University, 2015) classified types of restaurants according to the nature of the service into four types. These are presented as follows;

1) full-service restaurants (fine dining) serve with international standards and superb service. The food and beverage menu is not limited to the western style, but includes various types of food. In addition, food decoration is great with high-quality products or ingredients,

2) Casual dining restaurants are similar to full-service but different in the quality of service and restaurant exclusivity. The

food menu will be a general or well-known menu which has less need to explain its details. The decoration of the restaurant is focused on comfort and a relaxing style. This type of restaurant is easier to reach customers than a full-service style. Restaurants are often located in a mall, a department store or as a standalone restaurant.

3) A quick service restaurant or fast-casual restaurant is decorated in a simple style. Most customers have to walk to order foods and beverages at the front service counter. Food items are easy to understand and ordered at the service area without staff assistance. The menu lists familiar menu items, and the price of food is low. This kind of restaurant is limited in the number of staff. Therefore, quick service restaurants focus on customers to serve themselves, and

4) Mobile restaurant (street vendor) is a food and beverage service facility that is not attached to a permanent building, such as the sidewalk restaurants, boat restaurants serving in a floating market, and food trucks. This restaurant type can be further divided into five categories. Firstly, a general restaurant offers a general food from one nation, such as Thai, Korean, Italian, Japanese, or French cuisine. Secondly, local restaurants (Ethnic cuisine) focus on local or regional food, such as Southern Thai, Northern Thai, Rome Italian or Southern French. In other words, it is a restaurant that is specific to a local area and reflects the unique menu of that region. Thirdly, specialty food restaurants focus on the process of preparation, such as vegetarian food, bio-organic food, and halal food. Fourthly, a further specific type of restaurant focuses on cooking methods, such as Sukiyaki and BBQ. Furthermore, this type also refers to the restaurants that apply advanced scientific knowledge to molecular gastronomy. Lastly, international restaurants that offer a buffet self-service style and charge a single price (Sukhothai Thammathirat Open University, 2015) is the fifth category.

A chefs' table restaurant, is a style of restaurant service that has become popular during this current century. The term has no specific definition in the Thai language, and is translated literally from English. According to food timeline magazine, the editor Lynne Oliver explained that chef's Table probably originated in Europe a century ago. At the time, famous chefs were known to have a small table with chairs in their kitchen for friends and relatives to come and talk with them. Sometimes this special table was used to receive special guests who came to visit or see their work in the kitchen. More recently, "chef's Table" hit the spotlight from a 2015 Netflix documentary. The documentary was directed by David Gelb, and reflected the lives of many famous chefs, their cooking concepts, and their attitudes to living in various countries (Sitti-issara, 2020). In the research of the Aesthetics within Architecture of chef's Tables, Sitti-issara (2020) defined the chef's Table as a type of creative restaurant that offers course menus, which are prepared and served by renowned chefs. For most restaurants using the chef's Table style, customers have to reserve a seat or book in advance. The style normally involves a presentation of the food by the executive chef and menus differ from general menus. Furthermore, the menu is characterized by special raw ingredients available for each season or unique to a

destination. The food is made up of small portions so that customers may taste a variety of dishes to demonstrate the chef's skills and abilities. The " chef's table" style was popularized in recent times by contemporary famous chefs, such as Chef Ferran Adrià at El Bulli in Spain and Chef Thomas Keller at French Laundry in USA. The chef's Table style and menus is offered to customers at a very high price (Wayne Gisslen, 2006 cited in Sitti-issara, 2020).

The chef's Table style can be broadly defined by a pattern of services and eating that is served and arranged by chefs in a close, personal context. Often chefs set a long table in front of the kitchen, allowing customers to see the chef cooking all menu items. This style is similar to eating at the front counter, which is called "Omakase" in Japan. The essence of this service is the interaction among the diners, chefs, and cooking process. With this concept, the dining area is placed in the kitchen or very close to the kitchen. This type of service becomes an art form in which the chef becomes the art conductor. The kitchen resembles a small theater in which a pattern of ideas and beliefs are created and presented in the living space that is called a restaurant (Sitti-issara, 2020). Hence, the chefs' Table is a style of serving foods and beverages that reflect the personality of the chef. All menu courses are created by the chef and customers can see the overall food preparation process and steps taken in preparation. Furthermore, at a chefs' table restaurant, chefs always present the freshest ingredients, unique cooking techniques and methods, and background of each dish.

Storytelling as a marketing tool

The research work of Niemchai, Panyaem, Wattanaparb, and Tawatnagul (2019) reported that content marketing now plays an important role in people's lives. This kind of marketing creates content and stories, helping to capture the attention of the target market, and making a strong audience impression such that consumers remember the product and/or service. Content marketing can be conducted in various ways There are articles, images, videos, or other media that can reach the target market. By creating a special story, content marketing can convince readers or consumers to appreciate the value from viewing or reading the content. Content creators have to learn and understand what customers like, what they want to see, and what customers need. This understanding helps content creators develop appropriate content and increase the number of customers in the long run (Holliman & Rowley, 2014). Various distribution channels, such as infographics, may be used. Content creators need to gather salient information presented on websites, to create stories that can be delivered through video clips, posts on YouTube or other channels (Koiso-Kanttila & Nina, 2004).

Storytelling is a tool to generate strategic brand recognition. Storytelling creates value by developing a relationship between producers of the story and consumers. Recently, this technique has been found to be one of the most popular marketing tools in the restaurant industry. The content of storytelling can lead to greater business success (Pulizzi, 2012). The technique to describe a food

experience depends on the chef or storyteller. For example, a Japanese restaurant owner often tells the origin of the best ingredients, the use of a delicacy in making soup, and the special cooking process used. Likewise, Korean grilled meat shop owners often tell customers about the process of marinating the meat with special ingredients and the origin of meat which presented challenges in purchase and acquisition. Consequently, customers feel as though they are eating a rare and premium item. In addition, Chipotle restaurant is a Mexican food restaurant that focuses on the use of good ingredients, and creating engaging content about their food. Online advertising for this restaurant is effective because it describes the importance of traditional agriculture and animal production (Niemchai et al., 2019

In addition, storytelling is a tool that can affect customers before purchase or during their decision-making process. Storytelling that provides attractive information is a persuasive approach to convince customers (Woodside et al. , 2008; Groeppel- Klein, 2005) . For example, Fenger et al. (2015) argues that storytelling overcomes customer reluctance and increases demand when unique information, such as the origin of the food and ingredients, are provided. This unique information helps to arouse the interest of consumers. Furthermore, Evans, McFarland, Dietz, and Jaramillo (2012) indicate that storytelling also impacts the retail business in other ways. The authors found that storytelling enhances the relationship between customers and sellers, by the use of first-hand knowledge to impress customers. This study also suggests that the story can be divided into different parts reflecting an overall perspective, different entities, and even sub-topics that digress from the core. Furthermore, stories may be presented emotionally and rationally to convince customers to buy the services.

More specifically, Fenger et al. (2015) examined the customer response to storytelling through an online survey that collected data from a large sample. The researchers used the storytelling technique to design a story using a short message combined with pictures to describe the food product. This experimental research aimed to compare two groups of respondents. One group was provided with storytelling information while the second group did not receive any storytelling message. The researchers found that the first group was more interested in the products than the second group (Fenger, Aschemann, Hansen & Grunert, 2015). In addition, Young You Nie et al. (2017) examined consumer responses to organic food storytelling. In a study using 578 respondents in Taiwan, the authors tested four types of storytelling. The authors found that a story reflecting dietary therapy was the most impactful for customers, followed by environment-friendly food stories, price stories, and lastly self- health and disease treatment (Young You Nie, Austin Rong Da Liang & Dun Ji Chen, 2017).

Strategic management and competitive advantage

In fast growing industries, organizations are searching for organizational business excellence and competitive advantage. In this environment, competitor dynamics and changing environmental circumstances become key factors in developing business strategy and

subsequent effectiveness (Nandakumar, Ghobadian & O'Regan, 2010). Likewise, Chareanporn, Mingmalairaks, and Kumsuprom (2020) argue that many factors can drive business effectiveness, such as dynamics, complexity, and business competitiveness. Similarly, Chirapanda and Yoopetch (2008) state that organizational strategic fit among dynamics, complexity, and competitiveness of the firms has an effect on the firm's long- term performance. Furthermore, Mintzberg (1979) states that while organizational performance will vary according to the business strategy adopted, most firms focus on strategic resource management and competitive advantage development. In support, Lin, Tsai and Wu (2014) argue that comprehensive strategic analysis can generate more understanding of business strategies and their likely impact on organizational performance. A large number of empirical studies has led to a consensus among academics that appropriate business strategies will vary considerably according to the business context and environment (Chareanporn et al., 2020). However, scholars have attempted to classify strategic organizational management into key types. For instance, Miles and Snow (1978) and Porter (1985) define business strategy into four categories; prospector, analyst, defender, and reactor. While all organizational business strategy aims to gain more competitive advantage (Lin, Tsai & Wu, 2014), effective execution depends on the appropriate strategy and business context (Mintzberg, 1979). Thus, companies try to present a unique strategy that can develop competitive advantage (Parnell, 2010; Lin, Tsai & Wu, 2014). However, organizational effectiveness will be influenced by the degree of success in market access, customer value, and potential of new market segment creation (Chareanporn et al., 2020). According to Porter (1985) competitive business advantage can be achieved by one of three strategies; cost advantage, differentiation, and speed to the market to obtain the highest market share. This categorization is supported empirically by the work of Lenoidou et al. (2013), especially in how business responds quickly to changing customers' needs (Anatan, 2014; Koseoglu, et., 2013).

Research methodology

This qualitative research study used documentary research, participant observation and in-depth interviews to provide three rich sources of data. The study began with data collection from documents related to restaurant type, chef's table restaurant characteristics, storytelling as a marketing tool, and business strategies. The data was collected from both government and private agencies, including academic reports, research, books, academic articles and journals, and online databases. Second, participant observation was undertaken at a particular chef table restaurant. Khongsawatkiat (2013) argues that participant observation techniques are very good for gathering information from an ongoing situation and also help to explore situations where little is known about a phenomenon.

The third data collection approach used semi-structured interviews. Interviews were recorded by audio recorder and personal notes and later transcribed. As Khongsawatkiat (2013) explained, this

technique is suitable for a small population. The instrument consisted of open-ended questions adopted from past research. According to Neuman (2006), there are several non-probability sampling approaches, such as convenience, quota, purposive sampling, and snowball sampling. Purposive sampling was one of two approaches adopted for this study because the number of chefs' table restaurants is limited and it is difficult to gain access to business information from owners/managers/chefs. Additionally, snowball sampling was also found essential to generate an adequate sample for the study. Semi-structured interviews were conducted with 30 participants. Participants included chefs' table restaurant owners or managers, executive chefs, and customers. Data analysis for this study comprised content analysis of interview transcripts, observation file notes and all collected documents. Furthermore, the analysis was based on thematic analysis by using the constant comparative method to identify and refine new categories. The validity of the data was assured by reviews and comments from external experts (Khongsawatkiat, 2013; Havanon, 2009).

Study results

The results of the study provide a rich summary of the various contexts of Chef's table environments. Findings from interviews reflected the characteristics presented in the literature review. The interviews showed that a chef's table restaurant generally serves a set menu with meals served divided into courses. Each menu is set by the chef (fixed menu), starting with appetizer, soup, main course, dessert, respectively. The number of courses depends on the chef in each restaurant. In serving food and drink, there is usually a story, especially detailing the journey of the food, beverage and other ingredients prepared for the meals.

Seven patterns of food storytelling

Seven patterns of storytelling were revealed from the data, as shown in the following details.

1) Concept and origin of food: The data from in-depth interviews with service providers, participant observation and analysis of the website or Facebook pages of chefs' table restaurants revealed that the chefs' table style of food service is a small restaurant that accepts a limited number of customers, usually not more than 30 people. There is an open kitchen area where the customers can see what is happening as the chef prepares the food and applies cooking techniques. The staff take customers to sit at a prepared table until all customers come together. The chef introduces himself and the menu of all the dishes that are subsequently served at each meal. An explanation of the concept of food associated with each dish served accompanies each dish serving, e.g.., Thai fusion cooking, Northern fusion food, traditional Thai food, or French cuisine. In addition, the source and origin of the ingredients used were provided to customers and most often highlighted their freshness and the element of seasonality. Two respondents highlighted this storytelling concept and origin of food as follows:

"Today's menu is fusion Thai food. It combines Thai food with the western

style of cooking and serving. Today's meal consists of four courses, the first appetizer by Ma Hor Phulae, where we use the local raw materials, Phu Lae pineapple to create today's menu, followed by Boat Noodle Ravioli Soup, Chicken Roulade. Red curry sauce served with local seasonal vegetables and ending with mango sticky rice with lychee sauce…" The 2nd Chef

"Food is local, seasonal, and cultural. We use local ingredients but not just from Chiang Mai or the North of Thailand, we tried to use them from everywhere because we don't want to limit ourselves. The purpose is that we want to say that our food in our country is good. .. all vegetables we get from our own organic vegetable garden." The 4th Chef

2) Cooking methods: a brief description of how to cook each meal was given. The following respondents illustrate this issue as follows:

" Ab is a traditional Northern food cooked with meat to mix with curry paste then wrapped in banana leaves cooked by roasting or grilled with low heat until the inside is cooked, creating a mesmerizing aroma of banana leaves…" Chef number 1.

"We make Boat noodle soup by a method known as consommé, to simmer pork bone soup and seasoning to taste like Thai Boat noodles. Then we filter only the clear water for use. . . " Said Chef Number 3.

3) The composition of each dish is a description of the food placed on a serving plate consisting of what and why it is served with a particular look or appearance. Two respondents highlighted the composition of each dish as shown:

"This Wellington Chicken will be a real star and lead the main character of this dish. The chicken is marinated in Ab's curry paste, wrapped in banana leaves and then grilled until the aroma and fragrant of the banana leaves absorb into the whole ingredients. There will be Shiitake mushrooms and fried spinach inside, then wrapped in pie crust. It is served and paired with carbohydrate element and it's a French toasted sesame seeds that's very well-known in Chiang Rai. The dish would be served with a side of vegetable in a dish that helps break down Ab's spicy flavor. The vegetables are carrots and Baby Choy with garlic and oyster sauce. A yellow pumpkin puree will also give this dish more color." Said Chef number 5

"Ma Hor is our appetizer. In this dish, it consists of Ma Hor's fillings made from minced pork and peanuts molded into cubes, seasoned similar to those of sago candy. Eat with Phu Lae pineapple with a little sourness. The combination of salty, sweet, and sour flavors makes the customers feel appetize and they want to eat more… This dish is decorated with a sugar dome with pineapple syrup aroma and edible flowers to enhance the color of this dish." Chef number 2

4) Method of eating: This part of the story is about how to properly eat each dish because the appearance of the food is beautifully decorated with the chef's creativity that highlights the various elements of the food. Due to the unfamiliarity customers have with the appearance of many unique styles of food, the chef uses the opportunity to explain appropriate eating methods to enhance the consumption experience. The following respondents illustrate this issue as follows:

"The way to eat it is to slowly pour the hot soup from the jug over the other ingredients on the plate. For the soup served, we have calculated that it is suitable for this dish. Suitable for one person, just enough to eat." Chef number 6

"The way to eat this dish is to use a fork to knock the sugar dome apart and eat everything together. Having eaten sugar dome peanut and pineapple filling together in one bite will bring combination of tastes of food to your mouth." Said Chef number 2.

5) Food benefits and nutritional value to the consumers: From the interviews, it was found that descriptions of the properties of the ingredients used in each menu were added to allow diners to see the benefits of that particular dish. The following respondents demonstrate this issue as follows:

" This dish contains proteins, carbohydrates, fats, vitamins and minerals from organic vegetables, non-toxic, fresh, clean under the concept of "Farm to Table". The whole dish has a complete nutritional value from 5 essential nutrients… " Chef number 1 describes the main dish of the meal.

"After finishing this menu, drink cold honey Oolong tea to cleanse the palate and release the spicy taste. We added passion fruit jelly to the tea to add freshness before going to the next menu. The Oolong tea itself has antioxidant qualities, reducing the risk of cancer and heart disease…" Restaurant Manager 1

6) Cleanliness and safety of kitchen operation and restaurant service. It was also found to be helpful to provide images of the food production process relating to cleanliness and food hygiene. Such measures also included images of team members paying attention to the safety aspects of their work. The slogan "cook from the heart" or "like making people at home eat" was featured on the website or Facebook of the restaurants. In addition, websites presented measures to maintain cleanliness and safety in a new normal way to prevent the spread of COVID-19. There is a new normal cleaning standard training for employees. Technology is used to make online bookings and online payment to reduce exposure, prevent infection convenient from booking, and access to services. Interview respondents highlighted cleanliness and safety of kitchen operation and restaurant service as follows:

"We consider serving fresh food. For example, meat must be at the right temperature. Cleanliness and safety of diners are at the heart of cooking." Chef number 6

"We also follow TAT's SHA standards for the safety of our customers and employees from the spread of COVID-19." Restaurant Manager 1-7

7) Social responsibility and environmental concerns are presented through the story of selecting local ingredients to generate income for the community, supporting farmers affected economically during the COVID-19 pandemic, and using organic raw materials from farmers in the community. Moreover, there are systematic waste separation management practices to reduce environmental problems or zero-waste cooking, reducing food waste. These stories were conveyed through the restaurant's social media outlets and from interviews with the service provider. The following

respondents illustrate this issue as follows:

“ We will also plan menus before purchasing ingredients to prevent leftovers from having to be discarded. For example, for one fish, we try to use all parts from the meat to cook. The bones and heads are boiled in the broth to reduce food waste.” Chef number 7

"We choose to use organic vegetables that the villagers grow in the season because they are new, fresh, safe and also promote income for the community. We earn from customers. We support communities like this, our business. People around us can live together for a long time." Chef number 2

“ There is already a systematic waste separation at the store. Organic waste will be picked up as animal feed. Plastic waste will be collected and sold as a small amount of income almost every month,” said the Restaurant Manager number 5

Table 1 The table of theme in food storytelling of chef’s table restaurant

Theme	Subtheme
1. Concept and origin of food	- Nationality of food e.g. Thai food, Western food, Lanna food, Fusion food. - The original place of food and their ingredients where they come from.
2. Cooking methods	- The way of cooking food e.g. frying, simmering, roasting, grilling, boiling, mixing.
3. The composition of each dish	- The appearance of food. - The details of each component on a food dish.
4. Method of eating	- The sequence how to eat each dish.
5. Food benefits and nutritional value to the consumers	- Food nutrition e.g. Proteins, carbohydrates, fats, vitamins, minerals. - Health benefit of food to prevent or healing human body.
6. Cleanliness and safety of kitchen operation and restaurant service	- Food production process concerning cleanliness and hygiene. - Cleanliness and safety in a new normal way to prevent the spread of COVID-19.
7. Social responsibility and environmental concerns	- Supporting local community. - Preservation of the environment for the future.

Competitive advantage obtained by food storytelling

Thirty informants described the competitive advantages from food storytelling techniques in Thailand's chefs' table restaurant business into three themes: 1) cost leadership, 2) differentiation and 3) responsiveness to guests' special requests.

1) Cost leadership advantage: From the result, it was found that the service by using food storytelling techniques in Thailand's chefs' table restaurant business created more attractiveness. Furthermore, it leads to reduce restaurant costs in three aspects; the cost of public relation, the cost of reservation and payment processes, and the cost of raw materials storage and menu printed for presentation. Two respondents highlighted cost leadership advantage that:

"We present and tell the story of the entire menu through the website. Both in terms of the menu, what are ingredients each dish has and also the price. Additionally, what will customers eat? how is the service they received? All of these have been shared on the website and the restaurant's Facebook page and personal Facebook. This makes people interested in making reservations and fastens the booking." Store Manager 2.

"The website that we use is free; there is no cost to create. Using Facebook is also definitely free. We can simply say that we have used no cost from any publicity at all but the result of doing this is quite impressive. The customers perceive and know about our shop, our products, and decide to book with us." Restaurant Manager 3

The findings from the interviews also indicated that the limit of guest numbers in the booking process helped the restaurant predict the use of raw materials and ingredients. If the restaurant knows the exact number of customers, it can also reduce the cashier's workflow steps. The following respondents illustrate this issue as follows:

"From the traditional restaurant services where customers may walk in and ask to see the menu, review the menu selections and make a decision whether he/she might eventually make a booking of the restaurant if interested. Eventually, when they finish the meal, the customers would typically pay with the staff to deliver money to the cashier. But by making a website of a restaurant like this, customers can go to menu reviews, read menus, decide to make a booking online. Some customers even completed a booking by making a money transfer before their arrival. It can be considered that the work process of the staff in the restaurant is reduced," said the Restaurant Manager 5.

"Customers can go to review the menu online, visualize the food and ingredients of each dish from the website. They can even decide to book and transfer money to us immediately. We will also know the exact reservation number before the date that we have to go to work. It is also convenient in terms of seating layout for customers. The cashier himself will also know which customers to collect money from, which is not much left after the first payment online as an outstanding balance. By doing this, the cashier staff would be less busy during the actual working shift, making them available and be an extra hand to help serve drinks to

customers." Said the Restaurant Manager 7

Furthermore, the cost of raw materials storage and menu printing also decreased. Two respondents illustrate this issue as follows:

"The Chef will know the reservation numbers and prepare ingredients and food supplies to fit the number of the guests' bookings. We may order extra food supplies just in case if something went wrong...Our chefs will explain the story of each food that customers are about to eat. We decided together that we don't have to print paper menus for customers. They can even view menus from our website using their Smart mobile phones." Restaurant Manager 7

"We can predict food cost because we know the number of dishes we will produce. Making chefs' tables is good in that we can reduce food wastes compared to a typical restaurant service where customers walk in to order food available on the menu. We have to prepare all ingredients available to the menu in the restaurant, making it very difficult to forecast and manage the food cost that way…" Chef Number 2

2) Differentiation advantage: From the results, using food storytelling techniques in Thailand's chefs' table restaurant business can generate the business differentiation. The food delivers to the customer with food story such as the description of originality or special ingredients make more attractiveness. It can make a difference for businesses in three aspects; the food creativity of each menu, the fresh ingredients and the support for local farmers or community, and the knowledgeable staff and chefs about food story and origins. Three respondents explain this issue as follows:

"I like food, it's strange that it's a perfect blend of local food and western food. I like that he uses organic ingredients from villagers to cook. For example, this salted egg that uses soil from termite mounds is very cool and quirky, I never knew that Chiang Rai had this product…so creative that you can use salted eggs to make desserts. The chef is very talented and knowledgeable." Customer number 1

"I like having the chef describe the food characters. It's like listening to fun and very informative lectures. After listening to all explanations and that makes us want to eat the whole plate. It seems like he's been thinking for a long time and put lots of effort to create one dish...The staff is also very knowledgeable in answering questions about foods." Customer number 3

"There hasn't been a lot of restaurants like this so far, having received knowledge about foods from chef and it's inexpensive too. I wish they could do it more often. It is also good that it helped local farmers." Customer number 8.

3) Responsiveness to guests' special requests: The use of food storytelling techniques in Thailand's chefs' table restaurant business can create business competitiveness in terms of a quick response to guests' special requests. The online advertisement on website or social media provided an impactful channel. The customers can access product information and make a reservation via online platform. For example, participants gave a general comment on response to guests' special requests:

"I saw many people shared it on Facebook. Then I went to have a look at the delicious and unusual menu and decided to book via QR code shown on the website. Then I transferred money for food via LINE...When the day I booked the restaurant comes, I came and eat. The restaurant prepared a table for me and my friends. It's convenient." Customer 3,4,5,6,10,11,12,15 use the same booking method.

One respondent further asserted that:

"I have been asked if I'm allergic to any food or not when making a restaurant reservation. I informed the staff that there was a friend who is allergic to honey...When we came to eat in the restaurant, the staff remembered that there was one person at our table who was allergic to honey and informed us that the drink that normally put honey had replaced with syrup to keep the drink sweet." Customer number 7

Conclusions and discussion

The objectives of this research were to study patterns of food storytelling leading to competitive advantage for chefs' table restaurant businesses in Thailand. This style of business uses two channels to deliver food storytelling: social media and face to face from the chef. The findings are consistent with the work by Youg, Austin, and Dun (2017) that stories related to self- health and disease treatment, being environmentally friendly, highlighting the source of food and production process, and dietary therapy are important sources of topics that can be used in a chef's table style of restaurant. Furthermore, the results are consistent with the literature that has highlighted the importance of source of raw materials, cooking process, the composition of each dish, method of eating, food nutritional value, social responsibility and environmental concern in previous patterns of food storytelling (Niemchai et al. , 2019; Sharma, Amit, Moon, Joonho, Strohbehn, and Catherine, 2014).

All respondents affirmed that food storytelling is an important tool for creating a strategic competitive advantage for chefs' tables restaurant business. Three strategic competitive advantages were found; cost leadership, differentiation, and responsiveness to guests' special requests. All three competitive advantages led to positive organizational outcomes, such as profitability, customer satisfaction, customer loyalty, and word of mouth advertising. The findings found that chefs' table restaurants with their unique style of storytelling attracted more customers. The strategy also led to reduced restaurant costs for public relation, reservation and payment processes, raw materials storage and printed menus. These results are consistent with Lenoidou (2013) who reported that competitive advantage can be achieved through a cost advantage over competitors. Furthermore, the results are also consistent with the work of Blanchard (2014) and Wanarat (2020) who argued that creating a competitive advantage can be achieved by producing different products or services that are better than competitors. The results indicate that the use of food storytelling techniques in Thailand's chefs' table restaurant business can generate a clear differentiation from key competitors. Food is delivered to the customer with an

authentic food story, including descriptions of originality and special ingredients, making the food and restaurant more attractive. Three aspects make the story effective: (1) the food creativity of each menu, (2) ingredients are fresh and support local farmers or community, and (3) the staff and chefs are knowledgeable about the food story. In addition, most interviewees affirmed that the use of food storytelling techniques can create business competitiveness in terms of quick response to guests' special requests. Online advertising on the firm's website or through social media is an influential channel. Customers can access product information and make a reservation via the online platform. This finding is supported by Niemchai, Panyaem, Wattanaparb and Tawatnagul (2019) who reported that the story of the origin of the food and the reputation of the chef can attract more customers and increase sales volume. Furthermore, most respondents indicated that food storytelling in chefs' Table restaurant can create a competitive advantage for business performance. Yoopetch (2010) noted that measuring performance is very important for small and medium sized business in hospitality industry and can help the firms achieve the long-term competitive advantage.

Recommendations and future research

This paper provided an analysis of the crucial patterns of storytelling observed in the Chefs' Table restaurant chain in Thailand, as presented in Figure 1. The restaurant chain should continue to create story types that demonstrate the chain's unique stories, history and original food processes. This storytelling approach develops a strong competitive advantage which leads to better financial performance. In addition, the use of adopting social media, such as YouTube and Facebook, can continuously engage guests. Such word-of-mouth engagement can build long-term relationships with guests, leading to sustainable competitive advantage for Chef's Table restaurants.

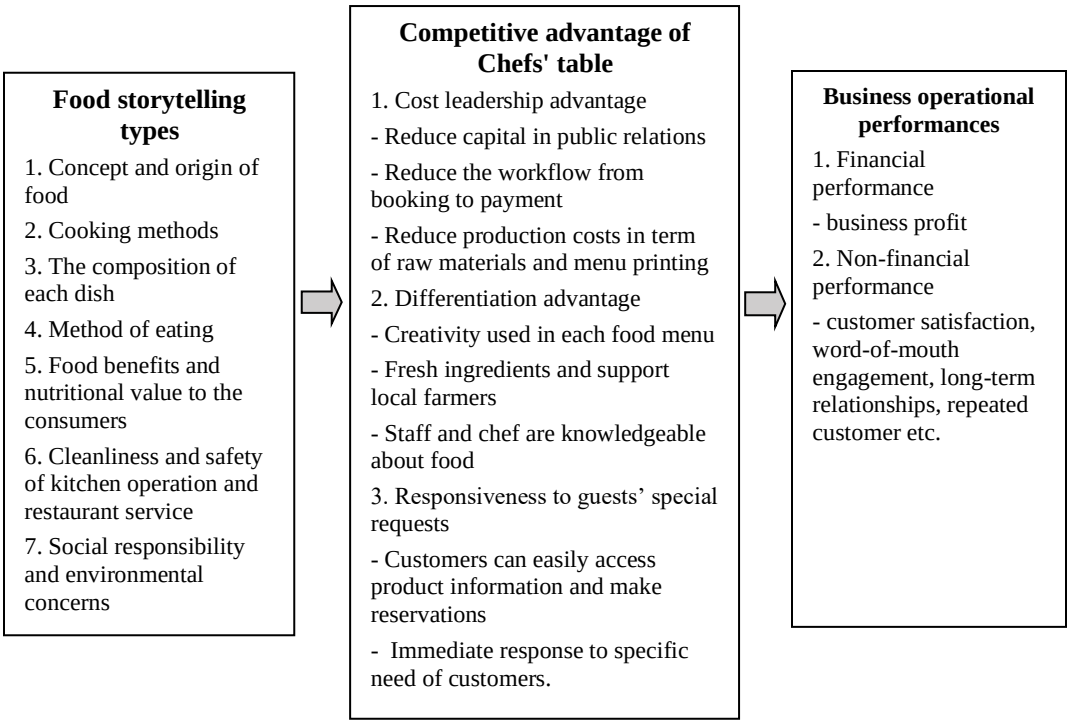

Figure 1 The framework of the study of food storytelling in chefs' table restaurant business

Further research can investigate various types of restaurant businesses, such as fine dining restaurants or ethnic cuisine shops. In addition, quantitative methodologies could be used to increase the generalizability of the results. Moreover, further study into the relationship between competitive advantage and financial performance should be considered.

References

Anatan, L. (2014). Factors Influencing Supply Chain Competitive Advantage and Performance. International Journal of Business and Information, 9(3), 311-334.

Blanchard, D. (2014) Supply chain & logistics: The competitive advantage of a supply chain. Industry Week, Retrieved June17,2018. from https://www.industryweek.com/competitive-chain

Chareanporn, Tarittawan. Mingmalairaks, Phoommhiphat. and Kumsuprom, Siridech. (2020). The Influencing Context of Organizational Implementation Strategy Toward Accommodation Business in Thailand. Suthiparithat Journal, 34(109), 216-229.

Chirapanda, S., & Yoopetch, C. (2008). Organizational strategic fit and long-term performance: The sufficiency economy approach. Proceedings of International Conference on Business and Information 2008, Korea, 6–10 July Retrieved from http://hdl.handle. net/10527/10603

Department of Business Development. (2019). Restaurant Business Analysis for February 2019. Retrieved May 20, 2021, from https://www.dbd.go.th/download/document_file/Statisic/2562/T26/T26_201902.pdf.

Groeppel-Klein, A. (2005). Arousal and consumer in-store behavior. Brain Research Bulletin, 67, 428– 437.

Evans,K.R.,McFarland,R.G.,Dietz,B.,&Jaramillo,F.(2012).Advancingsalesperformancere search:A focus on five under researched topic areas. Journal of Personal Selling & Sales Management, 32(1), 89–106.

Fenger, M. H. J., Aschemann-Witzel, J., Hansen, F., & Grunert, K. G. (2015). Delicious words – assessing the impact of short storytelling messages on consumer preferences for variations of a new processed meat product. Food Quality and Preference, 41, 237–244.

Havanon, Napaporn. (2009). Narrative approach: the turning point of social science research. Journal of the Mekong Societies, 5 (May-August), 1-22.

Holliman, Geraint, & Rowley, Jennifer. (2014). Business to business digital content marketing: marketers' perceptions of best practice. Journal of research in interactive marketing, 8(4), 269-293.

Khongsawatkiat, Kittiphun. (2013). Business research methodology: Business research methods. Bangkok: Pongwarin Printing.

Koiso-Kanttila, Nina. (2004). Digital content marketing: a literature synthesis. Journal of Marketing Management, 20(1-2), 45-65.

Koseoglu, M. A., & Other (2013). Linkages among business strategy, uncertainty and performance in the hospitality industry: Evidence from an emerging economy. International.Journal of Hospitality Management, 34(1), 81-91.

Leonidou, L. C., Leonidou, C. N., Fotiadis, T. A., & Zerti, A. (2013). Resources and capabilities as drivers of hotel environmental marketing strategy: Implications for competitive advantage and performance. Tourism Management, 35, 94-110.

Lin, C., Tsai, H.L. & Wu, J.C. (2014). Collaboration strategy decision-making using the Miles and Snow typology. Journal of Business Research, 67(9), 1979-1990, doi: 10.1016/j.jbusres.2013.10.013.

Mintzberg, H. (1979). Patterns in strategy formation. International Studies of Management & Organization, 9(3), 67-86.

Nandakumar, M. K., Ghobadian, A. & O'Regan, N. (2010). Business-level strategy and performance The moderating effects of environment and structure, Management Decision, 48(6), 907-939.

Neuman, W.L. (2006). *Social Research Methods: Qualitative and Quantitative Approaches*. (6th ed.), Boston, USA: Pearson Education.

Niemchai, Saranyaa. Panyaem, Kosin. Wattanaparb, Narathip and Tawatnagul, Thaweedet. (2019). Using Storytelling Marketing Concepts to Promote Thai Cuisine in 4 Regions. Dusit Thani College Journal, 13(1), 459-474.

Parnell A. J. (2010). Strategic clarity, business strategy and performance. Journal of Strategy and Management. 3(4). 304-324.

Plidtookpai, N., & Yoopetch, C. (2021). The electronic Word-of-Mouth (eWOM) trustworthiness, brand image and other determinants of purchase intention of the middle class to luxury hotel services. *Kasetsart Journal of Social Sciences*, *42*(1), 61-68.

Porter, M. E. (1985). Competitive Advantage: Creating and Sustaining Superior Performance. New York: The Free Press

Pulizzi, Joe. (2012). The rise of storytelling as the new marketing. Publishing research quarterly, 28(2), 116-123.

Rungsatianputorn, Nattawut. (2016). Type of restaurants, Food Quality, Service Quality and Social Network affecting customers' decision to choose restaurants for dinner in Bangkok. Retrieved 25 May, 2021, from http://dspace.bu.ac.th/bitstream/123456789/2109/1/nattawut_rung.pdf.

Sharma, Amit, Moon, Joonho, Strohbehn, Catherine. (2014). Restaurant's decision to purchase local foods: Influence of value chain activities. International Journal of Hospitality Management, 39, 130-143.

Singjawala, Wanida. (2011). Grilled beef-grilled pork restaurant "Nobita". Independent Studies Master's degree, Bangkok University.

Sitti-issara, Wassana. (2020). Aesthetics within architecture of Chef's Tables. Graduate School, Silpakorn University.

Stettler, J., Rosenberg-Taufer, B., Huck, L., Hoppler, A. A., Schwarz, J., Yoopetch, C., & Huilla, J. (2018). A Conceptual Framework of Commercial Hospitality: Perception of Tourists in Thailand and Switzerland. In *Contemporary Challenges of Climate Change, Sustainable Tourism Consumption, and Destination Competitiveness*. Emerald Publishing Limited.

Sukhothai Thammathirat Open University. (2015). Food Service Management in Institutions.1st ed. Nonthaburi : Sukhothai Thammathirat Open University Press.

Wanarat, S. (2020). Increasing Competitive Advantage through Supply Chain Management and Information Technology Management. Journal of the Association of Researchers, 25(1), 107-122.

Woodside, A. G., Sood, S., & Miller, K. E. (2008). When consumers and brands talk: Storytelling theory and research in psychology and marketing. Psychology & Marketing, 25(2), 97–145.

Yoopetch, C. (2010). The model of knowledge acquisition: the study of SMEs in the Thai Hospitality Industry, World Academy of Science, Engineering and Technology 42: 351–354

Yoopetch, C. (2021). Women empowerment, attitude toward risk- taking and entrepreneurial intention in the hospitality industry. *International Journal of Culture, Tourism and Hospitality Research*, *15*(1), 59–76.

Young You Nie, Austin Rong Da Liang & Dun Ji Chen. (2017). Assessing the effect of organic-food short storytelling on consumer response. The Service Industries Journal. 37, 968-985.

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THE MARKETING MIX (4C'S) AFFECTING THAI TOURISTS' INTENTION TO VISIT BANG SAEN DISTRICT, CHONBURI PROVINCE

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Abstract

The purposes of this research study were to study the relationship between demographic characteristics of Thai tourists and intention to visit Bang Sean District, Chonburi Province, and to study marketing mix (4C's) that influences the intention to visit Bang Saen District, Chonburi Province. The questionnaire was used for data collection. The statistics used for data analysis involved the percentage, mean, standard deviation, t-test, One-Way ANOVA, and multiple linear regression analysis.

The results revealed that Thai tourists with different ages, different intentions to visit Bangsaen District, Chonburi Province. Moreover, the marketing mix (4C's), including Thai tourist's cost and Convenience to buy affected intention to visit Bang Sean District, Chonburi Province at .05 significant level.

Keywords: Marketing mix (4C's), Thai tourists, Intention to visit, Chonburi Province

Introduction

Tourism is an industry consistently generating revenues for our country although Thailand's economic circumstances have not yet been improving. This is because Thailand is one of the worlds' top ten destinations where foreign tourists intend to visit, together with the present trend encouraging Thai people to experience the local travels. By the above reasons, Thailand's tourism industry has been a main business generating a large amount of revenues for the country. All sectors as well as the public sector should pay

attention to the improvement of tourist attractions along with the natural conservation, cultivation of conscious mind, attitude, and behavior of tourists so that they perform any activities appropriately and relevantly to the culture and ways of life in each local area, and tourists' image and safety as well. These should be recognized and cared by every sector while the friendly welcome should be offered to tourists for Thailand's good image (Industrialnew, 2018).

In 2019, there were 167,031,943 tourists who have been accommodating, which generated revenues amounting to Baht 2,781,180.58 million. Chonburi Province is a tourist attraction regularly favored where the tourists can visit the sea there after few hours of traveling. Bang Saen District of this province is the location of Bang Sean Beach that can be visited throughout the year under the administration of Saen Sook Municipality. It has been always visited by tourists, and is a top tourist attraction of Bangkokians because there are the integrated tourist services there and the tourists can appreciate the nature or sunset, swim in the sea, do various water activities, enjoy fresh seafood, or visit many activities supported by both government and private sectors at Bang Sean in order to encourage and attract more tourists after the sluggish time due to economic problems, political problems, and COVID-19 pandemic crisis. On last year, Bang Saen Beach has been visited by many tourists (Prapasawas, 2011), especially by 15,027,645 Thai tourists, which generated revenues in the total of Baht 275,077.34 million (Ministry of Tourism and Sports, 2019). Therefore, the Researcher felt interested in studying the Marketing mix (4C's) affecting Thai tourists' intention to visit Bang Saen District of Chonburi Province, and in utilizing the research results to improve and develop any tourist attractions and other facilities there to meet the tourists' needs.

Objectives of the study

1. To study the relationship between demographic characteristics of Thai tourists and intention to visit Bang Sean District, Chonburi Province.
2. To study marketing mix (4C's) that influences the intention to visit Bang Saen District, Chonburi Province.

Benefits

1. To know the demographic factors of tourists that affect their intention to visit Bangsaen District, Chonburi Province.
2 To know the marketing mix (4C's) that affect their intentions to visit Bangsaen, Chonburi Province.

Literature review

All related documents and research papers were studied to be the knowledge basis. The studied issues were as follows:

Demographic factors

Serirat (2007) stated that demographic characteristics involved age, gender,

income, and education, which were the favored criteria to divide the market. Demographic characteristics are the important statistic features measured in the population to help determine the targeted markets, and they are easier to be measured than other variables. Some important demographic variables and persons with different demographic characteristics will have the different psychological characteristics.

Hanna & Wozniak (2001) and Schiffman & Kanuk (2006) stated that demographic characteristics were individuals' information about gender, age, religion, race, and occupation, etc., which influenced the expression of behavior.

Marketing mix (4C's)

Inbumrung (2010: 48) stated that attitude was an individual's assessment of feeling or opinion on anything whereas his/her attitude would influence his/her behavior. Therefore, if we want anyone to change his/her behavior, we must change his/her attitude first. However, in fact, it is hard to change attitude because it has been made up in mind. Thus, adapting consumers' behavior seems easier than changing it, which needs understanding, effort, and long length of time.

Prapasawas (2011: 11) stated that attitude was the direction we thought or were likely to do for something around us, e.g., attitude on retail shops, attitude on product, attitude or television program, etc. Attitude would indicate the direction of feeling to those things or how we feel, either positive or negative, like or dislike, good or bad, satisfied or unsatisfied, etc.

Pradeep and Aspal (2011) stated that the 4C's marketing strategy was a factor and fundamental strategy of doing the business to directly satisfy customers, and to make their decision to buy easier.

1. Customer solution means the customers' need on a product at present. The customers' need must be considered first, that is, the product demanded by customers must be able to solve their problems.
2. Customer cost means the cost spent in terms of feeling and money if the customers feel that it is worthwhile to buy a product. The consumer cost comprises 4 following components: (1) financial cost (2) time cost (3) energy cost (4) mental cost
3. Convenience means the consumers' convenience to buy the product.
4. Communications means that the good communications will make customers trust and believe in the product. We must consider which media and content will be accepted by customers.

Tourists' behavior of decision-making

Jittangwattana (2005) stated that the tourists' reaction directly related to the use of tourist services as well as any other processes to make decision on tourism. The tourists' behavior in making decision on tourism involved 9 important steps as listed below.

1. Promotion of tourism market is to provide the tourism information to the

targeted group of tourists via various media and related agencies.

2. Tourism needs of each tourist is different. When the targeted group of tourists receive the tourism information, the tourism needs will emerge in each tourist's mind

3. Motivation driving tourists to visit comes from 2 factors: force to escape from repetition of daily life by way of tourism; and attraction to visit tourist attractions or to join tourist activities.

4. Tourists' decision deems an important element affecting tourism when one who wants to travel from tourism receives the tourism information and, then, wants to go out for tourism.

5. Planning for tourism expenses by studying all expenses in tourism. Planning for tourism expenses must cover all expenses incurred while traveling.

6. Preparation for travelling. When a tourist decides to select a particular tourist attraction and plans for tourism expenses, he/she must prepare by booking the travelling ticket and tourist program, and confirming the preparation of tourist documents and visa to other countries.

7. Tourism trip is the travel from home for tourism and going back home after the end of trip. The tourist result is assessed from the starting point to the destination as well as accommodation and food.

8. Tourism and tourists. The tourism results are assessed in relation to place, environment, people, service, facilities, and tourist experience.

9. Tourists' attitude. Tourists have experience from tourism and, then, they have attitude toward that tourism trip. If they get safety, they will have the good attitude toward the next tourism trip, and repeat the trip.

Tourism motivation

Motivation means the need arising out from an individual's surroundings which drive him/her to visit various destinations, that is, motivation drives him/her to show his/her behavior. The tourist's motivation means the cultural power factor and biological factor. Both factors determine behaviors. The psychological power factor includes the need on relaxation after working, and need to see new things. The social power factor is gladness to see the worlds' wonders.

It could be concluded that motivation is a factor inspiring an individual to show his/her behavior based on tourist objectives. Such behavior must be motivated so that the tourists need to travel.

Decision

Kotler & Keller (2006) stated that this theory is to explain the fundamental psychology to understand what the consumers' process of decision to buy is. The marketeers should try to understand such behavior. However, it is not typical that all customers must pass all 5 steps of decision to buy; either of them may be skipped or any of them may be reversed before making decision to buy. The process of decision to buy comprises the following 5 steps:

1. Problem perception

2. Information searching
3. Assessment of alternatives
4. Decision to buy
5. Post-purchase behavior

These studies were used as the framework to analyze the process of decision to buy products and services at Bang Saen District of Chonburi Province in accordance with the process of decision to visit to serve the customers' fundamental needs until it became the intention to search for information about Bang Saen District of Chonburi Province from searching the information by tourists themselves, asking any persons, or sharing experience from surrounding people until the tourists decide to visit Bang Saen District, Chonburi Province.

Wongkraisri (2014) studied The Marketing Mix Model 4'Cs and 4'Fs, the Advertising on Social Network, and the Marketing Activities Affecting the Customer's Intention to Use the Artificial Turf Football Field in Bangkok. The results of the study revealed that the Marketing Mix Model 4'Cs in terms of convenience of purchase and consumer demand affects the intention to use the artificial turf football field in Bangkok.

Suphathanachotipong (2019) studied The Quality of Service that Affects the Intention of Customer to Repurchasebank of Ayudhya Public Company Limiteda Case Study of Bangkok Metropolitan Area, Region 203. The results showed that customers with different gender, age, educational level, average monthly income, and occupation had the same intent to re-use the banking service.

Kassapa & Sirimongklon (2021) studied The Affect of Marketing Mix (4C's) on Customer's Buying Decision Making via Social Media (Facebook) in Khon Kaen Province. The study found that the marketing mix model 4'Cs in terms of consumer demand, consumer cost, consumer convenience, and communication influences purchasing decisions through social media (Facebook) with statistically significant.

Conceptual framework

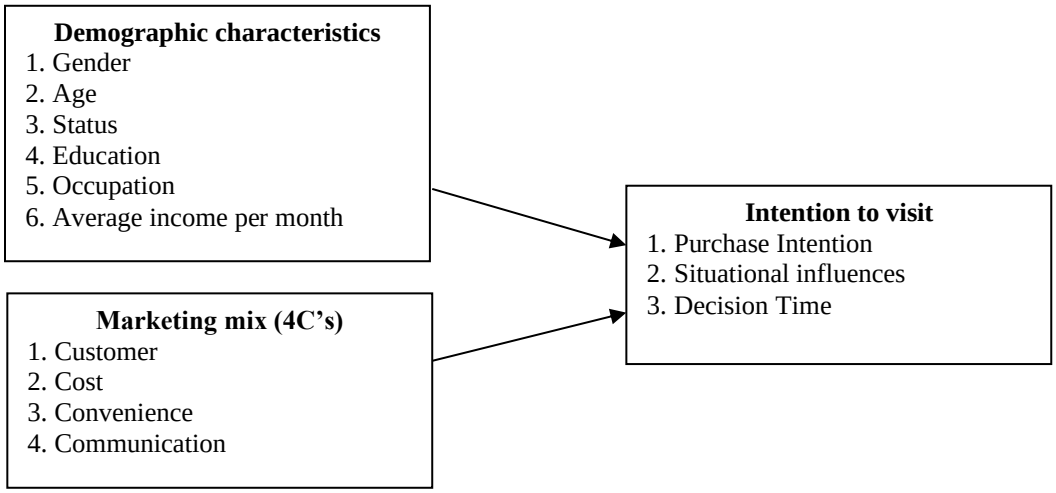

Figure 1 Conceptual framework

Research hypotheses

H1: Demographic characteristics of Thai tourists affecting the intention to visit Bang Sean District, Chonburi Province.

H2: Marketing mix (4C's) affecting the intention to visit Bang Saen District, Chonburi Province.

Methodology

Population and Sample

In this research study, the population involved Thai tourists who used to visit Bang Sean District, Chonburi Province. As the exact number of populations could not be found, the sample size was calculated by using the formula of Cochran (1953) with 95% reliability; therefore, the sample involved 384 persons.

Research Instrument

The instrument for data collection is the self-administrated questionnaire.

Data Collection

This study was the survey research. The data collection may be divided into 2 parts: primary data; and secondary data.

Data Analysis

Descriptive statistics were used to calculate mean, percentage, and standard deviation.

Inferential statistics were used to test the hypotheses, which included t-test, One-Way ANOVA (F-test), and multiple linear regression.

Results

Section 1: General information about questionnaire respondents. The result showed that most questionnaire respondents (55.8%) were male; 41.3% was at ages between 21-30 years; 84.8% was single; 50.8% attained the education lower than the bachelor degree; 48.5% undertook the private business; and 43.0% earned the income at the range of Baht 20,001 – 30,000 per month.

Section 2 Marketing mix (4C's)

Table 1 Mean, Standard deviation, and level of opinion on marketing mix (4C's)

Marketing mix (4C's)	Level of Opinion		
	$\overline{X}$	S.D.	Interpretation
1. Needs of Thai tourists (Customer)	3.29	.396	Fair
2. Cost of Thai tourists	4.08	.438	High
3. Convenience to buy	3.83	.616	High
4. Communications	3.84	.350	High
Overall	**3.76**	**0.233**	**High**

From Table 1 regarding Marketing mix (4C's), it was found that the overall marketing mix was at the high level ($\overline{X}$ = 3.76). When considering each aspect, the highest mean fell into Thai tourists' cost ($\overline{X}$ = 4.08), followed by the communications ($\overline{X}$ = 3.84), and the lowest mean fell into Thai tourists' needs ($\overline{X}$ = 3.29) respectively.

Section 3 Intention to visit

Table 2 Mean, Standard Deviation, and level of opinion on intention to visit Bang Sean District, Chonburi Province

Intention to visit	Level of Opinion		
	$\overline{X}$	S.D.	Interpretation
1. Purchase Intention	4.21	.476	High
2. Situational influences	4.03	.414	High
3. Decision Time	4.20	.490	High
Overall	**4.15**	**.273**	**High**

From Table 2, the sample group had an opinion on the overall intention to travel at a high level ($\overline{X}$ = 4.15). Considering each aspect, it was found that the aspect with the highest mean was the purchase intent ($\overline{X}$ = 4.21), followed by the duration of the intention to travel ($\overline{X}$ = 4.20), and the aspect with the lowest mean was the travel intention situation ($\overline{X}$ = 4.03), respectively.

Section 4 Hypothesis testing

H1: Demographic characteristics of Thai tourists affecting the intention to visit Bang Sean District, Chonburi Province.

Table 3 demographic characteristics of tourists that influences the intention to visit Bang Sean District, Chonburi Province

Demographic characteristics	Intention to visit		
Gender	Purchase Intention	02.8	.649
	Situational influences	.087	.769
	Decision Time	.128	.720
Age	Purchase Intention	1.248	.290
	Situational influences	2.817	.025*
	Decision Time	1.339	.255
Status	Purchase Intention	1.374	.254
	Situational influences	.292	.747
	Decision Time	.420	.658
Level of education	Purchase Intention	2.184	.114
	Situational influences	.707	.494
	Decision Time	.316	.730
Occupation	Purchase Intention	1.074	.360
	Situational influences	.100	.960
	Decision Time	1.126	.338
Average income per month	Purchase Intention	.405	.805
	Situational influences	.588	.672
	Decision Time	.863	.486

* $p < .05$

From Table 3, it was found that the general data for different ages had significantly different travel intentions in Bangsaen District at a statistical level of 0.05. The differences of gender, statut, level of education, occupation and average income per month were not different statistically.

H2: Marketing mix (4C's) affecting the intention to visit Bang Saen District, Chonburi Province.

Table 4 Multiple Regression of marketing mix (4C's) affecting Thai tourists' intention to visit Bang Sean District, Chonburi Province

Marketing mix (4C's)	β	S_E	Beta	t	P	VIF
Constant	3.755	.238		15.795	.000	
Thai tourists' needs (X1)	-.049	.034	-.071	-1.438	.151	1.004
Thai tourists' cost (X2)	.075	.031	.120	2.417	.016*	1.010
Convenience to buy (X3)	.055	.022	.123	2.490	.013*	1.008
Communications (X4)	.011	.038	.013	.273	.785	1.002
Adjust R Square (R^2) = 0.290, F = 3.995,						

*$p < .05$

From Table 4, it was found that no multicollinearity problem occurred while VIF value was in the range of 1.002 – 1.010 <10. This meant that each independent variable was independent while the constant was equivalent to 0.238. The result showed that t. = 15.795 and Sig. = 0.000. The Regression Analysis result presented the independent variable or marketing mix (4C's) with Sig. <0.05, e.g., Thai tourists' cost, and convenience to buy with the forecasting efficiency at 29%. The regression equation of this forecasting is as follows:

$$Y = a + \beta X_i$$

When Y represents attention to visit Bang Saen District, Chonburi Province

X_2 represents marketing mix (4C's) in respect with Thai tourists' cost

X_3 represents marketing mix (4C's) in respect with convenience to buy

Regression equation calculated by using raw scores is $Y = 3.755 + 0.075\ X_2 + 0.055\ X_3$

Regression equation calculated by using standard scores is $Z = 2.417\ X_2 + 2.490\ X_3$

Conclusion

The data obtained from the research study on marketing mix (4C's) affecting Thai Tourists' Intention to Visit Bang Sean District, Chonburi Province could be summarized below.

General information consists of different ages and different intentions to visit Bangsaen District, Chonburi Province. The reason is because the group of people aged 20 or under are teenagers who are students, so they intend to go to Bangsaen District with friends of the same age only during important festivals, which different from the group aged 21-30, which are undergraduates and working age groups. In the age group 31-40 years old are working people who earn income, which they traveling on vacation or taking the family to relax from hard work on weekends, including annual holidays such as New Year or Songkran.

As for the marketing mix (4C's), the cost of Thai tourists and the convenience of purchasing influenced their intention to visit Bangsaen District, Chonburi Province. The reason is because Thai tourists consider the cost and value of traveling to Bangsaen District, which is a beautiful and popular vacation destination, as well as being close to Bangkok, making it easy to travel. As a result, travel expenses are worthwhile in terms of food, travel, and travel expenses, as well as being able to book various services quickly and easily.

Discussion

1) the general data for different ages had significantly different travel intentions in Bangsaen District at a statistical level of 0.05. In accordance with Prapasawas (2011) study titled "Tourist Attitudes and Satisfaction towards One-Day Trips at Bangsaen Beach, Chon Buri Province of Bangkok Citizens". The research results showed that the demographic characteristics of sex, age, status, and

occupation had different attitudes towards one-day trips at Bangsaen Beach, Chonburi Province; also had varying levels of satisfaction across demographic characteristics of age, educational status, and income levels. Moreover, this is consistent with Doilom (2010) studied on Service Demands of Hotel Guests at Khao Kho, Phetchabun Province, which the results revealed that the results of the comparison of hotel guests' needs in Khao Kho District, Phetchabun Province, had no difference in the demand for hotels in Khao Kho District, Phetchabun Province by gender. As for the results of the comparison of the needs of hotel guests in Khao Kho District, Phetchabun Province classified by age, marital status, education level, average monthly income, and occupations were statistically different.

2) The marketing mix (4C's) were cost of Thai tourists and convenience of purchase, which had a statistically significant influence on the intention of traveling to Bangsaen at the 0.05 level. This is consistent with Choi & Chu (2000) who studied the factors of hotel guest satisfaction determinants in Hong Kong using Importance - Performance Analysis (IPA). The study found that the sample group focused on various factors such as service quality factor, service facility factor, value for money factor, hotel room and reception factors, food and entertainment factors, and safety factors. When analyzed by IPA, the factors that are highly valued by customers and that hotels are able to create high customer satisfaction include the hotel service quality factor, the hotel room and reception factor, and the safety factor. The factors that hotels need to improve due to high customer focus but low satisfaction levels are value for money factors. And the factors that were less important to customers were the amenities factor, and the food and entertainment factor.

Recommendations

The suggestions of this study are as follows:

1) The finding on marketing mix (4C's) affecting Thai tourists' intention to visit Bang Saen District, Chonburi Province indicated that such Thai tourists mainly focused on their cost significantly. Therefore, the hotel and accommodation operators should set up the appropriate room price to make the tourists feel that such price is worthwhile. Pricing may be used as the marketing strategy to encourage Thai tourists to accommodate in 5-star accommodation rooms at the affordable price.

2) The finding on marketing mix (4C's) affecting Thai tourists' intention to visit Bang Saen District, Chonburi Province indicated that such Thai tourists mainly focused on their cost significantly. Therefore, the restaurant operators at Bang Saen District should plan and prepare the marketing strategy in food price, and any promotion activities via various channels to encourage all customers groups to have Michelin food at the affordable price.

3) The finding on marketing mix (4C's) affecting Thai tourists' intention to visit Bang Saen District, Chonburi Province indicated that such Thai tourists mainly

focused on their cost significantly. Therefore, the business operators relating to the tourism industry at Bang Saen District, Chonburi Province, e.g., tourism guide business, travelling, souvenir, and other businesses should utilize the tourists' cost factor to plan and prepare the business strategy and sales promotion activities to make the customers feel that their trip is cost-effective, which will subsequently increase their sales sum consistently.

4) The finding on the marketing mix (4C's) in respect with the convenience to buy can be used to provide the facilities, or build the awareness that Bang Saen District is located in the appropriate area, close to Bangkok and other community area with the convenient traveling, and tourist services and information, e.g., accommodation, food, and other activities. It is a tourism city in high safety.

Recommendations for further study

1) Other additional research instruments should be used for data analysis to obtain more precise analysis results such as in-depth interview, focus group, etc. in order to find out more information, problems and opinions from related persons so that the information is complete in all domains.

2) Other important and related variables should be studied. The studied area should be expanded as well to obtain the complete information, which may be utilized efficiently.

3) Further studies should be done in foreign tourists, e.g., Chinese, European tourists or potential ones from other countries.

References

Choi, T. Y., & Chu, R. (2001). Determinants of hotel guests' satisfaction and repeat patronage in the Hong Kong hotel industry. *International Journal of Hospitality Management*, *20*(3), 277-297.

Cochran, W. G. (1953). *Sampling Techniques*. Oxford, England: John Wiley.

Doilom, A. (2010). *Study on Service Demands of Hotel Guests at Khao Kho, Phetchabun Province*. Master of Business Administration Thesis. Business Administration. Rajabhat Phetchabun.

Hanna, N., & Wozniak, R (2001). *Consumer behavior: An approach*. Upper Saddle River, NJ: Prentice Hall.

Inbumrung, J. (2010). *Marketing Mix and Attitude of Internet Banking Service Users of Krung Thai Bank PLC. in Muang Nakhon Pathom District, Nakhon Pathom Province*. Silpakorn University/Nakhon Pathom.

Industrialnew. (2018). *Tourism Industry – Business Making Money for Thailand*. Retrieved from http://industrialnew.com/ Business Making Money for Thailand.

Jittangwattana, B. (2005). *Tourism industry.* Bangkok: Thammasat university bookstore.

Kassapa, N. & Sirimongklon, T. (2021). The Affect of Marketing Mix (4C's) on Customer's Buying Decision Making via Social Media (Facebook) in Khon Kaen Province. *NEU Academic and research journa, 11*(1), 100-114.

Kotler, P. & Keller, K. (2006). *Marketing Management*. 12th ed. Upper Saddle River, NJ: Prentice Hall.

Ministry of Tourism and Sports. (2019). *Tourism Situation of Each Province in Thailand*. Retrieved from http://www.mots.go.th/more_new.php?cid=525.

Prapasawas, S. (2011). *Attitude and Satisfaction of Tourists towards One-day Trip at Bang Saen Beach, Chonburi Province among the Population in Bangkok*. Master of Business Administration. Bangkok University.

Schiffman, L. G., & Kanuk, L. L. (2006). *Consumer Behaviour*. Englewood Cliffs, New Jersey, NJ: Prentice Hall International.

Serirat, S. (2007). *Consumer behavior*. Bangkok: Teerafilm.

Suphathanachotipong, V. (2019). *Quality of Service that Affects the Intention of Customer to Repurchasebank of Ayudhya Public Company Limiteda Case Study of Bangkok Metropolitan Area,Region 203*. Master of Business Administration, Silpakorn University.

Wongkraisri, S. (2014). *The Marketing Mix Model 4'Cs and 4'Fs, the Advertising on Social Network, and the Marketing Activities Affecting the Customer's Intention to Use the Artificial Turf Football Field in Bangkok*. Master of Business Administration, Bangkok University.

Guide for authors

University of the Thai Chamber of Commerce International Journal of Business and Economics (UTCC IJBE) is published by University of the Thai Chamber of Commerce, and Thailand Management Association. It is published twice yearly in a spring and fall edition and is directed toward the needs of academia, practitioners, executives, researchers, students, and the general public interested in business management (i.e., Marketing, Service Management, Innovation and Design in Business, Finance, Banking, Accounting, Economics, Insurance and Risk Management, Production, Industrial and Operation Management, Strategic Management and Management, International and Global Business Management, Entrepreneurships, Organization Behavior, Business Ethics, Business Law, Business System, Hospitality and Tourism Management, Human Resource Management, and Office and Facility Management).

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The editorial objectives of UTCC IJBE are to advance knowledge and science and to stimulate greater thought and effort in the fields of business management, and by providing readers with:

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- New business management theory or techniques;
- Research explaining about business management thought and practice;
- Articles in subject areas which have significant current impact on thought and practice in business management.

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2. Articles that report on the development of methodologies and techniques that can enhance business management decision making.
3. Articles that report the application of decision tools to generic or specific business management problems.

Manuscripts should be between 4,000 and 6,000 words, typically 15-20 single-spaced, typewritten pages. Articles of shorter length are also acceptable. Only rarely will it be possible to publish a manuscript of more than 6,000 words.

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Articles are considered for publication if they have not been published or accepted for publication elsewhere and are not being concurrently considered elsewhere. Authors will usually be notified of acceptance, rejection, or need for revision within 16 weeks of submission.

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All manuscripts are judged on their contribution to the advancement of the science and/or practice of business management. The editors expect all manuscripts to follow accepted standards for scholarly work. Manuscripts are judged not only on depth and scope of ideas presented and their contribution to the field, but also on their clarity,

organization, readability, and comprehensibility.

Manuscripts should be written in a manner that is interesting and readable to both practitioners and academics. It is beneficial to include a section regarding managerial implications and discussion of the consequences of applying the proposed ideas. Technical terms should be defined.

Manuscript preparation

Manuscripts should be typed single-spaced in 12-point type using Times Roman or similar type. Use single spacing in endnote references. Please allow the text to wrap, rather than entering a RETURN or LINEFEED after every line.

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Chirapandu, S. & Yoopetch, C. (2009), "Bank Credit Card Adoption Criteria and Marketing Implications," *International Journal of Business in Asia, Vol.1, No. 1,* pp. 1- 20.

Books:

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