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RISK ATTITUDES AND GAME PLAYING EXPERIENCE: THE GAME OF HEDGE ACCOUNTING TOOLS FOR FOREIGN CURRENCY EXCHANGE

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ABSTRACT

The volatility of foreign currency exchange rate has created a great deal of risk to businesses. Thus, executives who are responsible for risk management in this area must be knowledgeable with the appropriate use of tools and methods to deal with this type of risks. Nevertheless, the accounting transactions to record these hedging activities can be complicated. Also, the selection of instruments to be used in managing the risks and impacts from exchange rate volatility is quite complex.

The overall research plan has two study objectives. The first objective is to develop a mobile game as the data collection instrument for this research. The game is called "Hedge Accounting Game for Foreign Currency Exchange, HAGFCE." HAGFCE is designed to run on the tablet with either IOS or Android platform. The scope of hedge accounting content is limited to two topics, Fair Value Hedge and Cash Flow Hedge. The foreign currency exchange hedge transactions are limited to account receivables and agreement to sell.

The second objective is to collect data from game users in terms of their learning experience. Personal risk attitude of each individual game user will also be collected. The relationship between the level of individual's personality risk and his or her choice making experience in the HAGFCE will be examined. Data will be collected and compared the difference between before and after an individual plays the game. A 2X2 group of semi-experimental design will be conducted with a total of 120 game users. The groups are first classified according to their personal risk attitudes (risk avoidance and risk-aversion) and then by the sequence of topics being introduced while playing the HAGFCE game (Fair Value Hedge before Cash Flow Hedge or Cash Flow Hedge before Fair Value Hedge).

The present manuscript outlines the research design of the computer-experiment using the HAGFCE. The paper also provides a baseline result used to classify personal risk attitudes. This is done by systematically verifying whether the Passive Risk Taking Scale (PRT) developed by Ruty Keinan & Yoella Bereby-Meyer in 2012 can be used in Thai environment. The original 25 self-administered statements were evaluated by 117 graduate students from three universities. Exploratory Factor Analysis was used to determine the applicability of various aspects of the original scale. Further analysis was done to reduce the original 25 statements to 13 manageable statements that will, in turn, be used to assess the individual's risk attitude of game players in the semi-experimental research.

Keywords: *1) Risk Attitudes* 2) *Hedge Accounting of Foreign Currency Exchange* 3) *Hedge Accounting Tools* 4) *Game-play Experience* 5) *Information Visualization*

1. Introduction

Foreign exchange transactions in Thailand are important because Thai economy has always relied heavily on export of goods and services. The massive flooding in 2011 had damaged many businesses and resulted in increased imports of essential machinery and parts, including some substitutes for products that could not be manufactured domestically (Council, 2012). Therefore, the value of imports in 2012 had increased by 11.89 percent from 2011 (Commerce, 2013). Also, as we enter the ASEAN Economic Community (AEC) which will be completely launched as of 1 January 2015, these transactions should soar even more. It is expected that when the ten ASEAN member countries namely, Thailand, Brunei, Burma, Laos, Vietnam, Malaysia, Singapore, Indonesia, the Philippines and Cambodia (AEC, 2012), economically merged, the Thai economy will benefit as a result of free trade of products and services (Center, 2012). Consequently, risk exposures to foreign exchange rates for Thai businesses will inevitably amplify.

According to the data between August 2011 and August 2013 shown in Figure 1, currency exchange rates between Thai baht and US dollars were relatively fluctuated. The rises and falls of Thai baht can have great impacts on the competitive edges of Thai businesses. Exporters may receive less than expected revenues when the Thai-to-US exchange rates decrease; importers, on the other hand, may encounter the increase in product costs when the Thai-to-US exchange rates increase.

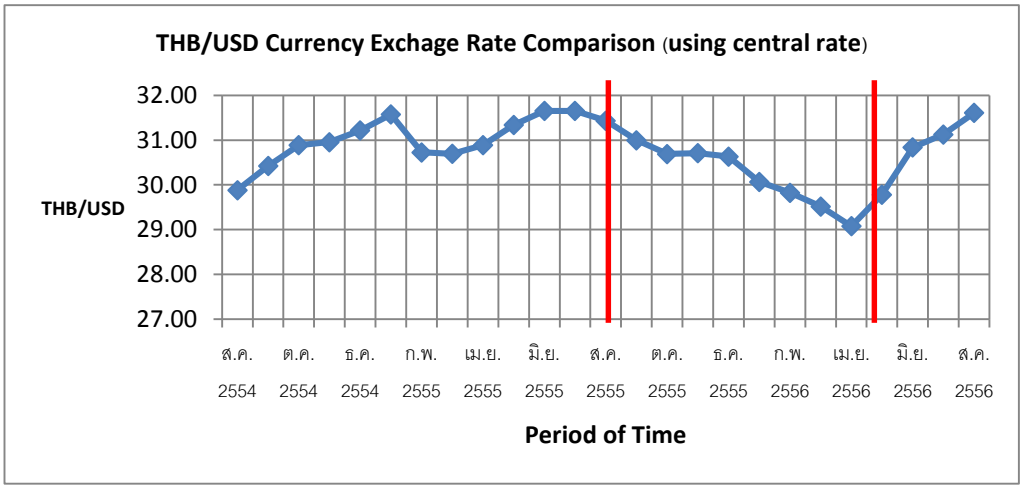

Figure 1: Baht currency exchange rate compared with US dollars by using the central rate (T.B.O., 2013)

As a result of the aforementioned circumstances, large and small businesses conducting transactions with foreign currencies, need protection from currency exchange risks because the loss caused by exchange rates can wipe out all business profits (T.B.O., 2011). However, there are two main preventive methods to hedge risks for currency exchange rates, namely, (1) Natural Hedges and (2) Financial Instruments; there are many types available and the method popularly used is derivatives. The benefit of using financial instruments to hedge foreign currency exchange rates is that income and cost can be projected so as to make viable business planning and sustainable growth (T.B.O., 2011).

The principle behind hedging foreign currency exchange rates is that foreign currency trade agreements will be made to set currency exchange rates in advance and

to preserve the stability of asset values in foreign currencies (Kasikornbank, 2013) . Successful hedging requires knowledge and skills from the person in-charged in the analysis and selection of methods and instruments suitable for each situation. The most worthwhile option in terms of remunerations and expenses should be assessed in order to maximize benefits to an organization.

More and more business professionals are interested in studying currency exchange risk prevention methods. However, the subject matter is complex and difficult to understand. Thus, game-based learning is an attractive alternative because games can drive the learner's interest and create fun and desire to learn at the same time (Lee, 2000). This concurs with a study on the success of game-based learning which found learning through game media could encourage a need to learn among learners, improve memory and understanding, increase a sense of participation in learning and create fun throughout the learning duration (Suksiri, 2007).. Hence, the objective of this research is to develop a Hedge Accounting Game for Foreign Currency Exchange (HAGFCE). The game will be run by using tablet computers which are currently popular and widely used. It is expected that players of the aforementioned games will learn and gain better knowledge about hedge accounting of foreign currency exchange rate.

2. Literature Review

Reviews of previous academic work and research include three main areas. First is to provide a brief overview of Hedge accounting concepts of foreign currency exchange rate. This includes explanation of various terminologies used. Second is to define the scope of personal risk attitudes used in this study as the factor affecting the selection of hedge method alternatives. Third and the final review includes the findings of previous research on learning experience using game as a teaching/learning tool.

1. Hedge Accounting of Foreign Currency Exchange Rate

The hedge accounting of foreign currency exchange rate comprises three parts: 1) Risk exposures of currency exchange rate, 2) Hedge methods of foreign currency exchange rate, and 3) Hedge accounting methods for foreign currency exchange rate. A brief description for each part are as follows:

A. Risk Exposure. There are three types of risk exposure for businesses dealing with foreign currency.

a) *Transaction Exposure* means exposure to the risks caused by transactions reported in financial statements and the risks caused by transactions not reported in financial statements (agreements to sell or to buy) that create value exchange risks in agreements using foreign currencies. Transaction exposure is a result of exchange rate fluctuations.

b) *Translation Exposure* is also known as accounting exposure. Translation exposure is the fluctuation of financial status or business performance created by financial budget translation, which creates profits or losses. The exposure is created in the following cases:

- A business operates domestically that uses foreign currency in its transactions has to translate its financial statement into local currency in order to report to public.
- A business operates in foreign country that uses foreign currency in its transactions and has to report its financial statement by using the foreign currency. Companies are required to translate their financial statements into foreign currency for the consolidated financial statements.

c) *Operating Exposure* means a change in cash flow by actions related to future income or expenditures as a result of changes in foreign currency exchange rates. This type of risk exposure occurs when currency exchange fluctuations affect

future business income and expenditures, which further affects operating cash flows (Sribunnak and etc, 2011).

The aforementioned risk exposure types constitute the root concept to the hedging of foreign currency exchange rate. The three types of exchange rate risk exposures will have an indirect effect on financial data. Therefore, businesses should take into consideration various factors in the assessment and hedges for each type of currency exchange rate (Sribunnak and etc, 2011). These risks occur from within or from outside businesses and in manageable and unmanageable ways.

B. Hedge Method. There are two primary methods of hedging for foreign currency exchange rate risks, Natural Hedge and Hedge by Derivatives.

a) *Natural hedge* means trade transactions that reduce risks created by other trade transactions by pairing opposite cash flows in one foreign currency without using derivatives (Sribunnak and etc, 2011). For example, a manufacturing factory launching its business in Thailand imports materials from a foreign country and makes payment in US dollars. The business can create a natural hedge by distributing products in foreign countries and accepting payment in US dollars to offset deficits caused by the currency exchange incurred by the materials imported.

b) *Hedge by Derivative* uses a financial instrument. The value of the instrument depends on the cash flow of the derived asset, not directly by the cash flow of the instrument (Khongsawatkiat, 2011). Derivatives can be categorized as follows:

- Forward Purchase/ Sale Contract means a contract in which a person or corporation agrees to a future purchase or sale of foreign currency according to an agreed upon cash amount and exchange rate.
- Future Instrument has characteristics similar to the forward purchase/ sale contract in terms of the agreement to purchase or sell foreign currency with a predetermined cash amount and rate of exchange. Nevertheless, future instruments have a liquid and elastic market for transaction and payment processes.
- Swap Contract means a contract stipulating that the parties to a given contract swap cash flows in different currencies in the future according to a predetermined cash amount and exchange rate; parties to such contract agree to purchase a foreign currency at a specific time and resell the foreign currency in the future.
- Option Contract means a contract entitling the parties to the contract to purchase or sell a derived asset to the other party at a predetermined cash amount and exchange rate within a specified time. Option contract is divided into foreign currency call option contracts and foreign currency put option contracts.

C. Hedge Accounting. The accounting method to record and acknowledge transactions of hedging activity for foreign currency exchange rate is quite important. This is to recognize derivative using its fair value amount by pairing the profit or loss of each derivative with profit or loss of the risk-protected transactions generated to reduce corporate performance volatility over the same period of time. Hedge accounting of foreign currency exchange rate can be classified into three types as follows:

a) *Fair Value Hedge Accounting* aims at hedging the fair value risks of asset or liability recognition in financial statements or the changes in the fair value of binding contracts that the corporation has not recorded in an account but this fair value risk can be identified and will have impacts on the profits-losses of the business.

b) *Cash Flow Hedge Accounting* aims at preventing risks from future cash flow fluctuations relating to asset or liability recognized in the Statement of Financial Position or to the expected cash flow from future business transactions. These cash flow risks will have impacts on profits and losses.

c) *Hedge of Net Investment in Foreign Operations Accounting* aims at preventing risks relating to the valuation changes in investments of subsidiaries carried out overseas. This type of hedge accounting is also used to hedge the risks from monetary items being recorded as part of net investment (Sribunnak and etc, 2011).

2. Risk Attitude

Risk attitude is a general guideline a person uses to confront or avoid risks in decision-making under uncertainty circumstance (Rohrmann, 2005). People with different risk attitudes will exhibit different behaviors. For example, lottery players with different risk attitudes will play lottery differently (Thomas et al., 2005). Previous research suggested that people can be classified into 3 different groups of risk attitudes, 1) Risk Averse, 2) Risk Neutral, and 3) Risk Seeking. Risk averse people are those who generally dissatisfy with uncertainty. They want to avoid or minimize threats from encountering risky situation and feel anxious about the outcomes of uncertainty. Risk neutral persons also dissatisfy with uncertainty. However, they displease the long-term uncertainty and would prepare to take short-term actions necessary to build long-term certainty. The risk seeking group, on the other hand, can tolerate uncertainty and tend not to avoid or minimize threats from risk. This group of people want to take advantage of the opportunities accompanying the uncertainty. They are ready to accept the outcomes of uncertainty (Roscoe, 1975). Risk attitude is a closely concept to the attitude towards level of risk acceptance. According to Sharpe (1964) and Lintner (1965), cited in Keeranan (2012), risk seekers see that "high risk means high expected return" (Keeranan, 2012). The relationship between risk attitude and level of risk acceptance is shown in Table:1.

Table 1: Links between Risk Attitude and Level of Risk Acceptance

Risk Attitude	Level of Risk Acceptance
1. Risk averse	Low
2. Risk neutral	Medium
3. Risk seeking	High

Although the three types of risk attitude are commonly addressed in northern American countries, Thailand somewhat unique culture appears to have some bearing on how Thai businessmen form their risk attitudes. In an interview with the executives of Pantainorasingh Manufacturer Company Limited., a small and medium enterprise (SME), viewed the hedging of exchange rate risks to be "The risks that SMEs tend to confront are loss of liquidity, increased interest and exchange rate fluctuations. In cases involving exchange rate risks, I want to recommend to businesses that we are not speculators, so we should accept what satisfies us. For example, if we calculate product prices today and use Forward to ensure our income amount in the next three months, we won't suffer losses for sure" (T.B.O., 2011). This view on hedging is similar to that of the executives from Thai Union Frozen Products Company Limited, "Thailand's implementation of the controlled floating of an exchange rate system caused businesses to have to manage exchange rate risks. Our company's policy is to use Natural Hedge method by matching US dollars amount of raw material purchases with US dollars of sales amount. The differences, if any, will be treated with a Forward agreement so as to see a clear and definite cost." (T.B.O., 2011) Both interview cases allude to the supposition that Thai businessmen tend to be in the 'Risk Averse' group.

Among many instruments that can be used to assess a person's risk attitude

and level of risk acceptance, Passive Risk Taking Scale (PRT) has been used in many studies. PRT was developed by Ruty Keinan and Yoella Bereby-Meyer in 2012 (Keinan & Bereby-Meyer, 2012). It contains 25 questions covering the following three aspects: 1) resources, 2) medical and 3) ethics. Each answer uses on a 7-point Likert scale with 1 being "Least frequently practiced" and 7 "Most frequently practiced." This instrument was chosen because it comprises questions covering risks related to daily life which are short, compact and capable of effectively measuring the risk attitudes of a person.

3. Learning Experience Using Game as a Teaching/Learning Tool

Modern educators have proposed the use of games as a teaching/learning tool because traditional instructional methods will not work with students in the Education 4.0 era. To motivate and get these students to crave for learning, the instructional method and material has to be fun and enjoyable. Instructional games can motivate learners to interact by attracting attention, building enthusiasm and fun while triggering learning of the lesson content hidden in games. The use of games as a teaching and learning tool appears to help creating learning motivation and consequently effective learning experience for students. This premise is supported by Malone's Motivation Theory (Malone, 1981). Game-based learning addresses all four factors of learning motivations: Challenge, Fantasy, Sensory Curiosity, and Control. Thus, there is no surprise that more and more computer games are used in learning at all levels of education. Also, one important group of Computer-Assisted Instruction (CAI) application is devoted to Instructional games according to Kemp & Smellie's (1994) CAI classification scheme (Kemp & Smellie, 1994).

A number of researchers have attempted to study various forms of learning methods. Experiential learning, which means knowledge created or forged through experience (Bruner, 1966), is one promising method of learning. Experiential learning has three main components namely, (1) Continuity, which means that students need to be given opportunities to frequently and continually practice the needed skills; (2) Sequence, which means sequencing from easy items to difficult items to ensure that students have more in-depth understanding of content, and (3) Integration, which means allowing students to express their ideas and opinions to align with the learning curriculum. The integration should increase students' learning capability because they would be able to apply their experience to different situations. Interaction between learners and their environment becomes the key process of this component (Tyler, 1971).

Prominent researchers in experiential learning like Kolb and Fry (1981) proposed 4 steps of experiential learning processes. The first step is for students to acquire Concrete Experience (CE). Learners should focus more on using feelings and real experience at time rather than trying to use systematic thinking to deal with the problem on hand. The second step is for students to learn by watching and listening. They effectively use Reflective Observation (RO) to understand the problem situation. The third step of experiential learning is for students to do Abstract Conceptualization (AC). Students at this step will engage in learning by thinking--cause and effect reasoning, analysis as well as synthesis will be employed instead of emotion and feeling being used as the basis of learning. In the last step for experiential learning is to have Active Experimentation (AE) where students will learn by doing, that is, to practice what they have learned so far. (Kolb & Fry, 1975) (Chukampang, 2006)

In sum, the hedge accounting of foreign currency rate exchange risks topic is important but complex. An individual will be more motivated to learn this subject if game-based instruction is used. Instructional game will enable more

productive learning experience and consequently result in better learning outcomes. The objective of present research is to develop an instructional game to help individuals learn how to select an effective hedging instrument that can prevent risks from foreign currency rate exchange. This instructional game will later be used as a data collection tool for the semi-experimental research. Leaning experience/outcome from game players will be measured and the experimental design will take into consideration the risk attitude and level of risk acceptance of each individual game-based learner.

3. Research Method

The present semi-experimental research design will use the mobile game developed to study game player experience and their learning outcome. This game is called the Hedge Accounting Game for Foreign Currency Exchange (HAGFCE, hereafter). The research design includes two independent variables, risk attitude /acceptance and play sequence of the hedge topics. Risk attitude is defined as high and low level of Risk acceptance level. The Sequences of hedge topic being played are "Fair value hedge before Cash flow hedge" and "Cash flow hedge before Fair value hedge." The dependent variable is the appropriate selection of hedge instruments for foreign currency exchange risks.

4. Research Design

A computer-based experiment will be conducted using the HAGFCE game developed for use on iPAD. Detailed design of the game and results of the full study is outside the scope of this manuscript. In brief, the experimental task requires subjects to do a pre-test questionnaire, play the game, and do a post-test questionnaire. The pretest has two parts, demographic data and assessment of personal risk attitude. The risk attitude scores will be calculated and used to divide subjects into two groups representing High and Low level of risk acceptance. During game play period, hedge practice exercises will be offered to game players--one group will play Fair Value Hedge first and Cash Flow Hedge later; another group will play Cash Flow Hedge before Fair Value Hedge. In the game, subjects will be asked to select the appropriate hedge instrument in the practice exercises. Brief tutorial and exercise solutions will be given. After game play, the subjects will do a hedge instrument selection case and the result will be used as their learning outcome. Subjects are also asked to do a post-test questionnaire to recheck their personal risk attitudes/ risk acceptance levels one more time.

In order to play the HAGFCE game, subjects should have some prior knowledge about the general concept of derivatives or hedges for currency exchange rates. Thus, students in the master degree program at a large public university will be recruited to the experiment. Since the research design comprises four groups (2 High/Low risk acceptance levels and 2 Play sequences of hedge topics), a total of 120 subjects will be used. This will give 30 subjects per groups, barely meeting the sample size needed as stated in the Rule of Thumb for statistical analysis (Roscoe, 1975). This is non-probability and judgmental sampling design.

Although previous researchers suggested that people have different types of risk attitude and subsequently risk acceptance levels which would be triggered during risk related decision situation, they did not agree on a "one size fits all" risk measure instrument. Neither do they have ideal numbers to differentiate high, medium, and low level of risk acceptance. While it is difficult enough to have a robust instrument to measure risk attitude and risk acceptance level, the difficulty extends multiple-fold when a person's belief, value system and cultural background are taken into consideration. In the present research, Passive Risk Taking Scale (PRT)

will be used to assess subjects' risk attitude and risk acceptance level. However, whether this risk measure instrument is good for use with Thai people is still questionable. Thus, a pilot study was carried out to check the applicability of PRT for Thai setting and to adjust this instrument as well as to obtain initial benchmark scores used as the basis for dividing subjects into the high/low risk acceptance groups in the full study. The following sections will report the results of pilot study.

5. Pilot study: Passive Risk Taking Scale for Thai Setting

The Passive Risk Taking Scale (PRT), developed by Keinan and Bereby-Meyer in 2012 (Keinan and etc., 2012), contains 25 statements for a person to rate. These statements were translated and back-translated into Thai by professional translator and edited by the researchers to ensure that they would portray their original meanings. The Thai version of the PRT was sent to 117 graduate students from three public, academic institutions. The objectives of the pilot study is twofold: to determine whether the risk attitude items are appropriate for Thai's culture and to systematically reduce the number of items in a manageable amount.

Thais' View of the Appropriateness of PRT Statements

As shown in Table 2, Item#10 "Always lock the house door when going to sleep" received the highest score (Mean=6.28, SD=1.35) on the practiced frequency rating and Item#18 received the lowest (Mean=2.81, SD=1.76). Among all 25 statements, 5 of them (#9, 12, 15, 16, 23) were rated to be inappropriate by more than 10% of the participants, only one statement (#21) more than 20%, and statement #18 "Ask the person I am dating about his/her sexual history" was rated to be inappropriate from 58.1% of respondents. Male and Female participants were similar in their appropriateness rating of the risk statements. For this reason, Statement #18 will not be included in the risk attitude assessment in Thai setting.

Although it appears that the PRT instrument is appropriate for Thai setting, except of the one statement stated earlier that will be excluded. However, with the left over 24 statements to be used, they will take too much time for a participant to answer during the pre-post experimental tasks. This is considered together with the amount of time needed for the participant to do other game play practice exercises and the final test of learning outcome. Thus, a systematic way to reduce the number of statements to be used in the main study is devised. The goal is to have the least numbers of statements that can reasonable represent the PRT's scheme as a viable instrument in this research. The shortened PRT will be referred to as Abridge-PRT hereafter.

Construction of the Abridged-PRT

To construct the Abridged-PRT, the researchers used the following four steps: 1) Apply Factor Analysis to the Thai's view of 24 statements; 2) Select statements from all factors with coefficient values or factor loading of $\pm$ 0.7 and up for the actual experiment; 3) Eliminate outliers from all sample groups and 4) Compare the mean score of the 25 questions with the mean score of the selected 13 items by using paired sample t-test to confirm effectiveness in measuring personal attitude toward risks.

Result from Step 1 and Step 2 is shown in Table 3, the component matrix. Nine factors were found with a total of 13 statements being selected based on the criteria that its Factor Loading have the value range of $\pm$0.7 and above. The statements constitute the Abridged-PRT including, Item# 3, 7, 8, 9, 12, 13, 14, 17, 19, 20, 22, 23 and 25.

Table 2: Descriptive Analysis for PRT Itemized Statements

Item#	Statement	Mean (SD), n=117	% App. : %Inapp. Total (N=117)
1	Buy an expensive product (computer, refrigerator) only after comparing prices in several stores.	5.25 (1.56)	99.1 : 0.9
2	Install an up to date anti-virus on my computer.	4.36 (1.83)	98.3 : 0.9
3	Check the credit card bill in detail every month.	4.86 (2.04)	93.2 5.1
4	Inquire all about a course before signing up (who is the lecturer, what are the topics, the assignments etc…	4.43 (1.55)	96.6 : 3.4
5	Read the fine print on any major document like a lease, an insurance policy or loan application.	5.18 (1.55)	99.1 : 0.9
6	Save receipts and warranty documents of major items in an organized fashion.	4.68 (1.66)	95.7 : 4.3
7	Check tolls and prices before calling long distance or overseas.	4.74 (1.7)	97.4 : 5.1
8	Back up all important files on the computer, including documents, pictures or videos.	4.76 (1.59)	97.4 : 1.7
9	Not save money regularly.	4.79 (1.72)	82.9 : 13.7
10	Always lock the house door when going to sleep.	6.28 (1.35)	92.3 : 7.7
11	Buy clothes without trying them on.	4.48 (1.65)	92.3 : 7.7
12	Buy a used car only after taking it to a complete check up in a licensed auto shop.	3.68 (2.33)	82.1 : 16.2
13	Immediately go to the doctor's when something in my body is aching or bothering me.	3.97 (1.53)	95.7 : 4.3
14	Have regular general medical check-ups every one or two years.	4.59 (1.87)	95.7 : 3.4
15	Get vaccinated for the flu in the winter.	2.63 (1.96)	84.6 : 14.5
16	Install an anti-collision device in the car.	4.37 (2.14)	88.9 : 10.3
17	Drive straight to the auto repair shop when the car makes a strange noise.	4.59 (1.54)	94.0 : 6.0
18	Ask the person I am dating about his/her sexual history.	2.81 (1.76)	41.9 : 58.1
19	Buy serious medical insurance when traveling to another country.	3.17 (1.91)	91.5 : 8.5
20	Always wear a seatbelt when sitting in the back seat.	2.88 (1.93)	94.9 : 5.1
21	Pay when parking in a blue-white zone as directed by the parking meter.	4.1 (1.95)	70.1 : 27.4
22	Change some part in the car (filter, strap, etc...) because the mechanic said it was old and due to fail.	4.83 (1.69)	92.3 : 6.8
23	Go through customs without declaring about goods I am bringing which are supposed to be taxed.	4.34 (2.04)	81.2 : 17.1
24	Report to social services about a child from the neighborhood that is being seriously neglected by his parents.	4.06 (1.92)	90.6 : 8.5
25	Not say anything when receiving too much change at the store.	5.47 (1.87)	94.0 : 6.0

Table 3: Component Matrix of the Factor Analysis of statements with Orthogonal Rotation

Statement No.	Factor Loading								
	1	2	3	4	5	6	7	8	9
Q_3	0.78	0.06	-0.027	0.111	0.02	0.267	0.005	0.084	-0.002
Q_7	0.778	-0.081	0.152	-0.293	0.073	-0.036	-0.033	0.094	0.032
Q_4	0.677	0.278	-0.018	0.284	0.025	-0.082	-0.076	0.044	-0.073
Q_5	0.599	0.388	0.152	0.143	0.215	-0.117	0.131	-0.012	-0.061
Q_6	0.459	0.288	0.294	-0.179	-0.129	0.403	0.102	0.027	0.225
Q_8	0.269	0.761	0.074	0.23	0.008	-0.087	0.006	0.111	-0.008
Q_22	-0.09	0.705	0.264	-0.127	0.18	0.255	-0.26	0.007	-0.074
Q_10	0.275	0.489	0.128	-0.218	0.029	-0.086	0.449	-0.24	-0.065
Q_17	0.06	0.248	0.803	0.104	0.047	-0.011	-0.054	-0.118	-0.133
Q_13	-0.003	0.062	0.73	0.14	0.224	0.046	0.172	0.198	0.25
Q_16	0.39	-0.023	0.511	0.151	-0.24	0.042	-0.396	0.011	-0.016
Q_2	0.161	0.358	0.396	0.101	0.144	-0.313	-0.01	0.263	0.207
Q_14	0.048	0.102	0.155	0.815	0.1	0.047	-0.041	0.085	0.039
Q_15	0.198	-0.163	0.342	0.561	0.12	0.229	-0.03	-0.157	0.195
Q_12	-0.014	0.071	-0.076	0.057	0.745	-0.049	-0.13	0.021	0.273
Q_19	0.112	0.074	0.243	0.114	0.73	0.081	0.007	-0.072	-0.171
Q_21	0.264	-0.033	0.307	-0.403	0.409	0.334	-0.25	0.101	-0.024
Q_20	-0.015	-0.048	-0.019	0.134	-0.064	0.748	0.11	0.008	0.177
Q_24	0.136	0.129	0.026	0.016	0.359	0.57	-0.096	0.108	-0.227
Q_23_Tran	-0.028	-0.083	-0.007	0.014	-0.174	0.091	0.786	0.104	-0.132
Q_9_Tran	0.168	0.194	-0.045	-0.01	-0.097	0.054	-0.214	0.791	-0.218
Q_11_Tran	0.028	-0.101	0.089	0.007	0.059	0.03	0.3	0.678	0.129
Q_25_Tran	0.142	0.151	-0.09	-0.254	-0.04	-0.012	0.236	0.057	-0.701
Q_1	0.264	0.457	-0.017	-0.217	0.046	0.205	0.081	0.016	ble

Step 3 and Step 4 are included so as to provide reasonable justification that the Abridged-PRT is good enough to be used as the instrument to assess risk attitude further in this research. Data from the Outliers were eliminated in Step 3 by using a Boxplot and visual examination. Eight outliers from a total of 117 respondents

were excluded, thereby leaving 109 samples to be analyzed in the next step. Step 4, the mean's comparison of the rating scores between the 25-item PRT and the 13-Abridged-PRT using Paired Samples T-Test, obtains results shown in Table 4 below:

Table 4: Paired Sample T-test for PRT and Abridged-PRT (N=109)

Instrument	Mean	Std. Deviation	Paired sample t-test	Correlation
PRT (25 Items)	4.3302	0.60233	0.795 (p=0.428)	0.910 (p=.000)
Abridged-PRT (13 Items)	4.3107	0.60518		

Mean comparison between the two instrument, PRT (25 items) and Abridged-PRT (13 items), are not significantly different (t-test = 0.795, p= 0.428). The average scores for the 25-item PRT is 4.33 (0.60, slightly higher than that of the 13-item Abridged PRT 4.31 (0.61). Also, the correlation between the two instruments is very high with r=0.91 (p=.000). From the analysis results, we are confident to use the Abridged PRT to assess risk attitude of subjects in the computer-experiment later. Also, the baseline average scores to be used to separate the respondents into high risk versus low risk groups is the Abridged-PRT score of 4.3.

6. Conclusion

Hedge accounting and derivatives are difficult concepts to comprehend. The main objective behind the present research is to develop an instructional game that will help students and game players learn the effects of using a given financial instrument to deal with the risks from foreign currency exchange rate fluctuation. Game players will also have ample opportunities to do accounting for various types of derivatives and hedging activities. The game, Hedge Accounting Game for Foreign Currency Exchange (HAGFCE), will then be used in a quasi-experimental study and the game players' learning experience and learning outcome will be examined.

The present manuscript gives a brief overview of this experimental design, including sampling procedures and factors affecting game players' learning experience and outcome. Data collection instrument, used to assess players' risk attitudes, the Passive Risk Taking Scale (PRT) were also discussed. Finally, this paper reports the detailed results from the pilot study conducted to systematically verifying whether the PRT can be used in Thai environment. The process of shortening the PRT into abridged version was presented as well.

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