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สถาบันบัณฑิตพัฒนบริหารศาสตร์

WISDOM
for Sustainable Development
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Research Articles:

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วารสารพัฒนบริหารศาสตร์
Volume 63 Number 1 (January - June 2023)

Aims and Scope Aims and Scope

The NIDA Development Journal (NDJ) publishes manuscripts that describe or synthesize research of direct relevance to development administration. Its main objective is to publish high quality, double blind peer-review papers using at least three referees that have not previously been published and that reflect the latest research in the area of policy, administration and development. The editors welcome a wide range of academic papers, including research articles, review articles, and book reviews.

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Office

Research Center,
National Institute of Development Administration (NIDA)
148 Serithai Road, Khlong-Chan,
Bangkapi, Bangkok, 10240 THAILAND
Tel. 66 2 727 3312, 66 2 727 3314
E-mail: journal@nida.ac.th

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Message from the Editor

We are pleased to present this issue of *NIDA Development Journal* (NDJ Volume 63 Number 1, January - June 2023). As in its previous issues, the articles being featured by the current one cover a wide range of topics to suit the various academic and practical interests of readers. The topics fall under a variety of subject areas, including tourism, HRD, marketing, finance, and investment. As always, we hope that the readers will substantially benefit from the information and analyses presented in the following research-based articles.

The first article by Associate Professor Dr. Ann Suwaree Ashton of NIDA's Graduate School of Tourism Management, **"Wellness Tourism Destination Development Strategy: Active Aging Tourists Motivation"**, presents a new trend in tourism, i.e., wellness tourism, and identifies individual passions and preferences as motivations for wellness travel. In view of unprecedented population aging, especially in the Asia-Pacific, this trend is destined to become increasingly dominant.

In the second article, **"Roles of HRD in Social Enterprise in Thailand a Systematic Literature Review"**, Asma Tehmarn and Prof. Dr. Chiraprapha Akaraborworn of NIDA's School of Human Resource Development, examine how HRD, which principally aims at performance improvement and increase in the competitiveness of for-profit organizations, at the same time shares some characteristics of social enterprise, especially the need to serve social and environmental goals. Such a dual role of HRD is thus particularly suitable to the hybrid character of social enterprise and relevant to the current concern for sustainable development.

The next article, **"Determinants of Purchase Intention of Functional Food in Thailand: A Study on Young Adults"**, by Paul Kalin of Panyapiwat Institute of Management, studies not only an interesting marketing topic but also an important innovation, functional food, that is becoming a crucial future trend. The article offers useful findings and analyses for marketing specialists, as well as entrepreneurs and consumers.

The fourth article, **"Exchange Rate Regime Performance under External Shocks: A Case Study of ASEAN"**, shifts our attention still to another subject area, that of Finance. In this article the author, Dr. Inpong Luanglath Paul of Bangkok University International Marketing Faculty-International College, examines the effectiveness of exchange rate management in the ASEAN countries, using quantitative tools for data analysis. The research results are of both academic and policy relevance.

The fifth article, **"The Effect and Prediction of Investor's Sentiment on Equity Return: An Empirical Study on the Thai Stock Market"**, is a Master's thesis research in Finance. The authors, Chang Chen and Associate Professor Sira Suchintabandid of the Business School of Chulalongkorn University, explore an essential question in finance, that of whether investor sentiment significantly affects stock returns. The study expands the attention from the developed stock markets to the emerging ones, which still lack substantive research, with a focus on the Thai equity market.

The last article, **"Investor's Perception: Sustainable Development through Investment Avenues in India"**, is a doctoral thesis in Finance, whose authors, Mohammed Nabeel. K and Professor Dr. M. Sumathy, are affiliated with School of Commerce, Bharathiar University, Tamilnadu, India. This doctoral research also involves a crucial issue in Finance, i.e., sustainable investment, which is one of the financial market's fastest-growing investment techniques since its start in 2022. The research is therefore of immense general interest.

These six articles can be accessed online at www.tci-thaijo.org. We hope that the readers of this NDJ Vol. 1/2023 issue will gain significant benefits from the contents of these articles. The editor would like to thank all members of the editorial board, the scholars who have kindly reviewed the articles, and the support staff of the NIDA Research Center, who have contributed to the production of this issue of the NIDA Development Journal, and, last but not least, the journal subscribers and all its readers.

Patthareeya Lakpetch
Editor

Prapin Nuchpiam
Associate Editor

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วารสารพัฒนบริหารศาสตร์
WISDOM for Sustainable Development

Contents

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Research Articles:

Wellness Tourism Destination Development Strategy: Active Aging Tourists Motivation

Ann Suwaree Ashton*

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Abstract

The aim of this study is to investigate the active aging tourist intrinsic and extrinsic motivation toward a wellness tourism experience. Qualitative approach was employed using the in-depth interview technique for data collecting, and content analysis was used for analysing data. The findings revealed that individual passions and preferences are motivations for wellness travel. These motivations set force to drive the active aging tourist, especially those of 50-plus years, to involve in the preferred activities for new meaningful experiences. The desired experiences from different levels of activities can also bring better health to their later lives. Results offer a new motivation model for wellness experience-based tourism with a view for further research and niche-marketing practices.

Keywords: Active Aging Tourist, Wellness Tourism, Wellness Attributes, Tourism Motivation

* Associate Professor, Graduate School of Tourism Management, National Institute of Development Administration
148 Serithai Road, Khlong-Chan, Bangkapi, Bangkok 10240, THAILAND.
E-mail: suwareeashton@hotmail.com, suwaree.n@nida.ac.th

ยุทธวิธีการพัฒนาจุดหมายปลายทางการท่องเที่ยวเชิงสุขภาพสำหรับนักท่องเที่ยวกลุ่มพฤตพลัง

สุวารี นามวงศ์*

รับวันที่ 10 พฤศจิกายน 2565 *ส่งแก้วันที่ 9 ธันวาคม 2565* *ตอบรับตีพิมพ์วันที่ 23 ธันวาคม 2565*

บทคัดย่อ

บทความวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาแรงจูงใจภายในและภายนอกของนักท่องเที่ยวเชิงสุขภาพในกลุ่ม Active Aging หมายถึง นักท่องเที่ยวกลุ่ม “พฤตพลัง” หรือผู้สูงอายุที่มีศักยภาพ (ในการศึกษานี้ผู้วิจัยได้กำหนดกลุ่มตัวอย่างที่มีอายุ 50 ปีขึ้นไป) ได้ใช้ระเบียบวิธีวิจัยเชิงคุณภาพและใช้การสัมภาษณ์เชิงลึกในการเก็บข้อมูลโดยนำเทคนิคการวิเคราะห์ข้อมูลเชิงเนื้อมาทำการวิเคราะห์ผลการศึกษาที่ได้รับจากการสัมภาษณ์ซึ่งผลการศึกษาจากครั้งนี้พบว่า กลุ่มนักท่องเที่ยวพฤตพลังมีความชื่นชอบหลงใหลและพึงพอใจที่จะเลือกการท่องเที่ยวเพื่อสุขภาพเพื่อตัวเองและพบว่า มีแรงจูงใจที่จะได้รับประสบการณ์จากการท่องเที่ยวเชิงมีผลที่น่าสนใจและแตกต่างกันออกไป ซึ่งผลการศึกษาส่วนใหญ่พบว่า การท่องเที่ยวเชิงสุขภาพนั้นผู้ให้สัมภาษณ์ต้องการที่จะเข้าร่วมกับกิจกรรมที่ทำให้ได้รับประสบการณ์ที่มีความหมายต่อชีวิตจริง ๆ และสำหรับการออกแบบกิจกรรมการท่องเที่ยวเชิงสุขภาพสำหรับวัยนี้นั้น ควรที่จะจัดกิจกรรมความหนักเบาในระดับต่าง ๆ ที่สำคัญเพื่อให้เหมาะสมกับความต้องการและความสามารถทางด้านกายภาพของแต่ละคน และการเข้าร่วมกิจกรรมเพื่อสุขภาพนั้นมีความประสงค์เพื่อในอนาคตข้างหน้าจะได้มีคุณภาพชีวิตที่ดีมีสุขภาพที่แข็งแรงและผลการศึกษาครั้งนี้ทำให้ได้รูปแบบของการสร้างแรงจูงใจในการท่องเที่ยวเพื่อสุขภาพเพื่อให้ได้รับประสบการณ์ที่ดีโดยเฉพาะให้กับกลุ่มนักท่องเที่ยวพฤตพลัง และบทความนี้ได้ให้ข้อเสนอแนะเกี่ยวกับหัวข้อวิจัยเพื่อนำไปต่อยอดเกี่ยวกับการพัฒนาการท่องเที่ยวเชิงสุขภาพเพื่อที่จะเป็นประโยชน์ทั้งทางด้านวิชาการและการปฏิบัติ และการพัฒนารูปแบบการท่องเที่ยวสำหรับนักท่องเที่ยวที่เป็นกลุ่มเฉพาะเจาะจงต่อไป

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* รองศาสตราจารย์ คณะการจัดการการท่องเที่ยว สถาบันบัณฑิตพัฒนบริหารศาสตร์
เลขที่ 148 ถนนเสรีไทย แขวงคลองจั่น เขตบางกะปิ กรุงเทพฯ 10240
อีเมล: suwareeashton@hotmail.com, suwaree.n@nida.ac.th

Introduction

At the present, the increasing numbers in the Aging population are a promising market to ensure the socio-economic growth for future tourism products (T.-S. Chen, Hwang, & Chang, 2022; Yue, 2022). By 2050, the number in the older population segment is expected to be over two billions, and will become the largest tourist group in history (Balderas-Cejudo & Leeson, 2017; Marcekova, Simockova, & Sebova, 2016; Nations United, 2017). Therefore, for decades wellness living has been a key issue concerning aging people and can be a successful way to have good quality in later life (Kim, Woo, & Uysal, 2015; Pyke, Hartwell, Blake, & Hemingway, 2016). Hence, people in this age group want to have a good life style with quality, and travel for wellness purposes.

In relation to wellness tourism and active aging studies, a number of scholars have paid attention into various areas. For example, a study on aging tourists and their behaviour, include the needs and wants in leisure activity related to well-being (Balderas-Cejudo & Leeson, 2017; Formosa, 2019; Koskinen, 2019). In addition, an area of a study emphasied on senior/aging tourists and their behavior and importance in this segment (Nikitina & Vorontsova, 2015), while in China scholars aimed to investigate the changing characteristics of the older adult population (Du & Yang, 2010).

As discussed from past studies, it was noticed that an investigation on motivations of the active aging tourist toward wellness tourism experience is still lacking. Thus, to achieve the research aim two research questions are raised as follows: What are the extrinsic motivations of the active aging 50-plus tourist group? What are the intrinsic motivations of the active aging 50-plus tourist group?

It is important to fill the research gap for number reasons. For instance, a number of researchers such as S. Q. Cutler and Carmichael (2010), Uysal, Sirgy, Woo, and Kim (2016) and Zhang, Wu, and Buhalis (2018) have confirmed that great memorable experiences can relate to one's quality of life (Cutler & Carmichael, 2010; Uysal et al., 2016). Firstly, the results of this study help to differentiate the meaningfulness of wellness tourism experiences and attract active aging tourists to destinations (Pullman, 2004). Because the study outcome will create tourist intention behaviour if wellness tourism product/activity meet tourist expectation

(Girish Prayag & Grivel, 2014; G. Prayag, Hosany, Muskat, & Chiappa, 2017). In addition, this study will be beneficial creating good reputation and brand image toward tourist perception; increasing revenue to all relevant stakeholders; and identifing crucial factors for further development at a destination (A. S. Ashton, 2014; Hankinson, 2005; Wray, Laing, & Voigt, 2010). Furthermore, the findings can give marketers and relevant stakeholders knowledge on the fundamentals of creating wellness tourism experience through the development of product/service/activity and emotional experience. In turn, it helps tourists to be motivated with the need or desire for healthy living, disease prevention, stress reduction, management of poor lifestyle habits, and authentic experience (B. Hettler, 1976; B. Hettler, 1980; Milner, 2013; Mueller & Kaufmann, 2001).

Literature Review

The Concept of Wellness Tourism

Wellness is about physical health, mental and social wellbeing, and the motivations of tourists to travel is also for health where there is a need to rest, relax and to have good quality of health well-being (Aicher & Brenner, 2015; Kamata & Misui, 2015; Laesser, 2011; Snelgrove, Taks, Chalip, & Green, 2008). Alternatively, wellness refers to a state of being describing a state of positive health in the individual comprising of biological and psychological well-being (Corbin, Pangrazi, & Franks, 2000, p. 8). Different keywords are widely used when referring to travel associated with quality of life and well-being. For instance, some scholars used the word health tourism referring to two main concepts of health: wellness and medical. As stated, wellness tourism is a subset of health tourism, which can also include a religious perspective (Azara, Michopoulou, Niccolini, Taff, & Clarke, 2018; Romanova, Vetitnev, & Dimanche, 2016). Alternatively, other scholars use the word health-well-being when studying the health context; in this instance it is defined as the state of health, and is concerned with improvement to achieve quality of life (Pyke et al., 2016). While the concept of health tourism alone is defined as the provision of health facilities utilizing the natural resources of the country, in particularly mineral water and climate (Goodrich & Goodrich, 1987, p. 213). Moreover, Hall (1992) analysed health tourism within the context of adventure and sport

tourism, but not including the physical, mind spiritual perspective (Azara et al., 2018). In this study the word wellness tourism will hereafter be used throughout this paper because it has true meaningfulness and is most relevant to the study's main aim. Wellness tourism in this paper is defined as rest, relaxation, and escapism reigning supreme; it is also tourist self-awareness, as active seekers of enhanced well-being, health, and happiness (Azara et al., 2018, p. 10).

In addition, wellness tourism for the active aging 50-plus tourist, and a number of scholars have proposed different concepts related to this context (B. Hettler, 1976; B. Hettler, 1980; Milner, 2013; Mueller & Kaufmann, 2001). Especially, Mueller and Kaufmann (2001) asserted that there are three rings of wellness concept related to intrinsic motivation: the outer ring; middle ring, and central ring. The outer ring comprises two aspects: social contacts and environmental sensitivity. The middle ring comprises four aspects: mind (mental, activity, education); body (physical, fitness, beauty-care); relaxation (rest and meditation); and health (nutrition and diet). Lastly, the central ring is related to self-responsibility (Mueller & Kaufmann, 2001). Likewise, Sameer Hosany (2012) identified five dimensions and determinations of wellness tourism intrinsic motivation: emotional well-being, positive functioning, life satisfaction, social well-being, and vitality. It can be concluded that the study of motivation is being used in revealing the active aging 50-plus group behaviour, and to understand their travel decision-making before participating in a wellness tourism activity (Azman & Chan, 2010).

Mindset of the Active Aging Tourists

The word active refers to continuing participation in social, economic, culture, spiritual and civic affairs; it is not just the ability to be physically active or to participate in the labour force (WHO, 2002). There are three approaches for active ageing tourists: firstly, the needs based approach; secondly, the rights based approach, and finally, the strength based or activity based approach (Alén, Domínguez, & Losada, 2012; Hung & Lu, 2016; Stewart-Brown, 1998). Firstly, the needs based approach refers to a basic need, want, or belief playing the important motive role for the aging tourists to travel (Hung & Lu, 2016). Secondly, the rights based approach refers to the opportunity for aging tourists to be able to access all aspects of life as they grow older (Alén et al., 2012; WHO, 2002). The last concept, strength based or activity based approach, refers to actively participating in both physical and mental health

activities while travelling (Stewart-Brown, 1998). Well-being is interchangeble with quality of life (Pyke et al., 2016). The holistic experiences for the active 50-plus is to integrate individual experiences into a holistic-health consideration (Neuhofer, Buhalis, & Ladkin, 2012).

The different motivations are the antecedents in the tourist experience because it reveals what tourists desire and their attempted activity behaviour (de Freitas Coelho, de Sevilha Gosling, & de Almeida, 2018). Notably, preventive health or health improvement are double essences of the active aging tourists' motivation to travel (Yeung & Johnston, 2017). Likewise, the individual inner motivations importantly drive the active 50-plus to fulfill what they need at this age (Milner, 2013). For instance, the need to go out associating with outside experiences and participate in some activities become important extrinsic motivations. The benefits of travel can be the lifestyles that relate to motivation and participation in more meaningful, transformational or eudemonic tourist experiences (Smith & Diekmann, 2017). Hence, to take a vacation is one of the activities tourist choose to maintain and enhance their personal well-being (SRI International, 2014).

In addition, aging tourists have different preferences in terms of activities and experiences (Cutler & Carmichael, 2010). They like to appreciate the natural environment, such as adventure tourism; participate with people in other cultures, or heritage destinations; visit people; learn about and acknowledge the harmonious locality of an environment; interact with the locals, try ethnic food, see unique lifestyles; and experience different desirable medical alternatives of treatments and services (health/medical/wellness tourism) (Oh, Assaf, & Baloglu, 2016).

Wellness Tourism Motivation Theory Foundation for this Study

A wellness tourism motivation theory has been developed and underpins this study in achieving the research aim. The concept proposal is created from the integration of two relevant concepts: motivation and wellness. The theory comprises two dimensions: intrinsic and extrinsic motivation (J. L. Crompton, 1979; S. S. Jang & C.-M. Wu, 2006). Therefore, the individual inner motivation is important to drive the active 50-plus in fulfilling what is needed at that age; it is so-called a holistic experience (Milner, 2013; Neuhofer et al., 2012). Hence, the inner urge that drives people to go out with a willingness to associate with a new experience and explore the activity they desire becomes an extrinsic motivation

(Choe & O'Regan, 2020; Milner, 2013), while the individual inner motivation or desire that drives people to consider their well-being, or quality of life, such as the need for preventive health and health improvement, becomes an intrinsic motivation (Milner, 2013; Pyke et al., 2016; Smith & Diekmann, 2017).

It can be summarised that the extrinsic motivation comprises four important constructs (John L. Crompton, 1979; S. Q. Cutler & Carmichael, 2010; S. Jang & C.-M. E. Wu, 2006). Firstly, seeking new activity experience; perceiving experience from new technology and digitalization information; locality related activity experience; and nature and environmental experience. Whereas, the intrinsic motivation comprises four important wellness constructs, including; physical, mental, social, and emotional (Baloglu & Brinberg, 1997; S. Q. Cutler & Carmichael, 2010; Mueller & Kaufmann, 2001; Romanova et al., 2016). The proposed theory is appropriated for this study for number reasons; such as the concept has been used with the senior market, especially in a study of motivation. Moreover, this concept is related to a psychology and behavioural study that links it to the aim of this study (Alen, Losada, & de Carlos, 2017). The two motivations are discussed below:

Extrinsic motivation

New activity experience

People's work stress was found to have the most effect on them, especially people of different nationalities individually need to get away on holidays and engage in the desired activities to better balance their lives (J. S. Chen, 2007; Islam & Namwong, 2019). Activity theory explains the increased free time available for active aging individuals to provide the opportunity for maintaining the essential role engagement in a meaningful activity level lined for life satisfaction (Kim et al., 2015). To fulfil the quality life and the preferred activities is to design a way of life satisfaction involving pleasurable trips (Anderson & Langmeyer, 1982; Patterson, 2018). Tourists need to try something new and unique for personal growth by gaining new experiences in life (AARP Research, 2014; Liu, 2018). Hence, a new attractive activity is one of the motivation options for the active aging tourist group (S. Q. Cutler & Carmichael, 2010; Oh et al., 2016).

Therefore, new activity experience can be created based on a variety of choices, those for instance creating activity uniqueness. It refers to when tourists participate in activities they are unable to find in ordinary daily life (A. S. Ashton, Thosuwanjinda, & Phetsome, 2019). For ways to create activity uniqueness, according to A. S. Ashton et al. (2019), it is proposed firstly, to be innovative and creative, such as providing new experiences based on introducing authentic and original local culture into new activities, such as trying ethnic food or leaning how to cook local food. Finally, some other activities that can be participated in is soft adventure tourism, ranging in various forms of activities, for instance green tourism or sport tourism (Patterson, 2017).

New technology and digitalized information

Tourists learn of new experiences by previewing information from social media or the Internet, and search for preferred destinations around the world with specific choices prior to their actual travel (Dwyer, Edwards, Mistilis, Roman, & Scott, 2008, 2009; Tussyadiah, 2014). Information and transactions on the Internet is a strategic marketing tool in helping businesses gain competitive advantage (Baloglu & Pekcan, 2006). The National Tourism Development Plan (NTDP) (2017) reported that tourist behaviour trends are now more sophisticated expectations requiring deeper connection; this being affected by Internet use from websites and social networking (Ministry of Tourism and Sports Thailand, 2017). In the main, about 75% of international travellers currently use online information as part of the trip planning, and only about one third use travel agencies, with one-fourth relying on information from friends or family (Ministry of Tourism and Sports Thailand, 2017). For example, a study by Azman and Chan (2010) confirmed that the tourist decision making process is mainly based on information from travel agents or friend's recommendation, but the most important source is via the Internet. The best way to distribute a destination's information is to create trustworthy information, especially through social media or the World Wide Web, and especially government websites (A. S. Ashton, Scott, & Choibamroong, 2019; Richards, 2009). In summary, the most important information that a reviewer or tourist destination must provide is that of an attractive tourism product: the service, people, place, activity, culture, knowledge, and through storytelling of the destination (Tussyadiah, 2014).

Activity experience at a local destination

Localism has now become a resource of tourism destinations and the differentiated experience value of tourist preferences (A. S. Ashton, 2015; Phukamchanoad, Santithammakul, Yordchim, & Palapin, 2014). The activity that shows locality for tourists can be traditional local types of massage (Azman & Chan, 2010). The activity can be created from social and cultural development, for example, festivals or events that can come in different sizes, from small to mega events (Richards, 2009). Likewise, local festivals give great experience and cultural knowledge to tourists when travelling to a destination and give some value regarding the particular community's celebrations (O'Sullivan & Jackson, 2002). Furthermore, authentic culture, for example the local bar or café: the intimate restaurant that serves local food where local people also consume is great for tourists hoping to encounter authentic culture (Richards, 2009). Hence, creativity is important in tourism because it helps to form the atmosphere; it feeds on people's desire for self-development, and is also a direct link between tourists and the host populations' culture (Richards, 2009).

Nature and the environmental experience

People and nature are definitely related, in contrast however, bad human behaviour causes global warming, air and water pollution, noise and loss of diversity; therefore there is a need to focus on sustainability and conservation of the ecology to bring back quality of life and wellness (Jena & Behera, 2017). Tourists desire to go out and appreciate nature by doing adventure activity (Oh et al., 2016), hence a poor environment can impact negatively on health and well-being (Perchinunno, Mongelli, & Rotondo, 2020). The indicators of a good environment are: clean dispersion of the municipal water supply, transfer of waste to landfills, availability of green urban areas, energy from renewable sources, and separate collection of urban waste (Perchinunno et al., 2020). In this vein, environmental well-being must be related to people with a strong pro-environmental attitude, in turn they are more likely to engage in pro-environmental behaviour and have a sense of responsibility to nature (Jena & Behera, 2017). For example, places or locations that influence and most satisfy the spiritual retreat tourist help them gain an authentic experience when joining the activity in a natural setting with a peaceful atmosphere, far from the usual places. Likewise, natural settings are identified as an important aspect if linking between the natural environment and culture of a village (Su, Long, Wall, & Jin, 2016).

Intrinsic motivation

Intrinsic motivation is holistic well-being, and comprises four dimensions: firstly; physical well-being; secondly, mental well-being; thirdly, social well-being; and finally, emotional well-being (B. Hettler, 1976; Mueller & Kaufmann, 2001; SRI International, 2014). Each dimension is discussed below:

Physical wellness

Physical activity is a healthy lifestyle that is among the most important aspects for promoting physical fitness, health, and wellness (Corbin et al., 2000, p. 10). The physical activity can help delay, prevent, and manage many of the chronic diseases; especially, adults aged 50 and older are at risk (Watson et al., 2016). The goal of living independently is one shared by many people, and physical well-being is necessary to achieve it. Tourists are health conscious, especially for physical well-being, and the activities they pursue basically include regular exercise, healthy eating, visiting spas and engaging in health related actions (Azman & Chan, 2010). Lifestyle choices that can maintain or improve health and functional ability include engagement in physical activity and choices of healthy foods with adequate nutrition (B. Hettler, 1976; Mueller & Kaufmann, 2001). In addition, physical activity certainly helps in maintaining fitness and health with such exercises as sport, dance and other forms (Corbin et al., 2000). Exercise is a leisure time physical activity conducted with the intention of developing physical fitness (Corbin et al., 2000). Physical well-being mainly involves physical activity with a healthy lifestyle, together with nutritious and healthy food (Meiselman, 2016).

Mental wellness

Mental health refers to a state which allows individuals to realise their abilities, cope with the normal stresses of life, work productively and fruitfully, and make a contribution to their community (Tennant et al., 2007, p. 2). Mental well-being in life can be modified through some physical activities, including forms of exercise, starting from walking (Windle, Hughes, Linck, Russell, & Woods, 2010). Likewise, mental well-being is positive psychological functioning, encompassing life satisfaction, happiness, resilience, self-esteem, being in control, and able to cope with life at any stage (Windle et al., 2010). A study on older adults carried out by Fox (1999) revealed that moderate and regular exercise helps in treating depression

and anxiety, thus improving mental well-being and enhancing mood states; activities are aerobic and resistance exercise. Similarly, regular moderate exercise may help to boost mental well-being with the condition that the activity takes place in a natural environment area, and not repeating the same experience (Thompson Coon et al., 2011). For example, walking outdoors has a positive effect on some aspects of mood, such as helping in revitalization, self-esteem, positive engagement, gaining energy, pleasure, delight; and especially decreases the feelings of frustration, worry, confusion, depression, tension, and tiredness (Thompson Coon et al., 2011).

Mental health well-being engagement in creative pursuits and intellectually stimulating activity is a proven approach to keep minds alert and interested, and includes taking short seminar courses, painting, cooking, or joining and challenging oneself with other creative activities and local people at a destination.

Social wellness

The characteristics of social well-being can vary, for example some people want and like to be accepted, some are concerned for others, friendly and socially supportive, while others feel afraid to be disconnected from society, and wish freedom from a feeling of loneliness (Meiselman, 2016). Social interactions with family, friends, or chosen peer groups, and people at a destination can be valuable for maintaining good health and a well-ness life. It has been proved that interactions with locals play an important role in constructing a rewarding experience, a deeper cultural understanding, and positively influences the social life of tourists (Su et al., 2016). There are several ways to interact with locals when travelling to visit a destination, such as mixing and befriending them when doing on-site visiting (Su et al., 2016). Moreover, it is suggested that local festivals help to create a positive social interaction with the locals and other tourists, and festivals help environmental improvement, in turn creating good social environmental outcomes (O'Sullivan & Jackson, 2002). Also, social well-being is created by using the concept of creative tourism because destination managers are always looking for a new ways to create social activities for interaction with tourists (O'Sullivan & Jackson, 2002).

Emotional wellness

Emotions can become very powerful in predicting tourist attitudes and behaviour (S. Hosany & Gilbert, 2010; G. Prayag et al., 2017; Girish Prayag, Hosany, & Odeh, 2013). Feelings are the lens through which people view the world, and the ability to be aware of and direct one's feelings helps to create balance in life (Milner, 2013). Emotional well-being can refer to the emotional quality of an individual's everyday experience; the frequency and intensity of experiences of joy, stress, sadness, anger, and affection that make one's life pleasant or unpleasant (Kahneman & Deaton, 2010, p. 16489). It includes positive mood and high self-esteem (Schutte, Malouff, Simunek, McKenley, & Hollander, 2002). The characteristics of emotional well-being can have both positive and negative effects. For instance, positive effects are such as how people feel about themselves, such as they feel that they are just as good as other people, are hopeful about the future, or are a happy person almost all the time and always enjoy life (Ostir, Markides, Black, & Goodwin, 2000). While negative effects are such as feeling depressed, feel life has been a failure, feel fearful, lonely, want to cry, and have an emotional feeling of sadness (Ostir et al., 2000). It has been proved that negativity affects an increase in fear and low self-esteem, hence leading to an increase in sadness (Ciarrochi, Heaven, & Davies, 2007). Moreover, emotional well-being can be potentially improved through mindfulness and self-compassion (Bluth & Blanton, 2014). Mindfulness can be referred to as an awareness of thoughts, recognition of degrees of self-judgment and rumination, and greater acceptance of oneself. While self-compassion is the ability to hold one's feeling of suffering with a sense of warmth, connection, and concern: for example how people recognise self as part of a common humanity, and have a greater self-kindness (Bluth & Blanton, 2014). Finally, emotional well-being can include being affectionate, calm, happy or sad, loved, relaxed or tense, satisfied and secure (Meiselman, 2016).

Research Methodology

A qualitative research approach was employed using in-depth interview technique for the data collection process. This process is suitable for this study because it is designed to explore the perspectives or new issues in detail on particular ideas, opinions, thoughts, experiences, behaviours, beliefs, motivations, programs, and situation of the participants

(Boyce & Neale, 2006). The criteria for selecting the participants in this study were: firstly, tourists who were aged 50 or above and aimed to travel for wellness experiences. Secondly they defined themselves as active aging persons, health experienced tourists, and finally some they were professionals health personal who provided knowledge on wellness, both Thai and international.

The study areas selected included Chiang Mai, Pattaya, Bangkok, Karnjanaburi, and Lopburi provinces. There were reasons to select these areas: they are places popular for tourists to travel to and many wellness activities are available for tourists, such as venues for good exercise, mountain cycling and local organic farmers markets. Some participants were inherently emotional about their personal actual wellness experience; their perception and direct experience about well-being in relation to wellness tourism activity certainly helped to achieve the aim of this study (G. Prayag et al., 2017).

Semi-structured interview was chosen for this study because it is flexible and allows freedom for the interviewer to ask questions and the interviewees (participants) to profoundly express their opinions (Fylan, 2005). The interview questions were separated into two parts: the first part asked about personal information, the second asked about attitudes and experience perception. Participants were asked to describe and explain about wellness, quality of later life, and healthy lifestyle during tourism activities. The first part of the interview questions asked about brief personal information, including age, gender, education level, financial status, profession, their preferred health benefits, destination and health-activity preferences, and their preferences of whom to travel with and length of travel. Moreover, the questions asked what activities they engaged in and their thoughts about wellness activities. Also asked, for instance, was how tourists perceived health activity experience while they are travelling, and what inspired them to travel for wellness activities. What were the benefits they wished to achieve from the wellness activity experience? What is their intention and preferences after all the satisfaction they have received? (Cohen, Prayag, & Moital, 2014; Prebensen, Kim, & Uysal, 2016).

After the participants were contacted and agreed to take part in the study, a letter of consent attached as a cover page to acknowledge the ethics and trustworthiness of conducting the interviews. All participants involved in this in-depth interview were voluntary

and strictly confidential; they can terminate any time without consequences. Before the actual interview take place, the interview questions had been tested by three experts within the area of this study; they reviewed and had validity checked for the Item-Objective Congruence (IOC) approval (Hair et al., 2010). The interview took around 45 minutes but not over one hour, the conversation was recorded for quality of information from participants, and a content analysis technique was used to analysis data.

Participant Profiles

The forty purposive and snowball participants were reached in tourist destinations, health-activity areas, and by appointment at venues. The interview took during just before COVID-19 pandemic (July-November 2019). Tourism destinations included famous temples, marketplaces, adventure/activity venues, beaches, hotels, organic food outlets, homestay, coffee shops and restaurants, shopping malls, street food vendors and sidewalks. Health activity areas included badminton courts, fitness centres, and cycling in bike-lanes. They all were found in Chiangmai, Pattaya, Bangkok, Kanchanaburi, and Lopburi. The participants' demographic profiles and preferences are included in Table 1. A total of forty participants were interviewed, male 25 and female 15, with a minimum age of 50 years, and a maximum of 74. Most were still working, with 10 already retired. Among the participants' various professional backgrounds were for instance: lecturer; business owner; engineer; writer; tourism TV channel production person; architect/office owner; acupuncturist/naturopath; freelance and volunteer/tour operator; and housewife.

Table 1: Participant Profiles

Participant #	Gender	Age	Nationality	Working	Professions
ID 1	F	58	NZ	Yes	Acupuncturist/Naturopath
ID 2	M	63	NZ	Yes	Director, IT Company
ID 3	M	52	Swedish	Yes	Voluntary/NGO Officer
ID 4	M	53	Thai	Yes	Freelance/voluntary works
ID 5	M	52	American	Yes	Lecturer/Researcher
ID 6	F	50	Moroccan	No	Housewife/Business partner
ID 7	F	54	Thai	Yes	Local business
ID 8	M	70	Canadian	No	Diplomatic services
ID 9	M	55	Thai	Yes	Expert/Supplier
ID 10	M	50	Thai	Yes	Expert/Supplier
ID 11	M	60	Thai	Yes	Business owner
ID 12	M	60	Thai	Yes	Business owner
ID 13	M	66	Australian	No	Transporter
ID 14	M	62	Chinese/ HK.	Yes	Business partner
ID 15	M	74	Norwegian	No	Petro-engineer/consultant
ID 16	M	55	Thai	Yes	Tour guide/tour operator/Cruise organizer
ID 17	M	60	Thai	Yes	Engineer/MRT consult
ID 18	M	61	Thai	Yes	Engineer/Company owner
ID 19	M	60	Thai	No	Engineer
ID 20	M	67	Thai	Yes	Special police officer
ID 21	M	66	Thai	Yes	Business owner
ID 22	M	70	Thai	Yes	Historical and museum study; destination development.
ID 23	F	66	Thai	Yes	Teacher/Local homestay owner/Knowledge provider
ID 24	F	56	Thai	Yes	Creative advertising/Lecturer/Tour guide/ Writer.
ID 25	M	50	Thai	Yes	Story writer/Creative concept interpreter & product designer
ID 26	M	71	Australian	No	Engineering/musician & teaching
ID 27	M	71	Australian	No	Engineering and drafting
ID 28	F	64	Thai	Yes	Lecturer/Researcher/Story writer
ID 29	F	55	Thai	Yes	Lecturer/Researcher
ID 30	F	50	Russian	Yes	Tourism TV channel production
ID 31	M	56	Thai	Yes	Architect/Office owner
ID 32	M	56	Thai	Yes	Architect/Office owner
ID 33	F	57	Thai	Yes	Story writer/Travel magazine Chief editor
ID 34	F	57	Thai	Yes	Story writer/Travel bookstore owner
ID 35	F	69	Thai	No	Engineering librarian
ID 36	M	68	Thai	Yes	Engineer/Company owner/Voluntary Zigong trainer
ID 38	F	55	Thai	Yes	Company's financial and accounting manager
ID 39	F	55	Thai	Yes	Accounting auditor/Office owner
ID 40	F	61	Thai	No	Supply chain/Office worker

Results

The main aim of this study was to investigate the active aging 50-plus tourist motivations towards wellness tourism. Thus, to achieve the research aim two research questions were raised: firstly, what are the extrinsic motivations of the active aging 50-plus tourist group? Secondly, what are the intrinsic motivations of the active aging 50-plus tourist group? The study findings are discussed below:

It can be summarised that the extrinsic motivation comprises four important constructs (John L. Crompton, 1979; S. Q. Cutler & Carmichael, 2010; S. Jang & C.-M. E. Wu, 2006). Firstly, seeking new activity experience; perceiving experience from new technology and digitalization information; locality related activity experience; and nature and environmental experience.

Motivation of the active aging 50-plus wellness tourist

The results revealed that motivation can be split into three distinct stages based on goal-driven motivation concept; first stage is motivation inspired by tourist past experience; the second is the desire and current interest of the tourist to have wellness in later life, and the desire to have wellness in life (S. Q. Cutler, & Carmichael, B. A., 2010). Details are explained below:

Firstly, participants' past experiences were mostly captured as their passions from the collected memorable experiences of their previous travel and tourism. Many participants had impressive past experiences at a young age and paused those for career and family settlement. After their children had grown up and became successful in their careers they have been responsiblity free, and preferred to start travelling again, to see and participate in new and different activities.

> *For example, participants admitted that for Kiwis who want to fly away again at age 58, passion and freedom have drawn them back with more dreams and creativity to see the world where they left such experiences at a young age [ID1]. One said, "This time, I'm taking a three-month*

get-away with my husband, travelling for leisure, especially to visit the music pub where we first met in Chiang Mai before getting married [ID1]." Likewise, another confirmed that "freedom, challenges, to meet new people, and to join group activities or voluntary work are all my passions to travel, from the first trip until now at 63 [ID2]." Another said, "Because I was not allowed to travel when I was young, the feeling of freedom becomes more passionate, inspiring me to travel again and again. I always try new things and have fun doing different activities with different groups of friends; running, bicycling, rafting, or other adventurous recreation [ID38]."

Sources of information and social media also motivate and drive tourists to travel for wellness. Hence, it can be concluded that passionate experiences happen after receiving information from well-known sources of information, including travel guidebooks and magazines, fiction novels, or famous people and places, consequently inspiring some participants to travel and have real experiences. Many of the participants work with a world travel magazine, being writers, journalists, editors, or tour operators. Evidence is revealed below:

"I started from reading, then travelling, and working as the editor in chief for a big-name travel magazine. I always appreciate seeing what I imagined from the books. Moving myself into the real places with the expected atmosphere has been my freedom to imagine more, to observe more, and to create more [ID33]." An architect said that, "Travel and tourism is like opening a big book which is full of amazing content. I found it exciting every time I explored the real experiences in new places I had visited, and gained impressive hospitality from the new people I had met [ID31]."

Exploring new ideas and observing people's behaviours have been some participants' purpose for walking tourism. Local visiting and travelling has become their passion following their careers of product design and development. A participant who loved walking exploration said:

"I travel for work only as a freelancer. Walking exploration is more a mental activity for me to find new inspiration and creativity. Culture and people are the only choices I always want to be involved with. I always walk a lot, take pictures, and talk to local people I meet, then I write on e-news or an in-flight magazine [ID25]."

Another former editor in chief of a travel magazine explained:

"My career and passion are integrated for favorite activities, including my personal interest in 'scent exploration'." "As a smelling tool, I enjoy seeking the nationality of each place from the herb-scent of food [ID33]." While another participant agreed: "I often travel because my career focuses on creating new extraordinary tourism-routes that bring more benefit to tourism industries. I have written travel books, run a tour company, teach tourism, and work as a tour guide and in creative advertising. My passion runs around my business opportunity [ID24]." Another said, "Bicycling has long been my business, my favorite hobby and physical exercise activity that I can do anytime, anywhere, alone or with my wife [ID9]."

Secondly, the participants' current interests were mostly captured from the participants' motivation to travel for wellness tourism. Overall findings revealed that the majority of things that interested participants in travel for wellness tourism were especially trying new activities, dealing with new challenges, learning new skills, and self-fulfillment with new experiences. Moreover, most of them preferred to gain more useful knowledge and to have an opportunity to share it with others.

For example, one said, "Learning and practicing new skills has now become my motivation for travel [ID4]." While another said, "I found the sports I like, bicycling, at age 47 and now at 60., I still enjoy bicycling, camping, walking tracks, and trekking. I have a small group and we take an activity trip together every weekend [ID11]." A journalist gave details of her passion: "Every year, I happily enjoy a month travelling abroad

for walking exploration or walking experience. The world belongs to diverse cultures that educate from one to another all the time. I am a journalist for magazines and books, taking long and slow travel to rest as well as to explore with respect to what people think and how they behave differently, in detail [ID34].”

Thirdly, the participants’ desire for quality of later life benefits were especially for physical, mental, social, and emotional well-being, and were the most desired to gain from their travel. The main issues were concluded as follows.

For physical wellness, it can be concluded that body fitness and consuming healthy food are the main aspects in gaining physical improvement and preventing disease, especially for ages 50-plus. In addition, some of the group took physical exercises or outdoor sports activities to ease their stress. For example, a participant mentioned, “My successful past experiences in doing outdoor health activities always encourage me to practice more until now. Finishing one mission always drives me to start the next one [ID10].” Hence sport is a tool to connect one to other people. In addition, a participant confirmed their health benefit was “Taking a month trip also gives me more time to take care myself, eat proper food and take pills three times a day, put lotion on my skin, and deep sleep every night [ID34].”

Participant ID12 confirmed: “My first time bicycling for a month made me lose 15 kg. Better physical health has me routinely bicycling since then. Bicycling has given me a peaceful mind, self-confidence, and self-fulfillment. I have planned for long and slow bicycling when visiting new places, and just to enjoy daily life travelling.” Finally, one said, “My past experiences mostly came from activities. I love doing outdoor activities with different groups of friends, which drew me to travel more often, to different places with different activities [ID4].”

Regarding mental well-being one participant said that mental wellbeing occurred while travelling to a new place with a good atmosphere. Thus, living in the mundane daily routine environment has been the important driving force for most participants to take trips for leisure and improve their health. “I love travelling and moving myself into new places or new atmospheres; just going anywhere can give mental freedom to think, to observe,

and to create more [ID33].” In addition, “My motivation for travel has always been for a way of living close to a natural environment [ID23].” Another participant told their story: “My past experience was to get away from routine stress and be in nice weather and a natural environment, especially to see beautiful mountain scenery, rare trees or islands and the sea. These are the best motivations pushing us to repeat travel again and again [ID7].” Likewise, another said, “Tourism is a tool to connect people to other things, activities, other people and places [ID3].” While one participant asserted: “Challenge was always in my past experience, but recently at age 60, I think more about being careful and safe [ID9].”

Discussion and Conclusion

The aim of this study was to investigate active aging 50-plus tourist motivation towards wellness tourism. Participants were asked about their motivation to gain experience when participating in wellness activity. The in-depth interviews were conducted by using content analysis to capture the key themes that answer to the main research aim. It can be concluded that the current motivation of the active aging tourist on wellness tourism depends on the experiences they obtain, especially from their past, social media, new activities, life challenges, and self-fulfilment, for such as gaining new knowledge and skills. Overall, tourists travel for wellness because they desire to have good quality and wellness in later life, specially they want to have physical fitness, good mental health, social wellness and emotional well-being.

Prior to setting the goal for a wellness trip, tourists may have had past experiences on previous wellness travel, and creating great memorable experience will entice them to want to return. Currently, this result is similar to the study carried by A. S. Ashton et al. (2019) with a different study context, but the same senior tourists. It studied the decision making process for international tourists to retire overseas based on prior experience with the destination, and the need to return after having a good and memorable experience (A. S. Ashton et al., 2019). This result also supports a study carried out by Hays, Page, and Buhalis (2013), contending that the experience perceived from sources of information, including social media, magazines, and any other form of information, have played an important part in motivating tourists to travel for wellness reasons.

Furthermore, the results revealed that in general some active aging 50-plus tourists have a need to explore new things and increase experiences in life. This age group has had long experience, but daily life has become mundane; hence they desire to partake in new experiences. They are keen to travel for wellness experience by participating in new activities or looking for new challenges for self-fulfilment and quality of life. These results are embedded with past literature on aging tourists participating in wellness activity for great experience (Cutler & Carmichael, 2010). Similarly, Oh et al. (2016) states that the aging tourist likes to appreciate a natural environment, for instance adventure tourism, with both hard and light activity. They also like to learn new things; especially, the findings in this study show that the goal of all wellness activity underpins having a better quality in later life, and to have wellness in life on the physical, mental, social and emotional levels.

Likewise, Smith and Diekmann (2017) asserted that mental or physical well-being are the current goals that motivate the aging tourism market to travel. For instance, the active aging tourist wants to visit local communities and interact with the local environment, taste different ethnic foods, and experience the unique lifestyle. It is obvious that the results from this current study confirmed that both young age to above 50 years of age have some similar motivation when determining to travel for wellness purposes. Significantly, it has shown that the desire for the 50-plus tourist is to have wellness with quality of living. Hence, if they have the opportunity to learn about new cultures, interact with locals and learn about their lifestyles, it certainly will fulfil their goal. Similarly, Su et al. (2016) confirmed that tourists will certainly want interaction with locals and try to learn about new cultures. Past studies have revealed three push factors and two pull factors that influence travel for wellness tourism. The push factors are attractive destination, relaxation and local people; the pull factors comprise culture and nature (Damijanic & Sergo, 2013).

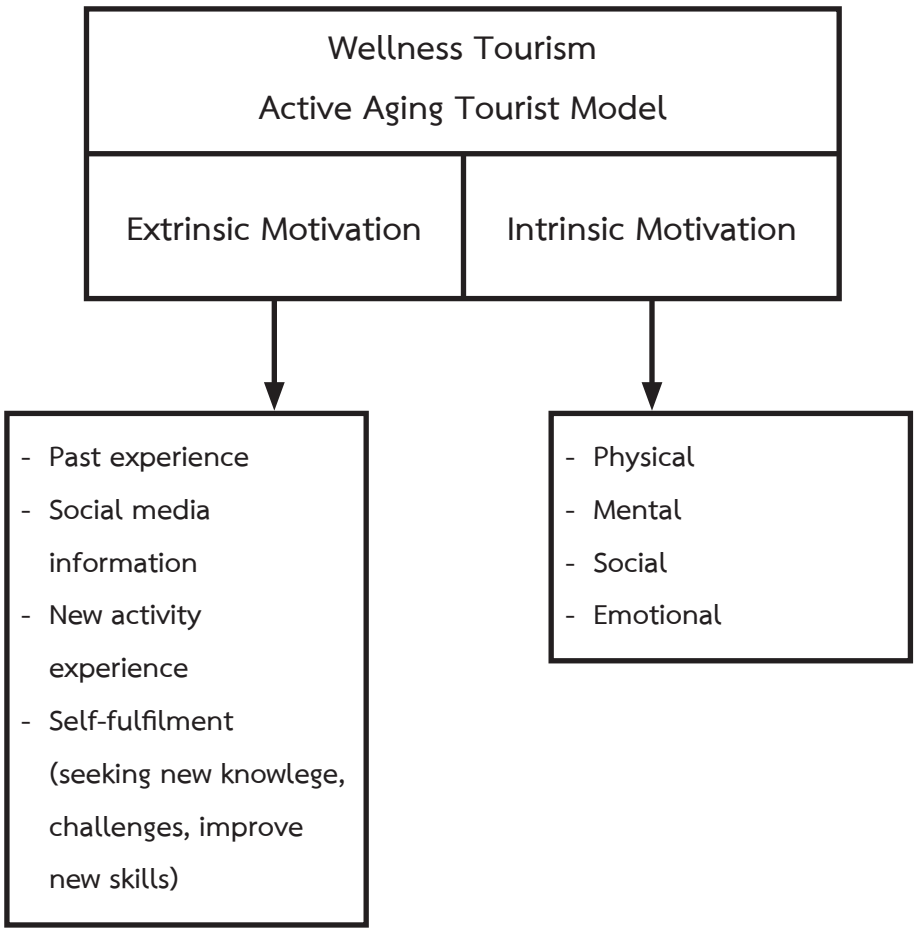

Figure 1: Wellness Tourism Active Aging Tourist Model

Contributions of the Study

The results from this study provide insight knowledge for both academic and managerial consideration. The significant findings from this study have proposed an original theoretical model of a wellness tourism motivation for the active aging 50-plus tourist. The model comprises two main constructs: extrinsic and intrinsic motivation. Extrinsic motivation relates to how external resources motivate tourists for wellness travelling purposes; it includes four aspects: 1) tourist past experience; 2) new technology and digitalization information; 3) new activity; and 4) challenge activity. First, past experience motivation refers to a tourist's past experience while travelling, and is a crucial experience for the need to go out

and explore more on wellness tourism activity. Second, new technology and digitalization information motivation is the information available on websites influencing tourist perception and decision to travel for their life wellness. Third, new activity experience motivation refers the activity that a tourist has never done before. For example, soft and hard adventure activity, non-competitive sport, or long distance running for charity, bush walking and cycling. Finally, challenge activity refers to the things that tourists need or desire to achieve, particularly in boosting knowledge and skills, doing something that challenges their ability, such as learning about new cultures, participating in wellness activities, or doing what they were unable or had no opportunity to do when they were young because of neither time nor money.

In addition, intrinsic motivations refer to the aspects drawn out and currently related to the quality of wellness in later life, especially: 1) physical; mental; social; and emotional. Firstly, physical wellness motivation refers to a tourist's need to promote physical fitness, especially improving and maintaining health well-being. Secondly, mental wellness motivation refers to the ability to cope with stress, self-actualise, realise one's own abilities, and be able to control and satisfy all situations in life. Thirdly, social wellness motivation refers to people's need to be accepted, valued in the society; they need an in-depth social/cultural understanding in order to have a healthy social life. Finally, emotional wellness motivation refers to the ability to control emotional quality and intense emotional experiences; negative and positive emotions, including joy, stress, depression or sadness can make a person's life happy or unhappy.

This study provides a managerial contribution for stakeholders in the tourism and hospitality industry when developing wellness products, services and activities for the active aging 50-plus tourist. The most important thing for life wellness in the active aging 50-plus sector is for the relevant service providers to consider developing activities that improve both the wellness of body and mind/soul and spiritual recovery. For physical wellness many stakeholders, particularly the destination hosts, service providers, business owners and travel agents, can use the managerial guidelines from this study. It has revealed insightful information on improving or increasing physical fitness, hence the need to have

activities that suit with their physical health and individual favourites. Thus, a business owner, destination host or service provider, must offer a variety of types of activities and respond to the needs of these tourists with extreme to soft adventure tourism, sports such as cycling, walking, trekking and running. Additionally, providing healthy food in a good environment will be advantageous in creating great memories, in turn inspiring destination intention, including revisiting or spreading positive words to friends and family.

For mind/soul or spiritual recovery activity, the tourist needs to have an opportunity to be accepted in the local society, hence the host destination should create activities that open such opportunities for interacting socially with the local community, perhaps in the form of volunteer tourism for such as helping society, teaching language, donating something of value, purchasing local products, or learning about the culture. Some like to take their life activities more slowly by visiting local cafés/clubs, tasting the local ethnic authentic food, sampling the produce of the locals, and enjoying healthy seasonal food. Most importantly, the food providers must consider supporting local farmers by purchasing the raw ingredients grown in the same area. Thus, slow life activity can help tourists relieve stress and have positive and warm emotions when contributing to the community knowing that all products and service were delivered by locals, including all resources and ingredients based on local culture and wisdom.

Lastly, nowadays the world has changed the way of convey a message from a host destination and business owner to the public or customers by utilising virtual tools to show authentic destinations. Furthermore, it's easy to access and connect to the various on-line information sources, at minimal cost. Hence, offering official websites can guarantee trustworthy information where people can rely on after reviewing, Hence, when tourists perceive images and information describing the destination, they will determine to travel to the place with an intention to buy products/services and participate in the desired activity. This special tourist group has more consciousness of their quality in later life, hence have their goals related to wellness, including eating healthy food, exercising and taking part in spiritual retreat activity, such as meditation for spiritual stress release.

Limitation and future research

This study faced many challenges while conducting the research project. The issues mainly concerned the timeline; conducting interviews took much longer than expected, but eventually were managed by extending enough time to allow obtaining the sufficient data required. Moreover, it was low season during the data collecting period, hence target samples were less to be found, and thus why data the collecting process took longer than planned.

For future research, the new normal of wellness tourism needs to be investigated, especially the perspective of wellness tourism from the supply side, such as how to run a business after COVID-19, and the development of online marketing as a crucial marketing tool to attract wellness tourists in the future, and the new strategy after COVID-19.

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Roles of HRD in Social Enterprise in Thailand: A Systematic Literature Review

Asma Tehmarn* and Chiraprapha Akaraborworn**

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Abstract

The concerns of sustainability lead to the development of social enterprise that aims to solve social and environment problems. Human resource development shares some characteristics of social enterprise, as it aims to develop organization, community, nation, and/or humanity. This study explores the roles of human resource development in social enterprise in Thailand by using systematic literature review. The results show that roles of human resource development in social enterprise are close to typical for-profit organization that aims for performance improvement and increase competitiveness of the organization, however, its strategy expands to serves social and environmental needs. Human resource development roles are composed of recruitment and selection, training and development, process improvement, knowledge management, and developing leadership and teamwork

* School of Human Resource Development, National Institution Development Administration
148 Serithai Road, Khlong-Chan, Bangkapi, Bangkok 10240, THAILAND.
E-mail: asma.tehmarn@gmail.com

**Professor, School of Human Resource Development, National Institution Development Administration
148 Serithai Road, Khlong-Chan, Bangkapi, Bangkok 10240, THAILAND.
E-mail: chira123@gmail.com

or employees of the organization. Moreover, its roles include development of organization culture that promote innovation for change, support network among the stakeholders. This research result can be tested in future empirical research design especially among the social enterprises that are affected by the COVID-19 pandemic if they are be able to sustain their businesses. Moreover, it could be a model for other type of business that aims for sustainability.

Keywords: Human Resource Development, Social Enterprise, Systematic Literature Review

บทบาทของการพัฒนาทรัพยากรมนุษย์ที่มีต่อกิจการเพื่อสังคมในประเทศไทย: การทบทวนวรรณกรรมอย่างเป็นระบบ

อัสมา เต๊ะหมาน* และ จิรประภา อัครบวร**

รับวันที่ 30 กันยายน 2565 *ส่งแก้วันที่ 6 ธันวาคม 2565* *ตอบรับตีพิมพ์วันที่ 9 มกราคม 2566*

บทคัดย่อ

กิจการเพื่อสังคมที่มีแนวทางการพัฒนาซึ่งมุ่งเน้นการแก้ไขปัญหาสังคมและสิ่งแวดล้อม ทั้งนี้การพัฒนาทรัพยากรมนุษย์มีเป้าหมาย คือ มุ่งเน้นการพัฒนาเพื่อพัฒนาองค์การ ชุมชน ประเทศชาติ หรือกระทั่งมนุษยชาติ ซึ่งมีความคล้ายกันกับกิจการเพื่อสังคม การศึกษานี้เป็นการศึกษาการพัฒนาทรัพยากรมนุษย์ในกิจการเพื่อสังคมด้วยวิธีการทบทวนวรรณกรรมอย่างเป็นระบบ ผลการศึกษาพบว่า การพัฒนาทรัพยากรมนุษย์มีบทบาทในระดับองค์การคล้ายคลึงกับองค์การที่แสวงหากำไรโดยทั่วไป โดยเน้นการพัฒนาประสิทธิภาพการดำเนินงานและความสามารถในการแข่งขันขององค์การ การพัฒนาทรัพยากรมนุษย์ในกิจการเพื่อสังคมสามารถแบ่งได้เป็นการพัฒนาองค์การ ได้แก่ การวางแผนกลยุทธ์ทั้งในด้านการแสวงหากำไรและการแก้ไขปัญหาสังคมและ/หรือสิ่งแวดล้อม การพัฒนาวัฒนธรรมองค์การเพื่อสร้างนวัตกรรมและการเปลี่ยนแปลง การสร้างเครือข่ายกับผู้มีส่วนได้ส่วนเสีย งานด้านการพัฒนาทรัพยากรมนุษย์รวมถึงการสรรหาและคัดเลือกพนักงานที่มีความรู้ความเข้าใจเกี่ยวกับชุมชน การฝึกอบรมและพัฒนา การประเมินผลการปฏิบัติงาน

* คณะพัฒนาทรัพยากรมนุษย์ สถาบันบัณฑิตพัฒนบริหารศาสตร์
เลขที่ 148 ถนนเสรีไทย แขวงคลองจั่น เขตบางกะปิ กรุงเทพฯ 10240
อีเมล: asma.tehmarn@gmail.com

** ศาสตราจารย์ คณะพัฒนาทรัพยากรมนุษย์ สถาบันบัณฑิตพัฒนบริหารศาสตร์
เลขที่ 148 ถนนเสรีไทย แขวงคลองจั่น เขตบางกะปิ กรุงเทพฯ 10240
อีเมล: chira123@gmail.com

และการจัดการความรู้ในองค์การที่รวบรวมความรู้จากภายในองค์การและจากผู้มีส่วนได้ส่วนเสียในชุมชน บทบาทการพัฒนาทรัพยากรมนุษย์ยังรวมถึงการพิจารณาคุณลักษณะของผู้นำและพนักงานภายในองค์การอีกด้วย ผลการศึกษานี้สามารถนำไปใช้ในการวิจัยในอนาคตและเป็นแนวทางให้องค์การประเภทอื่นอีกด้วย

คำสำคัญ: การพัฒนาทรัพยากรมนุษย์ กิจการเพื่อสังคม การทบทวนวรรณกรรมอย่างเป็นระบบ

Introduction

Business organizations are facing challenges from the changes in technology, the COVID-19 pandemic, and the concerns about sustainability development. The organizations are forced to transform from typical for-profit organization to become more responsible to the society and environment. Human resource (HR) practitioners in the organization have to change their role in order to serve the needs of organization.

In organization, HR practitioners play an important role to help organization achieving its goals. The responsibilities of HR are not only workforce replacement, but also development of employees and organization in many aspects. Akaraborworn (2022) summarized the overall roles of HR practitioners including workforce planning, recruitment and selection, employee relation, HR development, career management, performance management, compensation and benefit, organization and development, and corporate social responsibility (CSR).

Role of HR practitioner in CSR has changed from time to time. Akaraborworn (2022) had categorized HR roles into 5 eras comprised of personnel management, HR management, human capital management, HR business partner, and digital HR, respectively. CSR of each era has shifted from corporate philanthropy, CSR for community affairs, CSR in process, CSR for sustainability development, and social enterprise respectively.

Social enterprise concept has been developed to tackle social and environmental problem. Moreover, The United Nation's sustainability development goals will be reached shortly in 2030. The concerns of sustainability lead to the development of Social Enterprise (SE) that aims to solve social and environment problems. SE leader, or social entrepreneur, has goal to achieve SDGs by working together with related stakeholders (Pearson & McElwee, 2021)

SE shared some characteristics with human resource development (HRD) field. According to McLean and McLean (2001), the definition of HRD is *"Any process or activity that, either initially or over the longer-term, develops adults and their work based knowledge, expertise, productivity, and satisfaction. Such development can be for personal or group/team gain, or for the benefit at the level of an organization, community, nation, or, ultimately the whole humanity."* (p. 4)

SE aims for the development that basically benefits the level of community that it operates in, and tries to scale up to the nation and above level as stated in SDGs (Pearson & McElwee, 2021). SEs with successful in HRD have ability to change the society in a better way which is one of their major missions. (Prieto, Phipps, Thompson, & Ogbuehi, 2015; Sandal, 2014).

Research in HRD is required as it could lead to sustainability (Russ-Eft, Watkins, Marsick, Jacobs, & McLean, 2014). Moreover, the past researches from HRD were conducted in the western countries and developed countries (Wang, 2012). Research in countries that have different in term of economy, culture, social, history, ethnic, and geography should be conducted (McLean, 2010). Therefore, research in HRD in SE in Thailand is worth the exploration. As HRD roles can support the effectiveness of social enterprise, those roles might lead to sustainability development in Thailand.

Research objective

The objective of the study was to explore roles of human resource development in social enterprise in Thailand through the concept of systematic literature review.

Research question

The research question of this study was what are roles of human resource development in social enterprise in Thailand?

Literature Review

Social Enterprise

Social enterprise shares some characteristics with tradition for-profit organization. Both organizations devote their time and effort to find opportunities and persistently work to accomplish their vision, and gain rewards (Martin & Osberg, 2007). The main difference is the value proposition. Social entrepreneurship focuses on social wealth creation while business enterprises focus on economic wealth creation (Dees, 1998; Mair & Martí, 2006; Martin & Osberg, 2007).

The definition of SE can be summarized into four main elements. First, a social enterprise is an organization with the hybrid characteristics of being a for-profit organization and non-profit organization (Alter, 2007; Brouard & Larivet, 2010; et al., 2021; Cornelissen Defourny & Nyssens, 2008; Di Domenico et al., 2010; Haugh, 2005; Jung et al., 2016; Sengupta & Sahay, 2017; Thompson, 2008; Thompson & Doherty, 2006). SE aims for economic outcomes and social value at the same time.

Second, it aims for social value creation and is accountable to its stakeholders (Alter, 2007; Brouard & Larivet, 2010; Chell, 2007; Defourny & Nyssens, 2008; Di Domenico et al., 2010; Diochon & Anderson, 2009; Haugh, 2005; Jung et al., 2016; Mair & Martí, 2006; Sengupta & Sahay, 2017; Shaw & Carter, 2007; Thompson, 2008; Thompson & Doherty, 2006).

Third, it seeks economic outcomes by trading goods and/or services to become and remain financially sustainable (Alter, 2007; Brouard & Larivet, 2010; Chell, 2007; Defourny & Nyssens, 2008; Di Domenico et al., 2010; Haugh, 2005; Sengupta & Sahay, 2017; Thompson, 2008; Thompson & Doherty, 2006).

Forth, it uses entrepreneurial practices such as pursuing opportunities, developing innovations, gathering and utilizing resources and managing risks (Alter, 2007; Brouard & Larivet, 2010; Chell, 2007; Defourny & Nyssens, 2008; Di Domenico et al., 2010; Diochon & Anderson, 2009; Jung et al., 2016; Mair & Martí, 2006; Shaw & Carter, 2007; Thompson, 2008; Thompson & Doherty, 2006).

The main characteristics of SE in Thailand are community-based that aim for development of specific area. (Nitayakasetwat, 2011; Sansaneewitayakul, 2013; Sommit, 2014; Thiemboonkit, 2016). The cooperative policy and the Sufficiency Economic have influenced on SEs in Thailand (Sansaneewitayakul, 2013; Sommit, 2014).

Doherty and Kittipanya-ngam (2021) stated that social enterprise in Thailand was originated from the monarchy projects such as agriculture products in Northern Thai ethnic group. Then, there were non-profit sector and cooperative that aimed to help people in specific are. After that, there were institutions that support social enterprise operation. Then, the government developed supporting policies and legal framework. The social supports played important role in sharing resources and expertise.

Human Resource Development

Swanson (2022) defined HRD as "a process of developing and unleashing expertise for the purpose of improving individual, team and work process, and organizational-system performance" (p. 4). Two primary components of HRD are training and development and organization development that aim for unleashing human expertise. Figure 1 illustrated the HRD definitions, components, applications, and contexts.

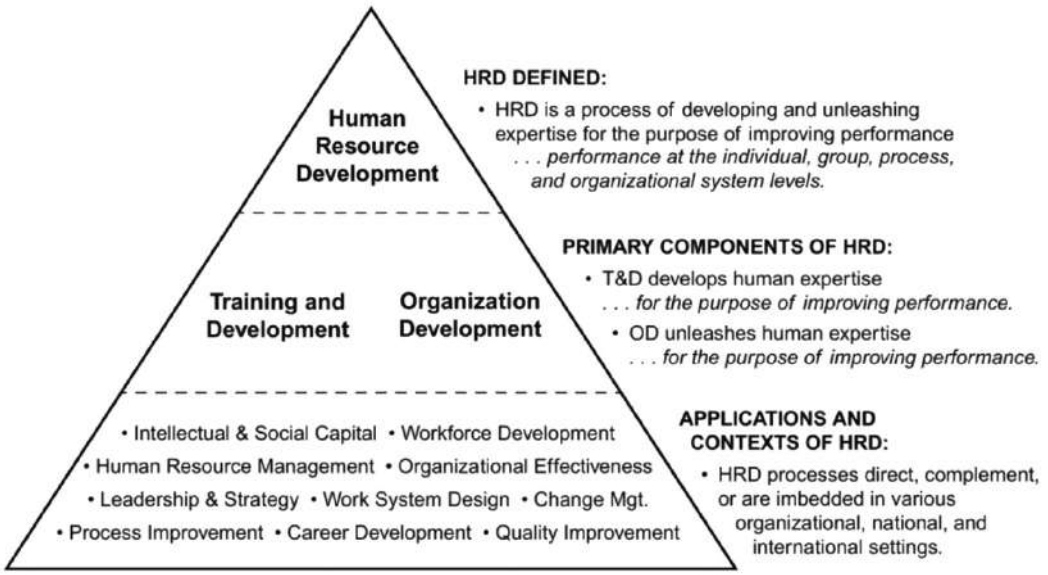

Figure 1: Human Resource Development: Definitions, Components, Applications, and Context. Reprinted from "Foundations of Human Resource Development" by R. A. Swanson, 2022, Oakland, CA: Berrett-Koehler. Copyright [2022] by R. A. Swanson.

Training and development focus on developing human expertise in order to improve performance (Swanson, 2022). In training process, learning is the key to acquire knowledge and experiences. Learning can be conducted by using formal or informal form. The development process is to expand the knowledge and experience from training beyond the requirement of the current jobs ibid.

Organization Development (OD) focuses on unleashing human expertise ibid OD is planned change that implemented in entire organization to increase organization effectiveness and health (Beckhard, 1969). Developing culture is an OD intervention

which it shares core value among employees in the organization (Swanson, 2022). Strategic planning intervention is the other OD intervention that focuses on the internal organization alignment to support the corporate strategy while HRD practitioners are strategic partner in executing the corporate strategic plan (Sritanyarat, 2019; Swanson, 2022).

HRD practitioners play a role of change agent by adapting concept of HRD (Wang, 2012). HRD helps increasing skills, knowledge, and ability of the community and results in the development of community and nation (Prieto et al., 2015). Moreover, Royce (2007) stated that HR management could be tools to support social enterprise in many aspects. Training and development support learning in both employees and volunteers in the organization. Suitable leadership styles, strategic planning, and networking also have impact on effectiveness of SE.

Three Levels of Performance

Rummler and Brache (2013) viewed the organization is as a system that comprises of structure of the organization, customers, products, and flows of work. Rummler and Brache (2013) introduced the concept of Three Levels framework that portrays level of performance that could be improved. These levels are organization level, process level, and job/performer level. Each level is interdependent, meaning that if any level fails, the overall system will not achieve its goals effectively.

Organization level. Performance in organization level represents the big picture of the organization. The factors that are considered in this level are organization goals and their measures, the structure of the organization, and the utilization of the resource that have impact to the organization.

Process level. The organization achieves its goals if the performance of the process is effective. The process in the organization should consider the alignment of the process with the organization goals and strategies. It is well-designed and managed to achieve the effectiveness of each process.

Job/performer level. Job/performer or individuals are those who get the process works done. If they perform the job effectively, it will impact the effectiveness of the processes and leads to the better organization performance. Therefore, the goals of individual level have to be clear and managed to align with the process and organization goals.

Methodology

This research used systematic literature review method to explore the roles of HRD in social enterprise in Thailand. This study focused on peer-reviewed articles including the keywords of "social enterprise" and "human resource development", "social entrepreneurship" and "human resource development", and "social entrepreneur" and "human resource development". The database used was Thai Citation Index database. The dated of searching was June 22, 2022. There were 164 articles found from year 2003 to 2022. Those accessible articles were screened by considering the relationship between social enterprise in Thailand and the elements of HRD according to Swanson's (2022) including training and development, organization development. As a result, there were 55 articles from the screening process.

Data analysis was done by using research question as a core of the study. The data was coded based on Ruona (2005)'s coding technique. The themes were formed by applying theory-driven technique by using Rummler and Brache (2013)'s Three Levels of Performance. The authors categorized the emerging pattern and created a codebook that comprised the article's name in order to ensure traceability. The themes represented the roles of human resource development in social enterprise in Thailand.

Results

The data analysis process showed roles of HRD in three levels: organization level; process level; and individual level. The organization level is comprised of strategic planning, organization culture, and network. The process level is comprised of recruitment and selection, performance management, training and development, process improvement and knowledge management. The individual level is comprised of leadership and teamwork. The details of each level were portrayed as follows:

Organization level

Strategic planning. Literature showed that the characteristics of the strategic plan included:

1) The strategy aligned with vision and mission of the organization (Mattavanont & Ruenrom, 2016).

2) The strategy is inspiring (Suratpipit & Na Chiangmai, 2020), covered both economic plan (Rado & Rahman, 2020), social and environment plan (Chaimuang & Kanboonruang, 2018; Duangsonk, Techamaneesathit, & Maneeroj, 2015; Rado & Rahman, 2020; Sornsuphab & Kesapradist, 2018).

3) The strategy aimed for innovation, growth (Petmee, 2020) and sustainability (Chaikar, 2018; Chaimuang & Kanboonruang, 2018; Suratpipit & Na Chiangmai, 2020).

4) The strategy was clear (Chaikar, 2018; Loprakhon, 2020; Suratpipit & Na Chiangmai, 2020; Viriyaseubpong, Thongprasert, & Harnhirun, 2020), and systematic (Saowapaporn, Sangayotin, & Thanomsing, 2021).

5) The strategy incorporated entrepreneurship practices (Tepkaew & Angasinha, 2020).

6) The strategy incorporated the knowledge of human resource in the society (Tiyatrakarnchai, Kunides, & Supat-Anyaporn, 2021).

7) The strategy was suitable for context and characteristics of the organization (Charoensom, Saikaew, & Tanomsridejchai, 2020).

8) The strategy was guidance for stakeholders to participate (Mattavanont & Ruenrom, 2016).

Organization culture. SE in Thailand developed its culture to shared visions and common goals (Kittikun Sangnin & Pooripakdee, 2018; Mattavanont & Ruenrom, 2016; Pangprasert, Naipinit, & Permwanichagun, 2021; Suratpipit & Na Chiangmai, 2020). The culture included change (Duangsonk et al., 2015), openness for creativity (Suratpipit & Na Chiangmai, 2020), inclusion, adaptation, and customer focus (Noonin, 2014).

Network. The literatures revealed that network is crucial to SE. The stakeholders of the network of SE includes employees, the community, private sector, and the government agencies (Auiqon, 2021; Kulerttrakul, 2019; Nakudom & Jitpakdee, 2018; Rapassarada, & Lertputhirak, 2019; Saengtawee, Parinyasutinun, & Laheem, 2021; Sawasdee & Masae, 2020; Supsanma & Pansan, 2019; Supsanma & Wiroonrath, 2019; Thanongkij & Poboon, 2017). Each part of the network used its expertise to work together (Worachina & Lowatcharin, 2020). The purposes of the settlement of the networks were:

1) To create participation of people (Pusumpun, & Villavicencio, 2015; Sommit & Sitikarn, 2018; Sornsuphab & Kesapradist, 2018).

2) To share common goals (Supradith & Pooripakdee, 2019) which were accepted by everyone in the network (Pangprasert, Naipinit, & Permwanichagun, 2021).

3) To build trust between people in the network (Kittikun Sangnin, & Pooripakdee, 2018; Tepthong, 2014).

4) To create competitive advantage (Saowapaporn, et al., 2021).

5) To improve effectiveness of the solutions of the problems (Nakudom & Jitpakdee, 2019).

6) To improve quality (Mingchai, 2015).

7) To analyze problems and solutions, share knowledge (Duangsonk, Techamaneesathit, & Maneeroj, 2015; Nakudom & Jitpakdee, 2018; Nakudom & Jitpakdee, 2019; Nakudom & Jitpakdee, 2020; Pothipala, 2021; Sukontachart, Pinthapataya, & Simachokedee, 2021; Supradith & Pooripakdee, 2019).

8) To monitor the effectiveness of the social and environment development activities (Chaimuang & Kanboonruang, 2018).

9) To create innovation (Mingchai, 2015; Pongsittikanchana & Pongsittikanchana, 2021; Tiyatrakarnchai et al., 2021).

10) To create positive changes and sustainable outcomes (Pongsittikanchana & Pongsittikanchana, 2021).

Organizations in the network worked together in various ways including brainstorming (Loprakhon, 2020); regularly meetings (Pothipala, 2021), and mentoring (Tepkaew, & Angasinha, 2020) in order to analyze problems and solutions, share knowledge (Duangsonk, Techamaneesathit & Maneeroj, 2015; Nakudom & Jitpakdee, 2018; Nakudom & Jitpakdee, 2019; Nakudom & Jitpakdee, 2020; Pothipala, 2021; Sukontachart et al., 2021; Supradith & Pooripakdee, 2019).

Process level

Recruitment and selection. The process of recruitment and selection for both employees and leader was important to the success of SE in Thailand. They could be local people as they had experience and understanding about the community (Supsanma & Pansan, 2019; Supsanma & Wiroonrath, 2019). The manpower was well-planned and sufficiency for the operation (Potin, Meechaisue, Poopatanapong & Jinandej, 2020).

Performance management. Performance of employees of the organization were assessed based on their competencies (Duangsonk et al., 2015).

Training and development (T&D). Training was important to develop skills of employees (Wongphuka, Chai-Aroon, Phainoi, & Boon-Long, 2017). SE supported development of employees in every level (Noonin, 2014; Sornsuphab & Kesapradist, 2018; Suratpipit & Na Chiangmai, 2020). Skills and expertise in many aspects were needed from the organization, therefore the training and development were required (Potin et al., 2020).

Process improvement. Processes in the organization were well-organized in order to improve the effectiveness and develop competitiveness (Kittikun Sangnin & Pooripakdee, 2018; Nakudom & Jitpakdee, 2018). There were process innovations that integrated important processes and reduced or eliminated unimportant processes (Distanont, Khongmalai & Distanont, 2019; Kittikun Sangnin & Pooripakdee, 2018; Saowapaporn, et al., 2021). The feedback and knowledge management helped reducing time and cost (Juyjingam, Siriwong, 2015; Meethavornkul, Siriwong & Thirawat, 2020).

Knowledge management of SE helped improving organization productivity (Juyjingam & Siriwongm, 2015; Kittikun Sangnin & Pooripakdee, 2018; Noonin, 2014; Noonpakdee & Phothichai, 2016). Knowledge was shared among employees, leader, and people in the community (Distanont et al., 2019; Juyjingam & Siriwongm, 2015; Potin, et al., 2020). This process was not only effect the productivity of the organization but also built good relationship with the community (Meethavornkul et al., 2020). Knowledge management was done systematically (Distanont, 2016 Nakudom & Jitpakdee, 2019; Saowapaporn et al., 2021; Sukontachart et al., 2020). The process aligned with the strategy of the organization (Juyjingam & Siriwongm, 2015; Sukontachart et al., 2020).

Individual

Leadership. Leadership was one of the factors that affect the competitiveness of the organization (Nakudom & Jitpakdee, 2019; Pangprasert, Naipinit, & Permwanichagun, 2021). The leaders were the change agent of the community (Guleid, 2014). The qualities of leaders were as follows.

1) The vision in both social and economic perspective (Nakudom & Jitpakdee, 2019; Saengtawee et al., 2021; Sawasdee & Masae, 2020; Sommit & Sirikarn, 2018).

2) Persistency and determination to drive changes (Duangsonk et al., 2015; Photchanacha, Uppapong, Atchavanan, Mangkang, & Kanwivat, 2020).

3) Opened for new things, created social innovation, and took risk (Petmee, 2020; Petmee, 2020; Photchanacha & Thechatakerng, 2019; Photchanacha et al., 2020; Suratpipit & Na Chiangmai, 2020; Tepkaew, & Angasinha, 2020; Tepthong, 2014).

4) Entrepreneurial skills including seeking for opportunities, utilizing resources, financial capital management (Saxena, 2019).

5) Ethical behaviors, responsible for the society and lead the organization with ethics (Dhiravegin, Thirasirikul, & Sangsuwan, 2018; Duangsonk et al., 2015; Sakulsuraekkapong, 2016; Viriyaseubpong et al., 2021).

6) Education, knowledge, experiences related to the mission (Thanongkij & Poboon, 2017; Supsanma & Pansan, 2019; Suratpipit & Na Chiangmai, 2020; Wongphuka et al., 2017).

7) Quality to be a role model (Guleid, 2014), using coaching and mentoring system (Suratpipit & Na Chiangmai, 2020).

Teamwork. Employees were the center of the operation (Pangprasert et al., 2021). The qualities of employee of SE in Thailand were portrayed as follows.

1) Clear understanding about the business (Vichit-Vadakan & Sae-Ho, 2021).

2) Determination (Sukontachart et al., 2021).

3) Intrinsic motivation (Napathorn, 2018).

4) Skills, knowledge, and experience in different aspect (Lohprakhon, 2020; Potin et al., 2020; Suratpipit & Na Chiangmai, 2020; Thanongkij & Poboon, 2017; Wongphuka, 2017).

5) Ability to work as a team (Noonin, 2014; Pusumpun, & Villavicencio, 2015; Saowapaporn et al., 2021; Suratpipit & Na Chiangmai, 2020).

6) Ability to work with network organizations such as community and government agency (Rapassarada & Lertputhirak, 2019).

7) Ethical behaviors (Saengtawee et al., 2021).

The findings of the study were portrayed in figure 2.

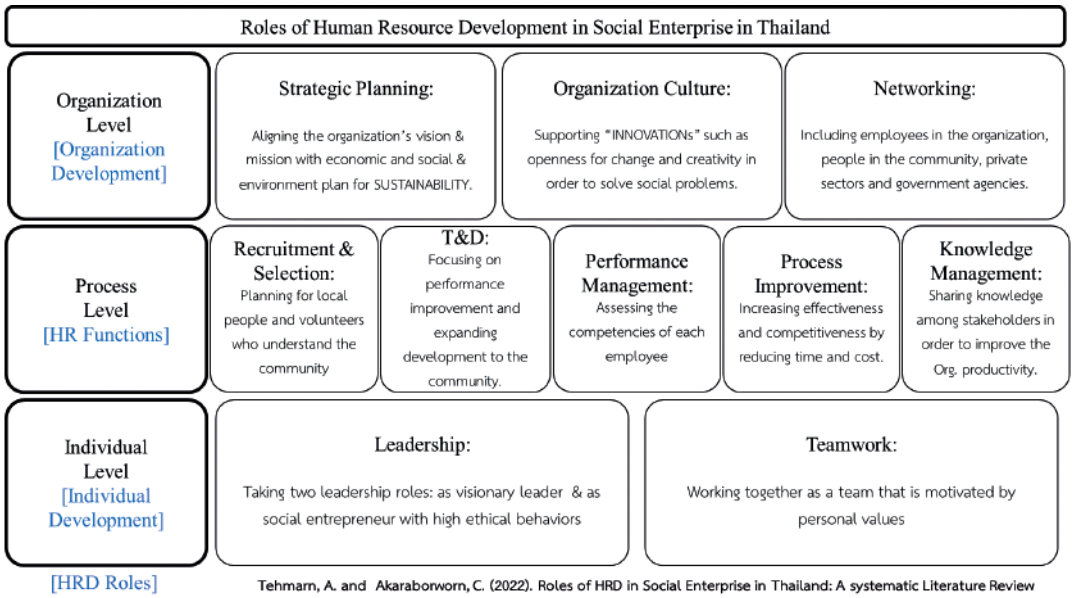

Figure 2: Roles of HRD in SE in Thailand (Created by Authors)

Discussion

The objective of the study is to explore the roles of HRD in SE in Thailand. The main output of this study is themes of roles of HRD that are emerged from a systematic literature review methods. Roles of HRD in SE in Thailand share some characteristics with those in typical for-profit organization. The main results from this study are shown as follow.

Strategic planning

The strategy aligns with vision and mission of the organization, which is similar to for-profit organization. However, SE aims for sustainability and incorporate social and environmental plan in its strategy which reflects the characteristics of SE. Moreover, it includes needs of stakeholders, which are the society of SE, to participate in the strategic plan. The development of innovation is included in the strategic plan to create solutions. This aligns with the study of Doherty and Kittipanya-Ngam (2021), Royce (2007), and Wang (2012). Moreover, the finding is aligned with Akaraborworn (2022) that one of HRD role is to be a strategic partner that helps organization achieving goals.

Culture

SE in Thailand developed its culture to shared visions and common goals. The culture supports innovations including openness for change and creativity. This aligns with the needs of SE to create innovation to solve social problems (Doherty & Kittipanya-Ngam, 2021).

Networking

The finding stated the importance of social networks in SE development in Thailand, which aligned with (Doherty & Kittipanya-Ngam, 2021; Wang, 2012). The network includes employees of the organization, people in the community, private sector, and government agencies.

Recruitment and selection, training and development, performance management

Literature shows the roles of HRD in recruitment and selection, training and development, and performance management of employees in every level of the organization in order to improve performance, which aligned with the study of Booth, Shin, and Gomezel (2019) and Royce (2007).

Recruitment and selection aims to be the first steps of HR function that SEs plans to be more efficient. SE in Thailand recruited the local people who have value and understand their community (Supsanma & Pansan, 2019; Supsanma & Wiroonrath, 2019). The finding showed that SEs in Thailand pay attention in local people as they will work closely with the community.

HR practices in SEs conduct the *training and development* not only for their employees in every level (Noonin, 2014; Sornsuphab & Kesapradist, 2018; Suratpipit & Na Chiangmai, 2020).

Performance Management in SEs has focused on the competencies of individual (Duangsonk et al., 2015) since they need to utilize the talent of limited employees. Performance of employees of the organization were assessed based on their competencies.

Booth et al. (2019) and Royce (2007) stated that SEs use volunteer as much as they can. However, it can be seen that SE in Thailand did not mentioned about volunteers that work with the organization. The future research can explore more about volunteers that involve with SE, as Booth et al. (2019) and Royce (2007) mentioned that there were challenges in managing different types of employees SE.

Process improvement

Swanson's (2022) stated that HRD aims for performance improvement. The finding showed this role of HRD. One of the roles of HRD in SE is to improve process in order to increase effectiveness and competitiveness of SE in Thailand (Sangnin & Pooripakdee, 2018; Nakudom & Jitpakdee, 2018) by reducing time and cost (Juyjingam, Siriwong, 2015; Meethavornkul, Siriwong & Thirawat, 2020). The finding also showed that the process can be improve by using feedback and knowledge sharing from stakeholders.

Knowledge management

Knowledge management of SE helped not only improving organization productivity (Juyjingam & Siriwongm, 2015; Sangnin & Pooripakdee, 2018; Noonin, 2014; Noonpakdee & Phothichai, 2016) but also building the relationship with the community (Meethavornkul et al., 2020). Knowledge is shared among stakeholders of the organization. The process aligned with the strategy of the organization (Juyjingam & Siriwongm, 2015; Sukontachart et al., 2020). The finding showed that.

Leadership

Findings focus on the important of leadership that affect the performance of the organization. The findings align with the study of Royce (2007) and Wang (2012). SE has visionary leader, or social entrepreneur, who aims for organization's mission success (Wang, 2012). Social entrepreneur opens for innovation and act as a change agent, same as the findings of Wang (2012). The qualities of social entrepreneur include many aspects. For example, the persistency of leader, this aligns with Thiemboonkit (2016). Entrepreneurial skills such as seeking for opportunities, utilizing resources were required. This finding aligns with Booth et al. (2019)'s research in Slovenian social enterprise. Moreover, the findings found the important of ethical behavior of leaders, which is different from the Western study.

Teamwork

The findings show that skills, knowledge, and experience that relate to work are required from the employees. Employees are able to work together as a team. Employees are motivated intrinsically that aligns with their personal values, this aligns with Booth et al. (2019). Moreover, the findings emphasize the important of ethical behavior of employees, which is different from the Western study.

Conclusion and Recommendations

As HRD plays important roles to SE in Thailand in organization, process, and individual level, HRD practitioners should play roles as a change agent of the organization. HRD practitioners can promote development within the organization, for example, support strategic planning, innovative culture, network of stakeholders, HRD process within the organization, and development of leader and employee. As typical for-profit organization has to shift to become more responsible to the society and environment, therefore, HR practitioners could apply the roles of HRD in social enterprise in Thailand as it serves the needs of the organization.

The limitation of this research is that it is systematic literature review to explore the roles of HRD in Thailand. The future research can use empirical study such as qualitative method that is the in-depth study. Moreover, the results of the study should be tested in other context such as the countries that have the different policy and practices in SE or the organizations that emphasized in each sustainability goals of the UN that might have different HRD roles. Furthermore, the future research can study the different HRD roles in the success SE before and during COVID-19 pandemic.

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Determinants of Purchase Intention of Functional Food in Thailand: A Study on Young Adults

Paul Kalin*

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Abstract

The increasing number of health conscious consumers has led to a growing demand of functional food in Thailand. The purpose of this paper is to examine the effects of perceived food quality attributes, food motives and health consciousness on the purchase intention of functional food.

The data were collected from 400 young adult consumers aging from 18 - 45 years old, living in Greater Bangkok, who consume functional food on a regular basis, using the convenience sampling approach. The data were then analyzed through descriptive and regression analysis.

The results indicated that perceived food quality attributes, food motives as well as health consciousness have a significant effect on purchase intention. This study makes an important academic contribution to the understanding of young adults' behavioral intention towards functional food in Thailand. This study also provides useful insights for product design, marketing activities as well as branding strategies of functional food in order to trigger purchase intention of their consumers.

* Panyapiwat Institute of Management
85/1 Moo 2, Chaengwattana Road., Bang-Talat, Pakkred, Nonthaburi, 11120 THAILAND.
E-mail: paulkal@pim.ac.th

This research is limited by the area scope as well as the nature and the number of determinants. Future research can focus on other areas in Thailand and also examine other determinants of purchase intention.

Keywords: Functional Food, Perceived Food Quality Attributes, Food Motives, Health Awareness, Purchase Intention

ปัจจัยที่ส่งผลกระทบต่อการตัดสินใจซื้ออาหารฟังก์ชันผลลัพธ์จากการศึกษากลุ่มวัยผู้ใหญ่ตอนต้นในประเทศไทย

พอล คาลิน*

รับวันที่ 30 กันยายน 2565 *ส่งแก้วันที่ 25 พฤศจิกายน 2565* *ตอบรับตีพิมพ์วันที่ 23 ธันวาคม 2565*

บทคัดย่อ

การเพิ่มตัวขึ้นของผู้บริโภคทางเลือกเพื่อสุขภาพกำลังส่งผลให้มีความต้องการของอาหารฟังก์ชันในตลาดเป็นอย่างสูง งานวิจัยนี้ถูกทำขึ้นเพื่อการสำรวจถึงผลลัพธ์ของการทำให้รับรู้เกี่ยวกับคุณภาพของอาหาร แรงจูงใจจากอาหารและการรับรู้ถึงคุณค่าทางโภชนาการของอาหารฟังก์ชันที่ลูกค้าได้ทำการซื้อ

ข้อมูลที่นำมาใช้ในการวิจัยนี้นั้นได้มีการทำการเก็บมาจากกลุ่มผู้บริโภคในกลุ่มผู้ใหญ่วัยต้น 400 คน ซึ่งมีอายุตั้งแต่ 18 - 45 ปี ที่อาศัยอยู่ในเขตกรุงเทพมหานคร และรับประทานอาหารฟังก์ชันเป็นประจำ โดยใช้หลักการสุ่มตามความกระแส ในการเก็บข้อมูล โดยได้นำข้อมูลมาทำการวิเคราะห์ผ่านหลักการวิเคราะห์เชิงพรรณนา และการวิเคราะห์เชิงถดถอยผลลัพธ์ที่ได้บงชี้ให้เห็นว่าการทำให้รับรู้เกี่ยวกับคุณภาพของอาหาร แรงจูงใจและการรับรู้ถึงคุณค่าทางโภชนาการของอาหาร เป็นแรงจูงใจที่มีความสำคัญต่อการตัดสินใจซื้อสินค้าในผู้บริโภคเป็นอย่างมาก

งานวิจัยนี้จะส่งผลทางการศึกษาอย่างสำคัญต่อความเข้าใจถึงการตัดสินใจของกลุ่มวัยผู้ใหญ่ตอนต้นต่ออาหารฟังก์ชันในประเทศไทย เช่นเดียวกันงานวิจัยนี้จะช่วยให้ข้อมูลต่อการพัฒนารูปแบบของสินค้า การทำการตลาดรวมถึงการวางกลยุทธ์ของแบรนด์สำหรับอาหารฟังก์ชันในประเทศไทยเพื่อกระตุ้นการตัดสินใจที่จะซื้อในกลุ่มลูกค้า

* สถาบันการจัดการปัญญาภิวัฒน์
85/1 หมู่ 2 ถนนแจ้งวัฒนะ ตำบลบางตลาด อำเภอปากเกร็ด จังหวัดนนทบุรี 11120
อีเมล: paulkal@pim.ac.th

งานวิจัยนี้ยังมีข้อจำกัดถึงในเรื่องของพื้นที่รวมถึงลักษณะและจำนวนของปัจจัยต่าง ๆ ซึ่งเป็นโอกาสสำหรับงานวิจัยในอนาคตที่จะมุ่งเน้นไปยังส่วนอื่น ๆ ของประเทศไทย รวมถึงการวิจัยถึงปัจจัยอื่น ๆ ที่ส่งผลต่อการตัดสินใจของผู้บริโภค

คำสำคัญ: อาหารฟังก์ชัน การรับรู้ถึงคุณภาพของอาหาร แรงจูงใจทางอาหาร ความตระหนักด้านสุขภาพ ความตั้งใจซื้อ

Introduction

The contribution of nutrition has shifted from the prevention of dietary deficiencies to the promotion of well-being, health and reduction of the risk of disease (Roberfroid, 2000a). Studies have revealed a relationship between nutrition and diseases. Nutrition is beneficial in preventing the risk of diet-related chronic diseases as well as promoting a better health (Kraus, 2015a) and this is one of the main reasons that consumers are more concerned about the health benefits of specific food (Bazhan, Keshavarz-Mohammadi, Hosseini & Kalantari, 2016). Consumers exhibit a growing concern on their health and accept healthier eating habits since they believe that foods can contribute directly to their health (Chen, 2011). The food demand and the food consumption have undergone substantial changes due to the increasing health consciousness among consumers over the past years (Singhal, 2017).

In reference to Japutra, Vidal-Branco, Higueras-Castillo and Molinillo (2022), health conscious consumers are concerned about their well-being and thus, motivated to improve or maintain their health and quality of life as well as preventing diseases through practice of healthy and self-conscious behaviors. The same study also stated that health conscious consumers will look for foods rich in nutrients. This phenomenon has provided new business opportunities to develop new functional food products (Salvatore, Adamashvili & Conto, 2021). Other changes such as socio-demographic evolutions, rising costs of health care, increase of life expectancy and higher demand of life quality, are contributing in the increasing importance of functional food (Bazhan et al., 2016, Kraus, 2015a; Roberfroid, 2000b). Hassan, Sade and Subramaniam (2020) mentioned that the current health issues of overweight and obesity will encourage more consumption of functional foods as prevention and treatment. In recent years, the market of functional foods has grown mainly in developed countries (Vecchio, Van & Annuziata, 2016). However, developing countries displayed growth opportunities and both food business and consumers can benefit from the development (Vicentini, Liberatore, & Mastrocola, 2016).

Although consumers accept healthier choices, their intentions and actual behaviors might not always align (Salvatore, Adamashvili, & Contò, 2021). According to Lim and An (2021), consumer purchase intention has been one of the main areas of focus for many researchers, because it is collectively considered the immediate antecedent of purchase (Chakraborty, 2019). Studies examine the antecedents of purchase intention because the findings can serve as market and consumer insights for business to adjust their products

or services (Chen & Lee, 2015). Despite the high number of studies investigating purchase intention, gaps concerning the influencing factors of consumer intention still remain. Therefore our study aims to examine the determinants of consumer purchase intention. The main objective of this research is to investigate the effects of perceived food quality attributes, food motives and health consciousness toward purchase intention. These variables are found to have a significant influence on purchase intention (Ghvanidze, Velikova, Dodd & Oldewage-Theron, 2017; Huang, 2014; Dowd & Burke, 2013) and are thus, considered as some of the key determinants of purchase intention of food products. Many papers supported this concept. First, according to Ghvanidze, Velikova, Dodd and Oldewage-Theron (2017), a decision to purchase a healthy food product is influenced by product attributes and food motives. The increasing concern about food quality has made food consumption a rationale decision (Konuk, 2018). However, little is known about consumers perception towards food quality attributes in their purchase decision (Wang, Gao & Chen, 2022). For this reason, it deems necessary to examine the effect of food quality attributes on purchase decision. Then, food motives are found with a significant contribution to the explanatory power in predicting purchase intention (Dowd & Burke, 2013). Finally, in the study of Huang (2014), health consciousness is shown to have an influence on food purchase decision. According to Maehle, Iversen, Hem and Otnes (2015), health consciousness plays an important role in food consumption and appears as a primary motive for purchasing organic food.

This research will fill the literature gaps by examining the determinants of purchase intention. The findings of this study can serve food business in designing their marketing strategies and updating with current consumer trends.

Literature review

Functional Food

According to Annunziata and Vecchio (2011), functional food is considered as one of the most intriguing areas of research and innovations in food industry because it aims to provide additional benefits to consumer through food modification or innovation (Salvatore, Adamashvili & Conto, 2021). Functional foods refers to foods that have been modified in order to create a functional and positive influence on the health and well-being through elimination, addition, or modification of specific components (Bazhan et al., 2016). Bigliardi and Galati (2013), identified different types of Functional Foods: (1) Fortified products

(increase the amount of existing food nutrient); (2) altered products (remove an existing harmful food nutrient); (3) enriched products (add a food nutrient that is generally absent); (4) enhanced commodities (improve raw material through new techniques of production).

Perceived Food quality attributes

Past studies have identified two types of food quality attributes. Extrinsic attributes are product-related attributes that are not part of the physical product itself such as product origin, raw material origin, package, price, brand, safety label or manufacturing date (Wang, Gao & Chen, 2022) and intrinsic attributes physical composition of a product such as colour, smell, appearance and flavor (Bukhari, Woodside, Hassan, Ali, Hussain & Waqas, 2021). The study of Memery, Angell, Megicks and Lindgreen (2015) mentioned that the "properties of food" have a significant influence on food choice through both phsysiological and sensory affect on consumer's decision making. In the same study, the authors also indicated that product quality is one of the most important criteria that provides an overall evaluation on the food or similarly named perceived quality. For many years, an abundance of researches has attempted to explore the effects of perceived quality on consumer behavior (Slack, Singh, Ali, Lata, Mudaliar, & Swamy, 2021; Wang, Liang, Ko & Lin, 2021; Espejel, Fandos & Flavián, 2007).

Food motives

According to Brecic, Gorton and Barjolle (2012), there are numerous motivations that underlie in consumers' choice of foods. Steptoe, Pollard and Wardle (1995) underlined nine distinct food choice motives ranging from health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity to ethical concern. Since then, many researchers attempted to explain the selection of foods by applying this concept. Ares and Gambaro (2007) studied the willingness to try functional food and concluded that the food motives are significant determinants but varies depending on the group age and gender. Milosevic, Zezelj, Gorton and Barjolle (2012) investigated food choice in Western Balkan Countries and concluded that the most important factors are sensory appeal, purchase convenience, and health and natural content whereas the least important are ethical concern and familiarity. Brecic, Gorton and Barjolle (2012) examined the functional food consumption in Croatia and found that health, convenience and familiarity are three factors that significantly influence functional food consumption. Kraus (2015b) explained that the maintenance of good health conditions, the contribution of functional food towards good health, product information and product knowledge are essential motives to consume functional food.

Health consciousness

Konuk (2018) defined health consciousness as the extent to which health concerns are coordinated with a person's daily activities. Tan, Lau, Sarwar and Khan (2022) explained that health consciousness reflects the desired state of well-being as well as the readiness to take actions to live a healthy life. Individuals exhibit different level of health consciousness in their behavior: lifestyle (Tan et al., 2022), eating behavior (Siegrist, Bearth & Hartmann, 2022), smart wearable device using behavior (Zhu, Lu, Gupta, Wang & Hu, 2022), etc. Health consciousness has been extensively examined and is found to drive consumers to adopt healthier behaviors. Consumers become more aware and concerned about their wellness and are motivated to improve and/or maintain their health and quality of life (Husic-Mehmedovic, Arslanagic-Kalajdzic, Kadic-Maglajlic & Vajnberger, 2017). Past studies explain that health-conscious consumers tend to explore foods with health and nutritional benefits or consume nutritious food (Japutra, Vidal- Branco, Higueras-Castillo & Molinillo, 2022; Jin, Line & Lee, 2017). Shin and Mattila (2019) elaborated that high level of health consciousness drives individuals to consider more both desirable nutrients (such as vitamins and minerals) as well as undesirable nutrients (such as saturated fat and sugar). The study of Lee, Conklin, Cranage and Lee (2014), a study in the context of restaurant, showed evidence that consumers are more likely to show more favorable responses to healthy foods.

Food quality attributes, motives, health consciousness and purchase intention

Applying the concept of Mohamad, Rusdi and Hashim (2014), purchase intention refers to the representation of a person's readiness to perform a purchase action, and it is considered to be the immediate antecedent of purchase. Purchase or repurchase intention towards a brand or product are behavioral intentions that triggers interest in marketing studies (Ahmad, Jamil, Latif, Ramayah, Ai Leen, Memon & Ullah, 2019). Numerous studies have attempted to examine the determinants of purchase intention. Bukhari et al. (2021) found that both intrinsic and extrinsic attributes have significant effect on consumer purchase intention, namely packaging and labeling. These findings align with the studies of Schnettler, Sepúlveda, Bravo, Grunert and Hueche (2018) and Oliveira, Machín, Deliza, Rosenthal, Walter, Giménez, and Ares (2016).

Micale, Giallanza, Enea and La Scalia (2018) explained that motives have a significant influence on purchase intention. Consumers are willing to purchase functional food in order to prevent diseases, improve physical and mental wellbeing, and so on. Salvatore, Adamashvili and Conto (2021) mentioned that nutrition information can encourage purchase and consumption, but it is not always sufficient. Dowd and Burke (2013) found that food choice motives are significant contributors in the prediction of purchase intention on sustainable food.

The effect of health consciousness on purchase intention is found significant by many scholars (Nguyen, Nguyen, Nguyen, Lobo,& Vu, 2019; Lian, 2017; Rana & Paul, 2017) and has been examined in different context such as organic food (Japutra et al., 2022), organic coffee (Lee, Bonn & Cho, 2015), restaurant (Konuk, 2018), fast-food (Ghoochani, Torabi, Hojjati, Ghanian, & Kitterlin, 2017), ecological food (Amin & Tarun, 2022). Japutra et al. (2022) explained that health consciousness is one of the most important determinants of purchase intention and also determines the consumers' willingness to pay for higher price.

Based on the literature, this research formulated 3 hypotheses:

H1: Perceived food quality attributes have a positive effect on purchase intention

H2: Food motives have a positive effect on purchase intention

H3: Health consciousness has a positive effect on purchase intention

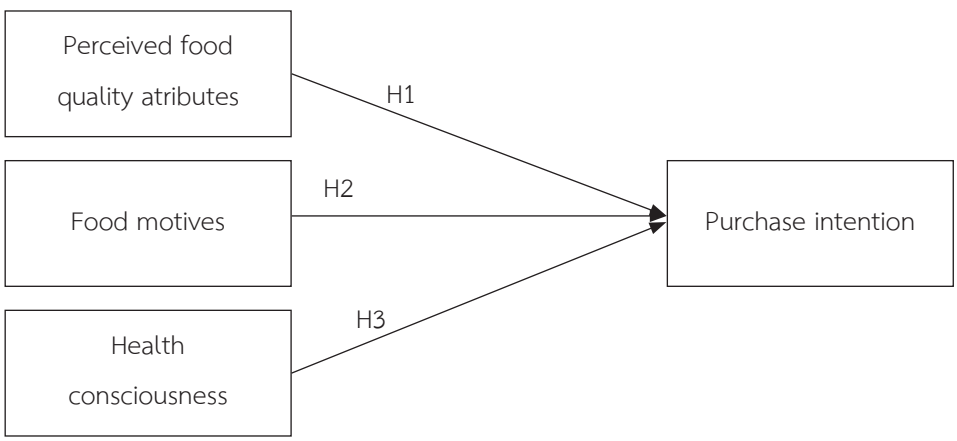

Figure 1: Conceptual framework of this study

Source: Own compilation adapted from Wang and Scrimgeour (2022), Pacho (2020), Husic-Mehmedovic, Arslanagic-Kalajdzic, Kadic-Maglajlic and Vajnberger (2017)

Methodology

Based on the literature review, this research only focuses on four main variables: three independent variables: Perceived Food Quality Attributes, Food Motives, Health Consciousness and one dependent variable: Purchase Intention. The data were collected from young adult consumers aging from 18 - 45 years old, living in Greater Bangkok, who consume functional food on a regular basis. Applying the convenience sample approach, the study approached people who are reachable and available to answer the questionnaire. Using the statistics from the National Statistical Office of Thailand and Yamane's formula, this study obtained a sample size of 400. The calculations are as follows.

$$\text{Formula} \qquad n = \frac{N}{1 + N(e)^2}$$

n = sample size N = number of young adults in Greater Bangkok

e = deviation of sampling design

$$n = \frac{10{,}899{,}786}{1+10{,}899{,}786\ (e)^2}$$

$$n = \frac{10{,}899{,}786}{1+10{,}899{,}786\ (0.05)^2}$$

$$n = 399.98$$

This study collected data from 400 respondents. The questionnaire is launched online in Thai language. According to Evans and Mathur (2018), the strengths of online questionnaire lie in the possibility to reach potential participants virtually anywhere and at any time. The questionnaire includes five distinguished sections: Socio-Demographic factors, Consumer Behavior, Perceived Food Quality Attributes, Food Motives, Health Consciousness and Purchase Intention. The questionnaire items are selected based on the works of Shimul, Cheah and Lou, (2021), Hassan, Sade and Subramaniam (2020) and Kraus (2015a). The constructs, the items and the respective sources are shown in Table 1. The questionnaire is designed with a few forms of questions including 5 points importance scale-low importance (1) to high importance (5), 5 points Likert-scale type - strongly disagree (1) to strongly agree (5), multiple choice type questions and open ended questions. A pilot test was conducted with

50 respondents to check the understanding of the questions. This study focuses mainly on two statistical methods to analyze the data collected. This study started with a descriptive analysis to examine the demographic characteristics and the behaviors of the respondents. Then, a multiple regression analysis was used to study the effect of Perceived Food Quality Attributes (independent variable) Food motives (independent variable) and Health consciousness (independent variable) towards Purchase intention (dependent variable).

Table 1: Constructs, items and sources

Constructs	Items	Sources
Perceived Food quality attributes	Natural product Nutritional value Nice taste Expiry date Environmentally friendly packaging	Kraus (2015)
Food motives	Functional food strengthens the immune system Functional food helps to maintain correct body weight Functional food provides components necessary for well-being Functional food improves external appearance Functional food reduces the risk of diseases	Kraus (2015)
Health consciousness	I make a lot of efforts for my health I consider myself health conscious. Health is important in my life I think it is important to know well how to eat healthy. I often dwell on my health.	Shimul, Cheah & Lou, (2021).
Purchase intention	I am willing to purchase functional food although the options are limited I am willing to purchase functional food due to the additional nutrients I am willing to purchase functional food although it is a bit pricy I am willing to spend time sourcing for functional food I prefer functional food to the conventional alternatives	Hassan, Sade & Subramaniam (2020)

Reliability test

According to Hair, Page and Brunsveld, (2019), a Cronbach's Alpha value above 0.7 is considered to be acceptable. Thus, all the four variables in this study are consistent: Perceived Food Quality Attributes (Cronbach alpha = 0.902), Food motives (Cronbach alpha = 0.928), Health consciousness (Cronbach alpha = 0.884), and Purchase Intention (Cronbach alpha = 0.844).

Results

Descriptive analysis

Table 2: Demographic Characteristics (n=400)

Demographics		Frequency	Percent	Cumulative Percent
GENDER	Male	187	46.7	46.7
	Female	213	53.3	100
AGE	18 - 25	87	21.7	21.7
	26 - 35	126	31.5	53.2
	36 - 45	187	46.8	100.0
EDUCATION	Bachelor degree	102	25.5	25.5
	Master degree	291	72.8	98.3
	Doctoral degree	7	1.7	100.0
MONTHLY INCOME	Less than 10,000 Baht	68	17	17
	10,000 - 20,000 Baht	57	14.2	31.2
	20,001 - 30,000 Baht	72	18.0	49.2
	30,001 - 40,000 Baht	107	26.8	76.0
	40,001 - 50,000 Baht	81	20.2	96.2
	Above 50,000 Baht	15	3.8	100.0
AVERAGE CONSUMPTION OF FUNCTIONAL FOOD PER WEEK	1 - 3 times	166	41.5	41.5
	4 - 6 times	138	34.5	76.0
	7 - 9 times	58	14.5	90.5
	Above 9 times	38	9.5	100.0

Table 2 shows a slightly higher number of female (53.3%) against male (46.7%) among the respondents. The respondents come from various age range: 18 - 24 years old (21.7%), 25 - 35 (31.5%) and 36 - 45 years old (46.8%). The majority of the respondents have received a Master degree (72.8%). The remaining respondents have received a Bachelor degree (25.5%) and a Doctoral degree (1.7%). It can be observed that the top three income ranges that the respondents received every month are 30,001 - 40,000 Baht (26.8%), 40,001 - 50,000 Baht (20.2%) and 20,001 - 30,000 Baht (18%). Finally, it is worth pointing out that 41.5% of the respondents consume functional food in average 1 - 3 times per week and 34.5% of the respondents consume in average 4 - 6 time per week.

Table 3: Descriptive Statistics of independent and dependent factors (n=400)

Constructs	Items	Min	Max	Mean	SD
PERCEIVED FOOD QUALITY ATTRIBUTES	Natural product	1.00	5.00	3.811	1.043
	Nutritional value	1.00	5.00	3.721	1.225
	Nice taste	1.00	5.00	3.799	1.021
	Expiry date	1.00	5.00	3.528	1.103
	Environmentally friendly packaging	1.00	5.00	3.513	1.209
FOOD MOTIVES	Functional food strengthens the immune system	1.00	5.00	3.717	1.081
	Functional food helps to maintain correct body weight	1.00	5.00	3.765	1.078
	Functional food provides components necessary for well-being	1.00	5.00	3.989	1.026
	Functional food improves external appearance	1.00	5.00	3.645	1.136
	Functional food reduces the risk of diseases	1.00	5.00	3.931	0.972
HEALTH CONSCIOUSNESS	I make a lot of efforts for my health	1.00	5.00	3.964	1.185
	I consider myself health conscious.	1.00	5.00	3.819	0.983
	Health is important in my life	1.00	5.00	3.979	1.112
	I think it is important to know well how to eat healthy.	1.00	5.00	3.751	0.948
	I often dwell on my health.	1.00	5.00	3.578	1.134

Table 3: Descriptive Statistics of independent and dependent factors (n=400)

Constructs	Items	Min	Max	Mean	SD
PURCHASE INTENTION	I am willing to purchase functional food although the options are limited	1.00	5.00	4.035	1.065
	I am willing to purchase functional food due to the additional nutrients	1.00	5.00	4.325	1.061
	I am willing to spend time sourcing for functional food	1.00	5.00	4.193	1.078
	I am willing to purchase functional food although it is a bit pricy	1.00	5.00	4.215	1.025
	I prefer functional food to the conventional alternatives	1.00	5.00	3.908	1.097

According to Table 3, the top three quality food attributes perceived with the highest level of importance are natural product (mean $\overline{X}$ = 3.811), nice taste (mean $\overline{X}$ = 3.799) and nutritional value (mean $\overline{X}$ = 3.721). The food motives that rank the highest are functional food provides components necessary for well-being (mean $\overline{X}$ = 3.989), functional food reduces the risk of diseases (mean $\overline{X}$ = 3.931) and functional food helps to maintain correct body weight (mean $\overline{X}$ = 3.765). The results also show that the respondents place high importance on health in their life (mean $\overline{X}$ = 3.979) and make significant efforts for their health (mean $\overline{X}$ = 3.964).

Multiple Regression Analysis

Table 4: Results of Perceived Food Quality Attributes, Food Motives & Health consciousness towards Purchase Intention

Variables	Beta	t-value	Sig
PERCEIVED FOOD QUALITY ATTRIBUTES	.370	9.119	.000*
FOOD MOTIVES	.228	4.568	.000*
HEALTH CONSCIOUSNESS	.255	7.385	.000*
R^2 = 0.797 adjusted R^2 = .0.635 F = 230.011 Sig = 0.000*			

*. Coefficient is significant at 0.05

The results in Table 4 show that perceived food quality attributes (β = 0.370), food motives (β = 0.228) and health consciousness (β = 0.255) exhibit a p-value lesser than 0.05. For these reasons, all 3 variables (perceived food quality attributes, food motives and health consciousness) carry a significant effect on purchase intention.

Table 5: Summary of Hypotheses

Hypothesis		Test result
H1	Perceived food quality attributes have a positive effect on purchase intention	Accepted
H2	Food motives have a positive effect on purchase intention	Accepted
H3	Health consciousness has a positive effect on purchase intention	Accepted

Discussion and Conclusion

This study investigated the effect of perceived food quality, food motives as well as health consciousness on purchase intention. The findings show that all 3 hypotheses are significantly accepted (as shown in Table 5). The findings in this research align with the findings in other studies. According to Hsu, Chang and Lin (2016), consumers show higher level of concern to health, quality and food ingredients. Correspondingly stated in Wang, Pham and Dang (2020), food quality is found to have significant effect on consumer's decision making. More exactly, this study found that perceived food quality attributes have significant effect on consumer purchase intention, which is similar to the findings of Wang, Tao and Chu (2020).

This study provides evidence that food motives have a significant influence on purchase intention. This finding is supported by the study of Micale et al. (2018) and Miranda, Anton, Redondo-Valbuena, Roca-Saavedra, Rodriguez, Lamas, Franco and Cepeda (2015). Well-being and the motive to reduce the risk of disease, are the two main food motives manifested by the participants of this research. These results align with the study of Irene Goetzke and Spiller (2014) stating that the desire for health and well-being represents an important determinant in the food market. Miranda et al. (2015) pointed out a continuous growing demand for functional food thanks to its capacity to decrease the risks of some diseases.

Resembling to the research of Amin and Tarun (2022), Japutra et al. (2022) and Konuk (2018), the findings of this study indicate that health consciousness has significant influence on consumer purchase intention. Health-conscious consumers, motivated to improve and/or maintain their health and quality of life (Husic-Mehmedovic, Arslanagic-Kalajdzic, Kadic-Maglajlic & Vajnberger, 2017), are more likely to purchase functional food (Siegrist, Bearth & Hartmann, 2022).

Implication

Intention behavior gap is often highlighted and captivates the interest of numerous researchers. Therefore, this study would enrich the understanding of consumer behavior towards functional foods. This study provides insights on the demographic characteristics of functional food consumers as well as the three determinants of purchase intention namely perceived food quality attributes, food motives and health consciousness. Future researchers can examine consumer behavior further based on the empirical results of this study.

Piggford, Raciti, Harker and Harker, (2008), stated that a deep understanding of motives is crucial in designing marketing strategies, from product design to marketing communications. In regards to practical implication, the findings of this study provide insights for manufacturers, marketers and retailers of functional products. This study provides empirical evidence on the effect of food quality, food motives as well as health consciousness on purchase intention. Businesses should focus on these factors in their product design, marketing activities as well as branding strategies, in order to trigger purchase intention of their consumers. For instance, it would be more effective to emphasize on natural product, eco-friendly packaging and nutritional value in the product development. It is noteworthy to spotlight well-being and risk of diseases reduction in various marketing communications. In order to get a higher engagement, brands can target individuals who are concerned about the nutritional value of what they consume and individuals who keep a strict diet to maintain a good shape.

In summary, this research sheds light on functional food and the related consumer behavior. Thus, this study makes an important contribution to the understanding of behavioral intention towards functional food in Thailand and the development of functional food in the future.

Limitation

Several limitations can be found in this study. Nevertheless, these limitations can provide avenues for further research. Since this research is conducted among young adults in Greater Bangkok, it requires further research to be able to generalize the findings. This study is also limited by the nature and the number of determinants of purchase intention. Although this study examined several determinants of purchase intention, there are other existing determinants of purchase intention. Bazhan et al. (2016) stated that functional food consumption surpasses consumers' individual factors and includes also other factors such as environmental factors. For these reasons, this research can be extended by exploring other factors in other to achieve higher clarity in understanding consumer behavior.

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Exchange Rate Regime Performance under External Shocks A Case Study of ASEAN

Inpong P. Luanglath*

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Abstract

This paper examines the effectiveness of exchange rate management in ASEAN countries. The sample size consists of 544 average weekly spot rates of ASEAN currencies traded against the US dollar from January 1, 2012 to June 5, 2022. Three quantitative tools were used to analyze the data. Time series modeling were employed to obtain predictive function and assess the stability of exchange rates. Extreme Value Theory (EVT) was used to analyze extreme devaluation of some currencies. Lastly, Weibull distribution was used to reinforce EVT under the rationale that extreme currency devaluation is a failure in monetary policy.

Among the 10 ASEAN countries, exchange rates against US dollar for currencies from Laos, Myanmar, Cambodia and Indonesia showed tail index of $\square < 0$ indicating significant weakening. Under AR(1) modeling, these four currencies showed high level of fluctuation through AIC information loss indicator, 10.23, 10.74, 8.77, and 13.20 respectively. Among three factors used to evaluate currency value, foreign reserves and current

* International College, Bangkok University
9/1 Moo 5, Phaholythin Road, Klong Nueng, Klong Luang, Pathumthani 12120, THAILAND.
E-mail: Inpong.L@bu.ac.th

account balance played important role for ASEAN currencies. We also tracked three non-ASEAN currencies (Euro, Chinease Yuan, and Russian Ruble) and found that Euro and Yuan are two most stable currencies that should be used for pegging under manage float exchange rate regime in ASEAN. This stability was confirmed by the AR (1) vector state of -0.0000089 for EUR and 0.0000182 for CNY with significance level of p = 0.0000 in both cases.

Keywords: Exchange Rate Regime, Extreme Value Theory (EVT), Time Series, Weibull Distribution

ประสิทธิภาพของระบบอัตราแลกเปลี่ยนภายใต้แรงสั่นสะเทือนจากภายนอก กรณีศึกษาอาเซียน

อินพงษ์ หลวงลาท*

รับวันที่ 27 มิถุนายน 2565 *ส่งแก้วันที่ 22 พฤศจิกายน 2565* *ตอบรับตีพิมพ์วันที่ 23 ธันวาคม 2565*

บทคัดย่อ

บทความนี้ศึกษาประสิทธิผลของการจัดการอัตราแลกเปลี่ยนในประเทศอาเซียน ขนาดของกลุ่มตัวอย่างประกอบด้วย 544 อัตราแลกเปลี่ยนสปอตเฉลี่ยต่อสัปดาห์ของสกุลเงินอาเซียนที่ซื้อขายเทียบกับดอลลาร์สหรัฐตั้งแต่วันที่ 1 มกราคม 2555 ถึง 5 มิถุนายน 2565 เครื่องมือเชิงปริมาณ 3 เครื่องมือที่ใช้ในการวิเคราะห์ข้อมูล มีการใช้แบบจำลองอนุกรมเวลาเพื่อให้ได้ฟังก์ชันการทำนายและประเมินเสถียรภาพของอัตราแลกเปลี่ยนทฤษฎีมูลค่าสูงสุด (EVT) ใช้ในการวิเคราะห์การลดค่าของบางสกุลเงิน สุดท้าย การกระจาย Weibull ใช้เพื่อเสริม EVT ภายใต้เหตุผลที่ว่าการลดค่าสกุลเงินอย่างรุนแรงเป็นความล้มเหลวในนโยบายการเงิน

ในบรรดา 10 ประเทศอาเซียน อัตราแลกเปลี่ยน เมื่อเทียบกับดอลลาร์สหรัฐสำหรับสกุลเงินจากลาว เมียนมา กัมพูชา และอินโดนีเซีย มีค่าหางที่ $\square < 0$ ซึ่งบ่งชี้ว่าอ่อนค่าลงอย่างมาก ภายใต้การสร้างแบบจำลอง AR (1) สกุลเงินทั้งสี่นี้แสดงความผันผวนในระดับสูงผ่านตัวบ่งชี้การสูญหายของข้อมูล AIC คือ 10.23, 10.74, 8.77 และ 13.20 ตามลำดับ ในบรรดาปัจจัยสามประการที่ใช้ในการประเมินค่าเงิน ทุนสำรองเงินตราต่างประเทศและดุลบัญชีเดินสะพัดมีบทบาทสำคัญ

* วิทยาลัยนานาชาติ มหาวิทยาลัยกรุงเทพ
เลขที่ 9/1 หมู่ 5 ถนนพหลโยธิน ตำบลคลองหนึ่ง อำเภอคลองหลวง จังหวัดปทุมธานี 12120
อีเมล: Inpong.L@bu.ac.th

ต่อสกุลเงินอาเซียน นอกจากนี้ เรายังติดตามสกุลเงินนอกอาเซียนสามสกุล (ยูโร ไชนีสหยวน และรูเบิลรัสเซีย) และพบว่ายูโรและหยวนเป็นสองสกุลเงินที่มีเสถียรภาพมากที่สุดที่ควรใช้ในการตรึงภายใต้ระบบจัดการอัตราแลกเปลี่ยนแบบลอยตัวในอาเซียน ความเสถียรนี้ได้รับการยืนยันโดยสถานะเวกเตอร์ AR(1) ที่ -0.0000089 สำหรับ EUR และ 0.0000182 สำหรับ CNY โดยมีระดับนัยสำคัญ p = 0.0000 ในทั้งสองกรณี

คำสำคัญ: ระบบอัตราแลกเปลี่ยน ทฤษฎีมูลค่าสูงสุด (EVT) อนุกรมเวลา การกระจาย Weibull

Introduction

This paper examines the stability of exchange rates in the ASEAN. ASEAN is comprised of ten countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. Two current events that motivated this paper are to examine exchange rate as a factor influencing economic stability in the ASEAN. The first factor is the COVID-19 pandemic that has been affecting the global economy since 2020. As the result of various measured imposed to control the pandemics, the global economy had edged closer to recession. During the early stage of the pandemic, international trade had been adversely affected due to curtailing of free flows of people and trade (UNTAD Report, 2022). Fear and uncertainties from the pandemic also affected exchange rate movement. Recent research shows that "adverse pandemic news at the country level cause an immediate, statistically significant, depreciation of the domestic currency vis-à-vis a basket of trade-weighted currencies" (Aquilante, Di Pace, and Masolo, 2022).

The second event that affects the global economy is the military conflicts in Ukraine. The war in Ukraine resulted in trade interruption in Ukraine and Russia; in turn, this war affects the global food and fuel prices. The rise in food and fuel prices since February 2022 had further depressed the global economy. The ASEAN economy is affected by these two global events. The Asian Development Bank reported that the ASEAN economy decline by 4% in 2020 and is expected to rebound to 5.1% by 2022 (ADB Report, 2022. The war in Ukraine brought about international sanctions against Russia; the rise of fuel cost followed after the sanction restricted Russian oil supplies to the global market. In addition, the US economy also faced rising inflation. In its attempt to fight inflation, the US Federal Reserve raised interest rates; as the result the US dollar became stronger against other currencies. These events are external shocks affecting exchange rate among currencies in the ASEAN countries.

Exchange rate performance was evaluated eamong ASEAN countries under economic shock. Economic shock is defined as unpredictable change in exogenous factors that affects the economy. The global economy faces two shocks, namely the COVID-19 pandemic and the current military conflict between Ukraine and Russia. Both events are negative shocks; these shocks affect both macroeconomic and microeconomic levels in the global economy (Margalit, 2019).

There are many studies explaining the social and economic impact of COVID-19. For example, McKibbin and Fernando (2020) argued that pandemics can affect households, governments, and businesses through increased business costs. COVID-19-related restrictions have obstructed food supply chain, including production, distribution, processing, and consumption (Siche 2020), and caused damage to perishable agricultural commodities, such as meat and vegetables (Nicola et al., 2020). Some studies examined potential impacts of the pandemic on global and national economic indicators such as poverty, government expenditures, GDP growth, budget deficits, and employment (ILO 2020; Nicola et al. 2020; Sumner, Hoy, and Ortiz-Juarez 2020; UN-Habitat and WFP 2020) Kansiime et al. (2020) found that people in East African countries experienced income shocks due to the COVID-19 crisis. We want to add to this body of literature by looking at the how exchange rate of ASEAN currencies withstood external shocks, such as COVID-19 and the war in Ukraine.

Exchange rate is an important issue because international trade is not denominated in the local currency. Common currencies used in international trade are USD (US dollar), EUR (Euro) and CNY (Chinese Reminbi or Yuan). The exchange rate of the local currency against these major currencies affects the terms of trade for each country. Countries with weak currencies may face inflationary pressure for their imports through exchange rate pass-through (ERPT) inflation, i.e. weak local currency leads to price increase of imported goods without any change in the underlying fundamentals of imported goods. Faced with external shocks from COVID-19 pandemic and the war in Ukraine, the ASEAN countries are faced with economic slow down coupled with rising inflation. Countries which are traditionally dependent on imports, rising inflation and devaluation of the local currency against the US dollar present formidable challenges to cope with rising prices. The issue of effective foreign exchange management becomes a key strategy to stay afloat in the looming recession.

Among ten member countries in ASEAN, only one country (Philippines) employs a free float system for its foreign exchange regime. Table 1 below provides information about current exchange rate, foreign currency reserves, and inflation in ASEAN. The remaining nine countries use managed float system. Brunei is a special case where the Brunei dollar is pegged against Singapore dollar and the Singapore dollar, in turned, is pegged against the US dollar.

Table 1: Exchange rate regime in the ASEAN

Country	Foreign Exchange Regime	FX per USD	FX Reserves*	CPI 2022	Current Accnt Balance 2022
Brunei	Pegged to SGD	1.38	4.00	3.20	0.892**
Cambodia	Managed float	4,050	20.27	4.00	-4.519
Indonesia	Managed float	14,435	144.91	3.47	-12.69
Laos	Managed float	13,950	1.39	9.86	-1.426
Malaysia	Conventional peg	4.39	116.92	3.20	15.561
Myanmar	Managed float	1,851	18.77	8.00	-0.619
Philippines	Free float	52.90	108.75	5.40	-7.505
Singapore	Managed float	1.38	425.10	5.50	62.315
Thailand	Managed float	34.30	246.03	5.00	12.354
Vietnam	Pegged to USD	23,187	78.33	4.00	13.258

*Billion US dollars, including gold

Source: https://data.worldbank.org/indicator/FI.RES.TOTL.CD?locations=BN-KH-ID-LA-MY-MM-PH-SG-TH-VN Accessed: June 10, 2022

**IMF, World Economic Outlook 2022, amount in billions of US dollar. The figures are IMF forecast for 2022.

The research question presented in this paper is whether the ASEAN countries have effective exchange rate management to cope with external shocks (COVID-19 and the war in Ukraine) Among the ten currencies in the ASEAN community, which currency is the most stable and could deal effectively with challenges in the global market place? We argue that currency stability is defined by insignificant variance in the exchange rate against a major currency such as the US dollar in face of external shock. A currency that experiences loss in value when faced with prolonged crisis, such COVID-19 and the war in Ukraine, may reflect ineffective currency regime. Two indicators, were used namely currency valuation and inflation, to evaluate effective currency management. In this paper, currency valuation is defined as the exchange rate of the local currency traded against another currency (O'Sullivan and Sheffrin, 2003); in this paper target currency for exchange is the US Dollar. Inflation is defined as the rise of general price level with a corresponding decrease in the purchasing power (Walgenbach, Dittrich and Hanson, 1973)

The conceptual framework of this study is confined to the study of factors influencing exchange rate valuation and how does that valuation affected by external shock. The scope of this paper is confined to the assessment of how do exchange rate regimes in the ASEAN countries perform under external shock. These shocks include from COVID-19 and the on-going war in Ukraine. Secondary data was used in this study; the data consist of weekly spot exchange rates over a period of 10 years or 544 weeks from January 1, 2012 to June 30, 2022. The weekly spot exchange rate is dependent variable. Independent variables are foreign exchange reserves and current account balance. The currencies used in this study include: THAI (Thai Baht), LAK (Laotian Kip), VND (Vietnamese Dong); SGD (Singapore dollar), BND (Brunei Dollar), KHR (Cambodian Riel), MMK (Myanmar Kiat), MYR (Malaysian Ringgit), IDR (Indonesian Rupiah), PHP (Philipinnes Peso), EUR (Euro), CNY (Chinese Yuan), and RUB (Russian Ruble). The intended contribution to the literature by this study comes from the new knowledge gained through empirical evidence showing that external shocks caused by war and pandemic affects the value of currency in the ASEAN countries.

Literature Review

The literature review is presented in three parts. First, provides a background literature on exchange rate regime. Second, a review of the literature on currency valuation is presented. Third, presents literature on exchange rate regime performance under external shock.

Conceptual framework of exchange rate regime and currency valuation

Exchange rate regime

Exchange rate is the value of one country's currency in relation to another currency (O'Sullivan and Sheffrin, 2003). Exchange rate practice is dictated by exchange rate regime. Exchange rate regime as defined as the way in which the monetary authority in a country manages the exchange rate of its currency against other currencies (Duwendag et al., 1999). Each country determines its own exchange rate regime (Broz and Friedman, 2001). There are three types of exchange rate regime: (i) floating, (ii) intermediate, and (iii) fixed rate. Under floating exchange rate, the value of the local currency is allowed to fluctuate according to foreign currency market conditions. The financial sector of countries with free floating exchange rate regime is characterized by high liability dollarization, financial fragility, and strong balance sheet effects.

Firstly, under the free float regime, liabilities are denominated in foreign currencies while assets are listed in the local currency. Unexpected devaluation of the local currency deteriorates bank and corporate balance sheets and threatens the stability of the country's financial system. Due to such risk, free floating regime is not preferred in developing economies (Calvo and Reinhart, 2002). After 1990s, especially with the experience of the Asian financial crisis in 1997, many developing economies tried to avoid floating exchange rate regime (Levy-Yeyati and Sturzenegger, 2005).

Secondly, exchange rate regime that lies between the fixed and the floating is called intermediate exchange rate regime. Under this type of exchange rate regime, the local currency is pegged or allowed to move within a certain band or range against foreign currencies, i.e. 2% (Sukumar, 2017). Under this regime in order to minimize the risk of exchange rate fluctuations, countries may also use currency basket. A basket is a portfolio of currencies to which the local currency is pegged. Each foreign currency in the basket is weighted and regularly reviewed by the monetary authority when adjustment becomes necessary (Daniels, Toumanoff and von der Ruhr, 2001).

Lastly, the third type of exchange rate regime is a fixed exchange rate system. Under fixed exchange rate regime, a currency's value is fixed or pegged to the value of another currency, a basket of other currencies, or another measure of value, such as gold. In order to achieve a fixed exchange rate the government may either buying or selling its own currency in the open market (Ellie, 2012). In order to buy and sell foreign currencies in the open market, the government must maintain foreign currency reserves. If the exchange rate drifts too far above the fixed benchmark rate (it is stronger than required), the government sells its own currency. If the exchange rate drifts too far below the desired rate, the government buys its own currency in the market by selling its reserves.

Fixed exchange-rates are not permitted to fluctuate freely or respond to daily changes in demand and supply according to open market mechanism. The government announces its own rate and sets a band within which the exchange rate is allowed to fluctuate within a preset band (O'onnell, 1968). The advantages of fixed exchange rate are that it minimizes instabilities in real economic activity, and it allows the central bank to acquire credibility by fixing their country's currency to a more disciplined economy (Garber and Svensson, 1995). The disadvantage of fixed exchange rate is that it is prone to

speculative attack (Krugman, 1979). Speculative attack occurs when investors selling off the country's currency when these investors think that the exchange rate fixed by the government is not reasonable. The country's central bank must be ready to buy back its own currency at the fixed exchange rate, paying with its holdings of foreign exchange reserves.

Currency valuation

Factors that influence exchange rate include (i) price levels, (ii) balance of payments, (iii) interest rates and (iii) exchange rate risk. The *current account balance* explains the balance of trade of the country. A balance of trade can affect currency exchange rates. A country with a high demand for its goods tends to export more than it imports; this condition increases the demand for its currency. A country that imports more than it exports will have less demand for its currency. More demand for a country's currency means that the currency is strong and vice versa. A country with negative current account has a trade deficit. The currency of such country is weaker when it is traded against US dollar. For example among the ASEAN group, these countries have negative trade balance: Cambodia, Indonesia, Laos, Myanmar, and Philippines. Likewise, the currencies of these countries have been relatively weak against the US dollar in the 10 years period covered by this study.

Another factor that affects currency value is interest rate (Kim and Ratti, 2006). When a country raises its *interest rate*, it will cause capital inflow, thereby increasing the demand for domestic currency. This simple law of supply and demand is important for stakeholders in exchange rate management. Countries that want to export more would want to maintain low valuation of its currency against the US dollar so that it can sell its goods competitively abroad. However, countries that imports components for assembly and re-export would want its currency to be strong. Strong currency allows more components of components and more export of the finish products. This type of economy would prefer higher interest rate. There is a positive correlation between interest rate and the strong of the currency (Agenor, McDermont and Ucer, 1997). The use of interest rate, as a policy tool to influence exchange rate, works only when the economy is not in crisis. During the Asian financial crisis in 1997, this policy tool did not work as currencies in the ASEAN region lost their values against the US dollar (Basurto and Ghosh, 2001). The limitation of the influence of interest rate on exchange rate was also explored by Furman and Stiglits (1998).

Lastly, *exchange rate risk* also affects the rate of exchange among currencies. Exchange rate risk refers to the difference between the forward exchange rate and the future spot rate. Forward rate comes from investor's expectation of the future exchange rate about the future spot rate. If these two rates are the same, exchange rate risk would disappear. However, when the expected future spot rate does not agree with the forward rate, there is a risk premium. Under monetarist approach, exchange rate risk is negligible because the bond interest is a reflection of supply and demand of the money supply in the market. However, under portfolio balance models, exchange rate risk depends on supply and demand of money and bonds denominated in different currencies. Differences among these two sectors may lead to different pricing of exchange rate in the market.

In explaining these three factors influencing exchange rate, this paper begins with the spot rate. The spot rate determination may be written as:

$$\%\Delta S = (\%\Delta P_A - \%\Delta P_B) + \%\Delta SREAL^e + \Delta(r_B^e - r_A^e) - \%\Delta RISK^e \quad (1)$$

where S = the spot exchange rate in unit of currency A per unit of currency B; PA, P_B = price levels in country A and B; SREAL = expectation of real exchange rate for the long-run; r_B^e, r_A^e = nominal interest rate adjusted for inflation; and $RISK^e$ = premium that investors expected to earn bearing exchange risk.

The spot rate is influenced by investor's expectation; therefore, the spot rate is a function of the forward rate and the nominal interest rate in countries A and B. In this paper, the difference in forward rate and nominal rate among the ASEAN countries and that of the US determines the spot rate. The spot exchange rate is rewritten as:

$$S = \frac{F(1+R_B)}{(1-R_A)} \quad (2)$$

The risk factor is defined as the ratio between the expected future spot rate to the forward rate:

$$RISK^e = \frac{S^e}{F} \quad (3)$$

The real exchange rate is the nominal exchange rate adjusted for different price level:

$$SREAL = S\left(\frac{P_B}{P_A}\right) \quad (4)$$

Real long-run interest rate may be approximated by:

$$r_A = R_A - \hat{P}_A^e \quad (5)$$

$$r_B = R_B - \hat{P}_B^e \quad (6)$$

$\hat{P}_A^e, \hat{P}_B^e$ are percentage changes in the price level expected to occur in the long-run.

The weekly spot exchange rates for the ten currencies in ASEAN are time series data. Time series modeling is used for forecasting times series data (Chen and Chiu, 2021). Time series modeling was employed to find patterns of currency exchange rates movement in the ASEAN (Sakar, Spott, Blackwell et al., 2016). When modeling time series data, three types of models are available; these are autoregressive (AR) models, the integrated (I) models, and the moving average (MA) models (Gershenfeld, 1999). In this paper, we employed AR model. AR model is used to forecast the variable of interest using a linear combination of past values of the variable. In this paper, the variable of interest is the value of the local currencies in the ASEAN traded against the US dollar (exchange rate). Weekly spot rates are used as the observed variable. Under AR model, the current week's spot rate is predicted by the prior week's spot rate. The term autoregression indicates that it is a regression of the current exchange rate against the prior exchange rate.

Thus, AR modeling goes through AR(*p*) process where *p* refers to the number of prior period used for regressing or lag period. For example, the simplest AR process is AR(0), which has no dependence between the terms. Only the error, innovation, or noise term contributes to the output of the process. Whereas an AR(1) process with a positive phi (γ), only the previous term in the process and the noise term contributes to the output. For an AR(2) process, the previous two terms and the noise term contribute to the output. In this study, we employed AR(1). We selected a lag of one period because we want to look for fluctuation. If the exchange rate time series data is not stationary at one lag period, it means that there is new mean for the series or equivalently, we assert that the exchange rate has fluctuated. Significant fluctuation is evidence of poor exchange rate regime performance.

The AR(1) model is given by the following notation:

$$X_t = c + \varphi X_{t-1} + \varepsilon_t \tag{7}$$

where ε_t is the process white noise with zero mean and constant variance of σ_ε^2. The process is stationary is $|\varphi|$ < 1 ; however, if $|\varphi|$ = 1 then the variance of X_t depends on time lag and the series is not wide sense stationary. If $|\varphi|$ < 1 then the mean $E(X_t)$ is identical for all *t* by definition of wide sense stationary. Assume that μ is the mean, then the expected value for the series $E(X_t)$ is given by:

$$E(X_t) = E(c) + \varphi E(X_{t-1}) + E(\varepsilon_t) \tag{8}$$

That the mean $\mu = c + \varphi\mu + 0$ therefore $\mu = \frac{c}{1-\varphi}$. Under this statement, if $c = 0$ then $\mu = 0$. The variance is:

$$\text{var}(X_t)) = EX_t^2 - \mu^2 = \frac{\sigma_\varepsilon^2}{1-\varphi^2} \tag{9}$$

where σ_ε is the standard deviation of the noise ε_t which can be shown by $\text{var}(X_t) = \varphi^2 \text{var}(X_{t-1}) + \sigma_\varepsilon^2$. The autocovariance is given by:

$$B_n = E(X_{t+1} \mid X_t) - \mu^2 = \frac{\sigma_\varepsilon^2}{1-\varphi^2}\varphi^{|n|} \tag{10}$$

AR(1) is discrete time series with parameter θ which cab also be written as:

$$X_{t+1} = X_t + (1+\theta)(\mu - X_t) + \varepsilon_{t+1} \tag{11}$$

where $|\theta| < 1$ and μ is the model mean, by putting it in the form $X_{t+1} = c + \phi X_t + \varepsilon_{t+1}$ we can write that the expected value for the next period is:

$$E(X_{t+1} \mid X_t) = \mu[1-\theta] \tag{12}$$

with variance of $\text{var}(X_{t+1} \mid X_t) = \sigma^2\left(\frac{1-\theta^{2n}}{1-\theta^2}\right)$. We can now write the general; form for AR(p) as:

$$X_t = \sum_{i=1}^{p} \varphi_i X_{t-i} + \varepsilon_t \tag{13}$$

The parameter φ_i where i = 1, 2, ..., p the value for φ can be determined by using the Yule-Walker equation:

$$\gamma = \sum_{i=1}^{p} \varphi_k \gamma_{m-k} + \sigma_\varepsilon^2 \sigma_{m,0} \qquad (14)$$

where $m = 0$, ..., p giving p + 1, the parameter γ_m is the autocovariance function of is X_t, σ_ε the standard deviation of the input noise. The input in this case is the weekly exchange rate; the noise is the fluctuation of the exchange rate. If $m > 0$ then matrix form is given by:

$$\begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \gamma_3 \\ \vdots \\ \gamma_p \end{bmatrix} = \begin{bmatrix} \gamma_0 & \gamma_{-1} & \gamma_{-2} & \cdots \\ \gamma_1 & \gamma_0 & \gamma_{-1} & \cdots \\ \gamma_2 & \gamma_1 & \gamma_0 & \cdots \\ \vdots & \vdots & \vdots & \\ \gamma_{p-1} & \gamma_{p-2} & \gamma_{p-3} & \end{bmatrix} \begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \gamma_3 \\ \vdots \\ \gamma_p \end{bmatrix}$$

Solve for all $\{\varphi_m; m = 1,2,...,p\}$ where $m = 0$ we have: $\gamma_0 \sum_{i=1}^{p} \varphi_k \gamma_k + \sigma_\varepsilon^2$.

In an alternative expression, we can summarize the autoregressive model order p is a simplified version as:

$$y_t = c + \phi_1 y_{t-1} + \phi_2 y_{t-2} + ... + \phi_p y_{t-p} + \varepsilon_t \qquad (15)$$

where ε_t is white noise. The model is structured is ia form of multiple regression using the lag values of y_t as predictors. Thus, it is called AR(p) model or autoregressive model of order p. As general rules of interpretation, for AR(1) model when $\phi_1 = 0$, y_t is equal to white noise; when $\phi_1 = 1$ and $c \neq 0$, y_t is equal to a random walk; when $\phi_1 = 1$ and $c \neq 0$, y_t, is equal to random walk with drift; and when $\phi_1 = 0$, y_t tends to oscillate around the mean. This paper looks at the exchange rate stability under autoregressive model. Therefore, the model is restricted to stationary data. The constraints on the values of the parameters are required as follows: (i) for AR(1) model: $-1 < \phi_1 < 1$, and (ii) for AR(2) model: $-1 < \phi_2 < 1, \phi_1 + \phi_2 < 1, \phi_2 - \phi_1 < 1$. For the purpose of testing for exchange rate stability, as a means to evaluate the effectiveness of exchange rate performance, we limit the lag to no more than 2 lag periods.

In this study, we employed AR(1) model because the exchange rate for most of the ASEAN currencies are stationary at $p = 1$. As for Laotian kip (LAK) and Vietnamese Dong (VND), we did not seek to test for integration because the loss in value of these two currencies had been steady. The continued weakening of these two currencies are outside of manageable ban under the current exchange rate regime, i.e. allowable fluctuation within a fixed band.

External shock and exchange rate regime performance

In this paper, we defined external shocks as COVID-19 pandemic and the on-going war in Ukraine. These shocks affect exchange rate in the ASEAN economies. We are using these shocks as independent variables to evaluate the performance of exchange rate regime in the ASEAN countries.

Prior research shows that "adverse pandemic news at the country level cause an immediate, statistically significant, depreciation of the domestic currency vis-à-vis a basket of trade-weighted currencies" (Aquilante, Di Pace, and Masolo, 2022). Fluctuations in the exchange rates can be attributed several economic variables; these variables include relative productivity levels, price levels, interest rates, preferences for local or foreign goods, and trade barriers (Musa, 1984). The impact of COVID-19 on exchange rate was studied by Jamal and Bhat (2022) who examine the effect of COVID-19 on exchange rate in 6 hot spots. Jamal and Bhat argued that "the impact of the COVID-19 on currency markets worked its way through the channel of changing relative expectations of future economic growth" (Id., p 3). A country with high incidence of COVID-19 cases will have growth expectation downgraded. As the result, the demand for the local currency is reduced. The weakening of the local currency due to the country's report of COVID-19 death rates also had been found other researchers (Czech et al., 2020; Dineiri and Cutcu, 2020; Tao. Diao and Cheng, 2021). We will extend the study of this relationship in the study of the effect of COVID-19 on currencies in the ASEAN countries. Unlike prior literature which proved the relationship between COVID-19 and the weakening of the currency, this paper assess how well does the exchange rate regime perform under external shock (COVID-19 pandemic).

A second shock factor that we will examine is the effect of the on-going war in Ukraine and its affect on exchange rate regime performance in the ASEAN countries. The war in Ukraine started in February 2022, by May 2022 a study by Lim et al. (2022) warned that this war will bring negative impact on business throughout the world. The negative impact will come from "limited access to funds, reduced purchasing power, an increasing inflation rate, and a threat to sustainable growth and restrictions on trade as a result of sanctions" (Prohorovs, 2022). The war in Ukraine contributed to sharp rise of the cost for food and fuel throughout the world. This rise in food and fuel cost further contributed to global inflation in 2022. In response to inflation, the US increased its interest rate. As the result, many currencies among the ASEAN countries lost their value as seen through exchange rates of ASEAN currencies against the US dollar. The effect of war in Ukraine is a second shock we claim contributed to the weakening of many currencies in the ASEAN countries.

Data and Methodology

The sample size for this study consists of 544 weeks of average spot exchange rate of each country's currency traded against the US dollar from January 1, 2012 to June 5, 2022. Sample size requirement for time series modeling varies. For example, Poole et al. suggested "... 40 observations is often mentioned as the minimum number of observations for a time-series analysis" (Poole et al., 2002, p. 56). Another source of literature stated that "... many models require at least 50 observations for accurate estimation (McCleary et al., 1980, p. 20; Jebb et al., 2015, p. 3), "Most time-series experts suggest that the use of time-series analysis requires at least 50 observations in the time series." (Warner, 1998, pp. 2-3). In this study, the sample size consists of 544 data points of weekly sport exchange rate for ten currencies of the ASEAN countries. The exchange rate data was obtained from a financial portal at www.investing.com. We employed methodologies in three areas. Firstly, the data used in this study is times series because it is the average weekly spot rate between January 1, 2012 to June 5, 2022; a period of 10 years with a sample size of 544 weeks. Myanmar's exchange rate between January 1, 2022 and March 25, 2022 was pegged against the Special Drawing Right (SDR) at 6.435 per USD. This period of SDR pegging was removed from out analysis. For MMK, the period between April 1, 2012 to May 29, 2022 was used; a total of 516 weeks.

From the sample of 544 weeks, we separated extreme fluctuation in exchange rate and analyzed the data under Extreme Value Theory (EVT). By using the tail index under EVT, we classified the exceedance set of data into their respective distribution types according to the tail index. Lastly, to study the weakening of currencies, we used Weibull distribution to explain the incidence under the pretext that over-valuation or under-valuation is not normal.

Data characteristics of weekly spot rates of ASEAN currencies

We began with the examination of the characteristics of the ten currencies in ASEAN plus three target currencies, namely CNY (Chinese Renminbi or Yuan), EUR (Euro), and RUB (Russian Ruble). The Chinese Yuan was selected for comparison because China is a large economy and plays a significant role in the global market. The Euro is a common currency representing a large EU market which is relevant to all ASEAN countries as a trading partner. Lastly, the Russian Ruble was selected as a comparative currency because of Russia's role, influence, and size in the global market.

Table 2: Selected currencies by weekly spot rates traded against US dollar

	Mean	STD	μ	σ	Skewness	Kurtosis
THAI	32.48	1.70	32.36	1.69	0.42	(0.61)
LAK	8,575.53	906.35	8,511.80	900.86	2.63	8.25
VND	22,278.80	895.21	22,215.85	889.78	(0.46)	(1.38)
SGD	1.34	0.06	1.34	0.06	(0.43)	(0.82)
BND	1.34	0.06	1.34	0.06	(0.43)	(0.81)
KHR	4,048.63	35.65	4,046.12	35.43	(0.41)	(0.20)
MMK	1,272.37	269.86	1,252.89	268.22	0.15	(0.67)
MYR	3.85	0.47	3.82	0.47	(0.67)	(1.17)
IDR	12,956.42	1,725.01	12,835.13	1,714.56	(1.02)	(0.11)
PHP	47.75	3.73	47.49	3.71	(0.27)	(1.18)
EUR	0.85	0.06	0.85	0.06	(0.44)	(9.97)
CNY	6.52	0.30	6.50	0.30	0.38	(1.07)
RUB	57.12	16.43	55.96	16.33	(0.40)	(0.68)

We used the law of large number and statistical stability as tools to verify the stability of exchange rate. Stability of exchange rate is defined by statistically insignificant fluctuation of the currency's exchange value against the US dollar. The stability of the exchange rate reflects the effectiveness of exchange rate regime. In the ASEAN, with the exception of Philippines which uses free float system; the remaining nine countries employ one form or another of managed float regime. We assert that if the exchange rate management is effective, the exchange rate fluctuation should produce minimal variance. We define minimal fluctuation by using the Z score at 95% confidence interval as the indicator (Kreyszig, 1979). Under this standard of evaluation, we allowed the fluctuation a band of $\pm$ 5%.

Under the law of large numbers, the outcome of repeated experiments is equal to the expected value. The expected value is the mean or average (Dekking, 2005). In illustrating the law of large numbers, Monte Carlo simulation is commonly used (Kroese, Breton, Taimre et al., 2014). The strong law of large numbers (also called Kolmogorov's law) states that the sample average converges almost surely to the expected value (Loève, 1977) and the weak law of large numbers (also called Khinchin's law) states that the sample average converges in probability towards the expected value. Another characteristic of the law of large number is statistical stability whereby the outcome of repeated events obeys the law of average. In case of instability, the sample average is not stabilized, even for long averaging intervals (Gorban, 2014). The instability may be caused by progressive error or drift, and noise (Zhigalskiy, 2003). Among the ASEAN currencies, we found that following fluctuations: Laotian Kip (σ = 11%), Malaysian Ringit (σ = 12%), and Indonesia Rupiah (σ = 13%). These currencies showed expected standard deviation of more than 10%. This large sigma value indicates significant fluctuation of the exchange rates. While the three currencies that we used as a reference group (Chinese Yuan, Euro, and Russian Ruble), only the Ruble showed significant fluctuation (σ = 29%).

Weibull analysis and extreme value theory (EVT)

Secondary data of weekly average spot exchange rates spanning from January 1, 2012 to June 5, 2022 were used in this research. The sample is comprised of 544 weeks of spot rates of selected currencies traded against the US dollar. This case studied employed 544 samples. The currencies selected for this study consist of the ASEAN currencies where

the Thai Baht (BHT) was used as a target currency for analysis. Additional currencies used include Chinese Yuan (CNY), Euro (EUR) and Russian Ruble (RUB). These three currencies were used as control variables because they play significant role in global trade. The Chinese Yuan, for example, has been fast becoming a currency of choice for foreign exchange reserves in many countries. The Euro has been used for international trade between countries and countries in the EU zone. Lastly, the Russian Ruble was selected as a control variable due to the current economic and political influence played by Russia, especially with the current economic and political sanctions imposed on Russia and that country's recent insistence of using RUB by its trading partners.

Generally, Weibull distribution is used for failure rate analysis. In this study, we examined exchange rate for two groups of currencies: ASEAN and proxy group which comprised of the Euro, Chinese Yuan and Russian Ruble. Prior research asserted that weak currency, unless it is intentionally devalued by policy tools to achieve certain policy goals, is seen as a possible mismanagement of exchange rate by the country's central bank (Kirshner, 2002). The goals of monetary policy are: (1) high employment, (2) economic growth, (3) price stability, (4) interest-rate stability, (5) stability of financial markets, and (6) stability in foreign exchange markets (Yeyati and Sturzenegger, 2010). Central banks in the ASEAN countries shared these monetary policy goals. With the rise of price level of food and fuel resulted from the twin shocks of COVID-19 pandemic and the war in Ukraine, the inability of the monetary authorities of central banks in the ASEAN indicates inadequacy of meeting central bank's policy goal. The weakening of some currencies in the ASEAN countries also indicated monetary goal short falls in achieving stability in foreign exchange market. The increase of interest rate by the US Reserve led to the appreciation of the US dollar against local currencies in the ASEAN countries. The weakening of the local currencies, for example, Laotian Kip (LAK) and Vietnamese Dong (VND), is indicative of central banks in those countries in fulfilling their monetary policy goals.

In our examination of 13 currencies over a period of 544 weeks, we found that currencies of Laos (LAK) and Vietnam (VND) had been weakened and exchange rates for these two currencies against US dollar had been unstable. In the case of Laos, the failure had been significant to the point that certain period of LAK's fluctuation had to be separated and treated with Extreme Value Theory (EVT). To the extent that we expect

to see the government to defend its own currency with effective intervention policies, Weibull distribution allows monetary authorities to put the weakening of the currency into context, i.e. by monitoring the value of beta (β), we can predict the weakening trend for the currency. Throughout this paper, failure in exchange rate regime as significant weakening of the local currency against US dollar. According to Kirshner (2002) the inability of the central bank to defend the value of its currency is seen as a weakness or failure of the monetary authority.

Analysis and Discussion

In the ASEAN countries, only Philippines employs free float exchange rate regime. The remaining nine other countries adopted managed float system where the local currency of each country is pegged to another currency. One unique pegging practice in ASEAN is practiced by Brunei. The Brunei dollar pegged its currency to the Singapore dollar. Singapore in turn employs managed float regime that pegs the Singapore dollar against the US dollar. For the past ten years, our examination of 544 weeks of sport rate shows that Brunei dollar and Singapore dollar had correlation coefficient of R = 1.00, a perfect positive correlation. For purposes of stabilizing its currency, Brunei benefited from the stability of the Singapore dollar. With a foreign currency reserve of 425.10 billion dollars, the Singapore dollar had shown remarkable stability for the past 10 years with variance of 0.0033 in its trade against the US dollar. Consequently, since the Brunei dollar is pegged against Singapore dollar, Brunei's currency also shows a mirror image of this unusually small variance (0.0033) in Brunei dollar trading against US dollar.

Traditionally, it has been argued in some literature that there are relationships between foreign exchange reserves, CPI and account balance. In this study, we tested these three factors for the ASEAN countries and found that there is a relationship between account balance and foreign exchange reserves. We defined account balance as a dependent variable (Y) and foreign exchange reserves as a dependent variable (X); we found that Y = -7.31 + 0.31X. The R square for this relationship is 0.65. Without exchange reserves, we expect to see -7.31 in account balance. The unit of measurement in billion US dollars; there is factor of 0.31 in unit change in foreign exchange reserves adjusted for the intercept of -7.31, see Table 1. There is no significant relationship between CPI and foreign exchange reserves, and between CPI and account balance.

System analysis under non-time series approach

We verified the trend of currency valuation as they were traded against US dollar. By using Weibull distribution as the verifier of trend of currency valuation, we designated the *beta* value as the trend indicator. If $\beta < 1$, the currency's trading against US dollar is likely to be weaken; if $\beta \approx 1$ the exchange rate for that currency is fairly stable. Finally, if $\beta < 1$ it means that the strength of the currency as it is traded against USD will tend to be weaken as time progresses. The summary of all selected currencies for the 544 weeks treated under Weibull analysis is presented in Table 3.

Table 3: Selected currencies treated under Weibull without extreme value separation

Currency*	a	b	Beta	Eta	CDF	PDF	R	H(t)
THAI	3.47	0.01	142.91	32.01	0.63	0.01	0.37	36.15
LAK	8.92	0.11	8.9	7,507.29	0.64	0.0001	0.36	0.003
VND	9.95	0.05	21.03	20,853.28	0.63	0.0001	0.37	0.004
SGD	0.27	0.02	51.23	1.31	0.63	6.15	0.37	111.03
BND	0.27	0.02	51.2	1.31	0.63	6.14	0.37	110.95
KHR	8.27	0.02	54.16	3,915.26	0.63	0.00	0.37	0.08
MMK	6.87	0.29	3.50	965.65	0.70	0.00	0.30	0.018
MYR	1.26	0.08	12.34	3.52	0.63	0.46	0.37	9.76
IDR	9.33	0.11	8.85	11,277.26	0.64	0.0001	0.36	0.002
PHP	3.8	0.06	17.1	44.61	0.63	0.05	0.37	1.146
EUR	-0.2	0.03	29.82	0.82	0.63	5.60	0.37	102.27
CNY	1.85	0.02	50.41	6.36	0.63	0.8995	0.37	26.036
RUB	3.75	0.24	4.18	42.64	0.66	0.01	0.34	0.25

Source: https://www.investing.com/currencies/usd-*.*-historical-data
Accessed: June 10, 2022.

All currencies were checked for extreme values, i.e. extremely weak or extremely strong. Extreme value defined by the "Peak Over Threshold" (POT) value (Leadbetter, 1991). In this paper, the threshold value for POT is 95% confidence interval obtained through the standard score equation. The standard score equation under 0.95 confidence interval with a Z value of ± 1.65 was used as the demarcation point for POT. The proxy currency (THAI) had been stable. Although there were short periods of the baht being weak (Z > 1.65) and strong (Z <-1.65), these periods of aberration did not last long to be significant devaluation or appreciation. However, some currencies had experienced significant weakness. These periods of weakness among some currencies had caused serious problem in bringing about inflationary pressure and adversely affecting local economies. The summary of significant fluctuations of currencies is listed in Table 4.

Table 4: Significant appreciation and devaluation of currency traded against USD

	k < -1.65	k > 1.65	Period for k	ζ Tail Index*	Distribution Type
THAI	-	-	-	-	-
LAK	-	33	Jan - May '22	(1,628.30)	Weibull
VND	-	-	-	-	-
SGD	36	12**	Apr'12 - Oct'13	4.28	Frechet
BND	36	11	Apr'12 - Oct'13	4.29	Frechet
KHR	39	-	Jan'13 - Mar'14	(26.43)	Weibull
MMK	-	39	Fb'21 - Nov'21	(102.51)	Weibull
MYR	44	-	Jan'12 - May'13	3.28	Frechet
IDR	77	-	Jan'12 - Jul'13	(483.83)	Weibull
PHP	35	-	Sep'12 - May'13	0.12	Frechet
EUR	-	48	Sep'13 - Aug'14	4.48	Frechet
CNY	-	34	Aug'19 - May-20	2.69	Frechet
RUB	-	-	-	-	-

*: *Fréchet* = $\zeta > 0$, *Weibull* = $\zeta < 0$ *and Gumbel* = $\zeta = 0$. **Disregard as insignificant for k < 30.

We found that extreme cases of weak currency has an exceedance level of $k > 1.65$ with the tail index $\zeta > 0$, and the data is Frechet distributed. In general, a strong currency was commonly seen as a mark of prestige, while devaluation was associated with weak governments (Kirshner, 2002). This is particularly true for countries with import dependence and has small export volume. However, for a country such as China who maintains a significant export market abroad, weak currency may be preferable because it makes Chinese products more competitive in the global market. Weak currency with tail index under EVT $\zeta < 0$, the data is Weibull distributed. Kirshner may be correct in asserting that weak currency among import dependence economies may mean weak government (Kirshner, 2002). Our data shows LAK (Laotian Kip), KHR (Cambodian Riel), MYR (Malaysian Ringgit), and IDN (Indonesian Rupiah) are Frechet distributed. In 2022, Laos has a positive balance of trade; however, in the past, it consistently had trade deficit. In 2022, Cambodia has a negative balance of trade; Indonesia and Malaysia have positive balance of trade. It is not conclusive whether balance of trade is a decisive factor for exchange rate stability.

Time series modeling

Autoregressive (AR) model is used for modeling the exchange rate for all currencies analyzed in this paper. We used the Akaike information criterion (AIC) and Bayesian information criterion (BIC) to evaluate the accuracy of the model. AIC is an estimator of prediction error; it evaluates the quality of statistical models for a given set of data (Stoica and Selen, 2014; McElreath, 2016; and Taddy, 2019). Among the available models, the preferred model is the one with the minimum AIC value (Akaike, 1974; and Burnham and Anderson, 2002). Both AIC and BIC were tools used for model quality evaluation. Similar to AIC, models with lower BIC are generally preferred (Schwarz, 1978). Table 5 provides model fitting and its evaluation.

Table 5: Model fit under autoregressive (AR) modeling

	Log L	Err Var	R^2	Rd^2	AIC	BIC	RMSE
THAI	(81.53)	0.06	0.9781	-0.0806	0.31	0.32	0.1507
LAK	(2,781.49)	2,386.18	0.9971	-0.0805	10.23	10.25	17.4551
VND	(3,026.83)	2,777.12	0.9965	-0.0806	11.14	11.15	33.0905
SGD	1,776.41	0.00	0.9749	0.0014	(6.51)	(6.46)	0.0003
BND	1,719.89	0.00	0.9730	-0.0806	(6.32)	(6.30)	0.0057
MMK	-2840.61	2763.58	0.9751	-0.7730	10.7382	10.78	20.5201
KHR	(2,384.34)	375.92	0.7047	-0.0806	8.77	8.79	11.4862
MYR	945.47	0.00	0.9933	-0.0806	(3.47)	(3.45)	0.0229
IDR	(3,588.54)	20,259.52	0.9932	-0.0806	13.20	13.22	87.5201
PHP	(228.54)	0.10	0.9930	-0.0806	0.85	0.86	0.1958
EUR	1,696.66	0.00	0.9752	-0.0806	(6.23)	(6.21)	0.0060
CNY	1,032.17	0.00	0.9883	-0.0806	(3.79)	(3.77)	0.0180
RUB	(1,292.81)	3.93	0.9855	-0.0806	4.76	4.78	1.3050

According to AIC standard practice for model selection, the lower the AIC number the less the probability of information loss produced by the model, i.e. the smaller the AIC number the better it is for the proposed model. Our result shows that, Thailand, Philippines, Singapore, Brunei and Malaysia show the lowest AIC index among the ASEAN currencies with AIC < 1. Among the comparative currencies (CYN, EU and RUB), CNY and EUR has AIC < 1. Low AIC means that the data conforms better to the proposed time series AR(1). As for currencies with higher AIC, AR(1) model may not be an appropriate tool for their modeling and the exchange rate data fluctuation may have greater instability.

Vector state of AR modeling described in Table 5 allows us to forecast the exchange rate of each currency against the US dollar and assess the stability of the exchange rate. The slope of the predictive value allows us to assess the stability of the exchange rate for the currency. Lower the slope coefficient means that the exchange rate for that currency is stable and is closely pegged to the US dollar. For instance, among 12 currencies, most are stable except the Laotian Kip (LAK). LAK shows the highest level of sensitivity. Even a point change in the US dollar will translate into a factor of 304.04 LAK units for loss in value against the US dollar.

Table 6 summarizes the rate of change of the local currency against one unit change of US dollar. As a tool for effective exchange rate management indicator, the slope in Table 6 allows stakeholders to assess risk of currency fluctuation. Positive slope means the local currency becomes weaker and negative slope means the local currency becomes stronger with every unit change in US dollar. The larger the value of the slope (β) means the greater the sensitivity of the local currency as it is traded against the US dollar.

Among the ASEAN countries, countries whose currencies are stable include: Thailand, Singapore, Brunei, Malaysia and Philippines. The slope of the AR(1) model of these countries are 0.03 for Thailand, 0.0002 for Singapore, (0.0005) for Brunei, 0.01 for Malaysia, and 0.10 for Philippines. As for the proxy currencies (EUR, CNY, and RUB), all showed slopes less than 1 which means the exchange rate is stable against the US dollar. Stability of exchange rate over time reflects the government's effective management of the country's exchange rate. This is an indicator of good performance of the exchange rate regime in that country. In Table 6, the countries that manifest large exchange rate fluctuation included Laos (β = 304.08), and Vietnam (β = 43.99). These two ASEAN countries are sensitive to the movement of US dollar.

Table 6: Vector state under AR modeling

	State vector components			Level		
	Level	Slope (β)	AR(1)	Std. Err.	T Stat	Prob
THAI	34.37	0.03	-7.38E-04	0.17	196.46	0.0000
LAK	13,765.93	304.08	4.97	33.94	405.54	0.0000
VND	23,207.35	43.99	0.769	36.62	633.73	0.0000
SGD	1.38	0.0002	8.36E-09	0.00	1,010.37	0.0000
BND	1.38	(0.0005)	-3.73E-05	0.01	210.92	0.0000
MMK	6.1214	2.51	0.6616	38.00	0.9450	0.3451
KHR	4,052.71	2.60	0.0686	13.47	300.80	0.0000
MYR	4.40	0.01	9.76E-05	0.03	165.33	0.0000
IDR	14,538.41	1.27	-0.1824	98.91	146.99	0.0000
PHP	52.63	0.10	8.39E-04	0.22	242.95	0.0000
EUR	0.94	(0.001)	-8.98E-05	0.01	135.51	0.0000
CNY	6.72	0.02	1.82E-04	0.02	297.70	0.0000
RUB	60.43	(2.17)	-0.0364	1.38	43.87	0.0000

Limitation of the current study

The findings and discussion of this paper are limited to the performance of exchange rate regime in the ASEAN countries during a period of external shocks from COVID-19 and the war in Ukraine. These shocks are externalities beyond the control of each country in the ASEAN. Future research in this area may extend the evaluation of exchange rate regime performance under shock from domestic policies. For example, the increase of money supplies among the ASEAN countries may be looked at as a potential cause for the loss in value of the local currency against the US dollar.

The poor performance of LAK in Laos and VND in Vietnam may be partly explained by the money supply of the countries. At the end of 1999, Laos' money supply was 203.224 million USD. By September 2021, this figure expanded to 12.882 billion USD. Similarly, throughout 2021, Vietnam had consistently increased its money supply. At the end of 2000, Vietnam's money supply was 13.573 billion USD. This amount was increased to 551.956 billion USD by January 2022. Both countries saw rapid increase in money supply in the same period. During the same period, both currencies also lost their values rapidly.

A rapid increase in money supply contributes to long-term inflation (Sysoyeva et al., 2021). Since there is a direct correlation between money supply and inflation, monetary policy is a tool for controlling inflation (Friedman, 1987). Money supply may be created from two sources: fractional banking by commercial banks, and open market operations by the central bank. In rational banking, banks accept deposits from the public and hold a proportion of these deposits liabilities in liquid assets as a reserves, and lend the remainder to borrowers (Abel and Bernanke, 2005. The fraction that the bank is required to hold is called reserves requirement. Since the reserves is only a fraction of total deposits, commercial banks would have to turn to the central bank for coverage if the demand for withdraw exceeds it reserves level (Mankiw, 2022). In developed economies, the central bank uses interest rate as a tool to control money supply. High interest rate results in contractionary money supply and has the effect of curtailing inflation. Low interest rate leads to increase money supply in the market and contributes to inflation. The issues are potential areas for further research under the topic of performance evaluation of exchange rate regime.

Conclusion

The ASEAN has ten countries and each country has its own currency. With ten different currencies in use, there is no common policy in the ASEAN Economic Community. Despite this diversity, two countries maintain perfectly correlated exchange rates. Brunei pegged its currency to the Singapore dollar. The correlation between exchange rate movement between SGD and BRD is +1.00. The remaining eight countries in the ASEAN adopted manage float exchange rate regime; however, since each country follows its own monetary policy, the exchange rate for each country in the past 10 years also followed different paths as they are traded against US dollar.

From the proxy group of currency against ASEAN currencies, we learned that the Euro and Chinese Yuan are the most stable and could be used as possible components of basket of currencies for the purpose of pegging local currencies in the ASEAN, especially in Laos and Vietnam whose currencies experienced significant weakening. We also learned that with R square of 0.65 between foreign reserves and account balance, policy makers in Laos and Vietnam could best pursue policy in increasing their foreign reserves.

It should be noted that an increase in foreign reserves has a tendency to devalue the local currency; however, with the experience of Singapore showing the highest foreign reserves and has one of the most stable currency in the region, high foreign reserves accompanied by good monetary policy can effectively stabilize the local currency. These countries need to explore possible means to increase foreign reserves that do not involve exchanging the local currency for US dollars.

As for pegging under managed float regime, EUR and CNY are strong candidates for foreign reserves. Due to the close trade ties between ASEAN and China, stakeholders in the ASEAN countries may seriously explore the inclusion of CNY into their foreign reserves. As shown through 544 weeks of data of the spot rates in this study, CNY had stable expected value of 6.50 ± 0.30 as it was traded against USD. This strength and stability of CNY was further supported by the AR(1) model where the slope was only 0.02 which means that if the ASEAN currencies are pegged to CNY, there is less prone to fluctuations.

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The Effect and Prediction of Investor's Sentiment on Equity Return: An Empirical Study on the Thai Stock Market

Chang Chen* and Sira Suchintabandid**

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Abstract

An essential question in finance is whether investor sentiment significantly affects stock returns. The empirical literature has expanded the study to the developed stock markets. However, the emerging markets lack the subject of study, especially the Thai equity market. The purpose is to understand further the relationship between investor sentiment and Thai stock market returns. The objectives include customizing investor sentiment indexes to reflect the Thai stock aggregate movement, estimating the predictive ability of the customized investor sentiment, and providing referable trading strategies for the equity investors.

* The Department of Banking and Finance,
Chulalongkorn Business School, Chulalongkorn University
254 Phayathai Road., Wangmai, Pathumwan, Bangkok 10330, THAILAND.
E-mail: akacooper@outlook.com

** Associate Professor, The Department of Banking and Finance,
Chulalongkorn Business School, Chulalongkorn University
254 Phayathai Road., Wangmai, Pathumwan, Bangkok 10330, THAILAND.
E-mail: sira@cbs.chula.ac.th

The empirical sample period is from 1999 to 2019. This paper uses the first Principal Component Analysis to construct the customized investor sentiment indexes at the domestic and global levels based on eight underlying proxies extracted from literature and then classifies the Thai stock market states using investor sentiment. Second, the paper compares the predictive errors of the Martingale model, the Autoregression model, and the Multivariate threshold autoregressive models using the customized sentiment indexes. Third, the paper designs trading strategies based on the sign of either models' projection or customized investor sentiment fluctuation for maximizing investors' profit.

The results show that 1) Customized investor sentiment strongly reflects the aggregate return movement of the Thai market, especially the local index. 2) The customized investor sentiment accurately forecasts the Thai stock aggregate movement using the out-of-sample method. 3) The trading strategy based on customized investor sentiment provides higher predicted returns than other empirical models. The paper suggests that taking the customized investor sentiment into regular financial reference would benefit the equity investors.

Keywords: Customized Investor Sentiments, Stock Returns, Aggregate Effect, Model Predictive Abilities, Equity Trading Strategies

ผลกระทบและการทำนายความเชื่อมั่นของนักลงทุนที่มีต่อผลตอบแทนของตลาดทุน: การศึกษาเชิงประจักษ์ในตลาดหุ้นไทย

ฉาง เฉิน* และ สิระ สุจินตะบัณฑิต**

รับวันที่ 13 กรกฎาคม 2565 *ส่งแก้วันที่ 20 พฤศจิกายน 2565* *ตอบรับตีพิมพ์วันที่ 23 ธันวาคม 2565*

บทคัดย่อ

ความสัมพันธ์ของความเชื่อมั่นของนักลงทุน และผลตอบแทนของตลาดหุ้นมักเป็นคำถามที่ได้รับการกล่าวถึง ซึ่งวรรณกรรมเชิงประจักษ์ได้มีการศึกษาในตลาดหุ้นที่พัฒนาแล้ว แต่อย่างไรก็ตามยังไม่มีการศึกษาในตลาดหุ้นของตลาดเกิดใหม่เท่าไรนัก การวิจัยฉบับนี้จึงมีวัตถุประสงค์เพื่อทำความเข้าใจเกี่ยวกับความสัมพันธ์ระหว่างความเชื่อมั่นของนักลงทุน และผลตอบแทนของตลาดหุ้นไทย โดยการสร้างดัชนีความเชื่อมั่นของนักลงทุน การคาดการณ์ผลตอบแทนของตลาดหุ้นต่อความเชื่อมั่นของนักลงทุน รวมไปถึงการคำนึงถึงกลยุทธ์การซื้อขายที่นักลงทุนใช้อ้างอิง

การวิจัยฉบับนี้ใช้กลุ่มตัวอย่างจากข้อมูลในช่วงระหว่างปี พ.ศ. 2542 ถึง พ.ศ. 2562 และใช้ Principal Component Analysis ในการสร้างดัชนี ความเชื่อมั่นของนักลงทุนแบบเฉพาะบุคคล และเปรียบเทียบผลคลาดเคลื่อนเชิงคาดการณ์ระหว่างแบบจำลองมาร์ติงเกล แบบจำลองการถดถอยอัตโนมัติ และแบบจำลองการถดถอยอัตโนมัติของหลายตัวแปร หลังจากนั้น ผู้เขียนได้สร้างกลยุทธ์การซื้อขายที่อิงการคาดการณ์จากแบบจำลอง หรืออิงระดับของดัชนีความเชื่อมั่น เพื่อสร้างผลกำไรให้แก่นักลงทุน

* คณะพาณิชยศาสตร์ และการบัญชี ภาควิชาการธนาคาร และการเงิน จุฬาลงกรณ์มหาวิทยาลัย
เลขที่ 254 ถนนพญาไท แขวงวังใหม่ เขตปทุมวัน กรุงเทพฯ 10330
อีเมล: akacooper@outlook.com

** รองศาสตราจารย์ คณะพาณิชยศาสตร์ และการบัญชี ภาควิชาการธนาคาร และการเงิน จุฬาลงกรณ์มหาวิทยาลัย
เลขที่ 254 ถ. พญาไท แขวงวังใหม่ เขตปทุมวัน กรุงเทพฯ 10330
อีเมล: sira@cbs.chula.ac.th

การวิจัยฉบับนี้พบว่า 1) ความเชื่อมั่นของนักลงทุนแบบเฉพาะบุคคลสะท้อนผลตอบแทนโดยรวมของตลาดหุ้นไทยเป็นอย่างมาก 2) ความเชื่อมั่นของนักลงทุนแบบเฉพาะบุคคลสามารถคาดการณ์การเคลื่อนไหวของหุ้นไทยได้อย่างแม่นยำในช่วงนอกกลุ่มตัวอย่าง 3) กลยุทธ์การซื้อขายตามความเชื่อมั่นของนักลงทุนแบบเฉพาะบุคคลให้ผลตอบแทนที่คาดการณ์ได้สูงกว่าแบบจำลองเชิงประจักษ์อื่น ๆ

คำสำคัญ: ความเชื่อมั่นของนักลงทุนแบบเฉพาะบุคคล ผลตอบแทนของตลาดหุ้น Aggregate Effect ความสามารถในการทำนายของแบบจำลอง กลยุทธ์การซื้อขายหลักทรัพย์

Introduction

The traditional financial theory believes that investor emotions do not affect stock prices (Fama, 1970). However, investors in major stock markets worldwide have experienced wild fluctuations in stock prices since the stock market's initial day. The traditional finance model on the macroeconomic and corporate fundamentals makes the stock market fluctuations challenging to explain rationally (Black, 1986; Kahneman & Tversky, 1979; Tversky & Kahneman, 1974). Investor sentiment has become an essential topic in the modern stock market.

Investor sentiment is an elusive concept that is hard to define and measure (Miller, 1977). Investor sentiment is either their subjective belief or noisy information that is irrelated to the value of stocks, resulting in stock mispricing in continuance, affecting stock prices (Barberis et al., 1998). The researchers describe the investor's sentiment as their subjective overly optimistic or pessimism about the stock market in general (Brown & Cliff, 2004). When rational traders find it hard to exploit profit opportunities from mispricing, the investor's self-evaluation is the main effect on asset pricing (Stambaugh et al., 2012). In recent research, investor sentiment could define investor conservatism, which leads to a subjective preference to adhere to prior options regardless of new information (Seok et al., 2019).

Furthermore, the existing studies consider that the market price can depart from sentiment-driven fundamental values (Keynes, 2018). The investor's sentiment could lead to overestimating or underestimating the entire stock market. Therefore, it affects aggregate market return (Bali et al., 2011; Da et al., 2011). Such irrational investors affected by sentiment factors express an optimistic (pessimistic) view of the aggregate stock price. Identifying and capturing a full picture of the investor sentiment is too board and vague, and contains many factors base on different research purpose. Therefore, the author creates a custom indicator, which calls this as the investor sentiment to capturing a researchable effect of the customized investor sentiment to study the Thai stock market.

The World Bank identified Thailand as an Asian "Tiger cub" economy as an emerging capital market. The Thai financial market represents the ASEAN finance region with a widely accessible investor group and comprehensive trade system (French, 2017). The Thai stock market has a high proportion of retail investors, and most have not mature enough investment concepts (Phansatan et al., 2012). The speculative market activities are relatively high,

which is more likely to cause "herding behaviour" and market overreaction (Padungsaksawasdi & Seetharam, 2020). The influence of investor sentiment in the Thailand stock market is more salient than the effect in the developed stock market.

This paper endeavours to construct two comprehensive customized investor sentiment indexes (local and global) for the Thai equity market to expand the financial understanding further. The logic is the basis of the existing papers (Baker & Wurgler, 2007; Hong & Lee, 2003). The Thai equity stock market is relatively smaller than other developed equity markets. Besides, its market sentiment is easily affected by domestic and global events. The authors capture the rapid change of customized investor sentiment utilising the daily data. This paper selects market turnover, the Thai T-bill rate, the RSI, and local gold price for constructing the local sentiment index. Also, this paper sets the U.S. T-bill rate, the S&P 500 index, the Exchange rate, and VIX for building the global sentiment index. The choice of selective variables is authors' subjective set of variables, which relates to investors' sentiment. And those selective variables could provide a researchable significant scale to the topic of investor sentiment.

The customized investor sentiment indexes obtained from the Principal Component Analysis are separated, taking the first principal component. Then, the customized investor sentiment indexes are applied to measure the Thai equity market's movement. Second, the sentiment indexes are implemented to classify the Thai equity market states using a Multivariate threshold autoregression model. The value of the Mean Squared Forecast Error and the Mean Absolute Forecast Error is evaluated with the empirical models, such as the Martingale model, Autoregression models, and out-of-sample forecasting performance. The third study uses sentiment indexes to design the trading strategy. The Mean Forecast Trading Return evaluation applies in this process. The customized indicators that create by author, have potential market predictive power. Then, the authors test the predictive properties of those indicators.

The authors study observations of the daily price of the index of the Stock Exchange of Thailand (.SETI) from January 1999 to January 2019. The majority of the sample expect from the Bloomberg DataStream and Reuters database and the Stock Exchange of Thailand.

Literature Review

Behavioural finance research can trace Noise Trading's related theoretical analysis (Black, 1986; De Long et al., 1990). The noise traders with strong subjective cognition will bring additional risks to the market. The early studies indicated a link between an investor's confidence in the success of their early action causing overconfidence in the following decision-making (Daniel et al., 1998). Also, a parsimonious theoretical model argues the different reactions of investors' sentiments to the good or bad news (Barberis et al., 1998). The existing research suggests that retail investors consider the impact of sentiment on their investment strategies (Sharpe, 2001).

The investor sentiment measurement reflects the investor sentiment's effect on the aggregate market return. Early researchers used closed-end funds as a standard proxy to measure the market sentiment because most retail investors own closed-end funds and small stocks (Neal & Wheatley, 1998; Swaminathan, 1996). After, a well-known composite investor’s sentiment was formed by the previous researchers to test the aggregate sentiment effect on stock market return(Baker & Wurgler, 2007). They provide shreds of evidence for sentiment affecting asset prices.

There are different predictive powers of investor sentiment for different investment horizons. In the short term, the sentiment mainly drives investors more aggressively during pessimistic periods (Ahmed, 2020). The existing noise traders drive intraday sentiment in the first half-hour, affecting the stock return in the last half hour in the U.S. stock market (Renault, 2017). Even though the intraday momentum effects from noise traders are only active in the last half hour, the sentiment effect continues at least the last two hours of a trading day (Sun et al., 2016). In the long term, the investor's behaviour could be an index for market forecasting. The researchers found that the sentiment has predictive power to explain the deviation of asset prices from the intrinsic value (Brown & Cliff, 2005), supported by the evidence of the consumer sentiment on U.S. stock returns (Gupta et al., 2014). An Exhibiting mean-reverting behaviour on the effect of investor sentiment on stock returns is negative but small in the long-term in the Chinese stock market (Ni et al., 2015). The investor sentiment index in European has a strong predictor of market return and conditionally market volatility long-term (Reis & Pinho, 2020). Therefore, investor sentiment has different predictive powers for varied horizons.

The investor sentiment is localisation property (Wu et al., 2017). Previous researchers show that the global and local sentiments are contrarian predictors of cross-sectional market returns (Baker et al., 2012). Another researcher found that the existing adjustment in the offer price by underwriters compensated the regular investor when the sentiment became progressively worse in Hong Kong IPO (Jiang & Li, 2013). Another researcher finds a very weak contagion to the Asia-Pacific stock returns using the predictive power of the Chinese investor sentiment (Li, 2021). Constructing a local sentiment index reflects the effect of local investor emotion and as a reliable reference for market prediction (Hei-Ling Lam & Chi-Man Hui, 2018). However, a prior study finds that global pessimism sentiment results in undervaluation in the entire market return (Chen et al., 2013). The assets are strongly related to global sentiments (Chen et al., 2017). In Thailand, the existing research use vary variables to construct the investor sentiment. The number of new IPO, foreign buy and sell volume, ratio of new issuance in bond and equity markets (Chuthanondha, 2016), the online social media word (Tantisantiwong, 2020). Also the Number of IPO securities registered, the turnover ratio of number of shares, the ratio of funding in equity instruments to debt and equity instruments, and the total trading fee Works of foreigners from the CMRI (SET-CMRI).

The proportion of constructing investor sentiment in different countries is diverse to the stock market dynamics. Thus, the component of investor sentiment is varied.

Market turnover

The early research discusses a considerable value on turnover associates, typically with a soaring stock price (Ying, 1966). The bull markets have a high turnover ratio on the market horizon, but the bear markets have a lower turnover ratio (Karpoff, 1987). Also, financial bubbles are associated with high turnover due to abnormal trading activities (Smith et al., 1988). The researchers found a correlation between trading and price differentials by the investor's speculative intentions (Mei et al., 2009). Also, the overpriced stocks are a pattern with a high trading volume (Baker et al., 2012). The turnover information is essential to investor sentiment index construction and reports the share volume to average shares in the listed firms. (Baker & Wurgler, 2006, 2007).

Treasury bill rate

The investors generally trade more and increase the speculative investor activities at a relatively low and short-term Treasury interest rate (Stambaugh et al., 2015). An increase in the government yield may cause an investment shift from a risky asset to a safety asset in an investor's portfolio (Fong & Toh, 2014). Investors who are more risk-averse and hold government bonds indicate a low sentiment period (Gómez-Puig et al., 2014). Research indicates a striking co-movement between the T-bill rate and the situal investor sentiment index (Chue et al., 2019; Sibley et al., 2016).

The relative strength index

The relative strength index (Ryu et al., 2016) examines whether the market is oversold/ overbought, reflecting the investor's overreaction/underreaction (Chen et al., 2010; Kim & Ha, 2010). In traditional interpretation, the RSI of 70 implies that the security is overbought, while the RSI of 30 implies the security is oversold (Chong & Ng, 2008). With a fluctuating relative index co-movement with the investor's abnormal trading behaviours, the price of sensitive-driven stocks is most likely volatile (Hudson & Green, 2015; Yang & Zhou, 2015).

Local gold price

In the emerging market, golds are like a “safe haven” against stock market volatility (Baur & McDermott, 2010). Gold represents a safe and risk-hedge instrument for the major equity markets by dropping before the extreme market downturn (Agyei-Ampomah et al., 2014). When the investor increases the weight on the commodities, the aggregate market returns are most likely to decline (Smales, 2014). The volatility of gold prices can reflect the intraday investor sentiment in the equity market (Balcilar et al., 2017). The change in gold price negatively correlates with the investor sentiment index, then comes with the short-term government yields (Capie et al., 2005; Reis & Pinho, 2020). Thailand's stock markets are one of the financial and commodity markets that have been highly volatile with high capital mobility in recent years (Pastpipatkul et al., 2016). Therefore, categorising the gold price into local sentiment would better reflect the market movement index.

U.S. treasury bill rate

The federal interest rate is a primary concern for the international investor on the weight of capital in the overseas financial market (Alam & Uddin, 2009; Gagnon et al., 2011; Schmeling, 2009). The announcements related to the change of the U.S. Federal interest rate significantly affect investor sentiment (Kurov, 2010). The federal interest rates are a good reflection of recalling overseas capital and purchasing a safe asset (Zouaoui et al., 2011). The monetary policy actions in downturn periods have a more significant effect on stocks that are more sensitive to investor sentiment changes (Glick & Leduc, 2012). The U.S. federal funds rate is a standard proxy for global liquidity conditions, showing that a lower federal funds rate is associated with higher liquidity (Csontó, 2014; Lee et al., 2014).

The S&P 500 index

Nowadays, domestic and international investors are eyes on U.S. financial market activity (Cheung & Mak, 1992). Foreign investors would increase capital allocations to emerging markets when global risk aversion decreases (Gagnon et al., 2011). The volatility of the S&P500 would affect the Thai equity market and retail investors (Alfonso Perez, 2017). The U.S. equity market's influence significantly impacts the value at risk in Asian markets (Shen, 2018). Therefore, the total return index of S&P 500 is a proxy to measure the global investor sentiment index.

The exchange rates

The exchange rate change would impact the investor's international asset allocation (Cushman, 1983; Viaene & de Vries, 1992). The change of exchange rate of the home currency to U.S. dollars through high-frequency trading positively influences the stock price (Richie & Madura, 2006). The expected exchange rate of USD changes accounts for a high share's total variation as many researchers take the change in the exchange rate (Arquette et al., 2008; Chan et al., 2008; Gagnon & Andrew Karolyi, 2010) and measure it for the home equity market (Wu et al., 2017). The THB keeps an eye on the movement of USD (Bouraoui & Phisuthtiwatcharavong, 2015). Thus, the paper considers the exchange rate (THB per USD) as a proxy to measure Thai investor sentiment.

The Chicago board options exchange volatility index (VIX)

Significantly, the VIX is a factor considered as the prior proxy for constructing the global sentiment index (Bandopadhyaya & Jones, 2006). The early research indicates that an increasing proportion of individual ownership is associated with volatility (Sias, 2019). The negative VIX reflects a global optimistic sentiment investment in emerging markets (Smales, 2017). The sentiment substantially affects hard-to-value and hard-to-arbitrage stocks in the international market (Marfatia, 2020). Therefore, the VIX is essential to study the global sentiment on the equity market.

The authors acknowledge that this paper might be missing some essential rational factors, but the authors feel the set of measured variables is a reasonable effort to mitigate the research problems.

Significance of the Problem

Based on the background and previous research, studying investor sentiment is unified in theoretical or practical aspects. For the Asian market, investor sentiment has the property of localization. Hence, studying the local sentiment should take local market features into account. Understanding the investor sentiment would provide a healthy growing stock market and contribute to the development of the whole economy. The main reason for selecting Thailand as the laboratory is that Thailand's equity market has been one of the most resilient after the 1997 Asian financial crisis (French & Li, 2017). Thailand's equity market and the Thai Baht rebounded rapidly after the financial crisis. With a higher percentile of foreign equity issuers and a low entrance barrier, the Thai equity market have more capital diversification and a high degree of capital flow (Calomiris et al., 2021). However, additional financial uncertainty, combined with political instability, may increase the likelihood of such reversals and significant Herd-behavior with firm-specific information in recent years (Padungsaksawasdi & Seetharam, 2020). Therefore, studying the investor sentiment effect is better for predicting the movement of the Thai equity market.

Many studies focus on the relationship between investor sentiment and stock market returns in developed markets, explaining how investor sentiment affects stock returns and price fluctuations (Tantisantiwong, 2020). Nevertheless, there currently is a paucity of studies on behavioral finance in developing countries. The existing literatures are far from understanding the investor sentiment issues in the Thai equity market (Phansatan et al., 2012).

The market's regulatory authorities' supervision and intervention do not fully consider the potential impact of irrational factor (French & Li, 2017). As a result, the policies are often ineffective and have severe side-effects on the stock market's growth. Therefore, researching investor sentiments based on the theory and framework of behavioral finance has crucial practical significance.

For theoretical significance, this paper assists the traditional financial theory research in studying the abnormal market phenomenon and offers a deep understanding of investor decision-making and capital market operation. As investor sentiment research is an essential part of behavioral finance theory, studying this issue helps the researchers understand how investor sentiment affects market operation and helps researchers develop and improve behavioral finance theory in the Thai equity market.

For empirical significance, the research on investor sentiment helps decision-making and supervision during the operation of the Thai stock market. Studying the investor sentiment helps investors understand the market business cycle and asset prices' actual characteristics. Besides, studying investor sentiment helps investors to cultivate a rational and healthy investment mind. For regulatory authorities, researching the investor sentiment helps them develop a more complete and adequate regulatory system. Moreover, researching the investor sentiment helps them perform more targeted supervision functions, thus positively developing the Thai stock market.

Research Questions and Objectives

The paper constructs two-principal component-based composite sentiment indexes (local and global) for the Thai equity market.

Research questions

The authors use the local sentiment index and global investor sentiment index to answer the below specific research questions separately:

1. Can the customized investor sentiment index significantly reflect the aggregate market return movement in the Thai equity market?
2. Can the customized investor sentiment index predict the Thai stock market movement using the out-of-sample method?

Objectives

1. Construct two appliable comprehensive customized investor sentiment indexes (local and global) to study the Thai stock aggregate return movement.
2. To estimate the investor's sentiment indexes' predictive performance on the expected return of Thai stock. If the investor's sentiment index is significant in predicting the stock price using the out-of-sample forecast method, it could be a valuable reference for investment timing.
3. To generate a trading strategy that uses the fluctuation of the customized investor sentiment indexes. Compared with empirical trading strategies that use other models, if the trading strategy based on the customized investor sentiment indexes has a higher expected profit, it could be a helpful reference for the investor's normal trading behaviours.

Data and Methodologies

The authors construct two comprehensive customized investor sentiment indexes separately for the Thai stock market. Studying the aggregate stock market's customized investor sentiment is learned from the existing research (Baker & Wurgler, 2007).

Empirical sample

The authors study observations of the daily price index of the Stock Exchange of Thailand (.SETI) from January 1999 to January 2019 and the daily total return index of the Stock Exchange of Thailand (TRI) from January 2002 to January 2019. Most of the sample expect from Bloomberg DataStream, the Stock Exchange of Thailand and The Bank of Thailand.

Measurement to Variables

The following factors' principal component is expected to develop the Thai investor sentiment's local and global measurement based on the literature review.

Market Value Turnover

The authors define a turnover ratio (*MVTN*) as follows:

$$MVTN_t = \frac{The\ average\ turnover\ for\ the\ past\ 10\ trading\ days_t}{The\ average\ turnover\ for\ the\ past\ 250\ trading\ days}$$

Thai Treasury Bill Rate

This research uses a daily Thai Government T-bill rate as a proxy for the localised investor sentiment index to capture the change of sentiment, "TTB" The daily T-bill rate in time t is expected to obtain from the BOT database.

The Relative Strength Index

The 14-day RSI is a standard measurement in the financial market, defined as follows:

$$RSI_t = \frac{\sum_{j=1}^{14}(P_{t-j} - P_{t-j-1})}{\sum_{j=1}^{14} | P_{t-j} - P_{t-j-1}|}$$

$$where\ (P_{t-j} - P_{t-j-1}) = P_{t-j} - P_{t-j-1} \quad if\ P_{t-j} - P_{t-j-1} > 0, otherwise = 0.$$

Gold Price

The Gold Price is the intraday price of one unit of gold in Thai currency. An uptrend in the local gold price would lead to pessimistic investor sentiment in the equity market. The Gold price, "TGP", at time t

The U.S. Treasury Bill rate

The daily Federal interest rate is the primary data to be the proxy of The U.S. Treasury bill rate to capture global investor sentiment change, defined as "UST".

The S&P 500 Index

The total daily return of the S&P 500 index is selected in the sentiment measure. The time-zone difference defines the rate of return on the U.S. equity market at time t:

$$SPX_t = \ln S\&P_{t-1} - \ln S\&P_{t-2}$$

Exchange Rate

The movement of the exchange rate closely relates the international capital flows. A sustained appreciation of THB attracts more Thai assets from international investors, leading to a higher investor sentiment index. The daily series of THB per USD is defined as "F.X. t".

VIX

VIX is a well-known index to measure volatility's market expectation. The daily time series of VIX is considered to construct the global sentiment index, defined as "VIX t".

Methodologies

The Principal Component Analysis (PCA) method's first principal component in econometrics represents the optimal combination of the selected proxies that maximises its total variance (Reis & Pinho, 2020). The authors firstly use the Stata to construct the compound customized investor sentiment index by PCA function, which selects the first principal components as the compound investor sentiment index is the highest eigenvalue, namely the Thai compound investor sentiment index, "SENT_th" and the Global Compound investor sentiment index "SENT_gb", with the statistic description. The authors then test the correlation between the selected variables and the SENT indexes by running the multiple regression.

The customized investor sentiment's effect on the Thai aggregate returns

First uses Excel to examine the customized Thai compound investor sentiment's effect on the aggregate return. The authors input the Rm, Rf and SEN indexes into the Excel sheet and then follow the single-index model to inspect the relationship between the customized investor sentiment and market aggregate return:

$R_{m,t} - R_f = \propto + \beta_i SEN_{i,t-j} + \varepsilon_t$, where the j is the lagged term daily, ε is the error term.

Then the authors check the regression result with a significant test result of 5%. After, the authors use the Granger Causality Test to estimate the causality relationship between the sentiment indexes and the market return.

Furthermore, The Granger causality test can test whether customized investor sentiment has impacted the value of returns in current and lagged terms. The regression results show the correlation between customized investor sentiment and the market aggregate return for answering research question 1.

The prediction power of Sentiment indexes on the Thai stock market movement

The authors use the Multivariate threshold autoregressive model (Chen et al., 2010; Chen et al., 2014; Tsay, 1998) and the rolling sampling test. First, the authors separately use the sentiment indexes (SEN_th, SEN_gb) to define the stock market cycle using the multivariate threshold model to classify the bull and bear market states. With the multivariate threshold autoregressive model, the authors use sentiment indexes as the threshold variable to capture the stock market's nonlinear movement. The authors input the data of the SET index of all the sample periods and then obtained the two threshold values for each sentiment index, X and Y, following the function:

$$R_t = \begin{cases} a_0 + a_1 R_{t-1} + a_2 R_{t-2} + \cdots + a_q R_{t-q1} + \epsilon_{1t}, & if\ Sen_{t-1} \leq X \\ \beta_0 + \beta_1 R_{t-1} + \beta_2 R_{t-2} + \cdots + \beta_q R_{t-q1} + \epsilon_{2t}, & if\ X < Sen_{t-1} \leq Y \\ \theta_0 + \theta_1 R_{t-1} + \theta_2 R_{t-2} + \cdots + \theta_q R_{t-q1} + \epsilon_{3t}, & if\ Y < Sen_{t-1} \end{cases}$$

$where\ R_t = 100 \ln\left(\frac{P_t}{P_{t-1}}\right),\ the\ Sen_{t-1}$ is the threshold variable, which constructs from the past date at time t-1. Note that the Sen_{t-1} is separately defined as the local sentiment index and the global sentiment index, namely $Sen_{th,t-1}\ and Sen_{gb,t-1}$ ϵ_{it} denotes noise terms, the X and Y are the threshold values relating to the local sentiment index, namely $X_{th}\ and\ Y_{th}$ And to the global sentiment index, namely $X_{gb}\ and\ Y_{gb}$.

The authors use the statistical method to calculate the threshold values, classify the bullish and bear market and compare the SET sentiment indexes.

$$Upper\ \ threshold\ value_i = mean_i + standard\ deviation_i$$

$$Lower\ threshold\ value_i = mean_i - standard\ deviation_i$$

Note that i is the sentiment index.

Second, setting the predictive criteria: the authors consider a sample size of *T=m+n,* where the *n* is the observations for the out-of-sample projection evaluation, and the *m* is the number of observations for estimation. The entire observation is 4178. The authors consider the sample size for testing the predictive ability of the multivariate threshold Autoregressive model based on the customized investor sentiment indexes ($MTAR_{Sen\ i,t}$) is *T=m+n*, where *m=1000*, *n=200*. The authors use a rolling sample of the size m to estimate model parameters, where the series t starts from 2nd Jan 2002 to 29th Mar 2017 (McCracken, 2000; West, 1996).

Third, use a rolling sample to predict the following sample, then replace the rolling staps through the end of the sample period. After, the authors generate a sequence of one-step-ahead projections. The authors compare the out-of-sample prediction with the criteria (Hong & Lee, 2003) of the Mean Squared Forecast Error (MSFE) and the Mean Absolute Forecast Error (MAFE) between the Multivariable threshold autoregressive model based on SENT indexes ($MTAR_{Sen\ i,t}$) with the Martingale model, with the simple Autoregression model (AR), in which the order p choosing by a particular information criterion, Akaike Information Criterion (AIC) (Shibata, 1976).

$$MSFE_t = \frac{1}{n}\sum_{j=0}^{n-1}(R_{t-j} - \widehat{R_{t-j}})^2 \qquad MAFE_t = \frac{1}{n}\sum_{j=0}^{n-1}|R_{t+j} - \widehat{R_{t+j}}|$$

The martingale model $R_t = \mu_t + \varepsilon_t$ And its prediction is $\hat{R}_t = \frac{1}{m}\sum_{i=t-m}^{t-1} R_i$.

To determine whether the MTAR model with the sentiment-based performs better than the other two models, the authors apply the average difference (AF) of MSFE and MAFE between the (1) Martingale model, (2) Autoregression model (AR), (3) Multivariable threshold autoregressive model with SENT indexes (MTAR),

$$AF_{MSFE} = \frac{\sum(MSFE_{i,t} - MSFE_{j,t})}{T} \qquad AF_{MAFE} = \frac{\sum(MAFE_{i,t} - MAFE_{j,t})}{T}$$

Where i and j are different models, T is the count of the entire rolling sample, starting from 22nd Nov 2006 to 31st Jan 2019.

If the criteria value is greater than 0, model i has a time series statistical dominance over model j. Thus, model i has better forecast ability than model j, and vice versa. Additionally, using the T-test with unequal variances estimates the significance of the average difference between the two models.

3. The trading strategies of using sentiment indexes on the Thai stock market

Most investors would use the economic either index or model to maximise their trading returns rather than minimising the model forecast errors. The trading strategies are designed differently as the property of the sentiment indexes. The paper provides two principles of a trading strategy based on the forecasting models and the local sentiment indexes. The authors, therefore, evaluate the models base on their expected trading profits (Hong & Lee, 2003).

The first principle of a trading strategy based on the forecasting models is to use the forecasting return value from the Martingale model, the Simple Autoregression model, the Multivariate threshold autoregression model using the local sentiment index and the Multivariate threshold autoregression model using the local sentiment index. If the forecasting return value in time t is positive, then the strategy should buy the benchmark index but should sell the benchmark index if the forecasting return value in time t is negative. The estimation for this trading strategy is the mean forecast trading return (MFTR), and it is defined as follows:

$$MFTR_i = \frac{1}{T-m}\sum_{t=m+1}^{T} sign(\hat{R}_{i,t})R_t$$

where T = Observation 4179, 31st Jan 2019. m=Observation 1000, 26th Jan 2006. $t=m+1$, start from 27th Jan 2006. $\hat{R}_{i,t}$ is the forecasting return value from model i, $R_t = 100\ln\left(\frac{P_t}{P_{t-1}}\right)$1)) of the Total returns index.

The second principle of a trading strategy based on sentiment indexes is to use daily values from the sentiment indexes to decide the buy and sell actions.

1) The trading strategy based on the local sentiment index is to follow the movement of the customized investor sentiment index. When the local investor sentiment index is higher, which means the investors are optimistic, the investor should buy the benchmark index, but when the investor sentiment index is lower, which means the investors are pessimistic, the investor should sell the benchmark index. Thus, the trading strategy is to buy the Thai Total return index when the local sentiment index is greater than the lower threshold value but sell the Thai Total return index when the local sentiment index is less than the lower threshold value. The estimation for this trading strategy is the mean forecast trading return ($MFTR_{th}$), and it is defined as follows:

$$MFTR_{th} = \frac{1}{T-m}\sum_{t=m+1}^{T} sign(Sen_{th,t} - the\ lower\ threshold\ value_{th,t})R_t$$

2) The trading strategy based on the global sentiment index is opposite to the movement of the customized investor sentiment index. When the global investor sentiment index is higher, global investors are optimistic, and they will seek other investment assets with better returns than Thai stocks. Thus, the trading strategy based on the global sentiment index should buy the benchmark index when the global sentiment index in time t is smaller than the upper threshold. However, the trading strategy should sell the Thai Total return index when the global sentiment index in time t exceeds the upper threshold value. The estimation for this trading strategy is the mean forecast trading return ($MFTR_{gb}$), and it is defined as follows:

$$MFTR_{gb} = \frac{1}{T-m}\sum_{t=m+1}^{T} sign(the\ Upper\ threshold\ value_{gb,t} - Sen_{gb,t})R_t$$

3) For the trading strategy of the buy-and-hold, the mean forecast trading return is defined as follows:

$$MFTR_{buy\&hold} = \frac{1}{T-m}\sum_{t=m+1}^{T} R_t$$

Note: T= Observation 4179, 31st Jan 2019. m=Observation 1000, 26th Jan 2006. $t=m+1$, start from 27th Jan 2006. The lower threshold value in the local sentiment index is -0.7254, while the upper threshold value in the global sentiment index is 0.7754. And $R_t = 100\ln\left(\frac{P_t}{P_{t-1}}\right)$. of the Total returns index.

The authors apply the T-test to test the significance of the mean forecast trading return and then compare its values—the higher value of the mean forecast trading return, the better the trading strategy.

Results and Discussions

1. Customized Investor sentiment indexes

Collecting the database on the methodology section and running in Stata and Excel program are customizing the investment sentiment indices for the Thai Equity market, then answering research questions. After data standardizing, the author applies the PCA method to the eight variables and develops two composite measures of investor sentiment for the Thai stock market. The Summary descriptive statistics and correlation matrix of the variables are reported in Table 1.

Table 1: The Summary descriptive statistics and correlation matrix of the variables.

Variable	Mean	Std.Dev	MIN	Max
MVTN	108.6335	47.4831	30.52733	427.5312
TTB	4.1904	1.3553	1.5396	8.75
RSI	53.2958	13.5668	14.6397	91.2293
TGP	14583.9	6765.735	4605.45	278868.8
UST	3.5906	1.2902	1.3579	6.788
SPX	0.0002	0.1183	-0.0946	0.1096
FX	35.9916	4.3673	28.68	45.8
VIX	19.9306	8.4706	9.14	80.86
			Observation:	4915

	MVTN	TTB	RSI	TGP	UST	SPX	FX	VIX
MVTN	1							
TTB	-0.698	1						
RSI	0.4897	-0.154	1					
TGP	-0.0716	-0.7241	0.1008	1				
UST	0.0172	0.8559	-0.1178	-0.9017	1			
SPX	0.006	-0.0227	0.1049	0.0219	-0.0181	1		
FX	0.0159	0.4894	-0.0909	-0.8566	0.6815	-0.0244	1	
VIX	-0.0773	0.1511	-0.2398	-0.2032	0.1444	-0.1179	0.1535	1

Table 1

For each time t, the authors name "$SEN_{i,t}$" as the stock market sentiment index defines the first principal component of the variables as mentioned above. $SEN_{th,t}$ represents the investor sentiment index constructed by Thai local variables, while $SEN_{gb,t}$ represents the investor sentiment index constructed by global variables. The Stata program is used to estimate the principal component, the PCA results as follows,

The PCA result of the customized local investor sentiment

Components	*Eigenvalue*	*Proportion*	*Cumulative*
PC1	1.791	0.4478	0.4478
PC2	1.4444	0.3611	0.8089
PC3	0.5043	0.1261	0.9349
PC4	0.26	0.0651	1.0

The eigenvecotrs of principal compoents

Variables	*PC1*	*PC2*	*PC3*	*PC4*
MVTN	0.2127	0.6883	-0.6698	0.1799
TTB	-0.6631	0.2192	0.1993	0.6874
RSI	0.3413	0.6076	0.7136	-0.0714
TGP	0.6313	-0.3301	0.0492	0.70

Note: PC# represents the order number of principal compoment

In the PCA results of the customized local investor sentiment, the upper panel shows the eigenvalues, proportion and cumulation of each principal component (PC1 to PC4) with descending order. The first principal component (PC1) dominates the highest eigenvalue, which is 1.791, while it has 44.78% explaining proportion of the total variance. Four principal components have cumulative 100% explanation of the total variance. The lower panel shows the corresponding eigenvectors of each selective variable to the principal components. The eigenvectors show the directors of selective variables in each principal component. For instance, the PC1 dominates the highest eigenvalues, compared with the rest of PCs. Then, the customized local sentiment index gets the most positive stretched from the Thai local gold price index but gets the most negative stretched from the Thai T-bill rate. Forwarding the similar interpretation to PC2 to PC4, the customized local sentiment index gets the most positive stretched from the market turnover rate in PC2. The customized local sentiment index gets the most positive stretched from the relative strength index in PC3, and it obtains the most positive stretched from the Thai T-bill rate in PC4.

The PCA result of the customized global investor sentiment

Components	*Eigenvalue*	*Proportion*	*Cumulative*
PC1	1.7464	0.4366	0.4366
PC2	1.076	0.269	0.7056
PC3	0.8592	0.2148	0.9204
PC4	0.3185	0.0796	1.0

The eigenvecotrs of principal compoents

Variables	*PC1*	*PC2*	*PC3*	*PC4*
UST	0.6746	0.1741	-0.1272	0.706
SPX	-0.0832	0.7883	0.6096	-0.0051
FX	0.6768	0.1606	-0.1213	-0.7081
VIX	0.2828	-0.5779	0.7729	0.0091

Note: PC# represents the order number of principal compoment

In the PCA results of the customized global investor sentiment, the upper panel shows the eigenvalues, proportion and cumulation of each principal component (PC1 to PC4) with descending order. The first principal component (PC1) dominates the highest eigenvalue, which is 1.7464, while it has 43.66% explaining proportion of the total variance. Four principal components have cumulative 100% explanation of the total variance. The lower panel shows the corresponding eigenvectors of each selective variable to the principal components. The eigenvectors show the directors of selective variables in each principal component. For example, the PC1 dominates the highest eigenvalues, compared with the rest of PCs. Then, the customized global sentiment index gets the most positive stretched from the exchange rate and gets the second larger positive stretched from the US T-bill rate. Forwarding the similar interpretation to PC2 to PC4, the customized global sentiment index gets the most positive stretched from the S&P 500 index in PC2. The customized global sentiment index gets the most positive stretched from the VIX index in PC3, and it obtains the most positive stretched from the US T-bill rate in PC4.

	MVTN	*TTB*	*RSI*	*TGP*
Local Sentiment index	0.2846	-0.8875	0.4567	0.8449

	USTz	*SPXz*	*FXz*	*VIXz*
Global Sentiment index	0.8915	-0.1099	0.8944	0.3737

Additionally referring the correlation results of the customized sentiment indices (PC1) and its selective variables, the Thai gold price has highest positive correlation to the customized local sentiment index. Thus, the Thai gold price performs a stronger positive influence on the PCA construction of local sentiment index. However, Thai T-bill rate has highest negative correlation to the customized local sentiment index. Therefore, the Thai T-bill rate has stronger negative influence on the PCA construction of local sentiment index. On the global aspect, the exchange rate has highest positive correlation to the customized global sentiment index. Thus, the exchange rate between THB and USD performs a stronger positive influence on the PCA construction of global sentiment index. Nevertheless, the return of S&P 500 index has highest negative correlation to the customized local sentiment index. Thereby, the return of S&P 500 has stronger negative influence on the PCA construction of global sentiment index.

The results of corresponding eigenvectors in the first principal component (as the customized investor sentiment indices) show that:

For the customized local sentiment index, the major positive driver is the local gold price,

$$SEN_{th,t} = 0 + 0.2127MVTN_t - 0.6631TTB_t + 0.3413RSI_t + 0.6313TGP_t + \varepsilon_t$$

$$SEN_{gb,t} = 0 + 0.6746UST_t - 0.0832SPX_t + 0.6768FX_t + 0.2828VIX_t + \varepsilon_t$$

which has 0.6313 corresponding eigenvectors to the principal component. The second positive driver for the local sentiment index is the relative strength index, which dominates 0.3413 corresponding eigenvectors. The third positive driver for the local sentiment index is the market turnover rate, which dominates 0.2127 corresponding eigenvectors. However, the main negative driver for the local sentiment index is the Thai T-bill rate, which occupies -0.6631 corresponding eigenvectors. For the customized global sentiment index, the major positive driver is the exchange rate between THB and USD, which has 0.6768 corresponding eigenvectors to the principal component. The second positive driver for the global sentiment index is the US T-bill rate, which dominates 0.6746 corresponding eigenvectors. The third positive driver for the global sentiment index is the VIX index, which dominates 0.2828 corresponding eigenvectors. Nevertheless, the main negative driver for the global sentiment index is the S&P 500 index, which occupies -0.0832 corresponding eigenvectors.

Notably, the turnover variable is positively related to the local investor sentiment index, but the Thai treasury bill rate is negative coefficient with the local sentiment index. Both the RSI and Thai gold price have a positive effect on the local sentiment index. The result of positive coefficient between the sentiment index and the Thai gold price could because 1) using the Thai gold price index as selective variable, the proportion of Thai gold price would lead to strong statistical effect on the customized local sentiment index. Thus, the Thai gold price is the main contributor to the principal component of customized local sentiment index. 2) the local gold price follows the global gold price. And the global sentiment negatively correlates with the local sentiment. Then the global gold price negatively correlated with the global sentiment index. Thus, the local gold price performs a positive correlation with the local sentiment index.

On the global horizon, the US T-bill rate, the spot exchange rate (THB/USD), and the VIX index explain the most variation in global investor sentiment. An increasing rate of US T-bills leads to positive global investor sentiment. Nevertheless, the good performance of the US equity market leads to negative global investor sentiment. A depreciation of THB attracts global capital into Thailand and benefits Thai export, and the exchange rate variable appears to be positively related to the global sentiment index. The volatility index has a positive relationship with the global sentiment index.

2. The aggregate effect

The first goal of the research is to analyze the correlation between the customized investor sentiment indices to the two returns of the Thai equity market index, namely, return of the price index and return of the total return index. After, the author estimates the lag terms of the customized investor sentiment indices to the two Thai market indices returns using the Granger Causality test.

1) The effect of Sentiment indexes to SET Price index

Table 2: The Summary results of the sentiment indexes to The Thai price index.

Sentiment index' s effect to SET Price index

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	**0.000**	**0.0124**	**0.0000**	**1**
SEN_{th}	**0.4439**	**0.0173**	**25.6264**	**5E-136**
SEN_{gb}	**0.0942**	**0.0175**	**5.3675**	**8E-08**
Multiple R	0.4935			
R Square	0.2435			
ANOVA Significance F	2E-298		Observations	4915

Table 2

$$R_{SETI,t} - R_{f,t} = 0 + 0.4439Sen_{th,t} + 0.0942Sen_{gb,t} + \varepsilon_t$$

Both local investor sentiment index and global sentiment index are a significant positive correlation with the market return of SET Price index, which adjusts the risk-free rate. The local sentiment has the stronger effects on the Thai price.

2) The effect of sentiment indexes to SET Total Return index

Table 3: The Summary results of the sentiment indexes to The Thai total return index.

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	**-0.188**	**0.0128**	**-14.7137**	**0.00**
SEN_{th}	**0.7316**	**0.0188**	**38.9385**	**3E-283**
SEN_{gb}	**0.2038**	**0.0181**	**11.2364**	**7E-29**
Multiple R	0.6213			
R Square	0.3860			
ANOVA Significance F	0		Observations	4179

Table 3

$$R_{TRI,t} - R_{f,t} = -0.1881 + 0.7316Sen_{th,t} + 0.2038Sen_{gb,t} + \varepsilon_t$$

A similar result from the Price index, both the local investor sentiment index and global sentiment index significantly positively correlate with the market return of SET Total Return index, which adjusts the risk-free rate. Moreover, the greater effect to the market return is generating from local investor sentiment.

3) Granger causality test

The causality result shows in Table 4. The author tests the causality of the two investor sentiment indices to the return of two market indices by subtracting the risk-free using the Granger Causality Wald Tests. The author implements the lagged periods of 1, 5, 10, 21, 126, and 252. The results show that the lagged local investor sentiment does cause the market returns over a year. Similarly, the results show that the lagged global investor sentiment does cause the market returns over a year.

The results on the P value are rejecting the null hypothesis of the granger causality test. Thereby, the causality results interpret that the past information of the investor sentiments significantly cause the return of Thai Price index and Total return index, as corresponding those p-values are less than 0.05. However, the causal effects of investor sentiments are diminishing over the sample period, corresponding to the decreasing trend i n the value of causality. Despite that, the results have a limitation, which ascertains whether the time series of investor sentiments help predicate the return of Thai market indices. The results do not show how well does the investor sentiment index predicts the return of the Thai equity market index. Overall, customized investor sentiments significantly cause the Thai equity market return in the near year.

Table 4: The summary results of Granger Causality Test

Equation	Excluded	lag 1	lag 5	lag 10	lag 21	lag 126	lag 252
$Price\ Index$	SEN_{th}	*30.994****	*55.319****	*12.945****	*5.5636****	*2.077****	*1.571****
$Total\ Return\ Index$	SEN_{th}	*703.34****	*45.681****	*10.863****	*3.55****	*1.442****	*1.2117***
$Price\ Index$	SEN_{gb}	*209.72****	*11.459****	*5.0547****	*2.4184****	*1.3606****	*1.3292****
$Total\ Return\ Index$	SEN_{gb}	*290.07****	*19.1****	*7.5606*	*3.5137****	*1.5809****	*1.4584****

The null hypothesis: The Exculded dose not Granger-cause the Equation.

The values in the table are F statistics; ** represents the significance level of 5%, *** represents the significance level of 1%.

Table 4

From the results of the multivariate regression model, all the variables significantly correlate with the Thai equity market return. Therefore, the conclusion is that both customized investor sentiment indices have significant and researchable explanatory power to the market index return movement in the Thai equity market, emphasizing that the change in local investors' sentiments significantly affects Thai equity market movement. Additionally, the past information of customized investor sentiments has significant causality to the return of market index.

3. Predictive ability

One main goal of the research is that the sentiment index can be used to identify Thai stock market states, which classify the equity market into bull and bear states. Then using the customized local investor sentiment index and global investor sentiment index separately as the threshold variable. The authors use the local investor sentiment index and global investor sentiment index separately as the threshold variable, and the authors construct the multivariate threshold model, which estimates to capture the movement of the Thai stock market.

1) The Thai stock market classification using the threshold model

Figure 1: The comparisons between the sentiment indexes and the Thai total return index with its threshold values.

The sample period is from 3rd Jan 2002 to 31st Jan 2019 since the total return index of the SET is available starting from 2002. Using the statistical method, the upper threshold value of the local sentiment index is 1.4296, while the lower threshold value of the local sentiment index is -0.7255. The upper threshold value of the global sentiment index is 0.7754, while the lower threshold value of the global sentiment index is -1.457. All the threshold values are statistical significance at the 5% level of the T-test. Using the threshold values, three regions of the stock market have been classified and shown in the below charts, compared with the Thai Total return index.

From the Time series plot of the sentiment indices, the local sentiment index is moving opposite the global sentiment index. When the local investor is optimistic about the local equity market, they would more focus on the local market and pay less attention to the global market. Therefore, the global sentiment declines. When the global sentiment is optimistic, which means the global equity market has more investment opportunities, the Thai local investor would shift their eyes to the global market, thus the optimist of local sentiment is diminishing

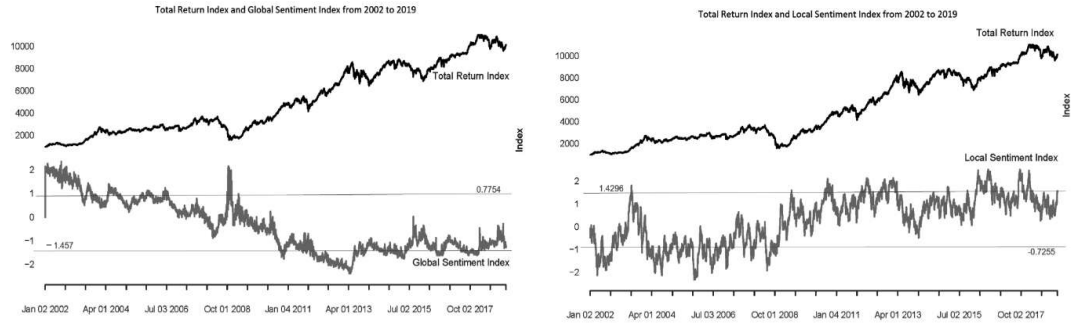

Figure 1: Total Return Index and Global Sentiment Index

The comparison between the local sentiment index and SET total return index shows that the local sentiment index is moving with the benchmark index in the same direction. When the local investors are optimistic, they are willing to invest their capital in the Thai stock market. Thus, it drives the benchmark index to go up. Such high-frequency fluctuation of the local sentiment index could reflect the investor's irrational financial behaviours. Additionally, the high-frequency oscillation could support that the local investors have a micro informational advantage in equity selection. The change of sentiment reflects the adjusting of their equity portfolio in real-time. The overall trend of the local sentiment index can reflect the Thai stock market movement. Therefore, it supports that the customized investor sentiment index positively correlates with market returns. The local optimistic (pessimistic) sentiment, the higher (lower) market returns on the local horizon.

The comparison between the global sentiment index and SET total return index shows that the global sentiment index is moving oppositely with the benchmark index. This comparison could imply that when the global sentiment index is high, the global investors are more optimistic about chasing the hot flood of other assets with relatively higher returns and become more risk lovers of another high-stake asset rather than investing in Thai stocks. When global investors find it challenging to handle the uncertainty of the global financial market, they will seek assets that could be able against the loss rather than a financial environmental downtrend. Therefore, the global investors would shift their capital to the Thai equity market against partial uncertainty in the global financial market. In addition to the relatively lower inflation in the Thai goods market and small bubble in stock prices,

this suggests that Thai listed stocks have "risk and loss resistance" in the downtrend of the global financial market than other assets with relatively higher national inflation and giant value bubble. It supports that the customized investor sentiment index negatively correlates with market returns. The global optimistic (pessimistic) sentiment, the lower (higher) market returns on the global horizon.

The estimation result of the multivariate threshold models (MTARs) is as respectively follows:

$$R_t = \begin{cases} -0.052 - 0.0016R_{t-1} + 0.0645R_{t-2} - 0.0512R_{t-3} + \varepsilon_{2t}, & if\ Sen_{th,\,t-1} \le -0.7255 \\ 0.0809 + 0.0491R_{t-1} + 0.0142R_{t-2} + \varepsilon_{2t}, & if\ -0.7255 < Sen_{th,\,t-1} \le 1.4296 \\ 0.1035 - 0.032R_{t-1} + 0.017R_{t-2} - 0.0783R_{t-3} - 0.0435R_{t-4} - 0.113R_{t-5} + \varepsilon_{3t}, & if\ 1.4296 < Sen_{th,\,t-1} \end{cases}$$

$$R_t = \begin{cases} 0.1036 - 0.0489R_{t-1} + \varepsilon_{1t}, & if\ Sen_{gb,\,t-1} \le -1.457 \\ 0.0533 - 0.0123R_{t-1} + \varepsilon_{2t}\ , & if\ -1.457 < Sen_{gb,\,t-1} \le 0.7754 \\ 0.0287 + 0.0923R_{t-1} + 0.0847R_{t-2} - -0.0028R_{t-3} + 0.0109R_{t-4} - 0.0462R_{t-5} - 0.0902R_{t-6} + 0.0228R_{t-7} \\ +0.0491R_{t-8} - 0.0744R_{t-9} + 0.1046R_{t-10} + \varepsilon_{3t}, & if\ 0.7754 \le Sen_{gb,\,t-1} \end{cases}$$

The AIC chooses the lag terms of the multivariate threshold autoregressive model. Using the Ljung-Box test, all the autoregressive models within the MTAR are consistent with time series stationary. The residual errors look like white noise.

With the different threshold values, the forecast model of each autoregressive in the MTAR is different. Based on the local sentiment index, the auto-regression in the bear period chooses three lag terms ($Sen_{th,\,t-1} \le -0.7255$). Nevertheless, the auto-regression based on the global sentiment index chooses one lag term ($Sen_{gb,\,t-1} \le -1.457$). In the natural period, auto-regression based on the local sentiment index chooses two lag terms ($-0.7255 < Sen_{th,\,t-1} \le 1.4296$). However, the auto-regression base on the global sentiment index chooses one lag term ($-1.457 < Sen_{gb,\,t-1} \le 0.7754$). In the bull period, the auto-regression base on the local sentiment index chooses five lag terms ($1.4296 < Sen_{th,\,t-1}$). By contrast, the auto-regression base on the global sentiment index chooses ten lag terms ($0.7754 \le Sen_{gb,\,t-1}$).

2) The predictive ability of models

Table 5: The averaging difference of MSFE and MAFE compared between the two models.

The result of Average difference(AF)

Table 5

	$AF_{(Martingale-AR_{(p)})}$	$AF_{(Martingale-MTAR_{th})}$	$AF_{(Martingale-MTAR_{gb})}$	$AF_{(AR_{(p)}-MTAR_{th})}$	$AF_{(AR_{(p)}-MTAR_{gb})}$	$AF_{(MTAR_{th}-MTAR_{gb})}$
MSFE	*0.359****	*0.516****	*0.353****	*0.157****	*-0.006*	*-0.163****
MAFE	*0.122****	*0.288****	*0.183****	*0.165****	*0.061****	*-0.104****

Note: $AR_{(P)}$ is Autoregression model with lag order p, $MTAR_i$ is the Multivariate threshold autoregression model.
*The values in the table are averaging difference bwtween two models; ** represents the significance level of 5%, ***represents the significance level of 1%*

From the result of MSFE, the Multivariate threshold autoregressive model based on the local sentiment index has the most statistical dominance in rank compared with the Martingale model, the Autoregression model and the Multivariate threshold autoregressive model based on the global sentiment index. The second statistical dominance model is the Multivariate threshold autoregressive model based on the global sentiment index, which has more minor forecast errors than the Martingale model. However, there is insignificance between the Autoregression model and the Multivariate threshold autoregressive model based on the global sentiment index. The least predictive ability is the Martingale model compared with other models. The results from MSFE suggest that the local sentiment index, as a reference to the Multivariate threshold model, had the most statistical advantage for predicting the aggregate movement of the Thai stock market. Additionally, the result suggests that the Multivariate threshold autoregressive model based on the global sentiment index has a better predictive ability to the aggregate movement of the Thai stock market than the Martingale model. Nevertheless, the predictive ability of the Autoregression model and the Multivariate threshold autoregressive model based on the global sentiment index are indifferent.

From the results of MAFE, the Multivariate threshold autoregressive model based on the local sentiment index has the most statistical dominance in rank like the result of MSFE. However, The Multivariate threshold autoregressive model based on the local sentiment index is the second statistical dominance in rank, which has more minor forecast errors than the Autoregression model with statistical significance. The third model is the Autoregression model, and the last is the Martingale model. The results from MSFE imply that using the local

sentiment index has a majority statistical advantage in predicting the aggregate movement of the Thai stock market. Then, the results imply that based on the global sentiment index has a better predictive ability on the aggregate movement of the Thai stock market than the Autoregression model then the Martingale model.

Overall, the above results indicate that the customized investor sentiment indexes have a better predictive ability of the Thai stock market movement, thus answering the second main research question of this paper, using the out-of-sample test, the customized investor sentiment index predicts the Thai stock market movement. Especially the local sentiment index is more reliable in forecasting the benchmark index based on MSFE and MAFE. The result implies that to predict the Thai stock market movement, the investor should pay more attention to the change in the local sentiment index. Furthermore, the authors suggest taking the global sentiment index as the second reference when the investors predict the entire stock market because of the deep global connection in nowadays financial market and the high degree of the open economic environment in Thailand.

4. The trading strategies

As the results from MSFE and MAFE, the customized investor sentiment index can predict the movement of the Thai stock market with fewer predictive errors. The authors apply the trading strategy for estimating the expected profit of the forecasting models, which includes the Martingale model, the simple Autoregression model, the Multivariate threshold autoregression model based on the local sentiment index and the Multivariate threshold autoregression model based on the global sentiment index.

Table 6: The expected profit result of using the forecasting models.

The Expected Profit Result of The Forecasting Models

Table 6

The Forecasting Models	*Mean Forecast Trading Return*
Martingale Model	*3.313%****
Simple Autoregression Model	*14.7%****
Multivariate Threshold Autoregression Model based on the Local Sentiment Index	*33.779%****
Multivariate Threshold Autoregression Model based on the Global Sentiment Index	*30.291%****

*The ***represents the significance level of 1%*

From the result of the mean forecast trading return of the forecasting models, The Multivariate threshold autoregression model (MTAR) based on the local sentiment index has a 33.779% expected return compared to the rest of the forecasting models. The multivariate threshold autoregression model (MTAR) based on the global sentiment index has a 30.291% of expected return. The Martingale and simple Autoregression models perform 3.313% and 14.7% of expected return, respectively. All the mean forecast trading returns are statical significant at the 1% level.

Table 7: The expected profit of trading strategies on the Total return index.

From the expected profit of trading strategies, the trading results show that the Total returns index gains 12.635% trading return following the local sentiment index to buy or sell. The implementation of the opposing the global sentiment index to buy or sell the Total returns index gains 9.293% trading return. The buy-and-hold strategy gains a 3.998% trading return. The results suggest that with different sentiment indexes, the trading strategy should keep different for chasing a higher profit.

The result supports the principle of trading strategies. The investors who use the trading strategy based on the local sentiment index should buy the Thai benchmark index when it exceeds its lower threshold, which means the local investors turn optimistic and buy the Thai stock market. When the local sentiment index falls below its lower threshold value, local investors turn pessimistic and have a higher probability of selling their Thai stocks. Then, selling the Thai stocks and moving the capital to other assets are recommendations. Therefore, following the local sentiment index could be more likely to gain a positive return.

The Expected Profit Result of Trading Strategies

Table 7

Trading Strategies	*Mean Forecast Trading Return*
Total Returns Index based on the Local Sentiment Index	*12.635%****
Total Returns Index based on the Global Sentiment Index	*9.293%****
Total Returns Index based on the Buy-and-Hold	*3.988%****

*The ***represents the significance level of 1%*

Unlikely the local sentiment index on the trading strategy, the investors who prefer the trading strategy based on the global sentiment index should invest in the Thai stock market when the global sentiment index is less than its upper threshold, which means the global investor turn to pessimistic to the other assets and seek for the assets that have well uncertainty-resistance. When the global sentiment index turns optimistic, the global market becomes boom. Then, the global investor would seek other assets that have expected higher returns as they are willing to bear more risk. The Thai stocks may be less returns-attractive to global investors. Selling the Thai stocks and chasing other assets would be better. Overall, opposing the global sentiment index could generate a higher profit.

As the paper mentions above, the MTAR of the local sentiment index follows the trading strategy of local sentiment, while the MTAR of the global sentiment index follows the trading strategy of global sentiment. The authors apply the Buy-and-Hold trading strategy to the Martingale and simple Autoregression models. Combining the results of the forecasting errors from the previous section, the paper suggests that the Multivariate threshold autoregression model based on the local sentiment index has the highest expected daily profit with the relatively lowest forecasting errors. The paper also implies that the Multivariate threshold autoregression model based on the global sentiment index has better expected daily profit with fair predictive ability than the Martingale model and simple Autoregression model. In addition to the trading result on the Total returns index, both sentiment indexes perform better than the Buy-and-hold strategy. Therefore, the paper recommends taking the customized investor sentiment indexes into account for the projection of the Thai benchmark movement. Moreover, the paper suggests using the customized investor sentiment indexes as a reliable reference to deal with daily trading.

Conclusions and Contributions

Studying the existing theories, the authors know there are noise traders in the stock market. The noise traders bring hazy information into the stock market and influence other investors through the social network. Thus, keeping a fully rational mind on investment behaviour is challenging for investors.

This paper studies the effects of customized investor sentiment in the Thai stock market from the existing concept of behavioural finance theory, which supports the applicability of behavioural finance theory in the Thai stock market, thus filling the gap of such research in the emerging financial market.

Research findings

This paper reviews the existing research to customize the two indicators by compiling composite investor sentiment using the first component of the principal component analysis (PCA). In addition to the result of the Granger Causality Wald Test, the findings of this paper are as follows:

1. The customized investor sentiment has a significant effect on the Thai equity market returns.
2. The customized local investor sentiment affects the market index returns more than the global investor sentiment over time.
3. The customized investor sentiment indices have significant time-delayed causality to the Thai equity market returns.

Furthermore, using the rolling out-of-sample method, the result from the estimation of predictive ability shows that the multivariate threshold autoregressive model based on the customized investor sentiment indices has fewer forecasting errors in the market index movement than other classical econometric models, such as the Martingale model and simple Autoregression model. Thus, the findings of this paper are as follows:

4. With a lagged term of customized sentiment indices, the local sentiment index is moving with the Total returns index of the Thai stock market in the same direction. However, the global sentiment index is moving with the Total return index in the pomposity direction.
5. The customized investor sentiment performs a high accuracy to predict the Thai equity market index movement, compared with other empirical econometric models.
6. In interval comparison of the customized sentiment indices, the local investor sentiment index has better forecast ability than the global investor sentiment index.

This paper designs a series of trading strategies to compare the average forecast return based on the forecasting models. The trading result shows that using the prediction returns of the Multivariate threshold autoregression model based on the customized local sentiment index achieves the highest expected trading profit than other empirical models. The Multivariate threshold autoregression model based on the customized global sentiment index achieves the second higher expected trading profit. Also, Using the change of customized investor sentiment indices have higher expected profit on the trading of the Total return index than the Buy-and-Hold strategy. Thus, the suggestions of this paper are as follows:

7. The daily equity traders should follow the trend of customized local sentiment to buy/sell the Thai benchmark index but oppose the trend of customized global sentiment to buy/sell the Thai benchmark index.
8. The daily equity traders should use the prediction from the multivariate threshold autoregression models based on the customized investor sentiment as a signal to buy/sell the Thai equity.
9. Compared with the passive trading method, following the change of customized investor sentiment indices to buy/sell the Thai equity on intraday is a recommended trading strategy.

Research contributions

This paper offers a small contribution to the growth of literature studying the role of customized investor sentiment:

1. As the lack of literature on the studying of investor sentiment in the emerging financial market, this paper customizes two indices using the local and global factors to study the movement of the Thai stock market's return, calling the local sentiment index and the global sentiment index, which are relatively more minor research focus. Also, this research extends the study of the global factors on the Thai market index returns.
2. The authors emphasize the localized investor sentiment. The segmentation of the customized investor sentiment would have a more substantial predictive power on the Thai equity market's return movement, comparing the existing research that mainly focuses on the explanation power of general investor sentiment.

This paper contributes to the customized investor sentiments by focusing on factors that could reflect the local and global properties, respectively, based on the previous literature studies:

3. The variables for constructing the local sentiment index include the market turnover, the Thai T-bill rate, the relative strength index, and the local gold price index.
4. The variables for constructing the global sentiment index includes the U.S. T-bill rate, the S&P 500 index, the Exchange rate, and the Chicago board options exchange volatility index (VIX).

Although the existing research provides evidence of investor sentiment can forecast the market return, it lacks the estimation of the predictive ability of investor sentiment in the stock market, thereby offering investment suggestion, especially the studies in the emerging market.

5. This paper estimates the predictive ability of customized investor sentiment compared with other classical econometric models. Customizing the investor sentiment is a valuable predictive reference for the Thai benchmark movement.
6. This research estimates the expected profit of customized investor sentiment on the Thai equity market and then offers the researchable investment strategy for investors who like to use investor sentiment as a signal to buy/sell equity, which follows the local investor sentiment but opposes the global investor sentiment.

Limitation

The literature indicates that investor sentiment reflects individual investors' subjective preference for the financial market. Additionally, retail investors in different financial markets react differently to the financial market change. Researchers utilize various variables to estimate the investor sentiment based on their subjective background. Thus, identifying the full variables of the investor sentiment index is a long-term journey and needs horizontal and vertical study resources. The papers admins that there are inappropriate estimations on selective variables, such as the Thai gold price index, which dominates the significant effect on the customized local sentiment index, and the US T-bill rate, return of the S&P 500 index,

which may contain the systematic risk of US market, affecting the measurement of global sentiment index. Therefore, this paper enlightens future research exploring other potential variables with more market explanatory power, measuring the selective variables appropriately, and better reflecting the subjective preference of the retail investor.

Last but not least, using high-frequency data in this paper aim to capture the rapid reaction of investor sentiment to the change in the Thai stock market. The side-effect is that such high-data frequency customizes and estimates the effects of the investor sentiment could contain the volatile market noise. Therefore, further study may consider using comparable low-frequency data to construct the investor sentiment index. Moreover, future research could expense other econometric models to examine, thereby improving investor sentiment's predictive accuracy.

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Investor's Perception: Sustainable Development Through Investment Avenues in India

Mohammed Nabeel. K* and M. Sumathy**

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Abstract

Sustainable investment is defined as investment that is vetted for environmental, social, and governance considerations. Sustainable investment has been one of the financial market's fastest-growing investment techniques since its start. The purpose of this study is to examine investors' attitudes on long-term investments in India. Using the snowball sampling technique, a questionnaire-based poll was undertaken to collect responses from 216 investors.

According to the study, investors' perceptions of risk and return on sustainable investments are influenced by demographic parameters such as age, educational qualification, and investment experience. It was also shown that the most important reason for investing in sustainable investments is the security of the investment and that energy conservation is an important criterion to consider before investing.

According to the findings of this study, investors should place a greater emphasis on the importance of integrating sustainable development into the transition to a more responsible and sustainable financial system.

Keywords: Sustainable Development, Sustainable Investment, Sustainable Development Goals (SDGs), Perception

* School of Commerce, Bharathiar University
Coimbatore, Tamil Nadu 641046, INDIA
E-mail: nabeelmohammed44@gmail.com

**Professor, School of Commerce, Bharathiar University
Coimbatore, Tamil Nadu 641046, INDIA

ทัศนคติของนักลงทุน: การพัฒนาที่ยั่งยืน ผ่านช่องทางการลงทุนในประเทศอินเดีย

โมฮัมเหม็ด นาบิล. เค* และ เอ็ม. สุมาธี**

รับวันที่ 6 กรกฎาคม 2565 *ส่งแก้วันที่ 27 ธันวาคม 2565* *ตอบรับตีพิมพ์วันที่ 9 มกราคม 2566*

บทคัดย่อ

การลงทุนที่ยั่งยืนได้รับการนิยามว่าเป็นการลงทุนที่ผ่านการพิจารณาแล้วว่าตอบโจทย์ด้านสิ่งแวดล้อม สังคม และธรรมาภิบาล การลงทุนที่ยั่งยืนนั้นเป็นหนึ่งในเทคนิคการลงทุนที่เติบโตเร็วที่สุดของตลาดการเงินตั้งแต่แรกเริ่ม การศึกษาวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาทัศนคติของนักลงทุนต่อการลงทุนระยะยาวในประเทศสาธารณรัฐอินเดีย จากเทคนิคการสุ่มตัวอย่างแบบแบบอ้างอิงด้วยบุคคลและผู้เชี่ยวชาญ (Snowball Sampling Technique) ผู้วิจัยได้สำรวจโดยใช้แบบสอบถามความคิดเห็นเพื่อรวบรวมคำตอบจากนักลงทุน 216 คน

จากการศึกษาวิจัยนี้ พบว่าการรับรู้ของนักลงทุนเกี่ยวกับความเสี่ยงและผลตอบแทนจากการลงทุนที่ยั่งยืนได้รับอิทธิพลจากปัจจัยค่าตัวเลขทางประชากรที่แยกตามคุณลักษณะ เช่น อายุ วุฒิการศึกษา และประสบการณ์การลงทุน นอกจากนี้ยังแสดงให้เห็นว่าเหตุผลที่สำคัญที่สุดในการลงทุนในการลงทุนที่ยั่งยืนนั้นก็คือความมั่นคงปลอดภัยของการลงทุน อีกทั้งการอนุรักษ์พลังงานก็เป็นเกณฑ์สำคัญที่ต้องพิจารณาก่อนการลงทุน

จากผลการศึกษาวิจัยนี้ นักลงทุนควรให้น้ำหนักมากขึ้นในเรื่องความสำคัญของการบูรณาการการพัฒนาที่ยั่งยืนให้เข้ากับการเปลี่ยนผ่านไปสู่ระบบการเงินที่มีความรับผิดชอบและยั่งยืนมากกว่าเดิม

คำสำคัญ: การพัฒนาที่ยั่งยืน การลงทุนที่ยั่งยืน เป้าหมายการพัฒนาที่ยั่งยืน ทัศนคติ

* คณะพาณิชยศาสตร์ มหาวิทยาลัยบาราเธียร์
เมืองโคอินบาโตร์ รัฐทมิฬนาฑู ประเทศอินเดีย 641046
อีเมล: nabeelmohammed44@gmail.com

** ศาสตราจารย์ คณะพาณิชยศาสตร์ มหาวิทยาลัยบาราเธียร์
เมืองโคอินบาโตร์ รัฐทมิฬนาฑู ประเทศอินเดีย 641046

Introduction

In academic and practitioner literature, sustainable investing—or the incorporation of sustainability considerations into capital market investment decisions—has received a lot of attention. To increase the co-evolution of the economic, social, environmental, and institutional (governance) systems, scholars, practitioners, and politicians have recently argued the crucial need for a worldwide transition to sustainable development.

As a result, the shift to sustainable development necessitates both a quick realignment and restructuring of national and international institutions in the direction of more effective governance as well as a greater focus on global issues in economic governance, and consequently in investments and finance. (Cumming & Johan, 2007). On the other hand, it highlights how far finance has progressed, from a sole focus on profit maximisation and shareholder wealth to a growing awareness of environmental issues such as the green and low-carbon economy, as well as climate change adaptation and mitigation, which has become critical in the aforementioned transition toward sustainable development. (Sciarelli et al., 2021).

One of the most alluring yet perplexing investments in the world today is cryptocurrency. Their value skyrockets. They fall. Their supporters assert that they will alter the globe by replacing established currencies like the dollar, rupee, and ruble. Today, in order to prevent the continually operating hardware from overheating, you need highly specialized devices, a lot of money, a large area, and adequate cooling power. Because of this, mining currently takes place in enormous data centers that are controlled by businesses or groups of people. Due to the decentralized structure of Bitcoin and the fact that its miners are generally anonymous, it is difficult to determine exactly how much of Bitcoin mining is powered by renewables. Due to the decentralised structure of Bitcoin and the fact that its miners are generally anonymous, it is difficult to determine exactly how much of Bitcoin mining is powered by renewables.

Because of the rise of financial markets, sustainable investment is considered a very essential issue in the study. On the one hand, including environmental criteria into investor investment decisions makes company behavior more sustainable. Firms and investors know that investing in line with sustainability principles may add long-term value and improve a company's success. In this way, improved management of the effects of business goods,

services, processes, and other activities on various corporate stakeholders (such as consumers and investors) may help enhance both corporate sustainability and financial success. Investor behavior, on the other hand, has emerged as one of the most important motivators for Indian governments to implement regulatory policies to promote long-term investment (Escrig-Olmedo et al., 2013) (Journal & Journal, 2018; Sujith et al., 2019).

As businesses devote more resources to environmentally friendly and socially responsible activities, it's critical to understand how such expenditures affect investor preferences across the board. Some investors will argue that allocating more resources to sustainability is expensive and contradicts the fundamental purpose of increasing profits. Others would argue that a well-run business should be concerned about the environment or that businesses should strive for aims other than profit maximization.

Others will value such investments not because they are concerned about the environment in general, but because they perceive them as a sensible way to boost earnings. Finally, some investors will be unaware or disinterested about a company's commitment to sustainability. (T S, 2017). While there are examples of each of these investors in the market, it is unclear if this type represents the average investor and, as a result, whether sustainability investments are in accordance with what investors desire. Simply put, do investors view sustainability as a positive, negative, or neutral quality of a company? The current study examines bitcoin investors' perceptions of long-term investment opportunities in Kerala. Using survey data, we investigate whether investors consider the environmental effect of their investments in this research.

Literature review

With data obtained from 3382 socially responsible investors, a recent study (Riedl & Smeets, 2017) addressed why investors retain socially responsible mutual funds. They discovered that investors' innate social preferences, as well as, to a lesser extent, social signaling, are key determinants of whether or not they will invest in SRI equity funds. SRI decisions are influenced by financial considerations as well. Investors who believe SRI equity funds would outperform conventional equity funds are less likely to make socially responsible investments. Their findings show that investors with strong social motivations are willing to forego financial profits to invest by their values.

A recent study (Akhtar et al., 2018) examined the relationship between an individual investor's personality trait and his perceived investment performance using data from 369 people. According to the researchers, social influence favorably moderates the association between extraversion and perceived investment performance but adversely moderates the relationship between agreeability and perceived investment performance. Investors have low expectations for their perceived investment success as a result of social contact. Individuals are also influenced by others since they believe that judgments made by a group of investors cannot be erroneous.

Phillips & Johnson (2021) investigated the perceived barriers that organizations face while dealing with SII, concluding that differences should be evaluated using a policy field paradigm. Important obstacles they observed include a lack of market awareness, inadequate financial literacy, and the difficulty of analyzing and measuring social repercussions. Furthermore, despite the inherent importance of social impact in this type of investing, nonprofits report that they currently use limited evaluation and impact metrics, and that intermediaries and investors, particularly in affordable housing, continue to priorities financial returns over social returns.

Cumming & Johan (2007) analysed institutional investors' investments in Dutch private equity companies with socially responsible investments across asset classes. They found that socially conscious private equity investments are less common among fund-of-fund investments and more common among institutional investors with a focus on the global market.

Narula (2012) argued that the world needs sustainable development now more than ever. It is especially true for developing nations like India, which must have sustainable economic growth. Economic growth and sustainable development continue to be at odds, despite the fact that the concepts of sustainable development and sustainable investment are emerging globally. The ecological and social elements are frequently casualties in the quest for economic expansion since the regulatory and enforcement systems are still insufficient in the majority of emerging economies.

Jain et al., (2019) compared if sustainable investing options provide higher financial returns than traditional indexes from developed and emerging countries. The developed markets (excluding the US) ESG index—TRESGDX, developing markets, and the S-Network global indices were employed in the study. US large-cap TRESGEX ESG index European TRESGUS ESG Index ESG index—TRESGEU, as well as the benchmark indices for the typical markets, such as MSCI World index (MSCI W), MSCI All Country World Equity index (MSCI ACWI), MSCI USA index (MSCI USA), MSCI Europe Australasia Far East index (MSCI EAFE), MSCI Emerging Markets index (MSCI EM), and MSCI Europe index (MSCI EU). The study concludes that there is information flow between the two investing paths and integration of the conventional and sustainable indexes. The findings show that there is no discernible difference between sustainable indices and traditional conventional indices in terms of performance, the former being a good replacement for the latter. According to the study, in order to gain from risk diversification and hedging, their portfolios should take into account both indexes.

Hartzmark & Sussman (2019) show that investors value sustainability as a whole, and they rule out the notion that investors are uninterested in this information or penalize a fund for keeping a sustainable investment portfolio. They also discovered that funds with the greatest globe ratings receive more than $24 billion in additional fund flows, while those with the lowest globe ratings saw a $12 billion loss in fund flows. This indicates that a significant section of the market considers sustainability to be a favorable company characteristic. Participants expect funds with a high sustainability rating to perform better and be less risky, which is in line with previous research on the affect heuristic (Sumathy & Mohammed Nabeel, 2020) (Nadarajah & Chu, 2017).

The Sustainable Development Goals investment trends were examined, as well as the large investment gaps that impede progress toward the SDGs. They found that the COVID-19 epidemic is aggravating SDG finance gaps in developing economies and risks reversing SDG investment progress made since the publication of the 2015 global development agenda. They believe that private investment will be critical in addressing public sector resource shortages for SDG-relevant investment and leading the global drive to rebuild better (Yadav et al., 2022; Zhan & Santos-Paulino, 2021)

Charles Rajesh Kumar & Majid, (2020) looked at the important developments, prospects, predictions, power production, obstacles, and investment and job opportunities brought about by the growth of renewable energy in India. According to the report, adoption of renewable technology is hampered by the lack of comprehensive policies and regulatory frameworks. To attract investors, the market for renewable energy needs clear rules and legal frameworks. Furthermore, a lack of defined policies causes a delay in the approval of projects in the private sector. The nation ought to take steps to draw in private investment. R&D should be used to address insufficient technology and the lack of infrastructure needed to build sustainable technologies.

Atif et al. (2020) looked examined data from S&P 1500 indexed businesses in the US from 2004 to 2016 to examine the impact of gender on a firm's sustainable investment goals. By presenting empirical proof that having women on the board has a significantly positive impact on sustainable investment, the study adds to the body of research on gender diversity. According to the study, companies with two or more female directors see a greater effect than those with fewer women on the board. Rather than female executive authority, the monitoring channel of female directors is primarily responsible for this influence. The study's findings suggest that this positive impact may eventually offer marginal advantages as corporate governance develops and becomes more effective. In the interim, companies with fewer women on their boards should think about adding additional female directors.

Talan & Sharma (2019) examined 225 publications about sustainable development that were listed on Web of Science in order to investigate the research gap, compile the current literature, and determine the themes on which the literature on sustainable investment has concentrated. According to the report, there is no conducive climate for the mainstreaming of sustainable investing practices. The basic objective of sustainable development has been twisted into a search for profits due to hasty attempts to mainstream sustainable investment. As an alternative to the current ESG framework, a more comprehensive approach to sustainable investing may be established. Furthermore, by assessing the financial and non-financial returns acquired from firms screened using these methodologies, the impact of this alternative framework in comparison to the current ESG framework may be assessed.

Methodology

The current study is a descriptive one. A self-administered questionnaire was used to investigate investors' perceptions of sustainable investments since it will allow us to study a vast variety of both objective and subjective factors that are not directly observable. Using the snowball sampling technique and after eliminating incomplete responses and extreme outliers, 216 investors were polled to see if they think about sustainability while making investments. The questionnaire was split into two sections, first section deals with the demographic details of the respondents; the second section contains questions related to the perception of sustainable investment opportunities. To measure the perception about risk and return in sustainable investment instruments, a five-point Likert scale is used with 5 for Strongly Agree and 1 for Strongly Disagree. The study used one way ANOVA to understand the difference in response towards the perception about risk and return based on the respondents' age group, educational qualification and investment experience. To examine the most valued reason for investing in sustainable investment avenues, the study employed mean rank coupled with Friedman test.

Results and Discussions

The collected data were analyzed using SPSS software and statistical tests such as ANOVA and Friedman were applied to have an idea about the perception of investors. Table 1 shows the demographic. profile of respondents. The sample mainly consists of Male investors (71.3%), which shows the dominance of males in investment. The majority of the investors are post graduated (42%) with the age of below 25 (71.3%). Concerning investment experience, most of them have an investment experience of one to three years. This may indicate that the subjects of the study are experienced in the financial market. About 71% of the respondents are aware of the sustainable investment avenues and most of them have invested in sustainable financial instruments.

Table 1: Participants Descriptions

Variables		Frequency	Percentage
Gender	Male	154	71.3
	Female	62	28.7
Age	Below 25	92	42.6
	25-35	60	27.8
	35-45	32	14.8
	Above 45	32	14.8
Educational Qualification	Higher Secondary	64	29.6
	Graduate	60	27.8
	Post Graduate	92	42.6
Investment Experience	Below 1 Year	62	28.7
	1 - 3 Years	92	42.6
	3 - 5 Years	32	14.8
	Above 5 Years	30	13.9
Have You heard about Sustainable Investment	Yes	152	70.4
	No	64	29.6
Have you bought a sustainable financial product?	Yes	152	70.4
	No	64	29.6

Table 2: The PCA result of the customized local investor sentiment

Components	Eigenvalue	Proportion	Cumulative
PC1	1.791	0.4478	0.4478
PC2	1.4444	0.3611	0.8089
PC3	0.5043	0.1261	0.9349
PC4	0.26	0.0651	1.0

The eigenvectors of principal components

Variables	PC1	PC2	PC3	PC4
MVTN	0.2127	0.6883	-0.6698	0.1799
TTB	-0.6631	0.2192	0.1993	0.6874
RSI	0.3413	0.6076	0.7136	-0.0714
TGP	0.6313	-0.3301	0.0492	0.70

Note: **PC# represents the order number of principal component**

Table 2 shows that the majority of the respondents consider sustainable investment as less risky than conventional investment. It is also evident that, regarding the return, respondents believe that sustainable Investment carries almost the same returns that of conventional investment.

Effect of Demographic factors on perception about risk and return

The perception of investors regarding risk and return may vary due to many factors like age, gender, and so on. To know the difference in perception, one-way ANOVA is incorporated.

Educational Qualification and perception about risk and return

An investors' perception on return and risk may vary based on his educational qualification. To know the difference in perception of investors on risk and return of sustainable investment avenues, one way ANOVA is used with the following hypothesis.

H0a: There is no significant difference in perception about risk based on educational qualification

H0b: There is no significant difference in perception about return based on educational qualification

H1a: There is a significant difference in perception about risk based on educational qualification

H1b: There is a significant difference in perception about return based on educational qualification

Table 3: The PCA result of the customized global investor sentiment

Components	Eigenvalue	Proportion	Cumulative
PC1	1.7464	0.4366	0.4366
PC2	-0.0832	0.7883	0.7056
PC3	0.6768	0.2148	0.9204
PC4	0.2828	0.0796	1.0

The eigenvectors of principal components

Variables	PC1	PC2	PC3	PC4
UST	0.6746	0.1741	-0.1272	0.706
SPX	-0.0832	0.7883	0.6096	0.0051
FX	0.6768	0.1606	-0.1213	-0.7081
VIX	0.2828	-0.5779	0.7729	0.0091

Note: **PC# represents the order number of principal component**

Table 4.3.2 shows that there exists a significant difference in perception about risk and return among the investors with different educational qualifications. As the p-value is .000 (less than .05), the null hypothesis is rejected and the alternative hypothesis is accepted.

Age and perception about risk and return

The age of an investor may influence his perception towards investment risk and return. In this regard, one way ANOVA is attempted with the following hypothesis.

H0a: There is no significant difference in perception about risk based on age of the investor.

H0b: There is no significant difference in perception about return based on age of the investor.

H1a: There is a significant difference in perception about risk based on age of the investor.

H1b: There is a significant difference in perception about return based on age of the investor.

Table 4: Local Sentiment index and Global Sentiment index

	MVTN	TTB	RS	TGP
Local Sentiment index	0.2846	-0.8875	0.4567	0.8449
	USTz	SPXz	FXz	VIXz
Global Sentiment index	0.8915	-0.1099	0.8944	0.3737

Table 4 shows that there exists a significant difference in perception about risk and return among investors of different ages. As the p-value is .000 (less than .05), the null hypothesis is rejected and the alternative hypothesis is accepted.

Investment Experience and perception about risk and return

The Investment Experience of an investor may influence his perception towards investment risk and return. In this regard, one way ANOVA is attempted with the following hypothesis.

H0a: There is no significant difference in perception about risk based on Investment Experience of the investor.

H0b: There is no significant difference in perception about return based on Investment Experience of the investor. H1a: There is a significant difference in perception about risk based on Investment Experience of the investor.

H1b: There is a significant difference in perception about return based on Investment Experience of the investor.

Table 5: The summary results of the sentiment indexes to The Thai price index.

Sentiment index's effect to SET Price index

	Coefficients	*Standard Error*	*t Start*	*P-value*
Intercept	0.000	0.0124	0.0000	1
SENth	0.4439	0.0173	25.6254	SE-136
SENgb	0.0942	0.0175	5.3675	SE-08

Multiple R	0.4935		
R Square	0.2435		
ANOVA significant F	2E-298	Observations	4915

Reason or investing in sustainable Investment

To identify the most valued reason for investing in sustainable investment, a Friedman test is used. The test results are presented in the following Table

Table 6: The summary results of the sentiment indexes to The Thai total return index.

Sentiment index's effect to SET Price index

	Coefficients	*Standard Error*	*t Start*	*P-value*
Intercept	-0.188	0.0128	-14.7137	0.00
SENth	0.7316	0.0188	38.9385	3E-283
SENgb	0.2038	0.0181	11.2364	7E-29

Multiple R	0.6213		
R Square	0.3860		
ANOVA significant F	0	Observations	4179

The mean ranks obtained for four reasons for investing are stated above. The lower the ranks, the higher will be the preference. It is evident from the table that the highest preference is given to the security of investment (Mean rank = 1.56) followed by ethical reasons (Mean rank =1.57). This is consistent with the previous studies (Escrig-Olmedo et al., 2013; Sciarelli et al., 2021).

Table 7: Friedman Test

Test Statistics	
N	216
Chi-Square	469.578
df	3
Asymp.Sig.	***.000****
a. Friedman Test	

** Significant at the 0.05 level*

Source: Primary Data

The $\chi 2$ statistic provides a value of 469.578, which is significant at a 5 percent level of significance (p=0.000<.05). This indicates the variation in the preferences of investors in investing in sustainable investments.

Most valued criterion for investing Sustainable Investment

To identify the important criterion considered by the investors before making a sustainable investment, the Friedman test is used. The following table shows the results of the Friedman test.

Table 8: Mean Rank

	Mean Rank	Rank
Recycling	2.71	3
Energy Conservation	1.44	1
Social Solidarity	3.85	4
Protection of Natural Resources	2.00	2

The mean ranks obtained for the four-valued criteria are stated above. It is evident from Table 4.5.1 that, the highest priority is given for those investments concerned with energy conservation (Mean Rank 1.44) followed by protection of natural resources. Social solidarity is considered to be the least preferred criterion for sustainable investment.

Conclusion and recommendations

The study examined the perception of investors in India concerning sustainable investments. The study found that the majority of the investors are male with the age of below 35 years and with graduation and post-graduation, with investment experience of below 3 years. According to the results of one-way ANOVA, it was found that demographic factors like age, education, investment experience influences the investor's perception of sustainable investment. Security of the investment is considered to be the most important reason for investing in sustainable investment. As per the Friedman test, it was found that energy conservation is the main criterion considered by the investors before investing in sustainable investment. Even though the majority of the respondents are aware of sustainable investment avenues, they are reluctant to invest due to the gestation period of such investments.

Thus investors must be fully informed on the characteristics of these goods, as well as the methodology and sources utilized for ethical screening, as well as the diversity of products offered, as well as their financial, ethical, and risk performance. Commercial brochures can be tailored to meet the needs of various investors. To appeal to each distinct cluster, commercial brochures should highlight a certain set of requirements. The government must do a better job of promoting long-term investment. Investors should seek greater information about the many types of financial products that their managers can provide.

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