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THE FACE AND CONTENT VALIDITY OF AN INSTRUMENT FOR MEASURING FINANCIAL RISK TOLERANCE

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ABSTRACT

Accurate evaluation of investment risk tolerance is critical in an investment decision-making process because a mismatch between the risk an investor could tolerate and the risk-return expectations could lead to frustration towards the actual financial gains or financial losses. This study aims to develop a valid instrument (or scale) for self-directed Malaysian investors to measure financial risk tolerance based on four main constructs, i.e., risk attitude, risk propensity, risk capacity, and financial literacy. An initial 36-item instrument was developed based on the assessment framework from Cordell (2001), which subsequently was examined by four lay experts for face validity. Consequently, according to Andrian et al. (2018), seven

professional experts, comprising theoretical, industry practitioner, and psychometric experts, were involved in reviewing the relevancy of the content of each item towards measuring financial or investment risk tolerance level. As a result, the instrument is deemed to have a good face value, with 94.4% of the items rated highly at 4 or 3 (out of the maximum rating of 4) by lay experts. Out of the 36 items, only 5.56% are rated 1 or 2, and 16.7% of the items require revision in terms of their face value and clarity. The content validity exercise resulted in high scores of more than 0.83 cut scores based on Lynn (1986) for the scale content validity index (S-CVI), with nine items recorded as item content validity index (I-CVI) below 0.83. The S-CVI improved further to 0.90 after the removal of items with low I-CVI. The findings have also successfully produced a valid instrument that can measure the financial risk tolerance level of investors in Malaysia.

Keywords: Content validity, face validity, financial risk tolerance, financial literacy, S-CVI.

INTRODUCTION

Background

The pandemic era has seen spectacular growth of self-directed investors entering the capital market globally. This has partly enabled structural changes in the capital market, such as easy cross-border access to online investment platforms, easy access to information, the emergence of social media investment gurus, and increasingly competitive transaction costs accessibility to new investment instruments. For instance, the number of new accounts created in Malaysia to trade digital assets such as cryptocurrency has increased by nearly 35% from January to September 2021 (Azman, 2021). For these self-directed investors, performing self-ascribed risk tolerance is one of the crucial steps to narrowing down the overwhelming choice of investment instruments. Unfortunately, many ventures are into investments without understanding their risk tolerance level.

In developed markets like the U.S., the usage of risk profiling or investment suitability assessment tools to assess investors' risk tolerance is common. It has long been practiced within the institutional space, i.e., by investment houses, banks, and insurance companies. Note that the assessment of risk tolerance is taken seriously by investment advisors

due to the nature of the commission structure, where the advisory fees are charged annually as a percentage of the investment value (U.S. Securities and Exchange Commission, 2013). This incentive structure motivates investment advisors to carefully assess their clients' risk tolerance before recommending any investments. In Malaysia, a one-off up-front sale-commission structure that ranges between 1% to 5% is still widely practiced by unit trust agents and financial consultants. This has led to the tendency of the unit trust agents to recommend popularly and historically performing funds to investors irrespective of the risk tolerance level of the investors. Recognizing this issue and the importance of risk matching, in 2022, the Securities Commission of Malaysia made it mandatory for licensed investment advisors or unit trust consultants where it prescribes a mandatory suitability assessment to be conducted by the investment advisors or unit trust consultants before making investment recommendations (Securities Commission Malaysia, 2019).

Consequent to the directives by the Securities Commission, all licensed investment houses have issued their version of a small set and untested risk tolerance assessment tool based on the issued guidelines. However, these assessment tools are observed to lack comprehensiveness in terms of factor coverage and sufficiency items to arrive at meaningful and reflective scoring. The same observation can be concluded for risk assessment tools issued by fund houses in developed markets like the U.S.

An accurate assessment of the financial or investment risk tolerance level is essential in the decision-making process as it helps investors to identify the right investment instruments that match the degree of fluctuations in investment returns that investors are willing to tolerate. However, a mismatch of risk, i.e., when an individual chooses investments that are either much higher or much lower than the risk tolerance level, could lead to frustration in terms of the actual financial gains or financial losses. Other than that, the study notes the absence of a financial literacy factor as part of the composite computation of risk tolerance levels in existing instruments in Malaysia as well as in markets like the U.S. and Australia (Rabbani et al., 2018). Hence, this readily available tool may not be ideal for self-directed investors to accurately gauge their risk tolerance level.

In Malaysia, there is quite a several research conducted to identify how certain determinants like financial literacy and the demographic profile of an individual contribute to the level of financial risk tolerance

(Akbulaev & Mammadova, 2021; Duasa & Yusof, 2013; Yong & Tan, 2017; Zakaria et al., 2017). There are also studies assessing the risk tolerance level among Malaysian investors (Karim et al., 2016; Chong et al., 2021). However, there is an absence of development of a valid and comprehensive investment risk tolerance assessment tool that self-directed investors can use to perform self-ascribed risk tolerance assessments specific to the Malaysian context. Risk assessment tools used by financial institutions in Malaysia commonly cover one or two elements of financial risk tolerance (Amanah Saham Nasional Berhad, 2022; Bayar et al., 2020; Phillip Mutual Berhad, 2022; Principal Asset Management Berhad, n.d).

Therefore, this study aims to establish a valid instrument to assess an individual's investment risk tolerance level. To achieve this, the research focuses on fulfilling the following research objectives:

1. To establish an initial item pool for the financial risk assessment instrument.
2. To examine the face validity of the initial item pool and improve the initial item pool.
3. To determine the content validity of the initial item pool and produce a revised item pool.

LITERATURE REVIEW

Risk Tolerance

Financial risk tolerance is the degree of uncertainty an individual is willing to accept when making a financial decision (Grable J. E., 2000). It reflects one's willingness to endure uncertain situations with the possibility of losing, to achieve a specific goal (Kogan & Wallach, 1964). Hence, from an investment or financial perspective, it is the number of uncertainties that investors are willing to accept to achieve a specific saving or investment goal, for instance, investing for retirement, investing for child education purposes, or saving to buy a car.

Risk Tolerance Theoretical Framework

Cordell (2001) proposed an assessment framework that determines risk tolerance level based on four factors (a) risk propensity – past

real-life decisions in financial situations, (b) risk attitude - willingness to incur monetary risk, (c) risk capacity – financial ability to incur risk, and (d) risk knowledge – understanding of risk and risk-return trade-off. In his research, Cordell posited that all four factors are positively related to each other, as demonstrated in Figure 1. For instance, risk attitude is influenced by risk capacity and risk knowledge but not vice versa.

Figure 1

Theoretical Framework of Financial Risk Tolerance Factors
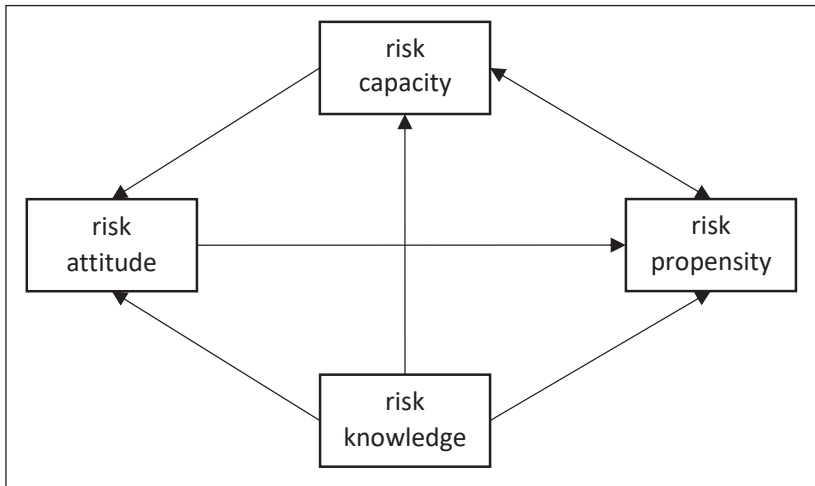
However, Cordell argued that in the absence of an assessment tool for risk knowledge and that the concept of investment risk may not be familiar to most individuals, the self-prescribed assessment might not be practical and result in inaccurate measures. Premised on Cordell's argument and the fact that the proposed instrument aims to serve self-directed investors, the risk knowledge factor is excluded from the calculation. Outside Cordell's framework, studies found that there is a significant positive relationship between financial literacy and the level of risk tolerance toward savings and investment (Bayar et al., 2020; Hermansson & Jonsson, 2021; Zakaria et al., 2017). Additionally, Bayar et al. (2020) showed that low financial literacy implies low-risk tolerance and deters investment participation. This is supported by a study by Hermanson and Jonsson (2021), which found that individuals with a lack of financial literacy tend to shy away from investments due to concerns about making losses.

Dependent Variable: Risk Tolerance

In constructing items for the construct and instrument, the risk tolerance level is utilized as the dependent variable, and the value is determined through indexing. In the absence of a standardized instrument to measure risk tolerance among Malaysian investors, references were made to instruments that have been used in the U.S. The first widely applied instrument to measure risk tolerance in the U.S. is the one-item Survey of Consumer Finances (SCF) introduced in 1983 by Avery et al. (1984) using four levels of risk and revised the scale to 11 levels of risk in 2016 (Kim et al., 2021). The second scale is a self-appraised risk tolerance level employed by many existing instruments, such as Finametrica , that aims to gauge the respondent's perception of their risk tolerance level. Meanwhile, the third scale is the investment holding question adopted by Grable & Lytton (2003) in their follow-up study to validate the original 13-item scale (Grable & Lytton, 1999). By adopting the SCF 4-level scale item, self-appraised risk tolerance level, and adapting Grabble and Lytton's investment holdings question with minor modifications to reflect more recent investment options readily accessible to retail investors, the risk tolerance level is computed by summing up the combined scores. Note that the study applied SCF's old 4-level scale instead of the revised 11-level scale due to the absence of evidence that the latter measure is better than the old one (Kim et al., 2021). The three questions are shown below:

Question 1: Adopted from SCF (1983)
"Which of the following statements come closest to the amount of financial risk you are willing to take when you save or make investments?

1. Take substantial financial risk expecting to earn substantial returns.
2. Take above-average financial risks expecting to earn above-average returns.
3. Take average financial risks expecting to earn average returns.
4. Not willing to take any financial risks.

Question 2: Self-appraised Financial Risk Tolerance
How would you rate your willingness to take financial risks?

1. Extremely low-risk taker

2. Low-risk taker
3. Average risk taker
4. High-risk taker
5. Extremely high-risk taker

Question 3: Grabble and Lytton (2003)

Suppose that you were to take a snapshot of your current financial position. Approximately what percentage of your total savings and investments are in the following categories?

1. Cash including fixed-deposit, ASB
2. Fixed income, including bond/Sukuk funds
3. Equities, including equity funds, individual stocks, direct business ownership, and real estate
4. Gold, bitcoin, forex, or derivatives instruments

The combined score for the three questions will be indexed and termed Financial Risk Tolerance Index (FRT Index). Subsequently, the FRT Index construction methodology will be further explained in the *Indexing FRT* sub-section of this paper.

Independent Variables: Risk Attitude, Risk Propensity, Financial Literacy, and Risk Capacity

This section will further elaborate on the operating definition of the study's four main constructs, i.e., Risk Attitude, Risk Propensity, Financial Literacy, and Risk Capacity.

Risk Attitude

Different people have different attitudes towards risk and exhibit different behaviors following their perceived beliefs (Hillson & Murray-Webster, 2004). The risk attitude plays an important and fundamental role in decision-making, especially in psychology and economics, as stated by Concina (2014) and Guiso et al. (2018), and is not necessarily stable and heterogeneous across risk types. Instead, an individual demonstrates a different level of risk attitude when engaging in different types of activities (Rohrmann, 2008). Risk attitude in the context of financial or investment space is the person's chosen response when facing the need to make financial choices to achieve specific financial goals where the outcome of the decision is uncertain.

Risk Propensity

According to Sitkin and Pablo (1992), risk propensity is described as "the tendency of a decision-maker either to take or to avoid risks," which depends on the nature of risk that the decision maker needs to face, e.g., risk in investing, risk in sports activities, and risk in office decision making. This means that a person's risk tolerance related to engaging in sports activities, for instance, could be different from risk tolerance when undertaking investment activities. Alternatively, Brockhaus Sr. (1980) establish another perspective to risk propensity by defining it as "the perceived probability of receiving rewards associated with successes of a certain situation, which an individual requires before he subjects himself to consequences associated with failure, the alternative situation providing less reward as well as less severe consequences than the proposed situation." Adapting this definition to the financial or investment setting, the propensity for financial risk-taking can be described as the perceived probability of getting investment returns from an investment instrument with an expected level of risk. In contrast, an alternative investment instrument with a lower expected return and lower expected risk are available for investment. The risk propensity of an individual is influenced by his or her own experience in investing and the capital market conditions that the person went through (Bucciol & Miniaci, 2018).

Kogan (1961) suggested that original Choice Dilemma Questions (CDQ) and CDQ-type questions within FinaMetrica and Kiplinger financial risk tolerance instruments are used as guides in creating an item pool for risk propensity. This study adapted the CDQs and Kiplinger's and made them more lay and relatable to Malaysia's investment context.

Financial Literacy

Financial literacy is the understanding and application of acquired financial-related knowledge, techniques, or skills that lead to good financial decisions (Fernando, 2021). The degree of financial literacy entails the development of skills through experience rather than mere possession of knowledge and information. It should not be equated with numeracy skills as it deals with broader applications and capitalizes on one's general cognitive talents (Hung et al., 2009). Recent studies have shown that the level of financial literacy affects a person's behavior and risk tolerance toward investments (Hendarto et al., 2021; Hermansson & Jonsson, 2021; Noviarini et al., 2021).

Risk Capacity

Risk capacity refers to one's financial capability to incur risk (Roszkowski et al., 2005). Holzhauer et al. (2016) suggested four yardsticks of a person's financial risk capacity – the level of equity, investment amount, net worth, and the number of years to retirement. At the same time, Hanna and Chen (1997) proposed a refined observation whereby risk capacity is based on wealth and age. In any case, a person with more net worth and wealth will be able to absorb more financial risk as the financial impact on this person is not as detrimental as compared to others. In coming up with the item pool for risk capacity, the ability to adjust financial goals, revenue expected from external sources like pensions rental income, and downside flexibility for withdrawal needs, as proposed by Brayman (2012), are considered.

METHODOLOGY

There are five steps involved in developing a valid financial risk tolerance assessment instrument. First, after subjecting the initial instruments to a rigorous evaluation process, the resulting instrument can be further utilized for reliability testing procedures and, consequently, pilot and field studies. References are made to various instrument development models by Ramli et al. (2020), Davis (1996), and Miller and Powers (1986) as guidance. The following Figure 2 presents the instrument development model used for this study.

Figure 2

Instrument Development Model
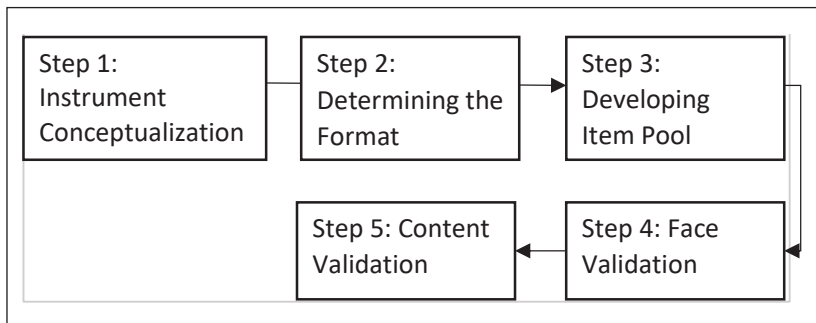
Step 1: Instrument Conceptualization

In the first stage, the concept of the instrument was developed by identifying the problem statement and scope of the problem, which led to the formulation of research questions and objectives. This has helped to establish the intended purpose of the test instrument, given that cores produced from the test instrument could represent either absolute or relative measures (Roszkowski et al., 2005). In this case, this study aimed to produce scores that measure an individual's relative financial risk tolerance. This study's targeted respondents are individuals who are interested in investing in various investment platforms.

For future reliability testing, the study has also established a construct that could measure the dependent variable. This process is needed due to the absence of reliable data or a financial risk tolerance index that can be employed immediately as the dependent variable for this study. Another construct included in the study is demographic profiling, which serves as a complementary construct.

Figure 3

Conceptual Framework of Financial Risk Tolerance
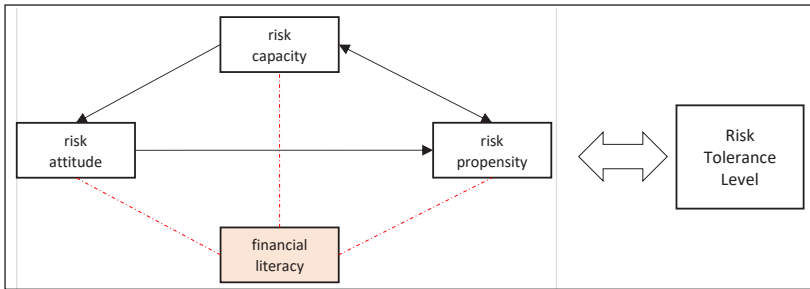
After defining the conceptual framework, each construct's conceptual and operational definitions are established based on Ramli et al. (2020).

Step 2: Determining the Format & Writing Instructions

In this second stage, the instrument plan started with the preparation of writing instructions which will be disseminated to each of the lay and professional experts.

There are several types of writing instructions in this study which are customized for the lay experts; professional experts comprising industry practitioners and theoretical experts, psychometric experts; and lastly, the actual respondents who will partake in the survey. The writing instruction for lay experts focuses on the clarity of the items, which is to rate the clarity of the questions as to whether they are easy to understand and less likely to cause misinterpretations or confusion.

Meanwhile, the writing instruction for the professional expert focuses on the relevance of the questionnaire, which is to rate the relevancy of the questions as to whether the question is useful and connected in assessing the aspect they intend to measure. It is also worth noting that the instructions for the psychometric expert were written slightly differently from the rest of the professional experts, as the expert will focus more on the psychometric aspects of the instruments.

Finally, the writing instruction for the respondents focuses on the instructions on how they are going to answer the survey. Items on the dependent variable will be a combination of interval, ordinal, and ratio scales for all the main constructs, i.e., Risk Attitude, Risk Propensity, Financial Literacy, and Risk Capacity, with the 5-point numerical interval scale used from 1=Strongly Disagree to 5=Strongly Agree. The interval scale was chosen premised on its flexibility to be further analyzed using various statistical testing techniques, minimizes missing values, no occurrence of outliers, and is easy to use by respondents (Chyung et al., 2017).

To ease the rating and scoring exercises by the lay experts, professional experts, and respondents, the dropdown menu – where the list of options will appear automatically for selection – will be applied for all items except Question 3, where the respondent would need to impute the asset allocation percentages in the relevant boxes.

Step 3: Developing Initial Item Pool

As Davis (1996) suggested, the inductive approach is used in developing the initial item pool where the researchers have conducted a comprehensive literature search on financial risk tolerance assessments. In the absence of a deductive process, i.e., focus group discussion, items were adapted from the financial risk tolerance instruments (commonly referred to as Investor Suitability Assessment) presently used by Malaysia-based financial service providers, e.g., Principal Asset Management, Hong Leong Asset Management, Public

Mutual & Phillip Mutual's versions of Investor Suitability Assessment Form. It also includes some instruments utilized by global financial service providers to create the initial item pool, namely FinaMetrica's 24-Item Risk Tolerance Questionnaire, Fidelity International's 10-item Risk Tolerance Assessment as well as Grable and Lytton 13-item Risk Tolerance Scale (Gilliam et al., 2010). This ensures the comprehensiveness and practicality aspects of the initial item pool within the Malaysian context.

Based on the stated process, the instrument is developed based on the theoretical framework by Cordell (2001), which consists of four item constructs: risk attitude, risk propensity, risk knowledge, and risk capacity. In addition, a construct on demographic profile and a new construct on financial literacy is included based on their proven strong association with financial risk tolerance. However, the risk knowledge construct was excluded from the theoretical framework due to the impracticality of the construct to be answered by self-directed investors. This was previously highlighted in our literature review section.

Because financial risk tolerance is not commonly known to laymen, especially to individuals with no training in finance, each item is reviewed by the research team mainly to reduce the usage of financial and technical terms and make the questions more conversational. Therefore, items comprised both positive (risk averting) and negative items (risk seeking) concerning financial risk tolerance (Magendans et al., 2017).

The study has developed 36 items in the initial item pool, double the number of items in the final instrument, summarized in Table 1. Please refer to Appendix 1 for the list of questions proposed in this study.

Table 1

Summary of Initial Item Pool

No.	Construct	Number of initial item pool	Number of target item pool
1	Financial risk tolerance (dependent variable)	3	3
2	Risk attitude	8	3

(continued)

No.	Construct	Number of initial item pool	Number of target item pool
3	Risk propensity	8	3
4	Financial literacy	6	3
5	Risk capacity	6	3
6	Demographic	5	3
	Total	36	18

Indexing Financial Risk Tolerance (Dependent Variable)

To index the dependent variable, i.e., financial risk tolerance, answers for Question 1, Question 2, and Question 3 will be scored. Details of the scoring and indexing are explained in the following paragraphs. The summed scores of these three questions will be indexed, with each getting 1/3 of the weight of the score. The FRT Index will have a value from 1 to 5, which are then mapped to the respective categories as depicted in Table 2b.

Question 1
In making investments, I am willing to take high financial risk, i.e., a high possibility of losing money, when expecting to earn high financial returns.

Rating by respondent on a 5-point numerical scale	Points
1	1
2	2
3	3
4	4
5	5

Question 2
How would you rate your willingness to take financial risks?

Rating by respondent on a 5-point ordinal scale	Points
Extremely low-risk taker	1
Low-risk taker	2
Average risk taker	3
High-risk taker	4
Extremely high-risk taker	5

Question 3

Suppose that you were to take a snapshot of your current financial position. Approximately what percentage of your total savings and investments are in the following categories?

Table 2a

Financial Risk Tolerance Indexing Method

Asset Class	% Allocation Weight (X_t)		Points Points (P_t)	Weighted Points A x B
1 Cash, including fixed deposits at banks, money market funds, ASB, Tabung Haji	X_1	%	1	X_1 x P_1
2 Bonds/Sukuk/Fixed-income/ Shariah-compliant Fixed-income funds that primarily invest in this asset class.	X_2	%	2	X_2 x P_2
3 Stock funds primarily invest in this asset class.	X_3	%	3	X_3 x P_3
4 Business ownership, private equity, or real estate.	X_4	%	4	X_4 x P_4
5 Gold, bitcoin, forex, or derivatives instruments.	X_5	%	5	X_5 x P_5
Total	**100**	%		$\sum X_t$ x P_t

Table 2b

FRT Index and Corresponding Risk Categories

Risk categories	FRT index range
Conservative	$1.0 \leq$ FRT index < 1.5
Moderately conservative	$1.5 \leq$ FRT index < 2.5
Moderate	$2.5 \leq$ FRT index < 3.5
Moderately aggressive	$3.5 \leq$ FRT index < 4.5
Aggressive	> 4.5

Scoring for Explanatory Variables

The explanatory variables are represented by each item under the four-item constructs. The score for each item will be the rating assigned

by the respondent based on the 5-point interval scale rating of 1= Strongly Disagree to 5 = Strongly Agree.

Step 4: Face Validation

At this stage, for face validity, the questionnaire was given to four lay experts on the research topic. Then, the face validity was conducted through email to the lay expert.

The study applied a total of four lay experts for the face validation exercise. The lay experts were selected based on two criteria. Firstly, it depends on the experts' willingness to participate in the study, and secondly, the experts must represent individuals with various levels of experience in investing. These two criteria became the requirement in selecting lay experts for the face validation process. For this study, lay experts with various levels of investment experience ranging from three to 23 years of personal investment experience are appointed. Note that the experts come from different backgrounds and working environments.

The lay expert evaluated the instrument on the clarity of the questions, as in whether the question is easy to understand and less likely to cause misinterpretations or confusion. Subsequently, the experts rated the questionnaire concerning problem, ambiguity, clarity, correct terminology and grammar, and comprehension using a 4-point ordinal scale as depicted in Table 3. The detail of the lay experts is summarized in Table 4.

Table 3

Scale for Face Validation

	1	2	3	4
Clarity	Not clear	Need some revision	Clear but need minor revision	Very clear

Table 4

Details of Lay Experts

Experts #	Expertise	Experience (years)	Institution
Expert 1	Personal investor - equity, unit trust	10	Muamalat Invest Sdn Bhd
Expert 2	Personal investor – property, equities, unit trusts	6	Renoir Consulting
Expert 3	Personal investor – unit trust	3	Securities Commission
Expert 4	Personal investor – unit trust, direct investment	23	Institut Kefahaman Islam Malaysia

The study considers feedback and recommendations from the expert to enhance the instrument of the study. This step is critical to ensure that individuals with different levels of investment experience can easily understand the questionnaire.

Step 5: Content Validation

After the face validation stage, the revised items of the instrument are compiled for further scrutiny and review by professional experts on the relevancy of the content. The role of professional experts is to rate the relevance of the items as to whether an item is useful and relevant in assessing the risk tolerance level. For instance, under the Risk Attitude segment, the expert will be assessed as to whether the statement "*When I am thinking about risk, I also think about possible losses*" is relevant in measuring the risk attitude of an investor. The content validity was conducted through email to the professional expert. Content validation refers to the degree to which an instrument includes an acceptable sample of items for the construct being assessed (DeVellis & Thorpe, 2021). It is divided into two types, namely, the I-CVI, which measures the content validity of individual items, and the S-CVI, which calculates the content validity of the overall scale (Hadi et al., 2020).

Content validity is performed at both item and instrument levels. The experts will rate each item's degree of relevance based on the four-point ordinal rating scale. For example, if the expert chooses 1 or 2, the value used is '**0**'; if the expert chooses 3 or 4, then the value used

is '**1**'. The assigned '0' or '1' for each item will be used to compute the item-level content validity using the I-CVI and instrument-level content validity using the S-CVI.

Table 5

Scale for Content Validation

	1	2	3	4
Rating	Not relevant	Somewhat relevant	Quite relevant	Highly relevant
Corresponding Score	0	0	1	1

The study appointed seven professional experts for the content validation exercise. The professional experts comprised three experienced personnel from the financial sector, one psychometric expert, and three theoretical experts. The details of the experts are summarised in Table 6. Past research concluded different opinions on the recommended number of experts to provide sufficient control of chance agreement. Apart from that, Rubio et al. (2003) recommended three to ten experts in each group of professional and lay experts, and Lynn (1986) suggested that five experts would be sufficient. However, only three experts were accepted for the area where the number of experts is limited (the number of experts should not exceed ten).

With seven experts, the acceptable CVI value is 0.83 (Lynn, 1986). This means that to ensure that the instrument has a high level of validation, items with low I-CVI will have to be excluded from the instrument.

Table 6

Details of Professional Experts

Experts	Expertise	Experience (years)	Institution
Expert 1	Corporate Governance, Auditing, and Financial Reporting Quality	20	Universiti Utara Malaysia
Expert 2	Economics, Business and Management, Social Sciences	18	Universiti Utara Malaysia

(continued)

Experts	Expertise	Experience (years)	Institution
Expert 3	Fund management: portfolio management, wealth management, unit trust	2	Public Mutual Berhad
Expert 4	Fund management: portfolio management, business development	30	Kenanga Islamic Investors Berhad
Expert 5	Fund management: regulatory and compliance	32	Masyref Shariah Advisory
Expert 6	Fund management: portfolio management, wealth management, regulatory	30	CGS-CIMB Sdn Bhd
Expert 7	Committee Member of the Malaysian Psychometrics Association, American Educational Research Association National Council on Measurement in Education, 2014- 2019	10	Universiti Utara Malaysia

RESULTS & FINDINGS

Conceptualization and Initial Item Pool

Initial item pools were demonstrated to make scale comparisons of properly defined item pools easier. The constructs and their respective initial items pool are summarised in Table 7 below:

Table 7

Summary of the Initial Items

No	Segments	Types of variables	Number of initial items	Question numbers
1	Risk tolerance	Dependent (y)	3	1 to 3
2	Risk attitude	Independent (x)	8	4 to 11
3	Risk propensity	Independent (x)	8	12 to 19
4	Financial literacy	Independent (x)	6	20 to 25
5	Risk capacity	Independent (x)	6	26 to 31
6	Demographic	Not Applicable	5	32 to 36

Based on the conceptual definitions described in the Literature Review section, the operational definitions of the main factors have been developed following Ramli et al. (2020) study, as presented in Table 8.

Table 8

Operational Definition Involved in the Project

Construct	Aspect (Operational Definition)
Risk tolerance	• Understanding the amount of financial risk willingness towards saving or investment. • Identification of different types of risk takers. • Understanding actual risk appetite based on asset allocation behavior.
Risk attitude	• Measurement of risk attitude when facing financial challenges. • Measurement of the attitude on risk and return dynamics. • Understanding the level of importance assigned to having financial security.
Risk propensity	• Choice's evaluation of the investment is based on the chances of the occurrence. • The understanding tendency toward risk-taking vs. risk-averting situations. • Evaluation of the tendency toward capital protection against
Financial literacy	• Understanding personal financial management acumen based on healthy financial practices like budgeting and savings. • Evaluating established knowledge in various types of financial products. • Assessing established habits of financial planning before making a financial decision.
Risk capacity	• Establishing a level of financial safety. • Understanding the financial capability to withstand loss-making investments over a long-term period. • Measurement of financial readiness and available resources when facing unforeseen financial challenges.

Face Validation on Initial Item Pool

All four invited public experts returned their answers. Generally, from the face validation, all participants stated that all items of the questionnaire were simple, clear, and understandable. Of the 36 questions, the percentage of items rated as 4 is 73.61%. Meanwhile, 20.83% of the items were rated 3, and the rest of the items were rated either 2 or 1. Therefore, the study paid closer attention to questions that were rated 1 or 2, whereby these low-rated items were refined and revised based on comments and suggestions by lay experts. After analyzing the responses, no items were removed at this stage.

Based on the results, six items from the segments have been revised to ensure the questions would convey the topic clearly and be easily understood. The revisions involved replacing technical terms with layman terms, reducing double-barrelled statements to single-objective statements, and simplifying the sentence structure for easier understanding. The summary of changes made from the face validity process is displayed in Table 9.

Table 9

Results of the Face Validation

Segment	The initial number of items in the instrument	Number of the items that have been revised	Number of surviving items
Segment 1: Risk tolerance	3	1	3
Segment 2: Risk attitude	8	2	8
Segment 3: Risk propensity	8	1	8
Segment 4: Financial literacy	6	0	6
Segment 5: Risk capacity	6	2	6
Segment 6: Demographic	5	0	5
Total	36	6	36

The lay experts exchanged views on the instrument's adequacy and inspected some items' wording for clarity and so on. After review, the initial instrument was ready for content validity assessment. The revised instrument is enclosed as *Appendix 1 – Instrument for Content Validation*.

Content Validation on Initial Item Pool

Table 10 summarizes the result of the content validation exercise on the 36 initial item pool. The overall S-CVI stood at 0.85, with nine items recorded below the 0.83 threshold of I-CVI (Lynn, 1986). To improve the instrument's validity, items with an I-CVI below 0.83 are excluded. This has resulted in a higher S-CVI of 0.90, with all items having an I-CVI of at least 0.83.

Table 10

Items with Low I-CVI

	Original number of Items	Items with Low I-CVI & Removed (I-CVI Value) [1]	Number of Surviving Items
Segment 2: Risk attitude	8	Item 6 (0.57)	7
Segment 3: Risk propensity	8	Item 13 (0.71), 15 (0.57), 17 (0.71) & 19 (0.71)	4
Segment 4: Financial literacy	6	Item 21 (0.71)	5
Segment 5: Risk capacity	6	Item 26 (0.71), 28 (0.71) & 31(0.71)	3

[1] Please refer to Appendix 1 to view the items.

In addition to the rating assignments, our professional experts have also provided invaluable feedback on the instruments, which have been considered to further improve the instruments. As a result, there are a total of six revisions made to the items. Revisions made do not involve changing the content but improving the representation and perspective of the items. Some of the key feedback that has been considered in revising the items are on the inclusion of commodity asset class (instead of gold only) in item 3, the inclusion of a time element in item 29 to improve clarity and perspective for respondents and to transform from the statement of 'knowing' to a statement of 'comprehend or use' for item 23. The other three revisions relate to the scale for and positioning of demographic questions and the choice of words used in the sentence. Following the exclusions of low I-CVI items and revisions made to the items based on feedback from professional experts, the final validated instrument is established. This validated instrument is available upon request.

CONCLUSION

This research discussed the process of development and validation of a newly developed FRT Assessment instrument. Other than that, the conceptualization and development of the instruments were carried out using an inductive process approach based on the literature of Cordell (2001) and Kim et al. (2021) on the subject, as well as existing instruments used by financial institutions in Malaysia (Amanah Saham Nasional Berhad, 2022; Phillip Mutual Berhad, 2022; Principal Asset Management Berhad), the U.S. (Fidelity Asset Management Services, 2022; Vanguard, 2022; Charles Schwab, 2022) and Australia (Lifegro Pty Ltd., 2022; Morgans Financial Limited, 2022). This includes the establishment of the conceptual and operational definitions for each construct within the instrument, which formed the basis for the 36 initial item pool. Furthermore, from the inductive process, the Construct of Risk Knowledge, originally in Cordell's framework, is removed due to the practicality aspect. Meanwhile, the Financial Literacy construct was introduced based on evidence that shows a high association of this factor to the risk tolerance level of an individual discovered (Hermansson & Jonsson, 2021; Noviarini et al., 2021), which is expected to improve the validity of the instrument.

Based on the face validity exercise, it can be observed that the established instrument has high face validity as only 5.56% of the items rated 1 or 2, and 16.7% of the items require revision in terms of their face value and clarity. The constructs did not have any serious issues in terms of clarity and usability by respondents with various levels of investment experience. In terms of content validity, it can be deduced that the established instrument has high content validity, as evidenced by the S-CVI value of 0.85, higher than the cut score of 0.83. Note that the S-CVI improved further to 0.90 after the removal of low I-CVI items. The validated instrument has a total of 27 final items.

Overall, the research has succeeded in producing a valid instrument that can measure the financial risk tolerance level of self-directed investors in Malaysia. This validated instrument is expected to be further utilized for pilot and field studies where confirmatory factor analysis can be done to identify the association between the Financial Literacy Construct and the other main constructs – Risk Attitude, Risk Propensity, and Risk Capacity. Additionally, reliability testing can also be performed together with the established FRT Index to identify

the internal consistency of the instrument, determining whether the instrument can be practically published for public usage.

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REFERENCES

Akbulaev, N., & Mammadova, M. (2021). Demographic analysis of financial literacy level in Azerbaijan. *Universal Journal of Accounting and Finance, 9*(3), 316-328. https://ssrn.com/abstract=3857452

Amanah Saham Nasional Berhad. (2022). ASNB. https://www.asnb.com.my/

Andrian, D., Kartowagiran, B., & Hadi, S. (2018). The Instrument development to evaluate local curriculum in Indonesia. *International Journal of Instruction, 11*(4), 921-934. https://doi.org/10.12973/iji.2018.11458a

Avery, R. B., Elliehausen, G. E., Canner, G. B., & Gustafson, T. A. (1984). Survey of consumer finances, 1983. *Federal Reserve Bulletin, 70*, 679-692.

Azman, N. H. (2021, 1 November). Investments in cryptocurrencies increasing steadily in Malaysia. *The Malaysian Reserve.* https://themalaysianreserve.com/2021/11/01/investments-in-cryptocurrencies-increasing-steadily-in-malaysia/

Bayar, Y., Sezgin, H. F., Öztürk, Ö. F., & Şaşmaz, M. Ü. (2020). Financial literacy and financial risk tolerance of individual investors: Multinomial logistic regression approach. *SAGE Open, 10*(3). https://doi.org/10.1177/2158244020945717

Brayman, S. (2012). Defining and measuring risk capacity. *Financial Services Review, 21*(2), 131-148.

Brockhaus Sr, R. H. (1980). Risk taking propensity of entrepreneurs. *Academy of Management Journal, 23*(3), 509-520. https://doi.org/10.2307/255515

Bucciol, A., & Miniaci, R. (2018). Financial risk propensity, business cycles and perceived risk exposure. *Oxford Bulletin of Economics and Statistics*, *80*(1), 160-183. https://doi.org/10.1111/obes.12193

Bujang, M. A., Omar, E. D., & Baharum, N. A. (2018). A review on sample size determination for Cronbach's Alpha test: A simple guide for researchers. *Malaysian Journal of Medical Sciences, 25*(6), 85-99. https://doi.org/10.21315/mjms2018.25.6.9

Charles Schwab. (2022). *charlesSCHWAB*. https://www.schwab.com/

Chong, S. C., Heng, H. K., Lim, S. J., Navaratnam, V., & Neoh, A. Z. (2021). Financial risk tolerance: the case of older Chinese in Klang Valley, Malaysia 2020. *International Journal of Financial Research, 12*(2), 1-9. https://doi.org/10.5430/ijfr.v12n2p1

Chyung, S. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-based survey design: The use of a midpoint on the Likert scale. *Performance Improvement, 56*(10), 15-23. https://doi.org/10.1002/pfi.21727

Concina, L. (2014). *Risk attitude & economics*. Foundation for an industrial safety culture (Foncsi). http://www.foncsi.org/

Cordell, D. M. (2001). RiskPACK: How to evaluate risk tolerance. *Journal of Financial Planning, 14*(6), 36-40.

Cordell, D. M. (2002). Risk tolerance in two dimensions. *Journal of Financial Planning, 15*(5), 30-35.

Davis, A. E. (1996). Instrument development: Getting started. *Journal of Neuroscience Nursing, 28*(3), 204-208. https://doi.org/ 10.1097/01376517-199606000-00009

Deck, C., Lee, J., & Reyes, J. (2008). Risk attitudes in large stake gambles: Evidence from a game show. *Applied Economics, 40*(1), 41-52. https://doi.org/10.1080/00036840701235704

DeVellis, R. F., & Thorpe, C. T. (2021). *Scale development: Theory and applications*. SAGE publications.

Duasa, J., & Yusof, S. A. (2013). Determinants of risk tolerance on financial asset ownership: A case of Malaysia. *International Journal of Business & Society, 14*(1), 1-16.

Fernando, J. (2022, 13 October). *What is financial literacy, and why is it so important?*. https://www.investopedia.com/terms/f/financial-literacy.asp

Fidelity Asset Management Services. (2022). *Fidelity asset management services*. https://www.fidelitybankinvestments.com/

Gibson, R. J., Michayluk, D., & Van de Venter, G. (2013). Financial risk tolerance: An analysis of unexplored factors. *Financial Services Review, 22*(1), 23-50.

Gilliam, J., Chatterjee, S., & Grable, J. (2010). Measuring the perception of financial risk tolerance: A tale of two measures. *Journal of Financial Counseling and Planning, 21*(2), 30-43. https://ssrn.com/abstract=2061313

Grable, J. E. (2000). Financial risk tolerance and additional factors that affect risk taking in everyday money matters. *Journal of Business and Psychology, 14*, 625-630. https://doi.org/10.1023/A:1022994314982

Grable, J., & Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial services review, 8*(3), 163-181. https://doi.org/10.1016/S1057-0810(99)00041-4

Grable, J., & Lytton, R. H. (2003). The development of a risk assessment instrument: A follow-up study. *Financial Services Review, 12*(3), 257-274.

Guiso, L., Sapienza, P., & Zingales, L. (2018). Time varying risk aversion. *Journal of Financial Economics, 128*(3), 403-421. https://doi.org/10.1016/j.jfineco.2018.02.007

Hadi, H. J., Omar, M. A., Osman, W. R., Ibrahim, M. F., & Hussaini, M. (2020). Performing a content validity: Establishing a reliable instrument to measure the intention to adopt cloud computing software as a service in public organization. *Journal of Theoretical and Applied Information Technology, 98*(22), 3531-3540.

Hanna, S. D., & Chen, P. (1997). Subjective and objective risk tolerance: Implications for optimal portfolios. *Financial Counselling and Planning, 8*(2), 17-26. doi:10.2139/ssrn.95488

Hendarto, K., Anastasia, N., & Basana, S. R. (2021). The effect of financial literacy, financial risk tolerance, and financial socialization agents on stock investment decision in the millennial generation. *Petra International Journal of Business Studies, 4*(1), 11-22. https://doi.org/10.9744/ijbs.4.1.11-22

Hermansson, C., & Jonsson, S. (2021). The impact of financial literacy and financial interest on risk tolerance. *Journal of Behavioral and Experimental Finance, 29*, 100450. https://doi.org/10.1016/j.jbef.2020.100450

Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. *Research in Nursing and Health, 31*(2), 180-191. https://doi.org/10.1002/nur.20247

Hillson, D., & Murray-Webster, R. (2004). *Understanding and Managing Risk Attitude*. Gower Publishing Limited.

Holzhauer, H. M., Lu, X., McLeod, R., & Wang, J. (2016). RiskTRACK: The five-factor model for measuring risk tolerance. *The Journal of Risk Finance, 17*(4), 428-445. https://doi.org/10.1108/JRF-04-2016-0054

Hung, A. A., Parker, A. M., & Yoong, J. K. (2009). *Defining and Measuring Financial Literacy.* RAND Corporation.

Karim, B. A., Wenceslas, C. N., & Shukri, M. H. (2016). Risk tolerance level among working adults in Kuala Lumpur Malaysia. *UNIMAS Review of Accounting and Finance, 1*(1).

Kim, K. T., Hanna, S. D., & Ying, D. (2021). The risk tolerance measure in the 2016 survey of consumer finances: New, but is it improved? *Journal of Financial Counseling and Planning*, 86-103. http://dx.doi.org/10.1891/JFCP-19-00022

Kogan, N. (1961). Attitudes toward old people: The development of a scale and an examination of correlates. *Journal of Abnormal and Social Psychology, 62*, 44-54. https://doi.org/10.1037/h0048053.

Kogan, N., & Wallach, M. A. (1964). *Risk Taking: A Study in Cognition and Personality.* Holt, Reinhart and Winston.

Kundi, B., Hashim, S., & Kanwal, A. (2017). Multinomial logistic analysis of income level of salaried class on financial risk tolerance. *Journal of Managerial Sciences, XI*(04), 205-212.

Lifegro Pty Ltd. (2022). *Lifegro Financial Planning.* https://lifegro.com.au/

Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research, 35*(6), 382-386.

Magendans, J., Gutteling, J. M., & Zebel, S. (2017). Psychological determinants of financial buffer saving: the influence of financial risk tolerance and regulatory focus. *Journal of Risk Research, 20*(8), 1076-1093. https://doi.org/10.1080/13669877.2016.1147491

Meertens, R. M., & Lion, R. (2008, May). Measuring an individual's tendency to take risks: the risk propensity scale. *Journal of Applied Social Psychology, 38*(6), 1506-1520. https://doi.org/10.1111/j.1559-1816.2008.00357.x

Miller, J. F., & Powers, M. J. (1986). Development of an instrument to measure hope. *Nursing Research, 37*(1), 6-10.

Morgans Financial Limited. (2022). *Morgans.* https://www.morgans.com.au/

Noviarini, J., Coleman, A., Roberts, H., & Whiting, R. H. (2021). Financial literacy, debt, risk tolerance and retirement preparedness: Evidence from New Zealand. *Pacific-Basin Finance Journal, 68,* 101598. https://doi.org/10.1016/j.pacfin.2021.101598

Phillip Mutual Berhad. (2022). *Phillip Mutual Berhad.* https://www.phillipmutual.com/

Principal Asset Management Berhad. (n.d.). *Principal.* https://www.principal.com.my/

Rabbani, A., O'Neill, B., Lawrence, F., & Grable, J. (2018). The investment risk tolerance assessment: A resource for extension educators. *The Journal of Extension, 56*(7), Article 3. https://tigerprints.clemson.edu/joe/vol56/iss7/3

Ramli, N. F., Talib, O., Hassan, S. A., & Manaf, U. K. (2020). Development and validation of an instrument to measure STEM teachers' instructional preparedness. *Asian Journal of University Education, 16*(3), 193-206.

Raykov, T., & Marcoulides, G. A. (2010). *Introduction to Psychometric Theory* (1st ed.). Routledge.

Rohrmann, B. (2008). *Risk perception, risk attitude, risk communication, risk management: A conceptual appraisal* [Paper presentation]. 15th International Emergency Management Society Annual Conference, 2008.

Roszkowski, M. J., Davey, G., & Grable, J. E. (2005). Insights from psychology and psychometrics on measuring risk tolerance. *Journal of Financial Planning, 18*(4), 66-77.

Rubio, D. M., Berg-Weger, M., Tebb, S. S., Lee, E. S., & Rauch, S. (2003). Objectifying content validity: Conducting a content validity study in social work research. *Social Work Research, 27*(2), 94-104. https://doi.org/10.1093/swr/27.2.94

Securities Commission Malaysia. (2019, 19 July). *Guidelines on Sales Practices of Unlisted Capital Market Products.* Securities Commission Malaysia.

Sitkin, S. B., & Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *The Academy of Management Review, 17*(1), 9-38. https://doi.org/10.2307/258646

U.S. Securities and Exchange Commission. (2013, March). *Regulation of Investment Advisers*. Staff of the Investment Adviser Regulation Office Division.

Vanguard. (2022). *Vanguard.* https://investor.vanguard.com/corporate-portal/

Whitehead, A. L., Julious, S. A., Cooper, C. L., & Campbell, M. J. (2016). Estimating the sample size for a pilot randomized trial to minimize the overall trial sample size for the external pilot and main trial for a continuous outcome variable. *Statistical Methods in Medical Research, 25*(3), 1057-1073. https://doi.org/ 10.1177/0962280215588241

Yong, H. N., & Tan, K. L. (2017). The influence of financial literacy towards risk tolerance. *International Journal of Business and Society, 18*(3), 469-484. https://doi.org/10.33736/ijbs.3139.2017

Zakaria, Z., Nor, S. M., & Ismail, M. R. (2017). Financial literacy and risk tolerance towards saving and investment: A case study in Malaysia. *International Journal of Economics and Financial Issues, 7*(4), 507-514.

Appendix 1
The Instrument for Content Validation

No.	Indicators

Segment 1: Risk Tolerance (Questions 1-3)

1

In making investments, I am willing to take high financial risk, i.e., a high possibility of losing money, when expecting to earn high financial returns.

Answer 5-point numerical scale:
1 = Strongly Disagree to 5 = Strongly Agree
How would you rate your willingness to take financial risks?

2

1. Extremely low-risk taker
2. Low risk taker
3. Average risk taker
4. High risk taker
5. Extremely high-risk taker

Suppose that you were to take a snapshot of your current financial position. Approximately what percentage of your total savings and investments are in the following categories?

3

1	Cash, including fixed deposits at banks, money market funds, ASB, and Tabung Haji.	…………… %
2	Bonds/ Sukuk/ Fixed-income/ Shariah-compliant fixed-income funds that primarily invest in this asset class.	…………… %
3	Stock funds primarily invest in this asset class.	…………… %
4	Business ownership, private equity, or real estate.	…………… %
5	Gold, bitcoin, forex, or derivatives instruments.	…………… %
	Total	**100.00 %**

No.	Indicators
	Segment 2: Risk Attitude (Questions 4-11)
4	My main goal when investing is that it needs to increase in value even if the returns are low.
5	It is important to set goals for my investments (e.g., retirement, Hajj, children's education, etc.)
6	I will borrow money to finance my investments if I think they could give high returns.
7	My main concern is the stability of investment growth.
8	I will increase my investment whenever I have the positive feeling that the price of the investment will continue to rise.
9	I think it is too risky to invest in stocks without getting regular dividend income.
10	When I am thinking about risk, I also think about possible losses.
11	I would like to know that my investments do not drop in value.
	Segment 3: Risk Propensity (Questions 12-19)
12	If I have RM5k to invest, I am more likely to choose an investment that gives an RM3k return with a 10% chance of occurrence compared to an RM1k return with a 90% chance of occurrence.
13	In a 2-round competition, the winner of the 1st round can either take home an RM5,000 cash prize OR proceed to the 2nd round with a chance of winning RM10,000. If I win the 1st round, I am more likely to choose to proceed to the 2nd round for a bigger win.
14	I am more likely to invest in high-growth companies with little or no dividends compared to slow but steady-growth companies with stable dividends.
15	I am likely to choose a loan with a floating interest/ profit rate compared to a lower but fixed interest/ profit rate.
16	I am more likely to maximize my investment in capital-protected funds (e.g., ASB) prior to investing in funds with no capital protection.

No.	Indicators
17	I plan to sell my house, which is currently valued at RM300,000. But if I wait a little longer and spend RM100,000 on renovations, the selling price could potentially reach RM600,000.
	Although there is some talk of highway construction works next to the house, which would lower its value considerably, I would most likely proceed with the renovations to fetch the higher selling price.
18	I do not mind putting more than 50% of my savings into risky investments like cryptocurrencies (e.g., Bitcoin) or stocks.
19	I am now more likely to put my money solely in capital-protected funds like fixed deposits, money market funds or ASB.

Segment 4: Financial Literacy (Questions 20-25)

20	I keep track of my money by doing regular budgeting.
21	I conduct market research to find the best financial product, such as loans or insurance rates.
22	I know how much money should be set aside as my emergency fund.
23	I am aware of the importance of saving for my future.
24	I will record all my spending throughout that month.
25	I have knowledge of different types of investments like unit trust funds, shares and properties.

Segment 5: Risk Capacity (Questions 26-31)

26	After deducting living expenses from my earnings, I am able to save money regularly.
27	After deducting living expenses from my earnings, I am able to fulfil my financial obligations timely.
28	I can wait several years for my investments to recover from the effects of a poor economic situation.
29	If I stop working for a year, I am still able to fulfil my financial obligations.

No.	Indicators
30	I don't need to sell off more than 20% of my total investment portfolio to meet any major financial goals in the next three years.
31	I am covered by a comprehensive medical insurance plan(s).
	Segment 6 – Demographic (Questions 32-36)
32	Please select your income level per month. 1. Less than RM5,000 2. RM5,000 to RM20,000 3. More than RM20,000
33	Please state your gender. 1. Male 2. Female
34	What is your marital status? 1. Not married/Others 2. Married
35	What is your highest qualification in education? 1. Certificate/Diploma 2. Degree (Bachelor, Master, Doctorate) 3. Others
36	What is your employment status? 1. Retired 2. Part-time 3. Full-time 4. Self-employed 5. Others